# GOVT. COLLEGE OF TEACHER EDUCATION, THYCAUD, THIRUVANANTHAPURAM

**INNOVATIVE PRACTICES**

**BY**

# DEPARTMENT OF COMMERCE

## GRAPHIC ORGANIZER BASED INSTRUCTIONAL PRACTICES

## 2017-18

**TITLE OF THE PRACTICE: GRAPHIC ORGANIZER BASED INSTRUCTIONAL PRACTICES**

**THE CONTEXT THAT REQUIRED INITIATION OF THE PRACTICE**

In this technological era, teachers will have to learn and practice new pedagogies capable of maintaining high standards in the face of India's socio cultural diversity and economic disparity. If we expect students to learn appropriate competencies and skills, we must structure the learning environment so that these can be addressed and practiced. For this, appropriate pedagogic practices and episodes of teaching and learning need to be evolved besides keeping track of child's interests and needs.

Graphic organizers are shape-based diagrams that organize students' thoughts. Graphic organizers help students sort, differentiate, show relationships, make meaning, and manage data quickly and easily before, during, and after reading and discussion. This method is can be adopted as an effective method of instruction. Our students use graphic organizer based instructional strategy during their teaching practice course. The prospective teachers know the effectiveness of this approach as they learnt through this method during their course of study.

The Graphic Organizers, an instructional processing tool for:

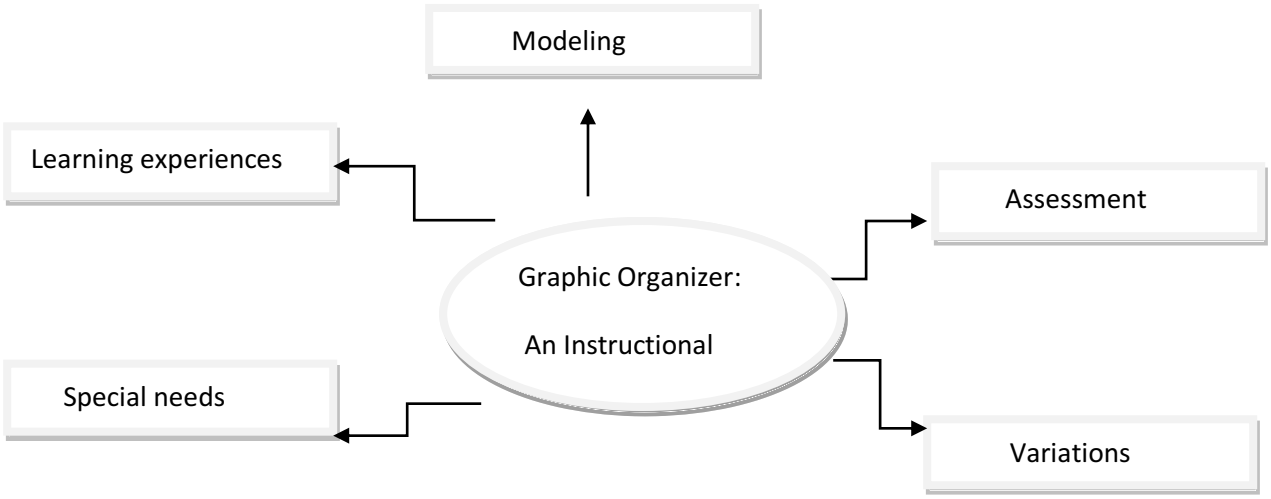

**Figure 2.6 Graphic Organizer: An Instructional Processing Tool**

- **Modeling:** It is critical to model Graphic Organizer when you present it in to the class.
- **Learning Experiences**: Graphic Organizers can be effective used or individual and small group instruction through which they provide a structure for the students.
- **Assessment:** Assessment should be reliable and varied. Graphic Organizers can be easily used for classroom assessment.
- **Special needs**: Students with special needs often have difficulty decoding and comprehending text and developing vocabulary.
- **Variations**: Students may have several variations of the same organizer for a given topic or subject. Further some students are more visually oriented than others.

## 2 ARCHITECTURE FOR SCULPTURING GRAPHIC ORGANIZERS

A graphic organizer is a visual display that is used to depict the relationships between facts, terms and/or ideas within a learning task. They form a powerful visual picture of the information and allow the young mind to discover patterns and relationships it otherwise may have missed. It uses visual symbols to convey meaning. Its purpose is to facilitate learning by presenting the most complete picture of all the available facts and the potential relationships that could develop among them.

Graphic Organizers can be constructed with a number of different structures or designs. They are called by different names such as knowledge maps, concept maps, story maps, cognitive organizers or concept diagrams. Important aspects of Graphic Organizers can make curriculum more

supportive of students and teachers as it allows them to actually see rather than have to imagine the possibilities contained within. The following are the structural design for sculpturing Graphic Organizers for integrating concepts and ideas.

- **Step 1**
- Orienting students to organize ideas in a Graphic Organizer so that they understand how to proceed. Use material from a recent lesson so that students are familiar with the vocabulary and concepts and can concentrate on seeing the relationships and understanding how to display them graphically.
- **Example:** Comparing and Contrasting Characters with a Venn diagram
- The teacher drew the Venn diagram on the board, explained to students where the categories of information would go, and first had students meet in small groups to discuss aspects of two characters from a novel they were reading. Next, groups reported the results of their discussions, and as they mentioned character traits, the teacher put the information in the appropriate places in the diagram.
- **Step 2**
- Model for students as to how they should use the information in the organizer for an appropriate learning purpose, such as a study aid or as a way of organizing a response to a test question.
- **Step 3**
- After constructing a few Graphic Organizers with students and shows them how to use the completed organizer for a specific purpose, put them in small groups,

and give each group a blank organizer to complete the given task. Have them work together to fit the information in to the structure and use the completed organizer for a specific purpose. Have groups share their work and discuss any differences in their completed organizers. Do this several times until students are comfortable using the organizing structures you provide.

- **Step 4**
- **S**tudents provide practices in constructing their own Graphic Organizers in small groups to accomplish specific learning purposes. For example, the class that learned to use a Venn diagram as the basis for designing a computerized compare- contrast presentation was given several additional assignments to construct and use a Venn diagram to design similar presentations to compare and contrast characters from other works of literature they had studied as a class.
- **Step 5**
- After providing students with information, such as a selection to read or a video, have students work in small groups to decide how they could organize the information graphically. Have groups share their organizers and discuss the kinds of thinking that went into their decisions. Do this several times with different texts to give students practice in deciding for themselves, how to organize information graphically.
- **Step 6**
- Give students opportunities to use Graphic Organizers in different content and contexts so that they have practice using these visual aids in various contexts.
- **2.3.3 EXHIBITION AND DESCRIPTION OF GRAPHIC**

**ORGANIZERS**

- Graphic Organizers come in many different forms, each one best suited to organizing a particular type of information. The following examples are merely a sampling of the different types and uses of Graphic Organizers.

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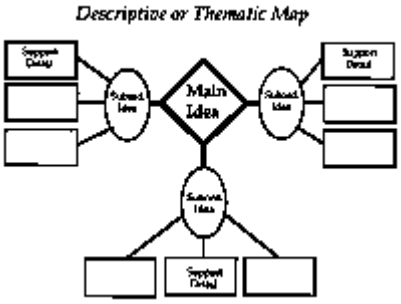


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**❖Figure 2.7 Descriptive Thematic Map**

- This Graphic Organizer is made up of a series of shapes in several rows. The top row is made up of a diamond in the center with two circles, one on each side, and two vertical rows of rectangles, one on each outer side. The diamond is labeled "Main Idea." The two circles are each labeled "Sub board. Idea" and the top rectangle of each outer row is labeled "Support Detail." Underneath the center diamond is a circle and beneath the circle is horizontal row of three rectangles. The circle is labeled "Sub board. Idea" and the center rectangle is labeled "Support Detail." Lines connect the center rectangle is labeled "Support Detail." Lines connect the shapes of the Graphic Organizer.

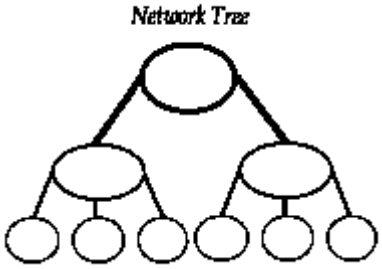



**Figure 2.8 Network Tree**

- This Graphic Organizer is entitled "Network Tree" and is made up of a series of ovals of two different sizes. At the top are three large ovals, one above a row of two. They are connected by two black lines. At the bottom are two rows of three smaller ovals. One row of three is connected by black lines to a larger oval above them on the right, and one set of three is connected by black lines to a larger oval above them on the left.

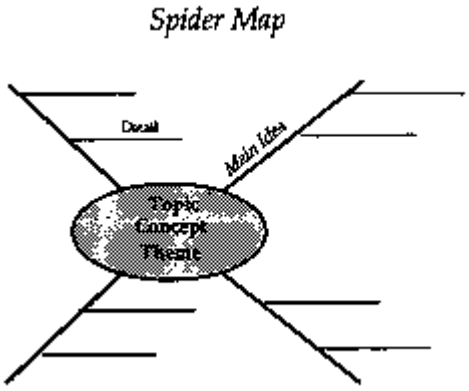



**Figure 2.9 Spider Map**

- This Graphic Organizer is entitled "Spider Map" and is made up of a large, central oval with four sets of black lines extending from it. The central oval is labeled "Topic, Concept, and Theme." Four slanted lines extend from the

oval, and each one has two horizontal lines attached. Along the side of the slanted line at the top right of the Graphic Organizer is the label "Main Idea." On one of the horizontal lines at the top left is the label "Detail."

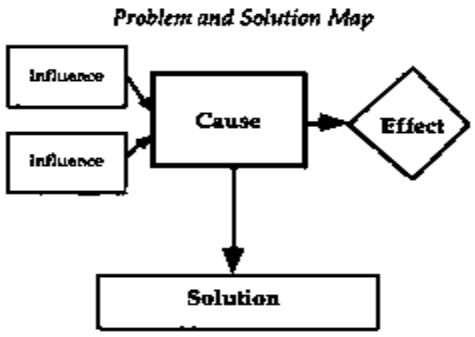



**Figure 2.10 Problem and Solution Map**

This Graphic Organizer is entitled "Problem and Solution Map" and is made up of a series of boxes. On the left, a vertical row of two boxes have arrows pointing to a larger box in the center of the Graphic Organizer. Each of the two boxes are labeled "Influence." The center box is labeled "Cause." An arrow points from the center box to a diamond on the right. The diamond is labeled "Effect." An arrow points from the bottom of the center box to a rectangle beneath it. The rectangle is labeled "Solution."

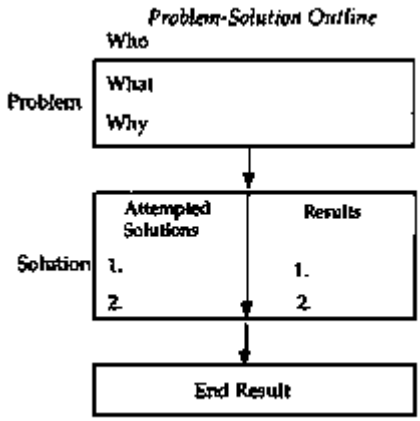
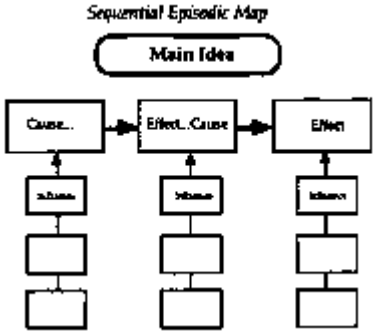



**Figure 2.11 Problem Solution Outline**

- This Graphic Organizer is entitled "Problem-Solution Outline" and is made up of a vertical row of three rectangles. To the left of the top rectangle is the label "Problem." The word "Who" appears at the top right corner, and the words "What" and "Why"

appear within the rectangle. An arrow points from the top rectangle to the one in the middle. The middle rectangle is larger than the other two. An arrow cuts through the center of the rectangle, pointing down. To the left of the rectangle is the label "Solution." Within the rectangle, on the left, the words “Attempted Solutions" appear, with the numbers one and two beneath. Within the rectangle, on the right, the word "Results" appears, with the numbers one and two beneath. An arrow points from the center rectangle to the one beneath, which is labeled "End Result."




❖ **Figure 2.12 Sequential Episodic Map**

This Graphic Organizer is entitled "Sequential Episodic Map" and is made up of an oval at the top and three vertical rows of boxes beneath. The oval is labeled "Main Idea." The top box on the left is labeled "Cause..." The top box in the middle is labeled "Effect...Cause..." The top box on the right is labeled "Effect..." Lines connect the boxes beneath, and arrows point from the rows to the top boxes. Each box in the second row is labeled "Influence."

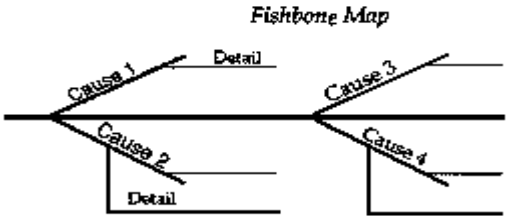


**Figure 2.13 Fishbone Map**

This Graphic Organizer is entitled "Fishbone Map" and is made up of a series of horizontal and slanted lines. In the center of the Graphic Organizer, is a thick black line with two sets of two slanted lines extending from it in the shape of two arrows pointing to the left. The arrow's lines on the left are labeled "Cause 1" on the top and "Cause 2" on the bottom. The arrow's lines on the right are labeled "Cause 3" on the top and "Cause 4" on the bottom. A horizontal line extends from the top of each arrow. The horizontal line on the left is labeled "Detail." Two horizontal lines extend from the bottom of each arrow. The bottom line on the left is labeled "Detail."

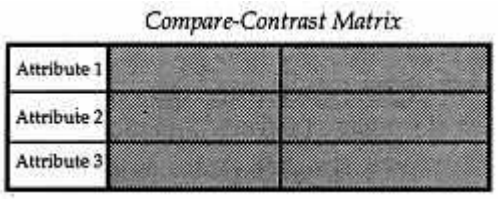
❖ 


**Figure 2.14 Compare- Contrast Matrix**

❖ This Graphic Organizer is entitled "Compare-Contrast Matrix" and is made up of a table with three columns and three rows. In the column on the left, the first table cell of each row is labeled "Attribute 1," "Attribute 2,"and "Attribute 3," from top to bottom. The rest of the table cells are shaded grey.

**OBJECTIVES OF THE PRACTICE**

Objectives of the practice are given below:

- To help learners in active construction of knowledge
- To equip our teacher educands with efficient ways of teaching
- To enhance cooperation among students
- To improve meta cognitive skills of our students
- To enhance higher order thinking skills of prospective teachers

## RESOURCES REQUIRED

The success of this method rooted in the preparation of suitable graphic organizers. Collective efforts from the part of both teacher and students are essential for ensuring this as best practice.Graphic organizers sould be prepared with atmost care.Otherwise it will fail to produce intended results.Assistance of supervising teachers will give cofidence and appropriate direction for the students.

## THE PRACTICE

The practice of applying graphic organizers undergone mainly 3 stages. They are discussed below:

### a) With in the class:

We adopt graphic organizers for teaching Commerce curriculum for teaching teacher educands. It will provide them needed guidance for taking classes based on graphic organizer based instructional strategy. They become aware of preparations needed and steps through which the process of instruction should proceed.

### b) Outside the class

Students adopt the graphic organizer based instructional practice during their teaching practice session. They prepared needed instructional materials under the supervision of teachers. They cooperatively worked for peers and created meaningful graphic organizers.

### c) Evaluation

The students took classes based on graphic organizer based practices. School students very actively participated in this practice. The classes were very dynamic as this method ensure active participation both teacher and learners. The classes were evaluated by supervising teachers. Peers also given opportunity to evaluate their classmate’s performance.

## OBSTACLES FACED IF ANY AND STRATEGIES ADOPTED TO OVERCOME THEM

Additional time needs to be allocated to guide students in graphic organizer based methods. Sometimes students find it difficult to prepare suitable graphic organizers. Creative ideas forms

the backbone of preparation of graphic organizers. But practices for enhancing creativity are lacking in normal classrooms. Supervision of experts can cure this problem by giving adequate training on creation and application of graphic organizers in time bound manner.

**IMPACT OF THE PRACTICE**

1. It gave opportunity for learners to work actively to construct their understanding
2. This method facilitated visual thinking as it represents what the learner understands
3. Graphic organizer based strategy made thought and organization of thoughts visible and lead to deeper understanding
4. It helps process and restructures thoughts and information.
5. Graphic organizer based strategy facilitated elicitation, explanation of a concept. It promoted recall and retention of our teacher educands to a great extend.
6. This method facilitated conceptual change and meta cognition skills.
7. Cooperation and friendship among prospective teachers improved a lot through this practice.

**GOVT. COLLEGE OF TEACHER EDUCATION, THYCAUD, THIRUVANANTHAPURAM**

**BEST PRACTICES**

**BY**

**DEPARTMENT OF PHYSICAL SCIENCE**

# Do you know what happened today in History of Science?

**2017-18**

## TITLE OF THE PRACTICE: DO YOU KNOW WHAT HAPPENED TODAY IN HISTORY OF SCIENCE?

### *THE CONTEXT THAT REQUIRED INITIATION OF THE PRACTICE*

This is an attempt to develop the ability to think divergent in the context of teaching learning science by students at the secondary level. Contributions made by scientists and their enthusiasm can be greatly influence secondary school children. When the prospective teachers under my guidance when trained a work related to the days of importance in science was under discussion when unit 1 of 04.08 Theoretical Bases of Teaching Physical science made in the classroom. Only few days were known by the students. Then we decided to prepare a material in a compiled form about 365 days of importance in science as part of academic work done to be done by the Physical Science Association of 2017-18 batch. As it is two- year course students from 2017-19 batch and 2016-18 batch together contributed to this work. This was a huge work done within a period of nine months from 2017 December to 2018 August. Even though it was started in the year 2017 it could be completed in 2018.

### *OBJECTIVES OF THE PRACTICE*

- To develop interest in science
- To enhance the knowledge in the field of history and inventions in science of student teachers
- To develop comprehensive report writing ability and editing materials for compilation

### *THE PRACTICE*

The information regarding days importance in science and it will serve as a source of information for anyone who is interested in science teaching and learning.

**JANUARY**

Named after the Roman God of beginnings and endings "Janus", January is known as chilly month, human resource month, natural eye care month, national volunteer blood donor month, national egg month. Every New Year starts with the month January.

**JANUARY: 1**

New Year's Day is observed on January 1, the first day of the year on the modern Gregorian calendar as well as the Julian calendar used in ancient Rome.

Edward Joseph Hoffman Born on Jan 1, 1942 Died on July 1, 2004

Edward Joseph Hoffman is the American biomedical physicist who helped to create PET (Positron Emission Tomography) scanner which is used to detect cancers and other diseases. PET Technology can also be employed in the diagnosis of cardio vascular disease, cancers and Alzheimer's disease. He became internationally known in the field of medical imaging.

Satyendra Nath Bose Born 1 Jan 1984 Died 4 February 1974

Indian physicist and mathematician who collaborated with Albert Einstein to develop the theory of statistical quantum mechanics, now called Bose-Einstein statistics. Bose wrote about planks black body radiation law using a quantum statistic of photons, Planks law and the light quantum hypothesis. He worked on X-ray diffraction, electrical properties of ionosphere and thermo luminescence.

Eugine Paul Wigner Died 1 January 1995 Born 17 November 1902

Hungarian American physicist who shared the 1963 Nobel Prize for physics for his insight to quantum mechanics, for his contributions to the theory of the atomic nucleus and the elementary particles particularly through the discovery and application of fundamental symmetry principles played a prominent role in the development of atomic bomb.

Johan Bernoulli Died on 1 January 1748 Born on 6 Aug 1667

He is the Swiss mathematician who is noted for his discovery of the exponential calculus and the equation of centenary.

**Events**

- Eniac: In 1946, ENIAC, the first U S computer was furnished by John Mauchaly

and J. Prespel Eckerc. It is regarded as the first successful general digital computer.

- Indian standard time: In 1906, in British India, all the railway and telegraph clocks were put at Indian standard time.
- Radio broadcast: In 1902, the first radio broadcast demonstration in U.S was given by Nathan. B. Stubblefied. His voice was the first to be carried in theairwaves.
- X-rays: In 1896, German scientist, Wilhelm Rontgen announced his discovery of X-rays.

**JANUARY : 2**

Donald B Keck: Born 2 Jan 1941

American research physicist who with his colleagues invented fused silica optical wave guide- optical fiber. This was a break through creating a revolution in telecommunications, capable of carrying 65000 times more information than conventional copper wire.

Albert. C. Barnes – Born 2 January 1872 – Died 24 July 1951

Albert looms Barnes was an American chemist who invented the antisepticArgyrol, a silver protein compound used in aqueous solution as a topicalantiseptic.

Rudolf Claussius – Born 2 January 1822 – Died 24 August 1888 He was one of the founders of thermodynamics. In 1850, he stated the second lawof thermodynamics. Claussius-Clapeyron equation expresses the relation betweenthe pressure and temperature at which two phases of a substance are inequilibrium.

Charles Hatchett – Born 2 January 1765 – Died 10 Mar 1847

English chemist who discovered an element he called columbium in 1801.

**Events**

- Solar system age: In 1960, John Reynolds set the age of the solar system at 4,950,000,000 years
- Luna 1: In 1959, the first lunar space shot to escape the Earth's gravitational pull , the unmanned Luna 1, was launched by the soviet union. It passed to within4600 miles of the moon before moving on to a solar orbit.
- Night vision Tube: In 1936, the first electron tube to enable night vision wasdescribed in St. Louis, Mo

- Chicago canal: In 1900 the Chicago canal was opened.

**JANUARY 3**

William Wilson Morgan – Born 3 Jan 1906–Died 21 Jun 1994

American astronomer, who in 1951 provided the first evidence that the Milky Way galaxy has spiral arms. He invented the UBU system of magnitudes and colors.

Robert L banks –Died 3 Jan 1989 –Born 24 Nov 1921

American Chemist who co-discovered crystalline polypropylene polymer, with J.Paul Hogan.

Charles Augustus Young –Died 3 Jan 1908 –Born 15 Dec 1834

American astronomer who made the first observation of the flash spectrum of the sun, proved the gaseous nature of the sun's corona and discovered the reversing layer of the solar atmosphere.

**Events**

- Electric watch: In 1957 the world's first electric watch was introduced in Lancaster, PA by the Hamilton watch company.
- Artificial transmutation of elements: In 1919, Prof. Ernest Rutherford succeeded in splitting the atom by bombarding nitrogen atoms with alpha particles emitted by radio active materials he transmuted the nitrogen atoms in to oxygen.

**JANUARY 4**

Brian D. Josephson –Born 4, 1940

Brian David Josephson is a hellish physicist who discovered the Josephson effect (1962) a flow of electric current as electron pairs called cooper pairs, between two superconducting materials that are separated by an extremely thin insulator. He was awarded a share of 1973 Nobel prize for physics.

Erwin Schrodinger Died 4 Jan 1961 Born 12 Aug 1887

Austrian theoretical Physicist who shared the 1933 Nobel Prize for physics with the Physicist, P M Dirac. He made a major contribution to the development of quantum mechanics Schrodinger realized the possible orbits of an electron would be confined to those in which its matter waves close in an exact number of wave length. This provided an explanation for discrete lines in the spectrum of exited atoms

Rudolph Leo B. Minkowski Died 4 Jan 1976 Born 28 May 1895

German astronomer who studied, distributions and motions of planetary nebulae and more than doubled the number known. He was awarded the Bruce Medal in 1961 for distinguished services to the army.

**Events**

- Martiar Rover: In 2002 spirit, a robot rover landed on Mass to analyze the planets rocks looking for evidence of water.
- Sputnik: In 1958, the Russian sputnik & Satellite, the first manmade object to orbit the earth, fell back into the atmosphere and disintegrated after 92 days in space. It was launched from Kazakhistan.
- Moon. In 1912, the closest approach to earth by moon was 221, 441 meters apart center to center.

**JANUARY 5**

Edmond Ruffin: Born 5th Jan 1794 Died 18th June 1865

The father of soil chemistry in the U.S., who have shown how to restore fertility of the depleted soil.

Harold C. Urey: Died 5th Jan 1981 Born 29th Apr 1893

American Scientist awarded the Nobel Prize for chemistry in 1934 for his discovery of deuterium, the heavy form of hydrogen (1932). He was active in the development of atomic bomb. He calculated the temperature of ancient oceans from the amount of certain isotopes in fossil shells.

Max Born: Died 5th Jan 1970 Born 11th Dec 1882

German- British Physicist who shared the Nobel Prize for Physics in 1954 for his statistical formulation of the behavior of subatomic particles. His studies of the wave function led to the replacement of the original Quantum theory, which regarded electrons as particles, with a mathematical description.

**Events**

- International Polio Initiative : In 2000 the WHO announced the final stage of the world wide initiative to eradicate Polio.
- X Rays: In 1896, the discovery of X rays was Published in an Austrian Newspaper, weiner presse. This was the first public account of the observation made on 8th Nov 1895 by German Physicist Wilhem Roentgen, of the new form of radiation that become known as X rays.
- Aurora photographed : In 1892, the first successful auroral photograph was made by the German Physicist Martin Brendel.

**JANUARY 6**

Anselme Payen: Born 6th Jan Died 12th May 1871

French Chemist who made important contributions to industrial chemistry and discovered cellulose, a basic constituent of plant cells.

Vladimir Ivanovich Vernadsky: Born 12th Mar 1863 Died 6th Jan 1945

Russian Geochemist and Mineralogist who was a founder of the specialist sciences of geochemistry and biochemistry.

Georg Cantor: Born 3rd Mar 1845 Died 6th Jan 1918

Georg Cantor was a Russian- German Mathematician who created modern set theory and extended it to give the concept of transfinite numbers with cardinal and ordinal number classes.

Gregor Mendel: Born 22nd July 1822 Died 6th Jan 1884

Gregor Johann Mendel was an Austrian Botanist, genetist and monk who pioneered in the study of heredity.

Louis Braille: Born 4th Jan 1809 Died 6th Jan 1852

French educator who developed a tactile form of printing and writing known as Braille since widely adopted by the blind.

**Events**

- Telegraph: 1838, Samuel Morse with his partner Alfred Vail gave the first public demonstration of their new invention electric telegraphic system at the Speedwell Ironworks in Morristown, New Jersey.

**JANUARY 7**

**John Ernest Walker** : born 7th January 1914

British chemist who shared the Nobel prize for chemistry 1977 for his pioneeringwork on how the enzyme, ATP synthetase catalysis the formation of high energy compound adinatine triphosphate.

EIlhardt MITcherlich: Born 7th January 1794 Died 28th feb 1863

German chemist who promulgated the theory of isomorphism, a relationship between crystalline structure and chemical composition

Vladimir Prelog: Died January 7, 1998 Born 23 july 1906

Yugostrian Swiss chemist shared the 1975 Nobel prize for chemist for his work onthe stereochemistry of organic molecules and reactors.

Jerome.L.Murray: Died 7th Jan 1998 Born 29 Aug 1912
American inventor of the peristaltic pump that made open heart surgery possible

Niksta Jelsa: Died 7th jan 1943 Born 10 July 1856

Serbian American inventor and researcher who designed and built the firstalternating current induction motor in 1883.

Sir.Alfred Euring: Died 7th Jan 1935 Born 27th Mar 1885

Sir James Alfred Euring was a Scottish physicist who discovered and named hysteresis, the resistance of magnetic materials to change in magnetic force.

**Events**

- Francium: In 1930, the element Francium [Fr] was discovered the last naturally occurring element is to be founds. Ti is the heaviest alkali metal atom, with atomic number 87. Marguerite Perey gave the name francium
- Thermal cracking palent: In 1913 , a U.S patent for the thermal cracking ofCrude oil was issued to Meriam Burton.
- Moon craters: In 1610 Galileo dated his first letter described telescope observation in which he saw the moons cratered surface using Sis 20 powered spy glass.

**JANUARY 8**

Stephem .W. Hawking: Born 8th january1942

English theoretical physicist who is one of the world's leaders in this field. His principal areas of research are theoretical cosmology and quantum gravity. Hawking wrote the book "a brief history of June"

Johannes pabricius: Born 8th Jan 1587 Died 1615
Dutch astronomer who was perhaps the first to observe sunspots.
Aleksander Milkhaylovich Prokhorov:
Sovcet physicist who received Nolbel prize for physics in 1964, " for fundamental work in the field of Quntam electronics which has lead to the construction of oscillators and amplifier based on the maser- laser principle"

Galileo Galile: Died 8 Jan 1642 Born 15th feb 1564

Italians natural philosopher who applied new techniques of the scientific method to

make significant discoveries in physics and astronomy.

**Events**

- Nicotin: In 1998, scientists announced the identification for the first time of a key brain chemical related nicotine addiction in the journal 'Nature'.
- Superfluidity of liquid Helium: In 1938, the super fluidity of liquid Helium at a temperature near absolute zero was reported in the journal 'Nature'.
- Spectrophotometer: In 1935 the first U.S patent for a spectrophotometer was issued to Prof.arthur ebb Hardy of wellesly mass (no: 1987441) which he called a photometric apparatus.

**JANUARY 9**

Hargobind Khorana : Born 9 january 1922 Died 9 November 2011.
Hargobind Khorana was an Indian- American biochemist, who shared the 1968 Nobel Prize in physiology or Medicine "for their interpretation of the genetic codeand its functions in protein synthesis".

John. B. Watson: Born 9 january 1878 Died 25 september 1958.

John Broadus Watson was an American Psychologist whose ideas initiatedbehaviorism as a branch of psychology.

Kenichi Fukui: Died January 9, 1998 Born October 4, 1918. Japanese chemist who shared the 1981, Nobel Prize for chemistry for investigation of the mechanisms of chemical reactions.

**Events**

- Ashen light of Venus – In 1643 Giovanne Riccoli first reported the phenomenon known as the Ashen Light of Venus. It is said to be a faint luminescence on thenight side of the planet, similar in appearance to "earth shine" on the moon, although not so bright.
- Stellar Parallax- In 1839, the Scottish Astronomer Royal, Thomas Henderson published the results of his measurement the first made of a stellar parallax. He observed the star

Alpha centaury from the cape of good hope South America.

- Moon Probe- In 1 968 the surveyor 7 space probe made a soft landing on themoon, the fifth and final space craft of the surveyor series to do so.
- Concorde- In 1969 the supersonic Concorde jetliner made its first test flight at Bristol, England.

**JANUARY 10**

Robert Woodraw Welson- January 10, 1936(Born)

American radio Astronomer who shared the 1978 Nobel Prize for physics for their discovery of cosmic microwave background radiation using a microwave hom antenna at Bell Laboratories , Holondel, NewJessy.

Frederic gardner lot :Born 10 January 1877 Died 16 november 1948.
American educator and scientist who invented the industrial electrostaticprecipitator which eliminates suspended particles from streams of gases.
Nicholas Joseph Callan: Died 10 January 1864 Born 22 december 1799
Irish physicist who pioneered in electrical science. He invented the induction coil before that of better known Henrich Ru
Carolus Linnaeus: Died 10 January 1778 Born 23 may 1707.

Swedish Botanist and explorer who was the first to establish a precise gological classification with a uniform system for naming organisms by ginera and species of organism.

**Events**

- Polio Verlis Isolated: In 1947 Stanford university reported the isolation of the polio verlis after 3 years of research funded by the national foundation for infantile paralysis.
- Bessemer Patent: In 1855 English inventor Henry Bessemer took out a British patent for his decarbonization process, utilizing a blast of air that revolutionized steel manufactuaring.
- Underground passenger Railway: In 1863 Londans Metropolitan the world's first underground passenger railway opened to fare paying passenger.
- Texas Oil- Texas oil was made at spindletop, near Beaniont
- Edism patent – In 1922 Thomas A Edison was issued a U S patent for a storage Battery electrode and the production of the same.

**JANUARY 11**

Albert Hofmann : Born 11 January, 1906 Died 29 April, 2008

Swiss pharmacologist who discovered LCD (Lysergic acid diethylamide)

George Washington Pierce : Born 11 Jan, 1872 Died 25 Aug, 1956

American inventor who was the pioneer in radio telephoning and a notedteachers of communication engineering

Care David Anderson: Died 11 Jan, 1991 Born 3 Sep, 1905

American physicist who shared the Nobel prize for physics in 1936 for discoveryof the positron, or positive electron, the first known particle of antimatter.

Isidor Issac Rabi : Died 11 Jan, 1988 Born 29 Jul, 1898

Austrian American physicist who was awarded the Nobel prize for physics in 1944 in invention of the atomic and molecular beam magnetic resonance methodof measuring magnetic properties of atoms, molecules and atomic nuclei.

Theodar Schwann : Died 11 Jan, 1882 Born 7 Dec, 1810

German physiologist, who is the founder of cell theory.

**Events**

- Alizarin – In 1869 the first samples of alizarin, synthetically prepared by Carl Graebe and Carl Lieberman were presented at the Berlin chemical university.
- Uranus moon – In 1787, William Herschel, the German Astronomer discovered the first two moons of Uranus, six years after he had discovered the planet, on March 1781.

**JANUARY 12**

Jan Baptista Van Helmont : Born 12 Jan, 1579 Died 30 Dec,1644

Belgian chemist, physiologist and physician who recognized the existence of different gases and identified CO2. He was a part of medieval alchemist and past scientist.

Antonio de Uleoa : Born 12 Jan, 1716 Died 5 Jul, 1795

Spanish scientists and naval officer who discovered the element platinum (at no. 78)

Paul Muller : Born 12 Jan, 1899 Died 12 Oct, 1965

Swiss chemist who received the Nobel prize for physiology or medicine in 1948, for discovering potent toxic effects on insects of D.D.T

**Events**

- First Hispanic astronaut : In 1986 the shuttle "Columbia 7" blasted off with a crew that included the first Hispanic American in space. Dr. Franklin R. Chang – Diaz and U.S Bill Nelson, D- Fla. It was the 24th space shuttle mission.
- Nuclear test: In 1965, at 10:58 am PST,scientists conducted what they called a "controlled excursion" burning up a nuclear rocket in Nevada. It produced a radioactive cloud over Los Angeles.
- Edison Patent: U.S patent for Thomas A.Edison
- 1919- for method and means for improving the Rendition of musical compositions
- 1909- Waterproofing paint for Portland cement building
- 1897- Phonograph
- 1886- Electrode for telephone transmitter.
- First U.S photograph was taken in 1896, by Dr.Henry Louis Smith which showedthe location of a bullet in the hand of a corpse, using a 15 minute exposure.
- Wireless message: In 1908, a wireless message was sent long distance for the firsttime from the Eifel tower in Paris.

**JANUARY 13**

Sydney Brenner,1927: South African biologist who the Nobel Prize in physiology or medicine in 2002 for their discoveries concerning how the genes regulate organ

development and programmed cell death(apoplosis)

Wilhelm Wien, 1864: German physicist who received the Nobel Prize for physicals in 1911 for his displacement law concerning the Radiation emitted by the perfectly efficient blackbody.

Peter Waage, 1900: Norwegian chemist who, with his brother-in-law Cato Guldberg published the mass action law in 1864.

**Events**

- Callisto: In 1610, Galileo Galilee discovered calisto the fourth satellite of Jupiter.
- First one kilometer circuit flight: In 1908, Henry forman, an English born French man, flew the first one Km circuit, winning the grand prize de Aviation and its 50,000 frane-purse.
- Plastic automobile patent: In 1942, the first us patent for construction of a automobile using plastic was issued to Henry Ford of Dearbrn
- Female astronauts: in 1978, NASA selected its first U.S women astronauts.

**JANUARY 14**

Shannon Lucid,1943: American biochemist and astronaut who stayed abroad the Russian space station Mir in 1996 for a record breaking 188 days.

Ernst Abbe,1905: German physicist who established a technical and theoretical foundation for the design of optical instruments.

Cato Maximillian guldberg, 1902: Norwegian chemist formulated the law of mass action which deals the effect of concentration, mass and temperature on chemical reaction rates.

Charles Hermite, 1901: French mathematician who provided the first solution to the general fifth degree eqn, the quadratic equation.

Johann Philip Reis, 1974: German physicist whose invention of an early telephone proceeded Bell's work.

Colin Maclaurin, 1746: Scottish mathematician who developed and extended Sir. Isaac Newton work in calculus, geometry and gravitation.

**Events**

- Huygens probe lands on Titan: In 2005 Huygens space probe landed on Titan, Saturn's largest moon

- Aristotle's cyceum found: In 1997, the discovery in Athens of cyceum where the philosopher Aristotle taught, 2500 years ago was confirmed by Greece's minister of culture.

- Telephone: In 1878, the first demonstration of Alexander Graham Bell's phone to queen Victoria at her Osborne house estate on the Isle of Wight.
- L-Dopa: In 1970, L-Dopa (levodehydroniphenylamine) was reported to benefit about 5% of the patients in reversing the progress of Parkinson disease.

**JANUARY 15**

Edward Jeller: Born on 15 jan 1908.died on 9 sep 2003.

Hungarian American nuclear Physicist who participated in the production of first atomic bomb & this led the development of world's first thermonuclear weapon ,the Hydrogen bomb.

James Heller : Born on 22 August 1915,died on 15 jan 2007.

Canadian Americn physic who was pioneer researcher for the electron microscope.

Bernard Jacques Flusscheum-Born on 27 nov 1874,died 15 jan 1955He was German British organic chemist.

Henri Alexandric Dislandus: Born 24 jul 1853.died 15 jan 1948

French astrophysict who invented a spectroheliograph(1894)to photograph the sun in monochromatic light and made extensive studies of the solar chromospheres and solar activity.

**Events**

- Space Craft Dock**:**In1969,the first docking &two manned space craft took place between soviet soyuz 4 and soyuz 5.
- The Element Vaccum Tube: In 1907 the three element vaccum tube was issud a U.S. patent to its inventer Dr.Lee de Forest as a device for amplifying fieble electric currents such for example as telephone currents.
- Newspaper-In 1863woodpulp paper was first used in the U.s. for printed newspaper by the Bosten morning Herald of Bosten mass. Itwas a four page item column ewspaper that sold for 3 cents per copy.

**JANUARY 16**

Sir Arthur Percy Morsis Fleming:Born 16 Jan 1881,Died 14 sep 1960.

English engineering who was a major figure in developing techniques for manufacturing radar components.During world war 1,Flemming made important advances in submarine detection gear.

Lenor Michelis:Born 16 jan 1875,Died on 9 oct 1949.

He was german American chemist

Anders Gustav Ekberg:Born 16 jan 1767,Died 11 feb 1813

Swedishchemist who was in 1802 discovered the element Tantalum

Robert Hangberg Brown :Died jan 16 2002,Born 31 aug 1916

English astronomer who was a pioneer in radar and observational astronomy.In the 1950s he applied this to astronomy .In the 1950s he applied this experience to astronomy ,developing radio telescope technology at jodrell bank observatory and mapping stellar radio sources.

Robert R Wilson:Died 16 jan 2000,Born 4 march 1901

American physic st and inventor of the Vande Graff generator ,a type of high voltage electrostatic generator that can be used as a particle accelerator in atomic research.

Charles Ihurstan Hotland:Died 16 jan 1941,bornmar 1863

English Radiologist who pioneered theclinical use of x rays in the U.K.,beginning shortly after the Wilhelm Rontgen announced their discovery.

William Henry Pickering: Died 16 jan 1938,Born 15 Feb 1858

Americn astronomer who discoveredprobe,the ninth moon of Saturn (1899).This was the first planetary satellite with retrograde motion to be detected ie.,the orbital motion directed in an opposite sense to that of the planets.

**Events**

- Fermium: In 1953,a sample amounting to about 200 atoms of fermium (atomic number=100)was
- First made by ion exchange chromatography and identified at the university of

California,Berkely.

- Optical Pulsar Identified:In 1969,an optical pulsar was identified for the first time by university of Arizona astronomers led by Johnlocke and Michael Disney at steward observatory.
- U.S.S.R. Moon Explorer:In 1973,U.S.S.R'S Lunakhod 2 begins radio controlled exploration of the moon.
- Nasa names shuttle astronauts:In 1978,NASAnamed b5 candidates to fly on the space shuttle including sally k Ridi who became Americas first women in space in

space on 18 june 1983,gium s Blufrd who became Americas first lack astronaut inspace on 30 aug 1983.

**JANUARY 17**

Sir Ralph H Fowler -Born 17 Jan 1889 Died 28 July 1944

Ralph Howard Fowler was an English Physicist and astronomer whose university education in mathematics led him to working on thermodynamics and statistical mechanics with importance applications in physical chemistry. Fowler proposed that white dwarf stars exsist of a degenerate gas of extremely high density.

Sir James Hall - Born 17 Jan 1761 Died 23 June 1832

Scottish geologist and physicist who founded experimental geology by artificially producing various rock types in the laboratory.

Benjamin Franklin -Born 17 Jan 1706 Died 17 Apr 1790

American printer and publisher, author inventor and scientist, and diplomat. He becomes widely known in European scientific circles for this report of electrical experiments and theories. He invented a type of stove, still being manufactured to give more warmth than open fireplaces and the lightening rod. He used bifocal eyeglass also were his ideas.

Friedrich William Georg Kohlrausch-Died 17 Jan 1910 Born 14 Oct 1840

German physicist who investigated the properties of electrolytes and contributed to the understanding of their behaviour.

Clyde William Tombaugh - Died 17 Jan 1994 Born 4 Feb 1906

Clyde William Tombaugh was an American astronomer who discovered what was

then recognized as the planet Pluto, which he photographed on 23 Jan 1930,the only planet discovered in the 20th century, after a systematic search instigated by the predictors of other astronomers.

**Events**

- Synchrotron : In 1949, for the first time, full energy was released by the first synchrotron which was installed at the Radiation laboratory, University of California, Berkeley.
- Expanding Universe: In 1929,Edwin Hubble communicated the new classic paper that simply titled "A relation between distance and radial velocity among extra galactic Nebulae"-He listed the data that he plotted on a graph. It showed a roughly linear relationship between radial velocity for various galaxies and theirdistance.
- Photometer : In 1928, the first U-S patent for a fully automatic photographic film developing machine was issued to its inventor, it was an apparatus for developing film strips.

**JANUARY 18**

Peter Mark Roget -Born 18 Jan 1779 Died 12 Sep 1869

English Physician who in 1814 invented a "log-log" slide rule for calculating the roots and powers of numbers.

Joseph Dixon - Born 18 Jan 1799 Died 15 June 1869

American inventor and manufacturer who pioneered the industrial use of graphite and many other innovations.

Sir Edward Frank land : Born 18 Jan 1825 Died 9 Aug 1899

English chemist who was one of the first investigators in the field of structural chemistry, invented the chemical bond, an became known as the father of valency.

Hans Goldschmidt : Born 18 Jan 1861 Died 25 May 1923

German chemist who invented the the process which was adopted worldwide for welding railroad and streetcar rails, and is still in use for on-site welding.

Adolf Fredrick Johann Butenandt : Died 18 Jan 1995 Born 24 Mar 1903 German biologist who was the co-winner the 1939 Nobel Prize for chemistry forpioneering work on sex hormones ,primarily on the isolation of estrone.

James B. Nelson : Died 18 Jan 1865 Born 22 Jun 1792

Scottish inventor who introduced the use of a hot air blast instead of a cold airblast for the smelting of iron. His process reduced the amount of coal needed and increased the efficiency to satisfy the demands of the rail industries.

**Events**

- Solar cells : In 1994, the U S department of energy announced production of solar panels giving nearly twice the efficiency of existing panels.
- Liquid air : In 1895, James Dewar demonstrated the intimate connection between phosphorescence and photographic action of the electric light on bodies cooled to the temperature of cooling liquid air
- First U. S X-ray machine: In1896, news of William Roentgen's discovery of the astonishingly penetrating X-ray had only been revealed to the world earlier in the month.

**JANUARY 19**

Johann Elert Bode :Born 19, Jan 1747 Died 23, Nov 1826

German astronomer best known for his popularization of his Bode's law. In 1766, his compatriot Johann Tetus Had discovered a curious mathematical relationship in the distances of the planets from the sun.

James Watt : Born 19, Jan1736 Died 19,Aug 1819

Scottish instrument maker and inventor whose steam engine contributesubstantially to the Industrial Revolution. In 1763 he repaired the model of Newton's steam engine belonging to Glasglow university and began experimentson properties of steam.

Henri- Victor Regnault :Died 19 an 1878 Born 21 Jul 1810

French chemist and physicist noted for his work in the properties of gases. His invaluable work was done as a skilful through patent experimenter in determine the specific heat of solids,liquids,gases and the vapour tensions of the water and other volatile liquids, as well as their latent heat at different temperatures.

**Events**

- Neon advertising signs – In 1915, a U.S. Patent was issued to George Claude of Paris titled a “System of illuminating by Luminescent Tubes” which leads to the Neon sign.
- Solid air: In 1894, Prof. James Dewar exhibited several properties of liquid air and produced solid air, at the Friday meeting of the Royal Institution.

**JANUARY 20**

David M Lee :Born Jan 1931

David Morris Lee is an American physicist who, with Robert .C. Richardson and Douglas .D. Osheroff, was awarded the Nobel prize for physics in 1996 for their fount discovery of super fluidity in the isotope helium-3.

Edwin Eugene Aldrick: Born Jan 1930

American astronaut who set a record for extravehicular activity and was thesecond man to set foot on the moon.

Camille Jordan: Died 20 Jan 1922 Born 5 Jan 1838

French mathematician and engineer who prepared a foundation for group theory and built in the peer work of Everest gallous .

Mary Watson Whetney :Died 20 Jan 1921 Born 18 Sep 1838

American astronomer who trained with Maria Metchell and succeeded her as professor and director of the Vassar College Observatory.

**Events**

- Cloning : In 1998, American researches announced they have cloned calves that may p[roduce medicinal milk.
- Movie : !n 1929, the first full length motion picture in the U.S to be taken outdoors was released, titled old Arizona.
- X-rays : In 1896, X-rays were first used in a clinical setting, both in America and

Germany.

- Galileo: In 1633, Galileo at the 68, left his home in Florence , Italy, to face the Inquisition in Rome. By 22 Jan 1633 he buckled under the threats and interrogation by the Inquisition , and renounced his beliefs that the Earth revolvearound the Sun.

**JANUARY 21**

Konrad Bloch : Born 21 Jan 1921 Died 15 Oct 2000

Konrad Bloch was a German-American Geochemist who shared the 1964 Nobel prize for Physiology or Medicine with Feoder Lyman for their discoveries concerning the natural synthesis of cholesterol and of fatty acids.

Felix Hoffmann: Born 21 Jan,1868 Died Feb 1946

German chemist who discovered aspirin, while a researcher for Bayer and Co. At first he considered pharmacy but turned to chemistry.

Johann Fetch : Born 21 Jan 1743 Died 2 Jul 1798

American pioneer of steam boat transportation who produced service ablesteam boats before Robert Fulton.

H.L. Callender : Died 21 Jan 1930 Born 18 April 1863

Hugh Longlourese Callender was an English who was famous for work incalorimetry, thermometry and especially the thermodynamic properties of steam.

Cameleo Golgi : Died 21 Jan 1926 Born 7 July 1843

Italian physician and psychologist who in 1873 published his he discovery, theuse of silver salts to stain samples for microscopic slides.

**Events**

- Retin – A : In 1988 Retin-A got a boost when a study published in the journal of the American Medical Association said the anti-ache drug could also reduce wrinkles caused by exposure to the sun.
- Test-tube Triplets: In 1984, Britain's first test to triplets a girl and two boys were born to

a couple in London.

- Neptune: In 1979, Neptune became the overmost planet as Pluto moved on its highly elliptical orbit closer to the sun that Neptune's orbit.
- Magnesium: In 1941, the commercial production of magnesium first began in the U.S at
- Freeport, Texas. Magnesium, the lightest of all structural elements, was extracted from water through an electrolytic process.

**JANUARY 22**

Lev Davidovich Landaur : Born 22 Janouary 1908 Died : 1 April 1968

Soviet Physcict who worked in such fields as low temperature phywsics, atomic and nuclear physics and solid state stellar energy and plasma physics. He was awarded Nobel prize for his theory to explain the particular superfield behavior of liquid helium at very low temperature. His major contributions are Landaur diamagnetism and Landaur levels in solid state physics.

Louis Paschen : Born 22, January 1865 Died 25 Feb 1947

Louis Carl Henrich Fredrick Paschen was a germen physicist who was an outstanding experimental spectroscopist. In 1895 in a detailed study of the spectral series of helium, an element newly discovered on earth he showed the identical match with the spectral lines of helium as originally found in the solar spectrum. He is remembered for the Paschen series of spectral lines of hydrogen which he calculated in 1908.

Albert Wallace Hull : Died- 22 January 1966 Born 19 April 1880

American physicist who independely discovered the powder method of X-ray analysis of crystals (1917)which permits the study of crystalline material in a finely divided microcrystalline or powder state.

**Events**

- Space debris hits person on earth: In 1997, American Lattice William wasreportedly the first human to be stuck by remnant of a spacevechicle after re- entering the earth

atmosphere.

- Uranium Fission: In 1939, the uranium atom split for the first time using the cyclotron at Columbia University in New York City.

**JANUARY 23**

John.C. Polanyi : Born 23 Jan 1929

German – Canadian chemist and educator who shared the Nobel Prize for Chemistry in 1986 for contributions to the "development of a new field of research in chemistry – reaction dynamics".

Hideki Yukawa : Born 23 Jan 1907 Died 8 Sept 1981

Japanese physician and physicist who shared the Nobel prize for physics for his "prediction of the existence of mesons on the basis of theoretical work on nuclear forces".

Paul Peter Ewald : Born 23 Jan 1888 Died 22 Aug 1985

German physicist and crystallographer whose theory of X-ray interference by crystals was the first detailed, rigorous theoretical explanation of the diffraction effects first observed in 1912 by his fellow physicist Max Von Lave.

Otto Diels : Born 23 Jan 1876 Died 7 Mar 1954

Otto Paul Herman Diels was a German organic chemist who with Kurt Alder was awarded Nobel prize for chemistry in 1950 for their joint work in developing a method of preparing cyclic organic compounds.

Paul Langevin : Born 23 Jan 1872 Died 19 Dec 1946

French physicist who was to explain first (1905) the effect of paramagnetism and diamagnetism using statistical mechanics.

Johann Wilhelm Ritter who discovered the ultraviolet region of the spectrum(1801).

**Events**

- Voyager Aeroplane: In 1988,the experimental aeroplane 'Voyager' piloted by Duck Rutan and Jeana Veager completed the first non stop around the world without refueling.
- Animal to human heart transplant: In 1964,the first animal to human heart

transplant was made Dr. James Hardy at the University of Mississippi transplanted the heart of chimpanzee into the chest of Boyd Rush in a last detch effort to save the man's life because no human heart was available.

- Pluto photographed :In 1930,Clyde Jornbaugh photographed the planet Pluto the only planet discovered in 20th century, after a systematic search instigated by the predictions of other astronomers.

**JANUARY 24**

Harold Delos Babeock : Born 24 Jan 1882 Died 8 Apr 1968

American astronomer who with his son, Horace invented the solar magnetograph (1951) for detailed observation of the son's magnetic field.

Morris William Travers :Born 24 Jan 1872 Died 25 Aug 1961

English chemist who, while working with Sir William Ramsay in London discovered the element Krypton (30 May 1898). The name derives from the Greekword 'hidden'.

Joseph Achille Le Bel :Born 24 Jan 1847 Died 6 Aug 1930

French chemist who was the first to present a theory on the relationship between molecules and how they absorb or reflect light. He theorized that the optical activity is due to asymmetric carbon atom bound to 4 different groups.He is regarded as the cofounder of stereochemistry.

Paul Walden: Died 24 Jan 1957 Born 26 Jul 1863

Paul Walden was a Latvian chemist who, while teaching at Riga, discovered the Walden inversion, a reversal of stereochemical configuration that occurs in many reactions of covalent compounds. He is also known for Walden's rule which relates the conductivity and viscosity of non-aqueous solutions.

Henrich Geissler: Died 24 Jan 1879 Born 26 May 1815

German glassblower from whom the Geissler (mercury) vaccum pump and the Geissler tube are named.

John Dairy : Died 24 Jan 1868 Born 24 May 1790

English chemist and doctor who first prepared, named and characterized the gas phosgene. He was the younger brother of Humphry Davy.

**Events**

- Uranus :In 1986, the Voyager II space probe made closest approach to Uranus.The spacecrafts came within 81,500 km of Uranus' cloudtops.
- Early computer : In 1948,IBM dedicated its "SSEC" in New York city. The selective sequence electronic calculator handled with data and instructions using electronic circuits made with 13,500 vaccum tubes and 21,000 relays.
- the cross sectional X- ray imaging process known as Computerized Axial Tomography (CAT)scanning.
- Leo Hendrick Backeland 1944 : American scientist who invented first thermosetting plastic ,Bakelite.

**JANUARY 25**

Ilya Prigogine: Born 25 Jan 1917 Died 28 May 2003

Russian born Belgian physical chemist who received the Nobel prize for chemistry in 1977 for contribution to non equilibrium thermodyanamics or howlife could continue indefinitely in apparant of laws of physics.

Robert Boyle: Born 25 Jan 1627 Died 30 Dec 1691

Irish English chemist and matural philosopher moted for his pioneering experiments on the properties of gases and his of a corpuscular view of matter that was aforerunner of the modern theory of chemical elements. He was founding member of the Royal society of London.

Sir Issac Shoenberg : Died 25 Jan 1963 Born 1 Mar 1880

Russian born British electrical engineer and principal inventor of the forst high definition television system, as used by the British Broadcasting corporation (BBC) for the world's first public high-definition telecast(from London 1936)

**Events**

- French solar power plant in 1977, France inaugurated its first operational solar generating plant at odeillo in the Pyamees of south western France. Its output of 64 killowatts was connected to the national electricity grid to demonstrate operational solar power.
- Atomic Clock: In 1955, Columbia university scientists developed an atomic clock accurate to within one second in 300 years.
- Faraday announces photography: In 1839, Michael faraday publicity announced for the first time the existence of photography as the subject of his Faraday evening discourse at the Royal institution.

**JANUARY 26**

Plykarp Kusch: Born 26 January 1911 Died 20 March 1993

German American physicist who shared Nobrl Prize for physics in 1955 for his accurate determination that the magnetic moment of the electron is greater tham its theoretical value. Thus he deduced from researching the hyperfine structure of the energy levels in certains elements, and in 1947 found a discrepancy of anout between the observed value and that predicted by theory.

Alexander King Born 26 January 1909 Died 28 February 2007

Scottish chemist who pioneered in environmental awareness, warning of the dangers to the environment from extensive industrial development.

Albert Sauveur: Died 26 Jan 1939 Born 21 Jun 1863

Belgian born American mettaurgist whose microscopic and photomicroscopic studies of metal structures make him one of the fouders of physical metallurgy.

Nikolaus August Otto : Died 26 January 1891 Born 10 June 1832

German engineer who developed the four stroke internal combustion engine, which offered the first practical alternative to steam engine as power source.

Edward Jenner: English physician and surgeon who discovered vaccination for smallpox.

**Events**

- Cyclotron: in 1932 the US patent office received a patent application for the cyclotron by Ernest Orlando lawerance as "Method and apparatus for the Acceleration of ions"
- Newton's 'sions claw' : In 1697 ,Issac Newton received and solved Jean Bernoulli's brachistochrone problem .He had resolved the issues of specifying the curve connecting two points displayed from each this laterally along which a body; acted upon by grainly would fall in the shortest time . When Bernoulli saw the solution he commented, "we recognize the sions by this law.
- Hydroplane: In 1911,glenn posted the first hydroplane flight at North Island, san Diego,californea with a successful takeoff from water and landing on water.

**JANUARY: 27**

Samuel C C Ting: Born : 27 Jan 1936

Samuel Chao Chung Ting is an American physicist who shared Nobel Prize in 1976 for Physics, for his discovery of a new subatomic particle, The **J**/Psi particle. Sir

John C Eccles: Born: 27 Jan 1903 Died: 02 May 1997

John C Eccles was an Australian physiologist who shared the 1963 Nobel Prize for Physiology or Medicine for his discovery of the chemical means by which impulses are communicated or repressed by nerve cells.

Issac Roberts: Born: 27 Jan 1829 Died: 17 Jul 1904

Issac Roberts was a Welsh astronomer who was a pioneer in photography ofNebulae.

Edward H White II: Died: 27 Jan 1967 Born: 14 Nov 1930

Edward H White II was the first US astronaut to walk in the space.

**Events**

- Terramycin: In 1950, Science Magazine announced the new antidote , Terramycin made by Charles Pfizer & Co. It was isolated from Indiana Soil and found effective

against Pneumonia, Dysentery and their infections.

- Einstein's Address: In 1921, Sir Albert Einstein suggested the possibility of measuring the universe, which startled the audience with his address on geometry and expansion given at the Prussian Academy of Science in Berlin.
- National Geographic Society Founded: In 1988 The National Geographic Society was established with Gardiner Greene Hubbard as its first President.

**JANUARY: 28**

Robert W Hotley**:** Born: 28 Jan 1922 Died: 11 Feb 1993

Robert William Hotley was an American Biochemist who shared the 1968 Nobel Prize in Physiology or medicine for conducting a research that helped to decipher the genetic code chemically and explain how the genetic information stored in the DNA of a cell controls the synthesis of proteins the building blocks of the cells.

Dame Kathleen Lonsdale**:** Born: 28 Jan 1903 Died: 01 Apr 1971

British Crystallographer who developed several X-Ray techniques for the study of crystal structure. Her experimental determination of the structure of Benzene ring by X-Ray diffraction whichshowed that all the ring C-C bonds were of the same length and all the internal C-C-C bond angles were 120° had an enormous impact on Organic Chemistry.

Auguste Piccard: Born: 28 Jan 1884 Died: 24 Mar 1962

Swiss – Belgian physicist notable for his exploration of both the upperstratosphere and the depths of the sea in ships of his own design.

Julian W Hill: Died: 28 Jan 1996 Born: 04 Sep 1904

Julian Warner Hill was v US research Chemist who discovered cold drawing, a technique of strengthening polymer fibers by stretching.

Klaus Fuchs: Died: 28 Jan 1988 Born: 29 Dec 1911

Emil Klaus Fuchs was a German - British physicist who was convicted as a spyon

01 Mar 1950, for passing nuclear research secrets to Russia.

**JANUARY 29**

Lewis Urry : Born 29 Jan 1927 Died 19 Oct 2004

Lewis Frederick Urry was a Canadian American chemical engineer who inventedthe alkaline battery and Lithium battery.

Abdus Salam Born 29 Jan 1926 Died 21 Nov 1996

Pakistani British nuclear physicist who shared the 1979 Nobel Prize for Physicswith Stephen Weinberg and Sheldon Lee Glasgow. Each had explained theunderlying unity of the weak nuclear force and em force

Edward Williams Morley Born 29 Jan 1838 Died 24 Feb 1923

American Chemist who is best known for his collaboration with the physicist A. A. Michelson in an attempt to measure the relative motion of the Earth through a hypothetical ether. He also studied variations of atmospheric oxygen content. Fritz Haber Born 9 Dec 1868 Died 29 Jan 1934

German Physical Chemist, winner of Nobel Prize for Chemistry(1918) for his development of a method of synthesizing ammonia (1909) directly from Nitrogen and Hydrogen.

William Cranch Bond Born 9 Sep 1789 Died 29 Jan 1859

American Astronomer who with his son George Philips Bond discoveredHyperion, the eighth satellite of Saturn and an inner ring called Ring C or theCrepe ring.

**Events**

- Ozone and Aerosol Sprays: In 1978, Sweden became the first nation to curb aerosol sprays to halt the destruction of Ozone layer.
- Artificial kidney: In 1960, an artificial kidney that operates without human monitoring was announced.
- Radiation treatment: in 1896, Emil H. Grubbe, a Chicago researcher became first person to administer x – ray radiation treatment for the recurrent breastcancer of a fifty five year old woman.

**JANUARY 30**

Doug Engelbart Born 30 Jan 1925

Douglas Earl Engelbart is an American electrical engineer and inventor who invented the computer mouse, which he developed in the 1960s and patented 17Nov 1970

John Bardeen Born 23 May 1908 Died 30 Jan 1991

American Physicist who was co-winner of the Nobel Prize for Physics in both 1956 and 1972. He got the same for invention of transistor and the development of the theory of superconducting called BCS theory.

Orville Wright Born 19 Aug 1871 Died 30 Jan 1948

American inventor and aviator who with his brother Wilbur, invented the first powered airplane, Flyer, capable of sustained controlled flight (17 Dec 1903).

**Events**

- Darwin Book: In 1868, Charles Darwin's book – "Variation of animals andplants after domestication" was published.
- Hydrogen bomb: In 1950, development of the Hydrogen fusion bomb wasordered by U.S. president Truman.
- Heart Pace Maker: In 1957, an external artificial pacemaker with internal heart electrode is first used.

**JANUARY 31**

Rudolf Ludwig Mossbauer: Born 31 Jan 1929

German physicist and co-winner of the Nobel prize for Physics in 1961 for his research concerning the resonance absorption of gamma rays and his discovery in this connection of the Mossbauer effect.

Irving Langensies : Born 31 Jan 1881 Died 16 Aug 1957

American physical chemist whose studies of molecular flins on solid and liquid surfaces opened new fields in colloid research and geochemistry and won him the Nobel Prize for

chemistry in 1932.

Theodore William Richards : Born 31 Jan 1868 Died 2 Apr 1928

American analytical chemist who was awarded the 1914 Nobel Prize for chemistry" in recognition of the accurate determination of the atomic weight of a large number of elements."

Derik Browner : Died 31 Jan 1966 Born 1 Sep 1902

Dutch American astronomer and geophysicist known for his achievements in celestial mechanics especially for his pioneering application of high speed digital computers for astronomical computations

**Events**

- End of Oscar 1: In 1962 Oscar 1 the first orbiting satellite carrying Amateur Radio burnt up in to the Earth's atmosphere . that day marked the 60$^{th}$ anniversary of Marconi's first radio transmission. It was little more than 4 years since Russia launched Sputnik on 31 Jan 1957.
- First primate in space: In 1961, the U S launched a 4 year old male chimpanzee named Ham on a Mercury-Redstone 2 rocket into a sub orbital flight to test the capabilities of Mercury capsule.
- First American satellite : In 1958, the U S entered the space age by launching the first successful orbiting satellite Explorer 1 four months after the Soviet launch of Sputnik.

## FEBRUARY

### FEBRUARY 1

**Birth**

Lloyd Veil Birkher:1905

Lloyd Veil Bircher was an American Physicist measured the extent, height anddensity of ionosphere.

Emilio Segre:1905

Emilio Segre was an Indian American physicist who shared the Nobel Prize forphysics

for the discovery of antiproton.

**Death**

Werner Heisenberg: 1976

He was a German physicist who discovered a way to formulate quantum mechanics in terms of matrices for that he was awarded the Nobel Prize.

Clinton Joseph Davisson: 1958

He was an American physicist who discovered the electrons can be diffracted likelight waves, there verifying the thesis of the de Broglie that electrons behaves both as waves and as particles.

Edwin Armstrong: 1954

E. Armstrong was an electrical engineer who laid the foundation for much of the modern radio and electronic circuitry.

Sidney Gil Christ Thomas: 1885

Gilchrist was British metallurgist and inventor who developed the Thomas- Gilchrist process that eliminates the phosphorous impurity of certain iron ores inthe Bessemer converter.

Antoine A. B. Bussy:1882

Busy was a French chemist who first prepared magnesium in a coherent form.

**Events**

- First scientific hand calculator : In 1972, the first scientific hand held calculatorwas introduced for $ 395, named HP-35 for 35 keys.
- Integrated circuit: In 1959, Texas instruments was issued a patent on IC.
- Moving X-ray picture: In 1951, the TV station KTLA broadcast of an atomic explosion was to be seen publically on television.
- Fingerprints : In 1911, Thomas Jennings was found guilty with the first use of finger print evidence in U.S
- First motion picture studio: In 1893, inventor Thomas A Edison completed works on the world's first motion picture studio in West Orange.
- Patent for a steam boat: In 1788, a patent for a steamboat was issued by the stateof

Georgia to Isaac Briggs and William long street.

**FEBRUARY 2**

**Birth**

John Gloker :1817

John Gloker was an English chemist who developed the Glaer tower toreclaim useful chemicals during the manufacture of $H_2SO_4$.

Jean Baptiste Boussingault:1802

He was French agricultural chemist who identifies the biological cycle.

Lodorico Ferrari: 1522

He was an Italian mathematician who was the first find an algebraic solutionto the quadratic equation.

**Death**

Samuel Cunliffe Lister 1906:

He was an English industrialist and inventor of successful wool combing andwaste silk spinning machine.

Edmund Fermi:

French chemist best known for his discovery of Hydrogen fluoride andinvestigation of Fluorine compounds

**Events**

- In 1862 eight planets lined up for the first time in 400 years.
- Polaroid land camera demonstrated: In 1942 Edwin H Land gave the firstdemonstration of instant photography at a meeting of the Optical society of America.
- Movie-close up: In 1893, first ekes movie close-up was filmed of Edison's studio.

**FEBRUARY 3Birth**

Paul Scherrer, 1890:

Paul Scherrer was a Physicist who produced a method for X-ray diffraction.

William Jackson Humpharey 1862 : He was an atmospheric physicist who applied basic physical laws to explain the optical, acoustical thermal, electrical properties and phenomena of the atmosphere.

**Death**

William Coolidge 1975 : He was an American physicist whose improvement of tungsten filament was essential in the development of modern incandescent lamb bulb and X-ray tube.

Oliver Heaviside, 1925: Was an English Physicist who predicted the existence ofionosphere.

Edward Charles Piclering, 1919: He was physicist & astronomer who introducedthe use of photometer to measure the magnitude of stars.

Jean Baptiste Biot, 1862. He was a French Physicist who developed Biot Savartlaw.

**Events**

- 1st soft landing on moon. In 1966 the unmanned Soviet Luna 9 spacecraft landed safely on the moon in the ocean of storms.
- Weather Satellite: In 1966 U.S. launched its first operational satellite ESSA-1 to provide cloud over photography.
- First incandescent light bulb demonstration. In 1879 the first incandescent lightbulb was demonstrated by its inventor Joseph Wilson Swan.

**FEBRUARY 4**

**Birth**

Clyde W. Tombaugh 1906: American Astronomer who discovered what was then recognized as the planet Pluto.

Fredrich Hund 1896: German Physicist known for his work on the electronic structure of atoms and molecules.

**Death**

Satyendra Nath Bose 1974 : Indian Mathematician & Physicist who collaborated with Einstein to develop a theory of statistical quantum mechanics, now called Bore Einstein statistics.

Hendrik Antoon Lorenz 1928: Dutch Physicist who shared Nobel prize for his theory of the influence of magnetism upon e.m. radiation.

**Events**

- Plato detailed images : In 2010, NASA released the most detailed view todata of entire surface of the dwarf planet Pluto
- Radioactive Synthesis: In 1936, the first radioactive substance to be producedin US by John Jacob.

**FEBRUARY 5**

**Birth**

Robert Hofstadter, 1915: American Physicist shared Nobel Prize for hisinvestigation in which he measured the size of neutron and proton.

**Events:**

- Venus Probe 1974: Space probe mariner 10 returns the 1st close up photos ofthe cloud structure of Venus.
- Indiana Pi law: In 1897, the Indiana Stole House legislative passed Billwhich in effect give 3.2 exactly as the value of Pi.

**FEBRUARY 6**

**Birth**

Sir Charles Wheatstone;1802: English Physicist who developed Wheatstonebridge.

**Death**

Joseph Priestley; 1804: English chemist who discovered the element Oxygen.

**Events**

- ICBM: In 1959, U.S. successfully test filed for the first time a Ballistic Missile Titan Ⅰ.

**FEBRUARY 7**

**Birth**

William Huggins 1824: England astronomer who explained the spectra of stars,nebulae etc.

**Death**

Galileo Ferraris, 1897: Italian physicist who studied optics, acoustics, but hismost importantdiscovery was the rotary magnetic field.

**Events**

- Untethered space walk: 1n 1984 the first space walk was made by challenger astronaut Brwce M C Candless
- Newlends law of octaves: In 1863 English chemist Newland organize the known element by Lishy chem. In order to atomic weight according to the law of octave

**FEBRUARY 8**

**Birth**

Dmitry Mendeleve 1834: Russian chemist who developed the periodic classification of elements.

Mosse Gomberg 1866: American chemist who initiated the study of freee radicalsin chemistry.

**Death**

Sir Robert Robinson 1975: English chemist who received Nobel prize for hisresearch on organic compounds.

John Von Neumann 1957: Hugerion Anerican mathematician who made important contribution in Quantum physics, logic meteorology.

**Events**

- Sky lab mission eided: In 1974, the third and the final astronaur crew from the U.S earth orbinity. Skylab space station, completing their mission in space net begon on 16 Nov 1973.
- Newton's first optics paper: In 1962, read his first optics paper before royal society in London.

**FEBRUARY 9**

**Death**

Jane Melville Gillis 1866: U.S. laual officer who founded U. S Naval observatory in Washington D .C.

**Events:**

- Element 112 in 1996 only a little more than a year after they created element 111 a team of German scientists claimed to have created an atom of theelement112.
- Shuttle discovery space walk: In 1993 the first British born American to walkin space Michael Foale.

**FEBRUARY 10**

**Birth**

Walter H Brattain 1902: American who shared Nobel Prize for Physics forinvestigating semiconductor & for the development of the transistor.
Ira Remsen 1846: American scientist who discovered saccharin.

**Death**

D. Allen Bromley Canadian scientist who discovered the dynamics of atomicnuclei.
Wilhemim Rontgen1923: German physicist who discovered the highly penetrating form of radiation that become known as x- ray.
Sir David Brewster 1868: Scottish physicist noted for his experimental work in optics &polarized light. He is known for Brewster's law.

**FEBRUARY: 11**

**Birth**

Leo Szilard 1898 : American who, with Enrico Fermi designed the first nuclearreactor for nuclear chain reaction.

Thomas Alva Edison 1847 : American inventor who held a world record 1,093 patents and many scientific inventions.

**Death**

Anders Gustav Ekeberg 1934: Swedish chemist who discovered Tantalum

J. Han D.Jensen 1973: He was a German physicist who proposed the shell theoryof nucleus structure of nucleons.

**FEBRUARY: 12Birth**

Julian Seymour Schwinger 1918: American physicist who shared nobel prize in electrodynamics. He developed important methods in e.m. theory.

Charles Darwin 1809: Charles Darwin was an English naturalist who presented the theory of natural selection.

**Death**

Dutch physicist Dirk Caster, in 1950 discovered the element Hafnium by skillfully applying Moseley's method of x-ray analysis who distinguish the lines ofHafnium.

**Events**

- Edison patented: In 1895, Edison was issued patent for filament of incandescent lamp.
- First penicillin test: In 1941, the first injection of penicillin human test subjectwas conducted by Ernst chain who developed the antibiotic.

**FEBRUARY 13**

**Birth**

Alfred Wolf, 1923: he was an American nuclear and organic chemist. He made pioneering contributions over nearly 50 years in the field of organic radio chemistry.
William. B. Shockley, 1910: he was an American physicist who shared Nobel Prize in physics for the development of transistor.

**Death**

**Henrik Steffens, 1845: Henrik was a philosopher and physicist, who combined scientific idea, with German idealist metaphysics**

**Events**

- Galilio prepares for trial: In 1633 Italian astronomer Galileo Galilee arrived in Rome for his trial before the inquisition for professing the belief that the earth revolves round the sun
- Cinematographe patent: In 1895, a French patent was issued for the cinematographe, a combined motion picture camera and projector.
- Millikan oil drop experiment: In 1912, Robert Millikan began collecting data from his famous oil drop experiment
- ENIAC first operated: In 1946, the world's first electronic digital computer ENIAC was first demonstrated at the moor school of electrical engineering.

**FEBRUARY 14**

**Birth**

Fritz Zwicky1898: American physicist and astronomer who proposed the existence of dark matter according for additional mass in the universe.
C.T.R.Wilson 1869: Scottish physicist who shared Nobel Prize for his invention of Wilson cloud chamber, which become widely used in the study of radioactivity, X-ray.

**Death**

Walter H. Zinn, 2000: American nuclear physicist who contributed to the U.Satomic bomb project during world war two.
Karl Guthe Jansky 1950: American scientist who discovered cosmic radioemission.

**Events**

- Dolly death: In 2003, Dolly, the world famous first cloned sheep was put down at the age of 6.5 year.
- Voyager I confirm photon of solar system: In 1990 radio signals were received from the US space probe Voyager that is successfully completed a four hour series of about 60 images looking back into the solar system of the sun andsix planets.
- Edison patent: in 1888, Thomas Alva Edison issued a patent for a telephone-transmitter.

**FEBRUARY 15**

**Birth**

Charles Edward Guillance1861:French chemist who discovered invar.

William Henry Dickeny:1858,American astroner who discovered phoebe,theninthmoon of Saturn.

George Johnstone Stoney 1826:Irish physicst who introduced the term electronfor the fundamental unit of electricity.

**Death**

Henry Way Kendall 1999:American nuclear physict shared nobel prize for obtaining evidence for the existence of the subatomic particle known as quark.

Ernest weber 1996:Austrian scientist who contributed to the development of microwave technology applied in Radar communication system.

Sir Owen Williams Richardson 1959:English scientist who won the nobel prize forhis work on thermoionic phenomenon especially for the discovery of law named after him.

**Events**

- Oscilloscope 1897:Ferninard Braun developed first cathode ray oscilloscope.He developed this as the method to record & study the dependence of A.C.
- Syntheti Diamonds:1955 the Genord electrical company announced their successful

synthesis of diamonds using the first process was reproducible.

**FEBRUARY 16Birth**

John Rex Whinfield:1901 ,an English chemist & inventer who converted a new polyster polyethylene terephthalate.

**Death**

Meghnad.N.Saha:1956,Indian astrologist noted for his development in 1920 of the hernel ionization equation ,which is widely applied to the interpretation of stellar spectra.

**Events:**

Helicopter:In 1946, the first commercial helicopter first flew.It was the firstsikorrsky helicopter.

Nylon patented: In 1937,Dr.wallace carothers, who invented Nylon received apatent for the synthetic fibre.

**FEBRUARY 17**

Ottosten 1969 German American scientist and winner of Nobel prize for physics for his development of nuclear beam as a uniform tool for studying characteristics of nuclei and for his measurement of magnetic moment of proton

Friedrich konard beilsten 1838 Russian chemist whose research included in studying isomeric benzene derivative

**Death**

George Philip bond 1865 American astronomer who made the first photograph astar discovered a number of comets

**Events**

- Mendaleeves periodic table : in 1869 mendaleeves classified elements in verticaland horizontal columns based on their property
- Baired TV demonstrator
- In 1938 the first public experimental demonstration of bared coloured televisionwas transmitted from crystal palace to dominion theatre London.
-

**FEBRUARY 18**

Harry Brearley 1871: he was an English scientist who invented stainless steel ,which is an alloy of steel with chromium and nickel

Ernst mach 1838 : Austian physicist who established important principles ofoptics ,mechanics and wave dynamics

Alexandro Volt 1745: Italian physicist who invented electric battery

**Death**

J.G. Hamilton 1957 : American medical scientist who pioneeredIn the medical uses and health effects of radio isotope

**Events**

- Pluto : in 1930, the plannet Pluto was discovered by clyde Tombaugh the onlyplanet to be founded by an American astronaut
- Isotope : In 1913 , chemist Federick Soddy introduced the term isotope

**FEBRUARY 19**

**Birth**

David gross 1941: american scientist who won Nobel Prize for discovery of asymptotic freedom in the theory of the story interaction.

Syante Arrhenius, 1859: Swedish scientist who won Nobel Prize in recognition ofthe extraordinary services. He has rendered to the advancement of chemistry by his electrolytic theory of dissociation.

**Deaths**

Ernst mech 1916: Austrian physicist established the principle of optics,mechanics& wave dynamics.

**Events**

- Photograph 1878,the photograph was presented by Thomas Alva Edison.
- Weather map 1885:m.se vernier presented the weather map at the Frenchacademy of science.

**FEBRUARY 20**

**Birth**

Robert Babber 1937: German physicist who won Nobel prize for determination of3D structure of protein complex that is essential to photosynthesis in bacteria **Death**
Maria G. Mayer 1972: She was a German chemist who one Nobel prize for their proposal of shell nuclear model.
Henry Moisson 1907: French chemist who received the Nobel prize for Chemistryfor issilation of highly reactive gaseous element florin and the development of moisson electric furnace.

**Events**

- Space station mir:in 1986,the soviet union launch into orbit mirs,a newspace station.
- Artificial radioactivity in 1934, was issued to Ernest .O. Leorence whichmethod and apparatus for acceleration and ions known as cyclotron.

**FEBRUARY 21**: **International mother tongue day**

**Deaths**

George Elley Hale 1938: An American astronomer known for his development of astronomical instrument .
Heike Kamerlingh Onnes 1926: Dutch physicist who was awarded Nobel prize forhis work on low temperature physics in which liquefied Hydrogen and Helium.

**Events**

- Refrigerator : In 1994, Whirl pool coporation began production of an energy efficient refrigerator that did not use Freon.
- Poloroid camera,1947: Edwin.H.Lord first demonstrated poloroid camera, thefirst used self developing film
- Chlorine: Sir Humphrey Davy introduced the name Chlorine

**FEBRUARY 22: world thinking day**

**Events**

Urea synthesis: In 1828,German biochemist Freedrich Wholer synthesised the organic chemical urea

**Births**

Fritz Strassmann 1902: German physical chemist discovered neutron inducednuclear fission in uranium.

Henrich Hertz 1857: German physicist who was the first broadcast receives radiowaves.

**FEBRUARY 23**

**Birth**

Allan Macload Cormack 1924: American Physicist formulated the mathematical Algorithm that made possible the development of a powerful new diagnostic technique, the cross sectional X- ray imaging process known as Computerized Axial Tomography (CAT)scanning.

**Deaths**

Leo Hendrick Backeland 1944 : American scientist who invented first thermosetting plastic ,Bakelite.

**Events**

- Supernova : In 1987 Supernova 1987 A in LMC was first seen.
- Diesel engine patent: Rudolf Diesel received a German patent for dieselengine.
- Aluminium isolated: In 1886,Charles M Hall completed his electrolyticprocess for the separation of Aluminium from its ore

**FEBRUARY 24: Central Excise day**

**Births**

Carl Graebe:1841: A German chemist synthesis red dye alizarin, which in the textile industry quickly supplemented the natural source of the dye from the madder plant root.

Henrich Hertz: 1804 He was a Russian scientist who devised Lenz's law to describe the direction of flow of electronic current generator by a wire through a magnetic field.

**Death**

Henry Cavendish,1810: He was an English sclientist who conducted experiments with diverse interest in his private labortary. He determined the mass and density of earth .

Edward Williams Morley 1923: He was an American scientist best known for the attempt tp measure the relative motion kof the earth through hypothetical ether. He also studied the variation atmospheric oxygen.

**Events**

- Pulsars announced 1968: Nature carried the amm of discovery of pulsars., which was discovered by Jocelyn Bell.
- First rocket to reach outer space : in 1949 the forst recorded man made objectto reach extra terrestrial space was launched . It was called 'Bumper WAC corpoprd'.

**FEBRUARY 25**

**Births**

Lev Artsimaich 1909: He was a soviet physicist who provided the baslis of the Tokamark, a device capable of containing ultra high temperature plasma suitable for research into controlled nuclear fusion.

William Thomas Astberg 1898: He was an English physicist first to make use of x-ray diffraction pattern to study the strength of nucleic acid

Ida Moddacle 1896: German chemist who discarded the rhenium.

**Deaths**

Theodor H.E. Sudenberg 1 971 : He was a Swedish physicist who awarded Nobel prize for the chemisty of colloid his invention of ultra centrifuge.

**Events**

- Check photograph: In 1936 the first bank check photography device patentedwas issued in U.S to its inventor George Lewis McCarthy
- Electricmotor : In 1837 Thomas Decenport patented the first practical electric motor as an application of magnetism and electromagnetism machinery.

**FEBRUARY: 26**

**Giulio Natta:** Born: 26 Feb 1903 Died: 02 May 1979

Giulio Natta was an Italian Chemist who contributed the developmentof high polymers useful in manufacture of films, plastics & synthetic rubber.

**Otto Wallach:** Died: 26 Feb 1931 Born: 24 Mar 1847

Otto Wallach was a German Chemist who was awarded the Nobel Prizein 1910 for identifying terpene compounds.

**Richard Jordon Gatling:** Died: 26 Feb 1903 Born: 12 Sep 1818 Richard Jordan Gatling was a US inventor who invented Gatty Gun

which was the first successful machine gun with high firing rate.

**Events**

- Atomic energy reactor shut down: In 1992 Yankee Atomic Electric Company nuclear reactor in US was shut down.
- First Saturn Rocket Flight: In 1966, Saturn Rocket 1B was launched from cape Cana Vernal, Florida.

**FEBRUARY: 27**

**Yulii Borisovich Khariton** Born: 27 Feb 1904 Died: 18 Dec 1996

Yulii Borisovich Khariton was a Russian scientist who played a key role in the development of the Soviet Union's nuclear weapon & nuclear physics research

**Bernard Lyot** Born: 27 Feb 1897 Died: 02 Apr 1952

Bernard Lyot was a French astronaut who invented the coronograph, an instrument which allows the observation of the solar corona when the sun is notin eclipse.

**Events**

Surgery on CCTV, 1947: The first closed circuit broadcast of a surgery procedure to observe in classroom.

Solar Radio, 1942: JS Hey discovered radio emission from Sun.

Neutron was invented, 1932: In 1932 Neutron was discovered by James Chadwick.

**FEBRUARY 28 : National Science Day**

**Birth**

Stephen Chu ( Born in **1948**) was an American Scientist who received Nobel Prizefor his independent pioneering research in cooling and trapping atoms using laser.

Daniel CTsmi (Born in **1939**) was an American scientist who was awarded Nobel Prize for discovering and explaining of electrons in a powerful magnetic field at very low temperature. Electrons form a quantum fluid whose particle has fractional quantum.

Leon N Cooper (1930): Leon was an American physicist for his experiments in developing BCS theory of Superconductivity.

**Death**

EilhardtMitscherlich (1863): He was a german chemist who promulgated the Theory of isomorphism a relationship between crystalline structure and chemicalcomposition.

**FEBRUARY 29**

**Birth**

Herman Holerith (1860): he was an American inventor of a tabulator machinethat was am important precursor of the electronic computer.

**Events**

- Nucleaus 1930: Bohr explained the effect of bombarding particle on a nucleus.
- Solid: this Dutch chemist reported Bohr'sin 1908 to have produced solid

## MARCH

### MARCH 1

**Seymour Papert** born 1 Mar 1928 is an American computer scientist who invented the Logo computer programming language, an educational computer programming language for children. He studied under Piaget, absorbing his educational theories. He has studied ways to use mathematics to understand better how children learn and think, and about the ways in which computerscan aid in a child's learning. With Marvin Minsky, he co-founded the Artificial Intelligence Lab at MIT. In the mid-80's he worked in Costa Rica to develop a nationwide program of intensive computer use throughout the public education system. Costa Rica, which now has the highest literacy rate in the Americas, continues to serve as a model for large-scale deployment of computer technology in education.

### Edwin Herbert Land

Died 1 Mar 1991 at age 81 (born 7 May 1909). American inventor and physicist who founded the Polaroid Company. His one-step process for developing and printing photographs was the greatest innovation in photography since the introduction of roll film. He first demonstrated the Polaroid Land Camera in 1947, which gave fully developed prints in 60 seconds. Land also applied the name *Polaroid* to the light-polarizing filter he had previously invented by embedding suitable crystals in a plastic sheet, which was widely known for its use in the lenses of sunglasses. His other projects included instant X-rays, 3D movie projector among the over 500 patents he held.

**Jacobus Henricus Van't Hoff**

Died 1 Mar 1911 at age 58 (born 30 Aug 1852). Dutch physical chemist who was the first winner of the Nobel Prize for Chemistry (1901) "in recognition of the extraordinary services he has rendered by the discovery of the laws of chemical dynamics and osmotic pressure in solutions." In stereochemistry, in 1874, he identified the four chemical bonds of carbon as having a tetrahedral arrangement, which explained how certain moleculars can be arranged differently with the same atoms to give left- and right-handed isomers. (Achille Bel arrived independently at the same conclusion at about the same time.) With regard to the osmotic pressure of liquids, he derived laws (1886) for dilute solutions similar to the gas laws for gases by Robert Boyle and Joseph Gay-Lussac. These relationships enabled the experimental determination of the molecular weight of a substance in solution.

**Events**

***Soviet spacecraft reaches Venus surface***

In 1966, the mission of the Soviet Union's unmanned spacecraft *Venera 3* (Venus 3) was a partial success when it reached Venus and automatically released a small landing capsule intended to explore the planet's atmosphere during a parachute descent. However, contact had been lost since 16 Feb 1966. Although no data was returned before the capsule impacted, it became the first man-made object to touch the surface of another planet. The Soviet Union issued a commemorative stamp to mark the achievement. *Venera 3* was launched on 16 Nov 1965. The landing capsule (0.9-m diam., about 300-kg) had been designed to collect data on pressure, temperature, and composition of the Venusian atmosphere. Failure is believed due to overheating of internal components and the solar panels

***Radioactivity discovered***

In 1896, Henri Becquerel accidentally discovered radioactivity when he developed a photographic plate he left in a desk drawer with crystals of a uranium compound upon it. He found a fogged image of the uranium crystals resting on it, although the plate was wrapped in heavy black paper. He had left the objects together on 26 Feb, after postponing his intended experiment on phosphorescent emissions stimulated by the sun. Having being left in darkness, eventually he realized the crystals where not phosphorescing from sunlight. Instead he had found spontaneous and penetrating rays, independent of any input of energy. A glimpse of a new mystery of the atom had been revealed, investigated for years after by other scientists. He shared the 1903 Nobel Prize with Pierre and Marie Curie for their work on radioactivity.

**MARCH 2**

Georgy Nikolaevich Flerov Born 2 Mar 1913; died 19 Nov 1990 at age 77. Soviet physicist who, in 1941, recognized that uranium undergoes spontaneous fission (needing no neutron bombardment). He was


the early Russian investigators of nuclear fission. In early 1942 , Flerov noticed that articles on nuclear fission were no longer appearing in western journals. Recognizing the implication that such research had become secret, he wrote to Premier Joseph Stalin, insisting that "we must build the uranium bomb without delay," (subsequently led by Igor V. Kurchatov.) In later research, Flerovannounced synthesis of isotopes of element 104 (1965) and 106 (1974). Co- discoveries were made in the U.S. Several names were suggested. Eventually the adopted names were rutherfordium and seaborgium.

Edward U. Condon Born 2 Mar 1902; died 26 Mar 1974 at age 72. Edward Uhler Condon was an American physicist who is remembered for the Franck-Condon principle (1928), development of radar and contributing to the design of magnetic separation equipment subsequently applied to process uranium for atomic bombs. The Franck-Condon principle (1928) is a quantum-mechanical treatment of the earlier statement by James Franck (1925) that

in any molecular system the transition from one energy state to another occurs so near to instantaneously that the nuclei of the atoms involved are stationary. During the Manhattan project, he assisted J. Robert Oppenheimer assemble the team of scientist that created the first atomic bombs at Los Alamos, N.M. He leda scientific study of UFO's, which found no credible evidence.

**Events**

In 1972, U.S. spacecraft Pioneer 10 was launched. It passed close by Jupiter and Neptune before leaving the solar system. It is now more than six billion miles from Earth.

Radioactivity

In 1896, Henri Becquerel reported his discovery of the penetrating rays of a uranium compound to the French Academy of Sciences. The photographic plate, fogged by these rays, showing the outline of a metal cross lying between the compound and the plate, is the first recognition of the effects later known as radioactivity

**MARCH 3**

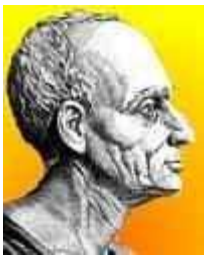
Daniel Chonghan Hong **Born 3 Mar 1956; died 2 Jul 2002 at age 46.**

Korean theoretical physicist specializing in statistical physics and nonlinear dynamic physics, who with colleague Hugo Caram, originated the void diffusing- void model of granular flow, which is recognized as an effective theoretical treatment for a broad range of dynamical phenomena in granular media. In general, his work ranged from percolation

network, viscous fingering, granular flows to traffic equations. He studied and taught in America from 1981, and wrote articles for popular magazines on various topics. He died at the young ageof 46 of cardiac arrest.

**Pierre Prévost** Born 3 Mar 1751; died 8 Apr 1839 at age 88. Swiss physicist and philosopher who first showed that all bodies radiate heat, no matter how hot or cold they are. In *Sur l'equilibre du feu* (1792) he made a significant step forward in understanding the nature of heat. With the Prévost theory of exchanges, he introduced the concept of dynamic equilibrium in which all bodies are both radiating and absorbing heat to and from the surroundings at the same rate. (As opposed to the two "imponderable fluids" of frigoric (cold) and caloric (heat) widely believed at the time.) Prévost recognized that cooling was the loss of heat, not the gain of cold. He believed all bodies contained some measure of heat at any temperature, and that heat would flow from a hotter body to a colder body. This interpretation in his caloric theory remained true when described seventy years later in Maxwell's kinetic theory (that heat is energy of particle motion). In his later years, Prévost studied the human aging process, using himself as the subject of his observations.

**Andreas Marggraf** Born 3 Mar 1709; died 7 Aug 1782 at age 73.



Andreas Sigismund Marggraf was a German chemist who was a member of the Royal Academy of Science and Literature of Berlin. In 1747, Marggraf demonstrated that various kinds of beet-root contained sugar and that the sugar could be extracted and crystallized. This discovery, however, was regarded for many years as being merely a laboratory determination and without practical value. However, it led to the development of the modern sugar industry, when Franz Karl Achard, a pupil of Marggraf, attacked the problem of beet-root cultivation and succeeded in extracting sugar from beets on a greater scale.

**Gerhard Herzberg** Died 3 Mar 1999 at age 94 (born 25 Dec 1904). German-Canadian physicist who was awarded the 1971 Nobel Prize for Chemistry "for his contributions to the knowledge of electronic structure and geometry of molecules, particularly free radicals." He published his first work in molecular spectroscopy at the end of the 1920's. His measurement of how molecules absorb ultraviolet and infrared energy yield information on energy

states in molecules, leading to knowledge of their size, shape and other properties. For example, he showed that radicals can drastically change their shape with increasing energy, such as methylene which is linear in its ground state but bent in higher energy states. He also applied spectroscopy in astronomy, identifying molecules in space, planetary atmospheres and comets

**Robert Hooke** died 3 Mar 1703 at age 67 (born 18 Jul 1635) English physicist who discovered the law of elasticity, known as Hooke's law, and invented the balance spring for clocks. He was a virtuoso scientist whose scope of research ranged widely, including physics, astronomy, chemistry, biology, geology, architecture and naval technology. On 5 Nov 1662, Hooke was appointed the Curator of Experiments at the Royal Society, London. After the Great Fire of London (1666), he served as Chief Surveyor and helped rebuild the city. He also invented or improved meteorological instruments such as the barometer, anemometer, and hygrometer.

**Events**

**Solo non-stop global flight:** In 2005, the first solo non-stop and fastest flight around the world without refueling ended as Steve Fossett landed at the Salina Municipal Airport, Kansas. He left there 67 hours earlier on 28 Feb 2005, in *The GlobalFlyer*, a single-engine, single-use experimental jet plane.

The first non-stop two-person flight around the world, was made in 1986 by Jeana Yeager and Dick Rutan in nine days, covering 26,366 miles without refueling. *The GlobalFlyer*, purpose-built of light composites, carried fuel comprising 86

percent of its weight at take-off in 13 tanks in its long wings and boom tanks. The chief designer, Jon Karkow, had spent five years planning the project, sponsored by Sir Richard Branson, owner of Virgin Atlantic Airways.

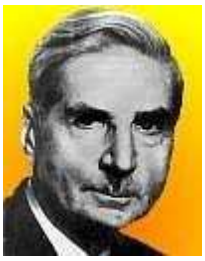
**MARCH 4**

**Robert R. Wilson** Born 4 Mar 1914; died 16 Jan 2000 at age 85. Robert Rathbun Wilson was an American physicist who was the first director of Fermilab. From 1967, he led the design and construction of Fermilab (the Fermi National Accelerator Laboratory) near Chicago, Illinois. He also improved the environment by restoring prairie at the site. It began operating in 1972 with the world's most powerful particle accelerator. With later improvements, it retainedthat status for well over three decades until it was superceded by the LHC (Large Hadron Collider) at the CERN laboratory in Geneva, Switzerland. Wilson is remembered for his justification of the needed financing at a Senate hearing in 1969, where he said "It has nothing to do with defending our country, except to make it worth defending." He resigned in 1978 because he did not believe the government was giving it sufficient funding for its research mission.

**George Gamow** Born 4 Mar 1904; died 19 Aug 1968 at age 64. Russian-born American nuclear physicist, cosmologist and writer who was one of the foremost advocates of the big-bang theory, which describes the origin of the universe as a colossal explosion that took place billions of years ago. In 1954, he expanded his interests into biochemistry and his work on deoxyribonucleic acid (DNA) made a basic contribution to modern genetic theory.

**Richard C. Tolman** Born 4 Mar 1881; died 5 Sep 1948 at age 67 was an American physicist and chemist who demonstrated that electrons are the charge-carrying entities in the flow of electricity, and also made a measurement of its mass. During the Manhattan Project of WW II, he was the chief scientific adviser to Brig. General Leslie Groves, the head of military affairs overseeing the development of the atomic bomb. After the war he was adviser to the U.S. representative to the United Nations Atomic Energy Commission.

**Walter Schottky** Died 4 Mar 1976 at age 89 (born 23 Jul 1886) is a Swiss-born German physicist whose research in solid-state physics led to development of a number of electronic devices. He discovered the Schottky effect, an irregularity in the emission of thermions in a vacuum tube and invented the screen-grid tetrode tube (1915). The Schottky diode is a high speed diode with very little junction capacitance (also known as a "hot-carrier diode" or a "surface-barrier diode.") It uses a metal-semiconductor junction as a Schottky barrier, rather than the semiconductor-semiconductor junction of a conventional diode.



Ira Remsen died 4 Mar 1927 at age 81 (born 10 Feb 1846) was an American chemist who codiscovered saccharin. He taught chemistry at Johns Hopkins University from 1876 (where he became its second president 1901-13). He introduced advanced laboratory instruction using teaching methods he had learned in Germany under Rudolph Fittig. Remsen specialized in the benzene ring and related groups. With Constantin Fahlberg, a student working under his direction, he first synthesized orthobenzoyl sulfimide (1879). Fahlberg accidentally discovered its intensely sweet taste by touching his fingers to his lips while unknowingly having a few grains on them. The compound was patented and marketed under the trade name "saccharin.

## Atomic power in Antarctica

In 1962, the Atomic Energy Commission announced that the first atomic power plant in Antarctica, the PM-3A, Naval Nuclear Power Unit, was in operation at McMurdo Sound. Between 1 Jan and 1 Mar 1962, the prefabricated plant was assembled on Observation Hill by a team of contractors and military technicians. This source of power was initially chosen when engineers realized that a fission power plant could operate for years without new fuel. In 1970, management and funding of all Antarctic operations was consolidated by President Nixon under the National Science Foundation. The NSF was to take over the funding of PM-3A as of 1 Jul 1972, but it was decommissioned that year, and replaced with a diesel electricity

generator.

**MARCH 5**

Jacques Babinet born 5 Mar 1794; died 21 Oct 1872 at age 78. French physicist who was the first to proposed the definition of the unit of length in terms of the wavelength of a spectral line. The red line in the spectrum of cadmium was chosen, and the angstrom was redefined as a fraction of this value.. He established a principle in diffraction theory (1837) that is named after him. The Babinet compensator was his invention to measure the polarization of light.

**Harold Dadford West**

Died 5 Mar 1974 at age 69 (born 16 Jul 1904). Black-American biochemist and college president, who was the first to synthesize the essential amino acid threonine. Although he is best known for his studies of amino acids, he conducted research in a wider field, including the biochemistry of various bacilli, the B vitamins, and antibiotics. He spent his career from 1937 as professor of biochemistry at Meharry Medical College, Nashville until his retirement in 1973 where he held also the position of college president (1952-63). He was plagued and often hospitalized by severe asthma, which contributed his death.

**Ernst Julius Cohen d**ied on Mar 1944 (born 7 Mar 1869) was a Dutch chemist who researched piezochemistry, electrochemical thermodynamics, polymorphism of compounds and the allotropy of metals, especially tin. He examined the different properties of tin's allotropes: white tin which is the familiar stable form above 13.2ºC and the powdery gray tin stable below that temperature. (The crumbling transition at low temperature is slow and called tin pest by Cohen. Because the cold transformation can be initiated or accelerated by seeding white tin with traces of grey tin, it is also known as tin disease, as if infected.) Cohen's life ended in the Auschwitz death camp following his arrest as a Jew by Nazi occupation forces in 1944. The exact date of his death is uncertain.

**Limelight:** In 1830, limelight as a form of lighting was presented before scientists at the Tower of London, in a trial with two other lamp designs. Invented by Thomas Drummond in 1816, limelight used jets of oxygen to assist heating lime to incandescence. More brilliant light was formed than by a flame alone. Limelight was adopted in lighthouses and for theatre stages. However, because it required constant tending, it was willingly superceded by newer inventions.

**Coperican theory decreed false**

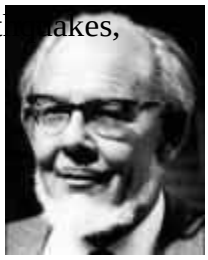
In 1616, Copernican theory was declared false and erroneous in The Decree of the Index signed by the Bishop of Albano, Cardinal of St. Cecilia. In it, the Holy Congregation of the Most Illustrious Lord Cardinals of the Catholic Church in Rome declared several books to contain heresies and errors that were to be prohibited from being printed in any language. In addition, the book by Nicolaus Copernicus, *On the Revolutions of the Heavenly Spheres* was held to teach a false doctrine, altogether contrary to the Holy Scripture, that the earth moves and the sun is motionless. No person was to be permitted to hold or teach the theory that the earth revolves around the sun. When Galileo subsequently violated the decree, he was put on trial and held under house arrest for the final eight years of his life.

**MARCH 6**

**Harry Coover** Born 6 Mar 1917; died 26 Mar 2011 at age 94 was an American chemist and inventor who invented Super Glue™. He accidentally discovered (1951) the adhesive properties of cyanoacrylate monomers that needed neither heat nor pressure to permanently bond between various surfaces. He patented the formula (U.S. No. 2,768,109) with the title "Alcohol-Catalyzed Cyanoacrylate Adhesive Compositions/Superglue." It was first marketed (1958) under the

"Eastman 910" name, after his employer, Eastman Kodak. From 1963, it has been sold as Loctite "Super Glue." Memorable advertising showed a car lifted by a crane using an attachment bonded with just a few drops. Its versatility extends to derivatives used for repairing arteries, veins, teeth and as a spray to seal open wounds of soldiers during combat in Vietnam. Coover held 460 patents in his lifetime. After Eastman, he joined Loctite as its president

**Sir Charles Frank** born 6 Mar 1911; died 5 Apr 1998 at age 87 was an English physicist and chemist whose work encompassed the physics of earthquakes, the growth of crystals (from diamonds to ice), the strength of polymers, and the molecular alignments within liquid crystals. During WW II, he worked for Scientific Intelligence at the Air Ministry. In 1946, at the University of Bristol, Frank looked into problems concerned with crystal growth and the plastic deformation of metallic crystals when mechanically loaded. His scientific fame was established by a decade bringing successes in applications of crystal-dislocation theory. This theoretical work has been the foundation of researches by scientists of all nationalities ever since, and continues to guide practice in the metallurgical and semiconductor industries.



**Joseph von Fraunhofer** born 6 Mar 1787; died 7 Jun 1826 at age 39. German physicist who was the first to study the dark lines in the solar spectrum, which were seen by Wollaston in 1802, but are called Fraunhofer lines. Fraunhofer was not able to explain them, but measured 576 lines. Over 25,000 have now been found in the solar spectrum. These are caused by selective absorption of those wavelengths by atoms of elements, and their relative positions are the same whether the light is produced by heated metals in the laboratory or seen from those gaseous elements in the sun or viewed from other heavenly bodies. Before other scientists so widely adopted the technique, he used a diffraction grating instead of a prism to disperse the spectrum. He also invented a heliometer

**Hans Albrecht Bethe** died 6 Mar 2005 at age 98 (born 2 Jul 1906) German-

American physicist who helped to shape classical physics into quantum physics and increased the understanding of the atomic processes responsible for the properties of matter and of the forces governing the structures of atomic nuclei. Bethe did work relating to armour penetration and the theory of shock waves of a projectile moving through air. He studied nuclear reactions and reaction cross sections (1935-38). In 1943, Robert Oppenheimer asked Bethe to be the head of the Theoretical Division at Los Alamos on the Manhattan Project. After returning to Cornell University in 1946, Bethe became a leader promoting the social responsibility of science. He received the Nobel Prize for Physics (1967) for his work on the production of energy in stars.

**Events**

**Bohr's model of the atom**

In 1913, this date was written by Niels Bohr on his first paper describing his new ideas on atomic structure, and mailed to his mentor, Ernest Rutherford. It was one of three historic papers he wrote on this subject.

**Aspirin**

In 1899, acetylsalycilic acid was patented by Felix Hoffmann. It is better known by its tradename as Aspirin. He had successfully created a chemically pure and stable form of acetylsalicylic acid in 1897. His handwritten laboratory notes suggested: "Through its physical characteristics such as a sour taste without any corrosive effect, acetylsalicylic acid has an advantage over salicylic acid and will therefore be tested for its usability in this context." His success was Aspirin - a better pain reliever for his father's rheumatoid arthritis than the salicylic acid previously used, which had an unpleasant taste and side effects, such as stomach bleeding. Hoffmann had improved on the earlier impure form derived by French chemist Charles Frederic Gerhardt (1853).

**MARCH 7**

**Stanley Lloyd Miller** born 7 Mar 1930 was an American chemist who made a series of

famous experiments beginning in 1953, to determine the possible origin of life from inorganic chemicals on the primeval, just-formed earth. He passed electrical discharges (simulating thunderstorms) through mixtures of reducing gases, such as hydrogen, ammonia, methane and water, believed to have formed the earliest atmosphere. Analysis days later showed the resulting chemicals included glycine and alanine, the simplest amino acids, the basic building blocks of proteins. Other compounds included urea, aldehydes and carboxylic acids. Thus a "primeval soup" is the currently accepted most plausible explanation, though incomplete, of the origin of the complex organic molecules of life.

**Arthur Rudolf Hantzsch** Born 7 Mar 1857; died 14 Mar 1935 at age 78. German chemist who won fame at the age of 25 for devising the synthesis of substituted pyridines. He studied stereochemistry of such nitrogen compounds.

He synthesised pyridine (1882), cumaron (1886) and thiazol (1889) and he gave a nomenclature of heterocyclic compounds. His investigations of triphenylmethane coloring materials led to progress in the spectrographic analysis, and also the theory of chemical indicators. He was also noted for his study of acids, in which he showed their properties depended on reaction with a solvent; and the electrical conductivity of organic compounds. From 1907 he studied cryoscopy and UV-spectroscopy.

**Ludwig Mond b**orn 7 Mar 1839; died 11 Dec 1909 at age 70. German-British chemist and industrialist who perfected a method of soda manufacture by improving the Solvay alkali process. Mond devised a process for the extraction of nickel when with his assistants, he accidentally discovered metal carbonyl compounds while investigating why nickel valves were corroded by carbon monoxide. Further research led to the synthesis of more metal carbonyls, which Lord Kelvin described as "metals with wings" and to the Mond nickel carbonyl process for refining nickel. The term "fuel cell" was coined in 1889 by Ludwig Mond and Charles Langer, who attempted to build the

first practical device using air and industrial coal gas, to generate electricity by reacting hydrogen with oxygen.

**William Draper Harkins** died 7 Mar 1951 at age 77 (born 28 Dec 1873) was an American nuclear chemist who was one of the first to investigate the structure and fusion reactions of the nucleus. In 1920, Harkins predicted the existence of the neutron, subsequently discovered by Edwin Chadwick's experiment. He made pioneering studies of nuclear reactions with Wilson cloud chambers. In the early 1930's, (with M.D. Kamen) he built a cyclotron. Harkins demonstrated that in neutron bombardment reactions the first step in neutron capture is the formation of an "excited nucleus" of measurable lifetime, which subsequently splits into fragments. He also suggested that subatomic energy might provide enough energy to power the Sun over its lifetime.

**Events**

***Kjeldahl Method:*** In 1883, Johann Kjeldahl reported to the Chemical Society of Copenhagen his procedure, still used in the present time and known as the Kjeldahl method. It enables the laboratory determination of the nitrogen content in organic compounds, and continues to be a practical procedure with great value for applications in agriculture, medicine and drug manufacture. While director of the Carlsberg laboratory (a research institution of the Carlsberg brewery), he devised the method to investigate the protein content of grain and its transformation during beer fermentation. His method replaced inexact and more cumbersome procedures

***Telephone*** : In 1876, Alexander Graham Bell patented an "Improvement in Telegraphy" (No.174,465) which established the principle of the telephone. He held earlier patents. One concerned the simultaneous transmission of two or more telegraphic signals along a single wire which utilized transmission of impulses at different rates to be received by different instruments each tuned to the pitch corresponding to one of the transmitting instruments. Another patent described ways of producing an alternately increasing and decreasing current without actually breaking the circuit. In this patent, he described a device to produce an undulatory

current (similar to a sinusoidal wave form rather than the square wave of a pulsatory current) on the line wire.

The Telephone Patent Conspiracy of 1876: The Elisha Gray-Alexander Bell Controversy and Its Many Players, by A. Edward Evenson. - book suggestion.

***Sewing machine :*** In 1854, Charles Miller of St. Louis, Mo., patented the first

U.S. sewing machine to stitch buttonholes (No. 10,609). His machine was adapted to sew the button-hole stitch, the whip-stitch, and the herring-bone stitch, by giving the cloth to be sewed "a movement laterally to the direction of the seam and in opposite directions, alternately, between every two stitches, in addition to the movement commonly given in the direction of the seam." For the button-hole stitch the movement in the direction of the seam is the distance of one thickness of thread, whereas that movement is greater for a whip-stitch. The herring bone stitch is made by taking all the stitches through.

**MARCH 8**

In 1979, space shuttle 'voyager-1' discovered active volcanoes on Jupiter's moon 'Io'-

The space craft voyager-1 launched from space Launch complex 41, at Cape Canaveral, Florida by NASA 0n 5$^{th}$ Sep 1977 at 12:56:00 UTC .It was constructed by the Jet Pro pulsion Laboratory that has got Hydrazine thrusters, three-axis stabilization, gyroscope and celestial referencing instruments. The Objectives of this spacecraft were to determine the physical properties of the Planet-Jupiter and Saturn and their satellites, the amount and size distribution of material in Saturn rings and ring dimensions. It had completed its first mission by 1979 and in 1980 started. Saturn observation phase. It studied about Io; Europa, Ganymede, and Callisto- the moons of Jupiter and Titan, Tethis, Mymas Enceladus, Rhea Hyperion- the moons of Saturn Voyager Overtakes 'Pioneer-10' another spacecraft, as the most distant manmade object from sun in 1997, After 20 years. In 2008, it terminated planetary radio astronomy Experiment operations.

**MARCH 9**

**1961, March-9, Sputnik-9 was launched.**

The soviet space craft Sputnik-9 was launched in 1961, March 9. It was a last flight of the nasal space craft carrying a dummy man named Ivan Ivanovich, a dog chernustika, some mice and a guinea pig. It was placed into the low earth orbit. It was invented to complete angle orbit. It de orbited shortly after the launch. Thus it was launched and successfully recovered. It was also known as Korbel Sputnik 4 or nostak-3KA No:1.

**1923, March 9, Walter Kohn was born.**

Walter Kohn was an Australian born, American theoretical physicist. He got Nobel Prize in 1998 for his contributions in understanding the electronic properties of materials. He helped in the development of density functional theory which made possible to incorporate quantum mechanical effect in the electronic density.

**1934, March 9, Yuri Gagarin was born**.

Yuri A Gagarin, a Soviet cosmonaut was the first man who travel into space.

**MARCH 10**

**Val Logsdon Fitch** born 10 Mar 1923; died 5 Feb 2015 at age 91. American particle physicist who was corecipient with James Watson Cronin of the Nobel Prize for Physics in 1980 for an experiment conducted in 1964 that disproved the long-held theory that particle interaction should be indifferent to the direction of time. Working with Leo James Rainwater, Fitch had been the first to observe radiation from muonic atoms; i.e., from species in which a muon is orbiting a nucleus rather than an electron. This work indicated that the sizes of atomic nuclei were smaller than had been supposed. He went on to study kaons and in 1964 began his collaboration with James Cronin, James Christenson, and René Turley which led to the discovery of violations of fundamental symmetry principles in the decay of neutral K-mesons.

**Jeremias B. Richter** born 10 Mar 1762; died 4 Apr 1807 at age

45. Jeremias Benjamin Richter was a German chemist who discovered the law of equivalent proportions. He studied chemistry in his spare time while in the Prussian army (1778- 1785) and afterwards while earning a Ph.D. in mathematics (1789). Richter was much influenced by Immanuel Kant, whose lectures he may have attended, in the contention that science is applied mathematics. Richter looked for mathematical relationships in chemisty, convinced that substances reacted with each other in fixed proportions. He showed such a relationship when acids and bases neutralize to produce salts (1791). Thus he was the first to establish stoichiometry, which became the basis of quantitative chemical analysis. He died of tuberculosis at age 45 years.

**F. Sherwood Rowland:** Died 10 Mar 2012 at age 84 (born 28 Jun 1927) Frank Sherwood Rowland was an Armenian chemist who shared the 1995 Nobel Prize for Chemistry with chemists Mario Molina and Paul Crutzen for research on the depletion of the Earth's ozone layer. Working with Molina, Rowland discovered that man-made chlorofluorocarbon (CFC) propellants accelerate decomposition of the ozonosphere, which protects the Earth from ultraviolet radiation from the sun.

**Lester Halbert Germer** died 10 Mar 1971 at age 74 (born 10 Oct 1896) was an American physicist who, with his colleague Clinton Joseph Davisson, conducted an experiment (1927) that first demonstrated the wave properties of the electron. They showed that a beam of electrons scattered by a crystal produces a diffraction pattern characteristic of a wave. This experiment confirmed the hypothesis of Louis-Victor de Broglie, a founder of wave mechanics, that the electron should show the properties of an electromagnetic wave as well as a particle. He also studied thermionics, erosion of metals, and contact physics.

**Frits Zernike** died 10 Mar 1966 at age 77 (born 16 Jul 1888), Dutch physicist who was awarded the Nobel Prize for Physics in 1953 for his invention of the phase-contrast microscope, an instrument that permits the study of internal cell

structure without the need to stain and thus kill the cells. In addition to its capacity to render colourless and transparent objects visible in the microscope, it also enables one to detect slight flaws in mirrors, telescope lenses, and other instruments indispensable for research. In this connection, Zernike's phase-plate serves as an indicator which locates and measures small surface irregularities to a fraction of a light-wavelength.

**Charles Gordon Curtis** died 10 Mar 1953 at age 92 (born 20 Apr 1860),

U.S. inventor who devised a steam turbine widely used in electric power plants and in marine propulsion. He was a patent lawyer for eight years. He patented the first U.S. gas turbine (1899). Among his other achievements, the Curtis multiple-stage steam turbine (patented 1896, sold rights to GE in 1901) required one tenth the space and weighed one eighth as much as machines it replaced. The Curtis generator was the most powerful steam turbine in the world and represented a significant advance in the capacity of steam turbines. In spite of its high-power output, this machine cost much less than contemporary reciprocating steam engine-driven generators of the same output. Image: One of Curtis's first steam turbines - 50kw.

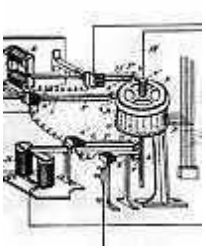
**Charles Hatchett** died 10 Mar 1847 at age 82 (born 2 Jan 1765). English chemist who discovered an element he called columbium in 1801. He worked at the British Museum. He found it while analyzing columbite, a blackrock in the collection from New England. The sample donor was Sir Hans Sloane, who received it decades earlier from the grandson of mineral collector, John Winthrop (1606-76), Connecticut's first governor. Hatchett was able to detect a new element in the complex mineral, but not to isolate it. It was called niobium by German chemist, Heinrich Rose, who rediscovered the metal forty years later. In 1864, the element itself was first separated by reducing the chloride by heating it in a hydrogen atmosphere. Niobium is a metal that burns when heated in air and is used in arc-welding rods.

**Johann Rudolf Glauber** died 10 Mar 1668 (born 1604) German-Dutch chemist, sometimes called the German Boyle; *i.e.,* the German father of chemistry. Glauber supported himself by selling secret chemicals and medicinals. He prepared hydrochloric acid from common salt and sulphuric acid and pointed out the virtues of the

residue, sodium sulphate - *sal mirabile*, or Glauber's salt. He also noted the formation of nitric acid from potassium nitrate and sulphuric acid. Glauber prepared many substances, made useful observations on dyeing, and described the preparation of tartar emetic. He urged that Germany's natural resources be developed and gave examples of such developments.

**Events**

**Telephone exchange :** In 1891, Almon B. Strowger was issued a



U.S. patent for his electromechanical switch to automate a telephone exchange (No. 447,918). Strowger did not invent the idea of automatic switching (it was first invented in 1879 by Connolly and McTigthe) but Strowger was the first to put it to effective use. His selector used electromagnets and pawls to move a wiper (with contacts on the end) vertically and around a bank of many other
contacts, able to make a connection with any one of them. Strowger formed his company, Strowger Automatic Telephone Exchange, in Oct 1891.

**MARCH 11**

**Nicolaas Bloembergen** born 11 Mar 1920. Dutch-American physicist who shared (with Arthur L. Schawlow of the United States and Kai M. Siegbahn of Sweden) the 1981 Nobel Prize for Physics for their revolutionary spectroscopic studies of the interaction of electromagnetic radiation with matter.

Bloembergen made a pioneering use of lasers in these investigations and developed three-level pumps used in both masers and lasers.

**Arthur Jeffrey Dempster** died 11 Mar 1950 at age 63 (born 14 Aug 1886). Canadian-American physicist who in 1918 built the first mass spectrometer (based on the invention of Francis W. Aston) and discovered isotope uranium-235 (1935). The mass spectrometer is an instrument that uses electric and magnetic fields to separate and measure a sample's atoms according to their mass and relative quantity. In 1935, he discovered that naturally occurring

uranium, though mostly uranium-238, contained 0.7% U-235 (later used as the primary fuel in atomic bombs and reactors after Niels Bohr predicted it could be used to produce a chain reaction releasing huge amounts of nuclear fission energy). During WW II, Dempster worked with the secret Manhattan Project that developed the world's first nuclear weapons.

**Henri-Étienne Sainte-Claire Deville** born 11 Mar 1818; died 1 Jul 1881 at age

63. French chemist and geologist who began the first industrial production of aluminium. His career started with research of turpentine. By 1849, turning to inorganic chemistry, he synthesized nitrogen pentoxide. Friedrich Woehler had isolated aluminum using costly potassium, as a laboratory curiosity. In 1854, Deville made aluminium, from aluminium chloride and less costly sodium. By 1860, he was producing aluminium at a factory in Javel, Paris, and later in Nanterre. The metal was more expensive than gold until Charles Hall invented the cheap electrolytic process. Deville also studied platinum and other minerals. As a geologist, he visited the coastal sites of Vesuvius and Stromboli. He proposed that volcanic eruptions resulted when sea water entered the fissures of the earth's crust where contact with hot rocks produced the explosive eruptions

Archibald Scott Couper died 11 Mar 1892 at age 60 (born 31 Mar 1831). Scottish chemist who, independently of August Kekulé, proposed the tetravalency of carbon and the ability of carbon atoms to bond with one another to form long chains, which concepts are fundamental to understanding the molecules found in living

organisms. He also created the use of a line between element symbols to indicate a chemical bond.

He wrote these landmark ideas in a paper to be submitted to the French Academy of Sciences through his superior, Adolphe Wurtz. Sadly for Couper, that paper was not forwarded from the lab in a timely fashion, and meanwhile another chemist, August Kekulé had published the same, though independent, idea of tetravalence, depriving Couper of his due fame.

**Events**

**Wireless telephone:** In 1919, a wireless telephone call was made by Secretary Josephus Daniels at his Navy Department desk, Washington D.C., to Ensign Faganwater, piloting a seaplane 150 miles away. A newspaper report said this was a record distance for such communication. Development began aided by Bell system experts since Feb 1917, with a successful test in Oct 1917. On 21 Nov 1919, President Wilson used a wireless telephone at the White House to direct maneuvers of a formation of planes nearby. Three years earlier, on 6 May 1916, the Secretary of the Navy had given orders, connected by AT&T Co. ship-to-shore radio telephone, to the captain of the battleship *New Hampshire*. Alexander Graham Bell had transmitted the first wireless telephone message using light in an experiment with his Photophone on 3 Jun 1880.

**MARCH 12**

**Gustav Robert Kirchoff** (12 March 1824 – 17 October 1887) born on 12$^{th}$march 1824. He was a German physicist who established the theory of Spectrum analysis, which Kirchhoff applied to determine the composition of the Sun. He found that when light passes through a gas, the gas absorbs those wavelengths that it would emit if heated, which explained the Fraunhofer lines in the Sun's spectrum. In his Kirchhoff's laws he generalised the equations describing current flow to the vase of electrical conductors in the 3 Dimensions, extending Ohm's law to calculation of the current voltage and resistances of electrical networks.

**John Friedrich Daniel** (12 March 1790- 13 March 1848) British chemist and

meteorologist who invented Daniel cell, Inventor of dew-point Hygrometer that measure relative humidity.

**Leo Esaki** (March 12, 1925) Japanese physicist who shared the Nobel Prize in Physics (1973) in recognition of his premiering work on electron tunnelling in solids.

Ragnar Asthier Granit died, he was a Swedish Physiologist who shares the 1967 Nobel prize in medicine for the study of internal electrical and chemical changes of the eye exposed to light.

**MARCH 13**

**Discovery of planet Uranus:** On march13, 1781, English astronomer William Hershel detected Uranus in the night sky but he thought it was a comet. It was the first planet to be discovered with the aid of a telescope.

**March 13, 1921 – Pencillin was discovered**

Birth date of Joseph Priestly (13, march 1737-6 Feb 1804).

Joseph Priestly was an English theologist, who was usually credited with the discovery of Oxygen.

1969 – Appollo -9 Returns to Earth:

**MARCH 14**

Albert Einstein –was a German-American physicist who developed the special and general theories of relativity and won Nobel prize in 1921 for the explanation of photoelectric effect. His theories proposed entirely a new thinking about space,time, and gravitation.Einstein was not only a scientist but also a great apostle of peace. To honour Einstein, an element Einstenium has been named after him.

**Thomas-L-Willson-Born on March 14 1860:** He was an American Chemist who discovered a commercial production method for calcium carbide using an electric arc furnace.

**MARCH 15**

**2004-DISCOVERY OF SEDNA ANNOUNCED**

Astronomers announced the discovery of the planetoid sedan.sedna,named after the Inuit goddess of the northern oceans, has become the most distant objectidentified in our solar system.

Arthur Holly Compton (died on 15 march 1962)

Arthur Holly Compton (September 10 1892- March 15 1962) was an American physicist and Nobel laureate in physics for his discovery of the Compton effect. He served as the chancellor of Washington University in St. Louis from 1945 to 1953.

Around 1913, Arthur Compton devised a demonstration method for the Earth، s rotation. In 1918, he began studying x ray scattering. In 1922, while on faculty at Washington University in St. Louis, Compton found that x ray lengths increases due to scattering of the radiant energy by free electrons. The scattered quanta have less energy than the quanta of the original ray. This discovery, known as the Compton effect. demonstrate the particle concept of electromagnetic radiation and earned Compton the Nobel prize in physics in 1927. Compton developed the method for the method for observing at the same instant individual scattered x ray photons and the recoil electrons.

John A People died 2004 March 15

People was an English theoretical Chemist who developed a computer program called Gaussian to apply the formulae of quantum mechanics to predict chemical reactions.

**MARCH 16**

George simon ohm-Born on march 16,1789

He was a german physicist who showed by experiment that there are no perfect electrical conductors.All conductors have some resistance.He stated the famous 'ohm's law'-if the given temperature remains constant the current flowing through certain conductor is

proportional to the potential difference(voltage0across it.i.e.,V=IR.

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**MARCH 17**

**Irène Joliot-Curie** died 17 Mar 1956 at age 58 (born 12 Sep 1897). French physicist and physical chemist, wife of Frédéric Joliot-Curie, who shared the 1935 Nobel Prize for Chemistry "in recognition of their synthesis of new radioactive elements." For example, in their joint research they discovered that aluminium atoms exposed to alpha rays transmuted to
radioactive phosphorus atoms. She was the daughter of Nobel Prize winners Pierre and Marie Curie. From 1946, she was director of the Radium Institute, Paris, founded by her mother. She died of leukemia, like her mother, resulting from radiation exposure during research.

**Christian Doppler d**ied 17 Mar 1853 at age 49 (born 29 Nov 1803). Christian Andreas Doppler was an Austrian physicist who first described how the observed frequency of light and sound waves is affected by the relative motion of the source and the detector, known as the Doppler effect. In 1845, to test his hypothesis, Doppler used two sets of trumpeters: one set stationary at a train station and one set moving on an open train car, all holding the same note. As the train passed the station, it was obvious that the frequency of the notes from the two groups didn't match. Sound waves would have a higher frequency if the source was moving toward the observer and a lower freqency if the source was moving away from the observer. Edwin Hubble used the Doppler effect of light from distant stars to determine that the universe is expanding. **Californium**

In 1950, a new radioactive element, element 98, named "californium" was announced by scientists at the University of California at Berkeley. This is a synthetic chemical element of the actinide series in Group IIIb of the periodic table, isotope californium-245. The scientists Stanley G. Thompson, Kenneth Street, Jr., Albert Ghiorso, and Glenn T. Seaborg produced it by bombarding curium-242 (atomic number 96) with helium-ions in the 60-inch cyclotron. Since then, longer lived isotopes have been created, including californium-251 with an 800-year half-life, and microgram quantities of compounds such as the oxychloride CfOCl, the oxide $Cf_2O_3$, and the trichloride $CfCl_3$. Also, californium- 252, with a half-life of 2.65-years, has industrial and medical applications as a very intense point source of neutrons. Used as a neutron emitter and to analyze the sulfur content of petroleum and to measure the moisture content of soil..

**MARCH 18**

**Superconductivity**

In 1987, the discovery of "high-temperature" superconductivity was announced to thousands of scientists at a packed meeting of the American Physical Society in New York City. The phenomenon, discovered 1911, was at first known to occur at only 4 degrees above absolute zero, when all electrical resistance in a metal sample

disappeared. In 1986, researchers discovered a ceramic material that was a superconductor at a temperature of more than 30 degrees above absolute zero. When published in September of that year, that news stirred the wider scientific community into action. By the time of the APS meeting, further discoveries had been made. The scene of excitement at the meeting was dubbed the "Woodstock of Physics."

**First spacewalk**

In 1965, *Voskhod 2* was launched into space carrying Aleksey Leonov and Pavel Belyayev aboard. On the second orbit Leonov left the spacecraft through the air lock while still tethered to the vessel. He was the first man to climb out of a spacecraft in space. While outside, he took motion pictures and practiced moving outside of the spacecraft for 10 minutes. *Voskhod 2* made 17 orbits at about 110 miles (177 km) above earth.

**MARCH 19**

Prince Louis Victor de Broglie: Born on 15th Aug 1892 Died on 19th Mar 1987

Louis Victor Piere Raymond duc de Broglie was French Physicist best known for his research in quantum theory and for his discovery of the wave nature of electrons. In 1923 as part of his Ph. D. thesis he argued that since light would be seen to behave under some conditions as particles (photo electric effect) and other times as waves. We should consider that matter has the same ambiguity of possessing both particle and wave properties. For this he was awarded the 1929 Nobel Prize for Physics.

**Events**

- In 1958, Britain's first Planetarium, The London Planetarium, opened in the west wing of Madame Tussauds. It is one of the former cinema and restaurant added in 1929, that had been destroyed by a German Bomb in 1940.

**MARCH 20**

Sir Issac Newton: Died on 20th Mar 1727 Born on 25th Dec 1642

He was an English Physicist who made seminal discoveries in several areas of science, and was a leading scientist of his era. His study of Optics included using a prism to show a white light could be split into spectrum of colours. The statements of his three laws of motion are fundamental in the study of mechanics. He was the first to describe the moon under the same influence of gravity as a falling apple embodied in the universal law of gravitation. 'Philosophiæ Naturalis Principia Mathematica', 'Binomial series', 'Newton's method' etc. are his famous work.

Julius Robert von Mayer: Born on 25th Nov 1814 Died on 20th Mar 1878

He was a German Physicist who measured the mechanical equivalent of heat. He beds an idea of conservation of energy before Joule and Helmholtz.

B.F.Skinner was born on 20 March 1904. He was an American psychologist, whose pioneering work in experimental psychology promoted behaviorism, shaping behaviour through positive and negative reinforcement and demonstrated operant conditioning.

**MARCH 21**

**Events**

- Plutonium named: In 1942 a secret report was submitted with the name plutonium for artificial element 94, since it followed by Neptunium and Uranium (93 and 92). The symbol Pu and Np were also suggested.
- Exclusion Principle: In 1925, Wolfgang Pauli published his exclusion principle at the age of 24 in an article in Zeitchriftfur physik. Pauli introduced the idea that two nearby electrons cannot be in exactly the same state at the same time. For this he was awarded Nobel Prize in 1945.

**MARCH 22**

Robert Andrews Millikan born 22 Mar 1868; died 19 Dec 1953 at age 85. American physicist who was awarded the 1923 Nobel Prize for Physics for "his work on the elementary charge of electricity and on the photoelectric effect." Millikan's famous oil-drop experiment (1911) was far superior to previous determinations of the charge of an electron, and further showed that the electron was a fundamental, discrete particle. When its value was substituted in Niels Bohr's theoretical formula for the hydrogen spectrum, that theory was validated by the experimental results. Thus Millikan's work also convincingly provided the first proof of Bohr's quantum theory of the atom. In later work, Millikan coined the term "cosmic rays" in 1925 during his study of the radiation from outer space.

John Canton died 22 Mar 1772 at age 53 (born 31 Jul 1718) a British physicist and teacher, who educated himself about science, and for developing a new method of preparing artificial magnets, won election to the Royal Society (1749).

In July 1752, he was the first Englishman to repeat French experiments verifying Franklin's hypothesis that lightning was just a huge electric spark, (as seen from charged Leyden jars). Following this, he studied the polarity of the charge on a cloud. He invented a portable electroscope to detect charge present in a system, and he remains well-known for electrostatic induction experiments. Canton proved that water is slightly compressible (1762). Noting compass needle irregularities during a prominent aurora borealis he made the first observations of magnetic storms (1756-9).

**Event**

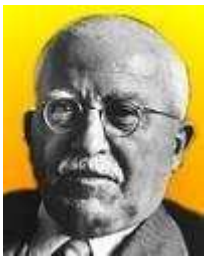
International ozone agreement: In 1985, the Vienna Convention for the Protection of the Ozone Layer was adopted and opened for signature. It entered into force on 22 Sep 1988 and established that secretariat functions would be carried out by the United Nations Environment Programme. Control of ozone- depleting substances was

needed because ecological and health damage results from a depleted ozone layer due to more UV-B radiation reaching the Earth's surface. Results include increased rates of skin cancers and eye cataracts, reduced plant and fishing yields from adverse effects on terrestrial and ocean ecosystems, weakened immune systems, and more damage to plastics.

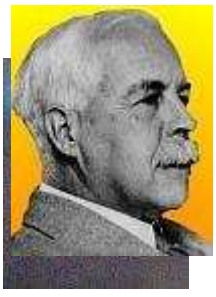
**MARCH 23**

Sir John Randall born 23 Mar 1905; died 16 Jun 1984 at age 79 English physicist whose critical improvements to the cavity magnetron, the microwave-generating device used in radar, was a major contribution to winning WWII. A magnetron is now commonplace in homes inside the microwave oven. Earlier magnetrons made in the 1920's gave low power output. By Feb 1940, development by Randall with Harry Boot of the small-sized cavity magnetron which generated centimeter wavelengths at much higher power allowed radar to detect smaller objects. In turn, this more compact equipment with a smaller antenna permitted easy mobile installation of high-resolution radar in aircraft.

Hermann Staudinger born 23 Mar 1881; died 8 Sep 1965 at age 84. German chemist who received the 1953 Nobel Prize for Chemistry for his discovery of the structure of polymers as long-chain molecules. In 1910, he developed a new, simple synthesis for isoprene, the basic molecular unit in synthetic rubber. By the 1920's, Staudinger had formed his view that polymer molecules could be very long chain of repeating units joined by normal chemical bonds, rather than the prevailing view that polymers were merely a disorderly aggregation of smaller molecules held together by some other forces. He coined the term *macromolecule* (1922). Eventually X-ray crystallography confirmed his long-chain structure of polymers.



Gilbert Newton Lewis died 23 Mar 1946 at age 70 (born 23 Oct 1875). American chemist who collaborated with Irving Langmuir in developing an atomic theory. He developed a theory of valency, which introduced the covalent bond (c. 1916), whereby a chemical



combination is made between two atoms by the sharing of a pair of electrons, one contributed from each atom. This was part of his more general octet theory, published in *Valence and the Structure of Atoms and Molecules* (1923). Lewis visualized the electrons in an atom as being arranged in concentric cubes. The sharing of these electrons he illustrated in the Lewis dot diagrams familiar to chemistry students. He generalized the concept of acids and bases now known as Lewis acids and Lewis bases

**Events**

**Mir destroyed:** In 2001, the Russian space station, Mir, ended 15 years in orbit by burning up in Earth's atmosphere as the way chosen to end its life. Mir, launched in 1986, had far exceeded its originalplanned five year lifespan.

**Cold fusion**

In 1989, fusion at room temperature was claimed by Martin Fleischmann andStan Pons, two Utah electrochemists. They believed they had sustained acontrolled nuclear fusion reaction in a bench-top fusion percolator made up of twoelectrodes with heavy water which generated up to 100 per cent more energythan they put in.

There were sporadic sightings of excess heat, which Fleischmann said cannot be accounted for by chemistry alone. However, the idea of cold fusion was discredited because leading scientists were unable to replicate the work and found no hallmarks of nuclear processes, especially none of the subatomic particles called neutrons.

**First xenon compound**

In 1962, the first compound of any "inert gas" was made by Neil Barlett by reacting platinum hexafluorideand xenon to form XePtF6, a yellow-orange solid that was stable at room temperature. The previous autumn, he had prepared a remarkable compound of oxygen with platinum hexafluoride. In that compound, $[O2]^{+}[PtF6]^{-}$, the platinum hexafluoride, PtF6 was such an extreme oxidizer that the oxygen formed

a positive cation. Interestingly, the energy to remove an electron from oxygen (12.2 eV), he realized, was extremely close to that for xenon (12.13 eV). This suggested a xenon compound could be made in a similar way. His success ended the half-century belief that xenon was an inert gas, and is since known as a "noble" gas.

**MARCH 24**

Robert T. Bakker born 24 Mar 1945. American paleontologist who was the first to prove that dinosaurs were warm blooded and have more in common with birds than cold-blooded lizards. He is an outspoken a maverick and holds controversial opinions about the dinosaurs that are his passionate study. He disagrees with the commonly held belief that dinosaurs perished in a cataclysmic global climate change caused by a monumental meteor strike. Instead, he maintains that a series of extinctions resulted as land bridges formed that brought together dinosaur species that may have been enemies, competited for resources, or carried diseases.

Joseph H. Taylor Jr. born 24 Mar 1941, American radio astronomer and physicist who shared (with Russell A. Hulse) the 1993 Nobel Prize for Physics for their joint discovery of the first binary pulsar (1974). This unique phenomenon, two stars orbiting each other - one of them giving off regular radio-frequency "beeps" - has been important as a deep space proving ground for Einstein's general theory of relativity. Their research group at Princeton used the 1,000 foot radio telescope at Arecibo, Puerto Rico, the largest and most sensitive in the world for catching radio waves from space

Sir John Cowdery Kendrew born 24 Mar 1917; died 23 Aug 1997 at age 80. English biochemist who shared the 1962 Nobel Prize for Chemistry (with colleague Max Ferdinand Perutz) "for their studies of the structures of globular proteins." Perutz had determined the structure of hemoglobin. Kendrew worked out the structure of the muscle protein myoglobin, which stores oxygen and gives it to the muscle

cells when needed.

Josef Stefan born 24 Mar 1835; died 7 Jan 1893 at age 57. Austrian physicist who

proposed a law of radiation (1879) stating that the amount of energy radiated per second from a black body is proportional to the fourth power of its absolute temperature. (A black body is a theoretical object that absorbs all radiation that falls on it.) This law is known as Stefan's law or the Stefan-Bolzmann law. He also studied electricity, the kinetic theory of gases and hydrodynamics.

Willem Hendrik Keesom died 24 Mar 1956 at age 79 (born 21 Jun 1876).

Dutch physicist who was a pioneer in cryogenics and was the first to solidify helium under pressure (1926). He was a research assistant for Kamerlingh Onnes working on the liquefaction of helium, and several years later, subsequently succeeded him(1923) as director of the Physics Laboratory at Leiden. In work done with M. Wolfke, after studying discontinuities in several properties of helium at very low temperatures (1927) they suggested that it may be due to a phase change. They called the helium above the transitional helium I and the helium below the transition helium II. In 1932, he produced a temperature just two degrees above absolute zero (-272° C or -457.6°F).

Johann Wolfgang Döbereiner

Died 24 Mar 1849 at age 68 (born 13 Dec 1780). German chemist whose observation (1829) that when certain triads of elements were arranged in order of increasing atomic mass, the mass of the central member was approximately the average of the other two, and intermediate in chemical properties between the other two elements. The triads are now found as consecutive members of the groups of the periodic table. For example, the atomic weight of bromine (80.970) was the arithmetic mean of the atomic weights of chlorine (35.470) and iodine (126.470) and the properties of the three elements varied in an orderly manner, from chlorine to bromine to iodine. Döbereiner found two other such "triads" - calcium, strontium,

barium; and sulfur, selenium, tellurium. He was one of the first chemists to offer laboratory instruction in chemistry. He studied in general, pharmaceutical, and analytical chemistry. Also, he invented a lamp in which hydrogen ignited on contact with a platinum sponge (1823). Although the lamp had limited application, Döbereiner was interested in catalysis in general. He discovered the catalytic action of manganese dioxide in the decomposition of potassium chlorate.

**Events**

Maser In 1959, the maser was patented by Charles Townes (No. 2,879,439). "Maser" is an acronym for "Microwave Amplification by the Stimulated Emission of Radiation ". The invention is an apparatus for amplifying and producing electromagnetic energy directly from excited molecules or atoms. The concept grew out of research in microwave spectroscopy following Word War II . The image shows Townes with the second maser at Columbia University. The normally evaculated metal box where maser action occurs is opened up to show the four rods (centre) that send excited molecules into a resonant cavity (to the right). The microwaves that were generated emerged through the vertical copper waveguide near Townes' hand.

**MARCH 25**

Pierre Weiss Born 25 Mar 1865; died 24 Oct 1940 at age 75. French physicist who investigated magnetism and determined the Weiss magneton unit of magnetic moment. Weiss's chief work was on ferromagnetism. Hypothesizing a molecular magnetic field acting on individual atomic magnetic moments, he was able to construct mathematical descriptions of ferromagnetic behaviour, including an explanation of such magnetocaloric phenomena as the Curie point. His theory succeeded also in predicting a discontinuity in the specific heat of a ferromagnetic substance at the Curie point and suggested that spontaneous magnetization could occur in such materials; the latter phenomenon was later found to occur in very small regions known as Weiss domains.

Friedlieb Ferdinand Runge

Died 25 Mar 1867 at age 72 (born 8 Feb 1795). quotes German chemist considered to be the originator of the widely used analytic technique of paper chromatography. In the course of his research on synthetic dyes, he isolated and named several important components of coal-tar oil, among them carbolic acid (1934, now called phenol), pyrrole, rosolic acid (aurin), and cyanol (aniline). He did not analyze any of these compounds, however. In 1850, Runge published the first systematic study of chromatography: concentric circles of different coloured substances diffused through paper. He also noted the ability of belladonna to induce long-lasting dilation of the pupil of the eye (mydriasis), and he developed a process for obtaining sugar from beet juice. He investigated dry distillation and the composition of matter.

**Events**

Color TV: In 1954, RCA announced the production of color television sets.

21cm radiation: In 1951, Edward Mills Purcell and H.I. Ewen at the Harvard physics lab detected 21-cm radiation in outer space.

TV demonstration: In 1925, the first public demonstration of his television system was held by John Logie Baird at the Selfridges department store, Oxford Street, London. It would be ten years before the introduction in Britain of televisions with higher definition on 2 Nov 1936.

In 1903, *The Times* newspaper reported that the French physicist, Pierre Curie assisted by Marie Curie, communicated to the Academy of Sciences that the recently discovered Radium "possesses the extraordinary property of continuously emitting heat, without combustion, without chemical change of any kind, and without any change to its molecular structure, which remains spectroscopically identical after many months of continuous emission of heat ... such that the pure Radium salt would melt more

than its own weight of ice every hour ... A small tube containing Radium, if keptin contact with the skin for some hours ... produces an open sore, by destroying the epidermis and the true skin beneath ... and cause the death of living things whose nerve centres do not lie deep enough to be shielded from their influence."

Sheet glass: In 1902, Irving W. Colburn patented the sheet glass drawing machine.

First eclipse photograph: In 1857, Frederick Laggenheim took the first photograph of a solar eclipse.

Thames Tunnel Opening: In 1843, the Thames Tunnel in London, the world's first tunnel under a navigable river, was opened for pedestrians between Rotherhithe and Wapping. Work had started on 2 Mar 1825. Excavation was engineered by Marc Brunel, for which he used a tunneling shield to reduce the danger of collapse while digging through soft sediments. Beginning his own engineering career, his son Isambad K. Brunel assisted. Together they persevered through 18 years, dealing with floods, human disasters, and delays caused by financing difficulties. Planned ramps for use by carts and freight traffic were never added due to cost. A railway line through the tunnel opened on 7 Dec 1869, and it remains in use as the oldest part of the London Underground.

**MARCH 26**

Count Benjamin Thompson Rumford born 26 Mar 1753; died 21 Aug 1814 at age 61. American-British physicist, government administrator, and a founder of the Royal Institution of Great Britain, London. Because he was a Redcoat officer and an English spy during the American revolution, he moved into exile in England. Through his investigations of heat he became one of the first scientists todeclare that heat is a form of motion rather than a material substance, as was popularly believed until the mid-19th century. Among his numerous scientific contributions are the development of a calorimeter and a photometer. He invented a double boiler, a kitchen stove and a drip coffee pot.

**Harry Coover**

Died 26 Mar 2011 at age 94 (born 6 Mar 1917). American chemist and inventor who invented Super Glue. He accidentally discovered (1951) the adhesive properties of cyanoacrylate monomers that needed neither heat nor pressure to permanently bond between various surfaces. He patented the formula (U.S. No. 2,768,109) with the title "Alcohol-Catalyzed Cyanoacrylate Adhesive Compositions/ Superglue." It was first marketed (1958) under the "Eastman 910" name, after his employer, Eastman Kodak. From 1963, it has been sold as Loctite "Super Glue." Memorable advertising showed a car lifted by a crane using an attachment bonded with just a few drops. Its versatility extends to derivatives used for repairing arteries, veins, teeth and as a spray to seal open wounds of soldiers during combat in Vietnam.

Edward U. Condon

Died 26 Mar 1974 at age 72 (born 2 Mar 1902). Edward Uhler Condon was an American physicist who is remembered for the Franck-Condon principle (1928), development of radar and contributing to the design of magnetic separation equipment subsequently applied to process uranium for atomic bombs. The Franck-Condon principle (1928) is a quantum-mechanical treatment of the earlier statement by James Franck (1925) that in any molecular system the transition from one energy state to another occurs so near to instantaneously that the nuclei of the atoms involved are stationary.

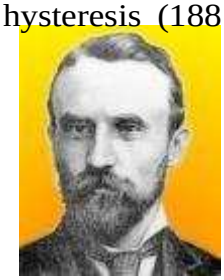
**Events**

Palomar telescope: In 1936, a glass casting for the first 200-inch diameter, reflecting telescope mirror was shipped by train from Corning, New York to California for the new Hale telescope at the Mt. Palomar Observatory. It was cast on 2 Dec 1934, put in an annealing oven, then slowly allowed to cool for a year. The mirror weighed 20 tons, and was made of Pyrex glass, which does not expand and contract as much during temperature changes as ordinary glass.

Continuous-strip photographic film:In 1885, commercial production began of George Eastman's flexible, paper-backed photographic film, the first continuous- strip negative able to be compactly spooled. The film consisted of a layer of paper and a coating of insoluble sensitized gelatin emulsion, separated by a layer of soluble gelatin to enable release of the film layer after developing.

**MARCH 27**

Sir Alfred Ewing born 27 Mar 1855; died 7 Jan 1935 at age 79. Sir James Alfred Ewing was a Scottish physicist who discovered and named hysteresis (1881), the resistance of magnetic materials to change in magnetic force. Ewing was born and educated in Dundee and studied engineering on a scholarship at Edinburgh University. He helped Sir William Thomson, later Lord Kelvin in a cable laying project. In 1878 he became professor of Mechanical Engineering and Physics at Tokyo University, where he devised instruments for measuring earthquakes.



Otto Wallach: Born 27 Mar 1847; died 26 Feb 1931 at age 83.German chemist awarded the 1910 Nobel Prize for Chemistry for identifying terpene compounds. His interest began began by analyzing fragrant essential oils - oils removed from plants by steam distillation, with industrial uses - and started research into determining their molecular structure. Wallach succeeded in determining the structure of several terpenes, including limonene

Wilhelm Röntgen Born 27 Mar 1845; died 10 Feb 1923 at age 77. Wilhelm Conrad Röntgen was a German physicist who discovered the highly penetrating form of radiation that became known as X-rays on 8 Nov 1895. He received the first Nobel Prize for Physics (1901), "in recognition of the extraordinary services he has rendered by the discovery of the remarkable rays subsequently named after him." This high-energy radiation, though first called Röngen rays, became known as X-rays.

Johann Wilhelm Hittorf born 27 Mar 1824; died 28 Nov 1914 at age 90. German physicist who was a pioneer in electrochemical research. His early investigationswere on

the allotropes (different physical forms) of phosphorus and selenium. He was the first to compute the electricity- carrying capacity of charged atoms and molecules (ions), an important factor in understanding electrochemical reactions. He investigated the migration of ions during electrolysis (1853-59), developed expressions for and measured transport numbers. In 1869, he published his laws governing the migration of ions. For his studies of electrical phenomena in rarefied gases, the Hittorf tube has been named for him.

Sir James Dewar died 27 Mar 1923 at age 80 (born 20 Sep 1842). Scottish chemist and physicist who blurred the line between physics and chemistry and advanced the research frontier in several fields at the turn of the century. He gave dazzling lectures and his study of low-temperature phenomena entailed making the Dewar flask, an insulating double-walled flask of his own design by creating a vacuum between the two silvered layers of steel or glass (1892), whichled to the domestic Thermos bottle.

**Events**

Mobile computer center: In 1961, the first mobile computer center, a UNIVAC Solid-State 90 computer loaded into a motor van, was used on assignment for the Douglas Aircraft Corporation, Charlotte, N.C. The mobile center was set up by Remington Rand UNIVAC, a division of Sperry Rand.

Long-distance phone call : In 1884, the first long-distance telephone call was made, between Boston and New York City. Branch managers of the American Bell Telephone Company in Boston called their counterparts in New York City.

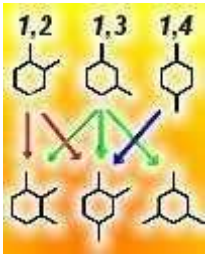
**MARCH 28**

Jerome Isaac Friedman born 28 Mar 1930, American physicist who, together with Richard E. Taylor and Henry W. Kendall, received the Nobel Prize for Physics in 1990 for their joint experimental confirmation of the fundamental particles known as quarks.

William Francis Giauque died 28 Mar 1982 at age 86 (born 12 May 1895). Canadian-

born American physical chemist and winner of the Nobel Prize for Chemistry in 1949 for his "achievements in the field of chemical thermodynamics and especially his work on the behavior of matter at very low temperatures and his closely allied studies of entropy." He is remembered particularly for his discovery of adiabatic demagnetization as a means to reach temperatures close to absolute zero as well as for his exhaustive and meticulous thermodynamic studies, over a lifetime of research, which utilized the third law of thermodynamics while also developing a large body of evidence for its validity.

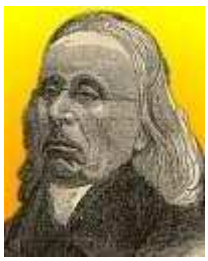
Wilhelm Körner died 28 Mar 1925 at age 85 (born 20 Apr 1839). German organic chemist who established in 1874 how to determine the positions of the substituents on di- and tri-substituted isomers of the benzene ring by counting product or source isomers (five years before the van't Hoff-Le Bel hypothesis of tetrahedral carbon.) Because the 1,2-disubstituted isomer gives two products; the 1,3 gives three; and the 1,4 gives only one, both starting compounds and products can be identified. This identifies both starting materials and products. From 1864-67, Korner worked directly with August Kekulé (who realized the ring structure of benzene). The 126 aromatic compounds he prepared included pyridine (1869) and asparagine (1887, with Angelo Menozzi). He died by suicide.




**Events**

Three Mile Island nuclear accident

In 1979, a nuclear accident occured at Unit 2 of the Three Mile Island nuclear power plant outside Harrisburg, Pennsylvania, USA. Caused by human and mechanical errors, a cooling system malfunctioned and permitted a partial meltdown of the reactor's core. Efforts to re-establish cooling of the reactor took several days. No evacuation was ordered, but 100,000 people fled.



Hoyle coined “Big Bang”

In 1949, Fred Hoyle unintentionally coined the term "Big Bang" as a household name, in a scripted radio broadcast on the BBC Third Programme. His talk was printed in the *The Listener* (7 Apr 1949). He compared his own belief in a "steady state" universe, saying, "earlier theories … were based on the hypothesis that all the matter in the universe was created in one big bang at a particular time in the remote past.

**MARCH 29**

John Robert Vane born 29 Mar 1927; died 19 Nov 2004 at age 77English biochemist, who shared the 1982 Nobel Prize for Physiology or Medicine (with Sune K. Bergström and Bengt Ingemar Samuelsson of Sweden) for their isolation, identification, and analysis of prostaglandins. In 1971, Vane discovered how aspirin's effect was to block the formation of the prostaglandins involved in pain, fever, and inflammation.

Francesco Zantedeschi died 29 Mar 1873 (born 1797). Italian priest and physicist, who published papers (1829, 1830) on the production of electric currents in closed circuits by the approach and withdrawal of a magnet, preceding Faraday's classic experiment of 1831. Studying the solar spectrum, Zantedeschi was among the first to recognize the marked absorption by the atmosphere of the red, yellow, and green light.

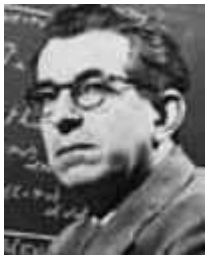
**Events**

French nuclear submarine: In 1967, the French Navy launched*Le Redoutable*, its first ballistic missile nuclear-powered submarine, in the presence of General de Gaulle at the Cherbourg naval shipyard.

Electron microscope: In 1956, Soviet scientists reported in the U.K. the development of a new form of electron microscope that enabled atoms to be seenfor the first time.

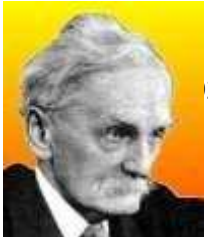
MARCH 30

Jean-François Pilâtre de Rozier: Baptized 30 Mar 1754; died 15 Jun 1785 at age 31. French physicist and aeronaut who, with Marquis Francois Laurantd'Arlandes, became the first men to fly.



Fritz Wolfgang London: died 30 Mar 1954 at age 54 (born 7 Mar 1900). German-American physicist who, with Walter Heitler, devised the first quantum mechanical treatment of the hydrogen molecule, while working with Erwin Schrödinger at the University of Zurich. In a seminal paper (1927), they developed awave equation for the hydrogen molecule with which it was possible to calculate approximate values of the molecule's ionization potential, heat of dissociation, and other constants. These predicted values were reasonably consistent with empirical values obtained by spectroscopic and chemical means. This theory of the chemical binding of homopolar molecules is considered one of the most important advances in modern chemistry. The approach is later called the valence-bond theory.

Friedrich Bergius died 30 Mar 1949 at age 64 (born 11 Oct 1884). Friedrich Karl Rudolf Bergius was a German chemist who invented a process to convert coal dust and hydrogen directly into gasoline and lubricating oils without isolating intermediate products (Stuttgart, 25 Jun 1921). Bergius succeeded, during distillation of coal, in forcing hydrogen under high pressure to combine chemically with the coal, transforming more carbon from the coal into oils than is possible with conventional distillation. To solve at distribution and temperature regulation problems, Bergius invented treating a mixture of pulverized coal in oil with the gas under high pressure. For his work in developing the chemical high pressure hydrogenation method necessary for this process he shared the 1931 Nobel Prize for Chemistry with Carl Bosch of Germany.



Sir Charles Vernon Boys died 30 Mar 1944 at age 89 (born 15 Mar 1855). English physicist and inventor of sensitive

instruments. His studies included in mining, metallurgy, chemistry and physics. He was also self-taught in a wide knowledge of geometrical methods. In 1881, he invented the integraph, a machine for drawing the antiderivative of a function. Boys is known particularly for his definitive book
(1890) on the physics soap bubbles. He employed the torsion of quartz fibres to measure minute forces, repeating (1895) Henry Cavendish's experiment, to improve the measurement of the Newtonian gravitational constant. He also invented an improved automatic recording calorimeter for testing city coal gas (1905) and high-speed cameras to photograph rapidly moving objects, such as bullets and lightning discharges. He was knighted in 1935. Upon retirement in 1939, he grew and studied garden weeds.
John Henry Poynting died 30 Mar 1914 at age 61 (born 9 Sep 1852). British physicist who introduced a theorem (1884-85) that assigns a value to the rate of flow of electromagnetic energy known as the Poynting vector, introduced in his paper *On the Transfer of Energy in the Electromagnetic Field* (1884). In this he showed that the flow of energy at a point can be expressed by a simple formula interms of the electric and magnetic forces at that point. He determined the mean density of the Earth (1891) and made a determination of the gravitational constant (1893) using accurate torsion balances. He was also the first to suggest, in 1903, the existence of the effect of radiation from the Sun that causes smaller particles in orbit about the Sun to spiral close and eventually plunge in.

Ellen Swallow Richards died 30 Mar 1911 at age 68 (born 3 Dec 1842). American chemist (née Ellen Henrietta Swallow) who was the founder of the home economics movement in the United States. She was

the first woman admitted to the Massachusetts Institute of Technology (MIT),[80] graduated with a B.S. in 1873, and stayed on as a chemistry assistant. She went to work analyzing Boston's water supply. In Nov 1876, she created the Woman's Laboratory at MIT where women could learn the rudiments of science. In 1884, MIT made Richards its first woman faculty member. She helped develop a new curriculum in air, water, and sewage chemistry. However, she also saw the home and child-rearing as complex and important work, saying the women who did it should be educated.

She spent thirty years developing the concept of domestic science.

Antoine J. Balard died 30 Mar 1876 at age 73 (born 30 Sep 1802). Antoine Jérôme Balard was a French chemist who in 1826 discovered the element bromine, determined its properties, and studied some of its compounds. Later he proved the presence of bromine in sea plants and animals. This discovery was a by-product of a more general chemical investigation of the sea and its life forms. Bromine had an atomic weight that was close to the arithmetic mean of two other known halogens, chlorine and iodine, suggesting they formed a "chemical family." He also researched the inexpensive extraction of salts from seawater. He discovered oxamic acid by using heat to decompose ammonium hydrogen oxylate. He studied and named amyl alcohol. Louis Pasteur and Marcellin erthelot were among his students.

**Events**

Einstein: In 1953, Albert Einstein announced his revised unified field theory.

Immense copper balloon : In 1844, the 30 Mar issue of the *Illustrated London News* reported the construction in Paris of a "vast balloon of copper, which is so far completed as to be exhibited to the public." Some facts were given: it was about 10-yards diam., of copper sheets 1/200-inch thick, weighed 800-lb, would contain 100-lb of hydrogen, and the Parisian journals stated that a French aeronaut would ascent with it. The copper skin would retain gas better than varnished silk

Egg incubator : In 1843, the first U.S. patent for an egg incubator was issued to Napoleon E. Guerin of New York City (No. 3,019). It described a "mode of distributing steam heat, purifying air, etc." for hatching chickens by artificial heat.

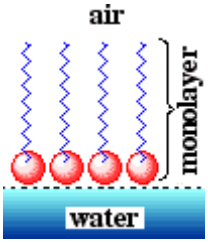
**MARCH 31**

Carlo Rubbia Born 31 Mar 1934. Italian physicist who in 1984 shared with discovery of the massive, short-lived subatomic W particle and Z particle. Around 1960, he joined the newly founded CERN where he investigated the structure of weak interactions. In 1976, he suggested adapting CERN's Super Proton Synchrotron (SPS) to collide protons and antiprotons in the same ring and the world's first antiproton factory was built, and started running in 1981.

Hin-ichiro Tomonaga: Born 31 Mar 1906; died 8 Jul 1979 at age 73 a Japanese physicist who shared the Nobel Prize for Physics in 1965 (with Richard P. Feynman and Julian S. Schwinger of the U.S.) for independently developing basic principles of quantum electrodynamics. He was one of the first to apply quantum theory to subatomic particles with very high

energies. Tomonaga began with an analysis of intermediate coupling - the idea that interactions between two particles take place through the exchange of a third (virtual particle)

Isidor Traube : Born 31 Mar 1860; died 27 Oct 1943 at age 83. German physical chemist who had founded capillary chemistry and whose research on liquids advanced knowledge of critical temperature (the point at which liquid and gas states of a substance are identical), osmosis, surface tension and colloids (suspensions of nanometer-sized particles). He studied liquids




including gastric juice, urine, blood, and milk. He designed a viscometer to measure viscosity and a capillarimeter to measure capillary action, the rise of a liquid in a narrow tube.

Friedrich Hund

Died 31 Mar 1997 at age 101 (born 4 Feb 1896). Friedrich (Hermann) Hund was a German physicist known for his work on the electronic structure of atoms and molecules. He introduced a method of using molecular orbitals

to determine the electronic structure of molecules and chemical bond formation. His empirical Hund's Rules (1925) for atomic spectra determine the lowest energy level for two electrons having the same n and l quantum numbers in a many-electron atom. (1) The lowest energy state has the maximum multiplicity

consistent with the Pauli exclusion principle. (2) The lowest energy state has the maximum total electron orbital angular momentum quantum number, consistent

with rule (1). They are explained by the quantum theory of atoms by calculations involving the repulsion between two electrons.

**Events**

Calder Hall nuclear power station closed

In 2003, Calder Hall nuclear power station was closed at the end of an almost 47 years of service since it was opened on 17 Oct 1956. It was the world's first commercial nuclear power station that was connected to a national electricity grid.

Atomic submarine division

In 1958, the U.S. Navy established the world's first Atomic Submarine Division

Foucault pendulum demonstrated

In 1851, Leon Foucault demonstrated his pendulum experiment at the Pantheon of Paris at the request of Napoleon Bonaparte, who had been informed of Foucault's recent discovery on 6 Jan 1851. He had installed a pendulum in his cellar in the Arras Street of Paris.

## APRIL

**APRIL**

**1**

French physicist 'Claude Cohen- Tannocidje' born in first April 1933, who shared the Nobel prize for Physics in 1997, for the development method using laser light to coal gases to the micro Kelvin temperature range.

Lev Dauidouich Landau : Died 1 April 1908 at age 60 Soviet physicist who worked in such field as low temperature physics, atomic and nuclear physics and solid state, stellar energy and plasma physics. He was awarded the 1962 Nobel prize for physics for his work to explain the peculiar super fluid behavior of liquid helium at very low temperature.

In1948, Alpher, Bethe and Gamous famous letter to physical receiver was published. The 'Big bang' theory had previously been around as a competing theory with 'steady state' for a while. Their paper gave a 'hot big bang' mathematical analysis of atomic events during the creation of the universe, and explains the relative abundance of the light elements in the universe. In fact, the paper was written by Ralph Alpher and George Gamow. The esteemed fans Bethe were persuded to lend his name as a co-auther for the amising similsiety to 'alpha, beta and gamma' the first letters of the Greek alphabet. he did actually make later contributions to discussion of the theory.

**APRIL 2**

"Francesco Maria Gumaldi" born 2 April 1618.Italian physicist and mathematician who studied the diffraction of light. He observed the image on a screen in a darkened room of a tiny beam of sun light after it passed through a vine screen. The image has iridescent fringes, and deviated from a normal geometrical shadow. he coined the name diffraction for this change of refectory of light passing near opaque objects. This provided the evidence for later physicist to support the wave theory.

"Theodorn William Richard "Died 2 April 1928. American analytical chemist who was awarded the 1914 Nobel Prize for Chemistry in recognition of his accurate determination of the atomic weight of a large number chemical elements.

**Radar patent**

In 1935 Scottish physicist Sir Robert Watson Watt was granted a patent for the RADAR. He become head of the radio section of the national physical laboratory, where his work on locating aircraft was an outgrowth of his earlier work on radio wave detection of thunderstorms to benefit airman. He realized the principle could also be used to lack enemy aircraft for all defense.

**APRIL 3**

Richard Withelm Himrich Abegy

Died 3 April 1910 German physical chemist who with Giudo Bodlander, proposed an election heatment of chemical affinity and valency in a papper Die elekhonaffinitate.

**April 4**

Zdenek Kopal,Born 4 April 1914,

Czech astronomer who directed an international project,fenaineed by the U.S Airface,the furcating telescope at the pie dei midi obseuealeery in Southern France.

Sir William Grookes died 4 April 1919, at the age 76.English physicist and chemist who discovered the elements Thallium and showed that earthed rays fast moving, negatively charged particles. The dark space is the dark region around a cathode making electrical discharges at low pressure. He invented the radiometer in which force Uranus suspended on a needle with one side black and other side white are observed to locate the effect of incident light. He also invented the Spinthariscope which reveals alpha particles emitted by radium as light flashes when they impact a Zinc sulphide screen received under magnification.

Challenger

In 1983, the space shuttle 'challenger' roared in to orbit on its maiden voltage. Hewas named after the British Naual research vessel HMS challenger that sailed the Kttanlee and pacific ocean during the 1807's.Challenger joined the NASA fleet of reusable ranged the 1870's.challenger joined the NASA fleet of reusable ranged spaceships and few nine successful space shuttle mission. But on 28, Jan1986.

**APRIL 5**

"Ilvar Giaever " born 5 April 1929, Norwegian-American physicist, who for his experimental discoveries on tunneling phenomina in superconductors shared theNobel prize in 1973 with Leo Esaki and Brian Josephson for work in solid state physics. Giaever demonstrated the tunneling of electron through a sandwich withan extremely thin oxide layer surrounded with metal either in superconducting state on both sides or in superconducting state on one side and in normal state onthe other side. This gave

direct evidence for the so called energy gap in super conductor.

Sir Charles Frank died on 5 April 1998. English chemist and physicist whose work encompassed the physics of earth quarks, the growth of crystal strength of polymers and the molecular alignment with in liquid crystal. This scientific fame was established by a decade bringing successes in application of crystal dislocation theory. This theoretical work has been the foundation of researches by scientist of all nationalities ever since, and continues to gain practice in the metallurgical and semiconductor industries.

In 1963, the U.S atomic energy commission gave the Fermi Award to J. Robert Oppenheimer for research in nuclear energy.

**APRIL 6**

"Horst L Stormer" born on 6 April 1949. German-American physicist, who shared the 1998 Nobel Prize in physics for the discovery of a new form of quantum fluid with fractionally charged excitations.

Pioneer 11: In 1973 pioneer 11 was launched to Jupiter and Saturn

Early Bird Satellite : Jupiter in 1965, the United States launched the "Early Bird" Intelsat 1 the first commercial geosynchronous communication satellite.

**APRIL 7**

"Francesco Selmi" born 7 April 1817, Italian chemist and toxicologist who is considered one of the founders of colloid chemistry. He coined the word 'ptomaine' to denote certain nitrogenous compounds easily detectable by smell. Ptomaines are the products of protein decay.

"Jacques Alexandre Ceser Charles" died 7 April 1823 French mathematician, physicist and inventor. When Benjamin Franklin visited France in 1779, Charles was inspired to study physics.

2001 Mars Odyssey

In 2001 NASA launched the 2001 Mars Odyssey space craft on a Delta 2 rocket. Odyssey would travel 286 million miles before entering orbit around the red planet on oct 2002.

Its primary mission was to look for water in the form of ice under the Martian surface and to create a map of the planet. From an altitude of about 250 miles, the space craft was to search for traces of hydrogen, which could point out the existence of water.

**APRIL 8**

Johann salamo Christophe Schweigger

Born 8 April 1779.German physicist who invented the galvanometer a device to measure the strength of an electric current.

Sunspot

In 1947,the largest sunspot group recorded was observed on the sun's southern hemisphere.

**APRIL 9**

Michel Eugene Chevreul

Died 9 April 1889.French chemist who began the study of the chemistry of facts.First astronauts selected

In 1959 NASA announced the selection of America's first seven astronauts for project Mercury. Scott, Carpenter, Gordem Cooper, John Glenn, Gus Grissom,Wally Schirra, Alan shepard and Donald Slayton were chosen from 110 applicants.

**APRIL 10**

Robert Burns Woodward:

Born 10 April 1917 American chemist who is best known for his synthesis of complex organic substances including quinine, the well known anti material the steroids, cholesterol ,and cortisone and vitamin B12.

.Jean Baptist Andre Dumas

Died 10 April 1884. French chemist who was a pioneer in organic chemistry. profounding new theories of relationship between organic compounds, he laid the

foundation for kekule's later work.

**APRIL 11**

Julius lothur Mayer: Died 11 April 1895, he was a German chemist who discovered the periodic law independently of Dmitry Mendeleyev, at about the same time.

Halley's Comet: In 1986 Halley's comet made its closest approach to earth this , 63 million KM on its out-bound journey.

Space shuttle repair: In 1984challenges astronauts completed the first in-space satellite repair

**APRIL 12**

Igar Yengenyenich Tanam: Died 12 april 1971, soviet physicist who shared the Nobel Prize for physics, for his efforts in explaining Cherenkov radiations.

Space shuttle: In 1981, the American space shuttle Colombia was launched in to space, NASA flight STS-1 to become the first of a series of usable space craft.

First earth orbit by man: In 1961 Yuri Gagarin becomes the first man to orbit the earth. This space craft, vostok 1 had radio, television and life support equipment to relay information on his condition.

**APRIL 13:**

Sir Robert alexander watson wutt born 13 april 1892 scottish physicst who is credited with the development of radar location of aircraft,in england.he become the rhead of the radio section of the national physic laboratory,where he began work on locating aircraft.his work led to the development of radar.

Leopard Gmelin:died 13 april 1853,german chemist who discovered potassium ferrocyanidedevised gmelin'slist for bile pigments and researched the chemistry of digestion.he published the notable hund book of chemistry to comprehensively servey the subject.

Appolo xii rescue:in 1970 explosion during the appolo 13 mission led to one of the

most spectacular rescue missions in u s space history.the explosion abord the odyssey space craft left the creue standed for four days more than 200,000 miles from earth.

**APRIL 14**

Christian Huygens ,born 14 april 1629 dutch physicist and astronomer who founded the wave theory of light,discovered the true shape of the ring of saturn,and contributed to the science of dynamics.the study of action of force on bodies.using lense he he ground for himself on 25 th march 1655,he discoverd the first moon of saturn later named titan.

William N. Lipscomb Jr.died 14 april 2011.william nunn lipscomb was an american physical chemist who won the nobel prize for chemistry in 1976 for his research on structure of boranes which also answered general questions about chemical bonding.

Space shuttle columbia:in 1981,the first test flight of americas fiest operational space shuttle,the columbia ended successfully as the orbitter landed at edwards air forse base in california.

**APRIL 15**

Robert L.Mills: born 15 april 1927.american physicst who shared the 1980 rumford premium prize with his colleague chen ning yang for their development of generalised guage invariant field theory in 1954.

Charles frederick cross:died 15 april 1935,english chemist who with edward benen clayton beadle ,discoverd cellulose could be produced by cellulose xanthate in dilute solution hydroxide.

3D X-ray: in 1966,the first X-ray 3 D stereo fluoroscopic system was installed for use in heart catherisation richard j kuchu.

**APRIL 16**

Ernest Solvay: Born 16 April 1838. Belgian industrial chemist who invented the Solvay processes a commercially usable ammonia. Soda process for producing soda ash widely used in the manufacture of such products as glass and soap.

Rosalind Franklin: Died 16 April 1958, he was an English physical chemist and x-ray crystallographer who contributed to the discovery of the molecular structure of DNA a constituent of chromosomes that serve to eco genetic information.

Solar power radio: In 1956, a radio made to run either on batteries as solar cell power uses first stage in USA.

**APRIL 17**

Augustus Edward Hough Love :

Born 17 April 1863, British geophysicist and mathematician who discovered the major types of each quark wave that was subsequently named for him.

Jean pevin :

Died 17 april 1942, Jean Pevin was a French physicist, who in his studies of Browning motion of minute particles suspended in liquid, unified Albert Einstein's explanation of this phenomena and there by confirmed the atomic nature of matter.

Apollo 13 return:

In 1970 the Apollo 13 mission ended safely with a splash down in the Pacific Ocean, few days after the space craft aborted its mission while it was four-fifths of the way to the ocean.

**APRIL 18**

Maurice Goldhaber :

born in April 1911. Austrian-American Physicist who discovered an experiment to show that neutrons always rotates in one direction. This method was simple elegant and used an apparatus enough to fit on a bench top, rather than employing a huge accelerator.

Albert Einstein:

Died 18 April 1955. German –American physicist who developed special and general theories of relativity and won the Nobel Prize for Physics in 1921 for his explanation of the photoelectric effect. Recognized in his own time as one of the most creative intelligent in human history, in the first fifteen years of the 20th century Einstein advanced a series of theories that proposed entirely new ways of thinking about space, time and gravitation,

**APRIL 19:**

Glenn T. Borg

Born 19 April 1912, American Nuclear chemist during 1940-1958 Seaborg and his colleagues at the university of California, Berkeley produced nine of transuranic elements by bombarding uranium and other element with nuclei in a cyclotron.

Percy L. Julian:

Died on 19 April 1975, Afro-American chemist whose patents include synthesis of coristone, hormones, and other products from soybeans.

Indian Satellite

In 1975, the first satellite build in India was launched from Volgograd launch station; Russia on a soviet intercoms C.I rocket .it was named Aryabatta, after a noted 5th century Indian mathematician. The 360Kg satellite had been built during 20 months by the Indian space research organization in peenya, Bangalore by a team led by Prof. U.R. Rao. It's shape was a 26 sided polygon, 1.4m diam with all faces covered in solar cells except the top and bottom .It was designed to carry out experiments in X-Ray, astronomy, aeronomics and solar physics communicating with a 46 watt VHF transmitter.

**APRIL 20:**

Alex Muller:

Born 20April 1927, Karl Alex Muller is a Swiss physicist who shared the 1987

Nobel prize for physics for their joint discovery of super conductivity in certain substance at higher temperatures than previously been thought attainable. They startled the world by reporting superconductivity in a layered, ceramic material at a then record high temperature of 33 degrees above absolute zero.

Their discovery set new research world wide into related materials that yielded dozens of new super conductors, eventually reaching a transition temperature of 135 Kelvin.

Ferdinad Braun:

Died 20 April 1918 .Karl Ferdinand Braun was a German physicist who shared the Nobel Prize for physics in1909 with Gerglielino Marconi for the development of wireless telegraphy. He published papers on deviation from ohm's law and on the calculation of the electromotive force of reversible galvanic element from thermal sources and discovered the electrical rectifier effect.

Electron Microscope:

In 1940, the first U.S electron microscope was demonstrated in Philadelphia, Pennsylvania. It was able to produce a magnification of 100,000 times in an apparatus 10feet high and weighing half a ton.

**APRIL 21:**

Percy W. Bridgman:

Born 21 April 1882, He was an American experimental physicist named noted for his studies of materials at high temperatures and pressure. He was award the Nobel Prize for physics in 1946 for his "invention of an apparatus to produce extremely high pressures and for the discoveries he made there with inthe field of high pressure physics.

Sir Edward Appleton:

Died on 21 April 1965 at the age of 72, he was an English physicist who won the 1974 Nobel Prize for physics for his discovery of the Appleton layer of the

ionosphere.

Apollo 16:

In 1972, Apollo 16 astronauts landed for a fifth manned mission to the moon's surface. The Lunar module Orion with John W. Young and Charles M. Duke set down in the central lunar highlands to explore a different terrain than previous astronauts' had seen.

**APRIL 22**

Donald J. Cram

Born 22 April 1980, He was an American chemist who shared the 1987 Nobel Prize in chemistry for his creation of molecules that mimic the chemical behaviour of molecules found in living system.

Fritz Strassmann

Died 22 April 1980, He was a German physical chemist who with Otto Hahn and Lise Mietner, discovered neutron enduced nuclear fission in uranium and there by opened the field of atomic energy used both in atomic bomb for war and in nuclear reactor to produce electricity.

Earth day

In 1970, the first nationwide earth day was celebrated in U.S as an environmental awareness event, celebrated by millions of Americans with marches, educational programmes and rallies.

**APRIL 23**

Max Plank

Born on 23 April 1858. He was a German theoretical physicist. He become professer of theoretical physics. His work on the law of thermodyanamics and the distribution of radiation from a black body led him to abandon classical

Neutonian principles and introduced the quantum theory for which he was awarded the Nobel Prize for physics in 1918.

Max von laue

Died 23 April 1960, German physicist, who was a recipient of the Nobel Prize for physics in 1914 for his discovery of the diffraction of X-ray in crystals.

Top quark

In 1994 physicist at the department of energy's Fermi National accaleratoe laboratory discovered the subatomic particles called the top quarks.

**APRIL 24**

Hendrik Anthony Kramers

Died 24 April 1952. Dutch physicist who with Ralph de laer kronig, derived important equations relating the absorption to the dispersion of light. He also predicted the existence of the Raman effect, an inelastic scattering of light.

Jean Charles Marignac

Born 24 April 1817, Swiss chemist whose life work consisted of making many precise determinations of atomic weights, suggested the possibility of isotope and the packing fraction of nuclei.

First Chinese Satellite

In 1970 the people's Republic of China became the fifth nation with a satellite in orbit with the launch of DFH 1 from Jiuquan satellite launch centre.

**APRIL 25**

**Wolfgang Pauli**

Born April 25 1900,Austrian-American physicist who was awarded the Nobel prize

for physics , for his discovery in1925, of the Pauli's exclusion principle which states that in an atom no two electrons can occupy the same quantum statesimultaneously.

**Sir William Mc Crea**

Died 25 April 1999.He was an Irish Theoretical astrophysicist whose early work was in quantum physics, relativity and mathematics ,but he gradually turned to applying theoretical physics in astronomy.

**Hubble Space Telescope**

In 1990,the $2.5 billion Hubble space telescope was displayed in space from the space shuttle Discovery into an arbit 381 miles above earth.

**APRIL 26**

**Arno Penzias**

He is a German- American astrophysicist (Born April 26,1933) who shared the 1978 Nobel a faint electromagnetic radiation throughout the universe.

**Srinivasaramanujan**

Died 26 April 1920,Indian mathematician known for his work on hyper geometric series and continued fraction. In number theory he discovered properties of the partition function

**Space Shuttle Columbia Mission**

In 1993, space shuttle Columbia was launched on the second German sponsoredD-2 space lobe mission lasting until 6 May.88 experiments covered materials and life science,technology applications, earth observation astronomy and atmospheric physics.

**APRIL 27**

**Maurice De Broglie**

Born 27 April 1875. He was French physicist who made many contributions to the

study of X-rays. From 1912 ,his chief interest was X-ray spectroscopy his method of "The Rotating Crystal" was an application of Bragg's ' Focussing effect' to eliminate spurious spectral lines.

**Rolf William Landauer**

Died 27 April 1999. He was a German born American physicist known for his formulation of Landauer's principle concerning the energy used during a computer's operations.

**Hahnium**

In 1970,the discovery of Hahnium, element 105 was announced at the American physical society meeting in Washington,D.C.

**APRIL 28**

Franz Karl Achard : Born on 28 April 1753. German Chemist and experimental physicist who invented a process for the large scale extraction of table sugar frombeets and in 1801 opened the first sugar-beet factory in Sileria.

Arthur L. Schaeulone

Died on 28April 1999. American Physicist who shared the 1981 Nobel Prize for physics for his work in developing the laser and laser spectroscopy

Space Shuttle Mission

In 1991, the space shuttle Discovery was launched with a crew of seven to perform "Star wars" defence research.

**APRIL 29**

Harold C.Urey

Born 29 April 1893. American scientist awarded Nobel Prize for chemistry in 1934 for his discovery of Deuterium, the heavy form of hydrogen

William Henry Eccles

Died 29 April 1966. British physicist who pioneered in the development of radio communications.

Russo-American space walk

In 1997 U.S astronaut Jerry m. Linenger and Russian cosmonaut verily Tribliyer completed the first ever Russo-American space walk, a five hour excursion from Russian space station “Mir”

**APRIL 30**

**George Robert Stileitz**

Been 30 April 1904 U.S mathematician who was regarded by many as the"father of modern digital computer".

**Joel .H. Hildbrand**

Died 30 April 1983. U.S education and chemist whose monograph solubility as the classic reference for almost a half century.

**Space medicine**

In 1993 an astronaut received a test infusion while in orbit on the space shuttle columbia.German physicist flans schlegel had the saline solution at body temperature pumped in to him through a needle.

## MAY

**MAY 1: International Labour Day/ May Day**

**Johann Jacob Balmer:** Born on 01 May (1825 – 1898)

Swiss mathematician and physicist who discovered a formula, the basic to the

development of atomic theory. His most important work was on spectral lines by giving a formula relating wavelength of the spectral lines of the hydrogen atom.

**First Basic Programe:**

In 1964, the first BASIC program was run on a computer invented at Dartmouth University by Professor John G Keony and Thomas E Kurtz. The first implementation was a BASIC compiler.

**Nereid Discovered:**

In 1949, Gerard Kuiper discovered 'Nereid' the second satellite of Neptune, the outermost and the IIIrd largest of Neptune's known satellites. Nereid's orbit is the most highly eccentric of any planet or satellite in the solar system. Its distance from Neptune varies from 1353600 to 9623700 Kms. Nereid's odd orbit indicates that it may be captured asteroid or Kuiper belt object. Kuiper, a Dutch
– American astronomer also studied the surface of the moon, discovered Miranda, a moon of Uranus and found an atmosphere on Titan, the moon of Saturn.

**Comte – Hilarie Chardonnet:** Born on 01 May (1839 – 1924)

French Chemist and industrialist who first developed rayon, the first commonly used artificial fiber.

**MAY 2**

**Electrolysis of Water:**

In 1800, English Chemist William Nicholson was the first to produce a chemical reaction by electricity. He had been working with Anthony Carlisle, a London surgeon experimenting with Allesandro Volta's voltaic pile. The new effect was discovered when wire from the poles of the battery being used came into contact with water and bubbles of gas were released as current flowed through water. Closer examination of electrolysis showed oxygen was released at the anode and hydrogen appeared at the cathode. Electricity had separated the molecules of water. Further, the effect of the amount of hydrogen and oxygen set free by the current was proportional to the amount of current used.

**Calium Carbide**

In 1892, the industrial method for the production of calcium carbide was discovered by Thomas L Wilson.

**Robert W Wood: Born on 2nd May (1868-1955)**

American Physicist who photographed the reflection of sound waves in air, and investigated the physiological effects of high frequency sound waves. The zone plate he deviced could replace the objective lens of a telescope. He invented an improved diffraction grating, did research in spectroscopy and extended the technique of Raman spectroscopy. He made photographs showing both infrared and ultraviolet radiation and was the first to photograph ultraviolet fluorescence. He was the first to observe field emission in which charged particles are emitted from conductors in an electric field.

**Sergey Vanilyevich Lebedev:** Died On 2nd May

Russian chemist who developed a method for industrial production of synthetic rubber.

**MAY 3:**

**International Energy Day & World Press Freedom Day**

**Steven Weinberg:** Born on 3rd May

American nuclear physicist who shared the 1979 Nobel prize for physics for work on formulating the electroweak theory which explains the unity of electro magnetism with the weak nuclear force.

**Oldest Eclipse Recorded**

In 1375 BC, the oldest recorded eclipse occurred, according to one plausible interpretation of a date inscribed on a clay tablet retrieved from the ancient city of Syria.

**Alfred Castler:** Born on 3rd May (1902 – 1984)

French Physicist who won the Nobel Prize for his discovery and development of methods for observing Hertizian resonance within atoms. This research facilitated the greater understanding of the structure of the atom, by studying the radiation that atoms emit when excited by light, and radio waves. He developed a method called optical pumping which caused atoms in a sample substance to enter higher energy state. This idea was an important predecessor to the development of masses and the lasers which utilized the light energy that was re-emitted when excited atoms released to extra energy obtained from optical pumping.

**MAY 4**

**Magallan Space Probe:**

In 1989, the space probe Magallan was carried in the cargo bay by the STS – 30 space shuttle Atlantis Mission launched from Kennady Space centre in Florida. The space probe was named after the $16^{th}$ century Portuguese explorers Magallan. This was the first planetary spacecraft to be released from a shuttle in earth orbit. It arrived at its planned polar orbit around Venus on 10 Aug 1990, which it circled once every 3 hours, 15 min. As the planet rotated slowly behind it, Magallan collected radar images of the surface in strips about 17-28 km wide and radiated back the information. Its mission included taking other measurements. On 11 Oct 1994, it was directed towards the surface collecting date until it burned up in the atmosphere.

**Galactic Radio waves:**

In 1933, the discovery of radiowaves from the centre of the Milky Way galaxy was described by Karl Tasky. The galactic radio waves were very low intensity, short wavelength , and required tentative apparatus for their detection. Their intensity varied regularly with time of day and with the seasons. They came from an unchanging direction in space and independent of terrestrial sources.

**D. Allen Bromley: Born on 4 may(1926 - 2005)**

Canadian American Physicist who was considered as the Father of modern heavy ion science for his pioneering experiments on both the structure and dynamics of atomic nuclei. He was a leader in developing particle accelerator detection systems and

computer based acquisition and analysis systems.

**MAY 5**

**William Whewell: Born on 5 May**

He was the first scientist who suggested the names of anode and cathode for the electrodes in the process of electrolysis. The terms are based on the Greek prefix "ana" meaning "up" and "kata" meaning "down". The chosen prefix referred to the idea that the electric current flowed from battery's positive to negative pole. In the manner that water could flow down from a hillside to a valley.

**Joseph Kennady: Died on May 5, 1957**

He was an American chemist and physicist, one of the four co-discoverers of Plutonium which was produced Uranium oxide bombarded with deuterons in a cyclotron at University of California at Berkly. Subsequently on 28 March 1942,

the scientists that plutonium like $U^{235}$is fissionable with slow neutrons, which implies its potential fission bomb material. He was also a chemistry instructor.

**Theodore Maiman: Died on May 6**

He was an American physicist who built the first working laser. The laser is a device that produces monochromatic coherent light. It has wide range of uses, including eye surgery, dentistry, range finding and manufacturing even measuring the distance between the earth and the moon.

**MAY 6 – Nurse's day and Lawer's Day**

**Robert Henry Dicke- Born on 6th May**

He was an American physicist who worked in such wide ranging fields as microwave physics, cosmology and relativity. He made a number of significant contributions to radar technology, and to the field of atomic physics. His visualization of an oscillating universe stimulated the discovery of the cosmic microwave background, the most direct evidence that our universe really did expand from a dense state. A key instrument in

measurement of this fossil of theBig bang is the microwave radiometer invented.

**Jack Allen: Born on 6th May,(1908 - 2001)**

He was a Canadian physicist who co-discovered the super fluidity of liquid helium near absolute zero temperature. He discovered that 2.7K temperature liquid helium could flow through very small capillaries with practically zero viscosity. Superfluidity is a visible manifestation resulting from the quantum mechanincs of Bose- Einstein Condensation.

**Alexander William Williamson : Died on 6th May**

English Chemist who researched on alcohols and ethers clarified organic molecular structure. He was the first to explain the action of a catalyst in terms of the formation of an intermediate compound. He was the first to make 'mixed' ethers with two different alkyl groups by a method still known as "Williamson synthesis", in which an alkoxide reacts with an alkyl halide. He was the first who describes the two processes 'dynamic equilibrium' and 'Reversible reaction'.

**MAY 7**

Integrated circuit: In 1952,the concept of the integrated circuit chip was first presented at a symposium on progress in Quality Electronic components in Washington DC by radar scientist geoffley W.a.Dummer. He believed that it would be possible in fabricate multiple circuit elements on and into a block of silicon half inch squqre.In 1956,his initial attempts to built such a circuit failed,and thereafter could get no further support for his idea.

**Edwin Herbert Land;Born on 7$^{th}$ may**

He was an American inventor and physicist who founded the polaroidcompany. His one step process for developing and printing photographs was the greatest innovation in photography since the introduction of roll film.he first demonstrated the polaroid hand camera in 1947,which gave fully developed prints in 60 seconds.Land also applied the name polaroid to the light polarising filter he had previously invented by embedding suitable crystals in a plastic sheet,which was widely known for its use in the center of

sunglasses.His otherprojects included instant x-rays,3D movie projector among the over 500 patents he held.

**Allan MacLeod Cormack;died on 7 may 1998**

American physicist who formulated the mathematical algorithms that made possible the development of a power new diagnostic technique knows as CAT scanning.

**May 8**-World Red cross day

**Nevil vincent sidgwick:Born on 8th may(1873-1952)**

He was an English chemist who contributed to the understanding of chemical bonding, especially in co-ordination compounds. He worked on kinetics(studying the rates of isomerisation of triphenyl methane dye intermediator and the hydration of carboxylic anhydrides),thermodynamics (investigating phase equilibrium and the solubility of organic acids and bases) as well as investigating the colour of copper complexes. He also work on the process for the production of acetone(propanone)from ethanol and also the production of phenol from benzene. His book, the electronic theory of valency was a culmination of many years interest in the nature of covalent bonds.

He was a French chemist, and known as the 'father of modern chemistry' was a brilliant experimenter also active in public affairs. He was an aristocrat and he built a large laboratory for his researches. In 1778, he found that air consists of a mixture of two gases which he called oxygen and hydrogen. By studying the roleof oxygen in combustion, he replaced the phlogiston theory. Lavosier also discovered the law of conservation of mass and devised the modern method of naming componds which replaced the old non-systematic method.

**MAY 9**

**Manfred Eigen :Born on 9th May**

He was a German physicist and biochemist who shared the 1967 Nobel prize in

chemistry. For their studies about extremely fast chemical reactions, affected by disturbing the equilibrium by mean of very short pulses of energy. In 1954, Eigen introduced the relaxation technique for the study of extremely fast chemical reactions (those taking less than a millisecond).his general method was to take a solution in equilibrium for a given temperature and pressure. If a short disturbance was applied to the solution the equilibrium would be very briefly destroyed and a new equilibrium quickly reached. Eigen studied exactly what happened in this very short time by means of absorption spectroscopy.

**Moon reached by laser light**

In 1962 alaser beam was bounced off the moon from earth by MIT scientists. The area of the light beam on the surface was estimated at a diameter of 4 miles.

**A.A. Michelson : Died on 9$^{th}$ may 1931**

Albert Abraham Michelson was a German American physicist who accurately measured the speed of light and received the 1907 Nobel prize for physics 'for his optical precision instruments and the spectroscopic and meteorological investigations; he carried out with him. He designed the highly accurate Michelson interferometer and used it to establish the speed of light as a fundamental constant. With Edward Morley, he also used it in attempt to measure the velocity of the earth through the ether(1887).

**MAY 10**

**Valence theory :** In 1852,the theory of valence was announced by English chemist sir Edward Frankland.The theory states that any atom can combine with a certain ,limited number of other atoms, which is remain fundamental to the understanding of chemical structure.

**Ceasium and Rubidium :** In 1860,the discovery of two new elements, ceasium and rubidium was announced by german chemists Robet Bunsen and gastoue Robert kirchoff, belongs to the Berlin Academy of scientists. Their salts were found in tiny amounts in the mineral water of durkeim.They were detected by spectral analysis.

Ceasium was first noticed by its characteristic sky blue spectrallines, for which colour was named. Likewise rubidium was characterized by deepred lines. They are alkali metals and have similar chemical properties of potassium.

**Augustine Jean Fresnal:Born on 10th may (1788-1827)**

French physicist who first investigated the effect of interference of light, with results known as Fresnal fringes. The discovery work, together with farther experiments using polarised light supported Thomas Youngs wave theory of light.Fresnal advanced the wave theory by identifying light as transverse waves rather than longitudinal waves previously assumed by Young and Christian Huggens. He showed white light is composed of a spectrum of innumerable wave lengths. In 1819, he improved the optical system of light houses.

**MAY 11: National Technology Day**

**Richard .P. Feynman : Born on 11th may(1918-1988)**

Richard Phillips Feynman was an American theoretical physicist who was probably the most brilliant, influential and iconoclastic figure in his field. By age 15,he had mastered calculus. He took every physics course at MIT. This life long interest was in sub atomic Physics. In 1942,he went to Las alamas where Hans Bethe made the 24 year old Feynman. A group leader in the theoretical division,to work on estimating how much uranium would be needed to achieve critical mass developed feynman diagramms,a simple notation to describe the complex behaviour of sub atomic particles. In 1965,he shared the Nobel prize in physicsfor work in quantum electrodynamics.

**Antony Hewish :Born on 11th may**

He was a british astrophysicist who won the Nobel prize for physics in 1974 forhis discovery of pulsars(cosmic objects that emit extremely regular pulses of radiowaves).In November 1967,using a radio telescope Hewrish and Ph.D. student Joulyn Bell observed an unusual signal corresponding to a sharp burst of energy at a regular interval of approximately one second. It is believed that rapidly rotating neutron stars with

intense electromagnetic fields emit radio waves from their north and south poles. From a great distance these radio emissions are perceived in pulses, similar to the way one sees the light from a light house's rotating lantern. He wish and Bell's discovery saved as the first evidence of his phenomenon.

**MAY 12**

First full functional programmable computer:

In 1941 ,Konard Zuh completed the world's first fully functional programmablecomputer hu Z3 machine. It was also the first such computer to utilize the binary system rather than decimal system. It was an electromechanical digital computer built with 2400 relays. The programe were input from punched rolls of discard movie film. Notably, the Z3 was programmable whereas the independently developed. The Z3 was used by the German aircraft industry solve systems of simultaneous equations and mathematical aspects of the vibration of air forms under stress. It was destroyed in 1944 during war.

William Francis giaugue: born on 12$^{th}$ may

Canadian born American physical chemist and winner of the Nobel prize for chemistry in 1949 for his achievement in the field of chemical thermodynamics and especially his work on the behaviour of matter at very low temperature and his closely allied studies of entropy. He is remembered particularly for his discovery of adiabatic demagnetization as a means of reaction temperature closeto absolute zero as well as for his exhaustive and meticulous thermodynamic studies, over a lifetime of research which utilized the third law of thermodynamics which also developing a large body of evidence for its validity.

**MAY 13:** National Solidarity Day

Marguerite Perey: Died on 13$^{th}$ may

Margerite Catherine Perey was a French chemist who identified Francium, the element 87, the last naturally occurring element to be discovered(7 January 1939). She joined the institute du Radium in 1929 as a technician to be the personal assistant of Marie Curie. Perey focused on Actinium for many years because it was considered as apossible source of Francium by alpha decay. However the necessary purification of Actinium

and concentration required dozens of difficult and paintaking procedures. After submitting a thesis concerning a work on element 87, in 1946 she received a doctorate degree in Physics. From 1949, she held the chair of a new nuclear chemistry department at the university of Strausbourg. In 1962, of sciences she retired as her health declined from cancer caused by radiation.Gas turbine to pump natural gas: in 1949, the first gas turbine to pump natural gas was installed at Willman Ark by the Mississippi River Fuel corporation.

First four engine plane:

In1913,the first four engine airplane was first built and flown by Iger Sikosky of Russia.

**MAY 14**

Nicholas Kurti: Born on 14$^{th}$ may (1908-1998)

He was a Hungarian– British Physicist who researched in low temperature physics and in a record breaking nuclear cooling experiment, that came within a millionth of a degree of absolute zero. He aiso investigated how to separate the isotopes of uranium.

Electric timer:

In 1932, the first electrical timing device was tested at a track meet for three events between Colombia and Syracuse at Baker field, New York city.

TV Programe signal transmitted by laser:

In 1963, a laser light beam link first carried the TV signal during a network braodcast. It was demonstrated during the CBS programe. The signal from a studio camera was used to modulate a laser beam that travelled two feet to a receiver that decoded the signal from the beam.the signal was relayed via the control room for the national broadcast. This communication system was thework of GTC scientists Samuel.M.Stone and Lowric Richard Bloom.

Yuvel Neeman: Born on 14th may(1925-2006)

israeli theoretical physicist who worked independently of Gell-mann but almost simultaneously (1961) devised a methodof grouping baryons in such a way thatthey fell into logical families. Now known as the 'Eightfold way'the scheme group mesons and baryons into multiplets of 1,8,10 or 27 members on the basis of various properties.

**MAY 15**: International Day of Families Pierre

Currie: Born on 15th may (1859-1906)

French physical chemist and cowinner of the Nobel prize for physics in 1903. His studies of radioactive substances were made together with his wife Marie currie whom he married in1895. They were acheieved under conditions of much hard ships-barely adequate laboratory facilities and under the stress of having to do much teaching inorder to earn their livelihood. Together they discovered radium and polonium in their investigation of radioactivity by fractionation of pitchblende. Later they did much to elucidate the properties of radium and its transformation products. Their work formed the basis for much of the subsequent research in nuclear physics and chemistry.

Kepler's law: In 1618, johannes Kepler discovered his harmonics law. He attempted to explain properties and geometry in planetary motion by relating them to musical seals and intervals. Kepler said each planet produces musical tones during its revolution about the sunand the pitch of the tones varies with the angulaar velocities of those planets as measured from the sun.

First British jet: In 1941, british first jet propelled aircraft the gloster whittle E 18/35, flew for the first time taking off from RAF Coranwell on a historic 17 minute flight. Its jet engines were designed by Frank Whitelle, "the father of jet engine".

**MAY 16**

Johannen gerog Bednorz: Born on 16th May

He was a German physicist who shared the 1987 Nobel prize for physics for thejoint

discovery of super conductivity in a new class of materials at temperature higher than had previously been thought attainable. The start led the world byreporting super conductivity in a layered ceramic material at a higher temperature of 33 Kelvin. Their discovery set off an avalanche of research worldwide in to related materials that yielded dozens of new super conductors eventually reacting a transition temperature of 135 Kelvin. He also develops complex oxide compounds with novel crystal structure for possible uses in micro electronics.

Space shuttle of Endeavour lands:

In 1992 the space shuttle Endeavour completed its maiden voyage with a safe landing in the California desert.

First Ruby Crystal Laser Operated:

In 1960 a synthetic ruby crystal laser was first operated at Hughes Research Laboratories in Malibu, California. The laser is a device that produces monochromatic coherent light(light in which the rays are all of the same wavelength and phase). This first operable laser device was invented by American physicist Theodox Maiman.

Tape recorder demonstrated: In 1946, the world's first magnetic tape recorder was demonstrated for the first time by Jack Mullin.

Record demonstrated: In 1888, Emile Berliner gave the first demonstration of flat dise recording and reproduction before the Franklin institute in Philadelphia.

**MAY 17 :** World Telecommunication Day

Sir Joseph Norman Lockyer: Born on 17th May

English astronomer who in 1686 discovered and named the element helium that he found in the sun's atmosphere before it had been detected on Earth. He also suggests the name chromoshpere for the sun's outer layer. Lokyer discovered together with Pierre. T.Tanssen, the prominences (red flames) that surrounded the solar disk. He was also interested in the classification of stellar spectra and developed the meteoric hypothesis of stellar evaluation. Its works include the book 'Contribution to solar

physics', 'The sun's place in Nature and Inorganic Evolution'.

Dissociation Theory: In 1883, Svante Arrhenius explains the theory that substances like salt when dissolved in water dissociate (separate) into electrically changed ions. This theory is now the basic fat in understanding the chemistry of ionic compounds.

Erwin Wilhelm Muller: Died on 17th May

German American Physicist who invented the field emission microscope (FIM) which provided magnification in excess of one million. For the first time made it possible to take pictures of individual atom. Images of the atomic structure of tungsten were first published. In FIM, a voltage about 10 KV is applied to a sharp metal tip, cooled to below 50 Kelvin in a low pressure helium atmosphere. Gas atoms are ionized by the strong electric field in the vicinity of the tip andrepelled perpendicular to the tip surface. A detector images the spatial distribution of these ions giving a magnification of the curvature of the surface.

**MAY 18**

Apollo X Launch: In 1969, the Apollo X Launched to be a complete staging of the Apollo X1 mission without actually landing on the moon. The mission was the second to orbit the moon and the first to travel to the moon with the entire Apollo spacecraft configuration. It made a successful eight-day dress rehearsal for the first manned moon landing. Astronauts Thomas Stafford and Eugene Lernan descended inside the Lunar Module to within 141 cm of the lunar surface.

Halley's Comet

In 1910, Halley's Comet was visible from earth moving across the face of the sun.

Oliver Heaviside: Born on 18th May (1850-1925)

English Physicist and Electrical engineer who predicted the existence of ionosphere. In 1870, he became a telegrapher, but increasing deafness forced himto retire in 1874. He then devoted himself to investigations of electricity. In 1902, Heaviside and Arthur

Kennelly predicted that there should be an ionized layer in the upper atmosphere that would reflect for long distance communication, allowing radio signals to travel to distant parts of the earth by bouncing off the underside of this layer, now known as Heaviside layer or ionosphere, was demonstrated in 1920's when radio pulses were transmitted vertically upward and the returning pulses from the reflecting layer were received.

**MAY 19**

Max Ferdinand Perutz: Born on 19 May (1914-2002)

Austrian British biochemist who shared the 1962 Nobel prize for chemistry for his x-ray diffraction analysis of the structure of haemoglobin, the protein that transports oxygen from the lungs to tissues via blood cells. He identified that haemoglobin is constructed of four protein chains wound together and that the molecule change shape when oxygen is added. Perutz was also interested in studying glaciers, making measurements which were the first to show differentrates of flow in different parts of the same glacier.

Sir Joseph Larmer : Died on 19th May

Irish physicist, the first to calculate the rate at which energy is radiated by an accelerated electron and the first to explain the splitting of spectrum lines by magnetic field. His theories were based on the belief that matter consists entirely of electric particles moving in the ether. His elaborate mathematical theory of the late 1890's included the 'electron' as a rotational strain (a sort of twist) in the ether. But Larmer's theory did not describe the electron as a part of the atom. Many physicists envisioned both material particles and electromagnetic forces as structures and strains in that hypothetical fluid.

MAY 20

Hubble's first photos: In 1990, the Hubble space telescope sent its first photograph from space, an image of a double star 1260 light years away.

Airplane delivered H-bomb: In 1956, the first hydrogen fusion bomb (H- bomb) to be

dropped from an airplane exploded over Namu Atoll at the northwest edge of the Bikini Atoll. The firewall was four miles in diameter. It was designed as 'Cherokee' as part of 'Operation Redwing'.

Helicopter: In 1940, inventor Igor Sikorsky demonstrated his helicopter invention to the public.

William Hallowes Miller : Died on 20 May 1880

Welsh mineralogist known for his 'Millerian Indices' built on his system of reference axes for crystals by which the different systems of crystal forms can be designed using a set of three integers for each crystal face. When he published his scheme in a treatise on crystallography, he provided an alternative to the existing confusion due to the many different descriptive systems previously in use. In his early career he published successful textbooks for hydrostatics and hydrodynamics, and differential calculus. Miller also prepared new standards in 1843 to replace the National standards of weight and length that had been lost in the 1834 fire that destroyed the parliament buildings.

Philipp Eduard Anton Von Lenard : Died on 20 May 1947

He was a Hungerian- German physicist who received the 1905 Nobel prize for physics for his research on 'Cathode rays'.

**MAY 21 : Anti Terrorism Day**

Gaston Plante: Died on 21 May, 1889

French physicist who produced the first electric storage battery or accumulator in 1859. In an improved form, his invention is widely used in automobiles.

Wiliiamina P.Fleming : Died on 21 May 1911

Scottish American astronomer who pioneered in the classification of stellar spectra and the first to discover stars called 'White dwarfs'.

William Nicholson: Died on 21 May 1815

English chemist who discovered the electrolysis of water, the first observation of a chemical reaction caused by electricity. He invented hydrometer to measure the density of liquids.

Carl Wilhelm Scheele: Died on 21 May 1786

Sweedish chemist who discovered oxygen in 1772. Scheele discovered many substances such as chlorine, manganese, tungsten, molybdenum, glycerol, hydro cyanic acid, citric acid, hydrogen sulphide and hydrogen fluoride. He also discovered a process resembling pasteurization.

Gustave Gaspard Coriolis: Born on 21 May (1792-1843)

French mathematician and physicist who first described the Coriolis force, an effect of motion on a rotating body of pasemount importance of meteorogy, ballistics and oceanography. Whereas pressure differences tend to push winds in straight paths, winds follow curved paths across the earth. In 1835 Coriolis first gave a mathematical description of the effect, giving his name to the Coriolis force.

**MAY 22**

Saturn moons: In 1995, astronomers Amanda.s.bosh and Andrews.s.Rivikin found two new moons of Saturn in photos taken by the Hubble space telescope.

George.A.Olah: born on 22 may 1927

Hungarian. American chemist who won the 1994 Nobel prize for chemistry for work conducted in the early 1960's that isolated the positively charged, electron deficient fragments of hydrocarbons known as carbo cations or carbonium ions. Carbo cations are elucive intermediates compounds formed when large hydrocarbon molecules are broken into smaller one or vice versa. His discovery has opened up a new area of economically important hydrocarbon research into bare reactions of oil refining, plastics and other industrial processes that continues today.

Herbent.c.brown: born on 22 may(1912-2004)

American chemist who developed organo borones-compounds of boron, carbon and hydrogen which provided many new techniques in synthetic organic chemistry. For this he got Nobel Prize for chemistry.

Julius Plucler: died on 22 may 1868

German mathematician and physicist whose work suggested the far reaching principles of duality, which states the equivalence of certain related types of theorems.

He also discovered the cathode rays are diverted from their path by a magnetic field, a principle vital to the development of modern electronic devices such s television.

**MAY 23**

John Bardeen: born on 23 may (1908-1991)

American physicist who was co winner of the Nobel Prize for physics in both 1956 and 1972. In 1956 got prize for the invention of transistors and in 1972 for the theory of superconductors, known as BCS theory.

Edward Lorenz: born on 23 may (1917-2008)

American mathematician , physicist and metrologist known for pointing out the 'butterfly effect' where by chaos theory predicts that "slight by differing initial states can evolve, into considerably different states". In his 1963 paper in the ' Journal of atmospheric sciences' he differing initial states cited the flopping of a seagall's wings as changing the state of the atmosphere in even such a trivial way can result in huge changes in outcome in weather patterns. Thus very long range whether for casting becomes almost impossible. He determined this unexpected result in 1961 while running a computer whether simulation that gave widely different results from even tiny changes in the input data.

Georges claude:died on 23 may 1960

French chemist, engineer and inventor who invented neon light, which was theforerunner of the fluorescent light. Claude was the first to apply an electrical discharge to a sealed tube of neon gas around 1902 and make a neon lamp (neon from Greek word neos meaning new gas). He first publically displayed the neon lamp on 11 December 1910 in Paris.

**MAY 24: Common Wealth Day**

Gabriel Fahrenheit: born on 24 may (1986-1736)

German-Dutch physicist and instrument maker. He invented alcohol thermometer and mercury thermometer

And developed the fareheit temperature scale. For the zero of his scale he used the temperature of an equal ice-salt mixtiure.30 $^0$ for the freezing point of water, and 90$^0$ for the normal body temperature. Later he adjusted to 32$^0$ for the freezing point of water, the interval between the two being divided into 180 parts. He also invented a hygrometer to measure the relative humidity.

Nicolas Copernicus: died on 24 may 1543

Parish astronomer who proposed that the planets have the sun as the fixed point to which their motions are to be referred, that the earth is a planet which, besides orbiting the sun and also turns once daily on its own axis, and that very slow, long term changes in the direction of this axis account for the precession of the equinoxes.

Tom Bacon: died on May 24, 1992

English mechanical engineer who pioneered the first modern hydrogen-oxygen fuel clls, which electrochemically convert air and fuel directly into electricity.

**MAY 25**

Moon Landing Announced: In 1961,The formal announcement of an American lunar landing was made by president John .F.Kennedy.

Jack Steinberger: Born on May 1921

German born American physicist who along with Leon.M.Lederman and Melvin Schwartz was awarded the Nobel prize for physics in 1988 for their joint discoveries of the neutrino beam method and demonstration of the doublet structure of the leptons through the discovery of the muon neutrino .In 1951,he met Lederman and schwarz and in 1958 they conducted a neutrino experiment at the New Brook haven gradient synchrotron.The results emerged in a classic. In 1962 paper and neutrino beams went on to become one of the standard tools of particle physics.

Pieter zeemen:Born on 25 May (1860-1944)

Dutch physicist who was an authority on magneto optics. In1896,he discovered the Zeeman effect the phenomena produced in spectroscopy bythe splitting up of spectral lines ina magnetic field . He shared the nobel prize for physics in 1902 f or his discovery of Zeeman effect.

Hans Goldschmidt:Died on May 1923

German chemist who invented the thermite(alumino thermic) processwhich was adopted worldwide for welding railrod &streetcar rails, and isstill in use for onsite weldin. The track so welded was laid in Essen.This method evolved from his Goldschmidt reductron process that he began investigating in 1893 for the preparation of carbon free metals.

**MAY 26**

**Apollo x returns:** In 1969,Apollo X astronaut returned to Earth after a successful eight day dress rehearsal for the fint manned moon landing .The mission was the second to orbit the moon and the first to trvelto the moon with the entire Apollo spacecraft configuration.

Sally Ride : Bornon 26 May 1951

The first American women to orbithe earth when she flew abroad space shuttle challenger on 18 jan 1983.

Julius Stieglitz: Born on 26 May (1867-1937)

U.S. chemist who interpreted the behavior and structure of organic compounds in the light of valence theory and applied the methods of physical chemistry to organic chemistry. His research in such fields as molecular rearrangements and stereochemistry helped lay the foundations of physicoorganic chemistry.

Waldo semon: Died on 26 May 1999

American chemical engineer who invented plasticized P.V.C. (vinyl).In 1926's, he discovered how to convert polyvinyl chloride from a hard ,unworkable substance to a pliable one. It is now used in hundreds of products such as floor tile, garden house , imitation leather , shower curtais and coatings. It is produced in larger quantities than any other plastic except polyethylene. Semon also made pioneering contributions in polymer science, including new rubber antioxidents. His technical leadership led to discovery of three major new polymer families: thermoplastic poly urethane , synthetic natural rubber and oil resistant synthetic rubbers.

**MAY 27:**

Highest temperature: In 1994,the highest temperature produced in a lab was plasma temperatue of 510 milllion degree celcius degree in the tokamak fusion test reactor operated at the Princeton university.

William Webstar Hansen : Born on 27May (1909- 1949)

American physicist who contributed to the development of radar and is regardedas the founder of microwave technology. He developed the klystron ,a vaccum tube essential to radar technology.Based onamplitude modulation of an electron beam rather than on resonant circuits of coils and condensers ,it permit the generation of powerful and stable high frequency oscillations. If revolutionizedhigh energy physics and microwave research ad led to airborne radar. The Klysstron also has been used in satellite communications, airplane and missile guidance systems, and telephone and television transmission . He demonstrated the first 4.5Mev linear accelerator in

1947.

Sir John Cockcroft : Born on 27 May (1897-1967)

British physicist who shared the 191 Nobel prize for pioneering the use of particle accelerator to study the atomic nucleus.

Kasmir Fajans: Born on 27 may (1887- 1975 )

Polish American physicist che mist who discovered the radioactive displacement law. According to this law ,when a radioactive atom decays by emitting an alpha particle, the atomic number of the resulting atom is two fewer than that of the parent atom.He discovered the element protactinium in 1913 through nuclear disintegration.

**MAY 28**

New planet in Taurus : In 1998 NASA released a picture of what California astronaumer , susan teseby said may be the first extra solar planet even seen dubbed TMR –IC . digitalized pictures taken by the Hubbles space telescope seemed to show and animage of planet apparently flung from a pairof young stars in the constellation Taurus, 450 light years from earth.

Mars landing:In 1971 the USSR mars 3 was launched it arrived at mars ondecember2 , 1971. The lander was released from the mars3 orbital and became the first space craft to land successfully on mars.

Alfred .O.C.Nier : born on 28 may(1911-1994)

American physicist who refined the mass spectrometer processed to distinguish the isotope In 1934 ,with lyman he applied the decay of potassium 40 to argon 40 tomeasure the age of geological material he discovered the number of new isotope of such low abudance they had not been previously detected , including s- 36 ,Ca46 , Ca48

**MAY 29**

Einstein's relativity theory proved

In 1919, a solar eclipse permitted observation of the bending of straight pathing through the Sun's gravitational field, as predicted by Albert Einstein's theory of relativity. Separate expedition of the royal Astronomical Society travelled to Brazil and off the west coast of Africa. Both made measurements of the position of stars visible close to the sun during a solar eclipse. The observation showed that, indeed, the light of stars was bent as it passed through the gravitational field of the sun. This way a key prediction of Albert Einstein's theory that gravity affected energy as an addition to the familir effect on matter. The verification of predictions of Einstein's theory, proved during the solar eclipse was a dramatic landmark scientific even

Sir Humphry Davy : Died on 29 Maqy 1829

English chemist who discovered several chemical elements and compounds. He discovered alkali metals : Potassium and sodium, alkaline earth metals : calcium, strontium, barium and Magnesium. He discovered Boron and recognized chlorine as an element.

Peter Higgs: Born on 29 May 1929

English theoretical Physicist, the namesake of the Higgs Boson. In the late 1960's, Higgs and others proposed a mechanism that would endow particles with mass, even though they appeared originally in a theory – and possibly in the Universe!-with no mass at all. The basic idea is that all particles acquire these mass through interactions with an all –pervading field, called the Higgs field which is carried by the Higgs bosons. No Higgs boson has yet been detected, its mass (ITeU) exceeds the capacity of any current accelerator.

**MAY 30**

Video CD ; In 1987, North American Philips company introduced the compact disc

video (CD V). The used the same fall motion video system as Laser vision but with additional CD digital audio.

Mass Probe: In 1971, the US Mass space probe Mariner 9 blasted off from cape Kennedy, Florida. It carried cameras, infrared spectrometer and radiometer, ultraviolet spectrometer, radio occulation and celestial mechanics instruments. On 13 November 1971, it entered orbit as the final artificial satellite of Mass

Krypton: In 1898, Morris William Travers, an English chemist while working with Sir William Ramsay in London, discovered the element krypton. The name derives from the Greek word for 'hidden"

Joseph Kennedy: Born on 30 May (1916-1957)

American chemist and physicist, one of the four co-discovers of plutonium which was produced from uranium oxide bombarded with duetrons in a cyclotron. They demonstrated that plutonium, like U235 is fissionable with slow neutron

Hannes Aifven : Born on 30 May (1908-1995)

Swedish astrophysicist who was one of the founder of the field of Plasma physics- the study of ionized gases. Shared 1970 Nobel Prize in Physics. He was rcognised for fundamental work in magnetohydrodynamics with fruitful applications in different parts of plasma physics.

**MAY 31:** Anti tobacco Day

Robert Schrieffer: Born on May 31, 1931

John Robert Schrieffer is an American physicist who shared the 1972 Nobel Prize for physics for developing the BCS theory, the first successful microscopic theory of superconductivity. The insight of the BCS theory is that, at very low temperatures, under certain conditions, electrons can form bound pairs. The pair of electrons acts as a single particle is superconductivity. Schrieffer continued to focus his research on particle physics, metal impurities, spin fluctuations and chemisorptions.

Martin Schwarzchild : Born on 31 May (1912-1997)

German born American astronomer who in 1957 introduced the use of high altitude not air balloons to carry scientific instrumrnts and photographic equipment into the stratosphere for solar research

C G Abbot : Born on 31 May (1872-1973)

American astrophysicist who is thought to have been the first scientist to suspect that the radiation of the sun might vary over time. His studies of solar redirection led him to discover in 1953, a connection between solar variation and whether on Earth, allowing general whether patterns to be predicted upto 50 years ahead.

James Rainwater: Died on 31 May 1986

He is an American physicist who won a share of the Nobel Prize for physics in 1975 for his part in determining the asymmetrical shapes of certain atomic nuclei. He has done valuable researches in atomic structure and on X-rays.

## JUNE

**JUNE**

**1**

American philosophical society (APS) Museum celebrates Transits of Venus past and present June 1-10-2012.

Solar battery: In 1955, a solar energy battery was first shipped from an American commercial factory. The battery was disc shaped, about the size of the half dollar, with two terminals.

E-Lamp: In 1992,the E lamp, an electronic electrodelers 20 year light bulb, was announced by Pierre villere. The E lamp is illuminated when radio waves excite a phosphor coating, an efficient process that can save as much as 75%of lightingcosts.

National light pollution law :In 2002 the first national law prohibiting "light pollution " went into effect.

Sir Christopher Cockerel died 1 June 1999.He was an electronic engineer with the Marconi Company.

Sudi Carnot born 1 June 1796. He was a French Engineer and physicist became a captain of engineers in the army and spent much office life investigating the design of steam engine.

**JUNE 2**

Radio Patent: in 1896, the first radio patent was issued to Guglielmo Marconi in England for his wireless telegraphy apparatus for "Improvement in transmitting electric impulses and in apparatus therefore".

Edison patent: In 1895 Thomas Edison received one of his many patent on phonograph.

Electric elevated railway: In 1883, the first electric elevated rail load in the U S had it trail trip. It was built around the outer edge of the main exhibition building of Chicago Railway Exposition .

Donate Comet : In1858, the Donate comet was first seen and named after its Discoverer, Giovanni Battista Donati Florence. It was the second brightest comet of the 19th century. It reached perihelion on 30 Sep 1858.

Publishing "Principia" : in1686 the publication of Newton's Principia was arranged in London at the Royal Society.

NielGabriel Sefstrom: Born 2 June 1787, Swedish chemist who discovered the element vanadium.

Eric voice: Born 2June 1924 –English nuclear scientist who volunteered to Ingest a minute amount of plutonium as a part of European research to track plutonium in the Body's metabolism.

**JUNE 3**

Rutherford on the neutron- In 1920 Ernest Rutherford speculated on the possible existence and properties of the neutron in his second Buckerion Lecture, London, on the nuclear constitution of Atoms.

First telephone twang- In 1875, Alexander Bell used his 'Harmonic telegraph' to transmit twanging sound from a reed vibrated by Bell's voice along wires to Watson.

Photo phone- In 1880 Alexander Graham Bell transmitted the first wireless telephone message on his newly invented telephone.

First American Space Walk: In 1965, the first American Astronaut to make a spacewalk was major Edward white II when he spend 20 minutes outside the Gemini 4 capsule during Earth orbit at an attitude of 120 miles.

Charles Bernard Derormes – Born 3 June 1771, died 30 august 1802 at age 91. He was a French chemist who collaborated with Niwlas cement in scientific investigations including the exact determination of the composition of the carbon monoxide and Carbon sulphide.

**JUNE 4**

Solar eclipsw- In 780 BC the first total solar eclipse reliably recorded by the chines wae noted.

First Canadian nuclear power plant- In 1962, the first electricity from nuclear fission in Canada was generated at the Nuclear power demonstration reactor (NPD).

Lloyd Viel Berkner- Died 4 June 1967 at age 62. He was an American Physicist and Engineer who first measured the Extent, including the height and density of the ionosphere propagation and he helped develop Radar system.

Jean Antonine Clacide Capital- Born on 4 June 1756. He was a French chemist who authored the first book on industrial chemistry. He also coined the name nitrogen. He was the first to produce sulphuric acid commercially.

**JUNE 5**

Liquid air- In 1878, liquid air obtained at a temperature of $-192^0$C was exhibited by professor Dewar at the Royal institution, London.

Colorscope- In 1930, colorscope was first publically demonstrated in New Yorkcity. It used a photocell thwat reacts to colours of light and could match colours more exactly than the Huham eye.

John Gadoline- Born 5 June 1760. He was finnish Chemist who discovered the element Yttrium (1794). This was the first of a family of 15 rare earth elements called the lanthanides.

Dennis Gabour- Born on 5 June 1900. Hw was a Hangarian British Physicist and electrical Engineer who was awarded the Nobel prize for physics in 1971 fot the invention of holography, a system of lensless, three dimentiodl photography.

**JUNE 6**

**Prof.Dewar demonstrater**- In 1902, Prof. Dewar exhibited air in the solid state and a jet of liquid air raising above it to about 6 ft with beautiful effects ,before the prince and princess of Wales.

**Edison Patent**- In 1899,Thomas.A. Edison was issued a patent for his "Filament and process of Incandescent Lamp"

**Ferdinand Braun**- Born 6 June 1850.He was a German physicist who shared the Nobel prize for physics in 1909 with Marconi for the development of wireless telegraphy.

**JUNE 7**

**Solar Power Plant**- In 1980, the first U,S power plant was dedicated.

**Edison Patent**- In 1870,Edison was issued a patent for a painting telegraph instruments.

**Joseph von Fraunhofer** – Died 7 June 1826. German physicist who was the first to study the dark lines in the solar spectrum. They are Fraunhoffer lines.

**Philip Lenard-** Born 7 June 1862.He was a Hungarian German physicist who received the 1905 Nobel prize for Physics for his research on Cathode rays.

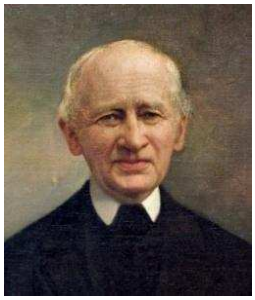
**JUNE 8**

**Neptunium-** In 1940, discovery of element 93, Neptunium (Np) was announced by Edwin.M. McMillan and Philip H Abelson. While studying nuclear fission, McMillan had discovered Neptunium as a decay product of Uranium-239 by betadecay.

**Nova-** In 1918,Nova Aquila, the biggest nova since Kepler's nova of 1604, was discovered in the constellation of the Aquilla the eagle.

**Achromatic Lenses-** In 1758, optician John Dolland, having created achromatic lenses, reported this to the Royal society.

**JUNE 9**



June 9 is Johann Gottfried Galle's birthday. Johann Gottfried Galle was the German astronomer who actually found Neptune and correctly identified it as a planet. The discovery of Neptune is a dramatic story involving a race between two countries to find an unknown planet that wascausing a strange perturbation in the orbit of Uranus. The English had John Couch Adams trying to calculate the position of Neptune and the French had Urbain Le Verrier working on the same problem.

**JUNE 10**

**Steam boat –** In 1809 John Stevans found first commercial steam boat.

**Wheatstone telegraph** – In 1837, the electric " five needle telegraph" was patented in London by Charles Wheatstone and William Fothergill Woke.

**Artificial lightning** –In 1932,artificial lightning using 10 million volts of electricity

was demonstrated in the US by the General Electric Company.

**Andre Marie Ampere** –Died 10 June 1836.A French mathematician ,physicist and chemist who founded and named the science of electrodynamics,now known as electromagnetism.

**JUNE 11**

Charles Fabry Born 11 Jun 1867; died 11 Dec 1945 at age 78.

Charles Fabry is a French physicist who specialized in optics, devising methods for the accurate measurement of interference effects. He worked with Alfred Pérot, during 1896-1906, on the design and uses of a device known as the Fabry- Pérot interferometer, specifically for high-resolution spectroscopy, composed of two thinly silvered glass plates placed in parallel, producing interference due to multiple reflections. In 1913, Fabry demonstrated that ozone is plentiful in the upper atmosphere and is responsible for filtering out ultraviolet radiation fromthe Sun, protecting life on the surface of Earth from most of its harmful effects.

Carl von Linde Born 11 Jun 1842; died 16 Nov 1934 at age 92.Carl von Linde is a German chemist, engineer and inventor who invented mechanical refrigeration. His first refrigeration equipment was tested in a Munich brewery. Brewing good lager beer required low temperatures, limiting brewing to winter, or in deep cellars with the use of large quantities of block ice. Through Linde's invention of refrigeration, beer brewing became seasonally independent. Linde also invented a continuous process of liquefying gases in large quantities which provided both impetus and means for conducting scientific research at low temperatures and very high vacuums. Linde's original industry has now grown to 120 companies around the world.

Julius Arthur Nieuwland Died 11 Jun 1936 at age 58 (born 14 Feb 1878). Julius Arthur Nieuwland is Belgian-American organic chemist who studied reactions of acetylene and invented neoprene. He was ordained as a priest (1903)before earning his Ph.D. (1904). He did not pursue his own discovery of the reaction between acetylene and arsenic trichloride, but it led to the development of the chemical-warfare agent

*lewisite* dubbed "the dew of death", a poison gas and vesicant used in WW I. He collaborated with DuPont chemists in thepolymerization of acetylene and development of chloroprene, which in turn could be polymerized to the first really successful synthetic rubber, neoprene. This was superior to rubber in many ways such as in its resistance to sunlight, abrasion, and temperature extremes.

**JUNE 12**

**Sound Movies :** In 1906, sound movies were patented by John Bullence.

**Blue Galaxies :** In 1965, the Big Bang Theory of creation of the universe is supported by the announcement of the discovery of new celestial bodies known as Blue Galaxies.

**Human Powered Flight :** In 1979, the Gossamer Albatross flew across the English Channel, in an air plane powered solely by human power.

**JUNE 13**

**Sun Spots :** In 1611, a publication on the newly discovered phenomenon of sun spots was dedicated.

**Moseley:** In 1915, Physicist Henry Moseley at the age of 27 departed with the military from England to flight in Turkey. He died at Gallipoli two months later. Britain lost a brilliant young scientist who had developed X-Ray analysis of elements and the concept of atomic number..

**James Clarke Maxwell:** Born on 13 Jun 1831, Scottish Physicist and mathematician.

**JUNE 14**

**Charles Augustin De Coulumb :** Born on 14 Jun 1736, French Physicist best known for the formulation of Coulomb's Law.

**Steam Power Demonstration:** In 1699, Thomas Savery, at the weekly meeting at Gresham College demonstrated before the royal society a small model of his invention, a steam powered water pump.

**James Clarke Maxwell:** Born on 13 Jun 1831, Scottish Physicist and mathematician.

## JUNE 15

### Lightning Experiment :

In 1752, Ben Franklin's kite flying experiment proved lightning and electricitywere related while flying a kite with a key attached.

## JUNE 16

### George Witty : Born 16 June 1897

German chemist whose studies of organic phosphorous compounds won him ashare of the Nobel Prize for Chemistry in 1979.

**Helicopter:** In 1922, henry A. Berliner demonstrated the first helicopter prototype for representatives of the US Bureau of Aeronautics in College Park,Maryland.

### Gas Turbine Electric Locomotive

In 1949, the first gas turbine electric locomotive in the US was publicly demonstrated in Erics Pa in 1946, a specific project to develop a gas turbine forrail road application got underway.

## JUNE 17

**Donald J Cram**

He was an American chemist who shared the 1987 Nobel Prize for chemistry.Died on 17 june 2001.

**Chinese Hydrogen Bomb**

In 1967, China tested its first Hydrogen Bomb. This was China's $6^{th}$ nuclear test.

**JUNE 18**

**Solar neutrino count**

In 2001, the result of experiments counting undetected, but theoretically predicted solar neutrinos was announced by a collaboration of Canadian, American and British scientists led by Arthur MC. Donald. They detected all three types of neutrinos (electron, muon and tau)the solar neutrino observatory.

**Mercury lamp :** In 1912, a patent was issued for a mercury vapour lamp to Petter Huerit.

**JUNE 19**

**Movie of sunspots :** In 1934, the first movie of the sun.

**Photocell operated doors :** In 1931, installation was completed on the first commercial doors by photoelectric cell.

**JUNE 20**

**Wireless car phone:** In 1926, a wireless phone for demonstrated in Berlin.

**Nuclear powered heating:** In 2002, an agreement was signed to establish a sea water desalination and heating plant using atomic reactors at the coastal city of Yingkou, China.

**JUNE 21**

**World's first solar sail space craft:** In 2005, the world's first solar sail space craft placed in orbit to test controlled flight was launched on Volna rocket fired farm a Russian submarine.

**Rocket patent:** In 1859, Andrew Lanergan of Boston, mass received the first rocket patent for "an improvement in exhibition rockets".

**Boron:** In 1808, the isolation of the element boron was announced by French chemist, Joseph Louis-**Lussac.**

**JUNE 22**

**Galileo Galilei:** In 1633, he was forced by the inquisition to "abjure, curse and detect" his Copernician helio antric views.

**Chadron discovered:** In 1978, evidence of the first moon of Pluto was discovered by astronomer James, when he obtained a photograph of Pluto that showed the orbital to be distinctly elongated.

**JUNE 23**

**Steel making patent:** In 1857, a U.S. patent was issued to William Kelley for manufacturing of steel and iron.

**X-15 speed record:** In 1961, a X-15 jet air plane set a speed record, travelling over 3000 mph at Edward's Air force base, California.

**Integrated circuit:** In 1964, a U.S. patent was issued to Jack. S. Kily for his invention of "miniaturized electronic circuits", now known as integrated circuits.

**JUNE 24**

**Video recorder:** In 1963, the first demonstration of a home video recorder was made at the BBC News studios in London.

**Meteocite:** N 1938, scores of eye witness observed the explosive of a huge fire ball streaking over Butler country, Pa, USA. A cow was struck and injured by a falling stone.

**Radar:** In 1930, the radar detection of air craft took place at Anacostia.

**JUNE 25**

**Walther Hermann Nernst :** Born on 25th June 1864 German physical chemist who was one of the modern physical chemistry.

**Coal to oil:** In 1921, German chemist Frederick Karl Bergius invented a way to convert coal dust and hydrogen directly in to gasoline and lubricating oils without isolating intermediate products.

**Ph.D for Curie :** In 1903, Marie Curie went before the examination committee for her Ph.D.

**JUNE 26**

**Baron William Thomson Kelvin :** Born on 26th June 1824, British physicist, mathematician and engineer who became an influential physicist, who has been described as a Newton of his era.

**Fluorine:** In 1886, Henri Moissan isolated the element fluorine for the first time.

**JUNE 27**

**Asteroid inlayed:** In 1997, the near earth asteroid was inlayed.

**Atomic power:** In 1954, the world's first atomic power station began producing electricity in USSR.

**JUNE 28**

Maria Goeppart Mayer- Born 28 June 1906. German Physicist who shared one half of the 1963 Nobel Prize for Physics with J. Hars D Jensen of west Germany for their

proposal of the shell nuclear model

Atomic reactor – In 1956, the first atomic r3actor built for private research began operations in Chicago

Satellite In 1965 the first commercial telephone conversion over a satellite book place

**JUNE 29**

**1995 - Space shuttle Atlantis docked with Mir space station.**

The American space shuttle *Atlantis* docked at the *Mir* space station in a joint US/Russian mission as a start to work more closely together. While the two were connected, they formed the largest man-made object in space. The docking tested a new dock link that would eventually be used on the International Space Station.

**1890 - Alexander Parkes died.**

Parkes was a British chemist who developed the first man-made thermoplastic. His plastic, named Parkesine was based on nitrocellulose and sometimes called synthetic ivory. He also developed an economical process to remove silver from lead ores known as the Parkes process.

George Ellery Hale (1868 - 1938).

**1868 - George Ellery Hale was born.**

Hale was an American astronomer who invented the spectroheliograph which allowed him to take photographs of the sun. He discovered the 22 year cycle of sunspot activity. He also founded the Mount Wilson observatory in southern California to study the sun. The 200 inch telescope at the Palomar Mountain Observatory was paid for by funds raised by him and ultimately was named theHale telescope after his death.

Cato Maximilian Guldberg (1836 - 1902) and Peter Waage (1833 - 1900). Wikimedia Commons

**1833 - Peter Waage was born:** Waage was a Norwegian chemist who, together with Cato Guldberg, discovered the Law of Mass Action. This law relates the rate of a chemical reaction is proportional to the amount of active mass, or concentration, of the reactants. This law became the basis for determining rateconstants of chemical reactions.

**JUNE 30**

Joseph Bienaimé Caventou: Born 30 Jun 1795; died 5 May 1877 at age 81. French chemist who is noted for the research he did in partnership with Pierre-Joseph Pelletier into vegetable bases and the resulting contributions of alkaloid chemistry to the field of medicine. They helped found the chemistry of vegetable alkaloids. They isolated chlorophyll (1817), for which they coined the French name *chlorophyle* in *Ann. de Chimie* (1818), IX, 195. Their alkaloid discoveries included strychnine (1818), brucine (1819), quinine (1820), caffeine (1821), and cinchonine. In 1823, using elementary closed-tube analyses in which the alkaloids were combusted, they discovered nitrogen was present in the compounds. Alkaloids are organic compounds which form water-soluble salts that perform various functions in medicine, including analgesics (pain-killers), and respiratorystimulants.

Félix Savart: Born 30 Jun 1791; died 16 Mar 1841 at age 49. French physicist who researched various manifestations of vibration. With Jean-Baptiste Biot, he developed the Biot-Savart Law (1820) concerning the magnetic field intensity around a current-carrying wire. After earning a degree in medicine (1816), he took an interest in physics, beginning with a study of the violin to explain the contributions from its components to the sound from the strings. He presented a memoir on the subject to the Paris Academy of Sciences in 1819. He conducted extensive research in acoustics, the nodal patterns of vibrating systems (including air columns), and related enquiries into the elasticity of substances. He also investigated the voice and hearing. He devised a rotating toothed

wheel to produce a sound of any frequency by a reed held against it, to measure high frequency hearing limits.

Paul Berg Born 30 Jun 1926 is American biochemist who made “fundamental studies of the biochemistry of nucleic acids, with particular regard to recombinant-DNA” techniques for which he shared the Nobel Prize for Chemistry in 1980 (with Walter Gilbert and Frederick Sanger). Berg's pioneering experiment, in which he was the first person to construct a recombinant-DNA molecule, initiated genetic engineering. Such molecules contain parts of DNA from different species, for example, a chromosome from a virus combined with genes from a bacterial chromosome. DNA molecules from viruses, being relatively small, are useful for such investigations. Important practical applications now include the manufacture of human hormone with the aid of bacteria.

Died 30 Jun 1919 at age 76 (born 12 Nov 1842): John William Strutt, Third Baron Rayleigh was an English physical scientist, 3rd Baron of Rayleigh (of Terling Place) who made fundamental discoveries in the fields of acoustics and optics that are basic to the theory of wave propagation in fluids. He received the Nobel Prize for Physics in 1904 for his investigations into the densities of the most important gases and his successful isolation of argon, an inert atmospheric gas.

**Eclipse:** In 1973, a solar eclipse, predicted as the longest for 1,000 years, was observed by British, French and American scientists aboard the French prototype Concorde 001 supersonic aircraft on a flight from Las Palmas, Canaries to Fort Lamy, Chad. The path of totality crossed the Atlantic, the Sahara Desert and East Africa.

The moon’s shadow travelled at over 3,000 km per hour. Flying at 55,000 feet, the jet’s speed made possible a continuous view of the solar eclipse for 74 minutes,ten times longer than could be seen by an observer on the ground. Four monthslater, Concorde 001, the first prototype to fly, was retired on 19 Oct 1973, to the French Air Museum at Le Bourget Airport. It had made 225 supersonic flights ina total of 397.

**Leap second**: In 1972, the first leap second day, one second was added to the world's time in order to keep the super-accurate atomic clocks in step

with the Earth's rotation. Since the adoption of this system in 1972, firstly due to the initial choice of the value of the second (1/86400 mean solar day of the year 1900) and secondly to the general slowing down of the Earth's rotation, it has been necessary to add over 20 seconds to Coordinated Universal Time (UTC).

**Soviet space tragedy :** In 1971, a Soviet space mission ended in tragedy when all three cosmonauts aboard *Soyuz 11* died as their capsule

depressurized during reentry. G.T. Dobrovolsky, V.J. Patsayev, and V.N. Volkov had successfully completed their objective, the first (and now only) manned mission to both dock and occupy the first space station, *Salyut 1* (launched 19 Apr 1971). After orbitting the earth for over 23 days, they were on the return journey. While still far outside the earth's atmosphere, their rentry capsule was separated from a lower stage of their spacecraft by firing explosive bolts. That shock caused an air vent valve to open prematurely, rapidly depressurizing the capsule. Having no space suits, the crew died in a minute. The capsule still landed automatically, grimly bringing their lifeless bodies back to earth.

**Atomic bomb:** In 1946, the first U.S. atomic bomb dropped from an airplane over water was named "Able," a part of Operation Crossroads. A U.S. Air Force B-29 Superfortress, *Dave's Dream*, was used to deliver the bomb, which was dropped over the Bikini Lagoon in the Pacific Ocean onto a target group of 73 ships moved there for the purpose. The explosion caused a 520-foot burst. The *Gilliam* and *Carlisle* transport ships were sunk, and 18 other ships were damaged.

**Boron**: In 1808, Humphry Davy announced in a paper read to the Royal Scociety that he had separated the element boron. Davy had taken boric acid with potassium in a copper tube and heated it to

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dull redness for fifteen minutes. The resulting olive-gray powder did not effervesce

with water or acids, indicating that the potassium had disappeared. However, working independently, French chemist, Joseph Louis Gay-Lussac had announced the same accomplishment nine days earlier, on 21 Jun 1808.

# JULY

## JULY 1

Doctors day

1770-Lexell's comet passed to earth than any other comet in recorded history approaching to a distance of 0.0146.a.u.

Lexell's comet: Discovered by Charles Messier on June14,1770.The comet has not been seen since 1770 and is currently considered a lost comet.The comet was observed in Japan.It's observed in constellation Sagittarius,byMessier,who had completed an observation Jupiter and was examining several nebula.At this time it was very faint,but his observation over the course of next few days showed that it rapidly grew in size.Surviving records identify it as an astronomical and historical phenomenon.

1881-The world's first international telephone callis made between St.Stephen,NewBrunswick,Canada andCalais,Maine,U.S.

1957-The international year started:It was an scientific projected,that lasted fromJuly 1 1957 to Dec 31 1958.It marked the end,after Joseph Stalin's death, of a long period during the cold war when scientific interchange between east and West was seriously interrupted.Both U.S and U.Q.S.R launched artficial satellites for this event;Soviet Union's Sputnik 1 oct-4 1957 was the first successful satellites

1959-Specific values for the international yard,pound & other derived units are adopted after agreement between U.S.A &U.K and other common walth countries.

## JULY 2

United State Independence Day

In 1906-Hans Albrecht Bethe – A German-American physicist, born on July 2,who was awarded the 1967 Nobel prize in physics for describing how stars produce energy .

In 1862-William Hentry Bragg was born.He shared the 1915 Nobel prize in physics with his son,WillianLawerence Bragg for the development of X-ray crystallography. He also worked on detection system against German U-boats during world war1.

1928-British parliament accept female sufferage

1956- U.S performs nuclear test at Enwetak-atmospheric tests.
1972- India and Pakistan sign peace accord.
1982- Soyuz T-6 returns to earth:- A manned spaceflight to earth orbit to the Salyut 7 spacestatonincluding two Russians and one Frenchman,launched from BaikonurCosmodrome

1985- European space agency launches Giotto-Halley's comet ,Flyby:-Giotto was ESA's first deep space mission.Its images showed for the first time the shape of a comet nucleus and its materials.

**JULY 3**

In 1993,Japan launches Nozomi Mars probe as their first mission to another planet. The planned mission was to accelerate around Earth and slingshot to mars and perform experiments from Mars orbit in 1999.

In 1969 Soviet rocket becomes largest explossion in history of rocketry:-The soviet NI rocket was designed to be the rocket to take cosmonauts to the moon. The rocket exploded with the fuel tanks nearly full. The explosion destroyed both the rockrt and the launch lower.

The ESA Mars Express mission sent back test images of its high resolution stereo camera are of these type of test pictures was a visual of Earth and moon from 8millions miles away . This test showed the kind ofbpictures ESA could expect when the Mars Express reached Mars orbit of 200 kms out..

**JULY 4**

1934- Marie Sklodowska Curie died :- A polish french chemist and physicist , who pioneered the study of radioactivity. She was awarded two nobel prizes: the 1903 Nobel prize in physics with her husband Pierre Curie and Henri Bequerel and 1911Nobel prize in Chemistry for the discovery of element Radium and Polonium. She died as a result of radiation poisoniry before the health effects of radiation were known.

1911-Fredrick Seitz was born -An American physicist who pioneered the study of solid state physics,through quantum mechanics, mettallurgy and crystallography.

1054-Astronomers record the appearance of a supernova in china and Arabia near the star Tauri. It appeared for several months in the sky,even during the day before fading.

**JULY 5**

1687-Isaac Newton publishes philosophy of Natural is principia mathematica,justly regarded as the most important work in the history of scince. It make the approach of a great revolution in physics. In formulating his physical theories Newton developed and used mathematical method now included in the field of calculus. In a revised conclusion to the principia, Newton used his expression that became famous "Hypothesis non fingo". The principia deals primarily with massive bodies in motion, initially under a variety of conditions and hypothetical laws of force in both non-resisting and resisting media ,thus offering criteria to decide, by observations, which laws of force are operating in phenomenon that may be observed. The principia begins with definitions and continues in three books talking on the motion of bodies, motion through resistivity mediams, and 3rd on the system of the world.

1954-The BBC broad casts its first television news bulletin.
1874-Eugen Fischer -German physician born.
1891-John Howard Northrop, American chemist born.

**JULY 6**

Events:

In 1573- Cordoba , Argentina is founded by Jeromimo Luis de Cabrera.

1609-Bobenia is granted freedom of religion.

1785- The dollar is unanimously chosen as the momentary unit for the U S.

1885- Louis Pasteur succesfully tests his vaccine against rabies. The patient was Joseph Meister a boy who was bitten by a rapid dog.

1962- As a part of operation plowsh are , the sedan nuclear test takes place.

2003- The 70 meter Eupatoria planetary radar sends a METI message to 5 stars: these messages will arrive to these stars in 2036

Birth days

1785: William Jacksob Hooket-Engliah botanist.

**JULY 7**

1959- Venus occults the star regulars. This rare event is used to determine the diameter of venus and the structure of the venasian atmosphere. An occultation is an event that occurs when one object is hidden by another object that passes between it and the observer. Regular is the brightest star in the constallation Leo.lying approximately 77.5light years from earth. The next occultation by venus occur on october 1 ,2044

1746- Italian astronomer Giuseppe piazzi born. Who established an observatory at palermo. One of his famous discovery was of the dwarf plannet ceres.

1878-Yegor Ivanovich Zolotavev,Russian mathematician died on this day.

1994-Captain Vikram Batra, Indian Army officer and param veer chakra recepient.

**JULY 8**

2011- Space shuttle Atlantis is launched in the final mission of the U S space shuttle

programme.

The space shutyle Atlantis is a retired space shuttle orbiter in the space shuttle fleet belinging to the NASA,the space flight space explotion agency of the U S Atlantis was the forth operational space shuttle to be constructed by the Rockwell international company in Southern California, and it was delivered to the , JohnF Kennedy space centre in Florida in april 1985. In its final flight it gives additionak supplies to the international space station and take advantages of the processing performed for Launch on Need mission,which would only have been flown in the event that Endeavours STS-134 crew required rescue. By the end of its final mission, Atlantis had orbited the Earth 4848 times travelling nearly 2.03×10^8 km in space or more than 525times the distance from the Earth to moon.

**JULY 09**

In 1934, Canadian scientist Herbert Jasper of Brown University made the first electrical tracing from a human brain. Jasper considered to be one of the founders of modern neuroscience pioneered the use of electroencephalogram (EEG) to study electrical activity associated with fundamental brain functions such as consciousness and learning. He and his collaborator neurosurgeon Wilder Penfield also elucidated the mechanism underlying epilepsy and invented a highly successful procedure to treat seizures. Their work has contributed largely to our understanding of functional anatomy and lateralization of human brain.

In 1994, Soyuz TM-19 lands.

In 1992, Space shuttle STS-50-columbia 13 lands.In
1979, Voyager 2 flies past Jupiter.
In 1972, U.S.S.R. performs underground nuclear test.

In 1962, U.S. performs atmospheric nuclear test at Johnston Island.In
1957, Discovery of element 102 (Nobelium) announced.

**JULY 10**

1902- Kurt Alder was born, a German chemist who shared the 1950 Nobel Prize in Chemistry with Otto Diels for their development of diene synthesis, otherwise known as Diels- Alder reaction. A diene is a hydrocarbon with two double bonds, and this reaction converts dienes and alkenes into ring molecules. It's important in the synthesis of many polymer steroids and alkaloids.

1997, In London Scientist report the finding of the DNA analysis of a Neanderthal skeleton which supports the "out of Africa theory" of human evolution placing an "African eve" at 100,000 to 200,000 years ago.

2000- EADS, the world's second largest aerospace group is formed by the merger of Aerospatiale- Mata DASA & CASA.

1832- Alvan Graham Clarck, American telescope maker and astronomer born. On Jan 31, 1862 while testing a new 18 ½ inch refracting telescope, he made the first observation of Sirius B in Cambridge port, Massachusetts. The magnitude 8 companion of Sirius is also the first known white dwarf star.

JULY 11

1927- Theodore Mainman was born, an American Physicist who was the first to construct a working laser. His laser used a synthetic ruby crystal that was silvered on two ends. The laser beam was produced by strobe lights shining on the crystal and exciting the chromium atoms in ruby.

1924- Cesar Lattes was born, a Brazilian Physicist who discovered the pi meson particles with Eugene Gardones pi mesons or pions are light weight mesons that have a significant role in explaining the story nuclear force.

1979- The Skylab space station re-enters Earth's atmosphere after six years in orbit. It is perhaps the most highly anticipated return of any space craft ever, save Apollo 13.

NASA's plan was for Skylab to remain in relatively low orbit until a space shuttle equipped with a reboots module could reach it in 1979 and boost it into a higher orbit.

Subsequent shuttle mission would focus on overhauling Skylab making repairs and replacing various components.

**JULY 12**

1928- Elias James Corey was born, an American Chemist who was awarded the 1990 Nobel Prize in Chemistry for his advancement of organic synthesis. He developed a method of organic synthesis that broke larger chemical compounds into smaller parts by reversible steps where synthesis is known. His process is called retrosynthesis analysis and could be used to predict the synthesis steps of other compounds with similar chemistry.

1854- George Eastman was born, an American chemist and inventor who invented rolled film and created the Eastman Kodak company. Rolled film put photography in the hands of everyone and helped found the motion picture industry.

1913- Wiilis Lambian American Physicist was born, who was awarded half the 1955 Nobel Prize in Physics for his discovery of hyperfine spectra of the Hydrogen atom called Lamp Shift. The Lamp Shift was the energy difference between the $2s^{1/2}$ and $2p^{1/2}$ energy levels of Hydrogen atom. Though these two levels have same energy, when exposed to magnetic field, the energy level $2s^{1/2}$ was slightly different. This discovery led to the renormalization of theory of quantum electrodynamics.

**JULY13**

1937- Henry Edward Armstrory, an English chemist and educator who made great contributions to the synthetic dye industry through his work with Naphthalene and its derivative died. Much of his scientific research was done on the subject of terpenes such as camphor and came close to recognizing the centric structure of benzene.

1921- Gabriel Lippmann, a Luxembourgish physicist who created the first colour photographic plate, died. The Lippmann plate used a glass plate coated with a silver emulsion on one side. The other side is exposed to light while; the emulsion side is backed by a reflective material such as mercury. The light is reflected back and

interferes with the incoming light creating a Bragg diffraction pattern. After the plate is processed, the patterns can be viewed by the reflection of a diffuse light source in colour. Lippmann was awarded the 1908 Nobel Prize in Physics forthis process.

1896- Friedrich August Kekule Von Stradonitz died. A German theoretical chemist who was the first to describe the ring structure of Benzene and that carbon could have a valence of 4. These discoveries involving the carbon atom greatly expanded the understanding of organic chemistry.

**JULY 14**

NASA's Mariner 4 space craft made its closest approach to the planet Mars and began recording pictures of the planet surface. It sent back 22 pictures that showed impact craters and vast stretches of barren terrain much like the Moon. It was later learned the terrain mapped by Mariner 4 was a typical of most of the Martian surface.

1921- Geoffrey Wilkinson was born, who shares 1973's Nobel Prize in Chemistry with Ernst Otto Fisher for their work in organometallic compounds.

1907- William Henry Perkin died; who was an English chemist and discovered the first aniline dye called mauvein. He was trying to synthesize awinine and discovered aniline mixed with sodium dichromate produced a very purple mixture. This discovery started the artificial dye business that revolutionized the textile industry. He also synthesized coumarin, the first synthetic perfume that began the synthetic perfume industry.

1874- Andre Louis Debierne was born, a French chemist who discovered the element Actinium. He was also active in the research of radium with Pierre and Marie Curie.

1827- Augustin Jean Fresnel, a French physicist best known for the development of wave optics, died.

**JULY 15**

1965- Eighteen Nobel Laureates sign the Mainau Declaration against nuclear weapons, later co-signed by 34 others. It was an appeal against the use of nuclear

weapons drafted by German Scientists Otto Hahn and Max Born. It was circulated at a conference of Nobel Prize Laureate in Lindau, Germany on July15, 1955.

1975- Space race: Apollo- Soyuz test project features the dual launch of an Apollo space craft and a Soyuz space craft on the first joint soviet U.S. human crewed flight. It was both the last launch of an Apollo space craft and the Saturn familyof rockets.

1915- Albert Ghiorso, American nuclear scientist born, who was a co-discoverer of a record 12 chemical elements on the periodic table.

**JULY 16**

2011- Ohi Nuclear power plant in Japan is being shut down due to technical fault, Fukushima Daiichi Nuclear disaster.

1945- Manhattan Project: The atomic age begins when the US successfully denotes plutonium based test nuclear weapon at the trinity site near Alamogordo,New Mexico. The Manhattan project was a research and development program, led by the United States with participation from the United Kingdom and Canada, which produced the first atomic bomb during World War II. From 1942 to 1946, the project was under the direction of Major General Leslie Groves of theUS Army corps of Engineers.

1969- Apollo Program: Apollo II, the first manned space mission to land on the Moon, is launched from the Kennedy space center at Cape Canaveral Florida. Apollo II was an American space flight in which the astronauts Neil Armstrong and Buzz Aldrin became the first end to land on the Moon on July 20, 1969. The 3rd member of the mission, Michael Collins was waiting to pick them up in an orbit around the Moon. They all returned to Earth safely after travelling in space for 8 days.

**JULY 17**

On 1975, July 17, an Apollo capsule carrying three astronauts docked with a soviet Soyuz capsule carrying two cosmonauts. It was the first time two different countries met in space. The Apollo Soyuz project was designed to test a docking module that

was designed by both US and soviet engineers that would be used in future joined missions. To prepare for this mission, astronauts visited both country's facilities and trained abroad simulators to familiarize themselves with each other's systems. Russian cosmonauts learned English and American cosmonauts learned Russian.

1920- Gordon Gould was born, an American Physicist who invented the laser. Hewas developing an optical equivalent to the recently developed maser and outlined a method to accomplish the task and coining the term LASER.

1912- Henri Poincare died, a French mathematical physicist who was co- discoverer of the special theory of relativity. He is also considered one of the founders of the mathematical fields of topology.

**JULY 18**

1937- Roald Hoffmann was born- Hoffmann was a polish American chemist who was awarded one half the 1981 Nobel Prize for his investigations in to the mechanism of chemical reactions. He was working with Robert Woodward on a set of rules determining the stereochemistry of pericyclic reactions based on the shape of the electronic orbital involved. These rules are known as the Woodward- Hoffmann rules. Woodward would not receive part of the prize because he diedtwo years prior, making him ineligible.

1859- Hendrik Antoon Lorentz was born, a Dutch Physicist who derived the transformation equations used by Einstein to describe the effects of motion on space and time in his relativity theory. Lorentz determined that moving frames of reference would measure time and distances differently from a stationary frame of reference. He also shared the 1902 Nobel Prize with Pieter Zeeman for describing what is known as the Zeeman Effect.1838- Pierre Louis Dulong, a French chemist who is best known for his work with specific heat capacity of crystals known as Dulong- Petit Law, died.

**JULY 19**

**1921-** Rosalyn Sussman Yalow was born. He is an American biophysicist, who was awarded half the 1977 Nobel Prize in medicine for the development of Radio Immuno Assay RIA. It is a sensitive technique to measure minute concentrations of antigens. She developed the RIA technique to measure insulin levels while researching diabetes.

1842-Pierre-Joseph Pelletier died a French chemist and pharmacist, who researched vegetable alkaloids. He discovered strychnine, quinine, caffeine and many other alkaloids. He also isolated chlorophyll, the green pigment in plants necessary for photosynthesis with French chemist Joseph-Bienaime Caventou.

1969 Space Apollo 11: Apollo 11 prepare for the next day's historic event by going into orbit around the moon.

**JULY 20**

In 1994, Major parts of Comet shoemaker- Levy hit Jupiter ( July $16^{th}$-$22^{nd}$).In 1972, U.S performs nuclear tests at Nevada Test site.
1996, First men on moon, Neil Armstrong and Edwin Aldrin, Apollo-11.

In 1960, USSR recovered 2 dogs; first living organisms to return from space.In 1956, US performs atmospheric nuclear test at Bikini Island.
In 1878, first telephone introduced in Hawail.

In 1847, German astronomer Theodor discovered Comet Brorsen-Metcalf: - It is a periodic comet in our solar system that was discovered by Brorsen and again by Kaspar Schweizer (Moscow) on August 11. The prediction was made, it would return between 1919 and 1922.

**JULY 21**

1998- Alan Bartlett Sphepard, Jr died. He was an American astronaut and one of the original seven Mercury astronauts. He was the first American in space during the freedom mission on May, 5, 1961, just three weeks after soviet cosmonaut; Yuri Gagarin made his historic flight.

1923- Rudolph Arthur Marcus was born. He is a Canadian born American chemist who was awarded the 1992 Nobel Prize in chemistry for his development of electron transfer theory during chemical reactions. This theory helps explain reactions like oxidation, photosynthesis and cell metabolism.

1694- Georg Brandt was born, a Swedish chemist who discovered the element cobalt. He was also one of the first chemists to separate chemistry from alchemy and spent his later years disproving claims of transmuting and creating games.

**JULY 22**

1887- Gustav Hertz was born, who was a German Physicist who shares the 1925 Nobel Prize in Physics with James Franck for their Frank-Hertz experiment. It shows that an atom absorbs energy in discrete amounts, confirming the quantum theory of atoms. This experiment was an important step confirming the Bohr model of the atom.

1784- Friedrich Wilhelm Bessel was born, who was a German astronomer and mathematician who is credited as the first to determine the distance to a star using parallax of the Earth's orbit. Parallax is measured by charting the position of the star at two different times, half a year apart. The difference in the angle and the diameter of the Earth's orbit gives a measure of the distance to the star.

Edward Farber:- Born 22 July 1914, was an American inventor who devised a portable, battery-operated stroboscopic flash unit for still cameras that effectively "stopped action".

Gregor Mendel:- Born 22 July 1822, was an Austrian botanist geneticist and monk who pioneered in the study of heredity. He was the first to lay the mathematical foundation of the science of genetics, in what came to be called Mendelism.

**JULY 23**

2007- Ernst Otto Fischer died; a German chemist who shares the 1973 Nobel Prize in chemistry with Geoffrey Wilkinson for their independent pioneering works with organometallic compounds. He worked on compounds with transition metal complexes and catalysts to hydrogenate alkenes to alkanes. He also identified the structure of the

sandwich compound, ferrocene.

1916- William Ramsay died a British chemist who discovered the four gases, Neon, Argon, Krypton and Xenon. This discovery would earn him the 1904 Nobel Prize in chemistry.

1906- Vladimir Prelog was born, who was a swiss-croatian organic chemist who was awarded half the 1975 Nobel Prize in chemistry for his research into the stereo chemistry of natural compounds and reactions. He named the right handed compound "dextro" and the left handed "levo".

**JULY 24**

Henri-Alexandre Deslandres:- Born 24 July 1853; died 15 Jan 1948 at age 94, French astrophysicist who invented a spectroheligraph (1894) to photograph the sun in monochromatic light and made extensive studies of the solar chromospheres and solar activity.

Sir William de Wiveleslie Abney:- English Astronomer and chemist who investigated color photography and color vistas born on 24 July 1843 and died 2 Dec 1920, at age 77. He pioneered a method to measure the relative proportions of the primaries in a sample color. Having developed a suitable photographic emulsion, he was the first to take infra-red photographs and study the solar infrared spectrum. In 1877, he was first to suggest a relationship between a star's rapid rotation and broadened lines in its spectrum. He introduced hydroquinoneas an effective photograph developing chemical.

Fritz Albert Lipmann, died on 24 July 1986, German American biochemist who shared the 1953 Nobel Prize for physiology and medicine for the discovery of enzyme A, with Sir Hans Krebs.

Sir James Chadwick: English Physicist who received Nobel Prize for his discovery of neutron (1935)

**JULY 25**

1906, Vincent Joseph Schaefer died. He was an American chemist and meteorologist

who pioneered the practice of cloud seeing. He discovered a sudden drop in temperature could seed existing clouds. He developed a method that used dry ice or solid carbon dioxide to seed the clouds and was successfully in creating snow.

1874- Sergery Visilyevich Lebedev was a Russian/ Soviet chemist who invented the Russian industrial process to produce synthetic rubber. This process would make the soviet the top synthetic rubber producers in the world by World War II.

1837- The first commercial use of an electric telegraph is successfully demonstrated by William cooke and Charles Weatstone on 25 July 1837 between Euston and Camden Town in London.

1925- Telegraph Agency of the Soviet Union (TASS) is established.
1973: Soviet Mars 5 space probe launched.
1976: Viking program: Viking 1 takes the famous face on Mars photo.

**JULY 26**

2004- William.A.Mitchell died; an American food chemist who was the inventor of Pop-Rocks, instant Jell O, cool whip and the orange drink Tang.

1971- Apollo, 15 Moon mission is launched. NASA launched their Apollo 15mission to become the forth mission to land on the moon. This mission would allow the astronauts to spend more time as the surface of the moon. The lander stayer three days on the surface and the crew conducted over 18hours of outside work. They also were aided for the first time by a lunar over vehicle.

1944- The first German V-2 rocket hits Great Britain. The V-2 rocket, technical name Aggregate-4 was a ballistic missile that was developed at the beginning of the Second World War in Germany, specifically targeted at London and later Antwerp. The liquid-propellant rocket was the world's first long range combat- ballistic missile and first known human artifact to enter outer space. It was the progenitor of all modern rockets, including those used by the US and Soviet Union's space programme.

**JULY 27**

1962- Conrad Arnold Elvehjem died. He was an American biochemist, who discovered nicotinic acid was an essential nutrient. Nicotinic acid is the vitamin B, niacin. He also found it greatly reduced the symptoms of pellagra, an health issue in us, for people who had a diet based on corn or sorghum. It makes victims look like they have a sunburn, have mental and digestive disorders and can be fatal, if untreated.

1844- John Dalton died.

1929- Raoul Pictet died, a Swiss Physicist, who was the first to create liquid nitrogen. He developed a technique originally to liquefy oxygen, announcing his achievements to the Academy of science in Paris within days of Louis Cailletet and applied in to other gases, including Nitrogen.

1881- Hans Fischer was born, a German chemist, who was awarded the 1930 Nobel Prize in chemistry for his research in to biological pigments. He researched chlorophyll, carotene and synthesized hemin a red pigment in hemoglobin. He found these structures were based on the structure of pyrrole.

1848- Friedrich Ernst Dorn was born, an German physicist, who discovered the element Radon. He found radon was a radioactive gas given off by radium.

**JULY 28:** World Hepatitis Day

Jacques Piccard, famous Swiss economist and physicist born on 28 July 1922.

Charles Townes born on July 28 1915, an American physicist who shared the 1964 Nobel Prize for physics with Aleksander M Prokhorov and Nikday Basov for "Fundamental work in the field of quantum electronics, which has led to the construction of oscillators and amplifiers based on the maser- laser principle."

In 1985 -19th space shuttle mission (51-F) challenger 8- launched. In
1972- France performed nuclear test at Muruora island.
In 1969- Mariner6 – begins transmitting far encounter photos of Mars.

1957- International Atomic Energy Agency formed by U.N.

1949- BBC radio began broad casting.

**JULY 29**

1958: Eisenhower authorises the certain of NASA :- President Eisenhower scgned an acr\t creating a national auronautics and space administration or NASA, was created to help the uus. Take leadership in the space age. Since this time NASA has gone from launching copies of German V-2 rockets to almost ruteen shuttle launches in to orbit, networks of sattelites relying communications and research data and pribes to othr planets and beyond our solar system.

1898 : John Alexander reina newlands died. He was a British chemist who noticed the repeating pattern of elements arranged by automatic weight were very light element had similar chemical properties. He called this the lwa of octaves. Was major contributions towards the development of the periodic table.

1898: isidor isaacrabi , a German American physicxist who wwas awarded the 1944 nobel prize in Physics for the discovery of nuclear magnetis resonance.

**JULY 30**

1641: Regnier de Graaf, Ducth physician and anactomist born

1889: Vladimer Zworykin, Russian physicist born, who was an Russian- American inventor, engineer, and pioneer of television technology. He invented a television transmitting and receiving system employing cathode ray tubes. He played a role in the practical development of television from the early thirtees,including charge storage type tubes, infrared image tubes and the electron microscope.

1832: Jean Antoine Claude Chaptal died. He was an French industrial chemist who made many improvements to the process of making sulphuric acid ands saltpeter and new ways of manufacturing dyes and bleaching. He also found that adding sugar to unfermented wine would increase the alcohol content of thefinished wine.

Apollo 15 mission become the fourth mission to land on the moon when the Faccon

Lunder touched doum.

**JULY 31**

1n 1790 : the very first US patent is issued to the inventer Samuel Hopkins for a potash process, just signed in to law by president Washongton on Appolo, 17x0. Hopkin had petieioned for a patent on an improvement " in the making of Peal ash by a new Apparatus $ process"

In 1971: Appolo program :Appolo 15 astronaut become the first to ride in a launder rover. Appolo-15 was the nintgh manned mission in the American Appolo space program, the forth to land on the moon and the gight vsuccesful manned mission. It was the first of what were termed "I mission", long duration stays on the moon with a greater focus on Science than had been possible on previous missions. It was also the first mission where the Lunar Roving Vehicle was used. The crew contain Eavid Scott, James Irwin and Aifred Worden.

1999- Discovery program/; Lunar prospector – NASDA intentionally crashes the space craft into the Moon, thus ending it,s missiom to detect frozen water on the moon's surface.

1718- John Canton- English physcicicst born

1800: Friendrich wholer, Gernanchemist and founder of organ

## AUGUST

**AUGUST 1**

**Georges Charpak:** Born 1 august 1924

Polish French Physicist, who was awarded the Nobel prize for physics in 1992, forhis invention and development of subatomic particle detectors, in particular the multi wire proportional chamber, a breakthrough in the technique for imploring the inner most parts of matter.

**Richard kirwan** : Born 1 august 1733, Died 1 July 1812

Irish chemist was elements of mineralogy (1784) were the first English systematic treatment of the subject He did valuable works on chemical affinity and the complaining proportions of acids bases forming salt.

**Phillip Hauge Abelson**: Died 1st august2004

American physical chemist, who proposed the gas diffution process for separating Urenium-235 from Urenium-238 which was essential to the development of the atomic bomb. He discovered a new element, later named neptunium, produced by irradiating Urenium with neutrons

**Events** 1: Microgravity

In 1955 first microgravity research began

Event 2: in 1771 Joseph Pretly , British Chemist identified a gas which he called "dephologisticated air" later known as Oxygen.

**Historical events:**

The first Olympic games opened in Berlin,Germany 1936.

**AUGUST 2**

**John Tyndall**: Born 2 august 1820: died 4 December 1893.

British physicist, who demonstrated why sky is blue,. He was the authers of the substantial work on the crystals, Heat as the mode of motion. He was a very popular lecturer.

**Leopold Gmelin**: Born 2 August 1788; died 13April 1853. German chemist who discovered potassium ferrocyanide (182) devised Gmelins test for bile pigments and research the chemistry of digestion.

**FGred Allison**: Died 2 August 1974;

American physicist who promoted a magneto optical technique to detect isotopes. This method he said able to distinguish 16 isotopes of lead.

**Event**1: Escalator- In 1892 George A wheeler patented the ideas for the first practical moving stair case. The earliest type of escalator, patented in 1891 by Jesse.W.Reno.

Event 2: Greenwich means time: In 1880 Grrenwich mean time (GMT) was adopted officially by parliament.

**Historical events**: the Persian Gulf War began 1990

**AUGUST 3**

George francis Fitzgerald : born 3 august 1851 died on 2 february 1901

Irish physicist whose suggestion of a way to produce waves helped lay afoundation for wireless telegraphy

Ritchard Willstaller: Died 3 august 1942

German chemist whose steady of the structure of chlorophyll and other plant pigments won him the 1915 Nobel prize of chemistry

Emit Berliner Died 3 august 1929

German American inventor who made important contribution to telephone to technology and developed the photograph recorded disk, the microphome in 1877 and gramaphone in 1887

Historical events : congress designated june 14 as flag day 1949

**AUGUST 4**

Alexander George mcadie : Born 4 august 1863 died 1 november1943
American meteorologist who was pioneer in employing kites in the exploration of high altitude air conditions, and situated the relation between atmosphericelectricity and aural phenomenon

Sir William Rowan Hamilton born on 4 august 1805 Irish mathematician in the field

of optics, geometrics and classical mechanics . He contributed to the development of optics, dynamics and algebra

Carl Auer Died 4 august 1929
Australian chemist, physicist and engineer who invented the gas mantle, formed from a gauze impregnated with incombustible Thorium and some uranium compounds, which becomes white hot incandescent in a gas flame. This enable a great increased brilliance of light output by gas lamps.

Events

UK supersonic fighter In 1954 britains first supersonic fighter plane made its maiden flight.

In 1922 every telephone in North Amerca was silent for one minute at sunset making the time funeral sevices were talking place for Alexander Graham Bell

The united state department of energy was created in1977

**AUGUST 5**

Neil Armstrong : Borm 5 august 1930

American astronaut , who was the first man to walk on the moon (20 july 1969, appolo11)

Nett Bartlett: died 5 august 2008

Engllish American Chemist who formed the first compound dwith a notable gas element, xenin platino fluride a yellow orange crystalline solid stable at room temperature by immersing platinum fluride in xenon gas

Heinrich otto Wieland died 5 august 1957

German chemist got nobel prize in 1927 for chemistry, for his study of steroidchemistry in which he determined the molecular structure of bile acids. He is also noted for studing the conversion of food into energy

Events

Mass 3- in 1973 the USSE launched mass6 ona proton sL-12/D I-e booster

Comet in 1864 giovanni batusta danali made the first spectroscopic observation ofa comet tail

The first Atlantic cable was completed 1858

The Rock and Roll Hall of fame was established 1985

**AUGUST 6**

Sir Alexander Fleming Born 6 august 1881 Scottish bacteriologist who discovered penicillin

William Hyde Wollaston Born 6 august 1766 English chemist and physicist who discovered palladium 1803and rhodium1804 during his invention of platinum ore.

Joseph Achitle Le Bd Died 6 august 1930 French chemist, who was the first to present a theory on the relationship between molecule and how they reflect or absorb light .He theorized optical activity . He is regarded as the co founder of sterio chemistry

Events

Electric Chair In 1890 electric chair was used for the first time

Life on Mars 1996 NASA administrator Daniel goldin announced the discovery of evidence of a primitive life form on mars

**AUGUST 7**

Alan Hazaltine Born 7 august 1886 American electrical engineer and physicistwho invented the neutrodyne circuit, which made commercial radio possible.

Jons Jacob Berzelius Died 7 august 1848 Sweedish chemist who was one of the atomic weight electro chemical theory development modern chemical symbols Events

Fultons steam Boat In 1807 Robert fullons north river steam boat beganchanging its way from Newyork city to albang 150 miles

The refugee Act was signed by president einsenhenver 1953

**AUGUST 8**

Paul A.M.Dirac-born on 8 august 1902- died 20 October 1984. An English theoretical physicist known for his work on quantum mechanics and for his theory of

spinning electron. In 1993 he shared the Nobel Prize for physics with the Erwin Schrodinger.

Ernest Orlando Lawrence- born on 8 august 1901 American physicist, who was awarded the 1939 Nobel Prize for physics for his invention of the cyclotron, the first device for the production of high energy particles.

German Henri Hess-born on 8 august 1802 Swiss-Russian chemist, whose studies of heat in chemical reaction found the foundation of thermo chemistry.

Viktor mayer- died 8 august 1897 German chemist who contributed greatly the knowledge of both organic and inorganic chemistry and invented an apparatus for determine vapour chemistry.

**Events**

In 1955 Geneva conference held to discuss peaceful uses of atomic energy. Refrigerator In 1899 A.T.Marschell of broklea M.A, patterned the refrigerator. Thomas Edison received a pattern for his mimeograph in 1876.

The USSR declared war on Japan, (1945).

**AUGUST 9**

Jean Piaget – born on 9 augst (1896-1980) Swiss psychologist and zoologist. He researching how mental growth develops in several successive stages from infancy to adulthood-"the embryology of intelligence"

Count of quaregna Amedeo Avogadro-born on 9 august (1776-1856) Italian chemist and physicist who found that at the same temperature and pressure, equal volume of all perfect gases contain the same number of particles, known as Avogadro's law (1811) leading to the Avogadro constant being $6.022*10^{23}$ units per mole of a substance Avogadro determined from the electrolysis of water.

Cecit Frank Parwell-died on 9 august 1969. English physicist who was awarded the Nobel Prize for physics in 1950 for his development and photographic method and studying nuclear process and for the resulting discovery of the pions (pi- meson).

Edward. L.Thorndike died on 9 august 1949. He was a psychologist considered to be the father of educational psychology. Who studied the animal learn through puzzle box experiment.

**Events**

Atomic bomb dropped- in 1945 during world war second an atomic bomb wasdropped on Nagasaki, Japan by the Americans.

**AUGUST10**

Arne Tiselius born on 10 august (1902-1971) :Swiss biochemist who won noble prize for chemistry in 1948 for his work on electrophoresis and other new methods of separating and detecting colloid and serum proteins.

Walther Gerlach-died on 10 august 1979: German physicist noted especially for his work with Otto stern on the deflections of atom in a nonhomogeneous magnetic field.

**Events**

In 1960an ejected space capsule from discoverer 13 was recovered when it returned from orbit.

Aspirin discovery in1897, Dr. Felix Hoffmann successfully created a chemically pure and stable form of acetylsalicylic acid.

**AUGUST 11**

Robert.W.Wood- died on 11august 1955: American physicist who photographed the reflection of sound waves in air and investigated the physiological effects of high frequency in sound waves.

**Events**

Total eclipse- in 1999,-the last total eclipse of the millennium occurred

Moons of mars-in 1877, American astronomer ASAP hall discovered the two moons of mars, which he named Phobos and Deimos.

**AUGUST 12**

Otto Struve-born on 12 august (1897-1963): Russian American astronomer who made

deteviled spectroscopic investigation of stars.

Erwin Schrodinger- born on 12 august(1887-1961): Austrian theoretical physicist who shared the Nobel Prize physics with the British physicist P.A.M.Dirac. He took Louis deBrogli's concept of atomic particles. Schrodinger realized the possible orbits of an electron would be confined to those on which its matter waves close in an exact number of wavelengths.

William. B. Shockley-died 12 august 1989: English-American physicist and engineer who shared the 1956 the Nobel prize for physics for their development of the transistor.

**AUGUST 13**

Frederic Sanger-born on 13 august 1918 : English bio chemist who was trice the receiptant of the Nobel Prize for chemistry. He was awarded the prize in 1958 for his work on the structure of proteins, especially the determination of the insulin molecule.

John Logie bairel-born on 13 august (1888-1946) : Scottish engineer who was the first man of to televise pictures of objects (1924) followed the next year by recognizable human faces. By 1926, he was able to demonstrate TV for moving objects at the royal institution, London and color TV in 1928.

Richard Willstatter- born 13 august (1872-1942) : German chemist, whose study of the structure of chlorophyll and other plant pigments, won him the Nobel Prize for chemistry.

**Events**

Balloon telecommunication- in 1960, the first two-way telephone conversation by satellite took place with the help of 'echo I' a balloon satellite.

Helium ions from radium- in 1903, the journal 'Nature' reported that helium gas is produced by the radioactive decay of the radium.

## AUGUST 14

**Richard.R.Ernst-born on 14 august 1933:** Swiss researcher and teacher whom was awarded the 1991 Nobel Prize for chemistry for his contributions to the development of the methodology of high resolution nuclear magnetic resonance (NMR) spectroscopy

**Arthur Jeffrey Dempster-Born 14 august (1886-1950):** Canadian American physicist who in 1918 built the first mass spectrometer and discovered isotope uranium-235(1935).

**Frederic joliot curie-died 14 august 1958:** French physicist and physical chemist who personal assistant of Marie curie at the radium institute, Paris. He shared Nobel Prize in chemistry "in recognition of their synthesis of new radioactive elements"

**Events**

In 1994 the Hubble space photographed Uranus with the rings and several innermoons.

In 1953, the whiffle ball, a ball that curved when it was thrown was invented byDavid mullany sr. for his 13 year old sun.

In 1989, William Gray of Hartford received a patent for a coin operatedtelephone.

## AUGUST 15

Prince Louis Victer de Broglie: Born on 15 august 1892 : French physicist, best known his research on quantum theory and for his discovery of the wave natureof electrons. In 1923,as part of his ph.D thesis he argued about the photoelectric effect and property of matter showing both particle and wave nature.for this hewas awarded Nobel Prize for physics in 1929.

Tor Bergeron: Born 15 august 1891;Died 13 June 1977: Swedish matereologist- best known for his work on cloud physics. He was the first materiologist to take into account the upper atmospheric phenomina and their effect on climate. Explain a phenomina related to raindrops form in the upper part of clouds and is known as Bergeren process.

Pierre Bouquer-Died 15 august 1758: French physicist whose work founded photometry, the measurrment of the light intensity. He invented the photometer to compire the

intensities of two light sources seperate halves of trans paper.

Events:

In 1914, the Panama canal officially opened.

In 1877, Thomas Edison formed the telephone greeting "hellow". He suggested the use of "hellow" to the president of the telegraph company to answer the phone instead of "Ahoy, Ahoy" suggested by Alexander Bell.

**AUGUST 16**

Frederic Stanley Kipping: Born 16 August 1863;Died 1May 1949: British chemist who pioneered in the chemistry of silicones, organic derivatives of silicon.

Gabriel Lippmann: Born 16 august 1845; died 13 July 1921: French physicist who was awarded the Nobel Prize for Physics in 1908 for producing the first color photographic plate.

Irving Langmecir -Died 16 august 1957: American physical chemist whose studies of molecular films on solid and liquid surfaces opened new field in colloid research and biochemistry and won him the Nobel prizse for chemistry in 1932.His work on gases leads to the invention of Langmeir condensation pump; He also introduced the terms covalence and elecrovalance.

Events

Element 110 named - In 2003 chemists met in ottawa to vote and make official a proposed name for the element 110, Darmsladtium.(Ds)

AI - In 1988, IBM introduced software for artificial intelligence.

**AUGUST 17**

Walter Noddack-Born 17 August 1893; Died 7 December 1960: German chemist who discovered the element 'rhenium' in collaboration with his wife Ida Tacke. Named 'Rhenium' after the Rhine river, It was the last stable element to be

discovered. He arguing for a concept, called allge genwartskonzentration or literally, omnipresent concentration.

John N Bahcall -Died 17 august 2005: American astrophysicist who pioneered the development of neutrino astrophysics in the early 1960's. He theorized that neutrinos can be used tonunderstanding how stars shine. He won the National Modal space telescope and his contributions to the planning and development of the Hubble space telescope and his pioneering research in neutrino astrophysics.

Otto stern -Died 17 Augustb1969: German American scientist and winner of the Nobel Price for physics in1943 for his development of the molecular beam as a tool for studying the characteristics of molecules and for his measurement of the magnetic moment of the proton.

**Events**

In 1891, the automobile electric self starter was patented. In
1877, Asaph Hall discovered Mass 'Moon' phobos.

**AUGUST 18**

Richard Synge- Died 18 August 1994: British biochemist who shared 1952 Nobel prize for Chemistry with A.P.J.Martin for their development of partition chromatography,notably paper chromatography, also introducing new method for separating various substances and explains filter paper chromatography.

B.F.Skinner- Died 18 August : American psychologist and he promoted behaviourism and invented the 'skinner box' inorder to establish Skinner box.

**Events**

Contraceptive- In 1960 the first oral contraceptive was marketed by the Searle Pung company in America.

UK fire services- In 1941, the National fire service was established in Brain.

Helium- In 1868, Pierre Janssan discovered helium in the solar spectrum during eclipse.

## AUGUST 19

Linus Pauling- Died 19 August 1994: American chemist , physicist and author who applied quantum mechanics to the study of molecular structures, in connection with chemical bonding and was awarded the Nobel prize for chemistry in 1954.

Donald William Kerst- Died 19 August 1992: American physicist who invented the betatron (1940) the first device to accelerate electrons (beta particles) speeds high enough to have sufficient momentum to produce nuclear transformation in atoms.Also he worked at Los Alamos on the atomic bomb project.

George Gamon- Died 19 August 1968: Russian born American nuclear physicist cosmologist and writer who was one of the foremost advocates of the bib bang theory which explains the origin of the universe as a colosal explosion that took place in billions of years ago. In 1954 his work on DNA made a basic contribution to modern genetic theory.

### Events

Commercial atomic theory- In 1960 the first commercial atomic energy reactor and third in the US achieved a self sustaining nuclear reaction.

Daguerrotype- In 1839 , Louis Daguerre announced the invention of the daguerrotype photographic process, the first process to allow an image to be chemically fixed as a permanent picture.

## AUGUST 20

Jons Jacob Berzelius - Born 20 august 1779; died 7 August 1848: Swedish chemist who was one of the founders of modern chemistry. He is specially noted for his determination of atomic weights, the development of modern chemical symbols, his electrochemical theory discovery and isolation of several elements, the development of classical analytical techniques and his investigation.

Adolf von Baeger- Died 20 August 1917: German chemist who synthesized indigo and

formulated the structure. He was awarded Nobel prize for chemistry in 1905 in recognition of his services in the advancement of organic chemistry and the chemical industry, through his work on organic dyes and hydro organic compounds. He studied benzene and cyclic terpene.

**Events**

Voyager 2 - In 1977 NASA launched voyager2 on a triten centaur rocket.

Television demonstration- In 1930 the first demonstration telecast of home television in the US was received in Newyork city.

Electric train signalling- In 1872 Willam Robinson was issues a US patent for electric train signalling.

**AUGUST 21**

Charles Gerhardt- Born 21 August 1816; Died 19 August 1856 : French chemist who developed a classification of organic compounds. Like most chemist he was aware about the dualistic system. He adopted what became known as type theory in which he taught all organic compounds were based on four main types- hydrogen, hydrogen chloride, ammonia and water.

Jean Servais Stas- Born 21 August 1813; died 13 December 1891:Belgian chemist notable for his accurate determination of atomic weights. He was worked under the direction of Dumas with whom he established the atomic weight of carbon.

**Events**

Triten- In 1989, the US space probe voyager 2 fires its thrusters to bring it closer to Neptune's moon Triten.

**AUGUST 22**

Willis R Whitney- Born 22 August 1868; Died 9 January 1958 : American chemist who founded the General electric company's research laboratory and directed pioneering work there. He is known as the father of basic research in industry.

Samuel Pierpont Langley- Born 22 August 1834 ; died 27 February 1906: American astronomer, physicist and aeronaut who built the first heavier than air flying machine

to achieve sustained flight.

Paul Peter Ewald- Died 22 August 1985: German physicist and crystallographer whose theory of x-ray interference by crystals was first detailed, rigorons theoretical explanation of the diffraction effects first observed in 1912 by his fellow physicist Max Von Laue.

**Events**

In 1989, the first complete ring around Neptune was discovered in photographs transmitted by voyager 2.

Nuclear ship- In 1962,the Savannah, the world's first nuclear powered ship completed her maiden voyage from Yorktown to Savannah.

**AUGUST 23**

William Henry Eccles- Born 23 August 1875 ; died 29 April 1966: British physicist who pioneered in the development of radio communication. He also suggested that the solar radiation accountant for the differences in the wave propagation during the day and night. He experimented with detectors and amplifiers for radio reception, coined the term 'diode' and atmospheric disturbances of radio reception.

Osborne Reynolds- Born 23 August 1842; died 21 February 1912:British physicist and educator best known for his work in hydraulics and hydrodynamics.

Charles Augustin Coulomb- Died 23 August 1806: French physicist best known for the formulations of Coulomb's law, which states that the force between two electrical charges is proportional to the product of the charges and inversely proportional to the square of distance between them.

**Events**

First photograph of the earth from the moon- In 1966, the lunar orbiter 1 took the first photograph of the earth from moon.

In 1783, filling of the first hydrogen balloon began.

Galileo's telescope- In 1609, the telescope was demonstrated by Galileo.

## AUGUST 24

Louis Essen- Died 24 August 1997: English physicist who invented the quartz crystal ring clock and the first practical atomic clock. These devices were of measuring time more accurately than any previous clocks.

Paul Gottlieb Nipkow- Died 24 August 1940 : German engineer who discovered television scanning principles in which the light intensities of small portions of an image were successively analysed and transmitted.

Rudolf Clausius - Died 24 August 1888 who was one of the founders of thermodynamics. In 1850 he stated the second law of thermodynamics. He also researched in molecular physics and electricity.

Sadi Carnot- Died 24 August 1832: French engineer and physicist became a captain of engineers in the army. His book "reflections on the motive powers ofheat"

**Events**

In 2006 Pluto was declassified as a planet by the International Astronomical Union (IAU) following a vote at their 10 day general assembly in Prague.

In 1997, Gordon Spence discovered the largest known prime number 2 raised to 2976221 minus 1 the 36th unknown Mersenne prime number.

## AUGUST 25

John R. Dunning- Died 25 August 1975: American nuclear physicist who experiments in nuclear fission helped bey the ground work for the development of the atomic bomb.

Michael Faraday- Died 25 August 1867 : English physicist and chemist whose many experiments contributed greatly to the understanding of electromagnetism and the laws of electrolysis.

**Events**

CAT Scan- In 1973 the first scan was made using CAT (computer assissted tomography)

In 1999, the oldest wild bat in Europe recorded to date was a 33 year old male lesser mouse-eared bat according to a claim published in the IndependentNewspaper.

**AUGUST 26**

James Franck- Born 26 August 1882; dies 21 May 1964 : German American physicist who shared the Nobel prize for physics in 1925 with Gustav Hertz for research on the excitation and ionization of atoms by electron bombardment that verified the quantised nature of energy transfer.

Lee De Forest- Born 26 August 1873; died 30 June 1961: American inventor of the audion vaccum tube which made possible live radio broadcasting and became the component of all radio , telephone, radar,television and computer systems.

Frederick Reines - Died 26 August 1998: American physicist who was awarded the 1995 Nobel prize for physics for his detection in 1956 of Neutrinos.

**Events**

In 1938 a tape recorder was used for the first time in the US to send a radio broadcast.

In 1843 the first US design of a type writer by Charles Thurber.

Historical event - Roman forces under Julius Caesar invaded Britain 55 B.C.

**AUGUST 27**

Carl Bosch - Born 27 August 1874; died 26 April1940: German industrial chemist who at BASF directed development of the industrial scale process for production of ammonia from atmospheric nitrogen. He shared the Nobel prize for chemistry for devising chemical high pressure methods.

Ernest Orlando Lawrence - Died 27 August 1958: American physicist who was awarded the 1939 Nobel prize for physics for his invention of the cyclotron, the first device for the production of high energy particle.

**Events**

In 2003 the world's biggest battery was connected to provide emergency power to Fairbanks.

Commercial rocket launch- In 1989 the first communication satellite Marcopolo 1was launched from Florida.

In 1962, the US launched the Mariner 2 space probe.

The revolutionary battle of Long Island was fought, 1776.

**AUGUST 28**

**Charles Stewart Rolls** Born 28 August 1877, Died 12 July 1910: British Motorist, aviator and automobile manufacturer who was one of the founders of the Rotts Royce Ltd automobile company

**Andre- Eugene Blondel** Born 28 August 1866, died 15 November 1938

French Physicist, Who invented the electromagnetic Oscillograph.He proposed lumen and other new photometric units for use in photometry based on the metre and violle candle

**Paul Mac cready** - Died 28 august 2007;

American engineer and inventor who invented first human powered flying machine, and first solar powered aircraft.

**Events**

Glider – in 1883 the first controlled flight in a glider was made by John. J. Ment gemery at wheeler hill California.

Saturn-In 1789 Sir William Herschel discovered saturn's moon Encleadus.

The last day of the Roman empire 476.

**AUGUST 29**

**Charles F. Kettering** Born 29 August 1876; died 25 November 1958: American Engineer whose 140 parents included the electric starter car lighting and ignition System. He created first electric cash register, and invented the key operated self starling motor

**Chrislian Friedrich Schonbein** Died 29 august 1868 : German swiss Chemist, Who discovered and named ozone, and was the first to describe guncotton (Nitrocellulose)

**Events**

**Element 109**- In1982 an atom of new element was made, it has been given the proposed name of Meitnerium**(Mt)**

**USSR's first atomic bomb**- in1949, the USSR tested the first atomic device,first lightning. It was an implosive type Plutonium bomb.

The second battle of Bull Run (Manassas) Began 1862

**AUGUST-30**

**Sir Ernest Rutherford** - Born 30 August 1871; Died 19 October 1937

New Zealand - English physicist who laid the ground work for the development of Nuclear Physics.

He devised alpha particle scattering experiment ,which leads to the discoveryof atomic nucleus.

In 1908 he was awarded Nobel prize for chemistry.

**Theodor H. E. Sweelberg** -Born 30 August 1884; Died 25 February 1971.

Swedish chemist who won the 1926 Nobel Prize for Chemistry for his study of the chemistry of Colloids and his investigating the molecular weights of very large molecules.

**Sir J.J. Thomson** - Died 30 August 1940: English physicist who helped revolutionize the knowledge of atomic structure by his discovery of electron .(1897 ).He received Nobel Prize for physics in 1906.

**Events**

Vaccum cleaner: In 1901, a dust removing suction cleaner patented was filed by Hubert ceil booth

First motor cycle patent in 1885 Germany.

Occupation of Japan by US troops began during world war 11 1945.

**AUGUST 31**

**Friedrich Adolf Paneth** Born 31 August1887 Died 17 September,1958 Austrian chemist who improve methods in the 1920's to isolate and measure minute released by traces of radioactive element in rocks.

**Edward L . Thorndike** – Born 31 August 1874 Died 9 August 1949 US Psychologist considered to be the father of Educational Psychology, he studied the process of flearning in animals, children & adults.

**Sir Joseph Rotblat** - Died 31 August 2005

Polish - British Physicist who is leading critic of nuclear weaponry. He gotNobel prize in 1995.

**Events**

Sun powered car and power ma - In 1955 first solar powered car was publicity demonstrated.

Air plane flight over water- In 1910, the first US airplane flight over water.

Thomas A Edison received a palent for his kindoscpe,1887The first professional football game played in Latrobe

## SEPTEMBER

**SEPTEMBER**

**1**

**Exotic meson :** In 1997, the discovery of new sub atomic particle was announced ,called the exotic meson. Scientists speculated that the exotic meson comprise four quarks , unlike all other known particles, Which have three.

**Atomic testing resumed :** In 1961, the soviet union ended a moratorium on atomic bomb testing with an above ground nuclear explosion in central Asia. The USSR had ended speculation the day before in a TASS broadast that announced it Hd resumed atomic testing , and by 5 sp,had conducted three nuclear weapon tests.

**Alpha and beta particle named** in 1898,in a paper dated 1 sep, Ernest uthrford coined the terms . Alpha and beta" for two distinct type of radiation , one that is very readily absorbed ,which will be termed for convenience the alpha radiation and the other of more penetrative character, which will be termed Betaradiation."

**SEPTEMBER 2**

**Frederick soddy** Born 2 sep 1877: English chemist and physicist who received the Nobel prize for chemistry in 1921 for investigating radioactive substances. He suggested that different elements produced in different radioactive transformations were capable of occupying same space on the periodic table and on 18 Feb 1913 he named such species isotopes from Greek words meaning same place.

**William Henry** Died 2 sep 1836 : English physician and chemist who in 1803 proposed Henry's law ; which states that the mass of gas dissolved by a given volume of solvent, at a constant temperature is directly proportional to the pressure of gas above the liquid , provided that no chemical reaction occurs.

**Wihelm Ostwald** Born 2 sep 1853 : Friedrich Wilhelm Ostwald was a Russian German physical chemist who almost single handedly organize physical chemistry int a nearly independent branch of chemistry

**SEPTEMBER 3**

**Ozone cycle :** In 2000, NASA data showed a hole at just under 11 million square miles , the biggest it had ever been to date. Antartic zone depletion starts in July,

when sunlight triggers chemical reaction in cold air trapped over the south pole during the Antartic winter .Depletion of the ozone layer over Antartica and Artic is being monitored because ozone protects earth from harmful ultraviolet radiation.

**Mars :** In 1976, the unnamed spacecraft Viking II landed on mars and took the first pictures of the surface of mars. Its twin ,Viking I was the first to arrive on the surface of Mars on 20 july 1976 Each lander housed instruments that examined the physical and magnetic properties of the soil, analysed the atmosphere and weather patterns of mars and determined any evidence of past or present life.

**Edison electric passenger train:** In 1931, the Lackawanna rail road inaugurated electric sub urban service train Hoboken to Montclair ,NJ, in an effort to keep smoke around New York. Thomas Edison himselfwas at the controls of the first multiple train to leave Hoboken Terminal.

**Dalton's atomic symbols:** 1803, j=John Dalton recorded in his notebook, 'observations on the ultimate particles of bodies and their combinations , "in which the introduced the atomic symbols.

**SEPTEMBER 4**

**John Mc carthy** Born sep 4 1927 : American computer scientist , the father of research and artificial intelligence ,who coined the term in 1956. He founded the first A I laboratory. He created LISP (List Processing Language) ,the computer language most commonly used in AI research.

**Stanford Mooore** Born 4 sep 1913: American biochemist .who showed the 1972 Nobel prize for chemistry for his contribution to the understanding of the connection between chemical structure and catalytic activity of the active centre of viborn Clease molecule ,an enzyme. The way in which an enzyme accelerates a chemical reaction involves the interaction of the reacting substance with active site of enzyme.

**SEPTEMBER 5**

Richard c Thomson was an American physicist and chemist who demonstrated

that electrons are the charge carrying entities in the flow of electricity and also made measurement of its mass. He was died on 5 sep 1948 at the age of67.

**Voyager 1 :** In 1977 , NASA launched voyager from cape Canaveral, Florida, abroad Titan centaur rocket. Voyager 2 had been launched similarly the previous month ,on 20 Aug 1977.

**Frederick George Donnan** ; Born 5 sep 1870: British Chemist , born Ceylon, whose research contributed to the development of colloid chemistry. He is remembered for his investigation of the Donnan Effect(1911 which advanced the understanding of the living cell. This is the effect of semipermeable membrane between two electrolytes and the electrical potential there by produced.

Eu**gen Goldstein**: Born 5 sep 1850 : German physicist who discovered and named canal rays (1886) which emerge through holes in the anodes of law pressure electrical discharge tubes.

**SEPTEMBER 6**

**John Dalton** Born on 6 sep 1766: English chemist . physicist, metereologist and teaches who from investigating the physical and chemical properties of the matter deduced an Atomic Theory (1803) whereby atoms of the same element are the same, but different from the atoms of ant other element. In 1804, he started his law of multiple proportions by which he related the ratios of the weights of the reactants to the proportions of elements in compounds.

**Atomic electricity Generator :** In 1954, ground breaking took place at shipping port Pennsylvannia for the first U.S. full scale atomic electricity generated station devoted exclusively to peaceful uses. It produced its full rated net capacity of 60 mega volts about 3 weeks later on 23dec. This would be sufficient to supply a city of 250000 hours.

**First U.S. long range rocket launch at sea :** In aircraft carrier midway became the first U.S. vessel from which a long rocket was launched . As part of operation sandy , accompanied by scientific observers, a captured German V 2rocket fired from the flight deck from a position at sea several hundred miles of the east coast of the

U.S. the rocket travelled about 6 miles.

**SEPTEMBER 7**

**August kekule** was born on 7 september 1829 : Friedrich August kekule von stradonitz was a German chemist who devised the ring structure of carbon atoms in organic molecules. Although at first intending to study as an architect ,his carrer in chemistry began after hearing Justus Liebig's lectures. He determined the tetra valence of carbon and its ability to link in chains and form polyvalent radicals. Further he envisioned double or even triple bonds between carbon atoms in those chains and isomers being molecules with the same atoms arranged differently. From a vision of serpent catching its own tail ,he realized that benzene has a ring structure . His idea became foundation of structural theory in organic chemistry.

**Edwin McMillan** Died 7sep 1991 : Edwin Mattison Mc Millan was an American physicist who shared the Nobel prize for chemistry in 1951 for his discovery of element 93. Just as the planet Neptune is beyond Uranus, this new element was named neptunium ,the first element beyond Uranium .This is called trans Uranium element by irradiating Uranium with rapid neutrons or with heavy hydrogen nuclei; others Neptunium isotopes were soon produced in Berkely. By 1940 Mc Millan with his colleagues working with Seaborg found that the radioactive decay of neptunium disintegrates yield element 94
,called Plutonium.

**SEPTEMBER 8**

**Sir Derek H. R. Barton** Born 8 september 1918 : He was an English chemist

,a joint recipient of the 1969 Nobel prize for chemistry for research that helped to establish conformational analysis . In a brief paper in Experienta entitled " The conformation of the steroid Nucleus " (1950),Barton showed that organic molecules in general and steroid molecules in particulars could be assigned a preffered conformation based on work of chemical physicists in particulars by odd hassel.

**Viktov Meyor** Born 8 sep 1848 : German chemist who contributed greatly to knowledge of both Organic & inorganic chemistry and invented an apparatus for determining vapour densities. Meyer experimentally proved Avagadro's hypothesis by measuring the vapour densities of volatile substances. Meyer in 1883 isolated thiophene, a heterolytic compound containing sulphur, which later was to become an important component of various synthetic drugs.

**Hideki Yukawa**: Died 8 sep 1981 : Japanese physician and physicist who showed the 1949 Nobel prize for physics for his prediction of the " existence of mesons on the basis of the theoretical work on nuclear forces". In his 1935 paper ,on the interaction of elementary particles he proposed a new field theory of nuclear forces that predicted the existence of the previously unknown meson.

**Hermann standinger:** Died 8 sep 1965 : German chemist who received the 1953 Nobel prize for chemistry for his discovery of the structure of polymers as long chain molecules . In 1910,he developd a new simple synthesis for isoprene the basic molecular unit in synthesis rubber.

**SEPTEMBER 9**

**Hans George Dehmelt** Born 9 sep 1922: German born American Physicist who called for the development of the " ion trap technique" shared the 1989 Nobel prize for physics . Their methods enabled the study of single ion with extreme precision. Delmelt's electromagnetic device the penning trap ,in 1973 successfully observed a single electron in a trap .In 1975,heintroduced a technique for "cooling" the electron. This led to single ion spectroscopy ,a new type of spectroscopy.

**SEPTEMBER 10**

**Authur Holly Compton**: Born sep 10 1892 : American physicist who was a joint winner with CTR wilson of England ,of the Nobel prize for physics(1927). For his discovery and explanation o the change in wavelength of x rays when they collide with electrons in metals. This is so called Compton effect is caused by

transfer of energy from photon to single electron than a quantum of radiation is reemitted in a definite direction by the electrons ,which in so doing must recoil ina direction forming a acute angle with that of the incident radiation.

**SEPTEMBER 11**

**Mars survey :** In 1997 Mars Global surveyor , launched in Nov 1996, wentto anelliptical orbit around Mars. To drop into a lower orbit the original mission plan was to use braking effect by dipping into the upper Martian atmosphere. The lower Orbit was a better position for mapping purposes.

**Comet exploration:** In 1985,the international cometary explorer (ICE) flew relatively unscathed through the gas tail of comet pluiacobini Zinner ,at a speed of 21 km/s at its closed approach of some 7.800 km down stream from the nucleus. The spacecraft found a region of interacting cometary and solar wind ions, and encountered a comet plasma tail about 25000 km.

**SEPTEMBER 12**

**Irene juliot curie** :Born 12 sep 1897 : French physicist and physical chemist

.wife of Joliot curie, who shared the 1935 Nobel prize for chemistry in recognition of synthesis of new radioactive elements. For example in their research they discovered that Aluminium atoms exposed to alpha rays transmitted to radioactive phosphorus atoms. She was daughter of Nobel prize winners Pierre and Marie curie. She died of leukemia ,like her mother, resulting from radiation exposure during research.

**SEPTEMBER 13**

**Sir Robert Robinson** : Born 13 sep 1886: English chemist who received the 1947 Nobel prize forhis research on a wide range of organic compound notably alkaloids ( complex, naturally occurring , nitrogen containing oganic compounds that can have profound effects on living things).In his early research he studied plant pigments and synthesized anthocyanins and flavoures. Later he discovered the structure of morphine.

**SEPTEMBER 14**

**Moon probe :** In 1959,the first space probe to strike the moon was the soviet Lunar,Which Crashed east of the sea of serenity. Thirty six hours after its launch ,it was the firstman made object reach a celestitial body.

**Pierre Duhem :** Died 14 sep 1916 was a French physicist philosopher of science and mathematician who

**SEPTEMBER 15**

**Neil Bartlett**(Born 15 Sep 1932, died Aug 2008): English American chemist who formed the first compound with a noble gas element, Xenon platinofluoride . ($XePtF_6$ ), a yellow –orange crystals ,stable at room temperature by immersing platinum fluoride in xenon gas. For a half century since Ramsay discoveredxenon, it had, with the other elements in its group on the periodic table, been known as an inert gas. After Bartlett's discovery, a new field of investigation was opened, and the other chemists found further compounds of not only xenon , but the noble gas elements radon and krypton. The heaviest elements of the noble gases, as the least inert, were susceptible to combination with a highly reactive element.

**SEPTEMBER 16**

**International ozone day :** In 2007, International ozone day was celebrated for the $20^{th}$ anniversary of the signing of the Montreal protocol. On 19 Dec 1994, the United nations General Assembly proclaimed 16 Sep to be the international day for the protection of the ozone layers ,commemorating every year the signing of the Montreal protocol on 16 Sep 1987, In Montreal Canada.

Oxygen

In 1774, Antoine Lavoisier observed that heating mercuric oxide produces metallic mercury. He thought the reaction might have been caused by contact with iron; he made no note of gas evolution in his notebook

Thomas graham(Died 16 sep 1869)

Scottish chemist often referred to as “the father of colloid chemistry” who studied the diffusion of gases and in 1833 proposed Graham’s law. Which stated that the rate of is inversely proportional to the squre root of its molecular weight. Later he extended the work to the diffusion of one liquid into another. He developed dialysis to separate colloidal solutions from electrolytes which is now importantin medicines.

**SEPTEMBER 17**

Harry Louis Le Chatelier Died 17 sep 1936 : French chemist who is best known for the principle of Le Chatelier, which makes it possible to predict the effect of change of conditions (temperature, pressure and concentration of reaction components) will have on a chemical reaction.This principle proved invaluable inthe chemical industry for developing the most efficient chemical process. Fritz Haber successfully utilized it in the process for the production of ammonia. Le Chatlier’s interests began in metallurgy, cements, ceramics and glass and his studies of flames led him to study heat and its measurement. Of several contributions to thermometry, his most important was the first successful designof a platinum and rhodium thermocouple for measuring high temperature.

**SEPTEMBER 18**

Sir John Cockcroft: Died 18 sept 1967: Sir John Douglas Cockcroft was a British physicist who shared the 1951 Nobel prize for physics for pioneering the use of particle accelerations to study the atomic nucleus. Together in 1929, they built an accelerator, the Cock Croft Walton generator that generated large numbers of particles at lower energies the first atom-smashes. On 14 April 1932, they used it to disintegrate lithium atoms by bombarding them with protons, the first artificial nuclear reaction not utilizing radioactive substances. They conducted for the research on the splitting of other atoms and established the importance of accelerators as a tool for nuclear research. Their accelerator design became one of the most useful in the world’s laboratories.

**SEPTEMBER 19**

Chester F. Carlson: Died 19 sep 1968: He was an American physicist who invented

Xerography, an electrostatic dry copying process that found applications ranging from office copying to reproducing out of print books. The process involved sensitizing a photoconductive surface to light by giving it an electrostatic charge Carlson developed it between 1934 and 1938 and initially described it as electro-photography.

**SEPTEMBER 20**

Sir James Dewar: Scottish chemist and physicist who blurred the line between physics and chemistry and advancedthe research frontier in several fields at the turn of century.He gave dazzling lectures and his study of low temperature phenomena entailed making the Dewar flask, an insulating double walled flask of his own designed by creating a vaccum between the two silvered layers of steel or glass, which led to the domestic Thermos bottle. In Jjne 1897, the scientific American reported that "Dewar ha sjust succeeded in liquefying fluorine gas at a temperature of -185 degree Celsius. He obtained liquid hydrogen in 1898.

Juan Jose D'Elhuyar: Died 20 sep 1796 : Spanish chemist and mineralogist who assisted his younger brothers separated tungsten metal from its ore. Two years earlier Swedish chemist Sarl Scheele discovered tungstic acid though did not isolate the elemental form. The Elhuyar brothers working at the seminary of Bergara succeeded in extracting the metal by reducing tungstic acid with charcoal.

**SEPTEMBER 21**

Galileo Probe ends mission: NASA in 2003, the US NASA Galileo space probe ended its eight years mission to Jupiter as planned. The jet propulsion laboratory in Pasadena, California directed the craft into jupiter's atmosphere to burn up, totally vapourizing its structure.

Louis Paul Caillete: Born 21 sep 1832 : French physicist and iron master notedhis work on liquefaction of gases, working at his fathers metallurgy business, he investigated the permeability of iron to hydrogen and other gases, accounting forthe unpredictable behavior of some irons in terms of an excess of dissolved gases. In 1870 he began carefully measuring whether real gases deviate from idealgas law behavior.

**SEPTEMBER 22**

Michael Faraday:Born 22 sep1791 : English physicist and chemist whose many experiments contributed greatly to the understanding of electro magnetism.Although one of the greatest experimentalists,he was largely self educated. Appointed by sir Humphry Davy as his assistant at the Royal institution Faraday initially concentrated on analytical chemistryand discovered Benzene in 1825. His most important work was in electromagnetism, in which field he demonstrated electromagnetic rotation and discovered electromagnetic induction.

Frederick soddy: Died 22 sep 1956 : English chemist and physicist who received the Nobel prize for chemistry in 1921. He suggested that different elements produced in different radioactive transformations were capable of occupying the same plane on the periodic table.

**SEPTEMBER 23**

Friedrich Wohler: Died 23 sep 1882 : German chemist who co-discovered Vanadium. Having studied first medicine, thenthen mineralogy. It was chemistry that became his primary interest. In 1828 he succeeded in the isolation of Beryllium as a black-grey powder as well as of yttrium and crystalline silicon. He is most well known for the synthesis of urea from ammonium cyanate (1828) which created an organic compound from an inorganic one, showing there was no absolute distinction between the two areas of chemical study.

Neptune discovered: In 1846 the German astronomer Johan G. Galle discovered Neptune after only an hour of searching.

**SEPTEMBER 24**

Michael J.S. Dewar: Born 24 sep 1918 : Michael James Dewar was a Scottish organic chemist who was born in India to Scottish parents in the civil service there. As a theoretician, he was an early master of molecular orbital theory and wrote the 'Electronic theory of organic chemistry' 1949, the first book applying molecular

orbital theory to organic chemistry. He studied carbonium ions, boron chemistry, super conductors. He devoted much effort to the study of chemical reactivity.

**SEPTEMBER 25**

Johann Heinrich Lambert: Died 25 sep 1777: Swiss-German mathematician, astronomer, physicist and philosopher who provided the first rigorous proof that pi is irrational. In 1766, Lambertt wrote Theorie des parallellinien a study of the parallel postulate. Lambert conjectured tha e and p are transcendental though this was not proved for another century. He is responsible for many innovations in the study of heat and light.

Arugo announces electromagnetism: In 1820 Francis Arugo announced that a copper wire between the poles of a voltaic cell, could laterally attract iron filings to itself. His discovery came in the same year that Oersted discovered that an electric current flowing in a wire would deflect a neighbouring compass needle. Arugo in the same publication described how he had successfully succeeded in causing permanent magnetism in steel needles laid at right angles to the copper wire.

**SEPTEMBER 26**

Sir Geoffrey Wilkinson: Died 26 sep 1996: English chemist who shared the Nobel prize for chemistry in 1973 for their pioneering work, performed independently on the chemistry of the organometallic, so called sandwich compounds.

Manne Siegbahn: Died 26 sep 1978: Karl Manne Georg was Sweedish physicist who was awarded Nobel prize for physics in 1924 for his and investigations in x- ray spectroscopy. In 1914 he began his studies in the new science of x-ray spectroscopy which had already established from x-ray spectra that there were two distinct shells of electrons with in atoms, each giving rise to groups of spectral lines, labeled K and L. In 1916 Seigbahn discovered a third of M series. Refining his x-ray equipment and technique, he was able to significantly increase the accuracy of his determinations of spectral lines. This allowed him to make corrections to Bragg's equation for x-ray diffraction to allow for the finer details of crystal diffraction.

**SEPTEMBER 27**

Hermann Kolbe: Born 27 sep 1818: Adolphe Wilhem Hermann Kolbe was a German chemist who accomplished the first generally accepted synthesis of an organic compound from inorganic materials.while working on his doctorate he also succeeded in producing acetic acid from inorganic compounds which according to doctrines of vitalism was impossible.In 1850 he succeeded using phenol and carbon di oxide to produce salicylic acid which led to the cheaper production of acetylsalicylic acid aspirin. The two reactions came to be called Kolbe's synthesis.

**SEPTEMBER 28**

Henri Moissan: Born 28 sep 1852: He was a French chemist who received the 1906 Nobel prize for chemistry for the isolation of highly reactive gaseous element Fluorine and the development of Moissan electric furnace. In 1884 he began studying Flourine compounds, and separated fluorine two years later when he electrolyzed a solution of potassium fluoride in hydrofluoric acid.

**SEPTEMBER 29**

Enrico Fermi : Born 29 sep 1901:Italian- American physicist who was awarded Nobel prize for physics 1938 as one of the chief architects of the nuclear age. He was the last of the double- threat physicists at creating both esoteric theories and elegant experiments. In 1933 he developed the theory of beta decay, postulating that the newly discovered neutron decaying to proton emits an electron and a particle he called neutrino.

**SEPTEMBER 30**

Jahann Deisenhofer: Born 30 sep 1943: German biochemist who received the 1988 Nobel prize for chemistry, along with Michel and Robert Hubes for the determination of the three dimensional structure of certain proteins that are essential to photosynthesis.

Jean Marie Lehn: Born 30 sep 1939: French chemist who shared the 1987 Nobel prize for

chemistry for his contribution to the laboratory synthesis of molecules that mimic the vital chemical functions of molecules in living organisms. Such molecules have a highly selective, structure specific interaction.

## OCTOBER

OCTOBER

1

George R Carruthers born 1 oct 1939: Black-America Astrophysicist who was the principal inventor of a new space camera to measure ultra violent light which can be used to identify inter sellar atomics and molecules. After several years in development, it was taken to the moon on the Apollo 16 mission (1972).Positioned on the moon's surface,the camera could also image the gases of the Earth's atmosphere. The concentration of the pollutants,such as carbon monoxide ,in theair surrounding large cities could be determined by many cities at the same time. Other space cameras developed by carruthers and his colleagues have surveyed the ozone later and transmitted photos of distant stars and planets for computer analysis. He also pioneered in the development of electronic telescope.

Otto Robert Frisch- Born oct 1 1904: Australian-British nuclear physicist born in Vienna with his neither described the division of neutron-bombarded uranium into lighter elements. He named the process fission borrowing from biology.

**Events**

In 1969 the prototype French-built concrete broke the barrier for its first time. The inaugural flight of the air craft had taken on 2 march 1969 in Toulouse France. The first commercial passenger supersonic flight on 21 Jan 1976 of the British and French concordejets marked a brilliant technological achievement. The concorde was the world's first air plane to be entirely controlled by computer.

In 1847 Maria Mitchell the first women astronomer in the United states discovered a comet for this discovery she was awarded a gold model by the king of Denmark.

Edison opens his first lamp factory: In 1880 the first electric incandescent lamp

factory in the U.S was opened in Menlo park N.J the Edison lamp work. More than 130000 bulbs had been manufactured by the plant was moved to Harrison ,N.J on 1 April 1882.

**OCTOBER 2**

Atomic clock: In 1956 the Atomicron the first atomic clock in the U.S was unveiled at the overseas press club in New York city. The basis of the timing was the constant frequency of the oscillations of the ceasium atom -9,192,631,830 MHZ. It was priced at $ 50,000.

X-ray Movie: In 1937 films of moving x-ray images on a fluorescopic screen showing the movement of organ of the human body were shown at the American Rontegen Ray society conscertion in New York city. The images were filmed with a home 16mm-movie camera at 16 frames per second. Two seconds explosure would capture 2 or 3 beats of the heart,the act of breathing,movements of the diaphram or motion of joints. Film clip loops could be projected to show repeating motion. The film made by Drs. William H Slewart William. J Hoffman and Francis H from Manhattan's henox hill hospital.

Birth:

Sir William Ransay-(Born oct 2 1852-died 23 July 1916) He was a Scotish chemist who discovered Argon,Radon,Calcium and Barium. He became a Nobel Laurearte in 1904, “in recognition of his service in the discovery of the inert gaseous elements in air and his determination of their place in the periodic system.”

Death:

Svante Arrheniun {Born 19 February 1859-Died 2 october 1927}:He was a Swedish physical chemist who was awarded the Nobel price in chemistry “in recognition of the extra ordinary services he has rendered to the advancement of chemistry by his electrolyte theory of dissociation”

## OCTOBER 3

First UK atom bomb test: In 1952,"Hurricane", the first British atom bomb was tested at the Monte Bello, Australia becoming the third country in the world to list such a weapon. The bomb used an unproued plutonium produced in Brilein at wind scale (now shellafield) with a low pu-240 content since hurried production led to short irradication times,plus same canadian origin plotinium. To test the effects of a ship - smuggled bomb ca threat of great coucero at the time hurricane was exploded inside the hull of the HMS plym (1450ton frigate)

which was anchired in 40 feet of water 400 yards offshone. The explosion 19-H below the water line,left a saueer shaped crater on the seahed 20ft deepand1000ft across.

Death :

Maximillian franz Joseph Cornelium Max Wolf (born 21 June 1863 -died 3 October 1932) used wide field photography to study the milky way and used statistical treat6ment of star counts to prove the existence of clouds of dark matter. He was among the 1st astronomer to show that the spiral nebulae have absorption spectra typical of stars and thus differ from gaseous nebulae. His most important contribution was the introduction of photography to discover hundreds of asteroids ,the first of which he named "Brucia" in honour of his 16-inch double telescope, Catherine wolfe Bruce.

## OCTOBER 4

Events

Mole: In 1971,the Mole-the amount of substance (matter)-was adopted as a chemical measurement added to the six base quantities of the SI (International system of scientific units). The decision made by the conference General des poids et Measures (CGPM),the principal executive organization under the Treaty of the Meter (which dtes back to the Metric concentration on 20 May 1875). IUPAC 's participation was

led by M. L. MC Glashan. The mole is the amount of substance of a system which contains as many elementary entities as there are carbon atoms in 0.012 kg of carbon 12. The elementary entities must be specified ,such as atoms,molecules,ions,electrons,other particles or specified groups of such particles. The agreed symbol for the unit is mol ,and the symbol for amount of substance is n.

Sputnik :In 1957,the space Age began as the Soviet union ,to the of the United states ,launched Sputnik ,the first man made satellite, into orbit around the Earth. The craft circled the Earth every 95 minutes at almost 20000 miles per hours 500 miles above the Earth. The Sputnik (meaning "companion" or "fellow traveler") was launched from Kazakhastan. It stayed in orbit for about three months. Sputnik fell from the sky on 4 January1958. The 184-lb satellite had transmitted a radio signal picked up around the world, and instrumentation for temperature measurement.

Solar-powered phone cell : In 1955, the world's first solar-powered telephone cell was made by Bell Telephone.

Neutron Measurement : In 1934,Enrico Fermi measured the sped of a neutron.

**OCTOBER 5**

Deaths:

Hars Onsager (Died 5 October 1976 -born 27 November 1903): Norwegian -born American chemist whose development of a general theory of irreversible chemical processes gained him the 1968 Nobel prize for Chemistry .These Onsagar reciprocal relations have importance in a wide range of applications. Throughout his career ,he studied the thermodynamics and kinetics of electrolysis. In 1944 he derived the exact solution of the 2D model, a model of a ferromagnet. This virheosie mathematical feat led to a deeper under standing of phase transitions and critical points . From about 1940 Onsager investigated low-temperature Physics. He suggested the quantisahen of Vortices in liquid helium,and in 1952 extracted information about the distribution of electrons from the de-Haas-Van Alphen effect.

Events:

Pacific flight: In1931, Clyde panghorn and high Hernden the completed the first non stop flight across the pacific ocean ,arriving in Washington state about 41 hours after leaving Japan.

2)Cepheid Variable star: In 1923, Edwin Hubble identified the first Cepheid variable star

**OCTOBER 6**

Events:

Aero engine: In 188o,Colonel Beaumonts air -engine for propelling railway carriages was successfully tried at woowich ,his system largely employed in various ways by Paris compressed Air company was described to the British Association at Newcastle-Upon-Tyre(Sep 1889)

Oral Polio Vaccine : In 1956,Dr Albert Sabin developed the oral Polio vaccine

Births :

Meghnad N-shah (Born 6oct 1893-died 16 Feb1956): Indian astrophysicist noted for his development in 1920 of the thermal incrization equation ,which in the form perfected by the British Astrophysicist E. Arther Mike ,has remained fundamental in all work on steller atmospheres. This equation has been widely applied to the interpretation of steller spectra, which are characterstic of the chemical composition of the light source.

Deaths:

Benjamin Peirce (Died 6 October 1880 born 4 April 1809): American astronomer,mathematician and educator who computed the general perherbations of the planets Uranus and Neptune. He was Harvard's Perkins professor of Astronomy and mathematican for nearly 40 years,and was largely responsible for mathematics as

a subject for research in American institutions. He is known especially for his contributions to analyse mechanics and linear association algebra,but he is also remembered for his early work in astronomy and for playing a role in the discovery of Neptune.

**OCTOBER 7**

Events:

Moon's dark side: In 1959,the dark far side of the moon was photographed for the first time and pictures relayed back to Earth by Russia's Luna 3 space craft. After passing the moon ,the Luna 3 looked back from a distance of 63500 km to take 29 photos of the sun lit far side of the moon. The photos ,taken over a period of 40 minutes were developed on board and radioed back to the Earth on18 October 1959. They covered 70% of the far side. The photographs were very noisy and oflow resolution ,but many features could be recognised. Despite the poor quality
,they provided the first view ever of this part of the moon.(The far side of themoon cannot be viewed from Earth because the moon rotates and revolves in such a way that the same part always face the Earth).

Transistor calculator: In 1954,in Pough keepsie, IBM displayed a large all- transistor calculator needing only 5% of the power of comparable electronic ones. Three years later,in 1957, IBM introduced the IBM 608, he first all-transistor commercial transistor.

Births:

Niels Bhor(born 7 October 1885 -died 18 November 1962): Niels Henrik David Bhor was a Danish Physicist who was the first to apply the quantum theory
,which restricts the energy of a system to certain discrete values ,to the problem of atomic and molecular structures. For this work he received the Nobel price forPhysics in 1922. He developed the so called Bhor theory of atom and liquid model of the nucleus. Bhor was of Jewish origin and when the Nazis occupied Denmark he excepted in 1943 to Sweden. From there he was flown to England where he began to work on the project to make a nuclear fission bomb.

## OCTOBER 8

Events:

Kepler's nova: In 1604,the super nova now called the “Kepler's nova” was first sighted in the constellation Ophiuchus ,the serpent bearer. Johannes Kepler observed it from the time of it's appearance as an apparently new star. It encouraged him to write The new star in 1606.

Congreue Rockets : In 1806,Congreue rockets were first used as destructive war implements at B when they set the Town on fire. Earlier in 1806,they have been demonstrated in England in the presence of Mr. Pittanol several of the cabinet ministers. These carcase rockets had been invented by sir William congreue about 1803. Improved rockets wre made by Hales in 1846. Boxer's life saving rope carrying rockets for communicating with standard vessels were in 1878.

Birth:

Henry Le Chatelier (Born 8 October 1850 -died 17 September 1936): French chemist who is best known for the principle of Le Chatelier ,which makes it possible to predict the effect a change of conditions (temperature ,pressure and concentration of reaction components)will have on a chemical reaction. This principle proved invaluable in the chemical industry for developing the most efficient chemical process. Fritz Haber successfully utilised it in his process forthe production of Ammonia. Le chatelier's interests began in metallurgy
,cements,ceramics and glass and his studies of flames led him to study heat and it's measurements of several contributions to thermometry ,his most important was the first successful design of a platinum and rhodium thermocouple for measuring high temperatures.(1887)

## OCTOBER 9

Events:

Sakharov Nobel price: In 1975 Andrei Sakharov often called the father of the Soviet Hydrogen bomb, became the first Soviet citizen to win the Nobel peace price for his

work as an outrolun disident to the soviet regime. In 1957,his concern with the radioactive of nuclear testing inspired him to write a pioneering article on the effect of low level radiations.

Electric blanket: In 1946, the Simmons company of Petersburg ,Va, manufacturedthe first electric blanket. It's price was $39.50. The temperature was regulated by an "electronic" thermostatic control.

Altimeter : In 1938, the radio altimeter was first demonstrated in New York by Bell labs, in the first public display of the device that gives the pilots the height of an air craft above the local terrain by burning the radio signals off the ground to give a reliable altitude reading ,thus changing aviation forever.

Telephone: In 1876, the first two-way telephone conversation over out door wires Alexander Graham Bell had a two-way conversation with Watson over the telegraph line linking Boston and East Cambrige.

Births:

Max Von Laue (Born 9 October 1879- died 23 April 1960): German Physicist who was a recipient of the Nobel price for Physics in 1914 for his discovery of the diffraction of X-rays in crystals.

Karl Schwarzchild (Born 9 October 1873 -died 11 May 1916): German theoretical Physicist who made both principal and theoretical contributions to 20$^{th}$ century astronomy. He completed the first 2 exact solar of the Einstein's field equations of general relativity.

Johann Andreas Von Segner (born 9 October 1704- died 5 October1777): German Physicist and mathematician who recognised the surface tension of liquids. He discovered that every solid body has 3 axes of symmetry.

**OCTOBER 10**

Events:

Metric system: In 1796, according to an unfounded legend ,the metric system was

born. The October 10 date seems to signify the base 10 way of using measurements. The earliest meter unit chosen was the length of a pendulum with half period of a second.

Triton: In 1846,Neptune's moon, Triton is discovered by William Larsell while hewas observing the newly discovered planet Neptune. He was attempting to confirm his observation of the previous week ,that Neptune had a ring ,instead hediscovered that Neptune had a satellite, Triton.

Births:

Lester Germer (Born 10 October 1896-died 10 March 1971): Lester Helbert Germer was an American Physicist ,who with his colleague Clinton Joseph Davison ,conducted an experiment (1927)that first demonstrated the wave properties of the electron . They showed that a beem of electrons scattered by a crystal produces diffraction pattern characteristic of a wave. This experiment confirmed the hypothesis of Louis-Victor de broglie a founder of wave mechanics,that the electron should show the properties of an emwave. He also studied thermo ionics , erosion of metals and contact physics.

**OCTOBER 11**

Events

Ozone layer: In 1995, American Mario Molina and sherwood Rowland and Dutch scientist Paul crutzen was the Nobel prize in chemistry for their work warning that CFCs are eating away Earth's ozone layer. In 1970, Dr.Crutzen showed that nitrogen oxides are important in the natural balance of ozone in the upper atmosphere. Thus research rapidly exalated in to global biogeochemical cycles. In 1974, Dr. Molina and Rowland established that there was a treat to the ozone layer from man made CFCs, such as gases then used in spray cans.

Deaths:

James Presscott Joule (Born 24 Dec 1818- Died 11 oct 1889): English physicist who

established that the various forms of energy mechanical,electrical and heat are basically the same and can be changed, one into another. Thus he formed the basis of the law of conservation of energy, the first law of thermodynamics. He discovered the relationship between the electric current, resistance and amound of heat produced. In 1894, he divised the kinetic theory of gases and a year later announced the mechanical equivalent of heat. Later with William Thomson, he discovered the Joule-Thomson effect.

Guillaune Amonfors( Borm 31 Aug 1663- died 11 oct 1705): French physicist who developed the air thermometer which relices on increase in volume of a gas with temperature and used it to measure change in temperature in terms of proportional change in pressure. This observation led to the concept of absolute zero in the 19th centuary

**OCTOBER 12**

VOSKHOD 1: In 1964 voskhod was launched by the USSR ,with col.vladinier konarov as pilot.It was the worlds first multi named space craft, and the first to carry a scientist and a physician into space . In the rush to launch before the U.S the Geminy flights , crew were left a risk with no space suite, ejection seats the mission returns television pictures of the crew from space ,and it had a significant world wide impacts. Geminy flights had been upstraged by the success , and the effect in the U.S was to help the space trace.

Iron lung: In 1928 the iron lung was used by its first patient a young girl at the children hospital in Boston.Itwas an artificial respirator that enabled her to breath despite begin parallised by polio. The negative pressure ventilator cenieted by Haward docter,Philip drinker , was the first widely used device of its kind. From the neck down, the patients bony tr y in a sealed galvanized iron box. The 3X7 feet, 700 lb apparatus was pored by to bounded vacuum cleaners. As airwas pumbed out of the metal box, the patients lung drew in air, which was expelled as the air pumb cycle next increased pressure in a cycle to make a normal breathing rate.

Birth

Ascanio Sobrero(born 12th Oct 1812- Died 26th May 1888): Italian chemist who discovered the explossure of a compound Nitrogen by adding Glycerin slowly to mixture of nitric and sulphuricacid. He discovered the exposure of fewer of even a single drop in a test tube, ha named the compound Pyro Glycerin. Sobreeo was horrified by the destructive potential of his discovery, and made no effort to develop that power it himself, though it becomes known as nitro glycerin or blushing oil.

**OCTOBER 13**

**Events**

Fermi accelerator : In 1985, at the Fermi National accelerator laboratory inIllinois the first observation was made of proton-antiproton collision by the collider detector by the Fermi lab with 1.6 TeV centre of mass energy. In all, 23 of collisions were detected in Oct 1985. The Tevatron 4 miles in circumference , is the world highest energy particle accelerator. Its low temperature cooling system was the largest ever buil\t when it was placed in operation in 1983. Its 1000 super conducting magnet are cooled by liquid helium to -268 $^0$C .

Death

Bertran. N. BrockHouse( Born 15 July 1918- Died 30 Oct 2003): Canadian physicist who developed neutron diffraction technique used for studying the structure and properties of matter for which he shared the Nobel prize for Physics 1994. By divising instrumentation to measure the energy of neuyromn scattered from a solid material, Brockhouse provided insight to its atomic structure. It made possible advances in semiconductor technology. His triple axis neutron spectrometer is now widely used not only to investigate atomic structure, but also virus and DNA molecules

Watter H Brattain(Born 10th Feb 1902- Died 30 Oct 1987): The Watter was a American physicist who shared the Nobel prize for Physicsin 1956 for investigating semiconductors and eor the development of the treansistor. At college he said ,he

majored in Physics and maths because they were only subject he was good at. He was solid physicist with a good understanding of theory but his strength was in physically constructing experiment. Working with ideas of Shockly and Bardeen, the Btattan's hands build the first transistor. Shortly the transistor replace bulkier vacuum tubes for many uses .

**OCTOBER 14**

Events

Metric system: In 1960 fourth legal definition of the meter was made to be 1650, 763.73 wavelength in vacuum of the orange red light radiation of the Krypton 86atom .It was adopted at the 11 th meeting of conference general des poids et at mesares , which also specifies the 7 basic unit of SI system .

The first supersonic flight: In 1947 chuck yeager, a WW11 fighter pilot became the first human fly faster than the speed of sound , b reaking through the sound barrier ina rocket pressured bell XS-1 aeroplane , over Murac Dry Lake ,California . The four rockets motor of this tiny needle nosed research craft could gulp and entire supply of fuel in 2 minutes, to save the fuel theBell XS-1 was carried by a B-29 then released and Yeager fired its rocket . At 37000 feet the X1 flew nearly but began to buffer as it approached the sound barrier when an airplane travels at the speed of sound in air particle ahead are compressed into and invisible .Others flying with less powerful engine could not push through this wall, with hazards and deadly result

Births

Frie Drich William geog kohlrausch(born 14 oct 1840-died 17 jan 1910): German physicist who investigated the properties of electrolyte and contributed to the understanding of their behavior .some of his pioneering achievement include conductivity measurement on electrolyte his work on the determination of basic magnetic and electrical quantities and experiment of associated measuring technology

**OCTOBER 15**

Events

Radio paging service : In 1950 , the first American radio paging service , Aircall of New York City, send the first page to a doctor who ona golf course. 25 miles away . Subscribers carried a 6 pocket radio receiver and could hear their cell numbers repeated in numeric sequence on the air at least once per minute with in a 30 miles radius

B irths

Evangelinta Torricelli(Born 15 oct 1608-died 25 oct 1647): Born in Falza, Italy .he was an Italian physicist and mathematician who invented the barometer and whose work in geometry aided in the essential development of integral calculus. Inspired by Galileo's writing , he write a text on mechanics which impressed Galilleo he also developed the technique for producing telescope lenses

Jesse.L. Greenstain(Born 15 oct 1909-died 21 oct 2002): He was an American astronomer who discovered quasars he measured the compostion of stars , through which he founded less heavy element in the stars of globular clusters, thus providing they are younger than the sun. In 1963 He and schmith were the first to interpret the red shift of quasars and correctly describe atheir compact, very distant and thus very old object .

**OCTOBER 16**

Events

The element 118: In 2006 the creation of the heaviest man made element was announced by researchers from Russias joined instituteof nuclear research and The U.S .The result were published in the journal review.The element is the first man made noble gas below radon on the periodic table . The new element resultedfrom the collision of accelerated calcium ions with the atoms of californium andexcited barely a millisecond before decaying into element 114 , then element 112and then split into

half

Halley's comet: In 1982 the halley comet was observed on its 30 recorded visit to earth. The first detected using 5m Halley telescope at the mount Dalomer observatory by team of astronomers led by David Jewett and G Edward Daniel son they found the comet, beyond orbit of Saturn ,about 11au from the sun .In 1705 Halley used newton theories to complete the orbit and correctly predicted return of this comet about every 76 years

The first chineese atomic bomb test: In 1964 china developed the countries first atomilc bomb and became the 5th country with nuclear arms after U.S..it was determined by the U.S atomic energy commission to have been exploded in the vicinity of hop Nor , a lake in a remote area of central asia . The AEC characterized it as a low yield explosion"typical of an early nuclear test" of a fission device employing uranium 235 equivalent to 20000 tonnes of TNT

**OCTOBER 17**

Events

First U.K nuclear power: In 1956 , the queen opened Calder , the first gas –cooledand britains first nuclear power station in the shadow of the massive chimneys of wide scale plant ,where explsions were made for Britain first atomic bomb . theplant closed on 31st march 2003

Death

Robert kirchoff(Born 12th march 1824-died 17 oct 1887): German physicist who, with Robert Benson , established the theory of spectrum analysis which kirchoff applied to determined the compostion of sun .He found that when light passes through a gas , the gas absorb whose wavelength that it would emit if heated , which explained the numerous dark line in the sun's spectrum. In his kirchoff's law he generalized the equation describing current flow to the case of electrical conductors in 3dimensions,extending ohm's law to calculation of currents,voltage and resistance of

electrical network. He demonstrated that the current flow in a zero resistance conductor at the speed of light.

**OCTOBER 18**

Events

Nobel Prize for DNA: In 1962 Dr.James D. Watson of the US, Dr. Francis Crick and Dr Maurice Wilkins of Britian was the Nobel Prize for medicine and physiology for their work in determining the double –helix molecular structure of DNA (deoxy ribo nucleic acid)

Antiproton: In 1955, a new atomic subparticle called a negative proton (antiproton) was fiscovered at U C Berkeley. The hunt for antimatter began in earnest in 1932, with the discovery of the positron, a particle with the mass of an electron and a positive charge. In 1955 the most powerful "atom smasher" in the world, the Bevatron built at Berkeley could provide the required energy. Detction was accomplished with a maze of magnets and electronic counters through which only antiprotons accelerated to 6.2 billion electron volts of energy, the scientists counted a total of 60 antiprotons

Long distance telephone: In 1892, the first long distance telephone line between Chicago and Newyork was formally opened as Chicago Mayor Hempstead Washtium greeted his New York counterpart, High **J** Grant House hold Electricity In 1878, Edison made electricity available for house hold usage.

**OCTOBER 19**

Events

Gold : In 1872 a slab of state in new south Wales , Australia was found containing 82.11 kg of gold known as holtermann's nugget ,it was largest mass of gold ever found more correctly it was not a nugged but a specimen also known as matrix this slab weigh 286 kg measured 150 cm by 66cm with an average thickness 10cm . It was founded at the bald Hill at Hill End Goldmines. 270kms Nw of Sydney .Alluvial gold had been discovered at Hill end 1851.

Engine : In 1860 the first combined to manufacture internal combustion engine

Subramaniyan Chadrasekhar(born 19th oct 1910-died 21aug 1995)

Indian American astronomer and astrophysicist who shared the 1983 Nobel prize for physics for formulating the currently accepted theory on the laterevolutionary system of massive star

He was newZeland English physicist who tried the groundwork for thedevelopment of nuclear physics.In 1908 he was awarded the Nobel prize for chemistry.

Sir Charles whetstone(born 6feb 1802-died19 oct1875): English physicist who popularised the wertstone bridge,a device that accurately measured electrical resistance.

Samuel authrie(born in 782-died 19 oct 1848): American chemist and physician who first discovered chloroform

**OCTOBER 20**

Sir James Chadwick Born 20 Oct 1891; died 24 Jul 1974 at age 82. Englishphysicist who received the Nobel Prize for Physics (1935) for his discovery of the neutron. He studied at Cambridge, and in Berlin under Geiger, then worked at the Cavendish Laboratory with Rutherford, where he investigated the structure of the atom. He worked on the scattering of alpha particles and on nuclear disintegration. By bombarding beryllium with alpha particles, Chadwick discovered the neutron - a neutral particle in the atom's nucleus - for which he received the Nobel Prize for Physics in 1935. In 1932, Chadwick coined the name "neutron," which he described in an article in the journal *Nature*. He led the UK's work on the atomic bomb in WW II, and was knighted in 1945.

**OCTOBER 21**

Events

Photoelectric cell: In 1925,the first U.S photocell which was publically demonstrated

was shown by the Weshighouse Electric and Mfg Co. at the electrical show Urend Central palacein New york.The sensitivity of photocell to light was used to count object as they passes through and interrupted a beam of light.

Light-bulb demonstration : In 1879,Edisen successfully demonstrated the first durable and commercially practical electric bulb at his laboratory in Mealopark,NewJersey.This model lasted 40hrs before burning out.

Deaths:

JaequesBabinet (Born 5 mar 1794 died 21 ot 1872): French physicist who was the first to proposed the definition of the unit of length in terms of the wavelength of spectral line.The red line in the spectrum of cadmium was chosen and the angstrom was redefined as a fraction of this value.He established a principle in the diffraction theory(1837) that is named after him.The Babanet conpensator was to measure the polarization of light.

EjnarHertzsprung(Born 8 oct 1873-died 21 oct 1967): Danish astronomer who classified types of stars bynotingtheir surface temperature (or colour) to their absolute brightness.A few years latter Henry Russel illustrated this relationship graphically in what known to be Hertzsprung-Russel diagram,which has become fundamental to the study of stellar evolution.In 1913 he established the luminosity scale of Cepheid variable stars.

**OCTOBER 22**

Events

Xerography: In 1938,xerography was demonstrated by Cheoter F Carlson with his assistant, Otto Ksornei,Carlson used a sulphur coating on a sineplate,vigorously rubbed with a handkercheief to apply an electrostatic charge.A glass slide was prepared using india ink to write “10-22-38 ASTORIA” then laid on sulphur surface in a darkened room.After illuminating then with a bright incandescent lamp for a few seconds,the slide was removed.When lycopodium powder was sprinkled on the sulphur surface and blown off, there remained a near perfect image of the

writing.Permanent copies were made by transferring the powder images to wax paper and heating the sheet to melt the wax. ‘Xerox’ is a term coming from ‘xerography’,which means dry writing and is atrademark.

Births:

Clinton Joseph Davisson(Born 22 Oct 1881-died 1 Feb 1958): American physicist who shared the Nobel prize for physics in 1937 for discovering that electron can be diffracted likelightwaves,thus verifying the thesis of de broglie that electrons have both wave and particle nature.Davisson studied the effect of electron bombardment on surface and observed(1925) the angle of reflection could depend on crystal orientation.Davisson helped to develop the electron microscope which uses the wave nature of electrons to view details smaller thanthe wavelength of visible light.

**OCTOBER 23**

Events:

Dalton’s atomic weights: In 1803,John Dalton presented an essay on the absorption of gases by water,at the conclution of which he gave a series of atomic weights for 21 simple and compound elements .He read his at a meeting of the Manchester hiterary and philosophical society.

Plastic surgery: In 1814,the first modern plastic surgery was performed at the Duke of York’s hospital, Chelsa, England.Thesurgeon,JosephCarpue was the ,men who performed it.Having first prachied on several cadauers,carpue operated on a British military officer who had lost his nose to the toxic effects of merurytreatments,and another ones nose mutilated by a sword.

Births

Gilbert NewtonLewis(Born 23 Oct 1875-died 23 Mar 1946): American chemist who collaborated with Irving Langmuir in developing an atomic theory. He developed a theory of valency, which introduced a covalent bond, whereby a chemical combination is made between two atoms by the sharing of a pair ofelectrons, one contributed from each

atom. This was the part of more general octet theory, published in "Valence and the structure of atoms and molecules (1923)". Lewis visualized the electrons in atoms as being arranged in concentric cubes. The sharing of these electrons he illustrated in the Lewis dot diagram familiar to chemistry students.He generalized the concept of acid and bases now known as Lewis acid and Lewis bases.

**OCTOBER 24**

Events

Uranus moons:In 1851,William Lassel discovered Ariel and Umbriel,satelites of Uranus. Like most of the uranian moons Ariel is named after a Shakespearean character. Ariel has an approximate diameter of 1160 km , an orbital period of 2.52 days and orbital radius 191,240 km from Uranus. Umbriel has a diameter of 1170 km, orbital period about 4 days and orbital radius of 266,000 km. Lassel, a British astronomer, had discovered Nephene's largest satellite. Priton (with William cranch Bond) and his son George P dischilip Bond …….

Births:

Wilhem Eduard Weber(Born 24 Oct 1804-died 23 June 1891):German physicist who investigated terrestrial magnetism. Weber developed sensitive magnetometers ,an electromagnetic telegraph (1833) and other magnetic instruments during his close collaboration on work with Carl Gauss. His later work(1855) on the ratio between the electrodynamics and electrostatics units of charge proved extremely important and was crucial to James Maxwell in his electromagnetic theory of light. The magnetic unit, Weber, is named after him. **OCTOBER-25**

**Events**

**Moon of Satum:** In 1671,Giovanni Cassini discovered lapetus,one of satum's Moons.Laptus is the Third largest and one of the stonger of the 18 Moons of Satcum.Its leading side is dark with a slighter reddish colour While Its trailing side is bright.Cassini (1625-1712),first director of the paris Royal observatory,also discovered other Moons of sectum (Tethys,Dione,Rher) and the major group in itsrings.

**Belgian Nuclear Reactor:**In 1962,Belgian's first Nuclear powered generation of electricity began with the inauguration of the BR-3 powerplant at mol by Minister spiroy.The BR-3 pressurized water reactor was the first PWR-Type in Europe. centrruction began in Jan 1956 and it ceased operation 30 jan 1987 at the end of its Wahighouse license. The BR-1 was a research reactor put into operation at Mol in 1956 with themal power of HMW.The BR-2 was a Materials testing reactor at Mol in 1963 with thermal power 80MW.

**Accutron:** In 1960, the Accutron 214,the World's first electric Wristwatch by Bulour,was placed on sale in Newyork city. The original circuit used a germanium PNP transistor circuit with a 360 Hz tuning fork,used for timing accuracy. In 1977 at was replaced by Quartz watches. The Accutron has the potential accuracy of better than 2 seemd per day,remarkable in its day of mechanical watches. Swiss Engineer,Max Hetzel in 1959 contri his development of the Bulover Accutron in Newyork with William Bannett.

**Microwave Oven:** In 1955, the first domestic Microwave was sold by Tappan.In 1947,Raytheon demonstracted the Raclaranre , the world's first Microwave oven.Ratheon's commercial,refrigeractor-sized microwave oven cost between $2000 and $3000.

**OCTOBER 26**

**Events**

**Baby Fae :**In 1984,Baby Fae becames the first new born receipient of a cross-species heart transplant.Dr.Leonard.L.Bailey,a heart surgon at homa hinde University Medical Center,California,transplrated a walnut-sized yorag baboon heart.she had been born prentuxddy 12 days earlier with hypoplastic left heart syndrome,a lethal under development of the leftside of the heart.Bailey suggested the experimental xerotransplant to the mother. Baby Fae devced 20 days before complications caused her death.

**Births:**

Lawis Boss (Born 26 oct 1846 – died 12 oct 1912): American astronomer bestknown for his compilation of two catalogues of stars (1910,1937).In 1882 he ledan expedition to chile to observe a harsit of venus. About 1895 Boss began to plan a general catalog of stars ,giving their positions and motions.

**OCTOBER 27**

**Events:**

**Nylon :** In 1938, Dupont annerinced a name for its new synthetic fiberyarn.”Nylon”

**First U.S.Astronomy expedition views Eclipse:** In 1780, the first U.S.astronomical expedition to record an eclipse of the sun observed the event which trsted from 11:11 am to 1:50 pm.Although the U.S. was at war with British Officer in charge of penobsiot Bay permitted the expedition to trnd and setup equipment to observe the predicted total eclipse of the sun .The exfedition was shocked to find itself outside the path of foklity.they sawa then are of the sun instead of its complete observation by the moon.

**Deaths:** Robert.L.Mills(Born 15 Apr 1927- died 27 oct 1999):American Physicistwas shared the 1980 Reimford premium prize with his collegues chen Nirg Yangfor Their ”development of a generalised gauge invariant field theory “ in 1954. They proposed a leasor equation for what are now called Yang-Mills fields .Theirmathematical work was aimed at understanding the strong interaction holding together nucleous in atomic nuclei.They constructed a mone generalized view of electromagnetism,thus Maxwell’s equations can be derived as a special case from their lensor equation.Quantum Yang-Mills theory is now the foundation of most of elementary particle theory,and its predictions true been tested at many experimental laboratories.

**OCTOBER 28**

**Events**

**Atomic Energy Commission :** In 1946, a fiue-man commission of civilians was

appointed by president Harry.S.Truman.The atomic energy commission was established by the U.S.Atomic energy act approved 1 Augest 1946 to develop and utilise atomic energy loward improving the public welfare,increasing the standared of living,strengthening free competition in private enterprise, and promoting world pease. the first meeting took place on 13 November 1946.

**Deaths**

Johan Aigust Arfwedson (Born 12 Jan 1792-died 28 oct 1841): Swedish chemist who discovered lithium (1817) is a compound in the mineral petrlite,through he was usable isolate it as metal .that required electrolysis with stronger batteries than he had available .Arfwedson abandoed scientific endervier to spend his time among his family's manufactories and mines that he inherited. petrlite is known to be lithium Alumininium silicate.

Richard.E.Smalley (Born 6 jan 1943-died 28 oct 2005): He was an American chemist and Physicist, known as the father of nanotechnology, who shared the 1996 Nobel prize for chemist with Robert.F.Curl, and sir Harold.W.kroto for their joint 1985 discovery of carbon-60 and the fullerenes.

**OCTOBER 29**

**Events:**

**Glenn returns to space :** In 1998,U.S.adronaut John Glenn was launched into space aboard space shuttle Discovery .In 1962,Glenn first made history as the first American to orbit the Earth, shapped into a nine-by-seven foot capsule .The 9-day mission released on 7 Nov 1998,after 134 Earth orbit, travelling 3.6 million rides in 213-hr 44 min. This original flight hedlocated about 5 hrs.

**Gaspra asteroid:** In 1991,space frobe Galileo become the first human object to fly past an asteroid Gaspra, making its closer approach at a distance of 1604 km passing at a speed of 8km/sec. The encounter provided much data, including 150 images, which showed Gaspra has numerous craters indicating it has suffered numerous collisions since its formation. Gaspra is about 20 km long and orbits the sun in the

main asteroid belt between Mars and Jupiter. Gaspra,asteroid 951, was discovered by Utrainian astronomer orrigority.N.Neujamin (1916) who named it after a Black sea retreat.

**OCTOBER 30**

**Events**

**Largest Nuclear device :** In 1961,the Soviet Union delonated a 58 negalon yield hydrogen bomb over Novaya Zenlya, which is still the largest nuclear device to ever be delonated.

**First TV transmission in UK:** In 1925,the first television transmission was seen in London. England John Baird built the transmitter in his attic from a lia chest, cardboard scanning discs, an empty biscutbox, old electric motors, darning needles, motor cycle lamp leases, piano wire, glue, string and sealing wax.

**Deaths:**

Gastav Hertz (Born 22 jul 1887-died 30 oct 1975) : Germen quantum physicist, who with James Frank, received the Nobel Prize for physics in 1925 for the Frank-Hertz experiment ,which confirmed the quantum theory that energy can be absorbed by an atom only in definite amounts and provided an important confirmation of the Bohr atomic model. He has a nephew of Heinrich Hertz

.Although he fought on the German side in world war 1,being of Jewish dexent, he was forced to resign his professionship (1934) when Hitler look power. from 1945 he worked in the soviet union, and then in 1955 was a professor of physics in Leipzig ,East Germany

**OCTOBER 31**

Births

Narinder singh kapany(born 31oct 1927): Indian American physicist who is widely acknowledged as the father of fiber optics.

Galileo Ferraris (born oct 1847 died 7 feb1897): Italian physicist was studied optics, several fields of electrotechniques. Hhe produced the field with two electromagnets in perpendicular planes, and each supplied with a current that was 90 out of phase.

This could induce a current in aincorporated copper rotor. Producing a motor powered by ac currents He produced his first induction motor in may- june 1885. Its principles are now applied in the majority of today's ac motor.

Death

George Eugene whlenbeck (born 6 dec 1900- died 31 oct 1988): Dutch American physicist , who with Samuel proposed the concept of electron spin a fourth quantum number which was a half integer This provided wolfgang Paulis anticipated "fourth quantum number" In their experiment a horizontal beam of silver atoms travelling through magnetic field was deflected in two direction according to the interaction of their spin with the magnetic field . This was the first demonstration of this quantum effect, and an early confirmation of quantum theory.

**OCTOBER- 31**

Births

Narinder Singh Kapany ( Born 31 oct 1927): Indian American physicist who iswidely acknowledged as the father of fiber optics. He coined the term fiber optics. for the technology transmitting light through fiber glass ded strands in devicesfrom endoscopy to high capacity telephone lines that has changed the medical, communications and business worlds.

Galileo ferraris (Born 31 oct 1847-died 7 feb 1897): Italian physicist who studied optics, acoustics and several fields of electrotechnics, but his most important discovery was the rotating magnetic field. He produced the field with two electromagnets in perpendicular planes, and each supplied with a current that was $90^0$ out of plane. This could induce a current in a incorporated copper rotor, producing a motor followed by alternating current . He produced his firstinduction motor (with 4 poles) in may-june 1885. Its principles are now applied in the majority of todays ac motors.

Deaths

George Eugene Uhlenbeck (born6 dec1900-died 31 oct 1988: Dutch American physicist, who with Samuel A Goudsmit, proposed the concept of electron spin (jan 1925) a fourth quantum number which was a half integer. This provided wolfgang pauli ، s anticipated fourth quantum number.In this experiment , a horizontal beam of silver atoms

traveling through a vertical magnetic field wasdeflected in two directions according to the interaction of this spin with magnetic field.This was the first demonstration of this quantum effect, and an early confirmation of quantum theory. As well as fundamental work on quantum mechanics. Uhlenbeck worked on atomic structure , the kinetic theory of matter and extended Boltzman equation to dense gases.

## NOVEMBER

### NOVEMBER1

First hydrogen bomb exploded

In 1952, in the first united state test of a thermonuclear device, a Hydrogen bomb dubbed "Mike" was exploded at Enicmckok Aboll in the pacific

Robert B Laugher was born on november1 1950

American physicist who shared the nobel prize for physics in 1998 for research on fundamental quantum hall effect

Donald William Kerst was born on November 1,1911 the device to calculate electrom to speed high enough to have sufficient momentum to produce muclear transformation in atom

In 1772 Antoine Lavosier discovered that sulphur and phosphours when

### NOVEMBER 2

Melcin schaactz was born in November 2, 1932: American physicist and entrepreneur who shared the nobel prize for physics in 1988 for research concerning neutrinos. Using a beam of neutrinos the team discovered a new kind of neutrinos called a muon, and a new information about the structure of the particle called leptons

Richard E Taylor born November 2 1929: Canadian physicist who in 1990 shared nobel prize for physics with Jerome Feiedman and henay kendall for his collaboration in pioneering investigation concerning deep in elastic scattering of electron and proton and

bound neutrinos, which have been essential input for the development of the quark model in particle physics

International space station : In 2000,An American astronaut and Russian cosmonauts became the first permanent residents of the international space station at the start of their four month mission

**NOVEMBER 3**

Daniel Rutherford was born on nov3 1749: Scottish chemist and photographer who discovered the proton of air that dies mot support combustion , now known to be nitrogen Rutherford also design the first maximum and minimum thermometer

Sputnick 2: In 1957 sputnik-2 was launched with the first five animal sent into space- a Siberian, dog named laika by design , the craft was not planned for discovery and laika died in orbit

Eugen Baumam was died on nov3 1896 german chemist who discovered that thyroid gland was rich in iodine an element not known before that to occur naturally in aniamal tissur making the thyroid gland unique in being the only tissue to contain iodine.

**NOVEMBER 4**

Faraday discover diamagnetism: In 1845, Michael faraday working in his laboratory at the royal institution, having a piece of heavy glass between the poles of an electromagnet and observed that the glass aligned itself across the lens of force of the magnet. He further experimented on many other substances with similar result, the phenomena that he named diamagnetism

James douglas born on nov4 1837: Canadian American metallurgist mining engineer who develops the copper mining industry in U.S south west .He died 25 June 1918 at age of 80

**NOVEMBER 5**

James clerk Maxwell died on 5 nov 1879at the age of 48 : Scottish physicist and mathematician Maxwell's introduced electricity and magnetism into the conceptof the electromagnetic field. In London around 1862, Maxwell calculated the speed of propagation of electromagnetic field is approximately that of speed of light. He proposed that the phenomenon of light is therefore electromagnetic phenomenon

Hook appointed curator of experiments.

In 1662 Robert Hooke was appointed curator of experiment to the Royal society

**NOVEMBER 6**

Tycho's supernova : In 1572, a supernova was first noted by wolfgang Schuler of witterberg in w- shaped constellation of Cassiopeia, but was seen by many observes throughout Europe

Comte claude Louis Berhollet Died on 6 nov 1822 at age 73: French chemist who was the first to note that the completeness of chemical reaction depends on masses of the reacting substance, he thus came close to formulating the law ofmass action

**NOVEMBER 7**

Sir Chandrasekhara Venkata Raman born on 7 nov 1888: Indian physicist whose work has influential in the growth of science in india. He was the recipient of the

1930 Nobel Prize for physics for the 1928 discovery. Now called raman scattering, a change in frequency observed when light is scattered in a transparent material. He died on 21 nov1970

Lix Matner born on Nov7, 1878: Austrian Swedish physicist who shared the eneico Fermi award with the chemists Otto Hann and fertz stessmann for thir joint research beginning in 1934that led to the discovery of uranium fission

Marie Curie born on 7 Nov 1807: Marie curie was French chemist and physicist whose celebrated experiment on uranium mineral led to the discovery of two new elements.

**NOVEMBER 8**

Hohannes Robert rhydberg born on 8 nov 1854 : Swedish physicist , known for the rydberg constant in his empirical formula that related the wave number of the spectral lilne of an element .this formula expressed fundamental relationship in thise lines, which he presumed were the result of the mature and structure of elements atom

Edmond halley born on 8 nov 1656 : Engllish Astronomer , geographical and mathematician who is best known for recognizingthat a bright comet had appeared several times, calculating its orbit and for successfully predicting its return

Saturns $15^{th}$ moon: In 1980 scientist at the jet propulsion labortary in California announced the discovery of $15^{th}$ moon orbiting the planet Saturn courtesy of voyager1

X-ray: In 1895, Willhem Rontegen first observed x-ray. During an experiment at Wurzburg university.

**NOVEMBER 9**

Element 110 in 1994 the first atom of element 110 was detected by an international group of scientist lead by peter aimburster and Sigmund Hofmann. A thin lead foil target was bombarded with accelerated nickel atom. A lead nucleus fused with a nickel nucleus to form a new nucleus of element 110. An isotope with atomic mass no. 269

Chain Weizmann was died on Nov 9, 1952: Russian british chemist who used bacteria for the synthesis of organic chemical . During a recent immigrant into great Britain. He discovered a way to use a bacterium to synthesize acetone during the fermentation grain

Ronald G.w. Noerish born on 9 nov 1897: Ronal G.W.Noerish was British chemist who shared Nobel Prize for chemistry with fellow Englishmen sir George Poiter and German manfied eigen for their studies of very fast chemical reactions

**NOVEMBER 10**

Charmed Quack: In 1974, the discovery of the "charmed quack" subatomic particle was announced, simultaneously by the two American experimental groups responsible. One was an MIT group at Brook Haven National Laboratory and the other a SLAC – Berkley group on the west coast at standard acceleration centre.

Ernest Otto Fischer, born 10th November 1918**:** German theoretical chemist and educator who was co – recipient of Nobel Prize for chemistry in 1973 for his identification of a completely new way in which metals and organic substances can combine.

**NOVEMBER 11**

Joseph.G.Hamilton, born 11th November 1907: Joseph.G.Hamilton was an American medical physicist who pioneered in the medical uses and health effectsof cardio active isotopes. On 23rd March 1936, he injected intravenously or sodium cardio isotope into leukemia patient.

Cosmic Rays**:** In 1925, the discovery of cosmic rays was announced in Madison Wisconsin by Robert.A.Millikan who coined their name.

Raemer.E.Schreiber, born November 11, 1910 :Raemer.E.Schreiber was an American experimental physicist who during world war 2nd was one of the scientists who worked on the Manhattan project in Los Alamos, N.M to during the first atomic bombs.

**NOVEMBER 12**

First Nobel Prize in Physics:In 1901, the first Nobel Prize for physics was awarded to Wilhelm Roentgen for his discovery of X-rays.

John William Strutt, Lord Rayleigh, Born 12 Nov1842: John William Strut, Third Baron Rayleigh was an English physical scientist 3rd Baron of Rayleigh who made fundamental discoveries in the field of acoustic and optics that are basic to

the theory of wave propagation in fluids. He received the Nobel Prize for physics in 1909 for his investigation into the densities of the most important gases and his successful isolation of argon, an inert atmospheric gas.

**NOVEMBER 13**

Herbert E. Ives , Died, 13 November 1953 : Herbert E. Ives was an American Physicist and inventor of transmission of mechanical video pictures.

Mars Satellite : In 1987, Mariner – 9, the first manmade object to orbit another planet, entered maritian orbit. The mission of the unnamed craft was to take photographs mapping 70% of the surface and to study the planet's thin atmosphere, clouds with its surface chemistry and seasonal changes.

**NOVEMBER 14**

Nicolas – Louis Vauquellin, Died 14 Nov 1829 : French chemist who discoveredthe elements of Chromium (1797) and Beryllium (1798).

Fullerenes: In 1985, the discovery of fullerene was published in the journalnature. In September 1985, the American chemist Robert F.Curl and Richard Smalley colleagues at Rice they discovered the first fullerene, C60, a spherical cluster of carbon atoms. The discovery, dubbed back minster fullerene or bulky balls, opened a new branch of chemistry, and all three men awarded the 1996 Nobel Prize for chemistry for their work.

**NOVEMBER 15**

Danniel Rutherford, Died 15 Nov 1819 : Scottish Chemist and photographer who discovered the portion of air that does not support combustion now known to be nitrogen. After letting a mouse live in a confined quantity of air until it died, he burned a candle an burned phosphorous in the same air as long as they wouldburn. He assumed the remaining gas was carbon dioxide, which he dissolved by passing it through a strong alkali. Yet there remained gas that was incapable of supporting respiration or combustion which he know no longer contained oxygen or carbon dioxide.

Johannes Kepler – Died Nov 15, 1630 : German astronomer who formulated three major laws of planetary motion which enabled Issac Newton to devise the law of gravitation.

**NOVEMBER 16**

Carl Von Linde – Died, 16 Nov 1934 : German chemist, engineer and inventor who invented mechanical refrigeration. His first refrigeration equipment was tested in Munich byway

James .W. Mitchell : Black American chemist who is best known for advancing the accuracy of liace element analysis.

**NOVEMBER 17**

Eugene Paul Wigner , born 17 Nov 1902 : Hungarian American physicist who won the 1963 Nobel Prize for physics for his insight into Quantum Mechanics, for his contribution to the theory of atomic nucleus and elementary particles particularly through discovery and application of fundamental symmetry particles.

Robert Hof Stadler, Died, Nov 17 1990 : American scientist who was a joint recipient of the Nobel prize for physics in 1961 for his investigation in which he measured the size of neutron and proton in the nuclei of atom.

Nuclear Bomb: In 1976, China detonated its most powerful device in n atmosphere test.

**NOVEMBER 18**

George. B. Kistiakowsky, Born Nov 18 1900 :George. B. Kistiakowsky was a Russian chemist who worked on developing the first atomic bomb but later advocated banning nuclear weapons.

Niels Bobe, Died, 18 Nov 1962 :Niels Henrik David Bobe was a Danish Physicist who was the first to apply the Quantum theory which restricts the energy of a system to certain discrete value to the problem of atomic and molecular structure. For this work he received the Nobel Prize for Physics in 1922. He developed socalled Bobs theory of the atom and liquid model of the nucleus.

Walter Hermann Nernst, Died 18 Nov- 1941 :German physicist chemist who was one of the founder of modern physical chemistry. In 1889 he devised his theory of electronic potential and conduction of electronic solution – the Nernst equation and introduced the solubility product to explain precipitation reaction.

**NOVEMBER 19**

Yuan. T. Hee, Born 19 Nov 1936 :Taiwanese – American chemist who shared the Nobel Prize for chemistry in 1986 for his role in the development of chemical reaction dynamics.

Rudolph Fitting, Died 19 Nov 1910 :German organic chemist who is famous for his extensive work synthesizing of organic compound in the late 19th century. The action of sodium on organic compounds discovered by waltz was extended by Fitting using a mixture of an aromatic & alkyl baroid to produce homologues of benzene.

Georgy Nikdavikch Flerov, Died 19 Nov 1990 : Soviet physicist who, in 1941, recognized that uranium undergoes spontaneous fission. He was one of the early Russian investigators of nuclear fission.

**NOVEMBER 20**

International Space Station :In 1998, the first module of the international space station was launched on a Russian proton rocket from Barkonar cosmodrime Kazakhstan.

Francis William Aston, Died 20 Nov 1945: English chemist, physicist and chemist who was awarded the 1922 Nobel prize for chemistry for his development of mass spectrography, a device that separate atoms or molecular fragments of different mass and measures those masses with remarkable accuracy.

Otto Van Guericke Born 20 Nov 1602 :German physicist who investigated the properties of vacuum invented the first piston air pump to produce a vacuum.

**NOVEMBER 21**

**Sri.ChandrasekharaVenkata Raman**, died Nov 21, 1970: Indian Physicist whose work was influential in the growth of Science in India. He was the recipient of the 1930 Nobel Prize for physics for his 1928 discovery, now called Raman Scattering.

**Edison's Phonograph**: In 1877, Thomas Edison announced his invention of

"talking machine"- tin foil cylinder recorder that preceded the phonograph. Bruno

Rossi. Died on November 21, 1993 : Bruno Benedetto Rossi was an Italian American physicist who was a pioneer in the study of cosmic radiation.

**NOVEMBER 22**

**Wolfgang Ostwald. Died November 22, 1943 :** German Chemist who devoted his life as a teacher, researcher, editor and one of the founders of colloid chemistry. He defined colloids as disperse system that are generally polyphasic and that possess particles 1-100 micron in size.

**Louis Neel Born 22 Nov 1904 :** Louis Eugene – Felise Neel was a French physicist who shared the Nobel prize for physics in 1970 for his pioneering studies of the magnetic properties of solids.

**NOVEMBER 23**

**Henry Mosley born 23 November 1887**

Henry Jeffreys Mosely was an English physicist who experimented anddemonstrated that the mayor properties of an element are determined by the atomic number, not by atomic weight, and firmly established the relationship between atomic number and the charge of the atomic nucleus.

**Johannes Diederick Van der waals Born 23 November 1837**

Dutch physicist who was awarded the 1910 Nobel prize for physics for his work on gaseous and liquid state of matter. His main work was to develop the van der Waals equation applied to real gases.

**NOVEMBER 24**

**TsungDac Lee. Born 24 November 1926**

Chinese born American physicist who received the 1957 Nobel Prize for Physics for their "penetrating investigation" of violations of the principle of parity conservation which has led to important discoveries regarding the elementary particles.

**The Origin of Species**

In 1859, The Origin of Species by Means of Natural Selection, Darwin's ground breaking book was published in England to great acclaim.

**Robert L. Banks. Born 24 Nov 1921**

American chemist who co-discovered crystalline polypropylene polymer with J. Paul Hogan.

**NOVEMBER 25**

**Robert Mayer. Born 25 November 1814**

Julius Robert Mayer was a German physicist also, while a ship's doctor sailing to Java considered the physics of animal heart.

**Hermann Kolbe Died 25 Nov 1884**

Adolphe Wilhelm Hermann Kolbe was a German chemist who accomplished the first generally accepted synthesis of an organic compound from inorganic compound.

**NOVEMBER 26**

**Karl Ziegler. Born 26 November 1898**

German Chemist who shared the 1963 Nobel prize for chemistry with "Giulio Natta" for their discoveries in the field of the chemistry and technology of high polymers improving the quality of plastics.

**John Alexander Newlands. Born 26 November 1837**

John Alexander Reina Newlands was English chemist who first established an order of elements by the atomic weights and observed a periodicity in their properties. Every eighth element has similar properties hence he named Law of Octaves.

**Thomas Andrews. Died 26 November 1885**

Physical chemist who demonstrated the continuity of the gaseous and liquid states, physical properties display no abrupt changes.

## NOVEMBER 27

### Laes Onsager. Born 27 November 1903

Norwegian born American chemist whose development of a general theory of irreversible chemical process gained him 1988 Nobel prize for Chemistry.

### Sodium Atmosphere

In 2001, Sodium was detected in the atmosphere of an extra solar planet by the Hubble Space Telescope.

### Hydrogen- fuelled Space Vehicle

In 1963, the First flight of a space vehicle powered by a liquid hydrogen and liquid oxygen fuel combination was made by a centaur II.

## NOVEMBER 28

### Russell Alan Hulse. Born 28 November 1950

American physicist who in 1993 shared the Nobel prize for physics with his former Teacher the astrophysicist Joseph H. Taylor Jr., for their joint discovery of the first binary pulsar.

### Enrico Fermi. Died 28 November 1954

Italian American physicist who was awarded the Nobel Prize for physics in 1938 as one of the chief architects of the nuclear age.

**Mariner 4 :** In 1964 Mariner 4 was launched from Cape Kennedy, Florida. Making its Mars fly-by on 14 July 1965. This was the first satellite to transmit a close-up photograph of Mars.

## NOVEMBER 29

**Robert A Sevanson. Born 29 November 1947 :** American chemist who at age 29 co-founded Geixteels, Inc. 1976, a research based company that pioneered the biotechnology industry.

### Christian Doppler. Born 29 November 1803

Christian Johann Doppler was an Austrian physicist who first described how the observed frequency of light and sound waves is affected by the relative motion of source and the detector, known as Doppler Effect.

**Jodine discovery announced**

In 1813, a new substance-iodine was announced at the French institute by Nicolas element, in the name of its discoverer, Bernard courtois.

**NOVEMBER 30**

**Sir Jagadis Chandra Bose. Born 30 November 1858**

Indian physicist and plant physiologist who investigated the properties of very short radio waves, wireless telegraphy and radiation-induced fatigue in inorganicmaterials.

**Aluminium Conductor**

In 1899, aluminium was first used commercially in the US as an electrical transmission conductor.

**AC Power Plant :** In 1886, the first commercially successful US alternating current power plant was opened at Buffalo, NY by George Wastinghouse.

## DECEMBER

**DECEMBER 1**

**Stephen. A. Benton** Born on 1st December 1941 : American physicist who was a pioneer in medical imaging and fine arts holography. His fascination with optical phenomena began with the 3-D glasses he used as an 11 year old to watch the 1953 movie 'house of wax'. In 1968, he invented the 'rainbow holograms', as seen on credit cards while working for Polaroid corporation.

**Martin Heinrich Klaporth:** Born on 1st December 1743 : German chemist, who was founder of analytical chemistry discovered Uranium(1789), Zirconium(1789), Cerium(1803) and contributed to the identification of others.

**Legionnaire's disease:** In 1977, the isolation of bacterium Legionella pneumophilia

that was the cause of Legionnaire's disease was described in a scientific paper published in the New England Journal of Medicine by scientists at the centers for disease control (CDC) in Atlanta, Georgia

**Earth photograph:** In 1959, the first colour photograph of the earth from outer space was taken from the nose of a throw missile launched from cape Canaveral, Florida.

**Commercial soiless culture of plants:** In 1936, the first U S patent was issued for the soiless culture of plants in a large commercial hydroponicum to Ernest walfrid brundin and Feank Farrigton Lyon as "system of water culture".

**DECEMBER 2**

**Isabella carle** Born 2nd December 1921 : American chemist who achievements include the development of her "symbolic addition procedure" which has become the method of choice for structure determination from X-ray diffraction data on crystalline materials, even in computerized programs. In 1969, she determined the crystal structure of toxins founds in venom of froys in south America, which are used in the study of nerve transmission.

**Heinrich Barkhausen** Born on 2nd December 1881 : German physicist who discovered Barkhausen effect(1919), a principle concerning changes in the magnetic properties of metal. His work in acoustics and magnetisam led to the discovery that magnetization affects whole domains of a ferromagnetic material, rather than individual atoms alone . with karl kurz he developed the Barkhausen-kurz oscillation(1920) for ultra high frequencies leading to understanding of the principle of velocity modulation. He is also known forexperiments on short wave radio transmission.

**Jarvick artificial heart :** In 1982, Dr. William. C. Devries replaced the diseased heart of Barney Clark with the Jarvick-7, the first permanent artificial heart even used for human patient.

**Atomic power station :** In 1957, the first full scale atomic electric generating station in the US began operation in shipping port, Pennsylvania-15 years to the day after Fermi's experiment at the university of Chicago.

**Atomic chain reaction :** In 1942, the first self sustained nuclear chain reaction was demonstrated in Chicago. At the university of Chicago, Enrico Fermi and his team achieved the world's first artificial nuclear chain reaction, in a makeshift lab underneath the university's football stands at stagg field. The chain reaction was part of the Manhattan project, a secret war time project to develop nuclear weapons.

**DECEMBER 3**

**Paul Cruzan** Born on 3rd December 1933 : Paul Joseph Cruzan is a Dutch chemist who invented that chemical compounds of nitrogen oxide accelerate the destruction of stratospheric ozone for which he received Nobel Prize for chemistryin 1995.

**Richard Kuhn** Born on 3rd December 1900 : Austrian biochemist who has awarded the 1938 Nobel prize for chemistry for work on carotenoids andvitamins. In 1933 Kuhn had discovered a third carotene Bomer. It was called gamma carotene because two other components were previously known mcarotene.

**Bhopal chemical leak:** Bhopal disaster was a gas leak incident in India, considered one of world's waste industrial catastrophes. It occurred on the night of December 1984 at the Union Carbide India Limited pesticide plant in Bhopal, Madhya Pradesh, India. A leak of methyl Isocyanate gas and other chemicals from the plant resulted in the exposure of hundreds of thousands of people.

**DECEMBER 4**

In 2011 December 4 Cancer Research UK scientists have discovered that cancer cells can 'bag up and bin' a toxic protein to cheat death- revealing a new Achilles Heel in cancer cells that could be targeted for treatment, reveals research in Nature cell Biology today.

The scientists at the Edinburgh cancer research UK center at the University of Edinburgh removed a protein called FAK from mice and from cancer cells grownin the lab. FAK is produced in much higher amounts in cancer cells and partners with another protein SRC. They work together to cause the tumour to grow and spread. Removing or blocking FAK increases levels of unpartnered 'free' SRC which becomes toxic in high amounts. This should, in theory trigger automatic cancer cell death. But the team

discovered that cancer cells can get rid of the problematic SRC protein and survive. They revealed that cancer cells use a process called autophagy to bag up and digest excess SRC. Essentially the cells have hijacked a normal housekeeping process, normally used to digest proteins and recycle nutrients.

In 1998 space shuttle Endeavour and a crew of six blasted off on the first mission to begin assembling the international space station.

Jupiter- in 1973 'pioneer 10' reached Jupiter.

**DECEMBER 5**

NASA's Kepler mission confirms its first planet in habitable zone of sun like star. In December 5, 2011 Kepler 22b planet known to comfortably circle in the habitable zone of sun like star.

NASA's kepler mission has confirmed its first planet in the 'habitable zone' the region where liquid water could exist on a planet's surface. Kepler also has discovered more than 1000 new planet candidates, nearly doubling its previously known count. Ten of these candidates are near Earth size and orbit in the habitable zone of their host star. The newly confirmed planet, Kepler 22b is the smallest yet found to orbit in the middle of the habitable zone of a star.

December 5 is the birth day of great German physicist called Carl Heisenberg. He was the originator of quantum mechanics, the modern theory of matter, radiation and their reaction and the formulation of the uncertainty principle, which places absolute limits on the achievable accuracy of measurement. Heisenberg won Nobel Prize in 1932.

**DECEMBER 6**

Sir George Porter : Born on 6$^{th}$ December 1920. In August 2002 at the age of 81 English chemist who was awarded share of 1967 Nobel Prize for chemistry with English man Ronald Norrish and German Manfred Eigen for 'studies of extremely fast chemical reactions effected by disturbing the equilibrium by means of very short pulses of energy'. Porter showed how the 'flash photolysis' method- a technique for observing the intermediate stages of very fast chemical reaction, can be extended

applied to many diverse problems of physics, chemistry and biology. An example is the examination of photosynthesis. He extended these techniques into the nanosecond and picoseconds regions. Porter also made contribution to other techniques particularly that of radial trapping and matrix stabilization.

Transit of Venus : In 1882 the transit of Venus across the sun was photographed on a series of glass plate negative made by Amherst College Astronomer David Peck Todd. He used a solar photographic telescope. This is perhaps the historical record of about transit of Venus. Of the photos 147 survived having been achieved in the mountain vault.

**DECEMBER 7**

Theodar Schwann was born on Friday December 7 1810, in Neuss and he was a famous scientist from Germany of Roman Catholic religion. He was famous for cell theory. He died on January 11, 1882 in Cologne.

Richard Brooke Robert : Born on 7$^{th}$ December 1910. American biophysicist who contributed much to the discovery of ' delayed neutron' that uranium fission does not release all the neutrons it produces at one time but some come off at measurably later times.

Gerard Peter Kuiper: Born on 7$^{th}$ December 1905. Dutch born American astronomer who discovered Miranda- a moon of Uranus and Nereid- a moon of Neptune. In the Martian atmosphere Kuiper detected $CO_2$ but the absence of $O_2$. In 1960's Kuiper pioneered airborne infrared observation using an aircraft and served as chief scientist for the Ranger Space craft Crash launching probes of moon.

Galileo space craft orbits Jupiter: In 1995, Galileo space craft arrived at Jupiter and entered orbit after six years of travel including a flying of Venus and two asteroids Gaspra and Ida. The orbiter had also carried an atmospheric probe with scientific instruments which it had released from the main space craft in July 1995.

**DECEMBER 8**

December 8 is Jan Ingenhouse birthday. Ingenhouse was a dutch scientist who made the first step to understanding plant respiration or photosynthesis. English chemist Joseph priestly recently demonstrated that plants give off oxygen,but absorb carbon dioxide and release oxygen.During the night or when sunlight was not available, he found the process reversed.plants absorb oxygen and release carbon dioxide in the dark.This was the first step to understanding the process ofphotosynthesis. Ingenhousz believed the water absorbed by plants and convertedinto vegetation and oxygen.

**DECEMBER 9**

Joseph Needham was born on December 9-1900 worked first as a biochemist concentrating mainly on problems in empryology. In 1930 s he learnt Chinese and began to collect material. The first volume of his science and civilization in china was published in 1954 and by 1989.Fifteen volumes had appeared. Joseph Needham was a British biochemist and sinologist known for his work on the history of Chinese science.

Fritz Haber was born on dec 9 1868 was a German chemist whose conversion of atmospheric nitrogen to ammonia opened the way for the synthetic fertilizer industry. His study of the combustion of hydrocarbons led to the commercial cracking or fractionating of natural oil into its components. For example diesel,petrol and paraffin.

In electrochemistry he was the first to demonstrate that oxidation and reduction takes place at the electrodes, from this he developed a general electrochemical theory. In world war 1 he worked on poison gas and devised gas masks, hence there were protests against his nobel prize in 1918.

**DECEMBER 10**

Howard M Temin was born on Monday December 10 1934 in Philadelphia and hewas a famous scientist from united states of Jewish religion. He was famous for tumor viruses and host genetics. He died on february 9 1994 in Madison. He dieddue to lung cancer. He was an American oncologist and virologist who shared the1975 nobel prize

for physiology or medicine for his co discovery of enzyme reverse transcriptase. In 1961 Temin formed a provirus hypothesis that cancer cells affect genetic material. Temin also investigated how genetic information in the provirus transforms a normal animal cell into a tumor cell.

Walter Henry Zinn: Born on 10 December 1906. He was Canadian American nuclear physicist who contributed to the U S atomic bomb project during the world war 2. and to the development of nuclear reactor.

In 1961 Thor – Agena rocket launched to deploy a military 36 satellite also caused carried the 10- lb OSCAR 1. The orbiting satellite carrying Amateur Radio was deployed in low orbit, just above

**DECEMBER 11**

International Mountain Day: 2011 Theme:' Mountain and Forests' view of deforested mountains near port-au-prince, Haiti.

This theme focuses on mountains and forests. Healthy Mountain forests are crucial to the ecological health of world. They protect water sheds that supply fresh water to more than half the world's population. They are also home to untold wild life,provide food and fodder for mountain people and are important sources of timber and non-wood products. Yet in many parts of the world mountain forests are under threat as never before and deforestation in tropical mountain forests continues at an astounding rate. Protecting these forests and making sure they are carefully managed is an important step towards sustainable mountain development.

John.W.macklin: Born on December 11-1939.Black-American analytical chemist and he refried the technique of Raman Spectroscopy to that very small sample sizes. In 1980's Maklin collaborated with NASA scientists to analyse mateorites and cosmic dust particles looking for complex carbon based life. Macklin extended Raman Spectroscopy to the study of environmental pollution.

Max-Born Born on 11 December 1882: He was a German British physicist who shared Nobel prize for physics in 1954 (with walther Bothe)for his statistical formulation of

behaviour of subatomic particles. Max Born's studies of wave funetron led to replacement of original quantum theory which regarded electrons as particles with a mathematical description.

Charles Frederick Cross Born on 11 December 1855 : English chemist who with Edward Bevan and Clayton Beadle discovered cellulose could be produced by the dissolution of cellulose Xanthate in dilute sodium hydroxide.

**DECEMBER 12**

Robert Noyce:Born on 12 December 1927:He was an American Engineer and inventor with Jack of integrated circuit. He held sixteen patents of semiconductor devices methods and structures.

Ross Franco Nigrelli: Born on 12 December 1903: He made notable discoveries in disease among marine organisms and factors influencing their health including pollution ,changes in salinity ,and changes in water temperatures.

Maria Telkes Born on 12 December 1900: Hungarian-American physical chemist who pioneered in the application of solar energy to water distillation and home heating.

First privately built satellite: In 1961 Thor- Agena rocket launched to deploy a military discoverer-36 satellite also carried the 10-lb OSCAR I. The orbiting satellite carrying Amateur Radio was depolyed in low orbit,just above Earth's atmosphere,and it began transmitting HI in the morse code,10 times a minute. It was 60$^{th}$ anniversary of Marconis first transatlantic radio transmission.

Artificial heart implantation: In 1957, the first total artificial heart implantation in an animal kept a dog alive for 90 minutes in a pioneering experiment, at the cleveland clinic by Dr. William Icolff and Dr. Tetuzo Akutsu.

Jet speeded record: In 1953,an aircraft first reached the speed of 2-1/2 times thespeed of sound. Chuck Yeager established the record flying a Bell X-IA a slightly larger much modified version of the Bell X-1.It was carried aloft of launching altitude by a B-29 to conserve it's four minutes of locket fuel.

European nuclear institute: In 1949 a recommendation to establish an all European institute of nuclear physics was adopted by the European cultural conference on it's closing day.

**DECEMBER 13**

Philip warren Anderson Born 13 December 1923: He is an Americanphysicist who shared (with John .H.Van Vleck and sir Nevill .F Moti) the 1977Nobel prize for physics for his research on semiconductors superconductivity and magnetism. He made contribution to the study of solid-state physics,and research on molecular interactions hasben facilitated by his work on the spectroscopy of gases.

Charles Alfred coulson: Born 13 December 1910: January 1947 at the age of 63 British theoretical chemist known for the application of molecular orbital theory to chemical bonding, the electronic structures of molecules and the concept of partial valency. He developed many mathematical techniques for solving chemical and physical problems. He explained the structure of benzene and other conjugated system.

Communication satellite: In 1962 Relay I the U.S communication Earth satellite to transmit telephone,television,teleprinter and fascimile signals was launched.

Casein fibre: In 1938 the first U.S patent was issued for casein fibre. Earl Ovando whittler and Stephen Philip could of Washington D.C had first produced Casien fibre in December 1935. They decided the patent to the free use of the people of the USA. Casien is the main protein in milk. These fibres can be used suitably as substitute for wool and other fibres.

**DECEMBER 14**

**Tycho Brahe** (1546-1601)was a Danish astronomer , who made accurate observations of the planets from which Kepler proved that planets orbit the sun in eclipses. His discovery and report of the 1572 supernova made him famous ,and his observations of the comet of 1577 proved that it moved on an orbit among the planets, thus

disproving the Greek view that comets were in the Earth's atmosphere . Brahe was a colorful figure who had to wear a metal nose after his own was cut off in a dual, and who took an interest in alchemy.

Brahe was the greatest observer in the days before telescope ,making the most accurate measurements of the positions of stars and planets.

Tycho Brahe is the famous for his accurate and comprehensive astronomical and planetary observations . He was the famous scientist from states.

**Nikolay Gennadiyevich Basov** BORN 14 dec 1922 : Soviet physicist, best known for the development of the MASER, the precursor of laser. He devised a microwave amplifier based on ammonia molecules. The two scientists shared the 1964 Nobel prize (with American Charles Towner ) who independently developed MASER for basic research in quantum electronics that led to the development of both maser & the laser. Basov went to develop the laser principle and introduced the idea of using semiconductors to achieve laser action (1958) .

**Voyager Aircraft**

In 1986 voyager the experimental aircraft piloted by Dick rutan and Jeana yeager ,took off from Edwards air force base in California on the first non—stop ,non-refuded flight around the world.

**DNA**

In 1967, the first synthesis of biologically active DNA in a test tube was announced at a Press conference by Arthur Kornberg who had worked with Mehran Goulian at Stanford and Robert L. Sinsheimer of MIT , Kornberg chose to replicate the relatively simple DNA chain of the Phix 174 virus, which infects bacteria.

**Quantum Physics:** In 1900 German physicist Max plank made public hisideas on quantum physics at a meeting of the German physics society ,revolutionizing scientists understanding of physics. He suggested the explanation energy exists in discrete packets which he called 'quanta'.

**DECEMBER 15**

**Maurice Hugh Frederick Wilkins** Born 15 Dec 1916: He was a New-Zealand born British biophysicist whose X-ray diffraction studies of De oxy ribo Nucleic Acid(DNA) were significant in the determination of molecular structure of DNA accomplished by James Watson and Sir Francis Cricks for this work the three scientists shared the 1962 Nobel prize for Physiology or medicine.

**Niels Rybery Finsen** Born 15 Des 1860: Danish Physician who founded modern phototherapy and was awarded the 1903 Nobel Prize for Physiology or Medicine " in recognition of his contribution to the treatment of diseases, especially lupus vulgaris with concentrated light radiation, where by he has opened a new avenue for medical science.

**Antoine-Henri Becquerel** Born on 15 Des 1852: Aug 1908 at age 55. He was a French physicist who discovered radioactivity in fluorescent salts of uranium." In recognition of the extra ordinary services he has rendered by his discovery of spontaneous radioactivity. His early researches were in optics

**Chernobyl final shut down:** In 2000 the ill fated Chernobyl nuclear plant was ceremoniously permanently shutdown in Ukraine more than 14 years after one of its reactors exploded in the world's worst civil nuclear catastrophe on 26 April 1986. The last working reactor, Number Three, had in fact been shut down the previous week because of technical problems.

**Space Maneuvers:** In 1965 two U.S. manned space craft Gemini 6 and Gemini 7 maneuvered to within 10 feet of each other while in orbit

**Street Cleaning Machine:** In 1854 Philadelphia residents were amazed as the first practical street cleaning machine was put in to operation this day. A series of brooms attached to a cylinder mounted on a cart was turned by a chain driven by the turning of the cart's wheel.

**School Vaccination:** In 1827 in the city of Botson , Massa chussetts , the school committee voted to require effective 1 march 1828, that public school Students show

that they had been vaccinated against small pox prior to school entrance. This initiative came just three decades after Edward Jenner's discovery of a method to immunize against small pox .

**DECEMBER 16**

**Johann Wilhelm Ritter** Born 16 December 1776: He was German Physicist who discovered the UV region of spectrum. (1801) and thus helped the broaden man's view beyond the narrow region of visible light to encompass the entire electromagnetic spectrum from the shortest gamma rays to the

**DECEMBER 17**

**Willard Frank Libby :** Born 17 Dec 1908; died 8 Sep 1980 at age 71. American chemist whose technique of carbon-14 (or radiocarbon) dating provided an extremely valuable tool for archaeologists, anthropologists, and earth scientists. For this development he was honoured with the Nobel Prize for Chemistry in 1960. Libby is a specialist in radiochemistry, particularly hot atom chemistry, tracer techniques, and isotope tracer work. He became well-known at Chicago University also for his work with natural tritium, and its use in hydrology and geophysics. On 18 May 1952, he determined that the age of Stonehenge was 1848 BC, based on analysis of radioisotopes in charcoal.

**Hendrik Anthony Kramers**

Born 17 Dec 1894; died 24 Apr 1952 at age 57. Dutch physicist who, with Ralph de Laer Kronig, derived important equations relating the absorption to the dispersion of light. He also predicted (1924) the existence of the Raman effect, an inelastic scattering oflight. Kramer's work covers almost the entire field of theoretical physics. He published papers dealing with mathematical formalism of quantum mechanics, and others on paramagnetism, magneto-optical

rotation, ferro-magnetism, kinetic theory of gases, relativistic formalisms in particle theory, and on theory of radiation. His work shows outstanding mathematical skill and careful analysis of physical principles.

**Edwin Joseph Cohn**

Born 17 Dec 1892; died 1 Oct 1953 at age 60. American biochemist who helped develop the methods of cold ethanol blood fractionation (the separation of plasma proteins into fractions). During World War II he headed a team of chemists, physicians, and medical scientists who made possible the large-scale production, allowing use of the individual fractions of human plasma for treatment of the wounded - all together about a dozen different materials. Some of the results of this work include the use of serum albumin as a substitute for blood or plasma for transfusion; the use of gamma globulin for short-term protection against such diseases as measles and hepatitis; and the use of antihemophilic globulin for the treatment of hemophilia.

Sir Humphry Davy

Born 17 Dec 1778; died 29 May 1829 at age 50. English chemist (Baronet), who discovered several chemical elements and compounds, invented the miner's safety lamp, and epitomized the scientific method. With appointment to the Pneumatic Institution to study the physiological effects of new gases, Davy inhaled gases (1800), such as nitrous oxide (laughing gas) and a nearly fatal inhalation of water gas, (a mixture of hydrogen and carbon monoxide). Davy discovered alkali metals: potassium and sodium, an isolation made with electric current for the first time (1807); as well as alkaline earth metals: calcium, strontium, barium, and magnesium (1808). He discovered boron at the same time as Gay-Lussac. He recognized chlorine as an element, which prior workers confused as a compound.

**DECEMBER 18**

Photon: In 1926, ina letter published in Nature , G.N.Lewis coined the word "photon"

Piltdown man: in 1912 the discovery of skull jnown as Piltdown man , the first important fossil human skull ever to be inearthed inEngland.The specimen known as Piltdown man

Earliest U.S celestial Photograph: In 1839 John William Draper took a daguerreotype of the moon, the first celestial photograph made in the U.S He exposed the plate for 20 minutes using a 5 inch telescope and produced an image one inch in diameter. Sraper, professor of chemistry at New York University lead his research in the effect of llight up on chemicals had led him to take up photography

**DECEMBER 19**

George d snell Born on 19 dec. 1903: He was American geneticist, known as the father of immunogenetics , who paved the way for modern organ transplants. Early in his career snell had beeb the first to show that X-rays can cause mutation in mammals, by showing that x- rays include chromosome trans location in mice

Albert Abraham Michelson Born 19 dec 1852: He was german American physicist who accurately measured the speed of light and received the 1907 Nobel prize for physics "for his optical precision designed highly accurate Michelson interferometer and fundamental constant

Artificial heart : In 1985 Mary lund received a human heart transplant 45 daus later. She survived until October 1986

Altair microcomputer : In 1974 the pioneering Altair 8800 microcomputer was first put on sale in the U.S as doit yourself computer kit

The first radio broad cast from space: In 1958 the first known radio broadcast from outer space was transmitted. The broad cast came from the first experimental satellite, project score which had been two days earlier. The battery operated 132 MHz all vacuum tubes transmitter had an 8W output.

**DECEMBER-20**

**Robert Jemison Van de Graff** Born 20 Dec 1901: American physicist and inventor of the Van de Graff generator, a type of high-voltage electro static generator that can be used as a particle accelerator in atomic research.The potential difference achieved in modern Van de Graff generators can be up to 5Mv.This generator has been used in medical and industrial applications.

**Jaroslav Heyrovsky** Born 20 Dec 1890 *:* Czech chemist who received the 1959 Nobel prize for chemistry 'for his discovery and development of the polarografic methods of analysis'[1922].

**Nuclear electricity:** In 1951 the first electricity ever generated by atomic power began flowing from the EBR-1 turbine generator when Walter Znn and his Argonne National Laboratory staff of scientist brought EBR-1 to critically with a core about the size of football. The reactor was started up and the power gradually increased over several hours

**First U.S Nobel physicist :** In 1907 the first U.S scientist to receive Nobel prize was Albert Michelson, a German-born.American physicist who received Nobel prize for physics 'for his optical precision instruments and spectroscopic and metrological investigations.'He designed the highly accurate measure the speed oflight and establish it as a fundamental constant.

**DECEMBER-21**

**Tom Bacon** Born 21 Dec 1904: English mechanical engineer who pioneered the first modern hydrogen-oxygen fuel cells,which electrochemically convert air and fuel into electricity.

**Hermann Joseph Muller:** Born21 Dec 1890: American geneticist who demonstrated that mutations and heredity changes could be caused by x-rays striking the genes and chromosomes of living cells,.He investigated the effect of different agents on the frequency of mutations . Muller was awarded Nobel prizefor physiology or medicine in 1946.

**Dried Blood Serum:** In 1933 dried human blood serum was prepared for the first time in the U.S at the school of medicine,university of Pennsylvania,Philadelphia.It was prepared by Drs.Earl.W.Flosdorf and stuart Mudd.The powderd dried blood serum was used successfully for transfusions forthe prevention of childhood diseases.

**DECEMBER 22**

**Srinivasa Ramanujan** Born 22 December 1887: Indian mathematician known for his work on hyper geometric series and continued fractions. In numbertheory he discovered the properties of partition function. He worked on elliptic functions continued fractions, and infinite series.

**Nicholas Joseph Callan** Born 22 December 1799: Irish physicist who pioneered in electrical science. He invented induction coil. Callan`s coil was built using a horse shoe shaped iron or bar wound with a secondary coil of thin insulated wire under a separate winding of thick insulated wire as the primary of coil.

**Live space telecast :** In 1968 the first U .S. live telecast from a manned space craft in outer space was transmitted from Apollo Vlll. A total of six live television transmission sessions were done by the crew during the mission.

**Sun`s flash spectrum:** In 1870, Charles Augustus Young an American astronomer, made first observations of flash spectrum of sun. He was a pioneer in the study of spectrum of the sun and experimented in photographing solar prominence in full sunlight.

**DECEMBER 23**

**Axel Fredrick Cronstedt** Born 23 December 1722: Swedish chemist and metallurgist who was the first to isolate nickel (1751) and notice it`s slight magnetic properties. He discovered zeolite, a water softening silicate and analyses the high- density mineral calcium tungstate.

**Small pox virus ;** In 1993 the U.S. centers for disease control Atlanta, Georgia announced that the small pox virus stock pile would now to be destroyed.

**Benjamin Franklin Experiment:** In 1750, Benjamin Franklin was severely shocked wile electrocuting a turkey.

**Moon of Saturn:** In 1672, astronomer Giovanni Cassini discovered Saturn`s moon, Rhea the fifth major satellite of Saturn which may be one of the most heavily cratered satellite in the solar system. In 1675, he discovered that Saturn`s ring are split largely in to two parts by a narrow gap known since as the "Cassini Division"

**DECEMBER 24**

James Prescott Joule was born on December 24, 1818. He was a British physicist whose work on the relations between electrical, mechanical and chemical effects led to the discovery of the first law of thermodynamics, that energy can be neither created nor destroyed owner, and dedicated to precise scientific research. He determined the mechanical equivalent of heat (Joule's equivalent) and the SI unit of energy, the joule is named after him. James Prescott Joule was an English physicist and scientist.

**USSR atomic bomb intention:** In 1945, a warning about Russian atomic bomb development was sent by an attaché at the U.S. Embassy in Moscow.

**Radioactive medicine:** In 1936 the radioactive isotope medicine was administered, Berkeley, Cal. It was the first time that a radioactive isotope had been used in the treatment of human disease as well as the start of a career –long contribution from John Lawrence.

**DECEMBER 25**

Sir Isaac Newton was born on December -25, 1642. He was born at woolsthorpe, Lincolnshire; he was educated at Grantham grammar school and Trinity college. He was elected fellow of Royal society in 1672 and soon afterwards published his new theory about light and colours. During1665-1666 he discovered binomial theorem, differential and integral calculus and also began to investigate the phenomenon of gravitation, It is greatest work, philosophiae Naturalis principia Mathematica was published in three volumes in 1686-1687 with the aid of Edmund Halley. Newton laid the foundation of physics as a modern discipline. Newton`s Universal law of gravitation and the three standard law of motion still in use today, Isaac Newton was an English physicist, mathematician, astronomer and is considered to be the greatest and most influential scientist who ever lived.

**Ernest Ruska** Born 25 December 1906: Ernest Ruska was a German electrical engineer who invented the electron microscope. "For his fundamental work in electron optics and for the design of the first electron microscope", he was awarded a share of Nobel Prize for physics.

Hubble telescope: In 1999 space shuttle discovey astronauts finished their maintenance work in the hubble space telescope, installing connectivity optics to repair problems due to a design flow in the mirror

Thyroxine: In 1914, the thyroid hormone theyoxine was first crystallized by biochemist Edward.C Kendall of the mayo foundation in Rochester, of carbohydrate metabolism and of protein synthesis and break down

**DECEMBER 26**

Clemens Alexander winkler Born 26 december 1838: German chemist who discovered element germanium After spening four monts tracking down and isolating the remaining 7% he found that the new clement called germanium for Germay

Ernst Feliz Hoppe seyler Born 26 dec 1825: Ernst felix Hoppe seyler was a

german phycician who was a pioneer of physiological chemistry.He studied the chemical blood spectroscopy , prepared hemoglobin in crystalline form and claddifed its role in red bloodcells

Supersonic passenger jet: Lin 1975, tupolev 144 the first passenger supersonic jet made its first commercial flight in airline service from Moscow to Alma-Ata Kazakhstan

Radium: In 1898 Marie curie discovered the radio active element radium while experimenting with pitchblende a common uranum ore. She hed observed that this ore was more radioactive than refined uranium

**DECEMBER 27**

Louis Pasteur Borm 27 dec 1822: Frenceh chemist who became a founder of microbiology . He began as a chemist working on the optical properties of tartaric acid and its stereochemistry. He created and tested vaccines for diphtheria , cholera. Yellow fever, plague, rabes, anthrax and tuberculosis

Johannes kepler Born 27 dec 1571: German astronomer who formulated three major laws of planetary motion which enabled Bewton to devise the law of gravitation.Kepler suggested that the tides are caused by the attraction of moon. He believed that the universe is governed by mathematical rules, but recognized the importance of experimental verification

**DECEMBER 28**

Kary.B.Mullis is an American biochemist who invented the polymer chain reaction on 1983 for which he shared the 1993 Nobel Prize for chemistry. It is a powerful aid in medical diagnosis of bacterial or viral infection

William Draper harkins Born 28 dec 1873: American nuclear chemist who was one of the first to investigate the structure of fusion reactions of the nucleus. In 1920, Harkins predicted the existence of neutron, subsequently discovered by

Edwin Chadwick's experiment.IN the early 1930's he built a cyclotron. Harkins demonstrated that in neutron bombardment reactions the first step in neutron capture is the formation of an excited nucleus of measurable life time which subsequently split into fragments. He also suggested that subatomic energy might provide enough energy of power the sun over its life time

Galileo satellite launched

Beryllium bombarded by alpha

rays

**DECEMBER 29**

Klaus Fuchs Born 29 Dec 1911: Klaus Fuchs was a German-British physicist who was convicted as a spy on 1 March 1950 for passing nuclearresearch secrets to Russia. He fled from Nazi Germany to Britain. Fuchs was released in 1942, in 1942, naturalized in 1942 and joined the British atomic bomb research project. In 1946, he became head of theoretical physics at Harwell, U.K.

Carl Friedrich Wilhelm Ludwig Born 29 Dec 1816: German physiologist and biochemist, he applied the experimental approach of chemistry and physics to explain the way the body functions. Ludwig investigated the structure of the kidneys and cardiac activity. The kymograph he invented (1847) continuously recorded blood pressure on a rotating drum. He was also first to study nitrogen content of urine as a measure of protein metabolism.

**Shockley Semiconductor Amplifier Idea:** In 1939, William Shockley wrote in his laboratory notebook – "It has today occurred to me that an amplifier using semiconductor rather than vacuum is in principle possible" He went on to develop the transistor, for which he shared (with John Bardeen and WatterBrattain) the 1956 Nobel prize in Physics.

Hong Kong bird flu:In 1997 Hong Kong began killing its entire chicken population up to 1.4 million birds to stem the spread of mysterious avian flu that had already killed four people. The Hong Kong government decision came after birds at two sites were found to be infected with H5N1 virus.

**Record Stay in Space :** In 1987 cosmonaut Yuri Romanenko ended his record 326 days space flight orbiting Earth in the Mir Space station, landing in a Soyuz spacecraft at a snow-covered site in Kazakhstan. His stay in space broke the previous Soviet record of 237 days.

**DECEMBER 30**

**Rodney A. Brooks. Born 30 December 1954 :** Rodney Brooks is an Austrian engineer and inventor who is a pioneer in applying artificial intelligence to build autonomous robots. He was the director of MIT Artificial Intelligence Laboratory and then the MIT Computer Science and Artificial Intelligence Laboratory.

**Sir John Houghton. Born 30 December 1931**

Welsh meteorologist who began in the late 1960's drawing attention to the build-up of carbon dioxide in the earth's atmosphere and its result of global warming, now known as Greenhouse Effect. As director General of the British Meteorological office, he began tracking changing climate patterns.

**Bluemoon:** In 1982, a second full moon of the month was visible, known as 'bluemoon' the name does not refer to its color, but it is a rare event giving rise to the expression, 'once in a blue moon' came from. This moon was special as a total lunar eclipse also occurred.

**Tungsten Filaments :** In 1913,Dr. William David Coolidge patented a method for making ductile tungsten for the purpose of making filaments for electric lamps. When Coolidge joined the General Electric Research Laboratory(1905), he was given the task of replacing the fragile carbon filaments in electric light bulbs with tungsten filaments, although tungsten was difficult to work. He developed a way to superheat the metal tungsten in order to draw it out into fine threads used for lamp filaments.

**DECEMBER 31**

**Jeremy Bernstein. Born 31 Dec 1929 :** He is the American physicist, educator and writer, widely known for the clarity of his writing for the day reader on the major issues of modern Physics. Bernstein has written over 50 technical articles.

***OBSTACLES FACED IF ANY AND STRATEGIES ADOPTED TO OVERCOME THEM***

Compilation and editing was very difficult for students as they were not well versed in word programme and this difficulty is overcomed by their collaboration.

***RESOURCES REQUIRED***

Internet resources were used for collecting information

***IMPACT OF THE PRACTICE***

This programme proved to be a productive initiative as it resulted in following benefits:

- Students became aware of history of scientific events.
- Wide reading habit developed among teacher trainees.
- Discussion on various aspects of scientific development can make them knowledge rich persons.
- Leadership quality of students enhanced a lot through this practice.
- Self confidence and cooperation among students improved to an appreciable level.
- Habit of reading and referring is enhanced among teacher trainees.
- Proper collaboration of events in an orderly manner was developed through individual contribution.
- Curiosity, Interest, Attitude & Appreciation in science were developed
- The knowledge in the field of history and inventions in science of student teachers were enhanced
- Teacher trainee's skill in comprehensive report writing and editing materials for compilation were developed.
- Using as a reference material by teachers and students.