

PARAM SCIENCE MAGAZINE

unsung heroes
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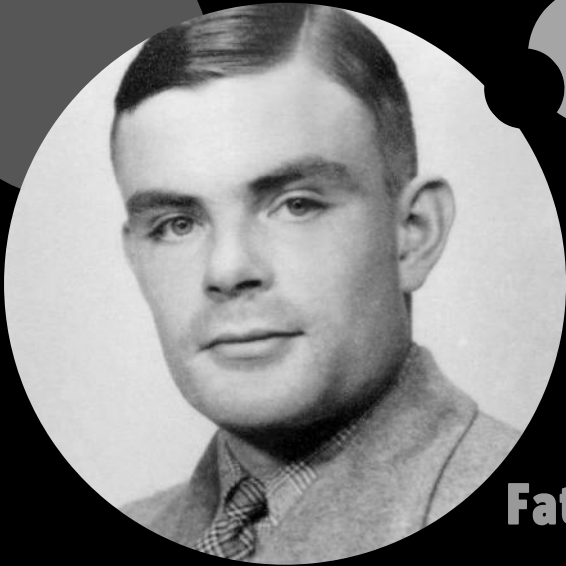
endless are the unsung champions of science whose extraordinary contributions often go unnoticed yet subtly shape our daily lives. Pause to honour these stalwart heroes who dedicate their lives to pursuing knowledge and scientific discovery, invisibly guiding our existence

JULY BIRTHDAYS

Gottfried Leibniz : 01 July 1646
Nikola Tesla : 10 July 1856
Ashoke Sen : 15 July 1956
Jayant Narlikar : 19 July 1938
S Ramanam : 20 July 1937
Rosalind Franklin : 25 July 1920

SCIENCE DAYS

World Population Day: 11 July
World Hepatitis Day: 28 July



ALAN TURING

Father of Modern Computer Science

INVENTIONS

Turing Machine: Suggested theoretical basis & design for modern computers, and algorithmic computation.

Cryptanalysis of Enigma: Developed machine to decrypt German WWII codes.

Turing Test: Criterion for machine intelligence mimicking human behaviour.

REAL-LIFE APPLICATIONS

Turing machines and the universal turing machines are fundamental to all computing devices.

Cryptanalysis of enigma significantly influences secure online banking encryption.

The Turing test guides the development of AI technologies such as chatbots and virtual assistants.

"A computer would deserve to be called intelligent if it could deceive a human into believing that it was human."
- Alan Turing

ALFRED WEGENER



Father of Plate Tectonics

INVENTIONS

Continental Drift Hypothesis: Proposed that the continents are slowly drifting around the Earth.

Meteorological Balloon Observations: Employed weather balloons for high-altitude atmospheric research.

Polar Air Circulation: Explored atmospheric dynamics on polar regions.

REAL-LIFE APPLICATIONS

Continental drift is crucial in earthquake predictions and oil and gas exploration.

Paleoclimatology helps in climate forecasting and is crucial for planning agriculture.

Polar air circulation improves global weather prediction and significantly impacts aviation.

“Nature does nothing in vain when less will serve; for Nature is pleased with simplicity and affects not the pomp of superfluous causes.” - Alfred Wegener



ANNA MANI

Pioneer of Atmosphere Science

INVENTIONS

Advancing Meteorological Instrumentation: Innovated weather measurement tools.

Solar Radiation Research: Investigated solar radiation patterns and impacts.

Ozone Dynamics Studies: Advanced understanding of ozone distribution and behaviour.

REAL-LIFE APPLICATIONS

Improved weather forecasts provide enhanced accuracy and are crucial for disaster preparedness.

Solar power optimization maximizes efficiency, contributing to renewable energy goals.

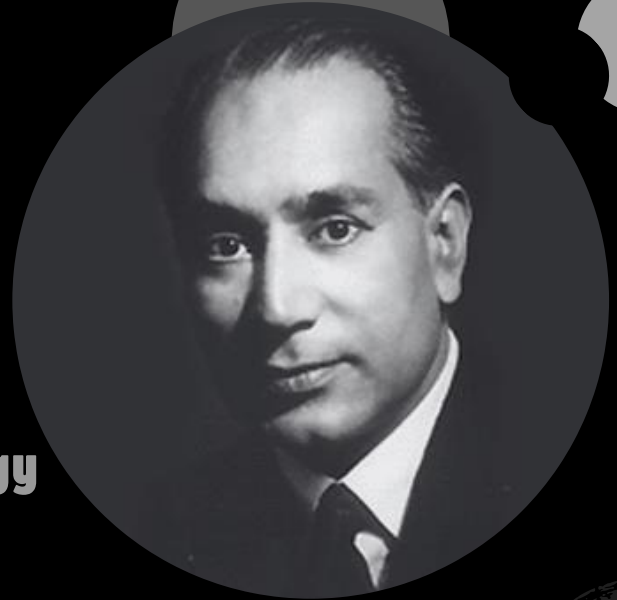
Ozone monitoring and protection safeguards human health and preserves the environment, ensuring a sustainable future.

"We have only one life. First, equip yourself for the job, make full use of your talents and then love and enjoy the work, making the most of being out of doors and in contact with nature."

- Anna Mani

BIRBAL SAHNI

Father of Indian Palaeontology



INVENTIONS

Study of Fossil Plants: Improved understanding of plant evolution.

Research on Living Fossils: Investigated "living fossils" like cycads and ginkgo.

Contributions to Stratigraphy: Aided dating of rock strata.

REAL-LIFE APPLICATIONS

Ancient ecosystems are reconstructed by studying fossil plants, contributing insights into climate change and Earth's history.

Heritage conservation plays a role in informing the preservation of "living fossils" such as cycads, ensuring their long-term survival.

Geological studies assist in dating and understanding Earth's geology, unravelling the secrets of our planet's past.

Through the span of a century, men have arisen now and again who, by their ability, their dint of application and inspiration, have shifted facts of science amidst a maze of confusing evidence and who have thus left an indelible impression upon the sands of time.

- Birbal Sahni

CHRISTIAN HUYGENS

Master of Precision



INVENTIONS

The Pendulum Clock: Invented and patented the pendulum clock.

Principles of Mechanics: Proposed escapement mechanism.

Wave theory of light: Light is a form of energy that travels in wave-like patterns.

REAL-LIFE APPLICATIONS

With its enhanced precision, the pendulum clock revolutionized maritime navigation and made way for modern atomic clocks.

The Balance Spring, a critical innovation, significantly improved the accuracy of mechanical watches used by Rolex.

The Wave Theory of Light revolutionized LCD screens and enables high-speed data transmission through fiber optic internet.

"I believe that we do not know anything for certain, but everything probably." - Christiaan Huygens



EDMOND: HALLEY

The Comet Navigator



INVENTIONS

Calculated the orbit of Halley's comet and discovered that they are elliptical and periodic.

Built a Diving Bell.

Designed an early working model of a Magnetic compass.

REAL-LIFE APPLICATIONS

The accurate prediction of Halley's Comet has enabled space exploration, including missions like the Mars rover.

The invention of the diving bell has significantly advanced underwater archaeology and bridge repair techniques.

Meteorology has played a crucial role in advancing weather forecasting and facilitating effective planning for wind farms.

"This sight... is by far the noblest astronomy affords."
- Edmund Halley



E.K. JANAKI AMMAL

Mother of Indian Ethnobotany

INVENTIONS

Ethnobotany: Compiled traditional Indian medicine information.

Sugarcane Research: Developed high-yielding, disease-resistant sugarcane varieties.

Chromosome Studies: Conducted pioneering chromosome studies in plants.

REAL-LIFE APPLICATIONS

The development and practices of natural and herbal medicine have been remarkably influenced by ethnobotany.

Sugarcane research has played a role in boosting productivity and economic growth in sugarcane-dependent economies.

Chromosome studies revolutionized agriculture, improving crop yields through genetically enhanced crops.

Magnolia Kobus Janaki Ammal is a
Magnolia plant named after her.

EMMY NOETHER



Mother Of Modern Algebra

INVENTIONS

Noether's Theorem: Links natural symmetries to conservation laws.

Theory of Ideals: Groundbreaking work in abstract algebra. Specifically Rings and Ideals.

Noether's Normalization Lemma: Connects commutative rings to polynomial rings.

REAL-LIFE APPLICATIONS

Noether's Theorem facilitates semiconductor technology, enabling advancements in modern electronics.

Studying ideals & Noetherian rings has been key in developing cryptographic systems ensuring secure communications.

Noether's Normalization Lemma is crucial in supporting advanced computations used in robotics.

"My methods are really methods of working and thinking; this is why they have crept in everywhere anonymously."

- Emmy Noether



GEORGES LEMAITRE

The Father of The Big Bang Theory

INVENTIONS

The Big Bang Theory: Proposed that the universe originated from a primeval atom.

Hubble-Lemaître Law: Relates galaxy distance to their recessional velocities.

Expansion of the Universe: Derived the concept of the universe's expansion.

REAL-LIFE APPLICATIONS

The Big Bang Theory explains the origin and evolution of the universe, its formation and subsequent development.

The Hubble-Lemaître Law is crucial in space exploration, calculating distances & expanding cosmic understanding.

Galaxies moving apart reveal the continuous expansion of our universe, providing compelling evidence of its growing nature.

**"There is no conflict between religion and science."
- Georges Lemaître**

GREGOR MENDEL

Father of Modern Genetics



INVENTIONS

Discovered the Fundamental Inheritance of traits across generations.

The three Laws of Inheritance:

Law of Dominance, Law of Segregation and Law of Independent Assortment.

Gene Editing: Laid the foundation for genetic research.

REAL-LIFE APPLICATIONS

Human genetics helps us understand inherited diseases by identifying related genes.

Forensic science plays a crucial role in solving crimes and establishes identities using scientific methods.

Biotechnology involves gene manipulation, advancing innovations in diverse scientific fields.

"I am convinced that it will not be long before the whole world acknowledges the results of my work."

- Gregor Mendel



JAGADISH CHANDRA BOSE

Father of Radio Science

INVENTIONS

Wireless Communication: Invented the first wireless detection device.

Microwave Optics: Demonstrated refraction, diffraction, and polarization using microwaves.

Radio and Microwave Sciences: Pioneer in radio and microwave sciences

REAL-LIFE APPLICATIONS

Wireless communication is integral to modern communication devices, enabling seamless connectivity and efficient exchange.

Microwave optics revolutionized radar, microwave ovens, satellite communication and various technological applications.

Radio and Microwave sciences revolutionized communication and navigation with transformative technologies like WiFi & GPS.

"The true laboratory is the mind, where behind illusions we uncover the laws of truth."

- Jagadish Chandra Bose

KAMAL RANADIVE



India's Forgotten Cancer Crusade

INVENTIONS

Cancer Research: Discovered a link between chewing tobacco and oral cancer.

Cellular Oncology: Explored virus and cancer cell interactions.

Work on Leukemia: Enhanced understanding of leukaemia.

REAL-LIFE APPLICATIONS

Cancer prevention informs policies combatting tobacco usage, reducing unhealthy habits and health risks.

Cancer treatment has explored the use of viruses to develop targeted therapies, advancing an innovative fight against cancer.

Leukaemia research drives advancements in oncology, improving diagnosis and treatment strategies for this challenging disease.

"I got an opportunity to dig profound into her life and work, to comprehend her brightness in the field. Work as well as how she was personally, which wouldn't have crossed me in any case."

- Rayintakath



KAMALA SOHONIE

First Indian Woman to Secure a PhD

INVENTIONS

Cytochrome C: Discovered vital enzymes powering life.

Vitamins Research: Uncovered the presence of Vitamin A in plant cells.

Nutrition Research: Highlighted nutritional superiority of ragi (finger millet).

REAL-LIFE APPLICATIONS

Cytochrome C is vital in energy production and various biological processes, contributing to cellular function and overall well-being.

Innovative research combats malnutrition, addressing inadequate nutrition, its consequences, and low-cost nutritious food.

Advanced food preservation improves food security by enhancing preservation techniques and extending shelf life.

"Breaking the barriers in the history of Indian Science."

-Ravi Viswakarma

m.s. SWAMINATHAN



Father of Green Revolution in India

INVENTIONS

Developed High-Yield, Disease-Resistant Wheat.

Introduced High-Yield IR8 Rice.

Led ICAR Wheat Improvement Program.

REAL-LIFE APPLICATIONS

High-yield, disease-resistant wheat varieties like Sonalika and Kalyan Sona boost production, increasing yields and crop life.

The high-yield IR8 rice tripled rice yield in India, preventing famine and ensuring food security.

ICAR wheat Program boosts productivity with disease-resistant varieties, enhancing crop resilience and yield.

"If agriculture goes wrong, nothing else will have a chance to go right."

- M.S. Swaminathan



MEGHNAD SAHA

The Maestro of Thermal Ionization

INVENTIONS

Saha Ionization Equation: Developed equation for star's spectral classification.

Theory of Thermal Ionization: Pioneered the theory explaining stellar spectra.

Research on Halley's Comet: Conducted significant research on Halley's Comet.

REAL-LIFE APPLICATIONS

The Saha ionization equation identifies elements in stars, deepening our understanding of stellar composition.

The theory of thermal ionisation advances plasma physics and nuclear fusion research, unravelling complex phenomena.

Research on Halley's comet enhances orbit prediction and our knowledge of comet dynamics in the solar system.

“Not numbering and counting, but ripening like a tree”.
- Meghnad Saha

NIKOLA TESLA



The Father of Modern Electricity

INVENTIONS

Rotating Magnetic Field: Conceptualized rotating magnetic field for AC power systems.

Tesla Coil: Invented high voltage, low current electrical-resonant transformer circuit.

Radio: Pioneered wireless signal transmission over a distance of 25 miles.

REAL-LIFE APPLICATIONS

Rotating magnetic fields and AC motors optimize efficiency and functionality in electric motors for appliances and machinery.

Tesla coil powers science museum demos and finds practical use in radio communication and medical devices.

Radio technology powers global wireless communication, enabling worldwide TV, mobile networks, and WiFi connectivity.

“If you want to find the secrets of the universe, think in terms of energy, frequency, and vibration.”

- Nikola Tesla



PRAFULLA CHANDRA RAY

INVENTIONS

Father of Indian Chemistry

Mercury Compounds: Discovered new stable compounds of mercury, mercurous nitrite.

Organic chemistry: Synthesized stable pure ammonium nitrite at low temperatures.

Pharmaceuticals: Experimented and researched traditional medicines for better health outcomes.

REAL-LIFE APPLICATIONS

Mercury Compounds have potential use in pharmaceuticals, electronics, and chemical manufacturing industries.

Ammonium nitrate is widely used in producing explosives and organic chemistry reactions.

The advent of pharmaceutical companies helped produce affordable indigenous ayurvedic medicines for ordinary people.

"There is no delight like that which springs from a discovery, it is a joy that gladdens the heart."

- Prafulla Chandra Ray

RAJESHWARI CHATTERJEE

First Woman Engineer from Karnataka



INVENTIONS

Microwave Research: Pioneered microwave research in India and established India's first microwave research lab.

Antenna Engineering: Innovated antenna design for communication.

Electromagnetic Theory: Enhanced understanding of microwave technology.

REAL-LIFE APPLICATIONS

Microwave research found widespread applications in communication & cooking appliances, revolutionizing them.

Antenna engineering is crucial for reliable and efficient mobile, television, and satellite signal transmission.

Electromagnetic theory shapes wireless communications and medical diagnostics, driving advancements in these fields.

"Lucky to be where I am"
-Rajeshwari Chatterjee



RICHARD FEYNMAN

Master Conjuror of Physics

INVENTIONS

Quantum Electrodynamics (QED): Developed light and matter interaction theory.

Feynman Diagrams: Introduced graphical method for particle interaction calculation.

Nanoscale Device Physics: Pioneered nanotechnology with his futuristic vision.

REAL-LIFE APPLICATIONS

Quantum Electrodynamics impact laser development and enhances our understanding of electron behaviour in electronics.

Feynman diagrams are essential for analyzing particle interactions and studying the small-scale universe.

Nanotechnology has driven crucial advancements in medicine and electronics, revolutionizing various applications.

"Gravitation is, so far, not understandable in terms of other phenomena."

-Richard Feynman

RODDAM NARASIMHA



The Fluid Dynamics Visionary

INVENTIONS

Fluid Dynamics Research: Revolutionized turbulence, flow control, and aerodynamics.

Aerospace Engineering: Advanced high-speed flows, supersonic combustion, aircraft design.

Wind Tunnel Design: Pioneered essential tools for Aerodynamics Research.

REAL-LIFE APPLICATIONS

Turbulence and flow control are essential in optimizing fluid flow and enhancing energy efficiency in various applications.

Aircraft design and performance focus on enhancing safety, efficiency, speed and driving advanced aviation technology.

Wind tunnel technology is pivotal in advancing aerodynamics research and optimizing vehicle design for performance.

"An outstanding scientist, passionate about leveraging the power of science and innovation for India's progress. "

-Prime Minister of India



ROSALIND FRANKLIN

Sylvia Plath of molecular biology

INVENTIONS

DNA Structure: Contributed to the discovery of DNA's double helix structures (Photo 51).

RNA Structure: Pioneered work on the RNA structure of the tobacco mosaic virus.

Coal and Graphite Structure: Explored porous nature and structures of coal and graphite.

REAL-LIFE APPLICATIONS

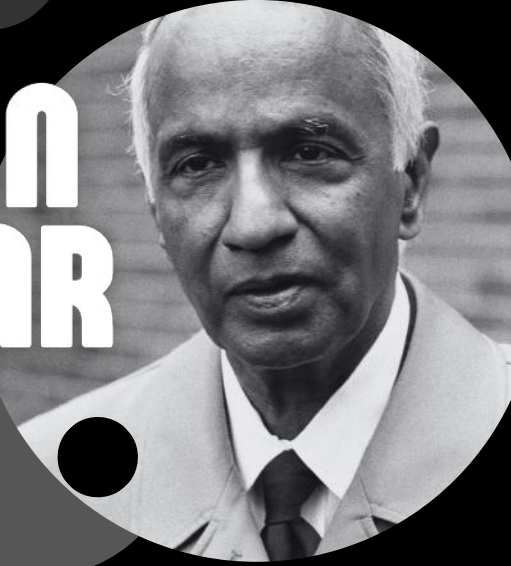
The **DNA structure** revolutionizes gene therapy, offering potential cures for genetic disorders and previously incurable conditions.

The **structure of RNA** plays a vital role in developing antiviral drugs, contributing to the advancement of medical treatment.

The **structure of coal and graphite** fuels advancements in energy storage technology, driving innovations in sustainable energy.

**"Science and everyday life cannot and should not be separated".
- Rosalind Franklin**

SUBRAHMANYAN CHANDRASEKHAR



The Man Behind The Name

INVENTIONS

Chandrasekhar limit: Discovered maximum mass of white dwarf stars.

Brownian motion: Suggested theory to understand random motion in fluids.

Illumination and polarization of sunlit sky: Proposed theory to explore light scattering and atmospheric polarisation.

REAL-LIFE APPLICATIONS

The Chandrasekhar limit helps in predicting the life of white dwarf stars, shedding light on their evolution and behaviour.

Brownian motion theory has significantly enhanced drug delivery systems and advanced diffusion studies.

The theory of illumination and polarization of the sunlit sky advances meteorology and satellite communication capabilities.

"Science is a perception of the world around us. Science is a place where what you find in nature pleases you."

- Subrahmanyan Chandrasekhar

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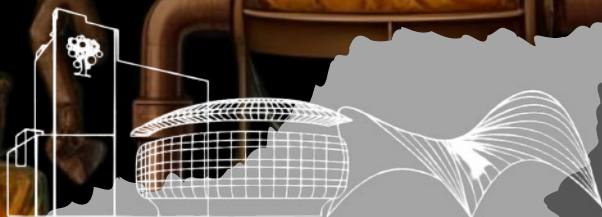
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