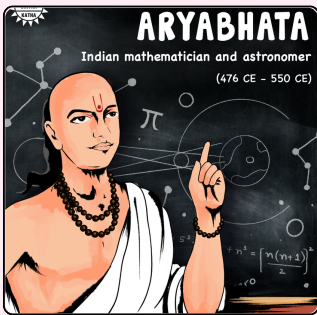


Indian Scientists

Ever wondered how the number zero came to be? Or how ancient surgeons performed incredible feats? From the mathematical genius of Aryabhata to today's space exploration, India has been a powerhouse of brilliant minds. This article explores the incredible journey of Indian scientists, a legacy of curiosity, ingenuity, and breakthroughs that continues to inspire globally.

Aryabhata (476-550 CE)



Aryabhata, a legendary Indian mathematician and astronomer, laid the foundation for India's scientific heritage through his work.

Key Contributions

- Introduced the decimal system and zero as a placeholder.
- Accurately calculated π (Pi) as 3.1416.
- Developed sine, cosine and versine functions in trigonometry.
- Solved linear and quadratic equations, introduced Kuttaka method for indeterminate equations.
- Provided geometric formulas for areas and volumes of triangles and spheres.
- Proposed that the Earth rotates on its axis and is spherical in shape.
- Gave scientific explanations for solar and lunar eclipses using shadows.
- Accurately computed sidereal periods and planetary motions.

Aryabhata's legacy shaped future Indian scholars Bhaskara I and II, deeply influencing astronomy, calendar calculations and education across centuries.

Charaka (100 BCE – 200 CE)

Charaka, a pioneering Indian physician, is considered one of the **"Fathers of Medicine"** or the **"Father of Ayurveda"** in India and



is considered a cornerstone in the practice of the ancient Ayurvedic medicine system.

Key Contributions

- **Charaka Samhita:** A foundational Ayurvedic text divided into eight sections, covering medical principles, diagnosis, treatment methods, pharmacology and preventive care.
- **Holistic Health:** Advocated for ethical living, balanced lifestyle and mental well-being as integral to healing.
- **Preventive Medicine:** Stressed the importance of diet, exercise and hygiene.
- **Concept of Agni:** Introduced the idea of digestive fire (Agni), as central to health and disease prevention.
- **Therapies:** Described herbal medicines, Rasayana (rejuvenation therapy) and Panchakarma (detoxification techniques).

Charaka's teachings focus on treating the body, mind and spirit together. His work continues to influence natural and integrative medicine worldwide.

Sushruta (c. 6th century BCE)

Sushruta, known as the **"Father of Surgery"** for his groundbreaking contributions to surgical science.

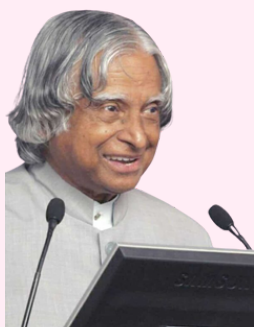


Key Contributions

- **Sushruta Samhita:** A detailed Sanskrit text on surgery, anatomy, diagnosis, prevention and herbal treatments.
- **Surgical Innovations:** Described over 300 surgical procedures and instruments, many of which resemble modern tools.
- **Pioneering Procedures:** Performed cataract surgery, caesarean sections and reconstructive surgeries like rhinoplasty (nose repair).
- **Anatomy and Hygiene:** Advocated human dissection for learning anatomy and promoted sterile techniques using herbal antiseptics.
- **Holistic Healing:** Treated illness through diet, herbs and balanced living, aligning with Ayurvedic principles.

Sushruta's work influenced ancient Greek and Roman medicine and laid the foundation for modern surgical practices.

Dr. A.P.J. Abdul Kalam (1931–2015)



Dr. Avul Pakir Jainulabdeen Abdul Kalam, known as the **"Missile Man of India"**, was a visionary scientist, educator and 11th President from 2002–2007. He played a significant role in India's defense and space programs.

Key Contributions

- Led the development of Agni and Prithvi missiles, boosting India's defence capability.
- Played a key role in the Pokhran-II nuclear tests (1998) as Chief Scientific Advisor, solidifying India's nuclear status.
- At ISRO, directed the successful launch of SLV-III, placing India's first satellite, Rohini, in orbit (1980).
- Headed DRDO, contributing to the Tejas Light Combat Aircraft and other military innovations.

Awards and Honours

- Bharat Ratna (1997), India's highest civilian award
- Padma Vibhushan (1990) and Padma Bhushan (1981)
- Honorary doctorates from over 40 universities
- International accolades, including the King Charles II Medal (UK, 2007).

Dr. Kalam's books and speeches continue to inspire generations to dream big and serve the nation with integrity.

Gagandeep Kang (Born in 1962)

Dr. Gagandeep Kang, an Indian microbiologist and virologist, is known for her groundbreaking work on enteric infections and her significant contributions to vaccine development and public health initiatives.



Key Contributions

- **Rotavirus Research and Vaccine Development:** She conducted extensive studies on rotavirus infections in Indian children and played a crucial role in developing and clinically testing Rotavac, an indigenous vaccine developed by Bharat Biotech.
- **Enteric Diseases and Public Health:** Researched enteric infections, sanitation, and water safety, focusing on child health and development. Established community-based birth cohort studies to understand disease natural history and long-term effects.

Dr. Kang's interdisciplinary approach, combining epidemiology and molecular biology, has significantly improved India's understanding of enteric diseases and vaccine development, thereby enhancing child health outcomes and shaping global health policies.

C.V. Raman (Chandrasekhara Venkata Raman) (1888–1970):



Dr. C.V. Raman, one of India's most celebrated physicists, was awarded the Nobel Prize in Physics (1930) for discovering the Raman effect, a

groundbreaking contribution to optics and molecular physics. He was also awarded Bharat Ratna in 1954.

Raman founded the Raman Research Institute in Bangalore (1948), fostering innovation in optics and quantum mechanics. His discovery revolutionized spectroscopic analysis, making it a vital tool in science and industry across the globe.

Key Contributions

- **Raman effect:** Showed that light changes wavelength when scattered by molecules, key to understanding molecular structure.
- Laid the foundation for Raman spectroscopy, widely used in chemistry, materials science and biotechnology.
- Advanced the study of acoustics, especially sound wave behaviour in musical instruments.
- Explained natural phenomena like the blue colour of the sky through light scattering principles.

Venkatraman "Venki" Ramakrishnan (Born 1952):

Venkatraman Ramakrishnan, an Indian-born American-British structural biologist, was awarded the 2009 Nobel Prize in Chemistry for his groundbreaking work on the structure of ribosome.



Key Contributions

- Used X-ray crystallography to map the 30S ribosomal subunit, revealing how proteins are synthesized in cells.
- His findings advanced understanding of genetic translation and how antibiotics target bacterial ribosomes.
- Contributed to the development of new antibiotics by showing how drug molecules bind and inhibit ribosomal function.

Awards and Honours

- Nobel Prize in Chemistry (2009)
- Padma Vibhushan (2010)
- Knight Bachelor (UK, 2012)
- Order of Merit (UK, 2022)

Ramakrishnan's work revolutionized structural biology, with major implications for medicine, drug design and biochemistry, inspiring a generation of scientists in molecular research.

Conclusion

Indian scientists have made remarkable contributions to science and technology, both in ancient times and in the modern world. Their work has advanced fields like medicine, mathematics, astronomy, physics and biology, showing a deep commitment to understanding the world and solving real-life problems.

Their legacy lies not only in their discoveries, but in the spirit of curiosity, perseverance and innovation they represent, paving the way for future generations to explore, create and lead in the global scientific arena.

World Earth Day – April 22

One Planet. One Chance.

World Earth Day is celebrated to unite people across the globe in a powerful movement to protect and preserve our only home, Planet Earth.

Why Celebrate Earth Day?

Earth Day is a special occasion to remind us how important our planet is and how we must take care of it.

- Nature needs our help: Trees, animals, rivers, and the air we breathe are being harmed by pollution and waste.
- Clean air, water, and land are not unlimited: We only have one Earth, and its clean resources can run out if we waste or pollute them.
- Every living thing is connected: Plants, animals and humans, we all depend on each other to survive. If we harm one part of nature, it affects everything.
- We must act now to protect our future: Earth Day encourages us to think of smart and innovative ideas to save energy, reduce waste, and keep our planet safe for future generations.



How can we Celebrate Earth Day?

- Celebrate with a Theme: Planet vs. Plastic
- Plant a Tree or Start a Mini Garden
- Organise a 'Trash to Treasure' Craft Contest
- Organise a Clean-Up Drive
- Go Digital-Free for an Hour
- Launch a Green Pledge Wall

Did You Know?

A plastic bottle takes over 450 years to decompose. 91% of plastic isn't recycled. Today, oceans have more than 170 trillion plastic particles.