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# Indian Association for the Cultivation of Science Marks 150 Years, Celebrating India's Scientific Awakening and Research Legacy

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## Recent Developments:

- **The Indian Association for the Cultivation of Science (IACS)** is commemorating its **150th anniversary**, marking the journey of India's oldest scientific research institution established by Indians for original scientific research.
- **The Union Government** inaugurated an **indigenous Plasma Enhanced Chemical Vapor Deposition (PECVD) facility** for India's first **amorphous silicon solar cell**, along with **RETINA (Research Entrepreneurship for Translation, Innovation and Navigation)** to strengthen the research-to-innovation ecosystem.
- **IACS** is also expanding its scientific infrastructure through a proposed **second campus at Baruipur**, aimed at enhancing research capacity and doubling student intake.

## Indian Association for the Cultivation of Science (IACS):

### *Introduction:*

- **The Indian Association for the Cultivation of Science (IACS)** was established on **29 July 1876** in **Calcutta (now Kolkata)** by **Dr. Mahendralal Sircar** as India's first national institution created specifically for scientific research by Indians.
- **IACS** occupies a unique position in the history of modern Indian science because it introduced an indigenous institutional framework for original scientific research during colonial rule.
- **The institution** laid the intellectual foundation for scientific self-reliance long before the emergence of modern national research laboratories.
- **At present**, **IACS** functions as an **autonomous institution under the Department of Science and Technology (DST), Government of India**, and is also a **Deemed-to-be University**.

### *Vision Behind its Establishment:*

- **The establishment of IACS** represented not merely the creation of a laboratory but the beginning of an organised national movement for scientific research by Indians.
- **Its central objective** was to enable Indians to generate original scientific knowledge instead of remaining passive recipients of Western science.
- **The institution** sought to cultivate scientific temperament, experimental inquiry, and intellectual independence among Indians.

## Historical Background:

### *Connection with the Bengal Renaissance:*

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- **IACS** emerged during the broader intellectual and cultural movement known as the **Bengal Renaissance**.
- **The Bengal Renaissance** became the leading centre of India's modern intellectual awakening by influencing philosophy, literature, education, social reform, and scientific thought.
- **Within this environment**, **IACS** became one of the earliest institutional expressions of scientific nationalism by promoting original scientific research among Indians.

### **Mahendralal Sircar and Scientific Self-Reliance:**

#### ***Scientific Vision:***

- **Dr. Mahendralal Sircar (1833–1904)** was the principal architect behind the establishment of **IACS** and one of nineteenth-century India's foremost scientific thinkers.
- **He believed** that scientific education was essential for India's intellectual, social, and economic advancement.
- **He argued** that the development of the physical sciences offered the most effective means for strengthening the intellectual capabilities of Indian society.

#### ***Advocacy for Scientific Research:***

- **In 1869**, through an article published in the **Calcutta Journal of Medicine**, **Sircar** emphasised the necessity of scientific education for national progress.
- **In 1872**, while addressing the **Bethune Society** at the **Medical College Theatre, Calcutta**, he criticised the colonial administration for failing to create adequate opportunities for scientific research by Indians.
- **His long-term vision** ultimately materialised with the establishment of **IACS** on **29 July 1876**, creating India's first indigenous institution dedicated to scientific research.

### **Role of IACS in Modern Indian Science:**

#### ***Promotion of Scientific Research Culture:***

- **IACS** provided one of the earliest institutional platforms where Indians could undertake independent scientific research during the colonial period.
- **The institution** promoted experimentation, scientific inquiry, and critical thinking instead of rote learning.
- **It established** a sustainable research culture that encouraged originality and scientific excellence.

#### ***Institution Building:***

- **IACS** nurtured several generations of Indian scientists and contributed significantly to the evolution of India's scientific institutional framework.
- **The institution** demonstrated that world-class scientific research could be conducted through indigenous institutions built and managed by Indians.

#### ***Contribution to Nation Building:***

- **IACS** linked scientific advancement with national development by promoting science as an instrument of modernisation, self-confidence, and nation-building.
- **Its success** strengthened confidence in India's ability to create globally competitive scientific institutions.

### **C.V. Raman and the Global Recognition of Indian Science:**

#### ***Association with IACS:***

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- **Sir C.V. Raman** joined the **Accountant General's Office, Calcutta**, in **1907**, where he first came across **IACS**.
- **Amrit Lal Sircar**, son of **Mahendralal Sircar**, recognised Raman's scientific interest and permitted him to conduct research in the Association's laboratories outside office hours.
- **For nearly a decade**, Raman balanced his government service with experimental research at **IACS** before resigning in **1917** to become **Palit Professor of Physics** at the **University of Calcutta**.
- **Even after leaving government service**, **IACS** remained the principal centre of his experimental research.

#### *Discovery of the Raman Effect:*

- **Sir C.V. Raman** announced the discovery of the **Raman Effect** on **28 February 1928** at the laboratories of **IACS**.
- **The Raman Effect** describes the inelastic scattering of light resulting in a change in wavelength after interaction with molecules.
- **This discovery** earned **Sir C.V. Raman** the **1930 Nobel Prize in Physics**, making him the **first Asian scientist** to receive a Nobel Prize in the sciences and securing India's first Nobel Prize in Science.

#### **IACS as a Symbol of National Scientific Awakening:**

##### *National Intellectual Transformation:*

- **The establishment of IACS** represented much more than the creation of a scientific research institution because it marked the beginning of India's organised scientific awakening during the colonial period.
- **The institution** demonstrated that **science could be pursued as a national mission**, and that scientific advancement was essential for India's intellectual, economic, and social transformation.
- **IACS** proved that Indians possessed the capability to establish and sustain world-class institutions dedicated to scientific research without depending exclusively on colonial support.
- **The institution** strengthened the idea that **scientific progress, social reform, and national development** were closely interconnected and mutually reinforcing.
- **The growth of modern India** required not only political consciousness but also scientific temper, research capability, and technological advancement.
- **IACS** therefore emerged as one of the foundational institutions responsible for shaping the evolution of modern Indian science.

#### **Continuing Legacy:**

##### *Scientific Relevance in Contemporary India:*

- **The legacy of IACS** continues because it represents the convergence of **scientific excellence, institution-building, and national self-reliance**.
- **The institution** remains one of India's leading centres for advanced research in **physics, chemistry, biological sciences, materials science, and interdisciplinary scientific research**.
- **Its continuing relevance** aligns closely with India's present emphasis on **research, innovation, indigenous technology development, Startup ecosystem, Deep Technology, and Atmanirbhar Bharat**.
- **The history of IACS** demonstrates that scientific capability develops through sustained institutional support, long-term investment, and a culture of inquiry rather than through short-term initiatives.
- **The celebration of the 150th anniversary** recognises not only the survival of a historic institution but also India's continuing commitment to scientific excellence and knowledge creation.

#### **Contribution to India's Scientific Institution-Building:**

##### *Long-Term Institutional Impact:*

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- **IACS** pioneered the model of independent scientific research institutions, which later influenced the establishment of several national scientific organisations in independent India.
- **The institution** strengthened India's research ecosystem by demonstrating the importance of dedicated laboratories, scientific collaboration, and institutional autonomy.
- **Its success** inspired the expansion of scientific education and research infrastructure across the country during the twentieth century.
- **The scientific culture** nurtured by **IACS** contributed significantly to India's emergence as an important scientific and technological nation.

### Related Institutions for UPSC:

#### *Major Scientific Research Institutions:*

- **Council of Scientific and Industrial Research (CSIR):** India's largest publicly funded research and development organisation with laboratories across diverse scientific disciplines.
- **Indian Institute of Science (IISc), Bengaluru:** India's premier institution for higher scientific education and advanced research.
- **Indian Institutes of Science Education and Research (IISERs):** Institutions established for integrating high-quality scientific education with research.
- **Department of Science and Technology (DST):** Nodal department responsible for formulating and implementing policies relating to science, technology, and innovation.
- **Department of Biotechnology (DBT):** Apex department promoting biotechnology research, innovation, and industrial applications.
- **Anusandhan National Research Foundation (ANRF):** National funding body established to strengthen research and innovation across universities, colleges, research institutions, and industry through competitive funding.

### Timeline of Major Events:

#### *Important Milestones:*

- **1869: Mahendralal Sircar** advocated scientific education through the **Calcutta Journal of Medicine**.
- **1872: Sircar** publicly called for an Indian scientific research institution while addressing the **Bethune Society**.
- **29 July 1876: Indian Association for the Cultivation of Science (IACS)** was established in **Calcutta**.
- **1907: Sir C.V. Raman** began conducting research at **IACS** while serving in the **Accountant General's Office**.
- **1917: Sir C.V. Raman** joined the **University of Calcutta** as **Palit Professor of Physics** but continued his experimental research at **IACS**.
- **28 February 1928: Sir C.V. Raman** announced the discovery of the **Raman Effect** at **IACS**.
- **1930: Sir C.V. Raman** received the **Nobel Prize in Physics**, becoming the first Asian scientist to receive a Nobel Prize in the sciences.
- **2026: IACS** is commemorating its **150th anniversary**, highlighting its enduring contribution to Indian science.

### Significance for UPSC:

#### *Why the Topic Matters:*

- **IACS** represents the origin of India's organised scientific research ecosystem and the institutionalisation of scientific inquiry.
- **The institution** illustrates the relationship between **science, nationalism, education, and socio-economic development** during the colonial period.

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- **The topic links the Bengal Renaissance, scientific nationalism, modern Indian history, and science & technology**, making it relevant across multiple UPSC General Studies papers.
- **The contribution of IACS** reflects the role of scientific institutions in promoting **Atmanirbhar Bharat**, innovation-driven growth, and knowledge-based development.

### **Value Addition for UPSC:**

#### ***Prelims Value:***

- **Indian Association for the Cultivation of Science (IACS)**
- **Mahendralal Sircar**
- **Bengal Renaissance**
- **Raman Effect**
- **28 February – National Science Day**
- **Sir C.V. Raman**
- **1930 Nobel Prize in Physics**
- **Department of Science and Technology (DST)**
- **Anusandhan National Research Foundation (ANRF)**

#### ***Mains Value (GS-I & GS-III):***

- **The evolution of modern Indian science demonstrates that institution-building, scientific temper, and indigenous research capability constitute essential foundations of national development, technological self-reliance, and long-term economic competitiveness.**