



## Gender Gap in Indian STEM Faculties

**For Prelims:** [STEM](#), Women in STEMM (WiS) Program, Vigyan Jyoti, [International Day of Women and Girls in Science](#)

**For Mains:** Underrepresentation of Women in Indian STEM, Policy Formulation about STEM Sciences, Education

[Source: TOI](#)

### Why in News?

A significant **gender gap exists in Indian [STEM\(science, technology, engineering, and math\) faculties](#)**, with a BiasWatchIndia study revealing that only 13.5% of faculty members across 98 universities and institutes are women.

- This underrepresentation is more prominent in India compared to countries like the US and UK.

### Why is there a Gender Gap in Indian STEM Faculties?

- **Social Bias Against Women in Certain STEM Fields:** Fields like Biology, seen as "soft sciences," have higher female representation compared to hard sciences like Engineering and Physics.
  - **Societal biases discourage women** from pursuing fields perceived as less feminine, affecting their choices in higher education and research.
- **Lack of Support During PostDoc to Faculty Transition:** The critical transition from postdoc to faculty often aligns with family planning, leading to difficult choices for women.
  - Societal pressure **prioritising family over career ambitions** and a lack of support structures exacerbate the challenge.
- **Toxic Workplace Environment:** Many women exit STEM academia due to a toxic work environment.
  - Factors include **disrespect, inadequate access to resources**, and limited advancement opportunities compared to male colleagues.
- **Difficulty Accessing Gender Representation Data:** Absence of a central database tracking women faculty in STEM across India.
  - Lack of data hinders understanding of the gender gap and monitoring progress towards gender equality.

### What are the Government Initiatives to Promote Women in STEM?

- **Women in STEMM (WiS) Program:** Launched by the [Department of Science and Technology\(DST\)](#), it provides scholarships, fellowships, and research grants to women in STEM. It also offers mentorship and networking opportunities.
- **Vigyan Jyoti:** It was introduced in 2019-20 to encourage meritorious girl students in classes 9-12 to pursue higher education and careers in STEM fields, addressing the underrepresentation of

women in these areas.

- Developed by the Department of Science and Technology, it offers workshops, mentoring, and resources for young women in STEM.
- The program provides support from the school level to PhD level.

▪ **Women in Science and Engineering-KIRAN (WISE-KIRAN):** It encourages women scientists to **pursue research in frontier areas of science and engineering** and to address societal problems through S&T-based internship and self-employment opportunities.

- Many well-qualified women face challenges in participating in S&T activities due to circumstances typically associated with gender, such as career breaks due to **motherhood and family responsibilities**.
- To address these issues, the **DST will provide opportunities for women scientists and technologists aged 27-57** who have taken a career break but wish to return to mainstream work.



# International Day for Women and Girls in Science



## ABOUT

- Celebrated **every year on February 11** since 2015
- Observed by the United Nation to **promote the full and equal access and participation of women in Science, Technology, Engineering and Mathematics (STEM)** fields.

## THEME 2023

- Innovate. Demonstrate. Elevate. Advance. Sustain (**I.D.E.A.S.**)

## STATUS OF WOMEN PARTICIPATION IN THE SCIENCE SECTOR

- According to the **All India Survey on Higher Education 2020-2021**, number of science researchers in India has **doubled from 30,000 in 2014 to over 60,000 in 2022**.
- Women's participation is the **highest in biotechnology at 40% and medicine at 35%**.

## INITIATIVES TAKEN FOR WOMEN IN SCIENCE

- **Gender Advancement for Transforming Institutions (GATI):**
  - To develop a comprehensive Charter and a framework for assessing Gender Equality in STEM.
- **Vigyan Jyoti Scheme:**
  - To create a level-playing field for the meritorious girls in high school to pursue STEM in their higher education.
- **Indo-US Fellowship for Women in STEMM (WISTEMM) program:**
  - Women scientists can work in research labs in the US.
- **Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) Programme:**
  - Improving R&D infrastructure and establishing state-of-the-art research facilities in order to create excellence in S&T in women universities.

## Women who Shaped India's Scientific History



**Anandibai Gopalrao Joshi (1865-1887)**

- First Indian female to study and graduate with a degree in western medicines from the United States.
- Believed to be the **first women to set foot on American soil from India**.



**Kamala Sohoni (1911-1998)**

- **First Indian woman to receive a PhD** in a scientific discipline.
- Discovered the enzyme '**Cytochrome C**' (helps in energy synthesis).



**Kadambini Ganguly (1861-1923)**

- Becomes **India's first female doctor & practitioner** of western medicine in the whole South Asia.



**Bibha Chowdhary (1913-1991)**

- First woman **high energy physicist of India** and the first woman scientist at the **TFIR**.
- IAU honoured her by naming a white yellow dwarf star after her name.



**Kamal Ranadive (1917-2001)**

- **Established India's first tissue culture research laboratory** at the Indian Research Centre in Mumbai.



**Anna Mani (1918-2001)**

- First woman to join the **Meteorological department**.



**Edavaleth Kakkat Janaki Ammal (1897-1984)**

- Made significant contributions to genetics, evolution, phytogeography and ethnobotany.
- **First director of the Central Botanical laboratory at Allahabad**.



**Sanghamitra Bandyopadhyay**

- She **has been conferred the Padma Shri in 2022**.
- She is the first woman director of the Indian Statistical Institute.



**Debala Mitra (1925-2003)**

- **First Indian archaeologist** served as Director General of the Archaeological Survey of India.
- Explored and excavated several Buddhist sites.



**Ms. Sujatha Ramdorai**

- She was **awarded the Padma shri award in 2023**.
- She became the **first Indian to win the prestigious ICTP Ramanujan Prize** in 2006.
- She was also **awarded the Shanti Swarup Bhatnagar Award**, the highest honour in scientific fields by the Indian Government in 2004.
- She is also the **recipient of the 2020 Krieger-Nelson Prize** for her exceptional contributions to mathematics research



## What Steps can be Taken to Bridge the Gender Gap in Indian STEM Faculties?

- **Flexible Work Arrangements and On-site Childcare:** Offer flexible work schedules, part-time options, and on-site childcare facilities for female faculty members, particularly those with young children. This can help address work-life balance challenges.
  - Programs like **DST's WISE-KIRAN** can be expanded to offer targeted support, such as **childcare options and flexible work arrangements**, to ease this crucial transition.
- **"Back to Academia" Fellowships:** Creating fellowship programs that support women who may have taken a break from academia to raise families, providing them with resources and mentorship to re-enter the research and teaching track.
- **International Collaboration and Exchange Programs:** Encouraging female faculty members to participate in international research collaborations and exchange programs, broadening their perspectives and research networks.
- **Visibility and Recognition:** Highlighting and celebrating the **achievements of female faculty members** through awards, public recognition, and media coverage. This boosts morale, inspires others, and promotes role models.
- **Women Safety and Data-Led Development:** Robust policies are needed in addressing workplace harassment and ensuring equal opportunities are crucial for retaining female talent.
  - Data collection on female faculty can be incorporated to create a central database, enabling better-targeted interventions.

### **Drishti Mains Question:**

Q. Analyse the factors contributing to the underrepresentation of women in Indian STEM and evaluate the effectiveness of existing initiatives related to promoting women in STEM.

## **UPSC Civil Services Examination, Previous Year Question (PYQ)**

### **Mains**

**Q.1** "Empowering women is the key to control population growth". Discuss. **(2019)**

**Q.2** Discuss the positive and negative effects of globalisation on women in India? **(2015)**

**Q.3** Male membership needs to be encouraged in order to make women's organisations free from gender bias. Comment. **(2013)**