International Day of Women and Girls in Science

For Prelims: **International Day of Women and Girls in Science (IDWGS)**, **Science Technology Engineering and Mathematics (STEM)**, Department of Science and Technology, Vigyan Jyoti Programme, GATI program.

For Mains: Representation of Women in Science and Associated Government Initiatives.

Source: PIB

Why in News?

The year 2025 marks the **10th anniversary** of the **International Day of Women and Girls in Science (IDWGS)**, observed annually on **11th February.**

- This day promotes the full and **equal participation of women and girls in Science, Technology, Engineering and Mathematics (STEM).**

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Drishti IAS

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.

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.

Edavaleth Kakkat Janaki Ammal (1897-1984)

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

Debala Mitra (1925-2003)

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

Kamala Sohonie (1911-1998)

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

Anna Mani (1918-2001)

- First woman to join the Meteorological department.

Kamal Ranadive (1917-2001)

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

Sanghamitra Bandyopadhyay

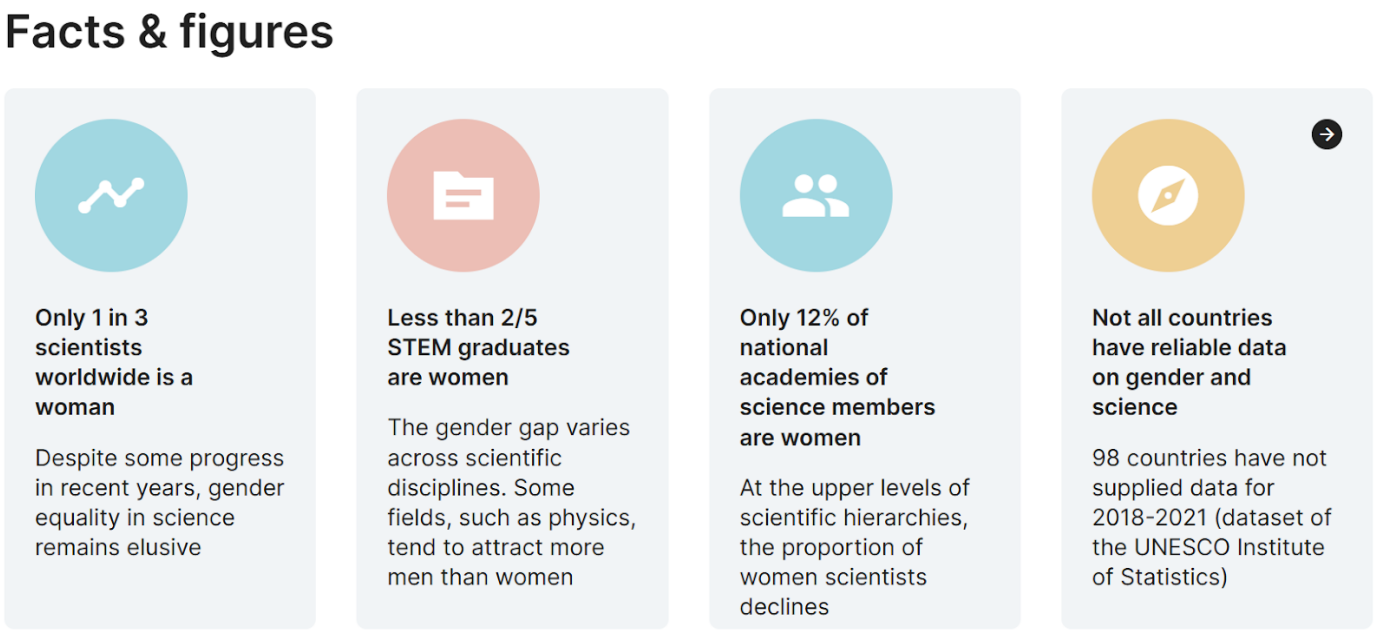
- She has been conferred the Padma Shri in 2022.
- She is the first woman director of the Indian Statistical Institute.

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 is the Status of Women in STEM?

- **Global Scenario:**
  - **Women in STEM:** According to **UN data,** globally, women remain underrepresented in **STEM education and careers**, constituting only **35% of STEM graduates**.
  - Between **1901 and 2024**, only **26 out of 650 Nobel laureates** in **Physics, Chemistry, and Physiology or Medicine** have been women.



- **Indian Scenario:**
  - **Women in Research:** Government data presented in **Lok Sabha (2024)** shows women comprise only **18.6% of the scientific workforce**.
  - **STEM Enrolment:** Women constitute **43% of STEM students** in higher education.
  - **Declining Representation:** Their presence significantly drops at **higher research levels** and **leadership positions** in scientific institutions.

Milestones of
Women in Indian Science

1848

Savitribai Jyotiba Phule
First female teacher of India who founded the first girls' school

1881

Lady Abala Bose
First Indian woman to study medicine at Madras University

1883

Chandramukhi Basu & Kadambini Ganguly
Calcutta University produces the first two women graduates in India

1886

Kadambini Ganguly
India's first female doctor & practitioner of western medicine in the whole of South Asia

Anandibai Gopalrao Joshi
First Indian female doctor of western medicine

Ramabai Ranade
Set up first girls' high school in Pune

1888

Chandramukhi Basu
First female head of an undergraduate academic establishment in the South Asia

Rupa Bai Furdoonji
World's first female anesthetist

1894

Rukhmabai Raut
The second woman to both receive a medical degree and practice medicine

1910

Sarala Devi Chaudhurani
Established first women's organization Bharat Stree Mahamandal for promoting female education

1917

Jagadish Chandra Bose & Lady Abala Bose
Basu Bigyan Mandir (Bose Institute) established

1926

Begum Rokeya Sultana
Pioneer in Women's Educational Rights in India

1938

Mary Poonen Lukose
First female Surgeon General in India

1939

Iravati Karve
First Indian female Anthropologist

Kamala Sohonie
First Indian woman to receive a PhD in a scientific discipline

1943

Ayyalasomayajula Lalitha
India's first woman engineer

1944

Asima Chatterjee
First woman to be awarded a Doctor of Science by an Indian University – Calcutta University

What are India's Initiatives Related to STEM?

- **National Initiative for Developing and Harnessing Innovations**
- **Vigyan Jyoti**
- **Gender Advancement for Transforming Institutions (GATI)**
- **WISE-KIRAN Scheme**

- **BioCARe Fellowship:**
  - It **supports women scientists in biotechnology and allied fields** to build successful research careers.
- **Technology Business Incubators (TBIs) at Women's Universities**
  - **TBIs** have been established at **IGDTUW (Delhi), SPMVV (Tirupati), and iTBI at DTU** to promote **women-led innovation and gender inclusivity** in entrepreneurship.

What are the Challenges Related to Women in STEM?

- **Workforce Dropout & Societal Barriers:** Women in STEM face **career discontinuity** due to **caregiving responsibilities, rigid work policies, and re-entry challenges**. **Cultural stereotypes** further discourage their participation, widening the gender gap in science.
- **Workplace Barriers: Gender biases**, lack of mentorship, and **underrepresentation in decision-making roles** restrict career growth. Women face lower access to **research funding and leadership positions**.
- **Institutional Barriers: Lack of gender-sensitive policies** such as **maternity benefits, flexible work arrangements** and **limited gender data access** hinder women's retention and equity in STEM.

Way Forward

- **Gender-Inclusive Policies:** Implement **gender-sensitive hiring, leadership quotas, and research grants** for women scientists. Promote **flexible work policies** and **family support programs** in scientific institutions.
- **Leadership & Mentorship:** Establish mentorship networks and **encourage women in leadership roles** in academia, research, and policymaking.
- **Workplace Equity:** Implement **transparent evaluation and promotion systems** to ensure equal pay and recognition for women.
- **Women Entrepreneurship:** Strengthen **NIDHI, BioCARe, and Technology Business Incubators (TBIs)** to support **women-led startups** in science and technology.
- **Global Collaboration:** Adopt successful models from countries with **higher women representation in STEM**, ensuring **global partnerships and exchange programs** for women researchers.

Drishti Mains Question:

Q. Examine the factors hindering women's participation and empowerment in STEM fields in India. Propose effective policy interventions to promote gender-inclusive growth in science and technology.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Which of the following gives 'Global Gender Gap Index' ranking to the countries of the world? (2017)

(a) World Economic Forum

(b) UN Human Rights Council

(c) UN Women

(d) World Health Organization

Ans: (a)

Q. Two of the schemes launched by the Government of India for Women's development are Swadhar and Swayam Siddha. As regards the difference between them, consider the following statements: (2010)

1. Swayam Siddha is meant for those in difficult circumstances such as women survivors of natural disasters or terrorism, women prisoners released from jails, mentally challenged women etc., whereas Swadhar is meant for holistic empowerment of women through Self Help Groups.
2. Swayam Siddha is implemented through Local Self Government bodies or reputed Voluntary Organizations whereas Swadhar is implemented through the ICDS units set up in the states.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: (d)

Mains

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

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

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