



MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÕES  
**INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS**

# Every action matters

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General Coordination of Engineering, Technology and Space Sciences

INPE

United Nations Expert Meeting on Space for Women  
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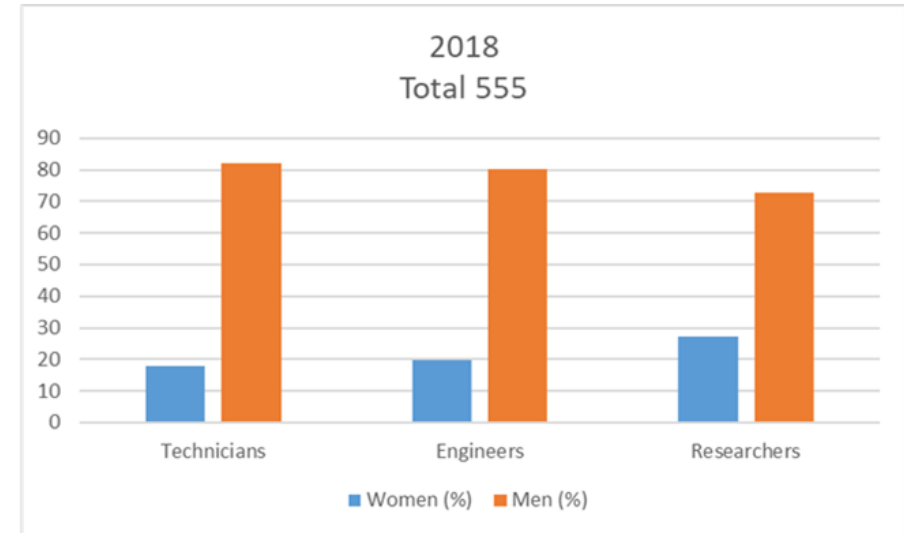
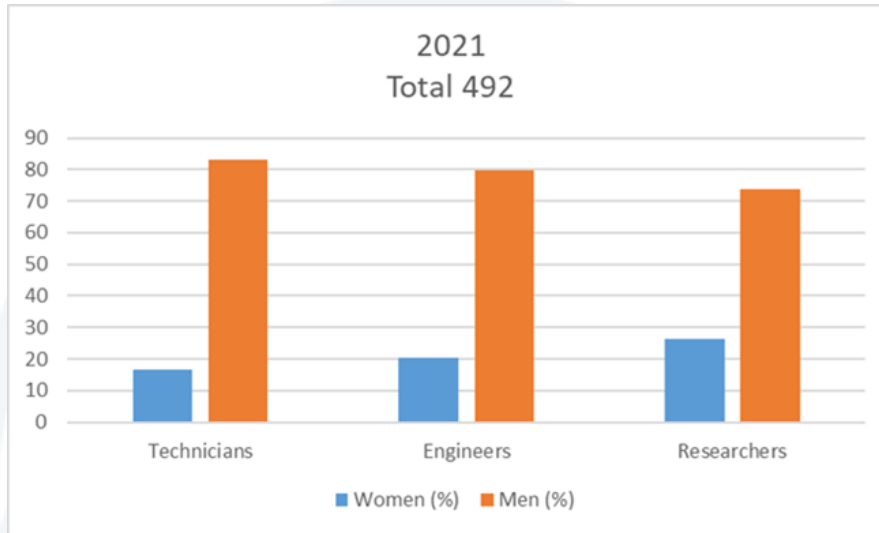
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# Collaborators

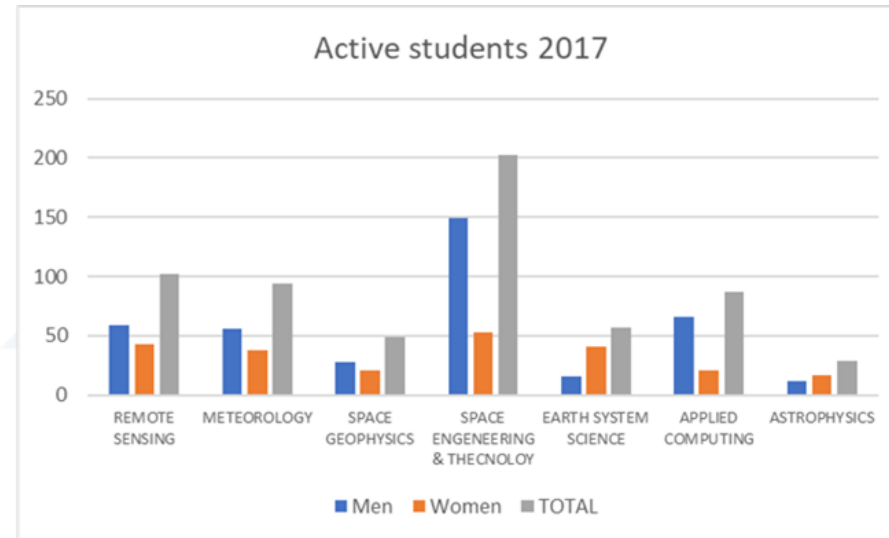
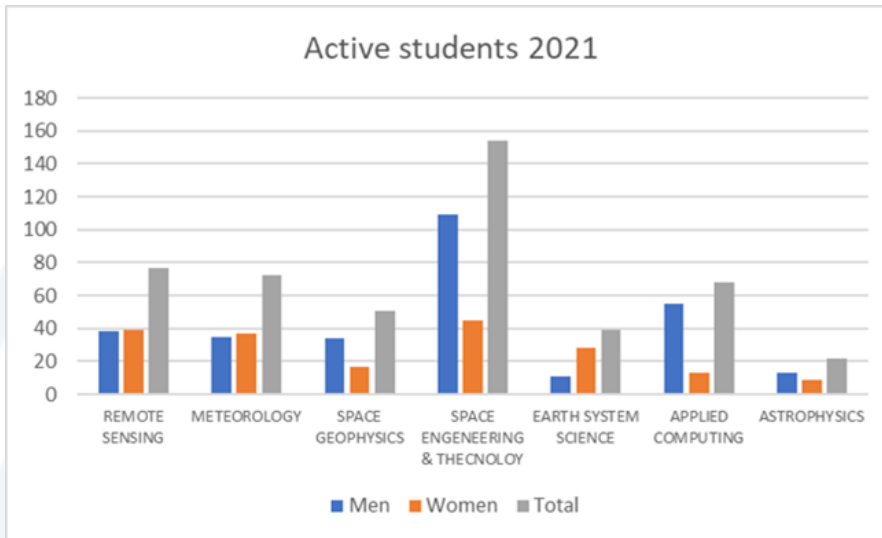
- Adriana Thome – MCTI
- Andreia Sorice - INPE
- Cristiane Zavati – INPE
- Fátima Mattiello – INPE
- Ludimila Moitinho de Souza - INPE
- Márcia Alvarenga – INPE
- Priscilla Sousa Frigi Raimundi – INPE

# Women presence at INPE (employees)



- INPE is now smaller than 3 years ago
- Considering the total of employees, we have ~23% of women
- Considering only STEM careers, among researchers ~27% women
- Among technicians and engineers, < 20% women
- Chief positions (for divisions, coordinations, etc): 26% of the positions are occupied by women. In 2017, it was ~23%.

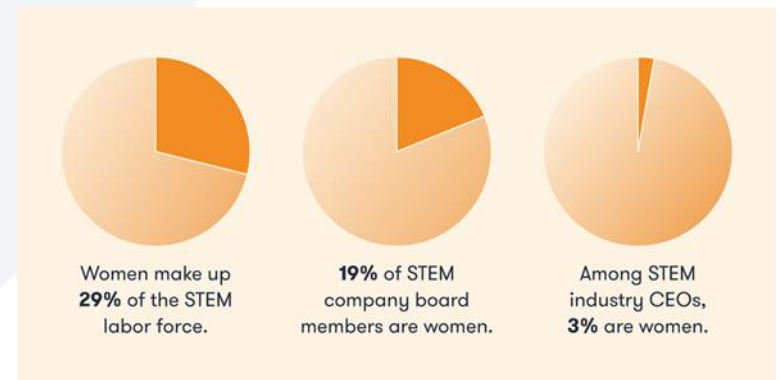
# Women presence at INPE (students)



- 2021 (left) - 483 active students on total, 188 women and 295 men (~39%)
- 2017 (right)- 620 active students on total, 234 women and 386 men (~38%) The number of students has decreased considerable
- the biggest differences in both years appear in the courses of Space Engineering and Technology and Applied Computing.
- In 2017, the Astrophysics course had more female students, which is not observed in 2021. For the Earth System Science course, most active students are women, for both years. For Meteorology and Remote Sensing, the percentage is ~50% for 2021.

# Around the world

- Women comprise 29% of the STEM workforce and 52% of the college-educated workforce (NSF).
- The number of women in board positions in STEM-related industries in 2020 was 19.2%, an increase of 18.3% over the previous year (MSCI)
- Women only make up 3% of STEM industry CEOs. (Credit Suisse)
- 29.3% of researchers worldwide are women. (UNESCO)
- Women make up 8% of global enrollment in manufacturing, construction and engineering courses. (UN)
- 5% of all mathematics and statistics students globally are women. (UN)



# Capacity building and training of INPE's employees

- INPE supports its employees in the development of graduate courses in different areas
- in the management career, encouraging the development of graduate works that can bring benefits to INPE's administrative activity
- some of these works diagnose the performance of women at INPE

# Action 1 - Women in science as a research object

Interviews with women researchers and technologists who held management positions, looking for identifying the critical incidents present in their professional trajectories. Common points:

- The presence of key people, including parents
- Studies abroad and the experience of other cultures (doctorate)
- be easy with math
- marriage at a very young age
- the experience of motherhood
- ability to balance personal and professional life

Source: "Professional Trajectories of Women Scientists in Positions of Leadership", by Priscilla Sousa Frigi Raimundi

# Action 1 - Women in science as a research object (cont)

Interviews with women engineers at INPE.

Common points:

- choice of engineering marked by the interest and skills of the exact sciences family and financial issues
- The choice for INPE influenced by the activities pertinent to the space research and the environmental issues resulting from them.
- career paths were defined by losses, such as deprivation of living with the family; and gains, such as those resulting from dedication to studies and career.
- being women brought more difficulties in their engineering careers than when they held leadership positions

Source: Scientific career in the space sector and the environment: : trajectories of engineers”, by Ludimila Moitinho de Souza



# Action 2 - Science transforming lives

- Andreia Sorice - chemical engineer, with a doctorate in Space Engineering and Technology (INPE).
- Cristiane Zavati - mechanical engineer, doctorate student in Space Engineering and Technology (INPE). Both are technologists at INPE.
- Márcia Alvarenga - doctor in law within the subject of space law. She is a from the management career at INPE.
- disseminate science in a very accessible language, accessed by youtube
- themes are always related to space science and a few of them have had women as speakers.
- Contribute to demystify the scientist's image as unattainable beings

# Action 2 - Science transforming lives (examples)

- “The Galileo mission and the volcanoes outside the Earth”, with the astronomer Rosaly Lopes (<https://www.youtube.com/watch?v=IXpYopTD4MA>)
- “The medical challenges of space missions” with the Master in Aerospace Medicine from Wright State University and PhD in Space Physiology from King's College London, Thais Russomano (<https://youtu.be/5bSe6UOuPuI>)
- “The space telescope Hubble”, with the astronomer Duília de Mello ([https://youtu.be/aToyPqi\\_63s](https://youtu.be/aToyPqi_63s))
- “NanosatC-BR2 Satellite and Professional Training”, with Fátima Matiello, Doctor in Space Engineering and Technology (INPE), and Pedro Ricotta, an 8 years student who dreams of being an astronaut. (<https://www.youtube.com/watch?v=5jHqG26JpWA>)

# Action 3 - Code of Conduct in Respect for Diversity

- All people, regardless of race, creed, gender, age, among other characteristics, should be treated with respect and consideration, valuing the diversity of views and opinions and providing a collaborative environment;
- Communication should be done in an open, respectful way, with criticism of ideas rather than individuals;
- The following behavior is considered unacceptable: harassment, intimidation or discrimination in any way; physical or verbal abuse of any individual.
- Examples of unacceptable behavior include, but are not limited to: verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion or nationality; inappropriate use of nudity and / or sexual imagery in public spaces or presentations; any kind of threat or harassment of any individual.
- This code shall be included in all event sites hosted by INPE.

# To think about

- When you are part of an evaluation group, value the work of women
- When you are a member of an organizing committee of conferences, seminars or others, consider inviting women to speak
- Don't forget that being an advisor often requires going beyond scientific work
- Are you prepared to leave your leadership position?
- Will your peers treat you differently after you have occupied a higher position?
- Do men ever think about this?

## Final comment

Once again, I appreciate the opportunity to be here. Many mentioned things may be obvious, but they always need to be remembered. As important as being here today, discussing the role of women in space activities, is thinking about how we can recover the respect for science, which is somewhat forgotten in so many places, and also how to obtain the necessary investments so that we can always advance.



Thank you!

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