

Girls InSpace

AT THE ARECIBO OBSERVATORY
FEBRUARY 11TH

with Dr. Alessandra Abe Pacini





← Girls In Space at the Arecibo... →

Title
Girls In Space at the Arecibo Observatory!

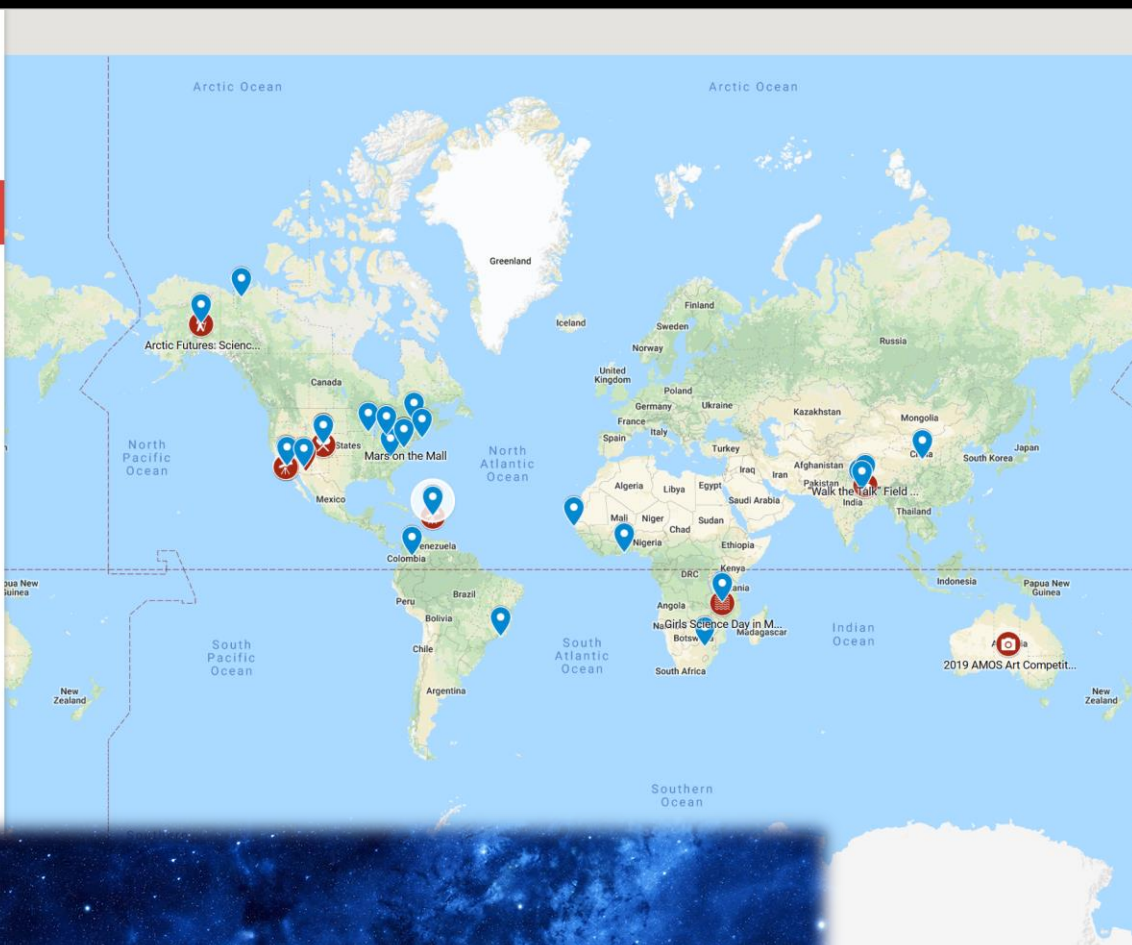
Date of Project
2/11/2019

Names
Alessandra Pacini

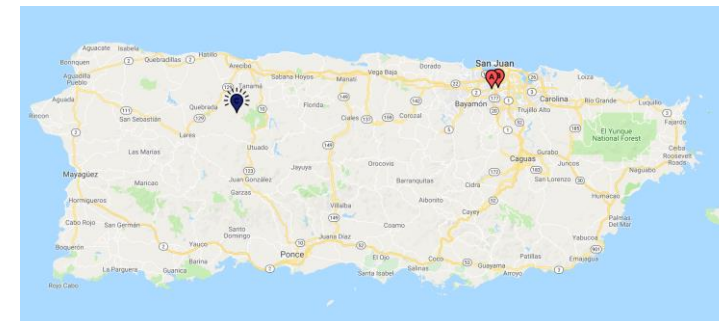
Email
apacini@naic.edu

Location
Arecibo Observatory - Arecibo, PR.

Description
This outreach event on International Day for Women and Girls in Science (11 February 2019) will bring 100 female students from Puerto Rican schools to the Arecibo Observatory's Science and Visitor Center (S&VC) to have a VIP backstage experience and participate on a workshop about the role of Women in Space Science. The event will be live-streamed (to promote a broader impact) and the onsite participant students will receive the Girls InSpace hardcopy books and stickers.

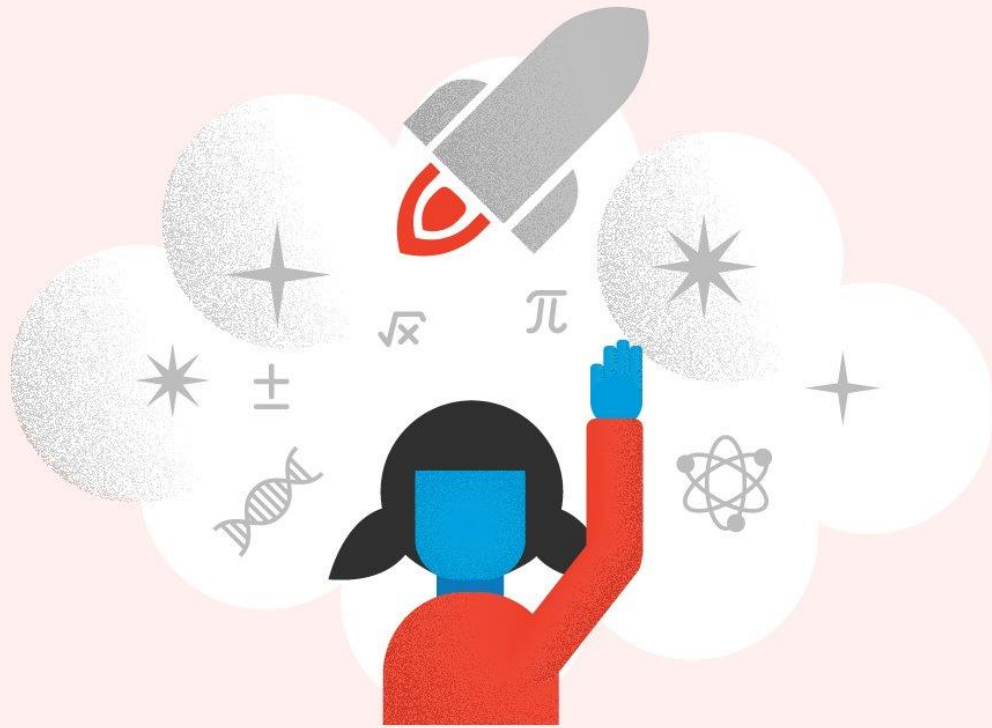


Colegio Puertorriqueño de Niñas Academia San José Guaynabo – Puerto Rico





International Day of
Women and Girls in Science



#WomenInScience



Feb 11 is the day to

"celebrate the achievements of known and unknown women, remembered or forgotten who initially paved the way for those who come later in every walk of life, as well as to provide an opportunity to all girls and boys to choose role models in science".

When one think of Science...

Draw-a-Scientist Test (Chambers, 1983)

5,000 students tested (~50/50)
28 girls, and no boys, drew female scientists.

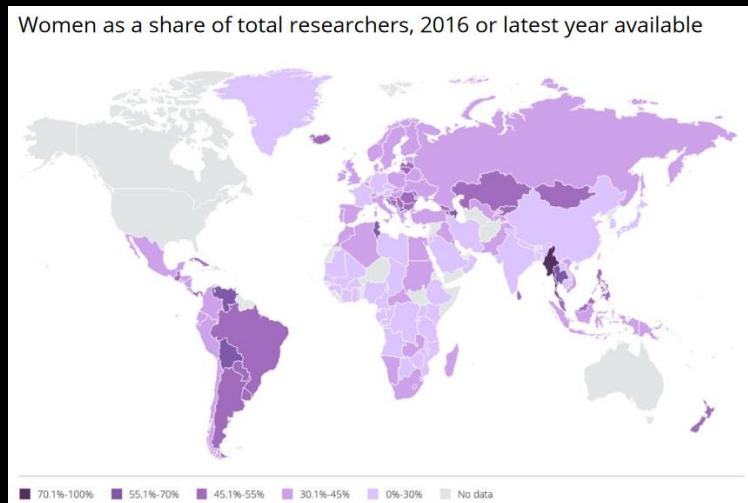


<https://doi.org/10.1002/sce.3730670213>

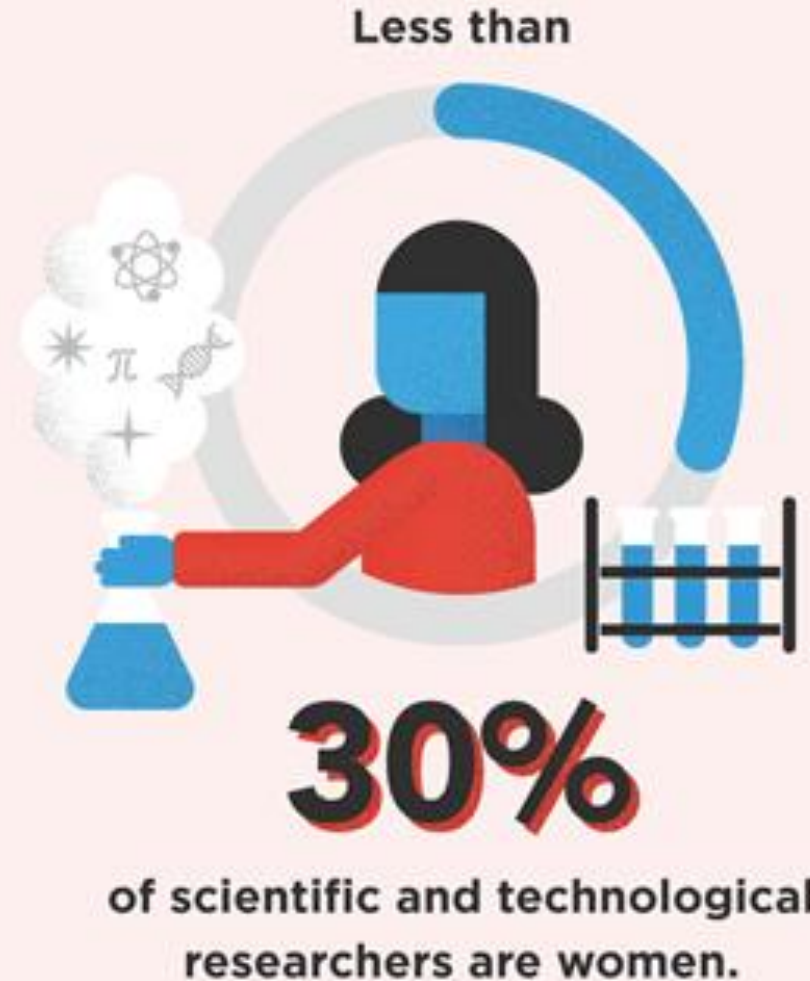


Today is Feb 11, 2019!

There is still a brutal low participation of women in STEM. Only 28.8% of the world's researchers are women. In poverty-stricken areas of the west and developing countries, the inequalities are more extreme.

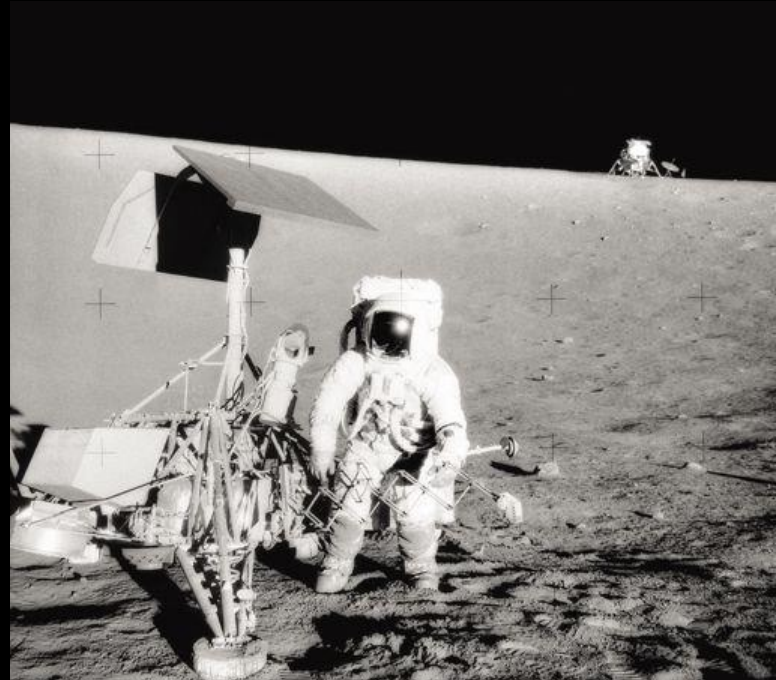
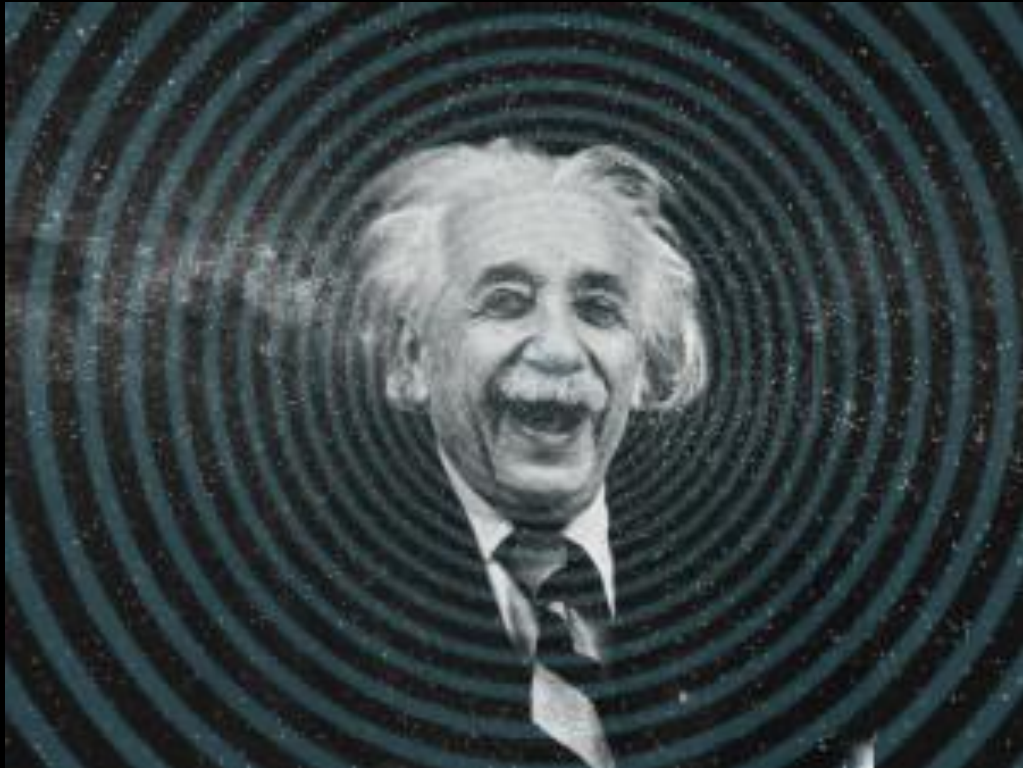
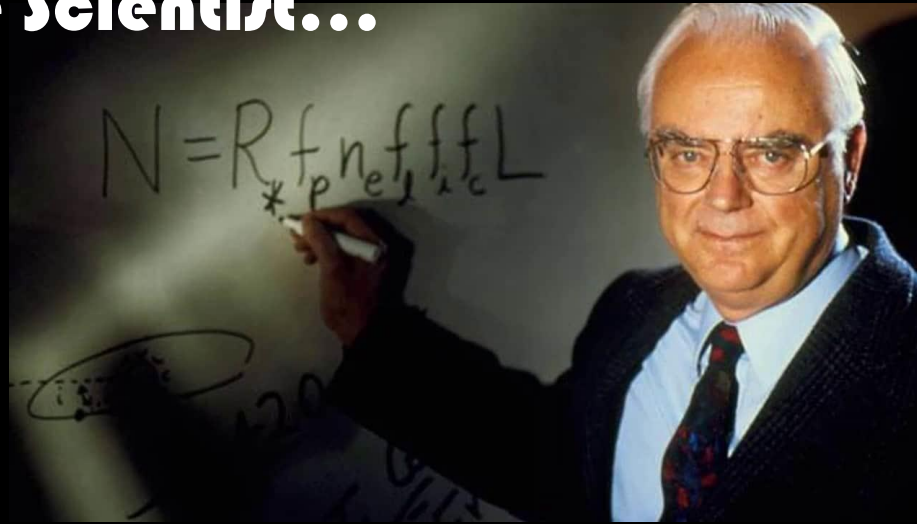


WOMEN IN SCIENCE



SOURCE | UNESCO

When one think of Space Scientist...





Some awesome PR space women



<http://astrocircle.org/>



Dr. Carmen Pantoja (UPR-RP)
1st Puerto Rican woman astronomer



Dr. Mayra Lebron-Santos (UPR-RP)
1st Puerto Rican astronomer to join the AO
science staff (in 2002)



Dr. Yari Collado-Vega (NASA)
Puerto Rican Space Weather specialist



<https://www.swise.org/>

Who am I? A Space Scientist

Alessandra Abe Pacini

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@_AlePacini



| @ale.a.pacini

- Brazilian Physicist (2004 - SP) 
- Master in Space Geophysics (2006 – SP/Brazil)
- PhD in Space Geophysics (2010 – SP/Brazil)
- PhD² in Physical Sciences (2015 – Oulu/Finland)
- Undergrad/grad professor (+10 years)



- Married with another nerd
- Mom²: Gabriel (7) and Aurora (2)
+ (little dog Indiana Jones)
- AO scientist and lover ♡



The Arecibo Observatory



305m (1,000 feet) diameter spherical single-dish antenna.

Largest single dish for 50 years

World's most sensitive ISR

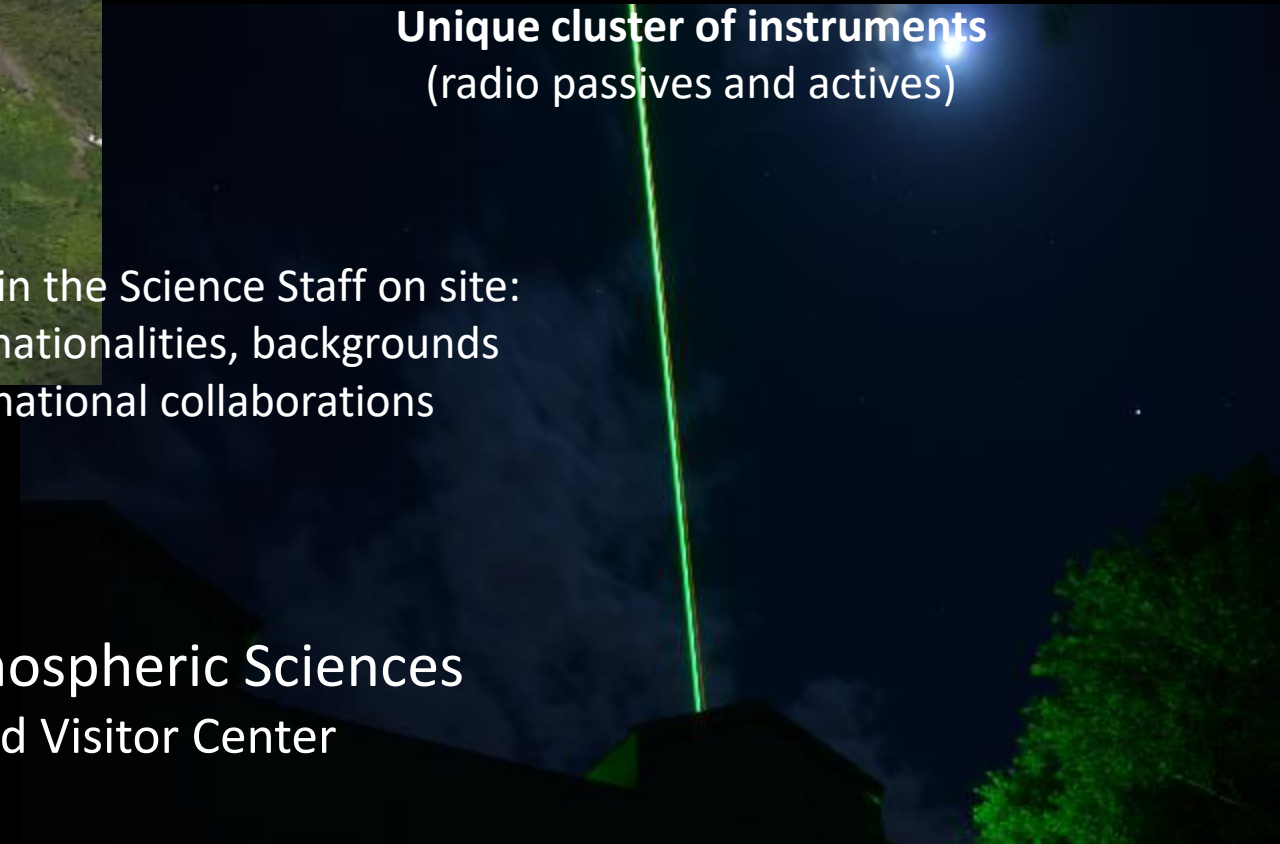
Incoherent Scattering Radar

Unique cluster of instruments
(radio passives and actives)

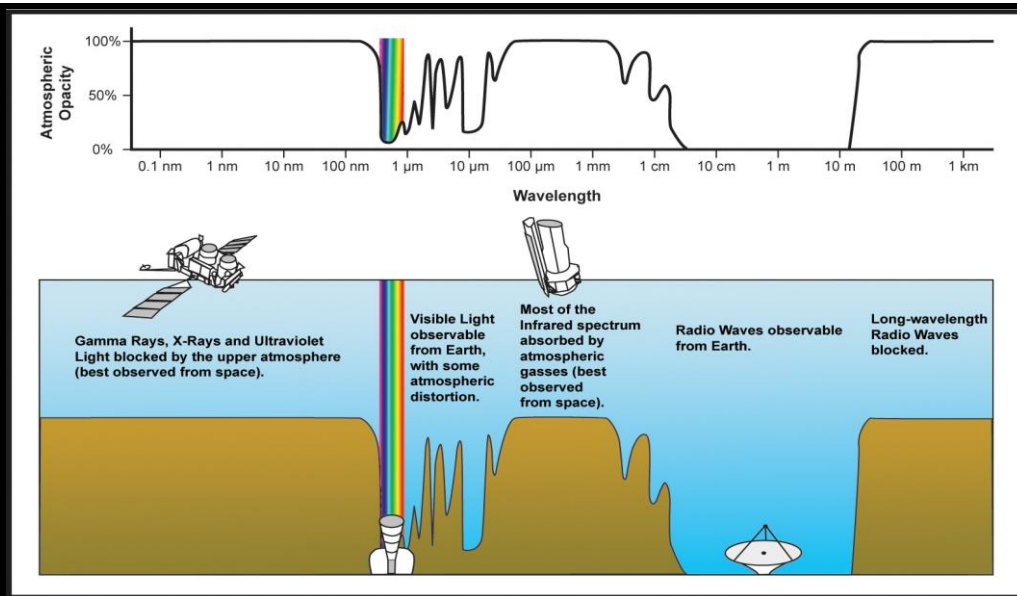
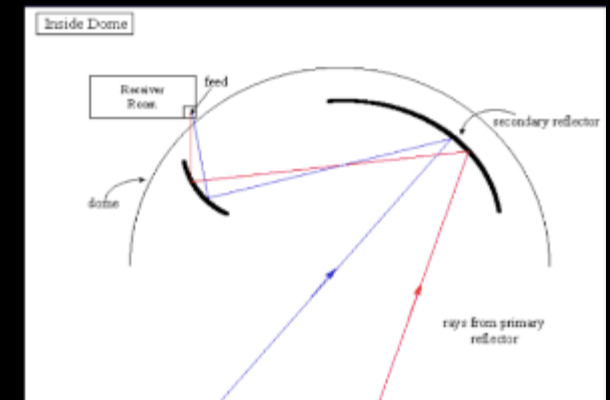
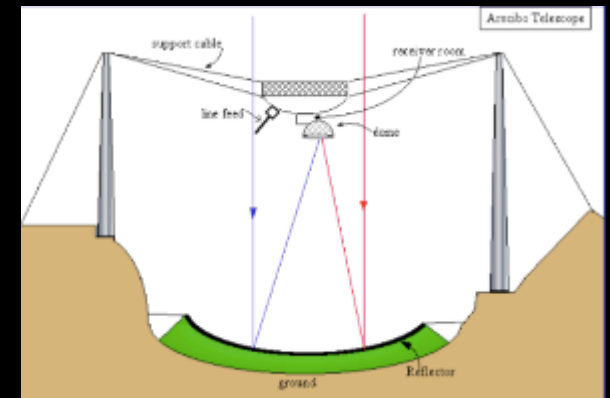
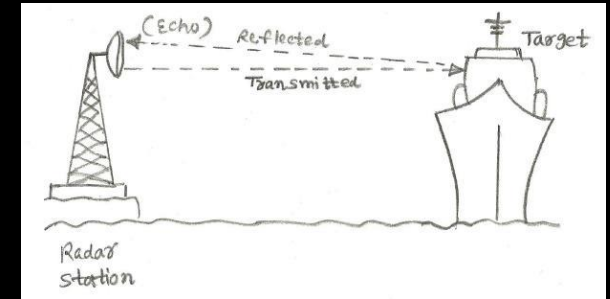
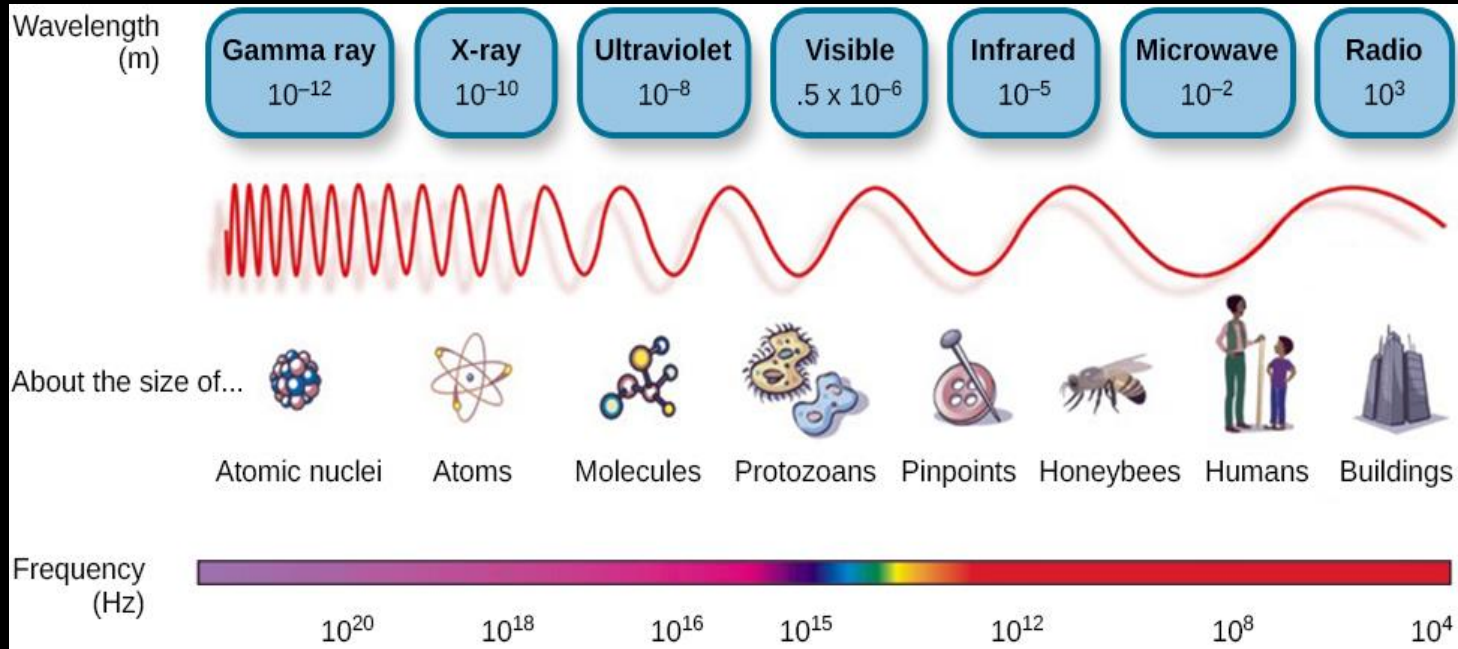
Diversity in the Science Staff on site:
gender, nationalities, backgrounds
International collaborations

Since: Nov 1st, 1963.

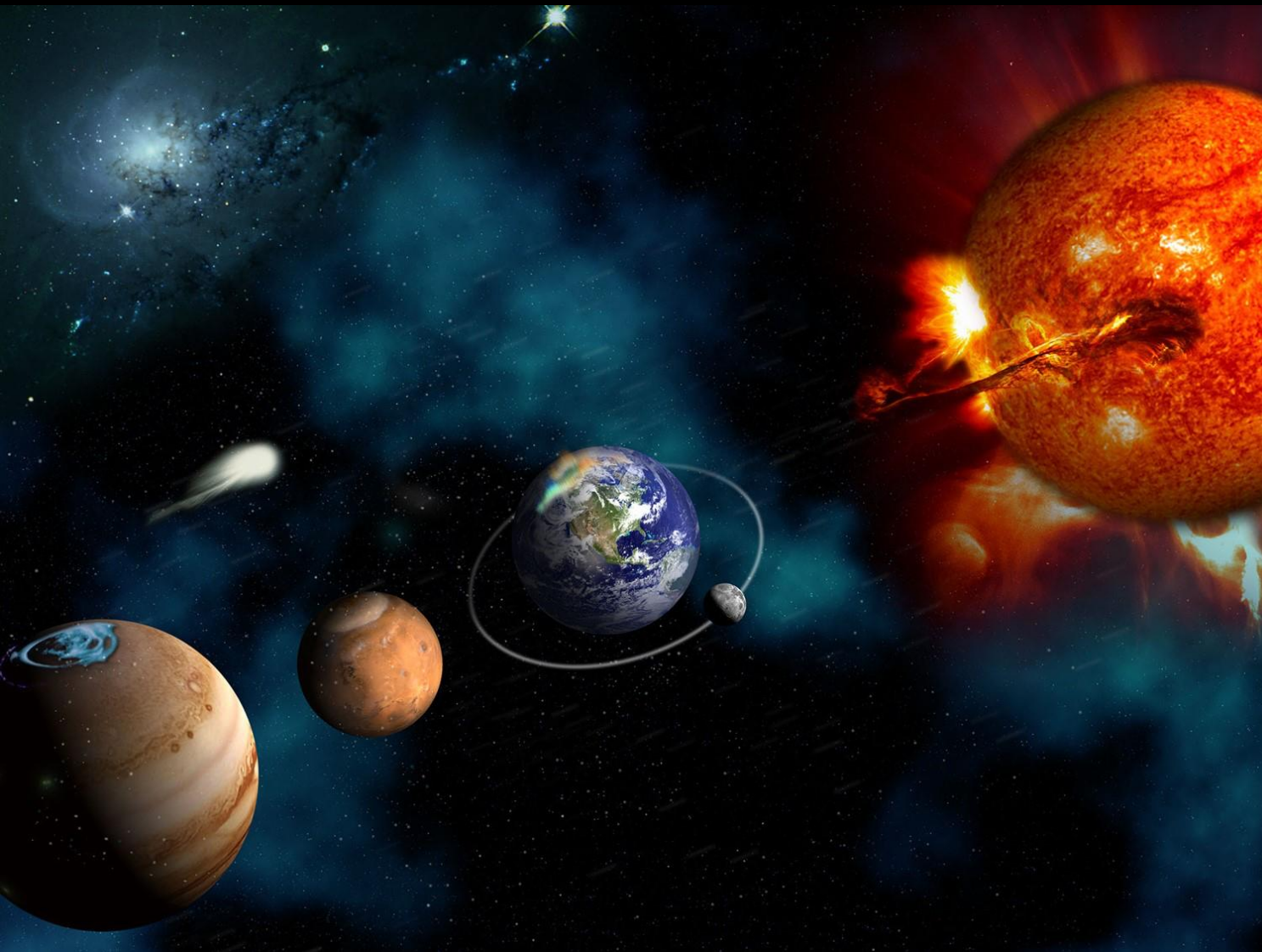
Astronomy – Planetary - Space and Atmospheric Sciences
Operations, Electronics, Maintenance, and Visitor Center



Radio waves from (and to) space



What do I study?



SOLAR/HELIOPHYSICS

- ▶ Solar Activity / Solar Flares / CMEs
- ▶ Solar Corona, Solar Wind, IMF
- ▶ Solar modulation of energetic particles (cosmic-rays / SEPs) transport
- ▶ Space Weather (at Earth and Solar System planets/moons)
- ▶ As applied to other stellar-planets systems

When I was a teenager and thought of Space for the 1st time...



Nerds dreams come true...

Dr. Jill Tarter (SETI)

CARL
SAGAN

A NOVEL
CONTACT



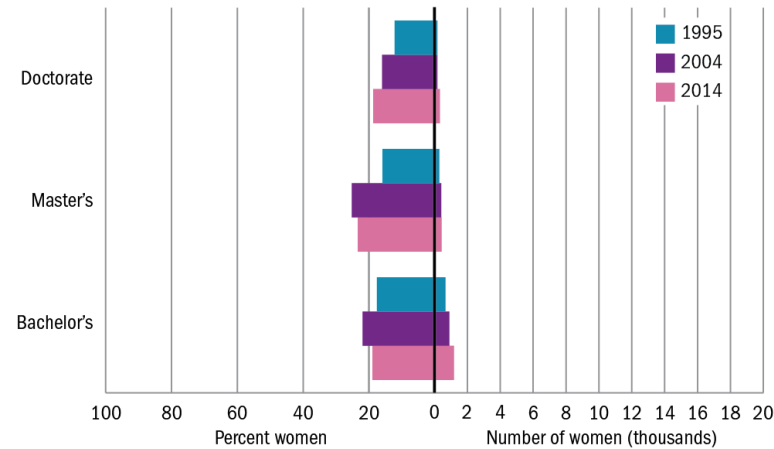


GOALS:

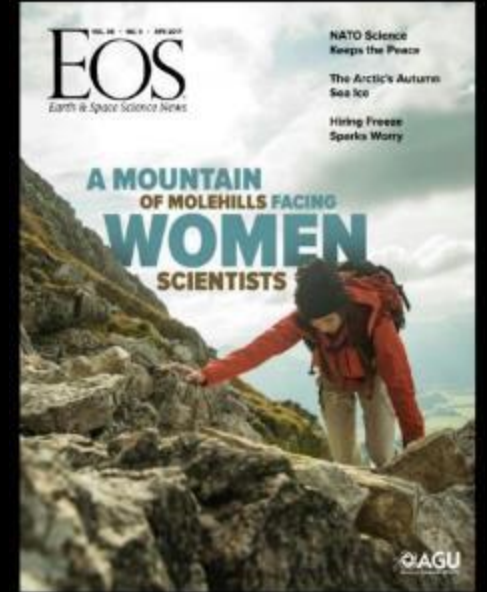
1. Promote gender equality in the Space Physics area.



Low participation field for women: Physics, 1995, 2004, 2014



Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017



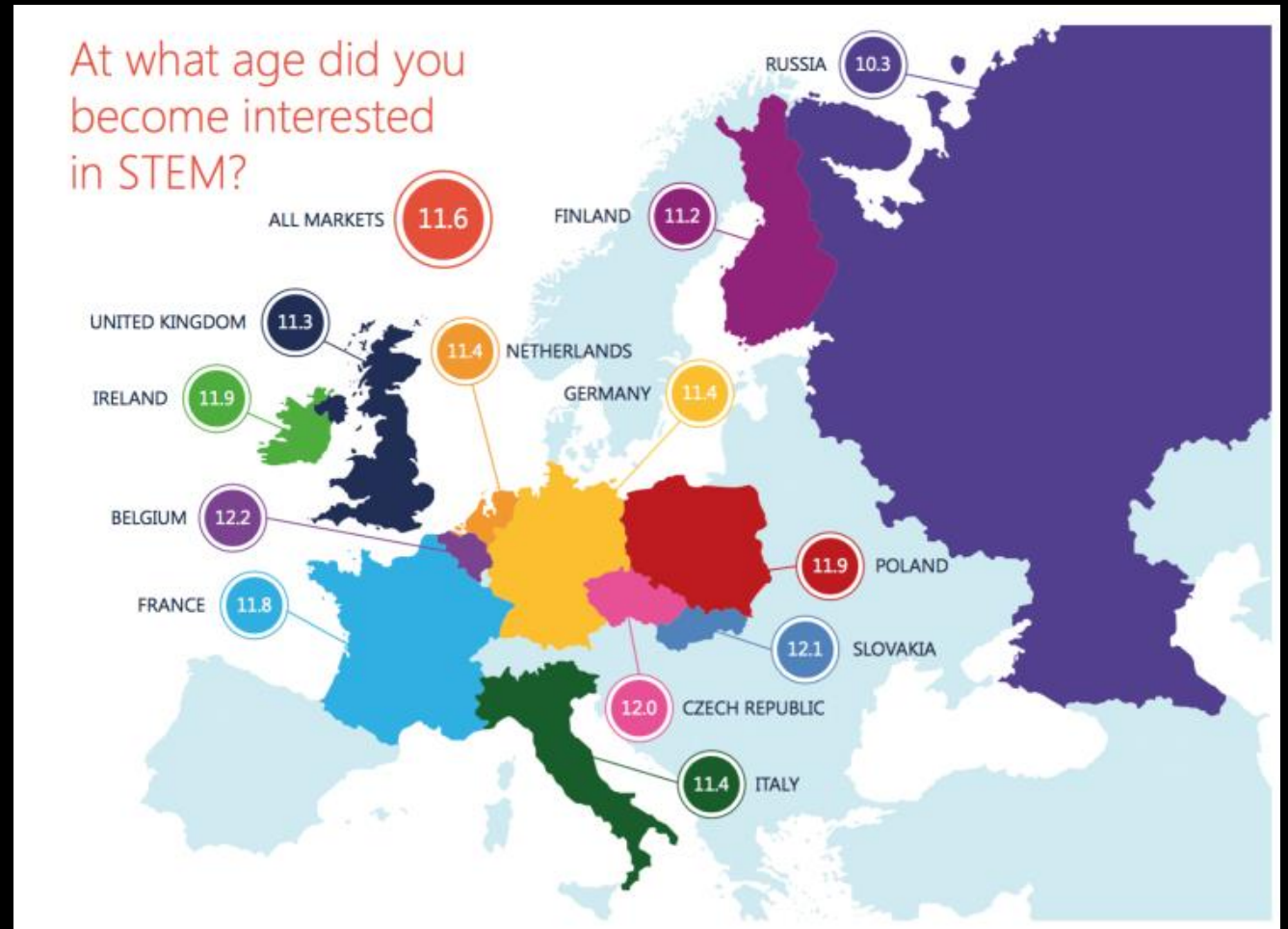
Target 5b of the UN Sustainable Goal 5 enshrines the goal to “enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women” in order to achieve gender equality and empower all women and girls.



GOALS:

2. Empower and motivate girls in STEM areas.

Targeting girls at the age group in which the gender gap in STEM starts (9-13 years old).



GOALS:

3. Instill girls critical thinking and engage them with readily available multimedia.



- Section “Keep investigating”;
- Future Web-content; Game apps; Lesson Plans.



GOALS:

4. Set more female role models in Space Sciences.

- Female main characters;
- Writer is a female scientist;
- Dr. Lindy inspired by Dr. Jocelyn Bell.
- Preface of each book written by a female space scientist;





GOALS:

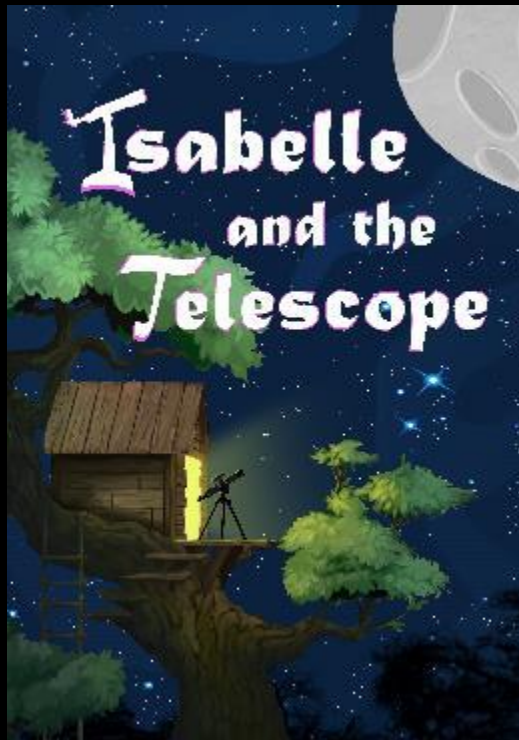
5. Raise awareness of space science topics/careers at developing countries' youth.

The content was written in Portuguese and will be also available initially in 4 other languages (English, Spanish, French and Arabic) aiming to reach out the Americas and most of Africa.





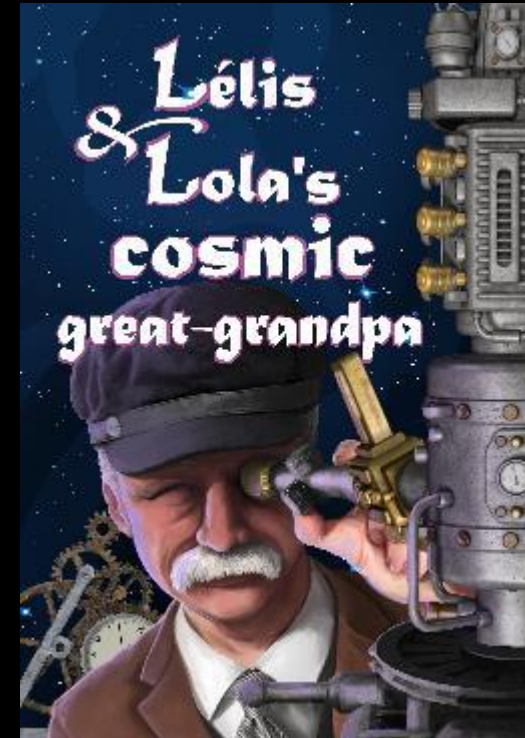
Books about a diverse group of young kids and their adventures (always related to the sky and simultaneously introducing Earth and Space science concepts).



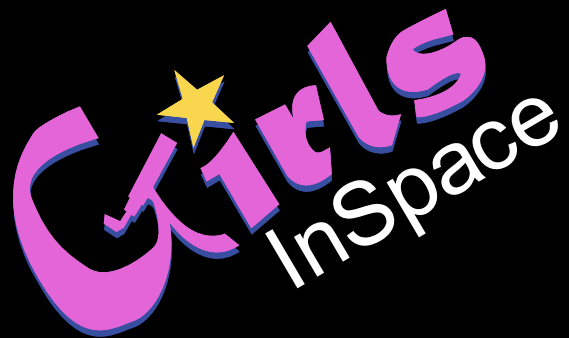
Astronomy



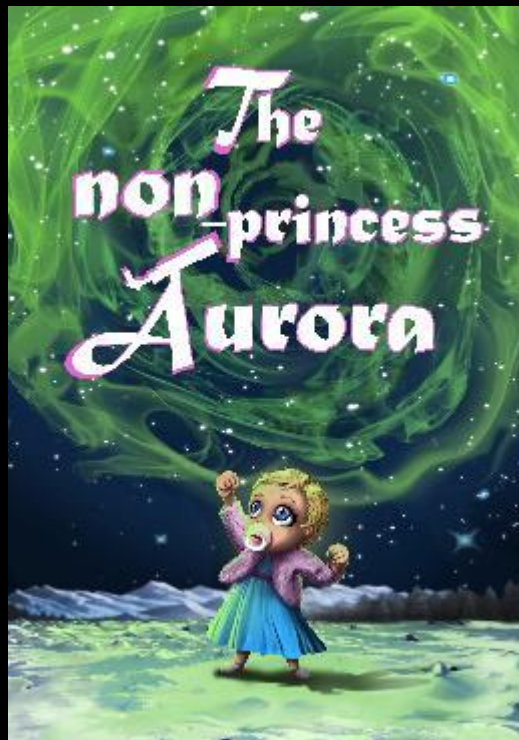
Sun and Space Weather



Cosmic-rays



Coming soon... ☺



Northern Lights



Radio Astronomy

Book 1 – Isabelle and the telescope



The journey of Isabelle and her friends looking for the most interesting object to observe using the telescope that she got as a gift from her aunt.

Astronomy

Sun

Solar System

Telescopes

Scientific method

Life meaning

Forewords by the invited
scientist **Adriana Válio**
(CRAAM/Mackenzie - Brazil).



Book 2 – Helio: Cecilia's first love



The girls need to learn how to deal with Ceci's mood oscillations (typical of the early-teens) that are comparable to the solar explosive behavior.

Sun and Space Weather

Solar Activity

Solar Flares, CMEs

Space Weather Hazards

Sun-Earth relationships

Greek mythology about the Sun

Early-teenager's issues

Forewords by the invited
scientist **Zama Katamzi**
(SANSA – South Africa).



Book 3 – Lelis & Lola's cosmic great-grandpa



An old picture of Leticia and Paola's Italian great-grandpa makes the girls investigate his history, which is connected to the discovery of the cosmic-rays.

Cosmic-rays and history of science

Air ionization

Cosmic shower

History of sciences

Cultural diversity

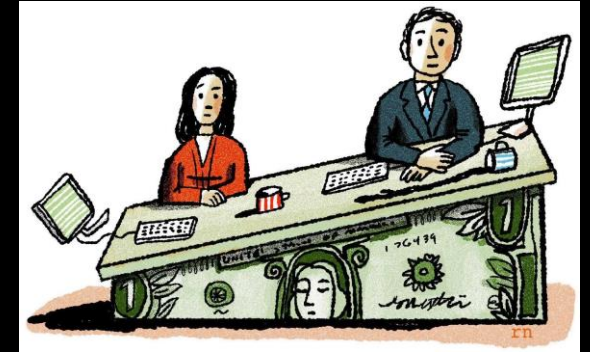
Forewords by the invited
scientist **Georgia de Nolfo**
(NASA/Goddard - US).



Challenges of #WomeninScience

<https://medium.com/we-the-peoples/sticking-points-in-stem-e552615d4511>

- Attracting her intellect
- Retaining women workers
- Redefining reintegration





Girls InSpace

AGU100 ADVANCING
EARTH AND
SPACE SCIENCE