WOMEN IN PHYSICS:
A HURDLE RACE IN A MASCULINE FIELD

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THE ADDED VALUE OF PHYSICIST-SOCIOLOGIST COLLABORATION

Women in science: Why is it important?

Better Science

- Doubling the talent pool
- Diversity

Better academy

- Organizational performance

Better Society

- Fairness

2020 Physics Nobel Prize

Reinhard Genzel

In keeping with the times, Reinhard Genzel was in the middle of a virtual conference when he was surprised by the call announcing, "This is Stockholm!" In this interview, he briefly summarises his 40-year effort to image the galactic centre, which began with his joining his "second father", 1964 Nobel Laureate in Physics Charles Townes, as a postdoc in Berkeley. Genzel describes the new technological developments that allow him to sense the gravity of the supermassive black hole by observing the motion of the stars orbiting it with exquisite precision, and looks ahead to possible future tests of the theory of general relativity in the decades to come.

Andrea Ghez

"It's a passion for the universe!" That's how Andrea Ghez succinctly sums-up her motivation for becoming an astrophysicist in this conversation recorded after she heard the news of her Nobel Prize in a 2am call from Stockholm. As only the fourth female Nobel Laureate in Physics, she describes the prize as "An opportunity and a responsibility." Celebrating diversity in science, Ghez reflects that "Seeing people who look like you, or are different from you, succeeding shows you that there's an opportunity." And regarding the 'other' team of her co-laureate, Reinhard Genzel, she concludes, "There's nothing like competition to keep you going!"

2020 Physics Nobel Prize

Reinhard Genzel

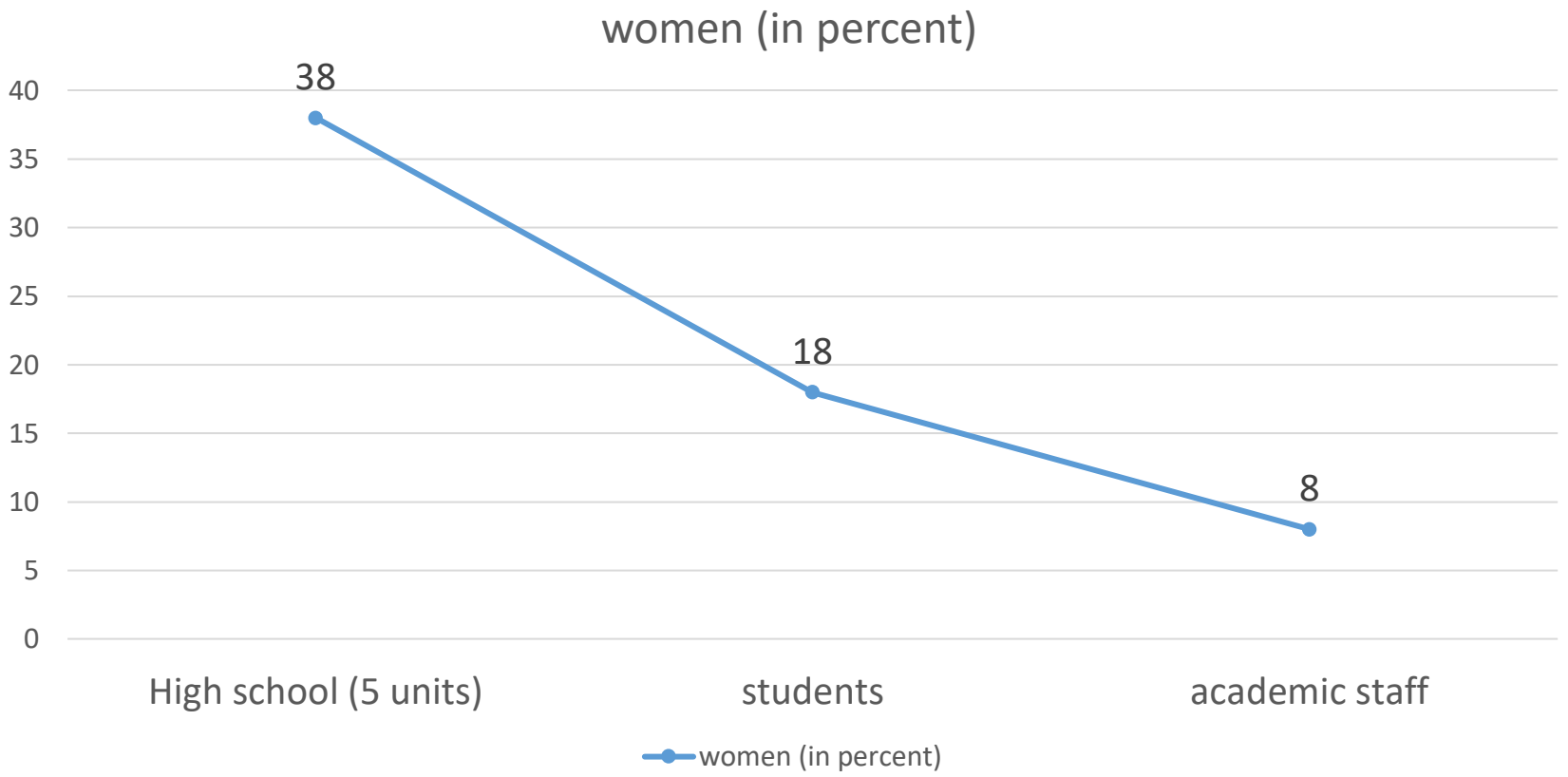
- The 212th male Nobel Laureate in Physics
- Advancing researcher
- Positioned within a lineage of physicists (physicist father, advisor (Nobel!), Einstein)

Andrea Ghez

- The fourth female Nobel Laureate in Physics
- Teacher, wife, mother
- Situated within a living social context (students, team, mother, partner, two sons)

Data: Students in Israel (2018/19)

- **Based on CBS data and data collected by us**



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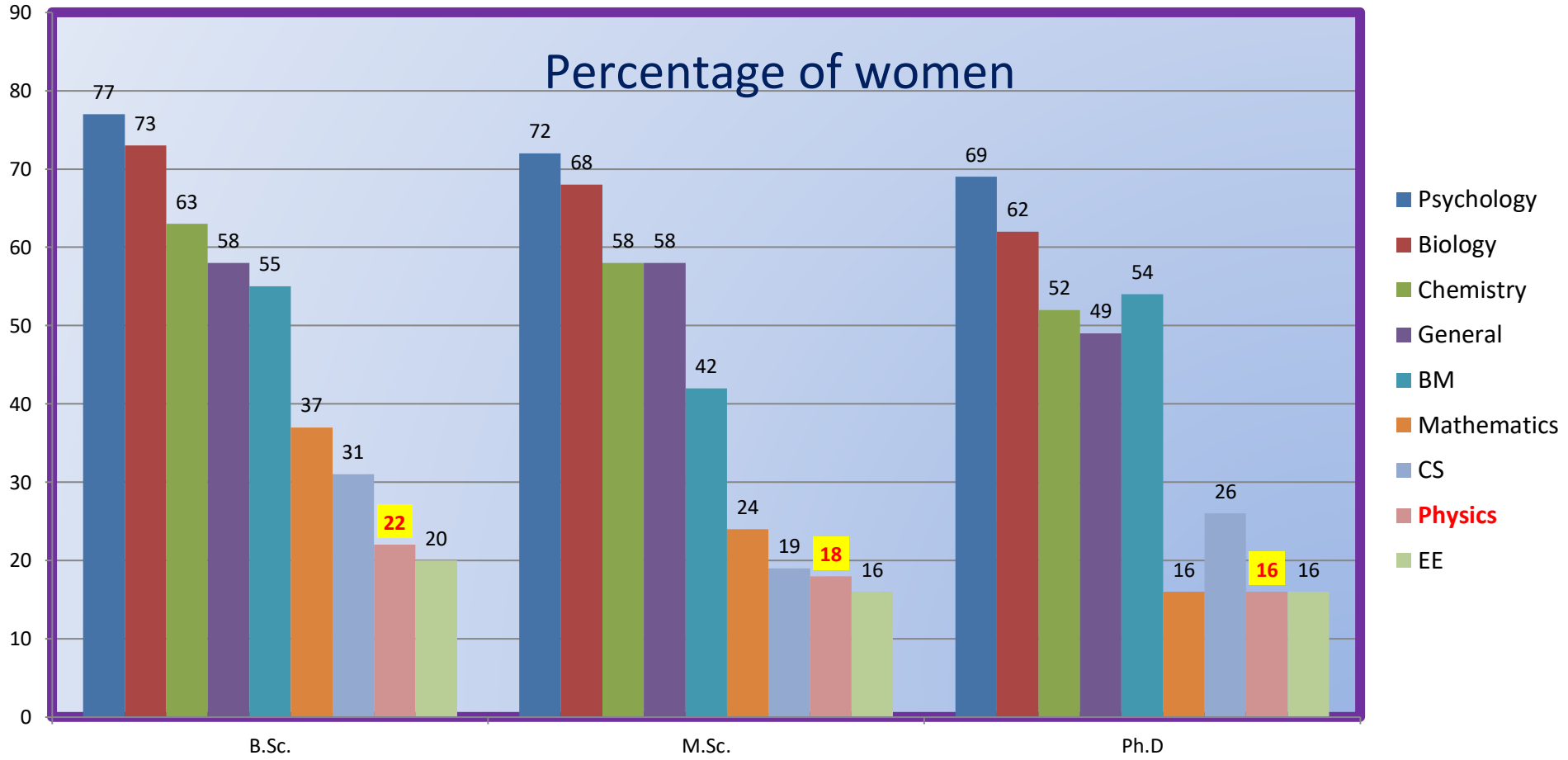
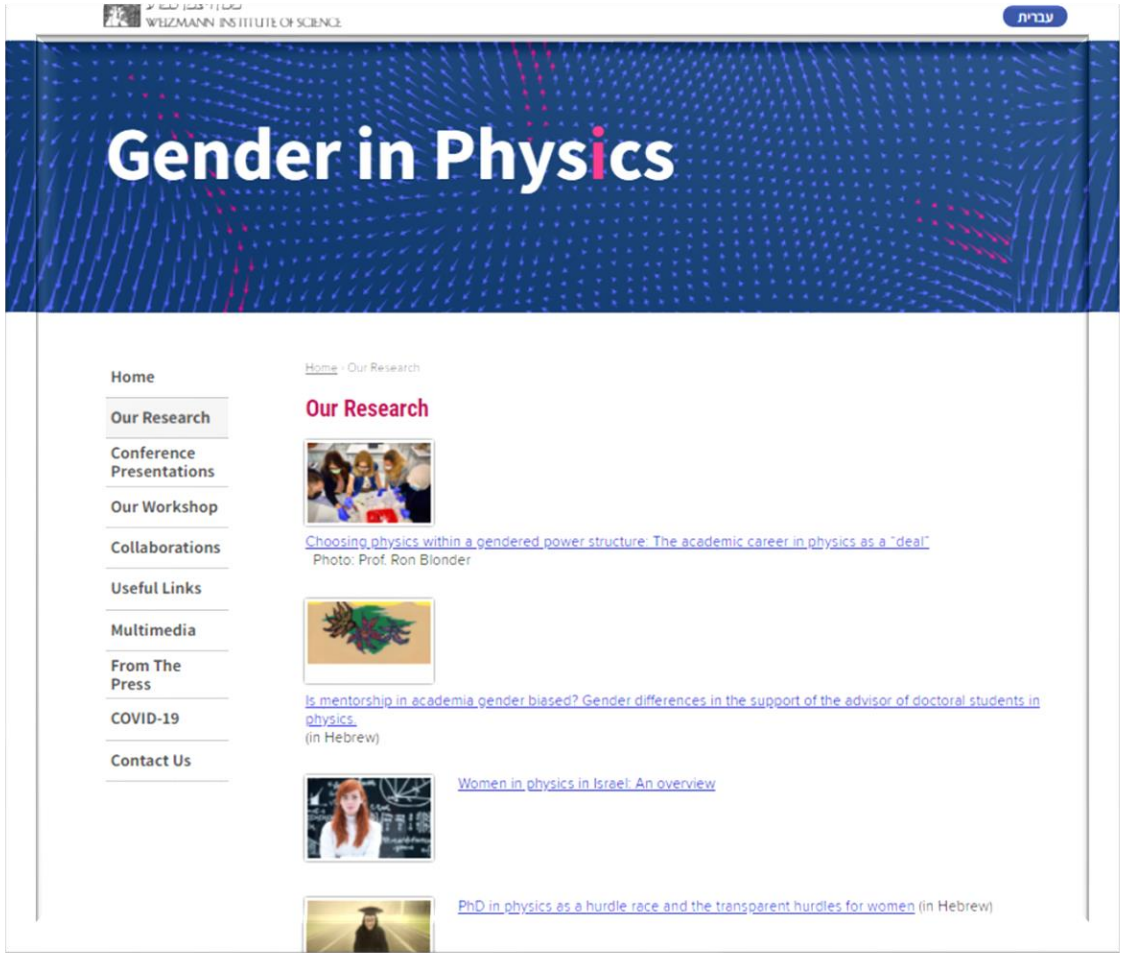


OUR RESEARCH



Research

“Women in Physics: why so few?”

In collaboration with Meytal Eran-Jona, a sociologist and gender-expert

Funded, first, by WIS and, later, by the IMoS

Emphasis on the Israeli context

- also some “universal” insights

Focus on

- Gendered difficulties during PhD
- Deciding to go or not to go for a postdoc
- Competing for a tenure track position

ALL STUDY - METHODOLOGY

Quantitative methods – Nationwide survey

- PhD students: N= 404, n= 267 (response rate 66%)

Qualitative methods -Interviews

- Population: n=25 female PhD students, age 26-36, married (21), mothers (12).
- Post Docs: n=13 female postdocs, age 30-46, almost all in relationship, only 2 without children.
- Physicists: n=7 female academic staff in physics
- Face to face in depth interviews, recorded (1-2.5 hours).
- Analysis : Atlas.it software, grounded theory.

The hurdles for doctoral students

Academic path

- Difficult and frustrating path of study
- Competitive learning environment
- Over-dependence on advisor

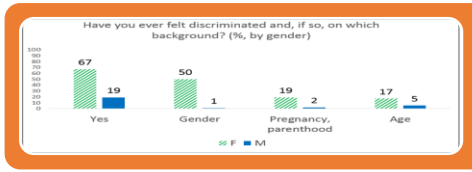
Economic aspects

- Unsatisfactory scholarship
- Difficult to finance family and children needs
- Unclear occupational future

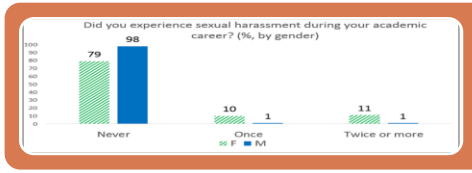
Emotional realm

- Stress, anxiety and depression
- Loneliness and persistent uncertainty

The glass hurdles for female doctoral students

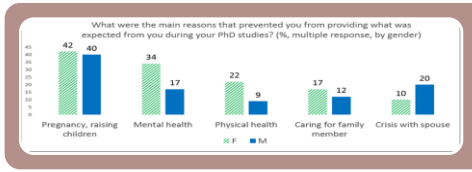


Gender-related discrimination

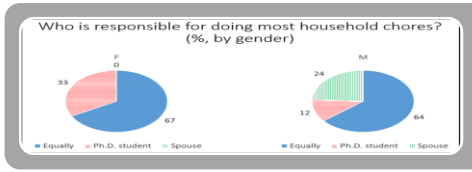


Sexual harrassment

Carry a heavier burden of childcare and household chores



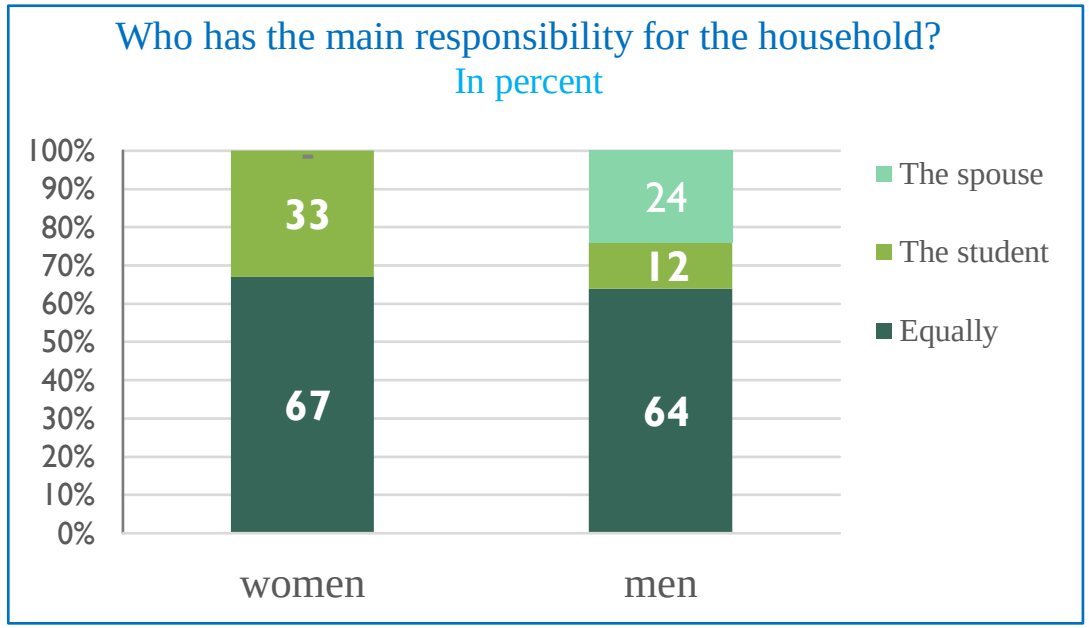
Physiological and psychological health issues

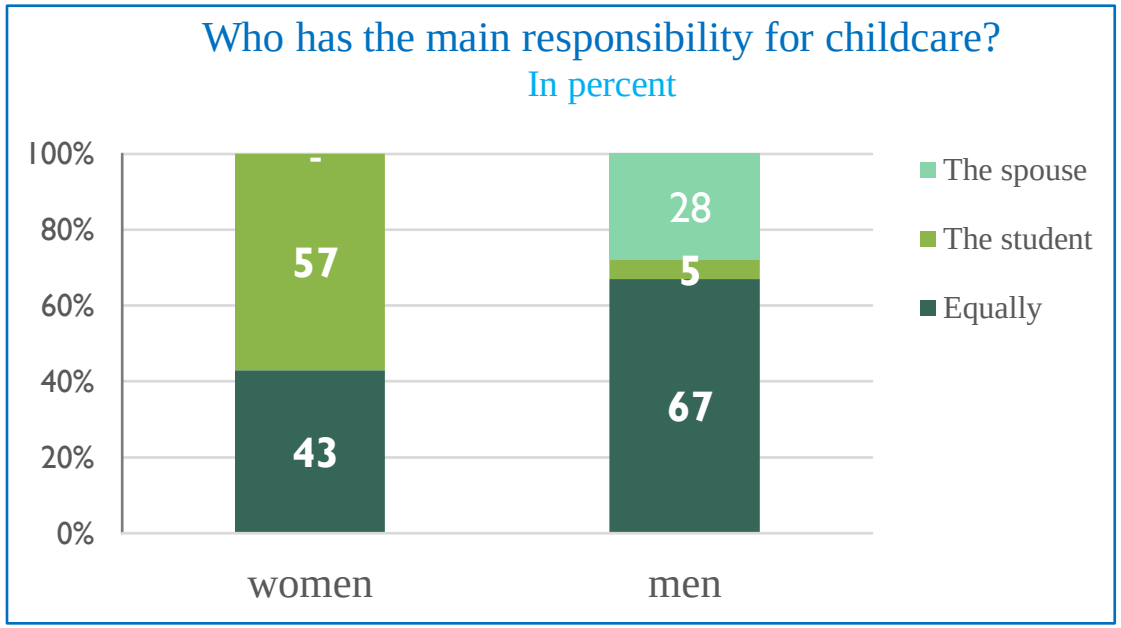


Pregnancy and parenthood

Childcare and household chores

What was the length of the last parental leave that you took?
66% of men: a week or less
69% of women: 4 months or more





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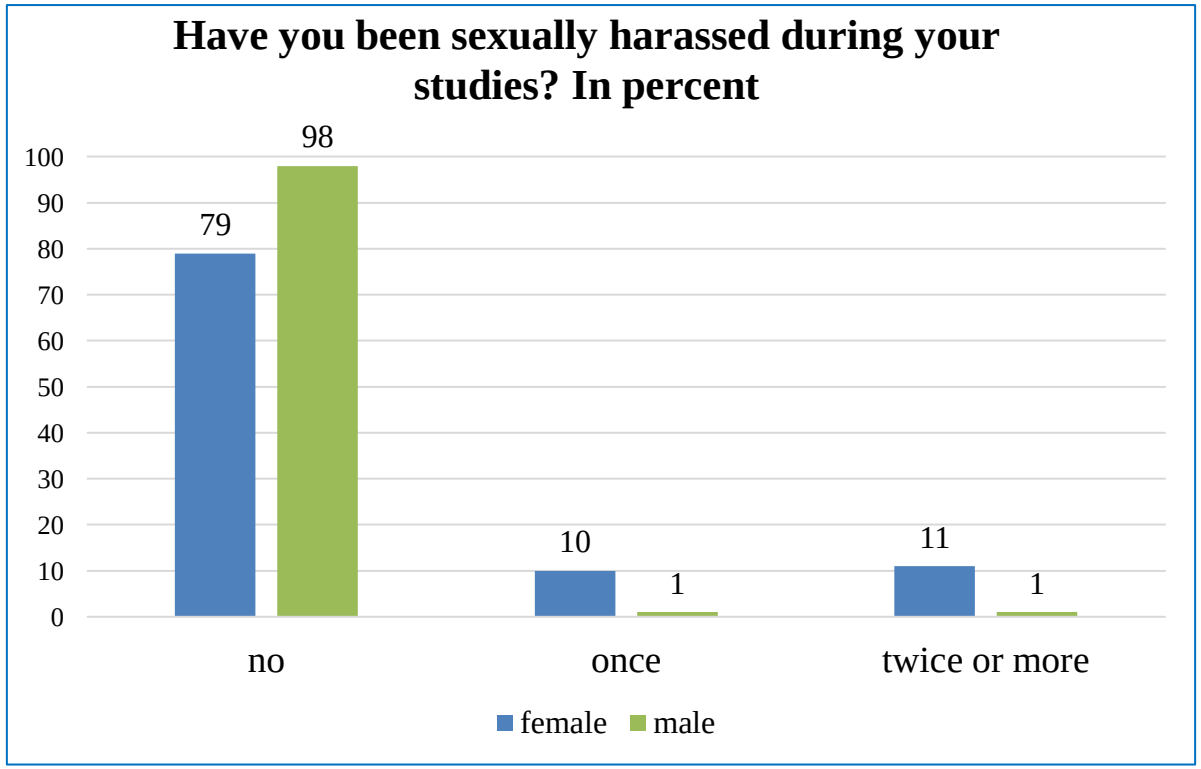

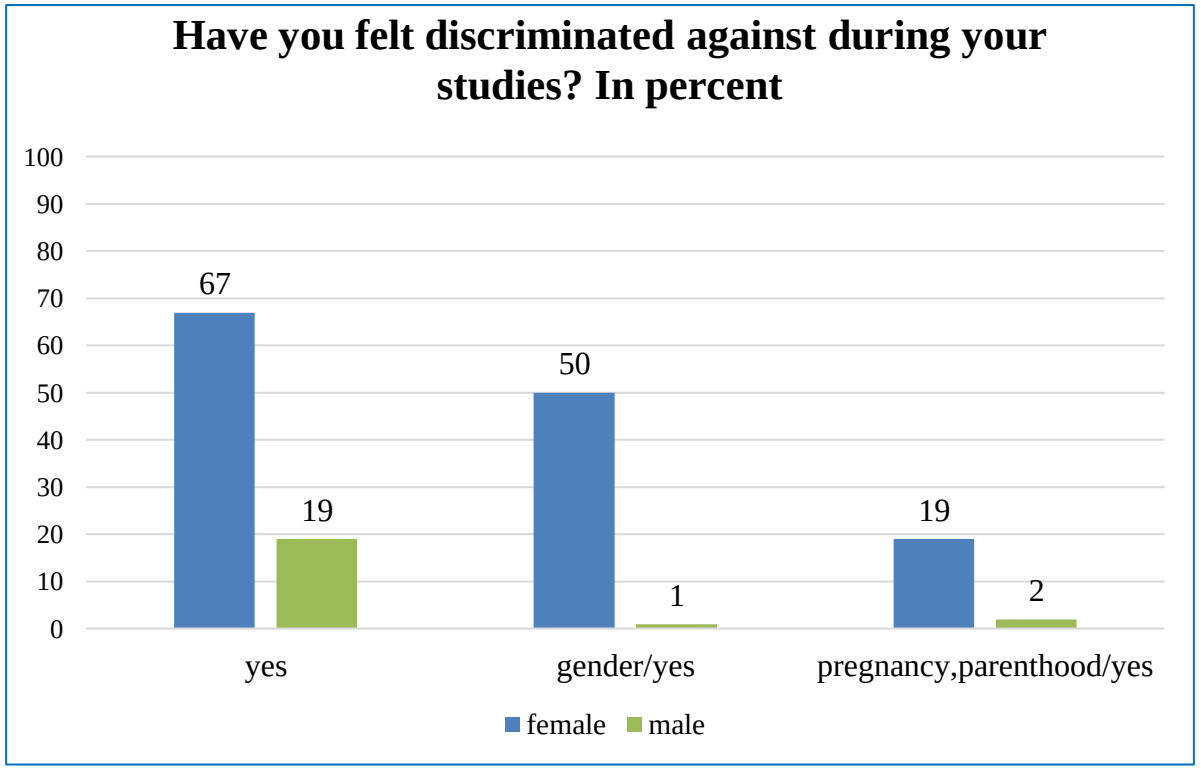

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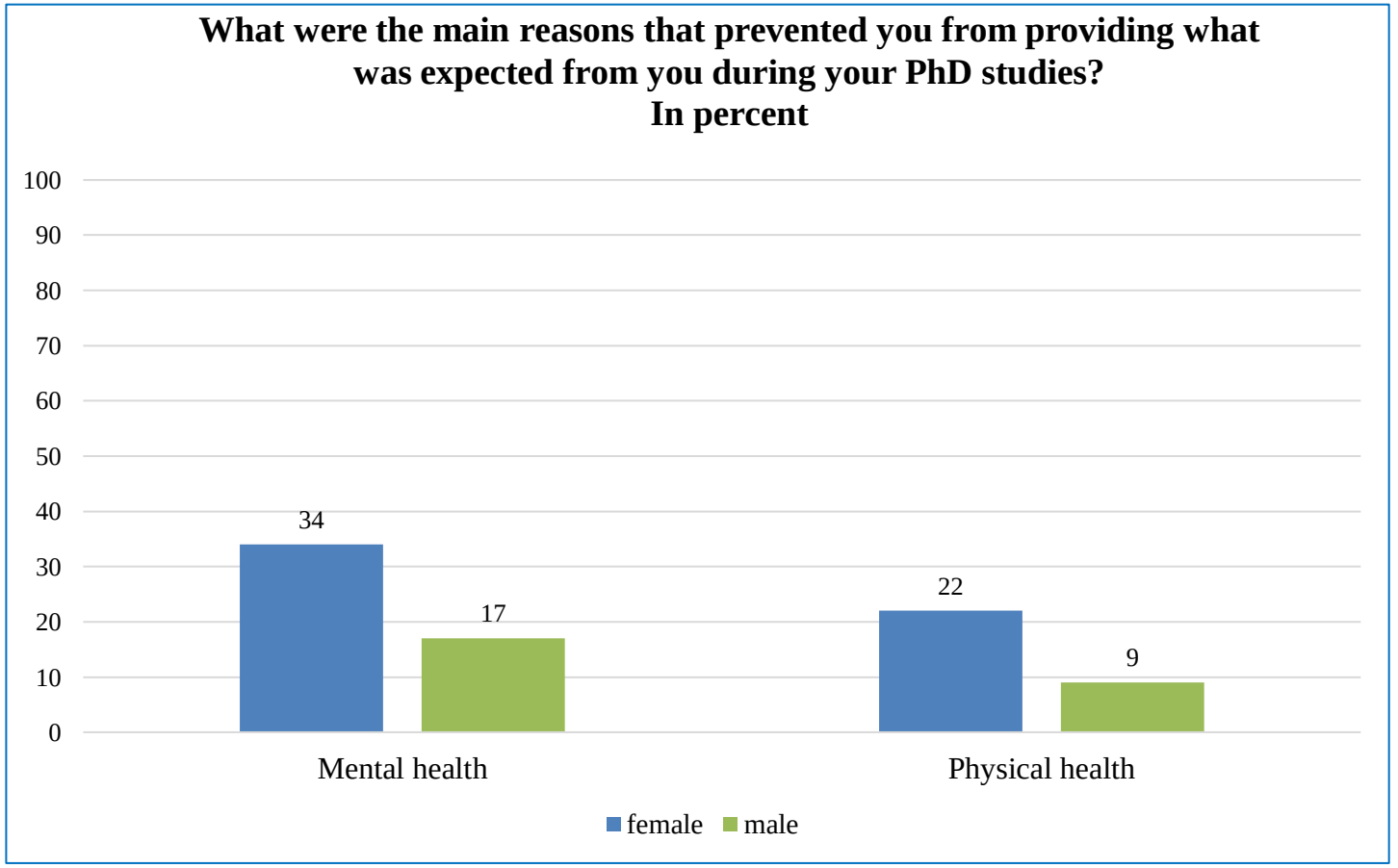
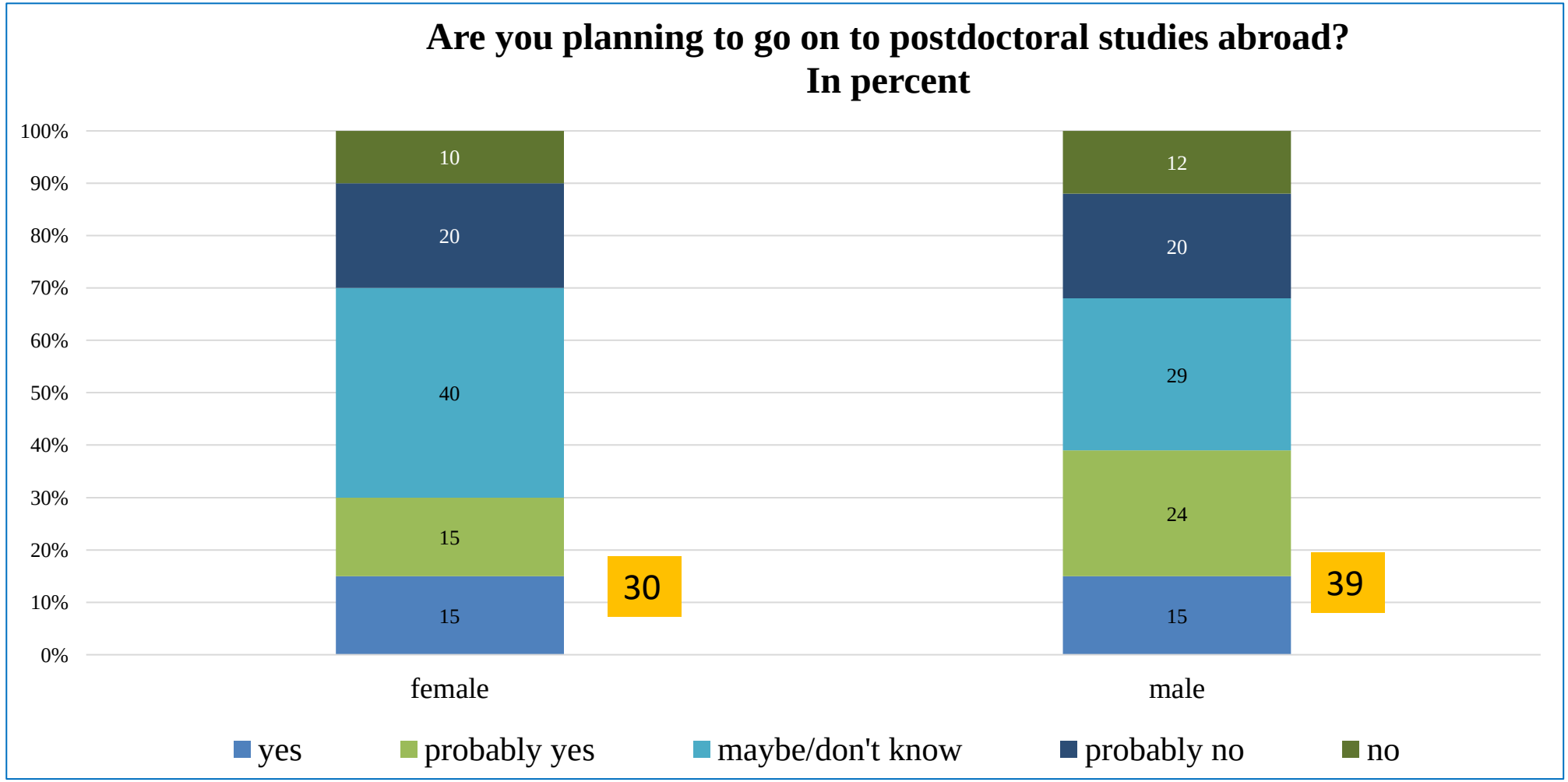


Consequences of the Glass Hurdles?



The academic career as a deal

Unequal competition in science as a masculine field

Prioritizing the man’s career

Disruption of the gender order

Self-expectations for excellence

Conclusions

The PhD path is long, difficult and frustrating, it includes academic, economic and emotional hurdles that all students face

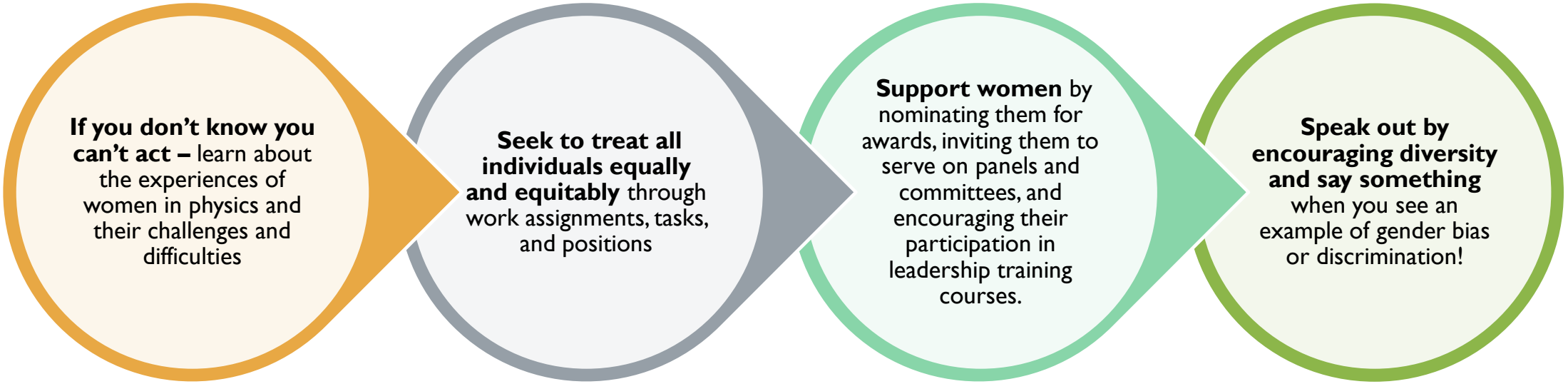
Female students face extra hurdles

- Physical and psychological difficulties
- Work life balance
- Gender discrimination & sexual harassment

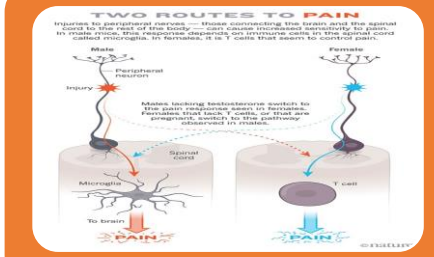
These hurdles are hidden for the academic institutions which believe **in meritocracy and equal expectations**, but **fail to create equality in the research environment** and to **see the gender gaps and the hidden burden on female students**

BECOME AN ALLY TO WOMEN IN PHYSICS

- We can not change society, but **we can change the physics culture !**
- **Men allies are extremely important for underrepresented groups in science**
- **What can you do as a student ally?**



Gender in science: Why is it important?



Reproducibility and efficiency

- Sex- and gender-specific reporting
- Disaggregating the data
- Vaiability, interactions

Opportunities for discovery

- Climate impacts in the ocean
- Targeted human therapeutics

Engineering equality

- Designing safer products
- Reducing gender bias in AI

GENERA NETWORK

GENERA Network originated from the EU-funded GENERA project and its vision is to support, coordinate and improve gender equality policies in physics research organizations in Europe and beyond.