

ANALYZING IMPLICIT GENDER BIAS IN OPTICS AND PHOTONICS AT THE PREDOCTORAL STAGE IN SPAIN

8th International Conference on Women in Physics

María-Baralida Tomás¹, Alba de las Heras^{2,*}, Beatriz Santamaría³, Ana Isabel Gomez-Varela⁴, Clara Benedi-García⁵, Martina Delgado-Pinar⁶, Verónica González Fernández⁷, and Rosa Ana Pérez-Herrera⁸

Area of Women, Optics & Photonics of the Spanish Society of Optics
SEDOPTICA MOF

1 Universitat d'Alacant

2 Universidad de Salamanca

3 Univ. Politecnica de Madrid

4 Universidade de Santiago Compostela

5 Indizen Optical Technologies S.L.

6 Universitat de Valencia

7 Universidad Complutense de Madrid

8 Univ. Publica de Navarra

* albadelasheras@usal.es



Theses in Optics and Photonics

- Is there any gender bias towards different categories of Ph.D. programs?

M. B. Tomás, A. de las Heras, B. Santamaría, A.I. Gómez-Varela, C. Benedí-García, M. Delgado-Pinar, V. González-Fernandez & R.A. Pérez-Herrera, (*submitted to Optica Pura y Aplicada*)



- Is there any gender bias within the subfields/topics of a certain scientific discipline?

R.A. Pérez-Herrera, M. B. Tomás, B. Santamaría, A. de las Heras, C. Benedí-García, A.I. Gómez-Varela, M. Delgado-Pinar, & V. González-Fernandez, *EDUCON 2022*, 1948–1955.
<https://doi.org/10.1109/EDUCON52537.2022.9766822>





METHODOLOGY AND GENERAL RESULTS

TESEO Theses repository



Years 2015 to 2020

Public and Private Universities

80 UNESCO codes

related to Optics and Photonics

4200 results studied and classified

code and name of descriptor

surname and name of thesis author

title of the thesis

university and department

year

Ph.D. program

kind of theses

number of members

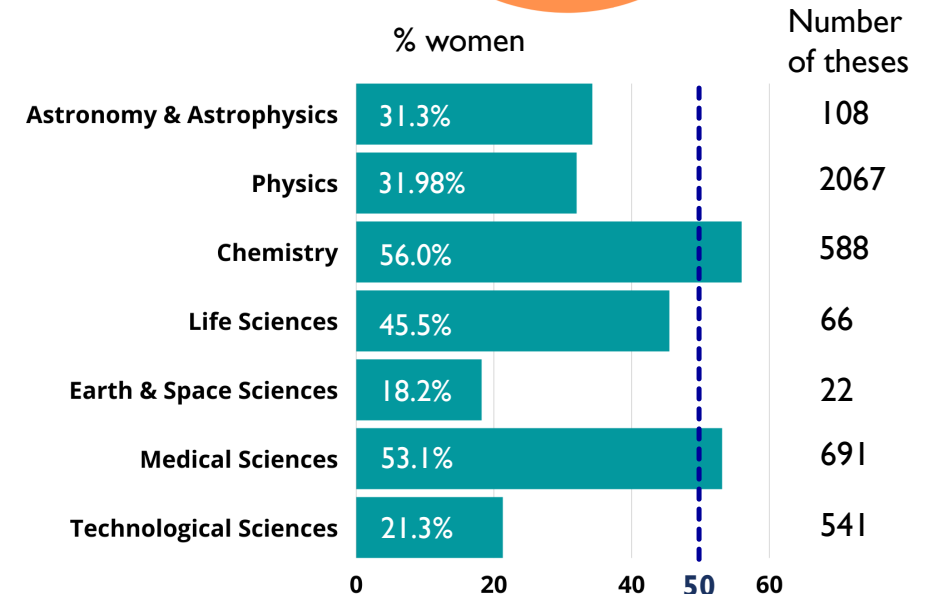
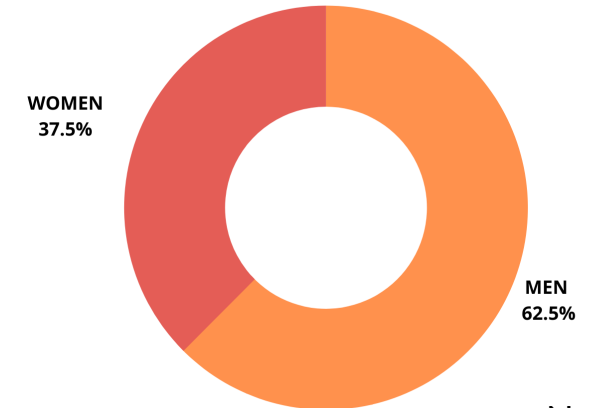
in the tribunal

number of women

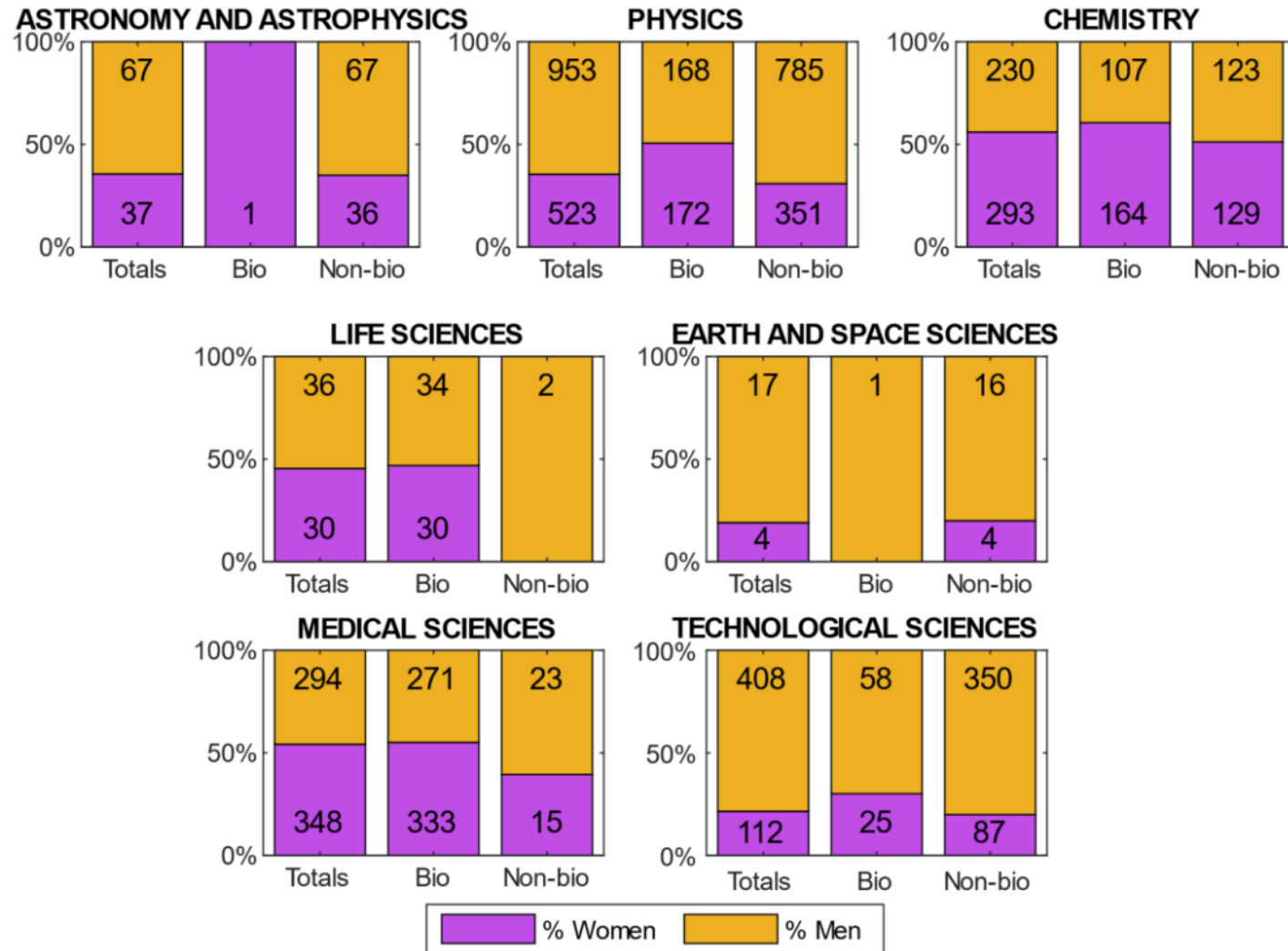
within the tribunal

No gender/sex information on TESEO,
thus the gender was inferred from the given name

Results overview

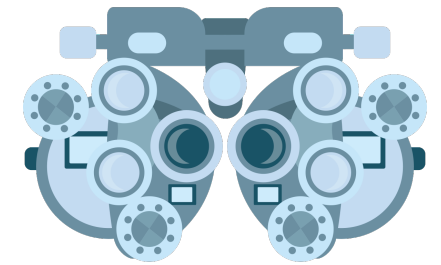
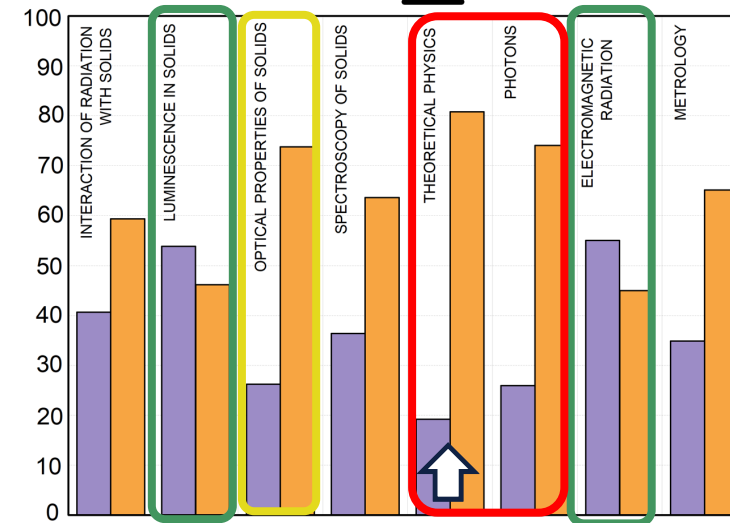
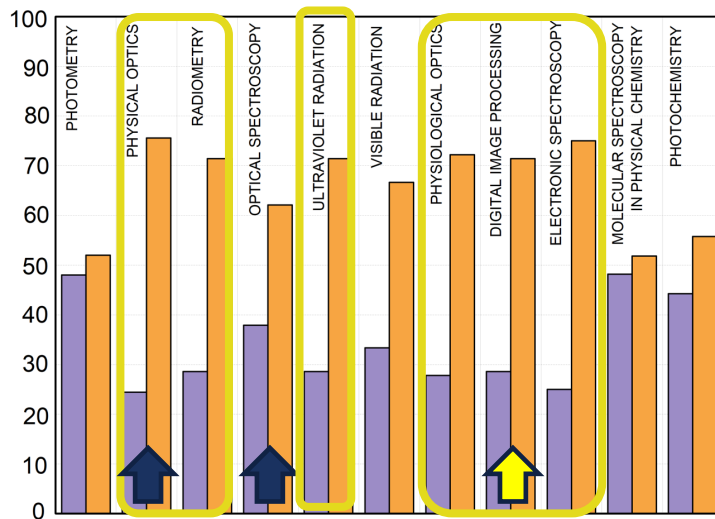
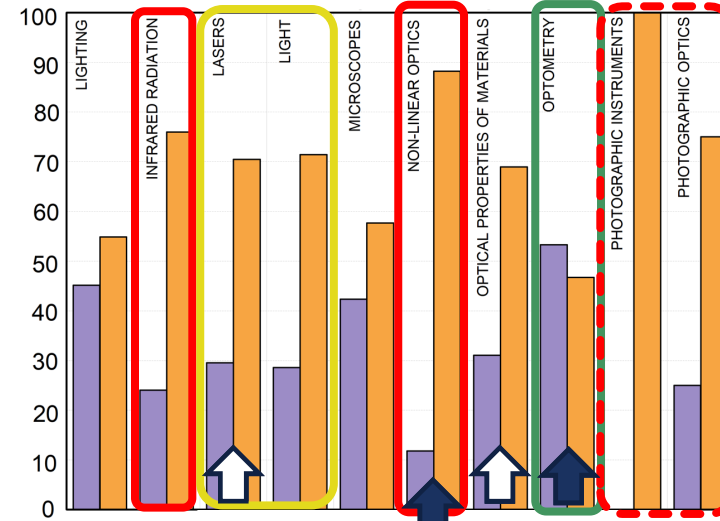
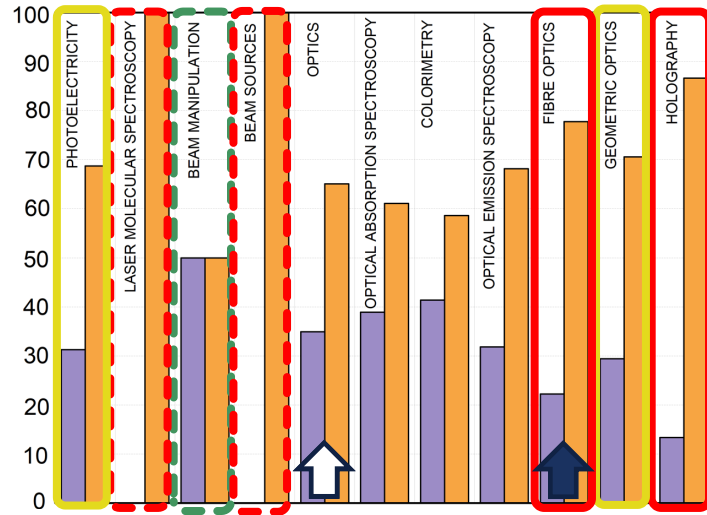
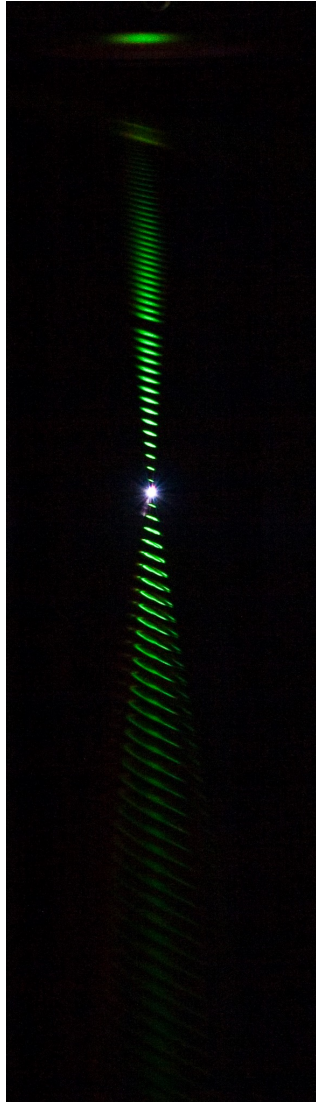


PhD programs divided into bio or non-bio categories



M. B. Tomás, A. de las Heras, B. Santamaría, A.I. Gómez-Varela, C. Benedí-García, M. Delgado-Pinar, V. González-Fernandez & R.A. Pérez-Herrera, (submitted to *Optica Pura y Aplicada*)

40 UNESCO codes belonging to the category of PHYSICS





CONCLUSIONS

- The underrepresentation of women in the Ph.D. stage in the optics community is more prominent in technological and theoretical domains. Within the Physics category, there is a drastic unbalance in special descriptors such as nonlinear optics, theoretical physics or electro-optical devices.

R.A. Pérez-Herrera, M. B. Tomás, B. Santamaría, A. de las Heras, C. Benedí-García, A.I. Gómez-Varela, M. Delgado-Pinar, & V. González-Fernandez, *EDUCON 2022*, 1948–1955. <https://doi.org/10.1109/EDUCON52537.2022.9766822>

- The gender gap is bigger in Ph.D. programs labeled as “non-bio”.

M. B. Tomás, A. de las Heras, B. Santamaría, A.I. Gómez-Varela, C. Benedí-García, M. Delgado-Pinar, V. González-Fernandez & R.A. Pérez-Herrera, (*submitted to Optica Pura y Aplicada*)

- Further studies and measures are required in specific areas of science to eradicate implicit gender-based associations in scientific disciplines and the academic community. In this regard, the organization of events with a gender perspective is an important measure that can be implemented.

A. de las Heras, A.I. Gómez-Varela, M.B. Tomás, R.A. Perez-Herrera, L.A. Sánchez, F. Gallazzi, B. Santamaría Fernández, M. Garcia-Lechuga, M. Vinas-Pena, M. Delgado-Pinar & V. Gonzalez- Fernandez, *Optics* 4, 156–170 (2023). <https://doi.org/10.3390/OPT4010012>