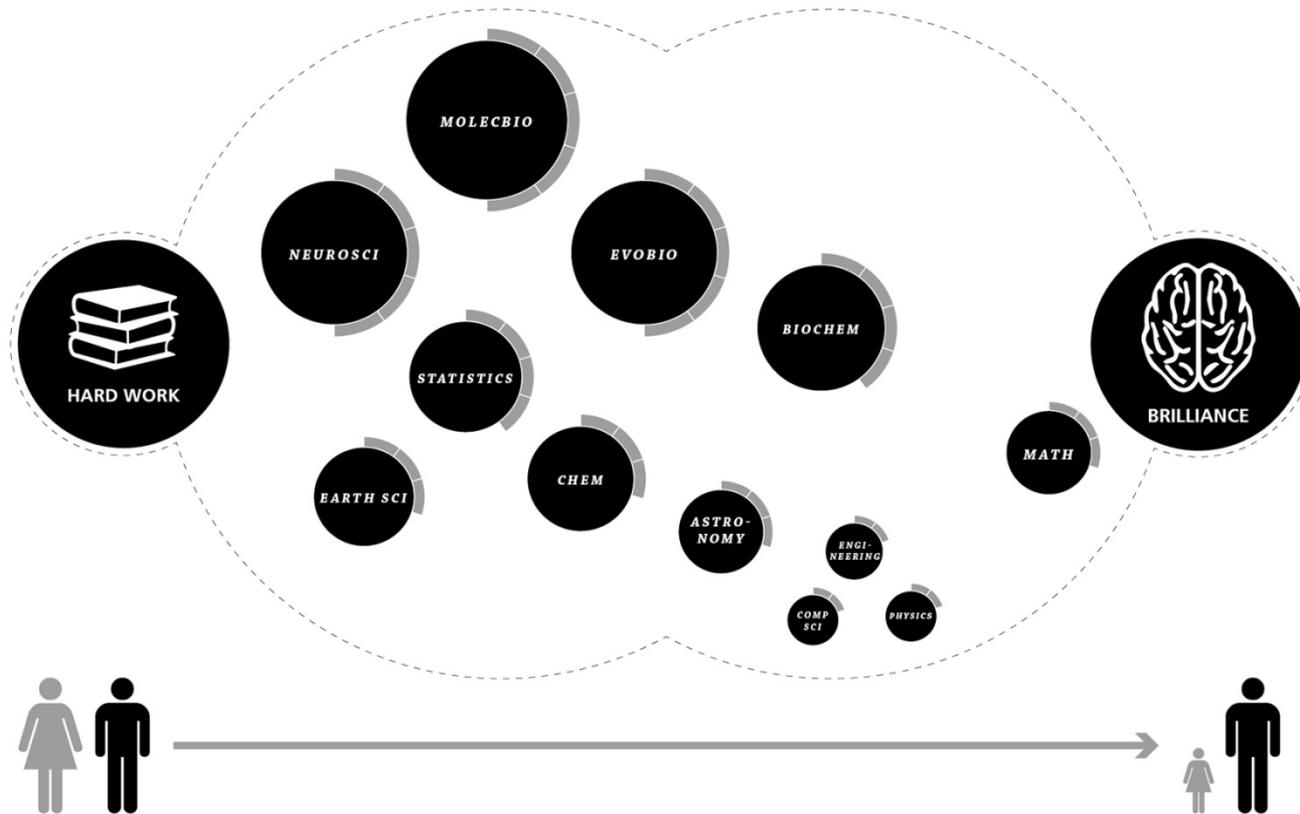

GENERA – A “NEW” PROJECT TO PROMOTE WOMEN IN SCIENCE?

Genera-Kickoff Meeting
Brussels September 17, 2015

Prof. Dr. Martina Schraudner
Fraunhofer-Center for Responsible Research and Innovation
Berlin, Germany

Field-specific ability beliefs and the percentage of female 2011 U.S. Ph.D.'s – in STEM



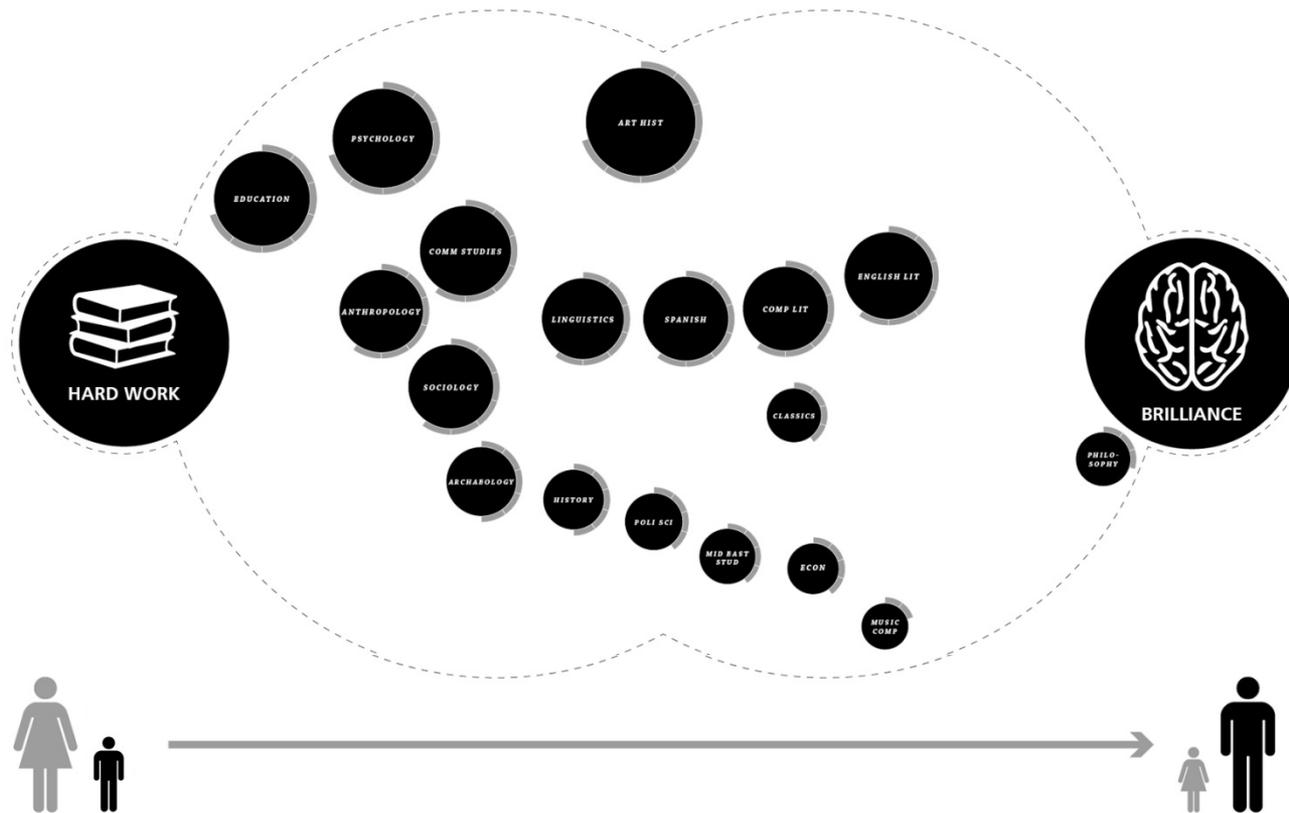
A larger circle indicates a higher percentage of U.S. Ph.D.'s who are female

Source: Leslie, S. J., *Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science*, 347(6219), 262–265

Visualization © Fraunhofer 2015

Survey: Faculty, postdoctoral fellows, and graduate students (N = 1.820) from 30 disciplines (12 STEM, 18 SocSci / Hum) at geographically diverse high-profile public and private research universities across the United States

Field-specific ability beliefs and the percentage of female 2011 U.S. Ph.D.'s – in Social Science and Humanities



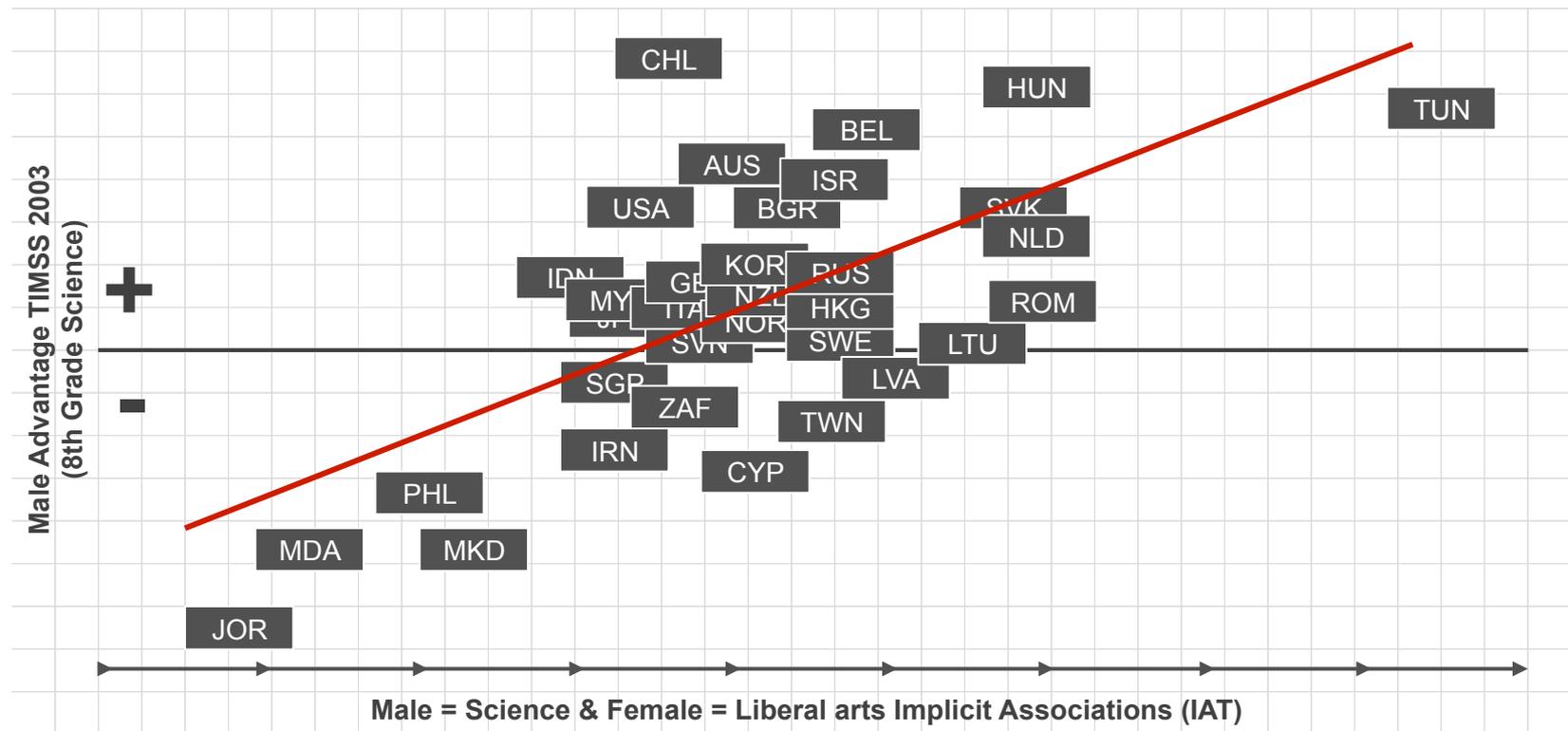
A larger circle indicates a higher percentage of U.S. Ph.D.'s who are female

Source: Leslie, S. J., *Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science*, 347(6219), 262–265

Visualization © Fraunhofer 2015

Survey: Faculty, postdoctoral fellows, and graduate students (N = 1.820) from 30 disciplines (12 STEM, 18 SocSci / Hum) at geographically diverse high-profile public and private research universities across the United States

National differences in gender–science stereotypes predict national sex differences in science and math achievement



Source: Nosek et al. (2009): National differences in gender–science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences*, 106 (26), 10593–10597.

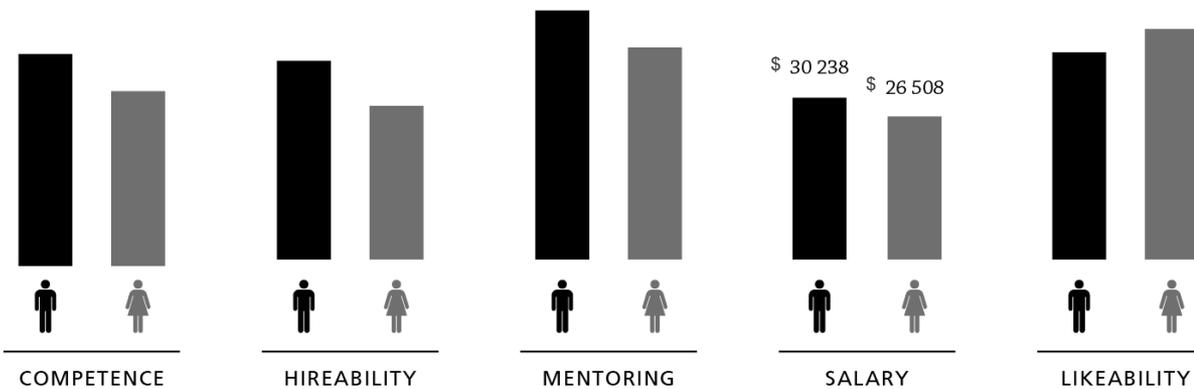
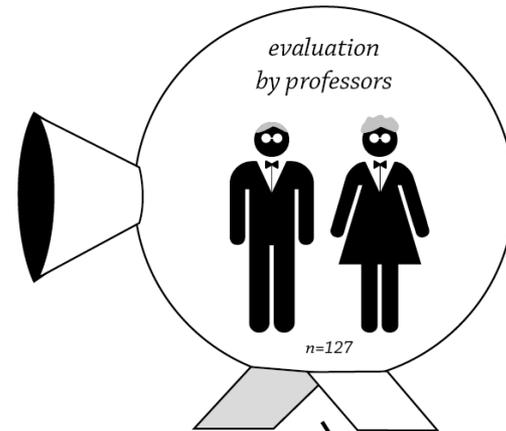
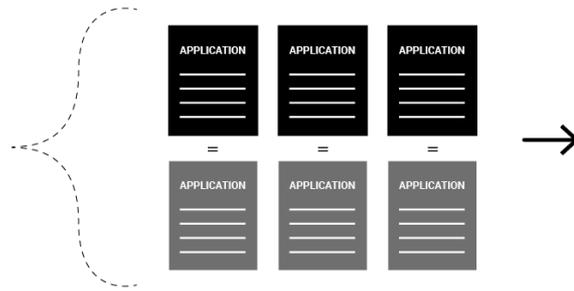
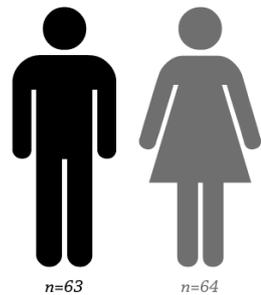
Visualization © Fraunhofer 2015

male science advantage: Trends in International Mathematics and Science Study 2003 (TIMSS) among 8th-graders in 34 nations

implicit gender–science stereotypes: Implicit Association Test (IAT) data (n = 298.846) from citizens of the 34 TIMSS nations – collected at the Project Implicit website 2000–2008 (<https://implicit.harvard.edu>)

Science faculty's subtle gender biases favor male students

same application material



Source: Moss-Racusin, Corinne A., et al. (2012): Science faculty's subtle gender biases favor male students. *Proceedings of the National Academy of Sciences*, 109 (41), 16474-16479.
Visualization © Fraunhofer 2015

Survey: Using validated scales, a broad, nationwide sample of biology, chemistry, and physics professors (n = 127) evaluated application materials of an undergraduate science student who had ostensibly applied for a science laboratory manager position. Participants received the same materials (randomly assigned either the name of a male or a female student)

High-performing companies have women in senior management

Source: <http://www.hiremorewomenintech.com/>

- In a study by Dezsö and Ross of 1,500 U.S. firms in the Standard&Poor's, **female representation in top management improved financial performance** for organizations where **innovation** is a key piece of the business strategy.
- In 2012, a NCWIT analysis of women's participation in IT patents found that **U.S. patents produced by mixed-gender teams were cited 30% to 40% more** than other similar patents.
- Gallup has found that companies with more diverse teams (including more women) have a 22% lower turnover rate. **Organizations with more inclusive cultures also have an easier time with recruiting.**

→ The connection between inclusion of women's perspective and innovativeness in science is under research!!

The DFG promotes equality to ensure quality of research

“Gender equality affects the quality of research since we can draw talented people from a larger pool, since a variety of research perspectives are being promoted [...] and so that the blind spots about the meaning of gender in research content and methods can be eliminated.”

DFG, Research-Oriented Standards on Gender Equality, 2008

- Talent pool size
- Variety of research perspectives
- Meaning of gender in research content
- Collective intelligence of mixed teams (*Woolley Anita W. et al., Science, Vol. 330, pp. 686-688, 2010*)

Expert recommendation on structural change in research institutions

Problems faced by the research organisations

- Opaqueness in decision making processes
- Institutional practices inhibiting career opportunities
- Unconscious biases in assessing excellence
- Wasted opportunities and cognitive errors in knowledge, technology and innovation
- Employment policies and practices

Essential elements for structural change

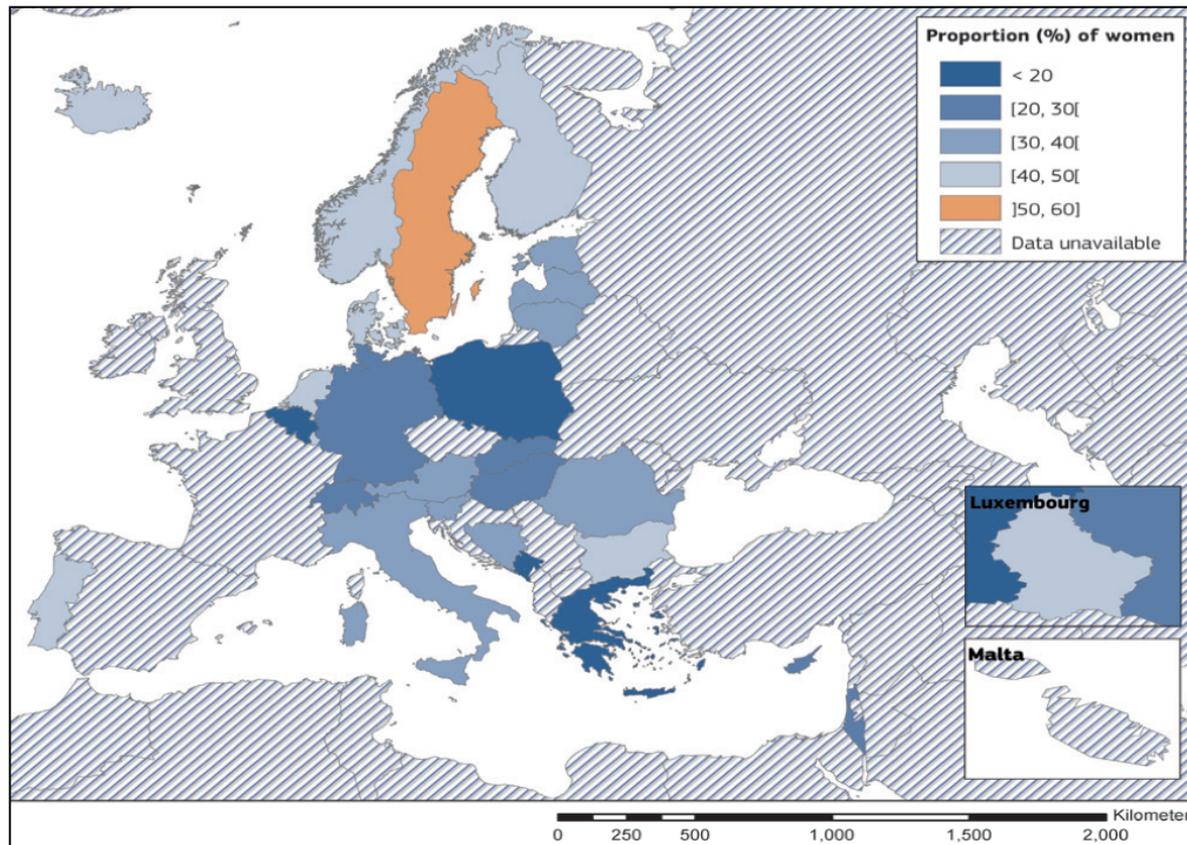
- Knowing the institution
- Securing top-level support
- Generating effective management practices

Source: European Commission (2011): Structural change in research institutions: Enhancing excellence, gender equality and efficiency in research and innovation, EUR 24905 EN, Luxembourg



Specific problems for the GENERA project

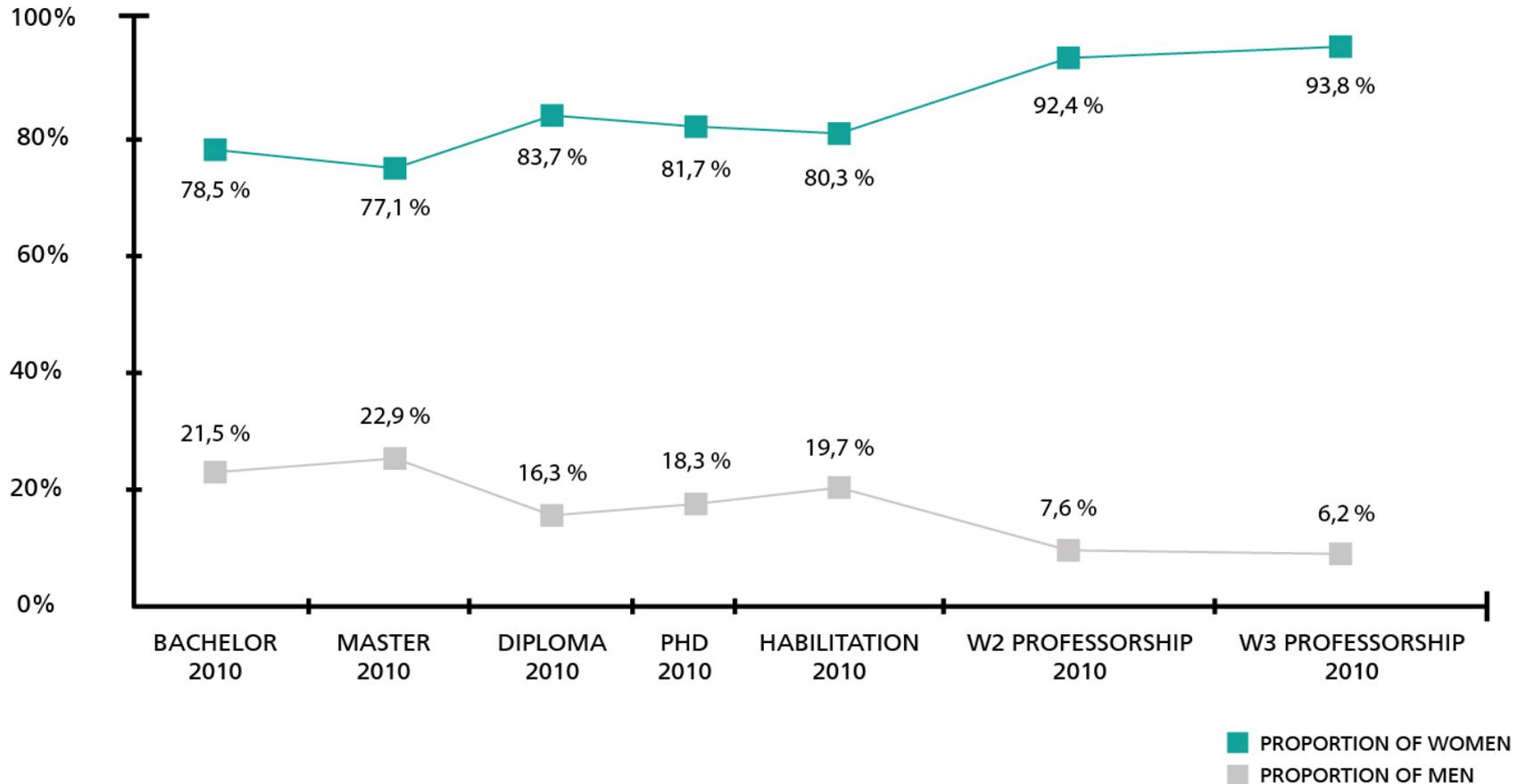
She figures 2015 – new data on women's involvement Proportion of women in scientific and administrative bodies (2014)



Source: She Figures 2015 , Gender in Research and innovation, Statistics and Indicators, EU
http://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-leaflet-web.pdf

Specific problems for the GENERA project

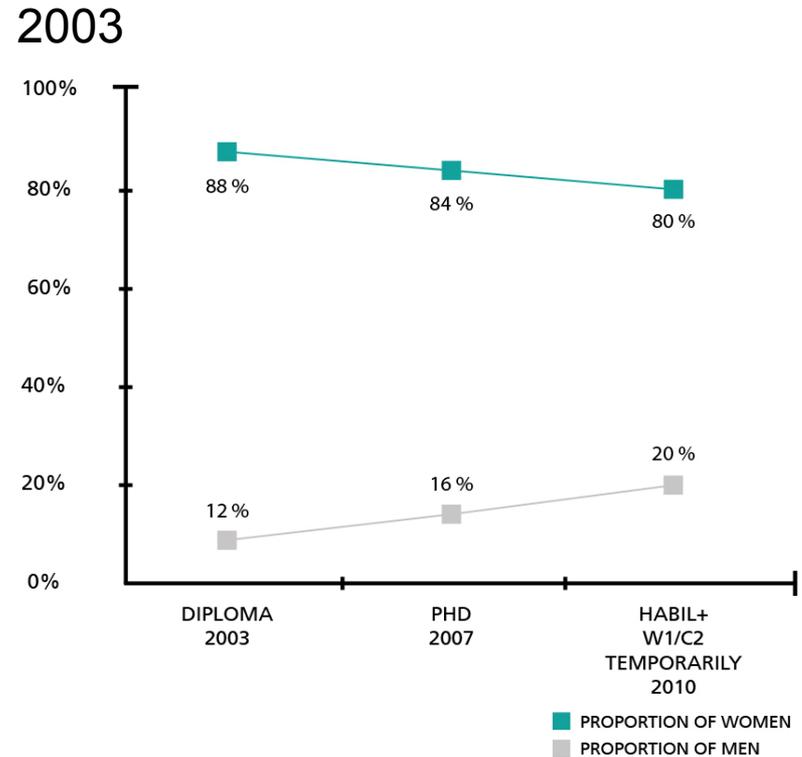
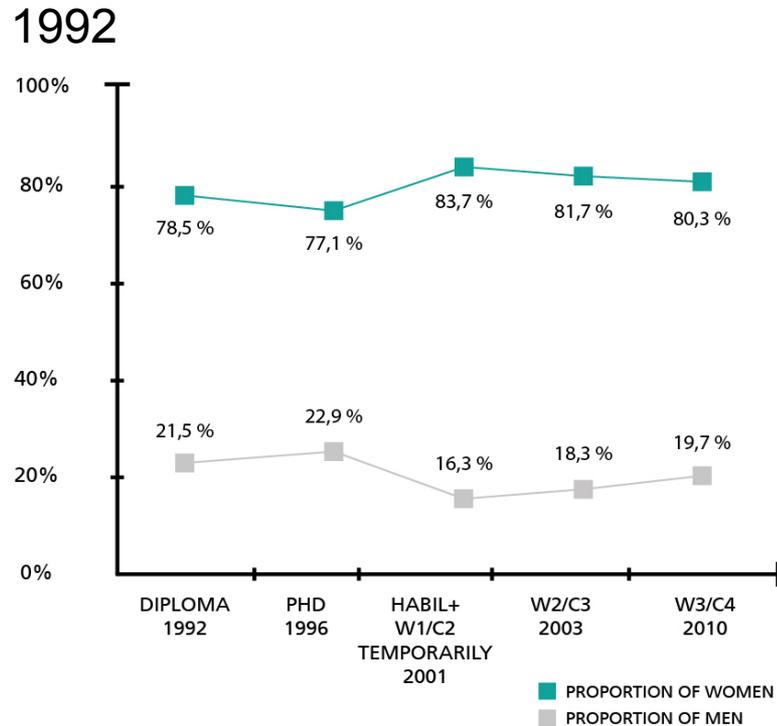
Academic careers in physics in Germany



Source: Statistisches Bundesamt

Specific problems for the GENERA project

Corrected data potential und time for qualification



Source: Statistisches Bundesamt

Specific problems for the GENERA project

At the level of pupils

“..The sample consisted of 3626 pupils (median age 15) in 61 schools. ... The most interesting things (especially for girls) were connected with human beings and the **less interesting (especially for girls) were connected to artefacts and technological processes.**“

Source: Javonen J. et al., 2005, Pupil Interest in Physics: A Survey in Finland NorDiNa 2/05 pp72 <http://roseproject.no/network/countries/finland/fin-lavonen-nordina2005.pdf>

Astronomy in textbooks

“The main message of the study is that interesting new curricular approaches and textbooks can be developed by combining technological and **human or astronomical contexts.**“

Source: Javonen J. et al., 2005, Pupil Interest in Physics: A Survey in Finland NorDiNa 2/05 pp72 <http://roseproject.no/network/countries/finland/fin-lavonen-nordina2005.pdf>

Kick off

What is new with Genera:

Genera originated from physics – not the equal opportunity department.

Genera is part of the physics community and will show variations in national and organisational contexts.

Genera is integrated in the educational and scientific ecosystem of physics.

Genera is organized by specialists in coordinating „large-scale research“.

It is your turn now to use all those opportunities!!!!

THANK YOU!

Contact

Martina Schraudner
martina.schraudner@iao.fraunhofer.de

Goals of GENERA

1. Assess the **status of gender issues** in the partner organisations
2. Identify gaps in existing Gender Equality Plans (GEPs) and determine specific needs or actions to **enhance gender equality and women's careers in physics**
3. Monitor and **evaluate the existing activities** of the involved organisations (partners and associates)
4. Formulate customized GEPs for all implementing organizations and create a roadmap for **their implementation in physics with the potential of application in other research fields**
5. **Support** involved organisations in implementing customized GEPs
6. **Create a network** of RPOs, HEIs and RFOs to promote gender equality in physics
7. Set up a long-term monitoring system allowing RPOs and RFOs to monitor the **impact of their GEPs in physics** with the potential for application in other research fields.