



Gender Dimension in European Research, FFG,  
Vienna 16/11/11

# THE GENDER DIMENSION IN SCIENCE

**genSET: research quality through equality**

Dr Elizabeth Pollitzer, Portia, [www.portiaweb.org.uk](http://www.portiaweb.org.uk)

# ABOUT PORTIA (1)

- Established in 1997, at the initiative of the Department of Trade and Industry, by a group of women scientists and engineers, mainly from Imperial College London
- Incorporated as a not-for-profit company in 2001
- Focus on achieving gender equality in SET (in participation, cultures, and knowledge)
- Named after literary character (with admirable qualities: fortitude, constancy, bravery, determination, self-worth) and a (very clever) spider: *Portia labiata*)



# ABOUT PORTIA (2): CREATING COLLABORATIVE WEB

- Major EU projects:
  - **Equalitec** (returners and careers in ITEC, 25 development and 50 associate partners – EU best practice award)
  - **EU Return** (transferring Equalitec best practice to other EU countries)
  - **genSET** (persuading leaders and building institutional capacity in Europe for mainstreaming gender in science, more than 100 institutions involved, over 80 science and policy leaders/experts)



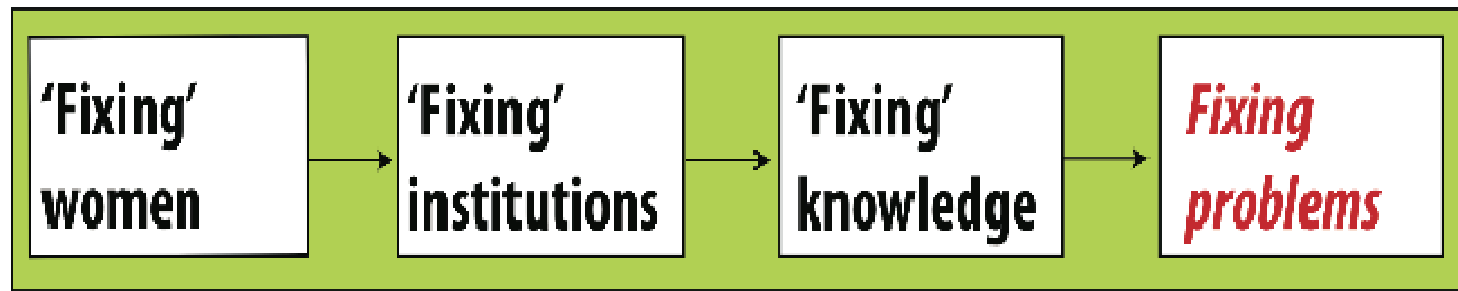
# ABOUT GENSET

- Funded by **FP7 Science in Society**, Support Actions
- **September 2009 – February 2012, 1.03m €**
- 4 Partners (Portia (UK) Coordinator and Lead), LiU (Sweden), Forth (Greece), WLW (Austria)
- Target for capacity building: **100 + institutions across Europe**
- Aim: capacity building for mainstreaming gender in science by transferring gender research knowledge into science institutions through dialogue involving scientists, gender experts and policy makers
- **Consensus Report** – voice of science leaders for science leaders
- **Gender Summit** – platform for the new gender in science constituency



# GENDER IN THE FRAMEWORK PROGRAMMES

FP 5 → FP8



interventions to help women fit-in better into the existing world of science

how institutions can improve their processes and practices to ensure men and women are treated equally

how research community can improve science knowledge making through integration of gender/sex analysis into the research process

how integration of the gender dimension can improve innovation and collective capability to achieve technological change and human wellbeing (EU 2020 Strategy)



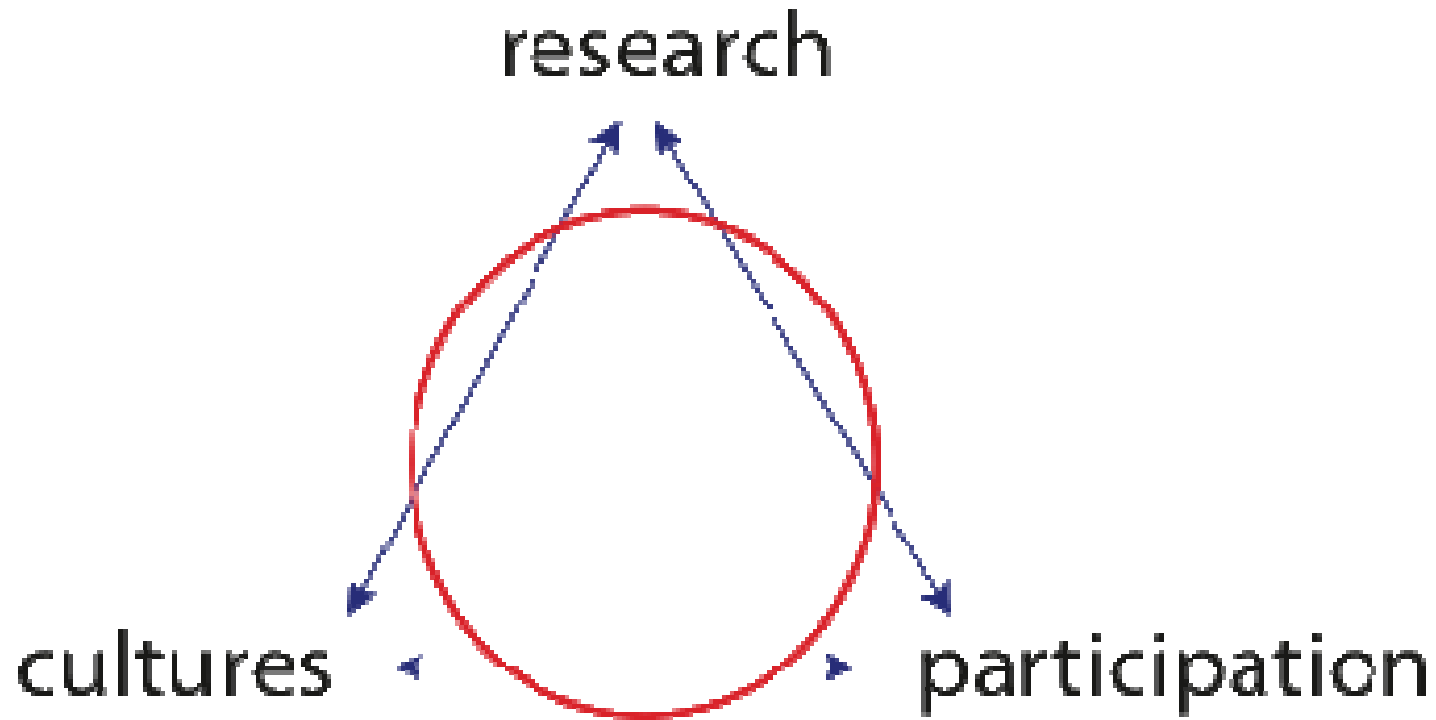
# EXAMPLE: GENDER ISSUES IN MEDICAL SCIENCES AND HEALTH

- Women in medical sciences – 52% (*100 years*)
- Women authors in core medical journals – 5.9% in 1970, 29.5% in 2005
- Women on editorial boards of core medical journals - 1.4% in 1970, 16% in 2005
- Women as subject of medical research – journal Pain: 75% of studies publishes involved male only





# GENDER STEREOTYPES AND IS STEREOTYPED BY SCIENCE AT THREE JUNCTIONS





# THE THREE MAIN DIMENSIONS OF GENDER IN SCIENCE

- **participation** governs how women and men are organised within and across different disciplines
- **scientific cultures** determines attitudes to gender roles and differentiates treatment of women and men
- **research and innovation** process controls how the similarities and differences between men and women are regarded in science knowledge-making and its application



# THE KEY MEANINGS IN GENDER DISCOURSE

- Sexual dimorphism (observable, physical characteristics, e.g. male and female different metabolic profiles)
- Biological differences
- Social differences (male/female roles)
- Combinations of the above



# KEY ISSUES AT THE LEVEL OF PARTICIPATION

- Leaky pipeline (over 50% graduates are women)
- Leadership (only 18% of professors are women)
- Career models (combining work and life)
- Clustering (social science, humanities, medicine)



# KEY ISSUES AT THE LEVEL OF CULTURES

- Favouring men (by women and men)
- Implicit and explicit gender stereotypes (in language, processes and practices)
- Gender bias in knowledge and decision-making (*male* panels and committees)
- Non-transparent assessment and selection processes and practices (how are leaders appointed?)

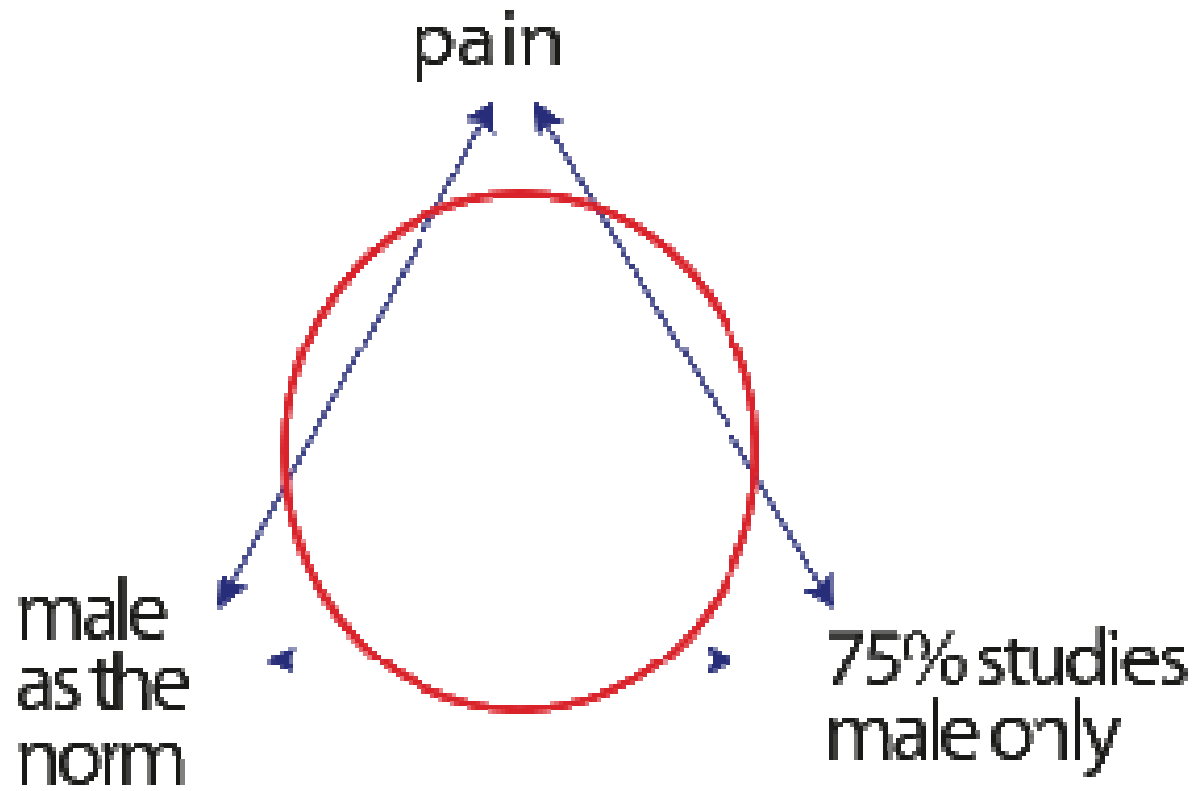


# KEY ISSUES AT THE LEVEL OF RESEARCH

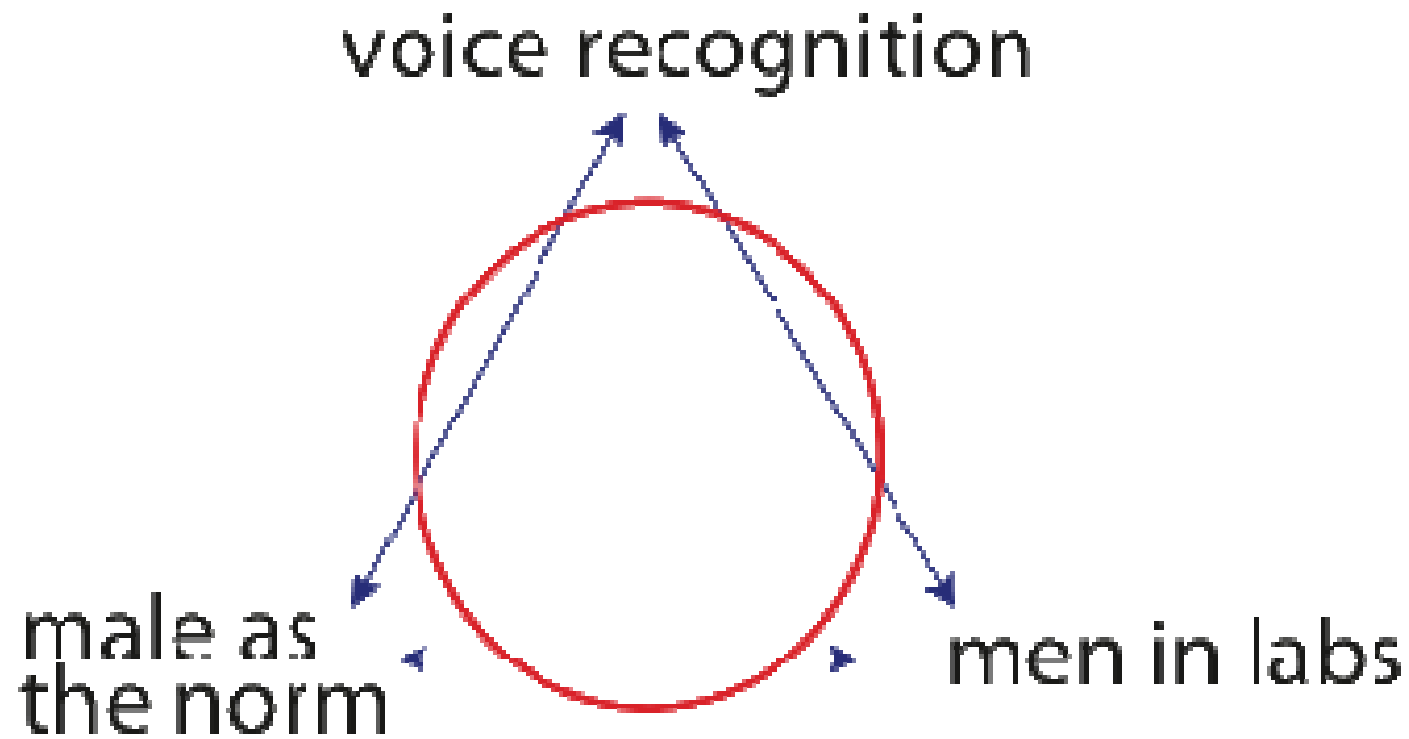
- Favouring male as the norm in research process
- Absence of sex/gender analysis in methods
- Sex/gender analysis not a requirement in assessment for funding or publication
- False assumption that 'excellence' protects knowledge making from biases and errors, caused by ignoring/undervaluing the role of sex/gender factors (differences/similarities)



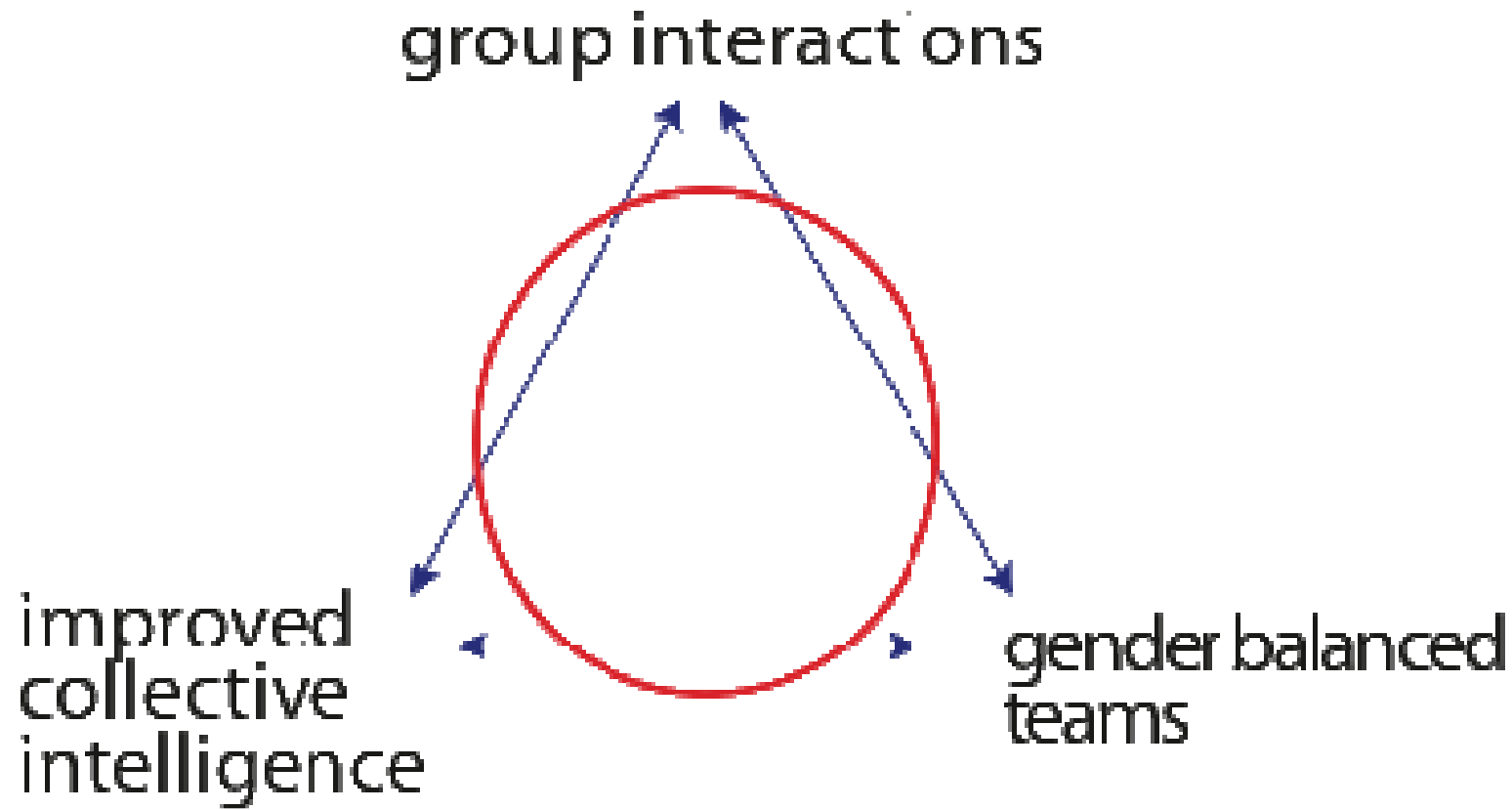
# EXAMPLE 1



## EXAMPLE 2



# EXAMPLE 3





# DENIAL: SOME COMMENTS FROM THE GREEN PAPER PUBLIC CONSULTATION

- “gender equality should not overrule the principle of excellence”
- “if women don’t want to do science, why force them”
- “not relevant for *Space* research”
- “leave it to the women, they are intelligent enough”
- “women are already well represented”
- “women are quite capable of looking after themselves in civilized countries”
- “the EU should wait it out: after all, there were very few, if any, female mathematicians a hundred years ago, and now there are many”



# FRIEDERICH FREBEL'S KINDERGARTEN - "CRYSTALS HAVE NO GENDER" (1)

**Bart Kahr** - University of Washington  
*Crystallography in Kindergarten* (CHE-0349882 and Center  
on Materials and Devices for Information Technology  
Research)

Friederich Froebel, a 19th C. crystallographer, invented Kindergarten. Crystallography infused every aspect of his conception, especially the self-actuated learning devices that were the cornerstones of his curriculum. Symmetry exercises and lattice constructions were primary occupations of millions of children in the first several kindergarten generations. The importance of crystallography in the history of early childhood education has not been known to a single crystallographer of my acquaintance despite the fact that we have presented this story at several international crystallography meetings. We have suggested that the exposure of many girls to crystallography before traditional schooling biases set in could account for the great proportion of women among the pioneers in X-ray crystallography, a gender distribution unmatched by any other physical science [1]. Jeanne Rubin believes that the way to interest preschool children in math and science should not be a mystery. Adopt the Froebel's pedagogy. The experiment was done ~75 years ago on millions, and it worked [2]!

[1] B. Kahr, *Cryst. Growth Des.* **2004**, *4*, 3-9.

[2] Rubin, J. S. *Intimate Triangle: Architecture of Crystals, Frank Lloyd Wright and the Froebel Kindergarten*, Polycrystal Book Service, Huntsville, Alabama, 2003.

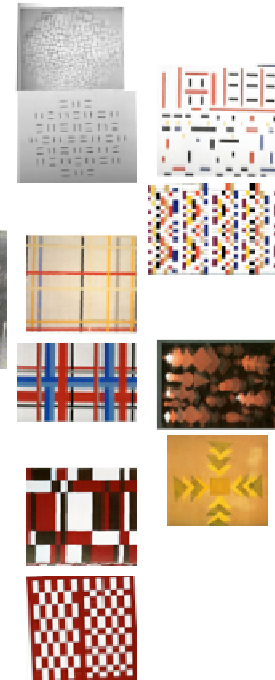
[3] Brosterman, N. *Inventing Kindergarten*, Harry N. Abrams, New York, 2002.



Atlanta kindergartners ca. 1900 in a room unadorned save for a portrait of Froebel.US Library of Congress.



Froebel gave us building blocks and many other lattice building toys. [from 3]. Kiyoshi Togashi, Zindman/Freemont NY.

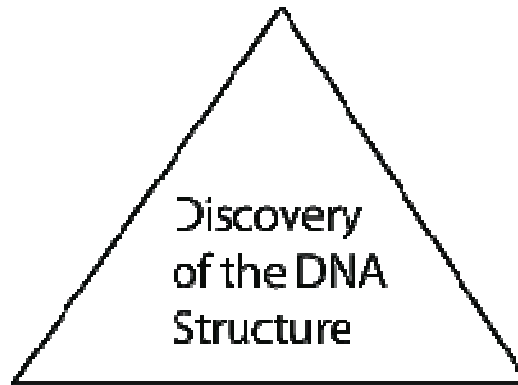


Brosterman [3] believes that crystallography in kindergarten was a driving force behind modernism in the arts.

QUIZ: Which in each pair was made by a famous modern artist and which by a 19th C. kindergartner? From Bottoms are by kindergartners (Kiyoshi Togashi, Zindman/Freemont NY). Top credits: The Mondrian Estate/Holtman Trust, Josef Albers/Paul Kleez/Bart van der Leek, ARS, New York.



# ROSALIND FRANKLIN AND THE DISCOVERY OF DNA STRUCTURE - “*CRYSTALS HAVE NO GENDER (2)*”



# USE-INSPIRED RESEARCH AND GENDER – “*CRYSTAL HAVE NO GENDER*” (3)

- Photonics
- Radiation
- Machine learning
- Robotics
- Virtual Reality
- Voice Recognition
- Transport
- Water
- Energy
- Environment
- Etc.



# GENDERED INNOVATION AND OPPORTUNITIES FOR NEW MARKETS

- Medical diagnostics
- Medical treatments
- Health programmes
- Security
- ICTs
- Engineering design
- Drug design and testing
- Agriculture and food
- Education
- Reducing risk
- Etc



# CHANGING THE FACE AND STYLES OF LEADERSHIP



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# POLISH EU PRESIDENCY (GENDER SUMMIT, 2011)

“Europe has an important competitive advantage globally in the form of the very high proportion of women participating in both higher education and employment. This human capital resource is also a potential target for developing new markets for innovation, which so far has been largely overlooked. By addressing women's needs, preferences and purchasing power, new ideas and new opportunities for research and innovation can be created. ”



# VICE-PRESIDENT OF EUROPEAN PARLIAMENT (GENDER SUMMIT 2011)

“As society looks towards science to help solve the many challenges ahead, it expects research and innovation that is more responsible and responsive to societal needs. Europe needs to improve its research and innovation strategy to gain better returns on investment in scientific and technical capital. Gender equality and diversity represent key elements of ensuring quality of human scientific resources and science knowledge.”





# COMMISSIONER DG RESEARCH (GENDER SUMMIT, 2011)

“ It is clear that time alone will not redress the under-representation of women in research or scientific leadership. Specific measures are needed to support women's scientific careers, and to address gender factors in the research process, with a view to improving quality. This will also help enhance scientific excellence in Europe. “



# CEO EUROPEAN SCIENCE FOUNDATION (GENDER SUMMIT 2011)

“ Research and innovation need the best and brightest to challenge dogmas, confront unsolved problems and come up with new findings, perspectives and discoveries that improve our lives and strengthen our societies. We need to engage all talented individuals, and create opportunities and equal playing fields to benefit from their skills, expertise, and creativity. This goal is unlikely to be met if we let gender prejudices or societal barriers keep in the shadow almost half of the research community.”



# CEO COST

“The European Union regards gender balance as a key contributor to innovation yet recognises that more specific measures are required to reach the goals of an increasingly dynamic European Research Area. This Gender Summit is the place to kick start a much-needed structural change that would allow us to keep up with other social spheres and marketplaces.”



# PRESIDENT OF UNIVERSITY OF LUXEMBURG (GENDER SUMMIT, 2011)

“It is important that knowledge of the effects of gender balance is publicized and integrated into discussions about gender mainstreaming within scientific institutions, on a European and national levels, and crossing cultural and linguistic barriers, in order to promote structural change.”



# CONCLUSIONS: THE GENDER DIMENSION IMPACTS ON SCIENCE QUALITY

- Better research design and process
- Improved social responsibility of science
- Improved responsiveness to societal need
- Important competitive R&D advantage
- Enhanced scientific human capital
- Economic benefits
- More effective collaboration
- Wider and refreshed supply of innovation ideas and ways of taking ideas to markets



**THANK YOU!**

Background information for this talk is on  
[www.genderinscience.org](http://www.genderinscience.org)

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