"Women in science and technology: education and professional aspects"

Martine JAMINON









H. A. Kramers N. F. Mott G. Gamlow P. Blackett M. Co*s*yns A. Piccard E. Stahel P. A. M. Dirac J. Errera C. D. Ellis E. O. Lawrence enriot F. Joliot W. Heisenberg E. Walton P. Debye B. Cabrera. W. Bothe E. Bauer J. Yerschaffelt J. Cockcroft L. Rosenf F. Perrin E. Fermi M. Rosenblum W. Pauli E. Herzen R. Peierls E. Schroedinger T. Joliot N. Bohr A. Joffe M. Curie O. Richardson E. Rutherford M. De Broglie L. Meitner J. Chadwick P. Langevin T. De Donder L. De Broglie Absent: A. Einstein and E. Guve

7th Solvay Physics Congress | Brussels, 1933

Congress of Mathematics | Toulouse, 2011



Brewing and Engineering Congress | Veldhoven, 2010







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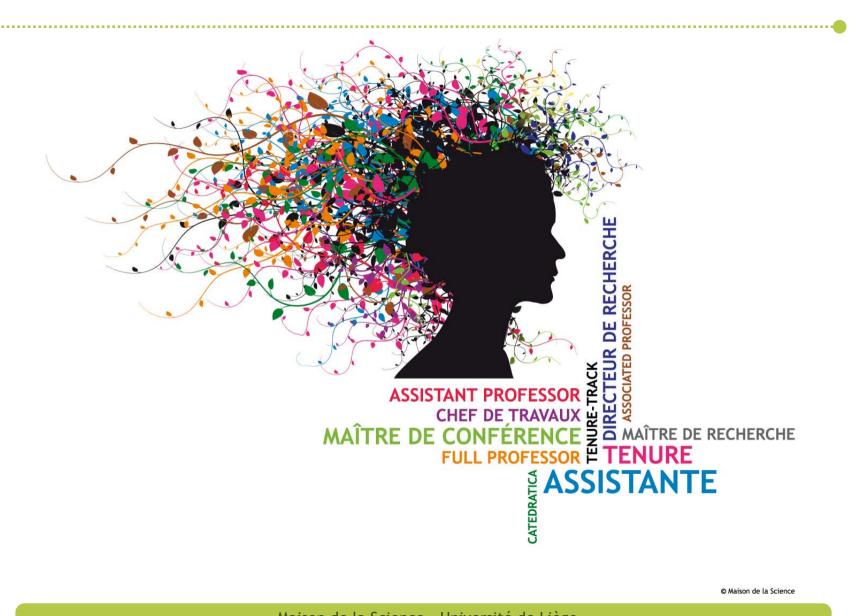


Outline

- 1. Some numbers
- 2. Some findings
- 3. Some recommendations



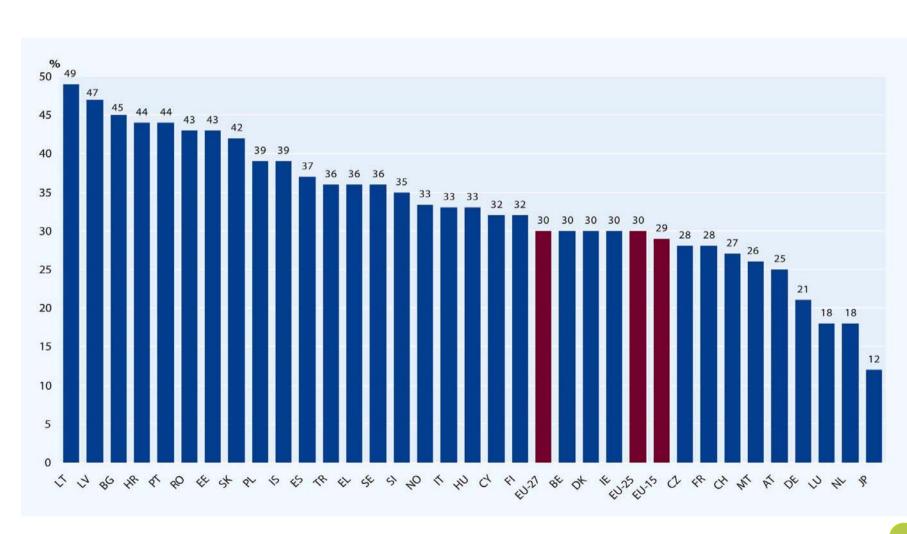
1. Some numbers



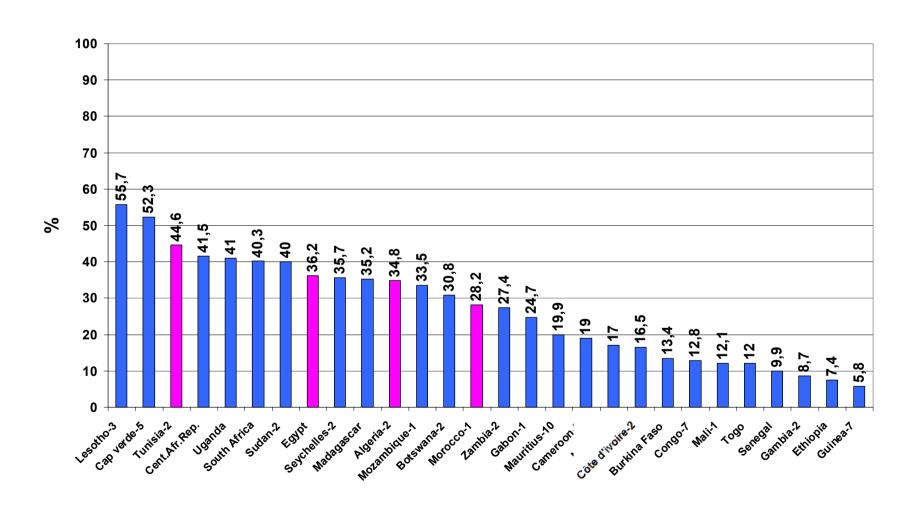
Sources

- •http://appsso.eurostat.ec.europa.eu/nui/show.do?d ataset=rd_p_femres&lang=fr
- •http://www.uis.unesco.org/pages/default.aspx

Proportion of female researchers | EU-15-25-27 2006

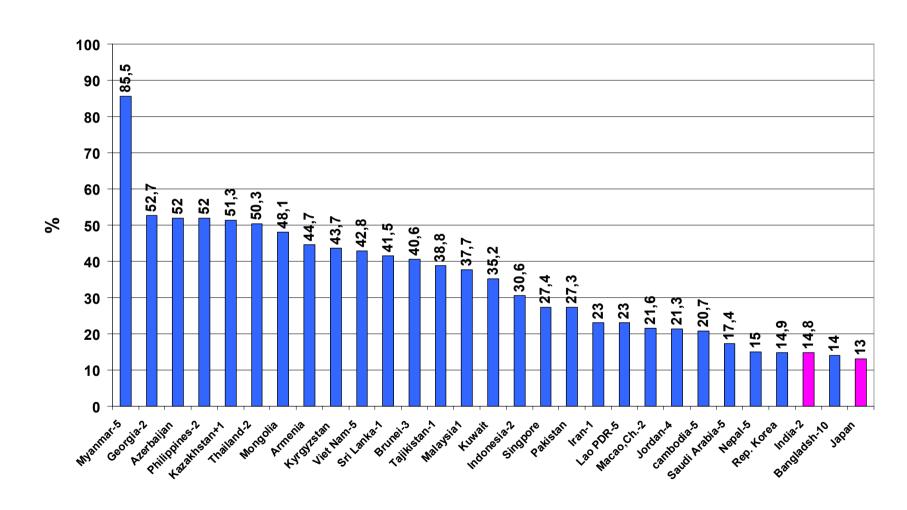


Proportion of female researchers | Africa Reference year 2007

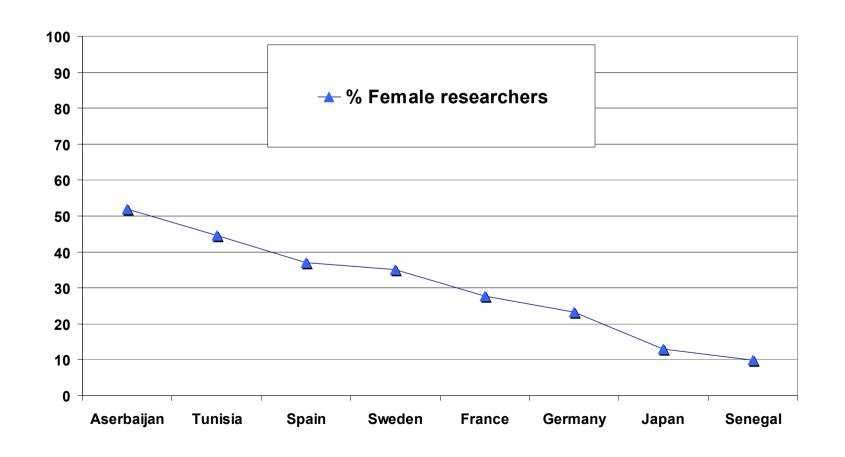


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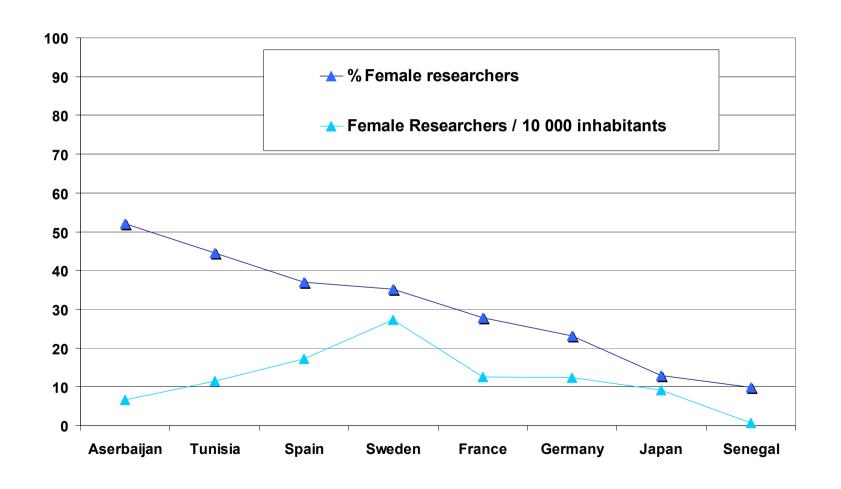
Proportion of female researchers | Asia Reference year 2007



Proportion of female researchers in 8 countries of Europe, Asia and Africa

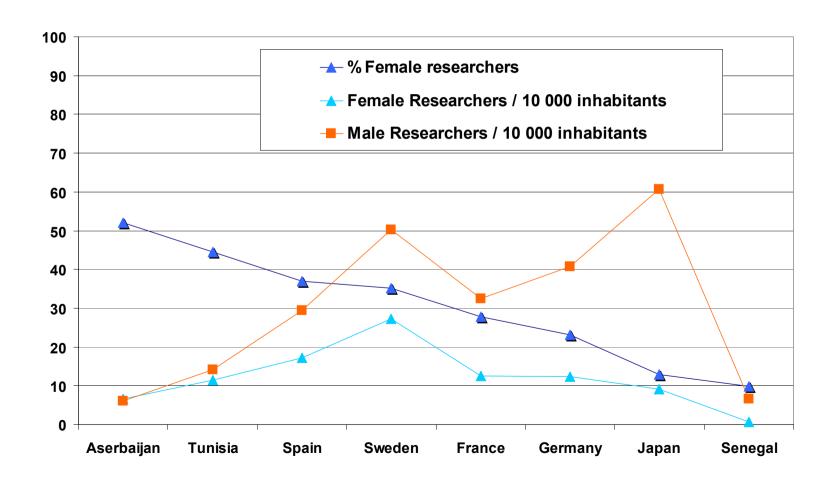


Number of female researchers in 8 countries of Europe, Asia and Africa/ 10 000 inhabitants



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Number of male researchers in 8 countries of Europe, Asia and Africa/ 10 000 inhabitants



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Proportion of female PhD graduates

	EU-27	US
	2006	2009
All fields	45	47
Education	64	67
Humanities arts	52	52
Social sciences business law	47	55
Sciences mathematics computing	<u>41</u>	<u>44</u>
Engineering manufacturing construction	<u>25</u>	<u>21</u>
Agriculture veterinary	51	54
Health welfare	54	70

Proportion of female PhD graduates | Natural science and engineering

	EU-27	US
	2006	2009
Life science	56	52
Physical sciences	<u>35</u>	<u>31</u>
Mathematics statistics	<u>34</u>	<u>31</u>
Computing	<u>18</u>	<u>22</u>

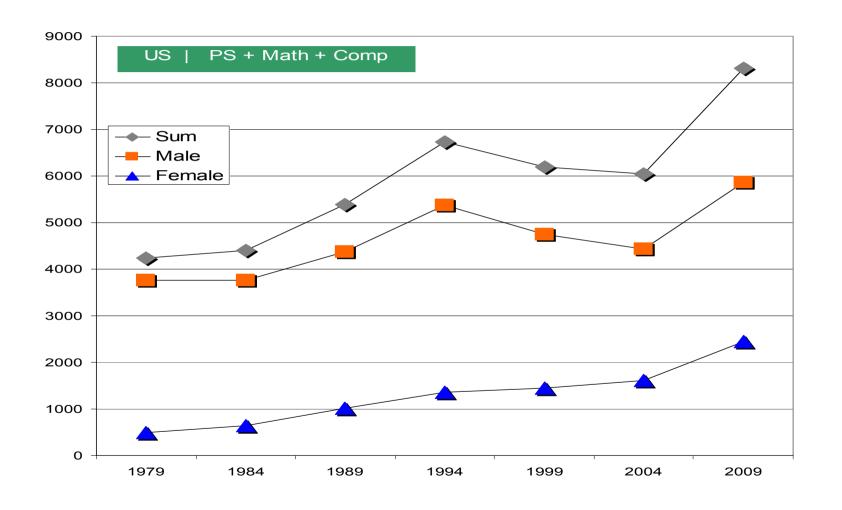
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Chemistry	<u>37</u>
Physics-astronomy	<u>20</u>
EAO	<u>38</u>

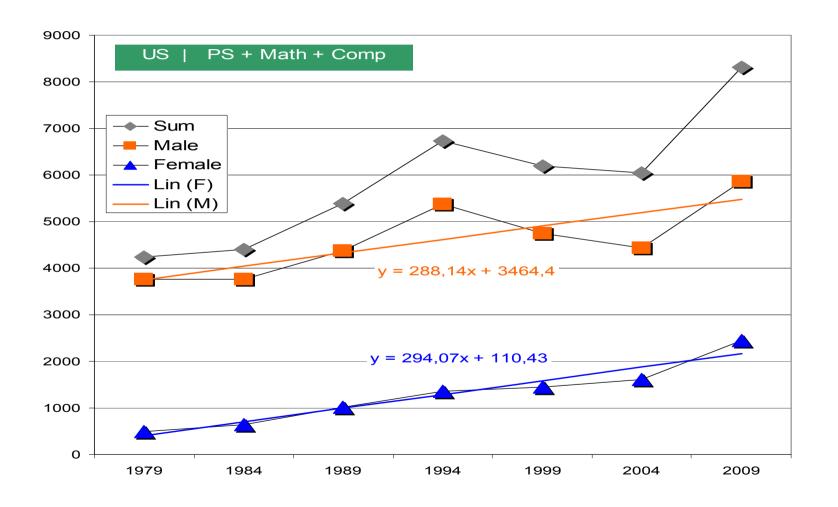
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Evolution of female PhD graduates | US Physical sciences + mathematics + computing



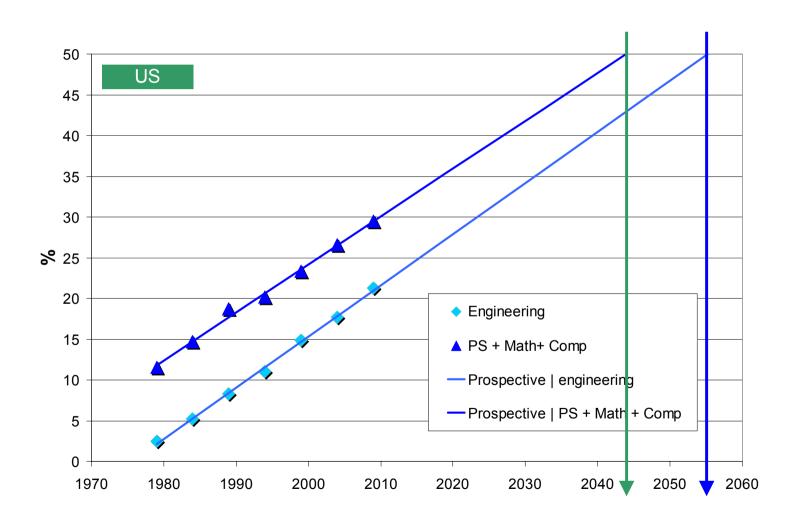
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Evolution of female PhD graduates | US Physical sciences + mathematics + computing



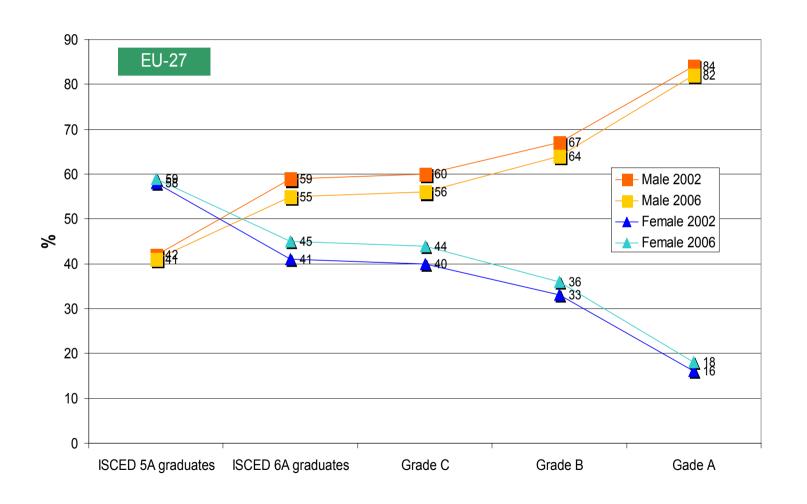
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Evolution of female PhD graduates | US

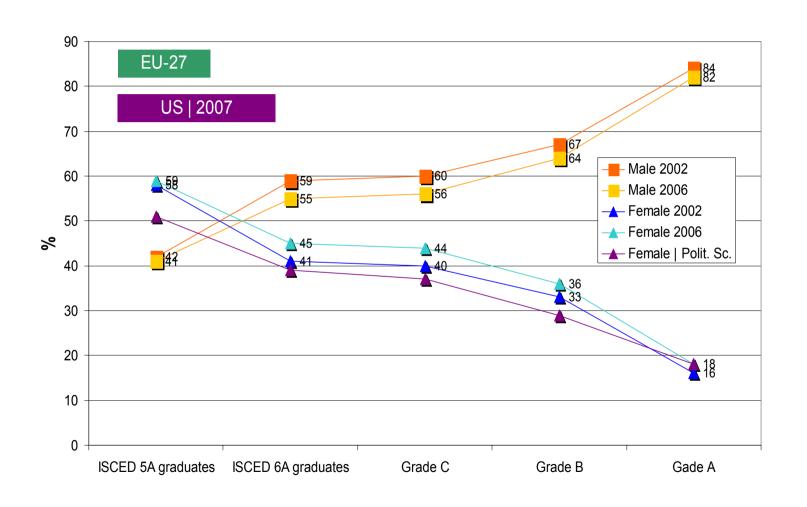


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academic career | 2002/2006

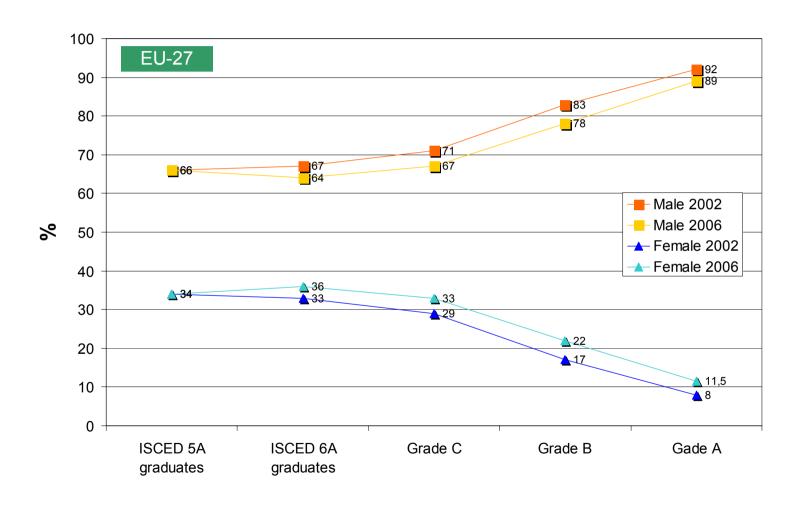


academic career | 2002/2006



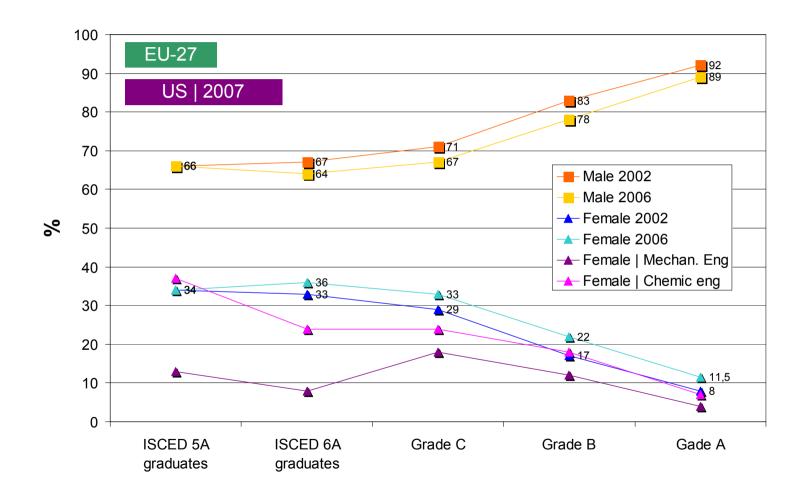
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Proportions of men and women in a typical academic career in science & engineering | 2002/2006



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Proportions of men and women in a typical academic career in science & engineering | 2002/2006



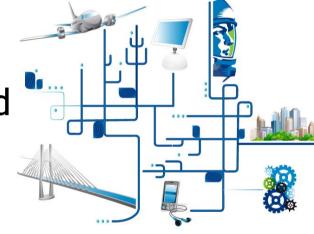
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To keep in mind:



Women remain a minority in research

... specifically in engineering and computing





 Existence of a leaky pipeline in the academic career

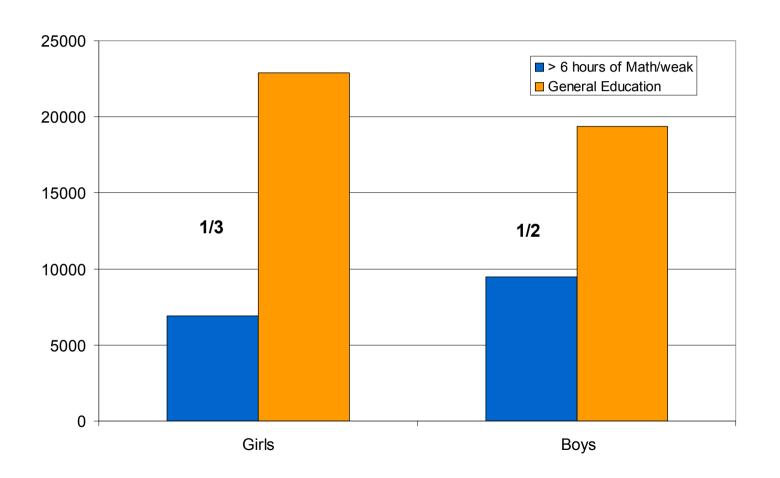
2. Some findings

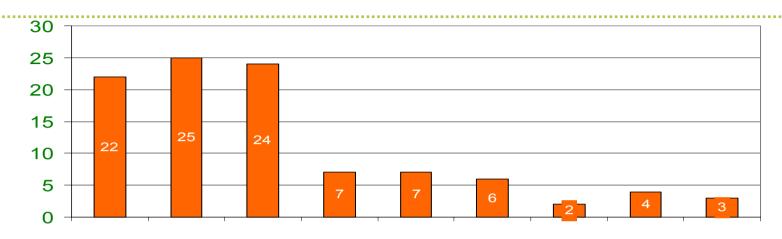


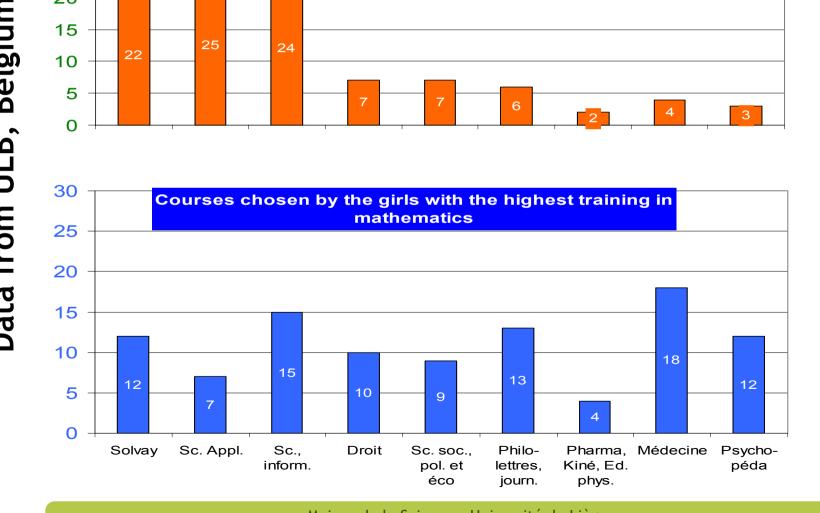
2. Some findings

- Educational level :
 - Sciences are not very attractive

CF (Belgium)|Terminal two years of general secondary education







Why?

- Poor picture of job prospects (G = B)
- Poor picture of jobs (G = B) [status]
- Difficulty to combine family and professional life (G ≠ B)
- Lack of support from the school or teachers (G ≠ B)

2. Some findings

- Educational level:
 - Sciences are not very attractive
- Professional level :
 - A research career is not attractive

National Academies Press, 2010

- « If women applied for positions at RI institutions, they had a better chance of being interviewed and receiving offers than had male job candidate »
- ... but they do not apply

	% Female Ph.D.s	Mean % of F applicants	Mean % of F → interview	Mean % of F → Offer
Biology	45	26	28	34
Civil eng.	18	16	30	32
Physics	14	12	19	20

3. Some recommendations



For schools

The main goal is to increase the number of girls that start science at University.



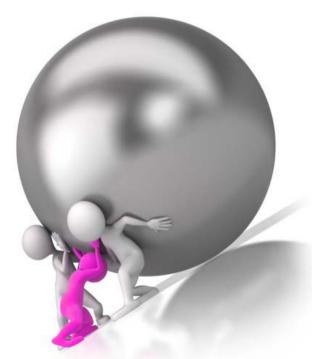
How?



- Information ?
 - School, family, Universities (website, open house days, booklets)
- Special events for girls
 - One week in a lab
 - Exhibitions
- Creative stories
-

For research institutions

The main goal is to increase the number of women applying for tenure-track or tenured positions



How?

Design and implement recruitment strategies :



Support of associations that promote women in scientific careers

Recruiting committee including a higher proportion of women

Recruiting at conferences

Targeted advertising

How?

Make the career more attractive :

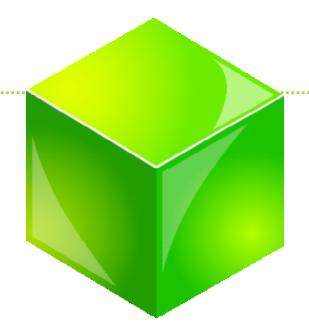


Initiate investigations

Develop stop-the-tenure-clock policies and assess their impact on advancement

Make tenure and promotion procedures as transparent as possible

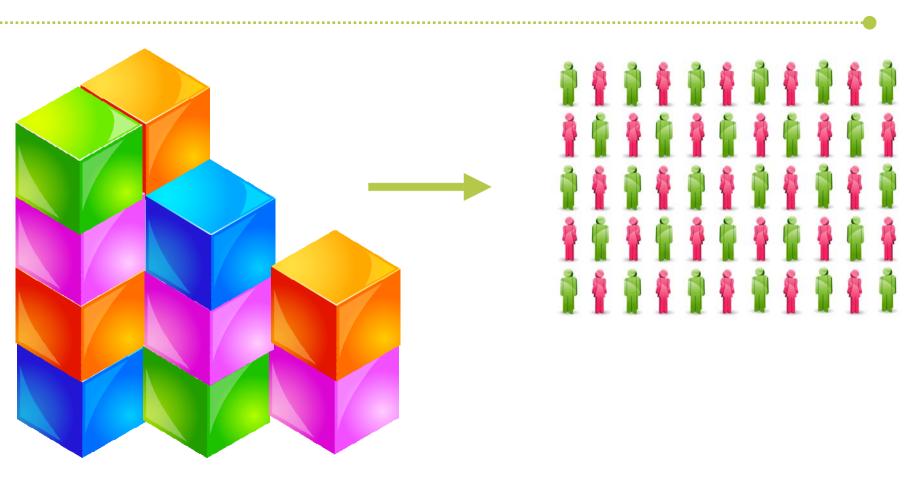
Inititiate mentoring programs



Investigations

- How is professional outcome affected by gender differences in family-related obligations?
- Why do female researchers feel a sense of isolation in the faculty?

It is hoped



that the implementation of these measures will lead to a greater number of women in research

Questions or remarks?







La citadelle, Antoine de Saint-Exupéry