

Women in Physics in Europe

Claudine Hermann

claudine.hermann@polytechnique.edu

Honorary professor of physics at Ecole Polytechnique, France
President of honor of the French association Femmes & Sciences
(Women and Science)

www.femmesetsciences.fr

Vice-president of the European Platform of Women Scientists

www.epws.org

FEMMES & SCIENCES
a s s o c i a t i o n

String theory
conference Paris
10/6 /2016



- Women scientists in the past
- Current research: common facts among countries
- Situation of women scientists: a few national examples (France, Germany, Portugal)
- The European Union and women scientists
- The European Platform of Women Scientists - EPWS

Women scientists in the past

- Physics or Chemistry Nobel awardees
 - 1903 and 1911: Marie Curie, France
 - 1935: Irène Joliot-Curie, France
 - 1963: Maria Goeppert-Mayer, Germany
 - 2009: Ada Yonath, Israel

Marie **SKLODOWSKA-CURIE** (1867-1934)

Nobel prizes in Physics (1903) and Chemistry (1911)

And her husband
Pierre CURIE (1859-1906)

First woman
professor
at the Sorbonne



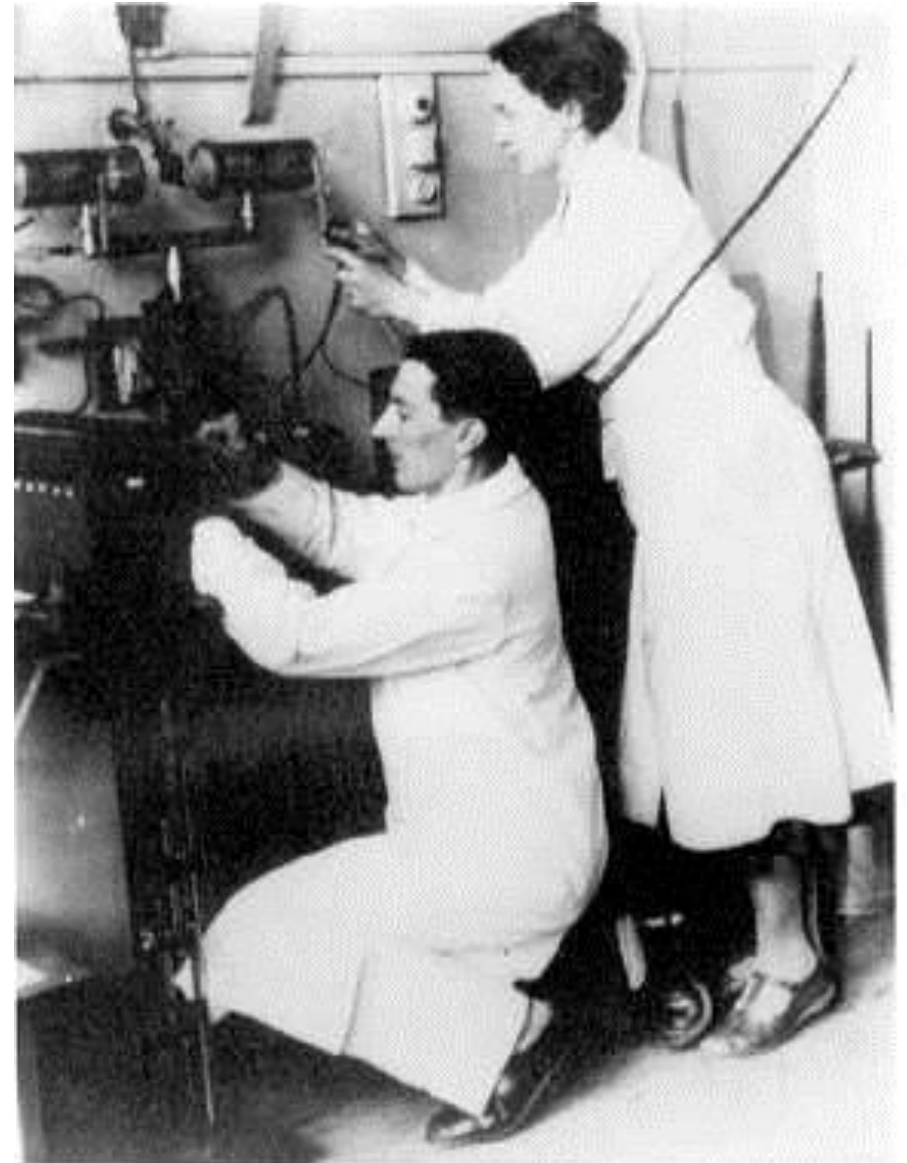
Irène JOLIOT-CURIE (1897-1956)

Nobel prize in Physics 1935

And her husband Frédéric
JOLIOT (1900-1958)

Discovery
of artificial radioactivity

Irène: Under-Secretary for
Research
of « Front Populaire » in 1936



Maria GOEPPERT-MAYER

(1906-1972), Nobel prize in Physics 1963
Germany and United States

Imagined the shell model
of nuclei



Ada YONATH (1939-), Nobel prize in Chemistry 2009
Israel

Identification of the
molecular structure
of ribosome
by cristallography



Women scientists in the past

- Forgotten by Nobel committees:

Lise Meitner (Austria, Germany, Sweden)

Rosalind Franklin (United Kingdom)

- To be remembered

Branca Edmee Marques (Portugal)

Lise MEITNER (1878-1968)

Discovered the nuclear fission process with Otto Hahn (Nobel prize in Chemistry 1944) and Fritz Strassmann.

Gave the name « fission » to the phenomenon and provided its physical explanation together with Otto Robert Frisch, her nephew.

Discovered element 91, Proactinium, with Otto Hahn.

Was proposed several times for the Nobel prize...



Rosalind FRANKLIN (1920-1958)

Responsible of a large part of the research work that lead to the understanding of the desoxyribonucleic (DNA) acid structure.

James Watson, Francis Crick and Maurice Wilkins were awarded the Nobel prize for the double-helix model of DNA in 1962, 4 years after her death.



Branca Edmee MARQUES (1899-1986)

Studied Chemistry at Lisbon university.

Did her PhD under Marie Curie's supervision in Paris.

Started up Lisbon Laboratory of Radiochemistry, then Lisbon Department of Radiochemistry and Nuclear Chemistry.

In 1966 her contributions were finally recognized with a full professorship at the University of Lisbon.



Women scientists in the past

- Before the 20th century, a few portraits:
Anne-Marie Paulze - Lavoisier, France
Maria Gaetana Agnesi, Italy
Maria Sibylle Merian, the Netherlands...

**Marie Anne
Pierrette PAULZE-
LAVOISIER (1758-
1836)**

**Antoine Laurent
LAVOISIER
(1743-1794)**





Heliog Arents

Lavoisier dans son laboratoire
Expériences sur la respiration de l'homme au repos

Fac-similé réduit d'un dessin de M^{me} Lavoisier

Print from the book « Lavoisier 1743-1794 » by Edouard Grimaux, 1888, Alcan
From a drawing by Madame Lavoisier

Maria Gaetana AGNESI (1718-1799)

Propositiones Philosophicae (1738):
logic, mechanics, hydraulics, universal
attraction, chemistry and zoology.

Instituzioni Analitiche (1748):
synthesis of the most advanced
mathematics of her time.

Professor of mathematics at Bologna
university



Maria Sibylle MERIAN (Francfort 1647-Amsterdam 1717)

Naturalist, author of *Metamorphosis Insectorum*

Surinamensium (Amsterdam, 1705)

and other works gathered after her death,

in *Histoire générale des insectes de Surinam et de toute*

l'Europe (3 vols., Paris, 1771)



Current research: common facts among countries

- Model of **excellence in research** inspired by that of USA
- (Lecturers-) researchers evaluated on their **research activity**. What about the other tasks (teaching, administration, science dissemination...)?
- Similar national problems for **women scientists' hiring or promotion** (« **biological clock**», « leaking pipeline », « glass ceiling »..)
- **Imbalance between women and men** in research decision positions.

Women scientists' situation: national examples

- France
- Germany
- Portugal

France

1. Situation of French women

- notable fertility rate
- daycare systems for young children
- law on parity in politics ...
- but quotas are unpopular (universalism)

2. Higher education

« Grandes écoles » and universities

3. Structure of research

Public research (civil servants hired in their early thirties) and R&D in the private sector

France

4. Women in research

- 33 % of women in public research

France: Higher Education

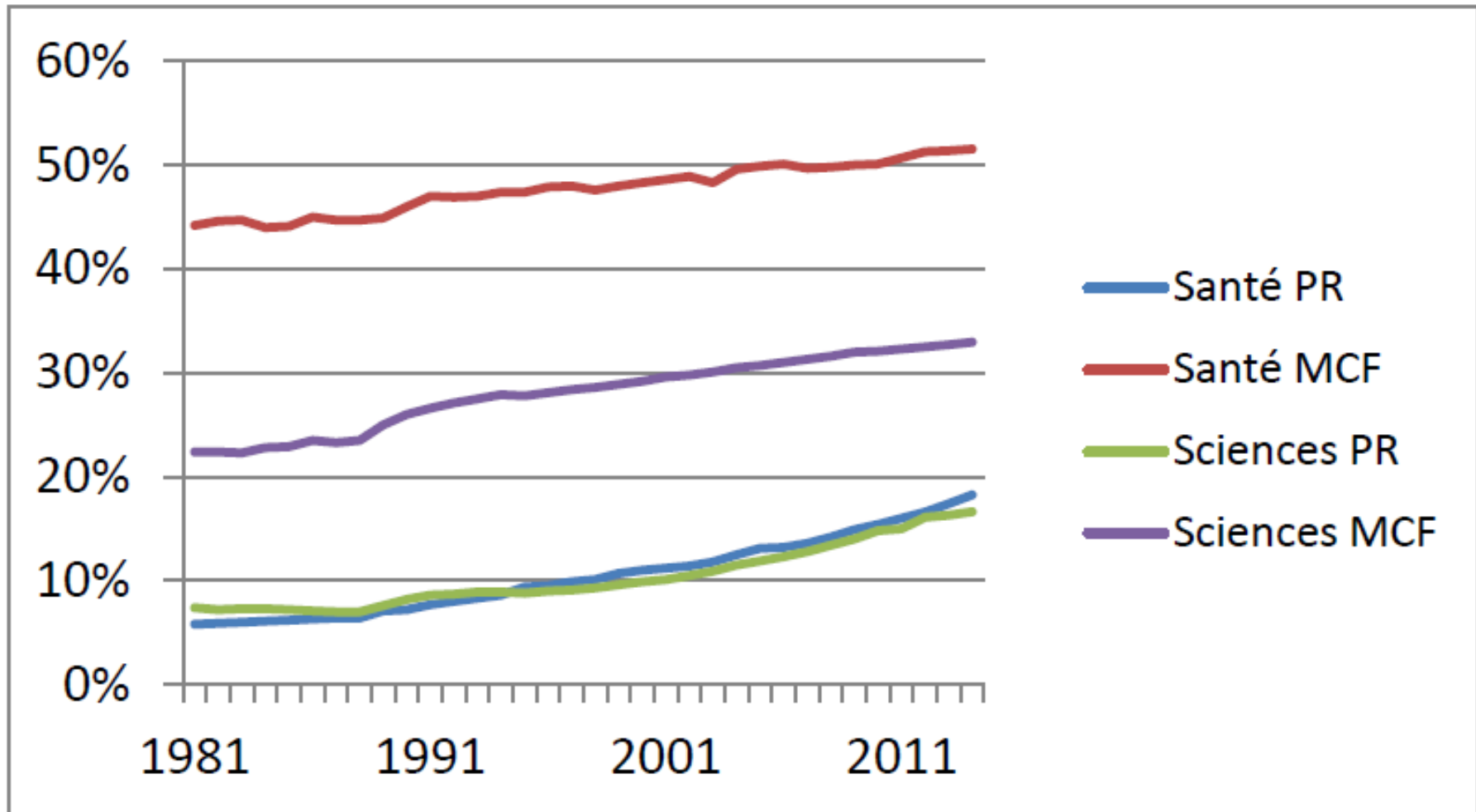
Percentage of women (2014)

	Assistant professors	Professors
All disciplines	44%	23%
Art	56%	36%
Law	48%	26%
Science	33%	17%

Women at the National Centre for Scientific Research (CNRS) (2014)

- 34% of the researchers are women
- 45% of the engineers, 64% of the technical and administrative staff are women
- Extremely low increase of the percentage of women among the researchers





Percentages of women among the university professors (PR) and assistant professors (MCF) in Health and Science in France between 1980 and 2014

France

4. Women in research

- 33 % of women in public research

Slow progress in universities, stability at CNRS

- Structures in favour of women scientists

*Missions for Parity : ministry of Research, CNRS +...

*Committee for professional equality in Higher Education and Research

- Gender studies

*Institut Emilie du Châtelet (Paris region, 2006)

*recognition of the domain later than in other countries

- 2013 law on Higher Education and Research

*Equal opportunities officers in universities

*Balanced women/men representation in committees

Germany

1. Burden of History:

- Bismarck and the 3K« Kinder, Küche, Kirche »
(children, kitchen, church)
- 3rd Reich

2. Science operation:

- Slow higher education studies until Doktorarbeit
- Compulsory geographical mobility until Habilitation

Germany

3. Women situation

- Previous situations in the Western (FRG) and Eastern (DRG) parts
- Lack of child care, school only in the morning
=>Dilemma between family and career
- More recent issues « Rabenmutter » (cruel mother)
+ low women fertility rate
=>Angela Merkel: modified parental leave,
additional creches
« Gebärmaschinen » (prolific child-bearer) !

Germany

4. Structures/measures for women scientists

37% women researchers in higher education (2012)

- actions since the 1990's
- women in the universities recruitment committees
- Centre for Excellence Women in Science
(support for women scientists)

5. Equality label

- In 10 years, 100 laureates,
- from the public or private sector



Germany

-*Deutsche Forschungsgemeinschaft (DFG)*, the structure financing research in higher education and public institutions:

*In 2008 declaration of its members committing themselves on « *The DFG's research-oriented standards on gender equality* », with both structural and personal aspects.

*In 2014 : « *Tool box* » with examples of good practises for gender equality

-*German universities : Professorinnenprogramm*, financed by the *Federal ministry of Education and Research (BMBF)*, for hiring new women professors.

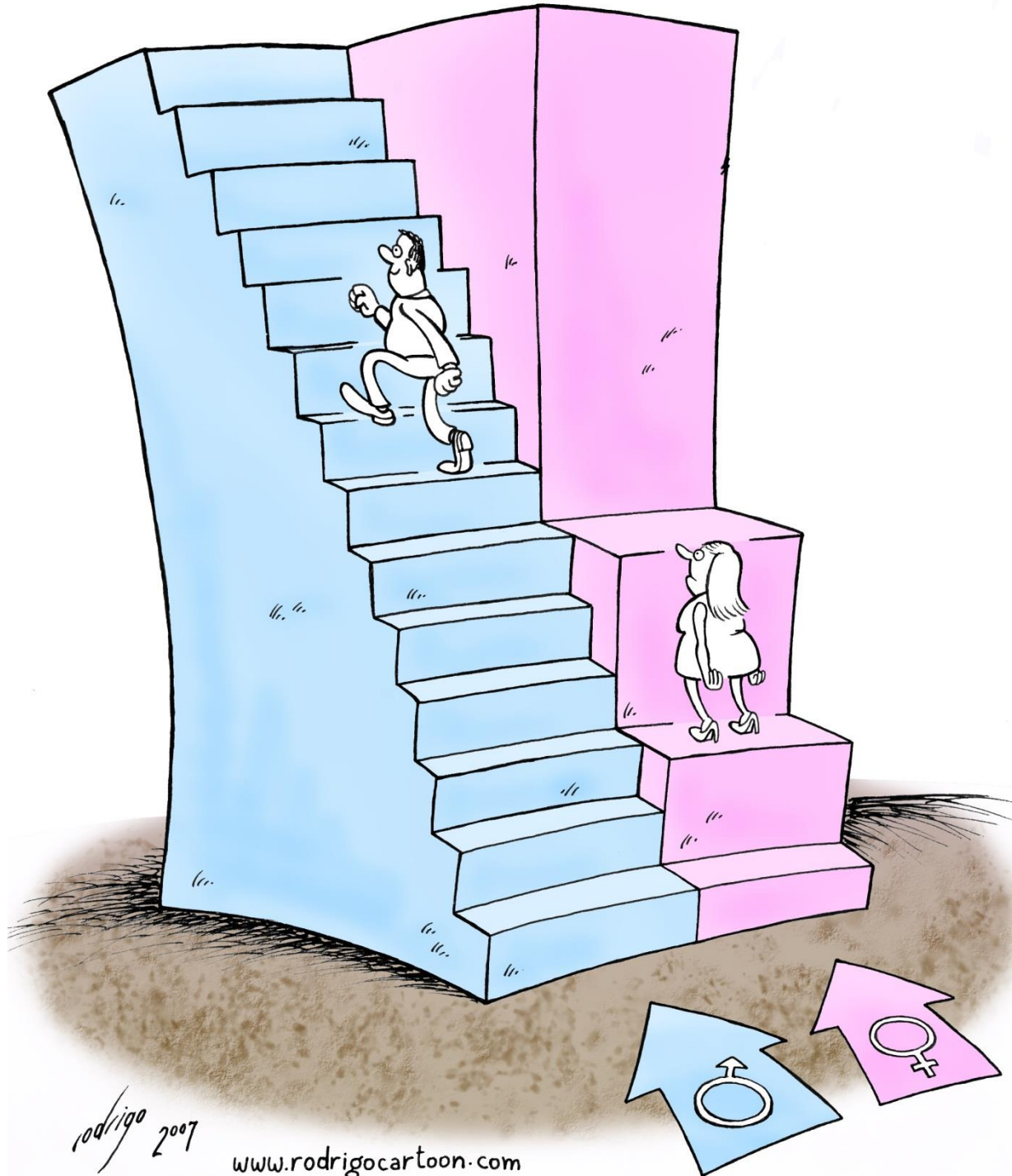
*2008-2012 : 150M€, 260 new women professors hired

*Programme renewed for 2012-2017 with the same financing

* To apply such a programme the university must evidence a *successful concept of gender equality*

Portugal

- 49% women researchers in higher education (2012)
- But they are not satisfied of their career



rodrigo 2007

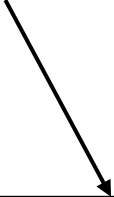
www.rodrigocartoon.com

The European Union and women scientists

- European structures
- Directorate General Research of the European Commission
- European Platform of Women Scientists - EPWS

European structures

European Council
of the 28 heads of state
or of government



European Commission
20 commissioners
appointed for 5 years



European Parliament
626 Members (MEPs)
elected for 5 years



DG Education,
DG Research...



Council of the European Union
the 28 relevant ministers

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The European Union (EU) and women scientists

- Egality between women and men:
one of EU main « pillars » according to Amsterdam Treaty (1997)
 - Need of scientific workforce:
Lisbon and Barcelona objectives for 2010
 - Europe 2020 : competitiveness based on Research and Innovation
- => Declarations and activities on Women and Science

The Women and Science issue at DG Research

- A devoted unit: « Women and Science » (1998-2006), « Scientific Culture and Gender Issues » (2006-2010), « Ethics and Gender » (2011-), Gender sector inside B6 Unit
- A group of national civil servants: the Helsinki Group (lobbying at **institutional level**)
- Activities:
 - * *Statistics She Figures*
 - * **Reports on** « Women and Science » (public and private)
 - * EU projects calls and « Gender Watch System »
 - * European Platform of Women Scientists - **EPWS** (lobbying at **associations and networks levels**)

Some European data (all disciplines) (*She Figures 2015*)

- « Hit parade » of women professors
- « Scissors diagramme »
- Gender-disaggregated percentages for academic staff

Percentage of women
academic staff grade A
She Figures 2015
and *ETAN report 2000*

Country	% 2013	% 1997 or 1998
MK	66,7	
MT	44,5	
HR	38,0	
LV	34,4	
BG	31,7	
RO	29,7	
IE	28,2	
FI	26,6	18,4
IS	26,3	8,0
NO	25,2	11,7
PT	25,0	17,0
HU	24,1	
SE	23,8	11,0
SK	23,7	
PL	22,6	
SI	22,5	
IT	21,1	11,0
EU-28	20,9	
ES	20,9	13,2
AT	20,3	6,0
EL	19,6	9,5
FR	19,3	13,8
CH	19,3	5,7
DK	19,2	7,0
UK	17,5	8,5
DE	17,3	5,9
EE	17,2	
LU	16,5	
NL	16,2	5,0
BE	15,6	7,0 and 5,1
LT	14,4	
CZ	13,1	
CY	10,8	



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Figure 6.1. Proportion of women and men in a typical academic career, students and academic staff, EU-28, 2007–2013

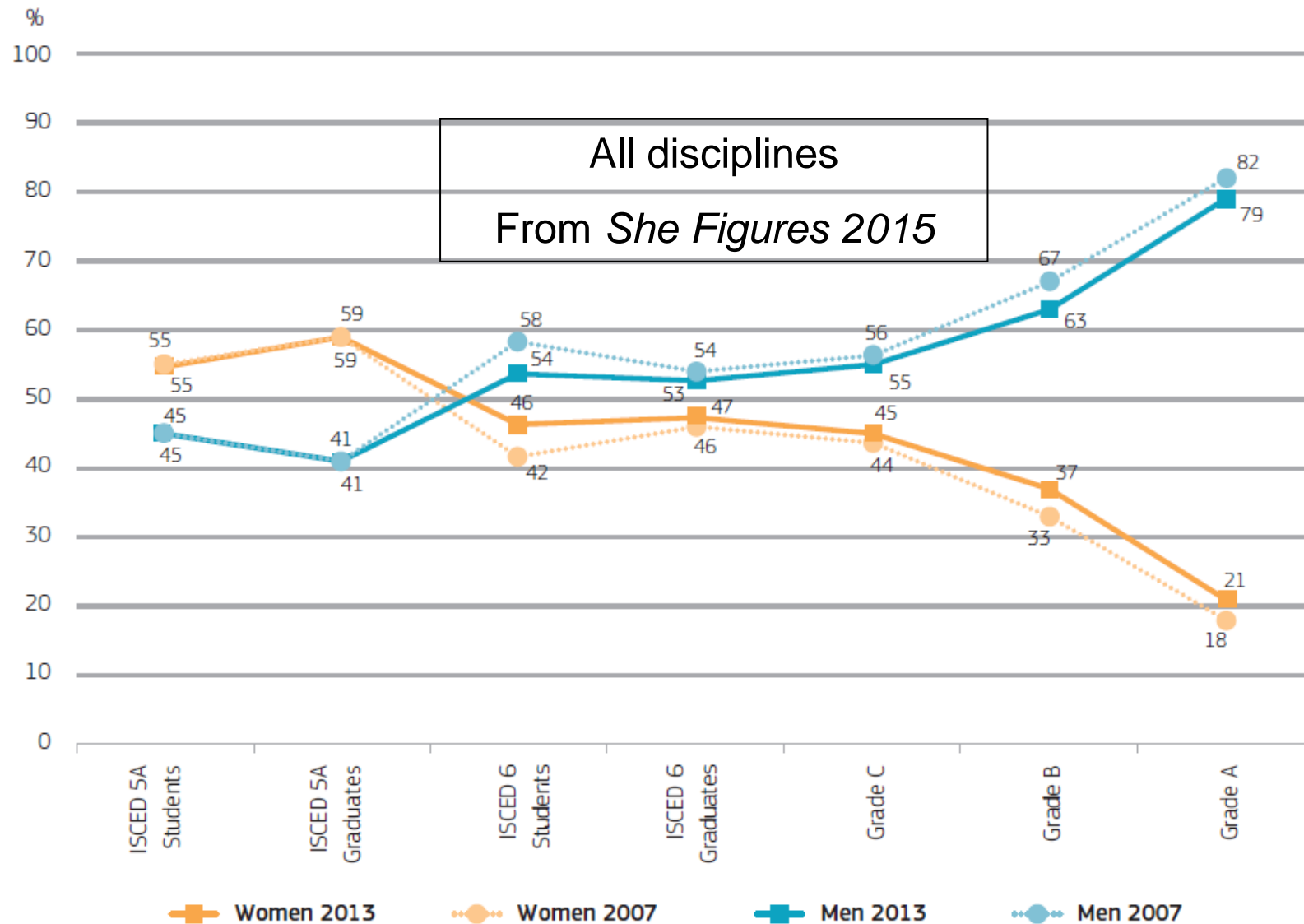


Figure 6.2. Proportions of women and men in a typical academic career in science and engineering, students and academic staff, EU-28, 2007–2013

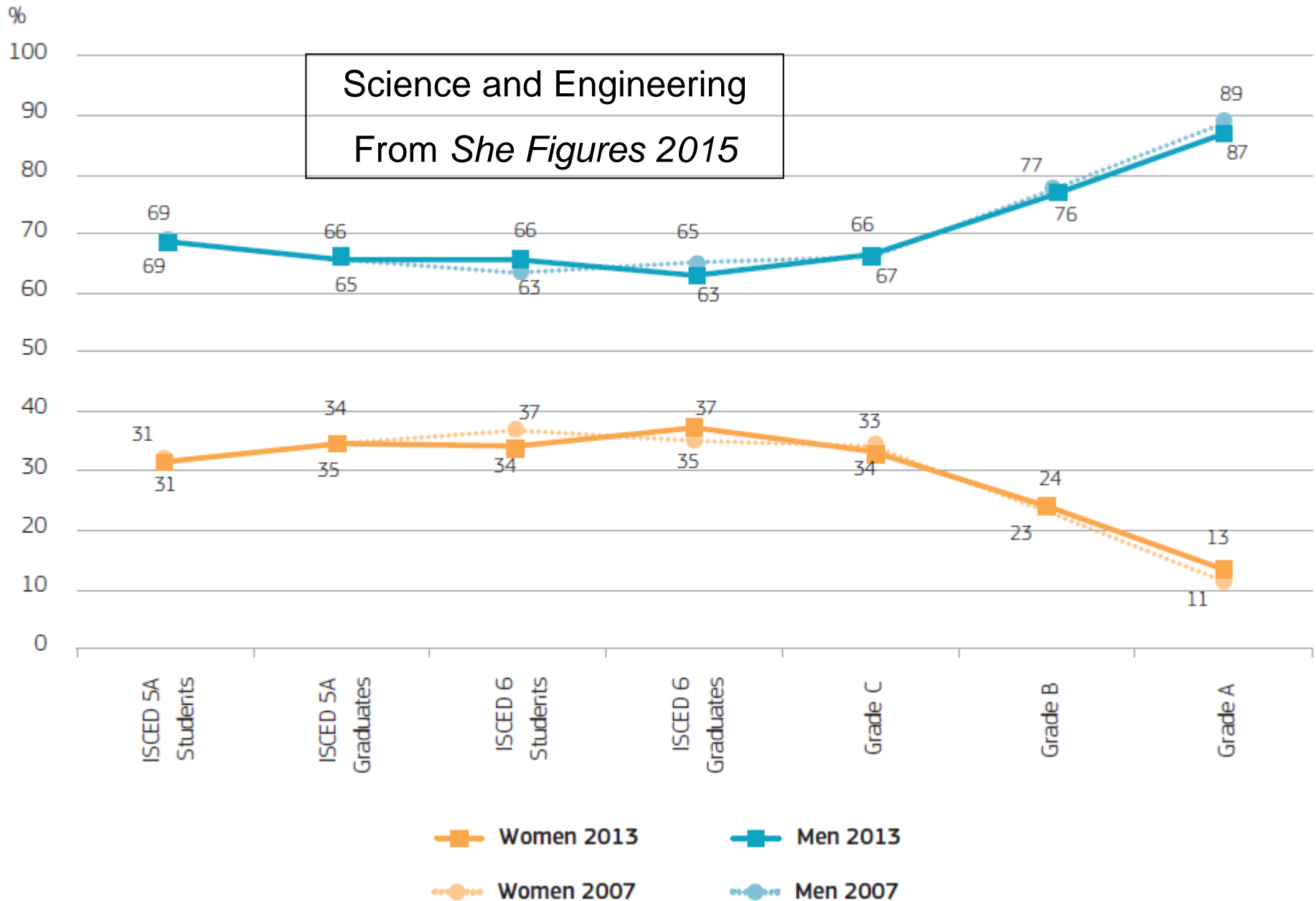
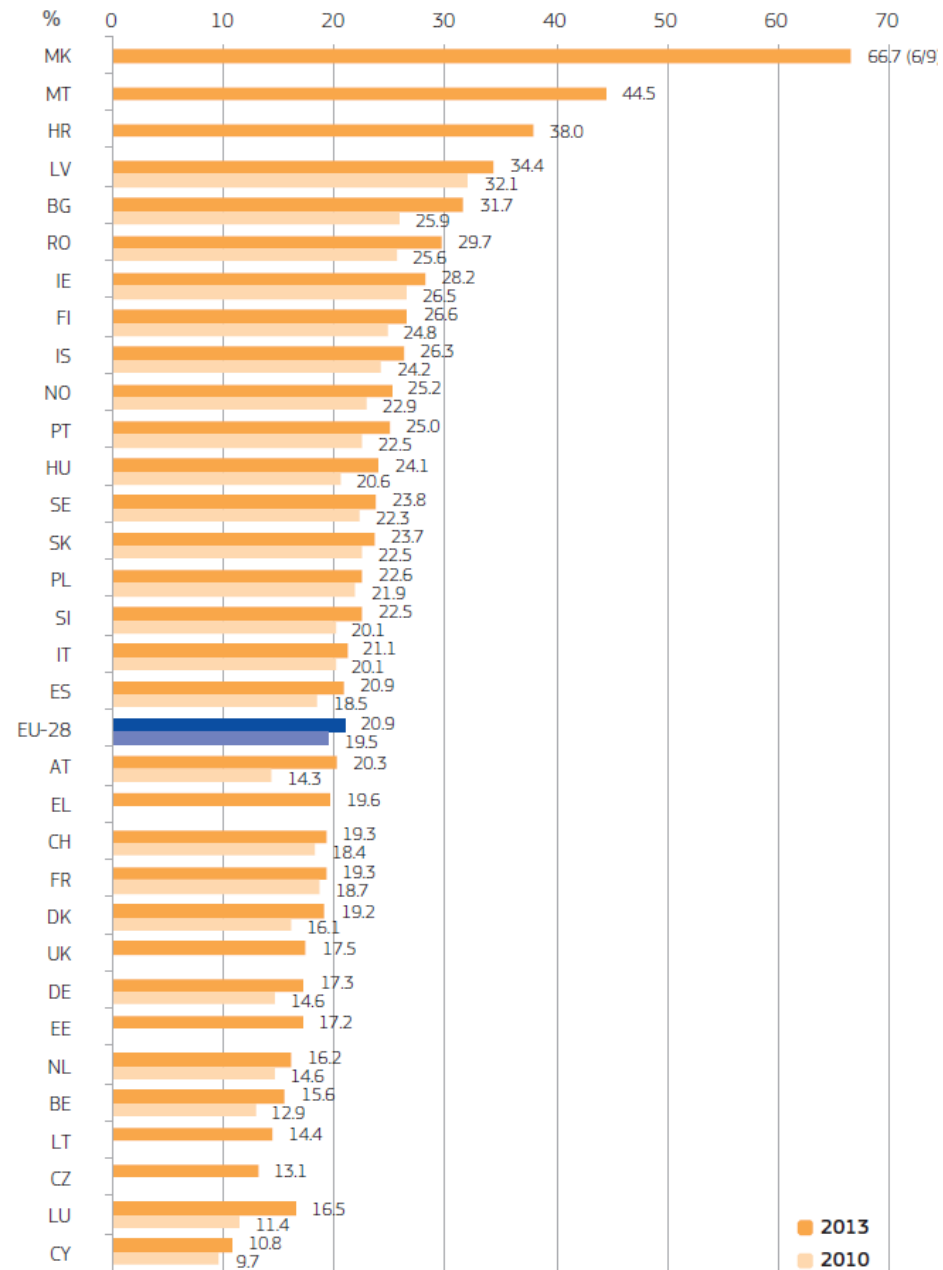
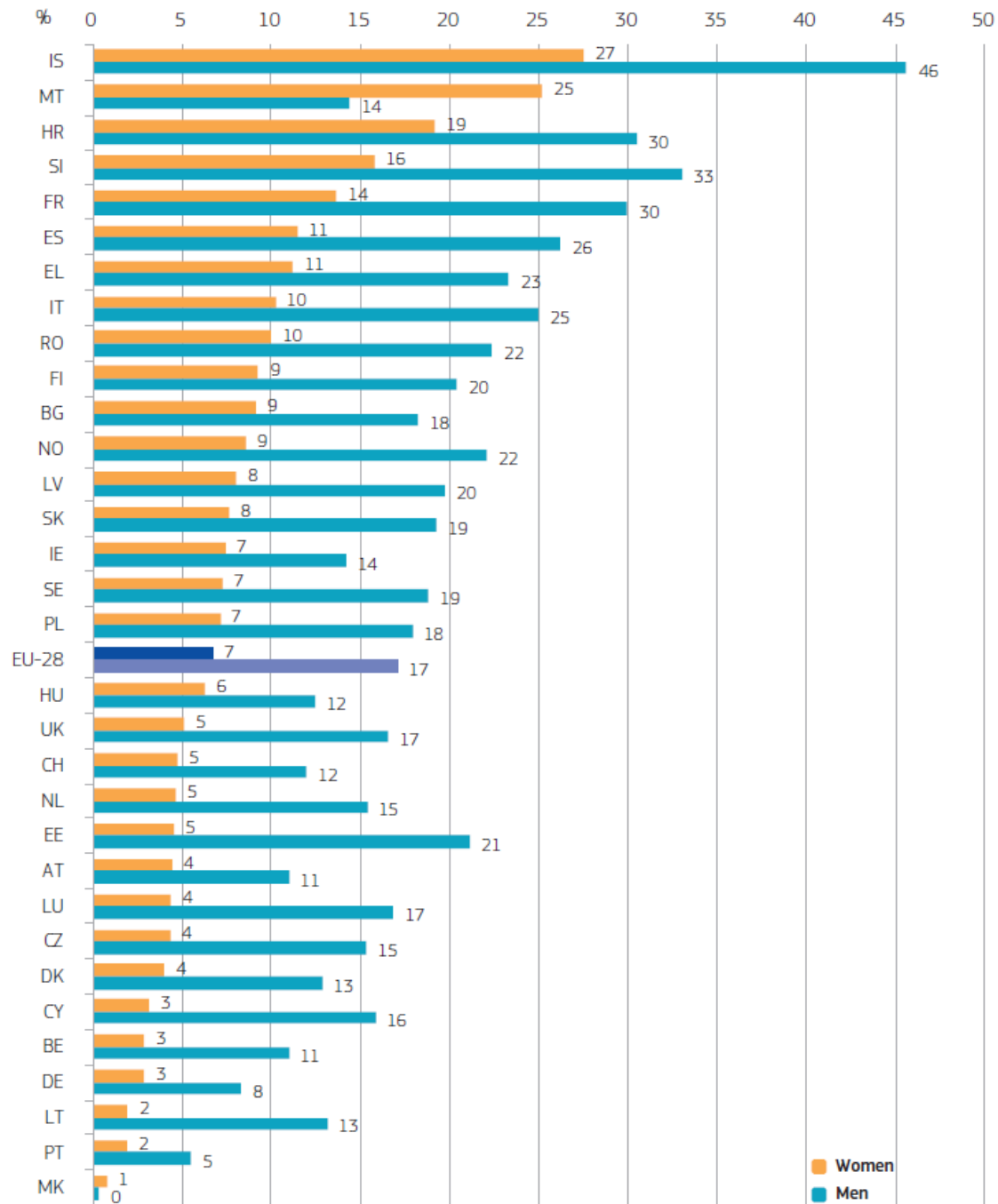


Figure 6.3. Evolution of the proportion of women in grade A positions, 2010 and 2013



From
She Figures
2015

Figure 6.4. Percentage of grade A staff amongst all academic staff, by sex, 2013



She Figures 2015

Some European data (by disciplines)

% of women PhD graduates by narrow field of study in natural sciences and engineering 2012, After She Figures 2015, Table 2.5

country	Physical Science	Mathematics and Statistics	Computing	Engineering and Engineering Trades	Manufacturing and processing
EU-28	37	35	21	25	36
CZ	33	38	10	14	59
DE	33	25	18	15	29
ES	46	34	22	29	19
FR	34	24	19	26	55
IT	47	43	24	22	30
AT	32	21	15	23	20
PT	45	63	30	41	59
SE	37	24	31	22	31
UK	37	30	23	20	32
CH	33	25	9	21	
TR	47	49	20	24	54

% of women researchers in the government sector, by field of science, 2012 After She Figures 2015, Table 4.4

country	Natural sciences	Engineering and technology	Humanities
CZ	33	21	45
DE	31	23	54
ES	43	37	46
IT	41	37	51
PL	38	27	59
SE	42	23	49
UK	29	13	53

Proportion of women grade A staff by main field of science, 2013

After She Figures 2015, Table 6.2

Country	Natural sciences	Engineering and technology	Humanities
EU-28	15.8	9.8	30.0
CZ	10.6	7.4	17.9
DE	11.6	7.6	28.6
ES	19.5	11.5	27.5
IT	21.6	10.4	35.9
PL	17.5	8.4	27.1
SE	16.2	12.6	36.1
UK	9.0	7.0	10.8
CH	12.9	12.0	33.3

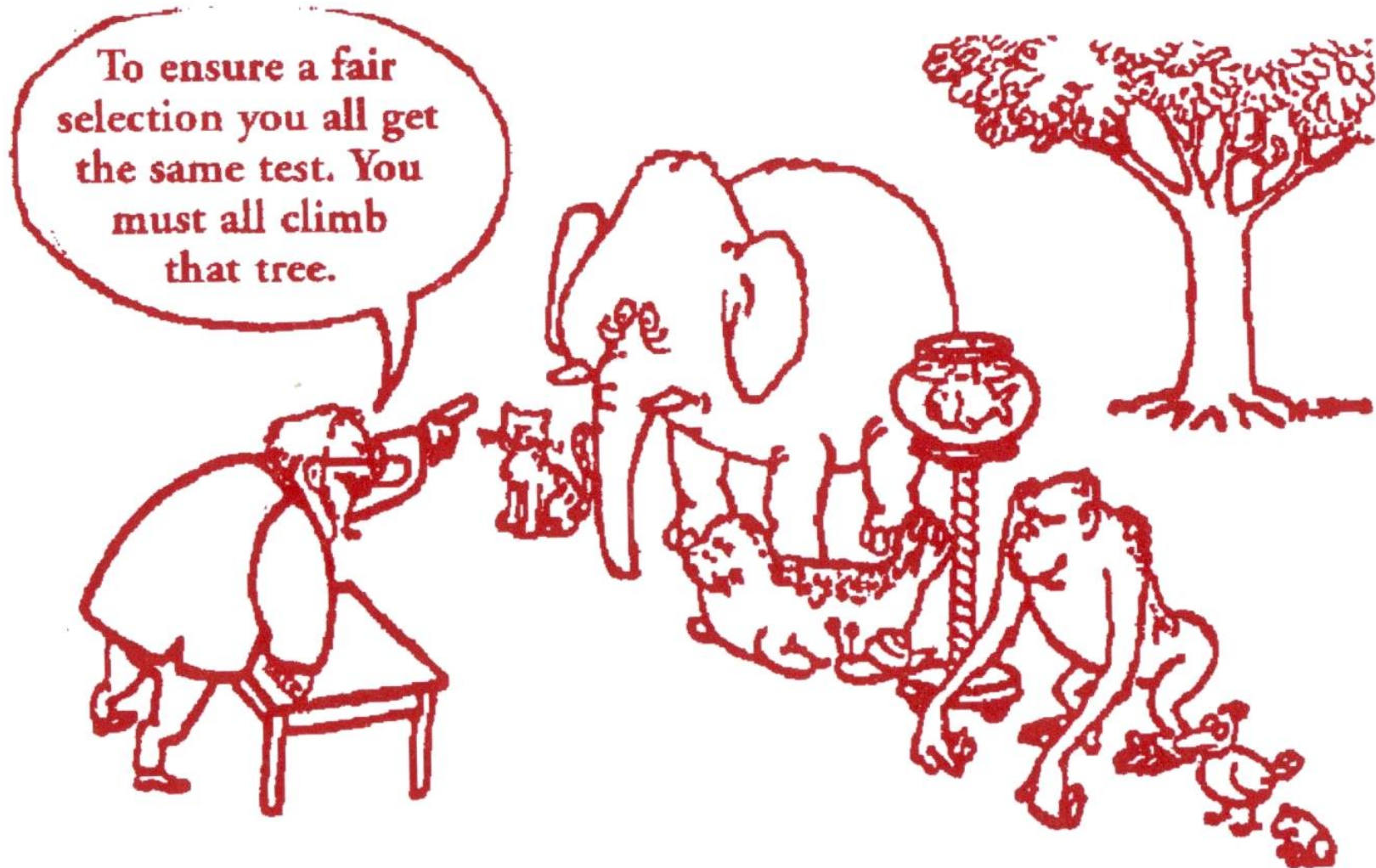
Which actions ?

*equality of treatment

*positive discrimination

*gender mainstreaming

Fair selection ?





Chemistry
The magic
of everyday
life

EU reports on Women and Science

- ETAN on women in academia in Western Europe, 2000
- Women in industrial research (WIR), 2003
- Gender and Excellence in the Making, 2004
- ENlarge Women In Science to East (Central Europe and the Baltic Republics) (ENWISE), 2004
- Women in Science and Technology (WIST), 2006, 2009
- Women in research decision-making (WIRDEM), 2007-2008
- Gender challenge in research financing, 2009...
- Structural change in research institutions : enhancing excellence, gender equality and efficiency in research and innovation, 2012...

« Women and/in Science » at DG Research (1999-2016)

Successive policies

- Sensitise science community to women issues
 - Change women
 - Change institutions
- (« Structural Changes »)

Currently 3 objectives

- Women participation
- Women/men balance in decision positions
- Gender dimension in research

9 December 2013

Fact sheet: Gender Equality in Horizon 2020

A renewed commitment

The promotion of gender equality in research and innovation is a commitment of the. It is enshrined in the core documents establishing Horizon 2020, with the following objectives:

- *Gender balance in research teams*
- *Gender balance in decision-making*
- *Integrating gender/sex analysis in R&I content.*

These three objectives are in line with the Commission's strategy on gender equality as well as with the goals set out in the July 2012 Communication on completing the European Research Area (ERA). They are integrated at each stage of the Research and Innovation cycle.

Gender balance in decision-making

The aim is to reach the Commission's target of 40% of the under-represented sex in each group (for example expert groups) and panels (for example evaluation panels).

For Advisory Groups, the target was raised to 50%, given the high response rate from women to the Commission's call for interest launched in February 2013. Also, each group includes at least one expert with gender expertise; all gender experts in the groups meet regularly.

As the pool of female scientists in Europe and beyond is constantly growing, Horizon 2020 wants to guarantee both a high level of expertise and the respect of gender balance. This will also help engage newcomers in EU research activities.

Gender balance in research teams at all levels

Horizon 2020 encourages a balanced participation between women and men in research activities at different stages of the cycle.

To reinforce applicants' engagement at proposal level, gender balance in the research team has been included among the ranking factors to prioritise proposals with the same scores.

In particular, by signing the grant agreement, beneficiaries will commit to promote equal opportunities between men and women in the implementation of their action. They will also commit to aim, as far as possible, for gender balance at all levels of personnel assigned to the action, including at supervisory and managerial level.

Gender dimension in research and innovation content



- *A Belgian non-profit international association (AISBL)*
- *Members: networks (+ individuals), from public and private sectors, all disciplines, over Europe*
- *Mission and Goals*

Main Goals

- *Provide genuine EU added value by ensuring that women scientists' concerns, needs, interest and aspirations are taken into consideration when setting the European research agenda*
- *Promote the understanding and the inclusion of the gender issue in science and research policy*

Main Areas of Activity

- *Networking*
- *Research Policy Making*
- *Public Relations and Information*
- *Electronic Platform*

Now an ordinary association operating on its members' voluntary work with

- *a website, a Newsletter, position papers....,*
- *a yearly General Assembly + Conference
Brussels 2010, 2012 ; Budapest 2011;
Essen 2013; Paris 2014*
- *participation to EU events*
 - *1st, 2nd European Innovation Summit;*
 - *Girls, Expand your Horizons, Geneva;*
 - *SAPGERIC Conference (Vilnius 11/2013);
RRI (Rome 19-21/11/2014)*
 - *events linked to EU projects*

Research-policy activities



European Platform of Women Scientists | Rue d'Arlon 38 | B-1000 Bruxelles

European Platform of
Women Scientists AISBL

The President
Dr. Brigitte Mühlenbruch

Rue d'Arlon 38
B-1000 Bruxelles

brigitte.muehlenbruch@epws.org

Date: 12.11.2012

EU Framework Programme for Research and Innovation *Horizon 2020*

Dear Colleague,

In view of the up-coming debate on the EU Framework Programme for Research and Innovation *Horizon 2020* in the European Parliament, I am contacting you today to draw your attention on the arguments of the European Platform of Women Scientists EPWS regarding the document in question.

The Platform has addressed the topic in the EPWS Lunch Debate in the European Parliament titled "Towards a Gender Balanced Science Culture to Foster Innovation" on 31 January 2012. Following the debate, EPWS as the voice of women scientists in European research policy has put forward the Platform's contributions to the discussion in an *EPWS Position Paper on the EU Framework Programme for Research and Innovation Horizon 2020* on 26 March 2012 which you find enclosed.

In this Position Paper, EPWS welcomes *Horizon 2020* and strongly supports the programme's endeavour for gender equality. The Platform also emphasizes the need for the programme's general statements concerning gender equality to be supported by practical actions to become reality. The EPWS Position Paper addresses three main areas: *Excellence includes women participation and gender research; Women participation in European research and projects; CSOs' participation in European projects* and puts forward constructive suggestions for amendments concerning the following issues:

- excellence definition and women scientists;
- excellent research and its gender dimension;
- administrative simplification should not be detrimental to gender issues;
- explicit targets for women participation in European research and projects;
- reasonable conditions for women scientists' mobility and working conditions;
- measures to strengthen the participation of Civil Society Organisations in European research.

As one of the protagonists in arguing for gender equality in science and the integration of the gender dimension in research, I kindly ask you to support the consideration of the Platform's arguments in

European Platform of Women Scientists AISBL • Siège social: Rue d'Arlon 38, B-1000 Bruxelles • Website: <http://www.epws.org> •
Numéro de TVA: BE 0877 239 987 • Fortis Banque: 0014756256-34 • IBAN: BE 68 0014756256-34 • BIC: GEBABEBB



Lunch debate at the European parliament,
Brussels, 30/1/2012

Gender dimension in Science and Research

The international conference “Ready for Dialogue” aims at initiating a strategic dialogue among relevant national and European key players, such as associations, institutions and organisations that work within and outside the university context on the integration of the gender dimension in science and research. The aim is to promote the integration of the gender dimension in science and research and to provide sustainable support.



To establish the initiated dialogue, a joint strategy paper is to be adopted by the participants. The following topics are scheduled for discussion:

- » The conceptual sharpening of the strategic approach *gender dimension*.
- » The challenges with respect to the scientific recognition of the gender dimension in science, research and innovation.
- » The positioning of the strategic approach *gender dimension* in national and international research policies.

Conclusion

- Variety of national situations in spite of many common points
- Inspiring foreign « Good practices »
- Essential impetus of the European Union
- Political and associative approaches are mutually complementary
- Individual protests may be dangerous...