

Women in astronomy: statistics

Catherine Cesarsky

High Commissioner for Atomic
Energy, France

IAU and IAU GA

- IAU GA in Rio: 667 out of 2109 participants were women - 31.6%.
- The IAU itself does less well - in 2003, 12.1% of all IAU members were women. This rose to 12.9% in 2006, but now in 2009, after Rio, it stands at 14.8% - around a 14 % increase this last triennium.

IAU members per country with more than 40 members

- Highest percentage of women:

Argentina (36)

Countries with more than 20% women:

Ukraine (27)

Italy, Bulgaria (25)

France(24)

Brazil (23)

Hungary(21)

Countries above average (16 to 20%)

- Spain, Austria (18)
- Mexico, Russia (17)
- Chile, Greece (16)

Middle ground

11 to 15%

- China Nanjing, Austria, Belgium (15)
- Sweden, South Africa (14)
- Poland (13)
- Canada, USA, Netherlands, Czech Republic, UK (12)
- Egypt (11)

Countries with less than 11% women:

Japan(6)

India, Israel, China Taipei (8)

Germany, Switzerland (9)

Denmark, Korea (10)

Statistics on Women in Astronomy

Country	Mexico	Denmark	Australia
Number of Institutes	8	3	19
Research Staff - men	116	36	-
Research Staff - women	28	4	-
Research Staff - total	144	41	111
Permanent Positions - men	65	22	96
Permanent Positions - women	16	1	11
Permanent Positions - total	81	23	107
Tenure Track - men	49	0	n/a
Tenure Track - women	12	0	n/a
Tenure Track - total	61	0	n/a
Postdocs - men	11	15	-
Postdocs - women	4	3	-
Postdocs - total	16	18	-
Staff with adv. degrees - men	116	37	-
Staff with adv. degrees - women	28	4	-
Staff with adv. degrees - total	144	41	-
Student supervisors - men	112	19	-
Student supervisors - women	29	2	-
Student supervisors - total	139	21	-
Graduate Students - men	75	19	111
Graduate Students - women	47	13	46

Mexico 17 14.5

Denmark 10 10

Australia 15 10?

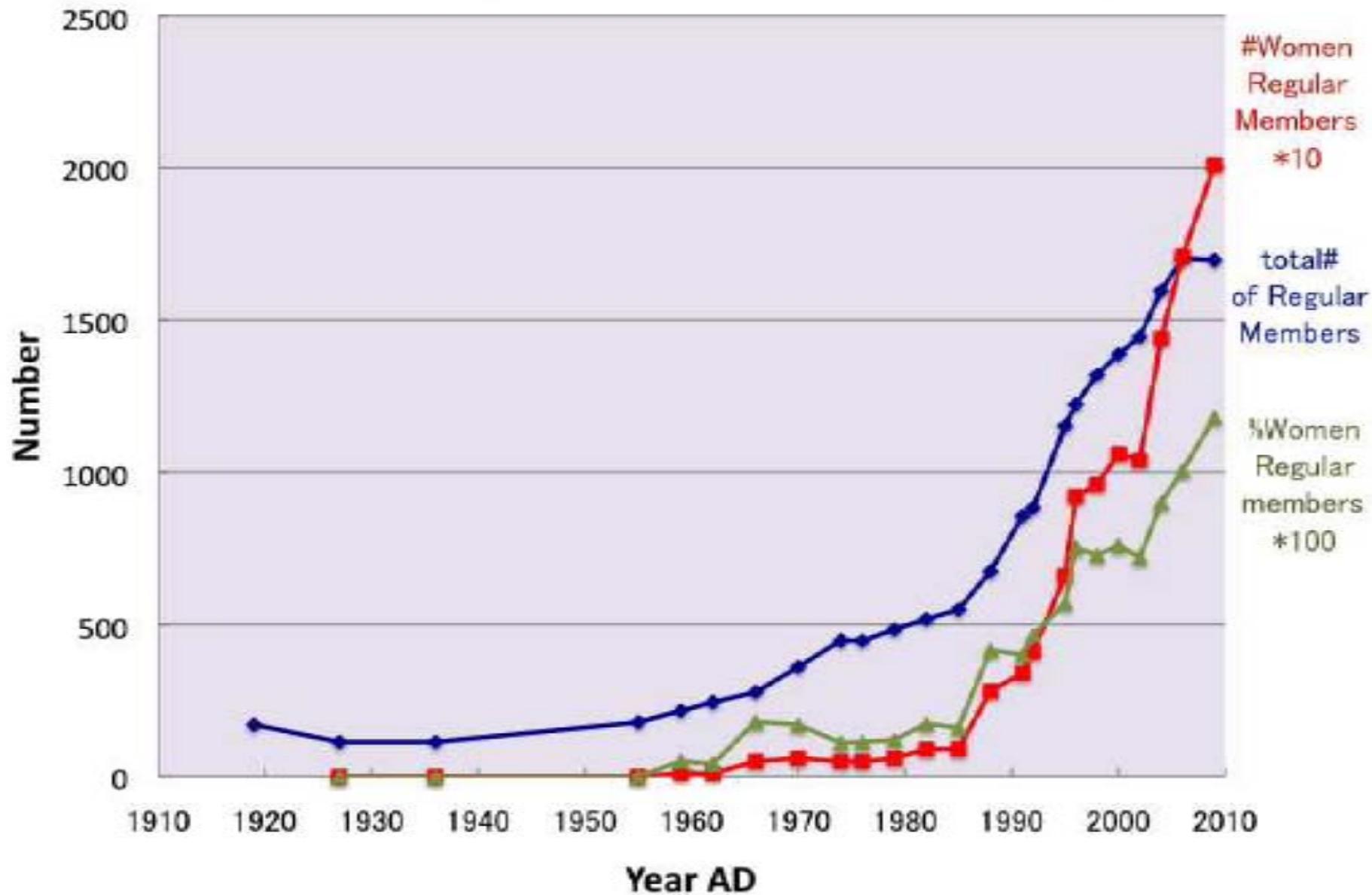
Data collected in
2004/2005

Asia: Japan (6)

The ratio of women researchers (including doctor-course students) is 12% in Japan in 2009.

Yuko MOTIZUKI

Ratio of Women Regular Members in Astronomical Soc. of Japan



Asia: China Nanjing(15)

Statistics of Women in Astronomy in China

Organizations	Women/Total	Percent
Members of CAS	422/2131	~20%
Members of BIAS for NAOC	95/312	~30%
NAOC staffs with permanent position	84/300	28%
NAOC staffs with contract	60/155	~39%
PKU+KIAA	3/15	20%
Beijing Normal University, Department of Astronomy	8/40	20%
Nanjing University, Department of Astronomy	2/20 for science (6/24 including office persons)	10% (25% including office persons)
<p>Notes: CAS= Chinese Astronomical Society BIAS = Beijing Astronomical Society NAOC=National Astronomical Observatories, Chinese Academy of Science PKU = Peking University, Department of Astronomy KIAA=Kavli Institute for Astronomy and Astrophysics in PKU</p>		

Yes, the women can be found in each level normally, but the ratio is lower, for example, among 70 Professors in NAOC, 7 of them are women,

so it is $7/70=10\%$. This case is similar in other institutes.

Also now there is no woman vice-director in our NAOC (total in five).

But the director of Nanjing Institute of Astronomical Optics & Technology(NIAOT)

is a lady, Prof. Xiaoqun Cui,

and the director of the Urumqi Observatory of NAOC-CAS is a lady too, Prof. Na Wang.

The most famous Women astronomer in China is Prof. Shuhua Ye, who is a

CAS Academician

Yanchun Liang

Latin America

ARGENTINA (2009)(36)

1) Distinguished researchers, emeritus

TOTAL	Men	Women	%
14	12	2	14.2 %

2) Researchers and professors, tenured

TOT: 175	M: 114	W: 61	% : 34.9 %
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3) Graduate students, young post-docs

TOT: 97	M: 49	w:48	:%: 49.5 %
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TOTAL IN ACTIVITY IN ASTRONOMY: 272

M: 163

W: 109 --> 40%

Gloria Dubner

I have recently been appointed director of my Institute, the president of the Argentina National Council of Scientific and Technological Research (CONICET) is a female astronomer, the recipients of the National Academy prizes in astronomy in the last three or four years have been women, in the astronomy advisory committee of CONICET, we are 5 women and 3 men, in the whole country we have about 40% of women in astronomy, and in my institute we are 50%. Besides, we have an important advance in CONICET, we got that the maximum age restriction to access to fellowships and permanent positions in CONICET were relaxed in cases of women that had their careers delayed because of maternity (everything, of course, based on the quality of the applicants). Besides, here the she-astronomers have presence in the news when there are discoveries or interesting news to report.

Gloria Dubner

VENEZUELA (2009) (26)

Researchers or Profesors: 22 --- 15 Men, 7
Women (32%)

Students (doctorate and master): 15 --- 9
Men , 6 Women (40%)

MEXICO (2006) (17)

1) Tenured researchers:

TOTAL	M	W	
81	65	16	20%

2) Non tenured (short-term, postdocs, etc)

76	60	16	21%
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3) Students Master and Doctorate:

122	75	47	39%
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TOTAL IN ACTIVITY IN ASTRONOMY IN MEXICO:

TOTAL	M	W	
279	200	79	----->%: 28.3 %

BRASIL (2004)(23)

Members of Sociedade Astronomica
Brasileira:

TOTAL: 479

M: 359

W: 120 ----->25 %

EUROPE

EU actions since 1998

- Helsinki conference 1998 & EU action plan “Women in Sciences” 1999
- Helsinki group: monitor, build synergies national & EU politics
- Action plan “Science & Society” 2001: (gender equity, indicators...)
- Representation of 40% women in EU programs
- Sets of rules for hiring (2005): att. to **flexible working conditions, child care support, gender-balanced representation at all levels**
- Women in industrial research WIR (experts group for monitoring)
- European platform of Women Scientists EPWS: **net of networks**
- Women scientists in central-E/oriental-E/baltic-E, ENWIRE
- Statistics: SHE figures, 2003 ---- 2006

What about all sciences across Europe?

29% of scientists/engineers are women

Situation in Sciences of the Universe (SU) **varies** from country to country, with some **persistent patterns** (examples hereafter)

Indicators used:

Percentages of women at different career levels (A-top, B- medium and C-start or postdoc),

Representation in decision-making positions & committees,

Recognitions in the form of honorific rewards & prizes & academies, & as invited speakers in international conferences... etc...

Gender advantage: % of men in grade A / % of women in grade A
(% with respect to same gender in A+B+C)

EU analysis, natural sciences, gender advantage

Gender advantage for promotion
(above 1: benefit to men)

Switzerland: **2.4**

Austria, Finland, Germany, Netherlands, UK: **2.1
to 1.9**

Denmark, Norway: **1.8 to 1.6**

France: **1.5 to 1.3**

Belgium, Italy, Sweden: **1.2 to 1.0**

France (24) in « Sciences of Universe »

France: SU within CNRS/France

26% women in the field (stable figure since 20 years)

Grade A (top: DR1+DRCE) : women **~21%**

Grade B (middle: DR2) : women **~21%**

Grade C (start: CR2+CR1) : women **~24%**

Gender advantage for promotion C/B: **1.5** benefit to men

Women as laboratory heads: **10%**

Women in Hiring/Evaluating Committee: **24%**

France: University

Grade A (professor) : women **~16%**

EU mean: 11%

Grade B/C : women **~38%**

EU mean: 28%, 32%

(Danielle Alloin)

SU France: recognition of women work

CNRS gold medal [1954-2004] **6**: women **0%**
CNRS silver medal [2000-2006] **14**: women **14%**
CNRS bronze medal [2000-2006] **28**: women **25%**

Academy of Sciences (2009):

31 members, women **10%**

15 foreign associate members, women **13%**

16 corresponding-members, women **12.5%**

Academy prizes [2003-2006]

43 nominees, of which 7 women: **16%**

France: Women in decision-making instances

- **Research grant allocation:** ANR (budget 825 MEuros)
Council, 6 members appointed (and 3 ministry representatives):
>20% women
- **Advisory Committee** for Science & Technology:
20 appointed members by government: **25%** women
- **Academy of Technologies** (founded 2000), co-optation:
235 members: **4%** women
- **CNRS Committee for hiring/evaluation**, SDU: **24%** women
- Percentage of women in **various ESO Committee** [2004]:
~0% STC, **~8%** Council, **40%** UC and FC, **~30%** OPC

« *Sciences of Universe* » (UK)(12):

22% women (age slot 20-24) to **12%** women (slot 40-50)

Grade A (professor pos.): women **~4%**

Grade B (snr reader pos.) : women **~10%**

Grade C (lecturer pos.) : women **~10%**

Gender advantage for promotion : ?

Percentage of women as laboratory heads: **~0%**

« *Sciences of Universe* » **SU (Spain)(18)**

25% women

She figures 2006 (natural sciences include SU, but also biology where the patterns are different): SU only are not available

Italy (25)

2002: 18.5

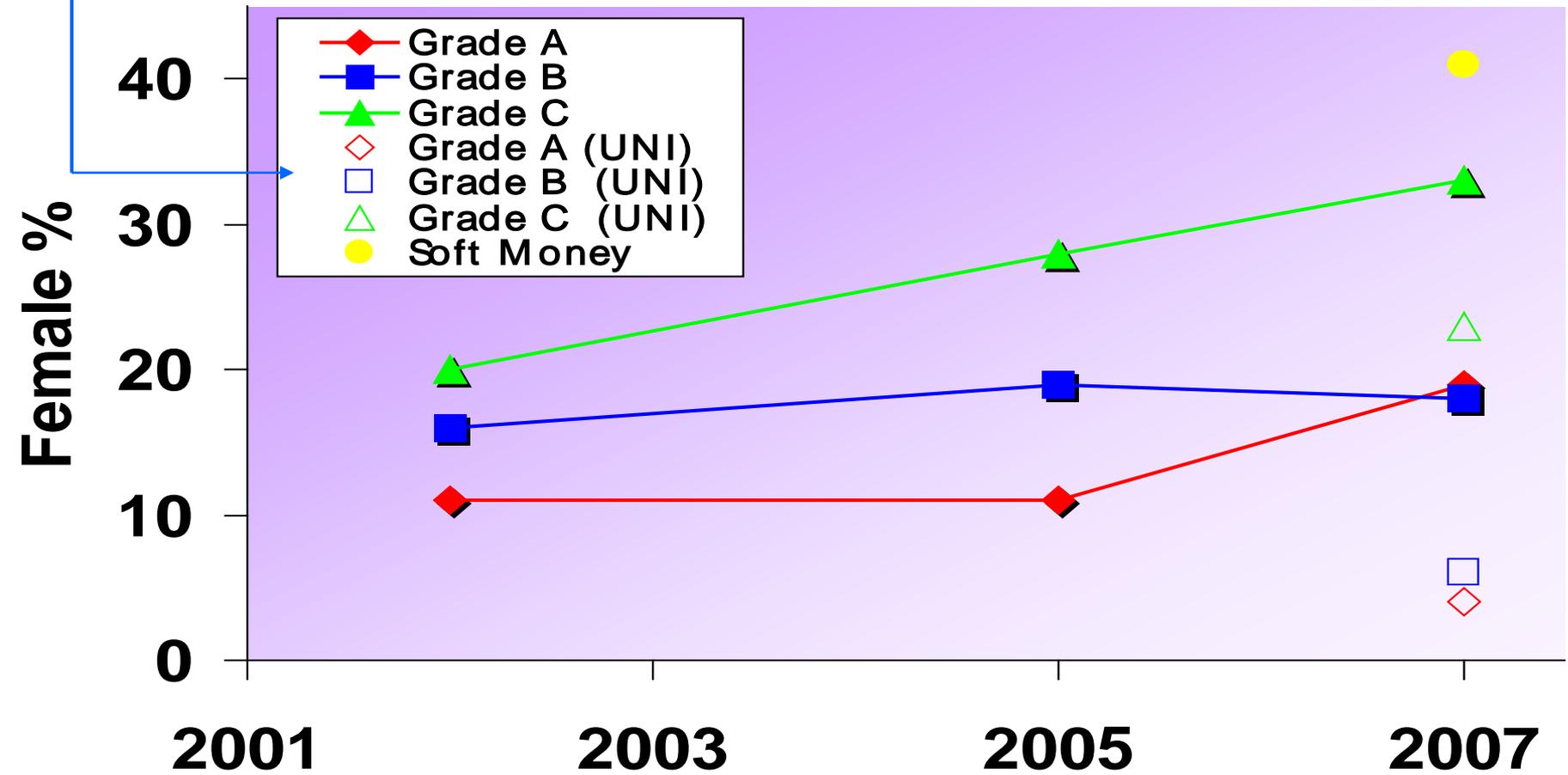
2005: 24

2007: 27



*Merging with CNR institutes has increased the totals
 **Major "job requalification" at ex-CNR institutes has shifted values to higher levels
 University values refer to "astrophysical science" only

Scientific staff	2002		2005*		2007**	
	F	M	F	M	F	M
Full- Grade A	5	41	7	55	13	55
Associate - Grade B	11	59	31	130	28	132
Researcher - Grade C	58	224	100	255	116	240
TOTAL	74	324	138	440	157	427





Istituto Nazionale di Astrofisica National Institute for Astrophysics

WOMEN in POSITIONS of POWER (2008)

- INAF's vicepresident
- 0 out of 2 directors of departments
- 2 out of 5 members of "executive board" : 40%
- 5 out of 12 members of "scientific council" : 42%
- 3 out of 19 directors of institutes : 16%

No "Equal Opportunity Committee" has been appointed (yet).

A major impact on the current percentage of women is due to the "new" constitution of the executive and scientific boards (~1 year).

Ginevra Trinchieri

ESO (Faculty)2005:

18.7% women

Grade A (full): women **~3.4%**

Grade B (associate) : women **~16%**

Grade C (assistant) : women **~32%**

Grade scientist (important duties): women **~28%**

Fellows (postdocs): women **~26.3%**

Gender advantages for promotion : **6.4** to **1.2** benefit to men

Women as division heads: **DG** and **one** division head

Percentage of women in various ESO Committee [2004]:

~0% STC, **~8%** Council, **~40%** UC and FC, **~30%** OPC

What about the political world?

Women representatives in **national parliaments**:

Sweden, Denmark, Finland, Netherlands: ~ 45% to 37%

Belgium, Spain, Austria, Germany: ~ 35% to 32%

Poland, Portugal, Balt's, UK, Luxembourg: ~ 20% to 17%

France, Greece, Italy: ~ 12% to 10%

{ **France**: low chamber 12%, high chamber 4% }

Women representatives in **European parliament**:

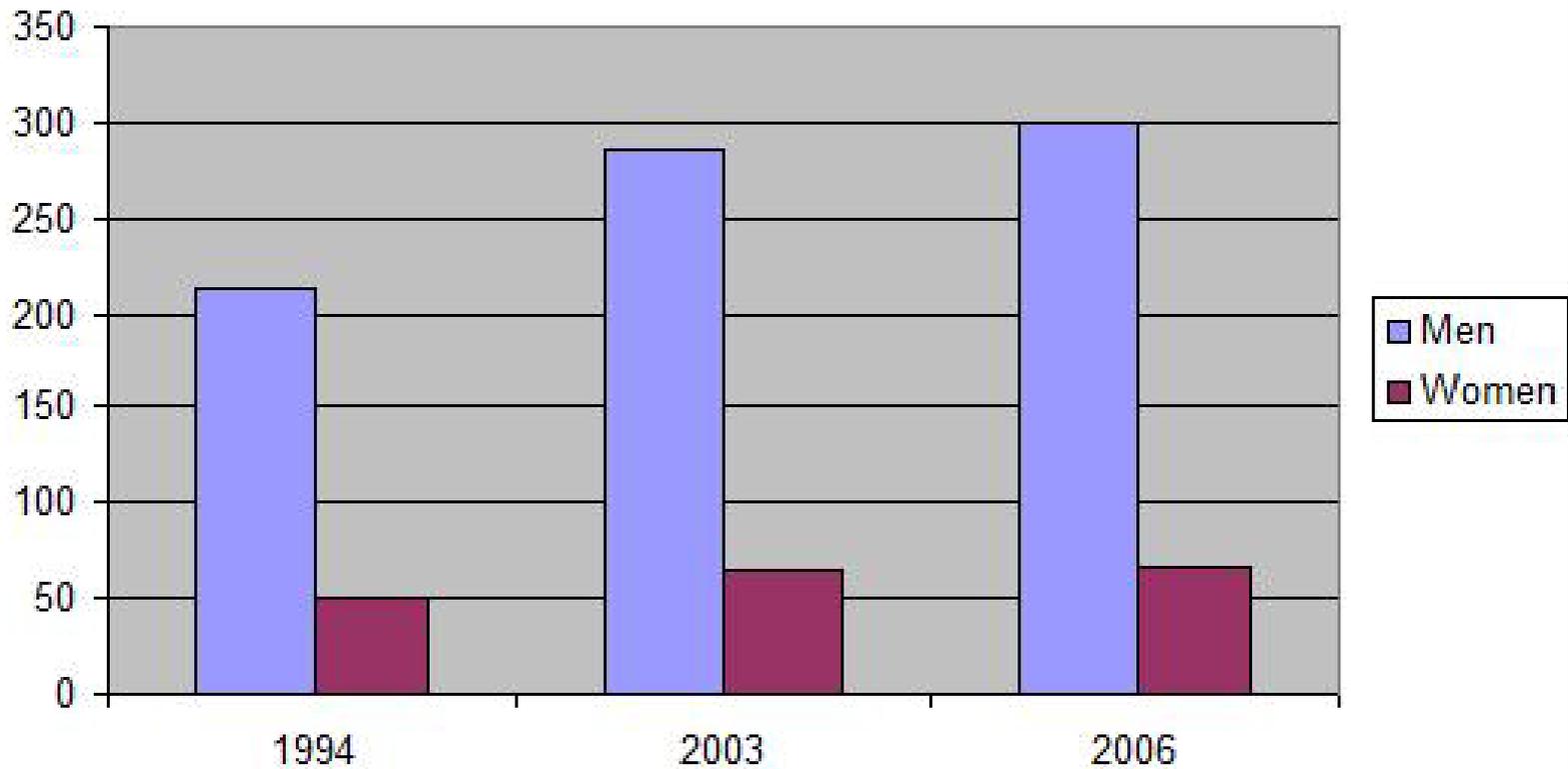
Finland, **France**, Sweden, Belgium, Germany: ~44% to 38%

Greece, Italy: ~16% to 11%

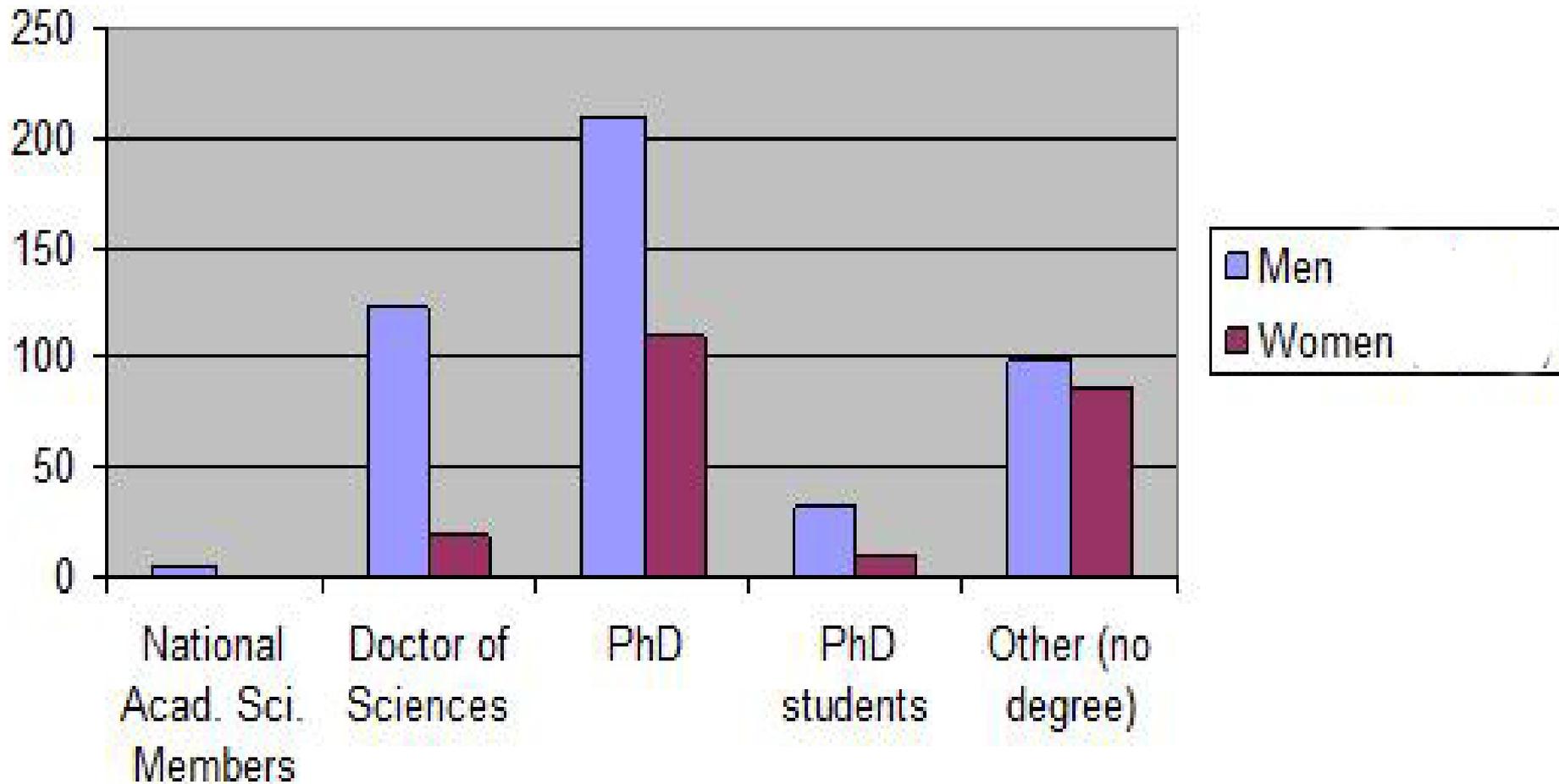
Mean: 31%

Russia

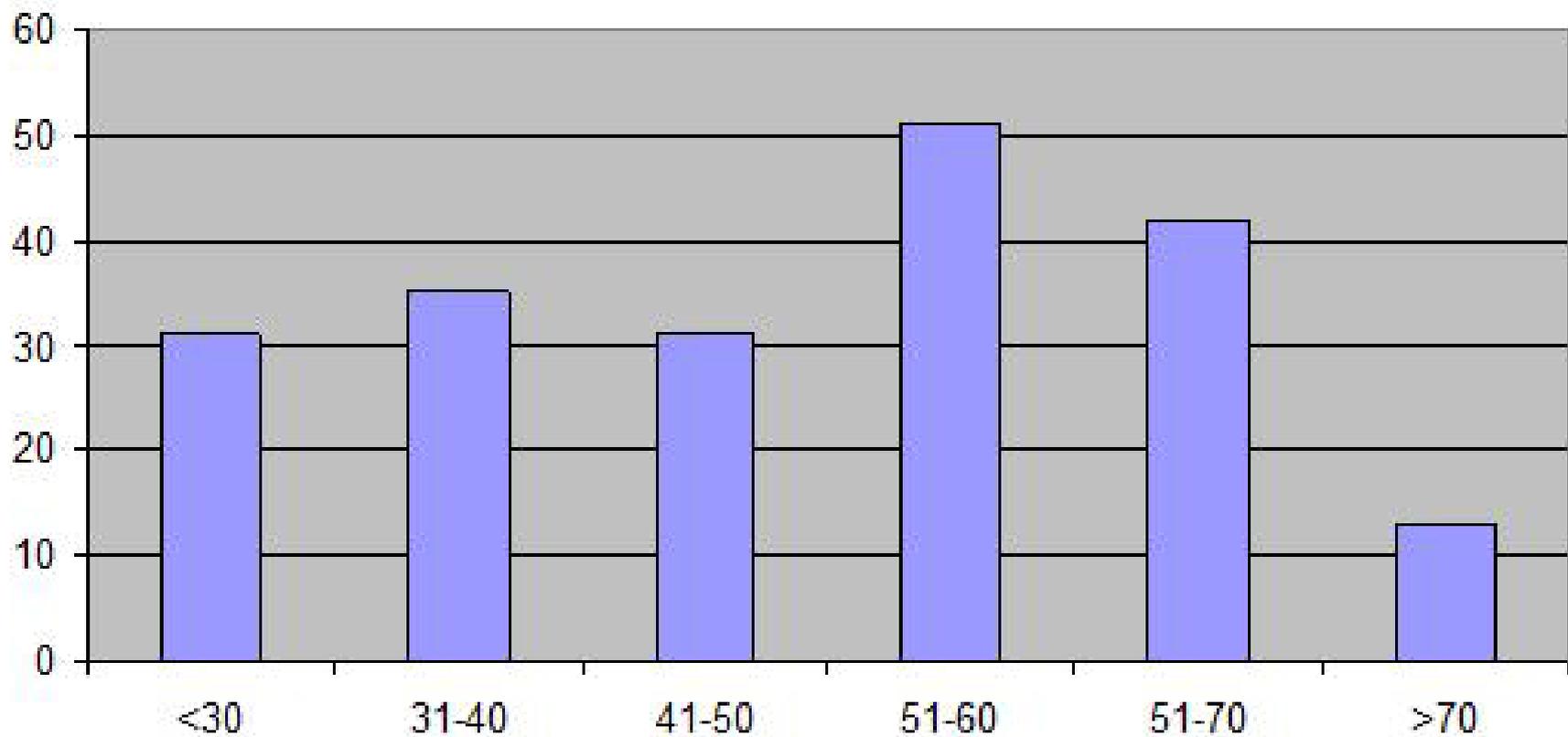
Russian astronomers: IAU membership



Scientific degrees - gender distribution



Women in Russian astronomy: age distribution



RESOLUTION B4

On Supporting Women in Astronomy

Proposed by: the EC WG IYA Task Group *She is an Astronomer*

Supported by: the EC WG *Women in Astronomy*

Proposer: Helen J. Walker < helen.walker@stfc.ac.uk >

Seconder: Sarah T. Maddison < smaddison@swin.edu.au >

The International Astronomical Union XXVII General Assembly,
recalling

1. the UN Millennium Development Goal 3: promote gender equality and empower women,

2. the IAU/UNESCO International Year of Astronomy 2009 goal 7: improve the gender-balanced representation of scientists at all levels and promote greater involvement by underrepresented minorities in scientific and engineering careers,

recognizing

1. that individual excellence in science and astronomy is independent of gender,

2. that gender equality is a fundamental principle of human rights.

considering

1. the role of the IAU Working Group for Women in Astronomy,
2. the role of the IYA2009 Cornerstone Project She is an Astronomer,

Resolves

1. that IAU members should encourage and support the female astronomers in their communities,
2. that IAU members and National Representatives should encourage national organisations to break down barriers and ensure that men and women are given equal opportunities to pursue a successful career in astronomy at all levels and career steps.