

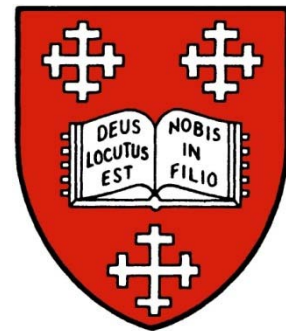
She is an Astronomer

Jocelyn Bell Burnell

University of Oxford Astrophysics

&

Mansfield College



Caroline Herschel



- Born 1750 Germany
- Died 1848 Germany
- Lived in Bath and Slough
- RAS Gold Medal (age 78)
- RIA Member (age 87)
- King of Prussia Gold Medal (age 96)

Some data

- Physics (and astronomy) undergraduates in the UK are 20 - 25% female
- About 15% of all physics staff are female
- Physics Professors
 - 1991: from 1 to 2 female
 - 2005: about 24 female (out of 150 -200)
 - Larger departments have higher % of their professoriate female

More statistics (mostly 2004)

- 22% A-level physics students are female
- 17% applicants for physics courses (30% for astro) are female. Acceptances very similar.
- 22% u/g and p/g physics students are female (30% for astro).
- 10% lecturers, 8% senior lecturers and 4% profs are female

% of astronomers who are female

Argentina	35.2
France	25.7
Italy	20.5
Brazil	19.7
Ukraine	19.4
Russia	17.9
Spain	17.8
Mexico	16.5
Finland	13.2
Sweden	13.0
IAU Average	12.8
Greece	12.6
Belgium	12.4
Denmark	12.1
Turkey	11.8
China (Nanjing)	11.7

South Africa	11.1
Egypt	10.5
USA	10.5
Poland	10.2
United Kingdom	10.0
Australia	9.7
Canada	9.2
Netherlands	9.0
Chile	8.8
Czech Republic	8.1
Switzerland	6.6
Germany	6.4
Korea	6.0
India	5.9
Israel	4.8
Japan	4.0

IAU 2005
Countries > 50
members:
% of
membership
that is female

So this tells us....?

- The issue is to do with CULTURE not BRAINS!
- Strong dependence on country
- Different reasons why different countries are high/low

Women in SET today

- Numbers are growing, % improving
.....slowly!
- Largest increases at u/g (p/g) level
- Issues around work-life, family-career to be addressed
- More subtle issues around 'climate' in the work-place to be addressed

Cecilia Payne Gaposchkin



- Born UK 1900
- Died USA 1979
- First person to recognise that stars were made largely of hydrogen.

'Women as deficient'

- Many programmes to get more women into science assume that it is women who need to change.
- Why should women do all the changing?
- Science should move towards women as much as women change, move towards it.
- Long term, 'climate' of science needs to change.

Unconscious Bias and Prejudice

- Wonneras & Wold *Nature* 387, 341, 1997
- Caffrey *American Economic Review*, 90, 715, 1997
- Valerian *Why So Slow? The Advancement of Women*. MIT Press, 1998
- Steinpreis et al *Sex Roles*, 41, 7/8, 509, '99
- Bauer & Baltes *Sex Roles*, 9/10, 465, 2002.
- Trix & Psenka, *Discourse & Society* 14(2), 191, 2003
- Heilman et al. *Journal of Applied Psychology* 89(3), 416, 2004

Beatrice Tinsley



- Born UK 1941
- Died USA 1981
- Pioneered the study of the evolution of galaxies

Meanwhile....!

- Educate and sensitise men and women to the gender differences and the unconscious prejudices
- Role models, mentoring, networking, girl-only classes
- Single sex schools and colleges let girls experience female leadership

NSF ADVANCE Program

- \$150 000 max to each institution p.a. for 5 years.
- To promote **institutional** transformation in SETM in Universities
- To increase participation and advancement of women in academic SETM.

Good for all...

- Good management benefits all, but seems to benefit women more.
- Bad management affects all, but seems to affect women more.
- [Poor physics teaching seems to affect girls more]

Sensing the ambiance

- Women are the 'canaries in the coal mine'
- More sensitive to the friendliness of a Dept
- Lack of (the success of) women may imply an issue that needs attention.



Advancing women's careers

- An **IOP** initiative to help University Physics departments ensure they are:
- welcoming, open, inclusive places where all can flourish and enjoy doing physics.



Prof Lene Hau

IoP 'site visits'

- The visits often led to a first consideration of gender issues by a Department.
- Found the same issues coming up repeatedly
- Set up Project Juno to encourage Departments to address those issues



Some good practices (general)

- Collect data *and look at it!*
- Harassment policy + *implementation!*
- Regular appraisal *by trained appraisers!*
- Exit interviews
- HoDs set example – work-life balance
- Female-friendly social atmosphere – *not football + pub*

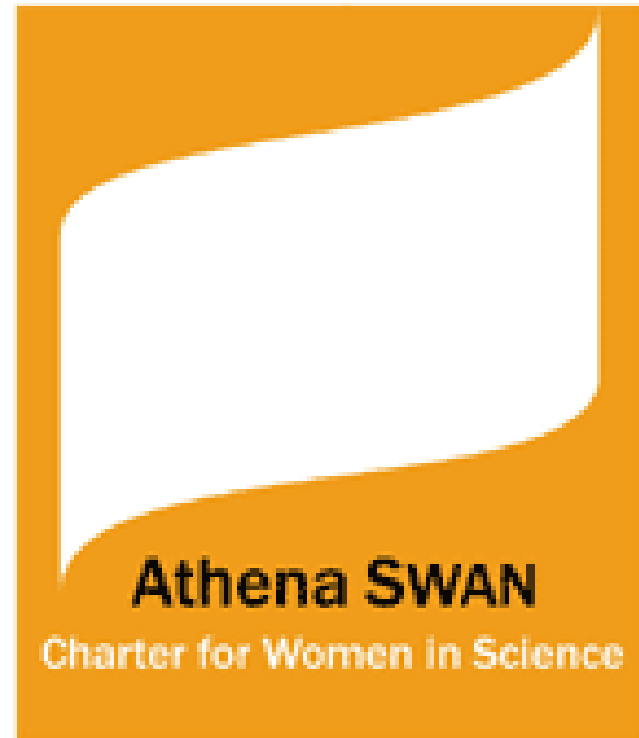
Further good practice (general)

- Transparent, well-publicised management
- Childcare facilities
- Fair % seminar/colloquia speakers female
- Appoint a diversity officer

- And similarly for u/g issues, p/g issues, research and academic staff issues

Other Developments

- Athena SWAN Charter and Awards – a recognition scheme for Universities and SET Departments
- Similar structure to Project Juno



Vera Rubin



- Through the study of the rotation curves of galaxies predicted the existence of dark matter