# The 3rd International Conference on Women in Physics:

## Global Perspectives, Common Concerns, Worldwide Views

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# Outline

- What is the International Conference on Women in physics?
- Why are there fewer women in physics?
- Why does it matter that there are fewer women than men in physics?
- What happened at ICWIP?
- What can we do?

# International Union of Pure and Applied Physics

To stimulate and facilitate international cooperation in physics and the worldwide development of science.

## 23rd General Assembly of IUPAP (1999)

**http://www.iupap.org/ga/ga23/resolutions.html**

## Resolution on Formation of the Working Group on Women in Physics

It is resolved that an IUPAP Working Group on women in Physics be formed. The mandate of the group shall be to:

- Survey the present situation and report to the council and the liaison committees
- Suggest means to improve the situation for women in physics.

# Previous International Conferences on Women in Physics

## The 1st IUPAP International Conference on Women in Physics (ICWIP), March 7-9, 2002 in Paris, France

The Working Group planned a three day International Conference on Women in Physics that was held at UNESCO Headquarters in Paris, France on March 7 to9,2002.The results of this conference were presented at the IUPAP General Assembly in October 2002. The IUPAP International Conference on Women in Physics brought together more than 300 participants, about 15 percent of them men, from 65 countries to review data, discuss barriers, share success stories, propose ways to improve participation globally, develop resolutions for action by the IUPAP General Assembly, and help teams develop appropriate strategies to improve the status of women in physics in their home countries.

## The 2nd IUPAP ICWIP 2005, May 23-25, 2005 in Rio de Janeiro, Brazil

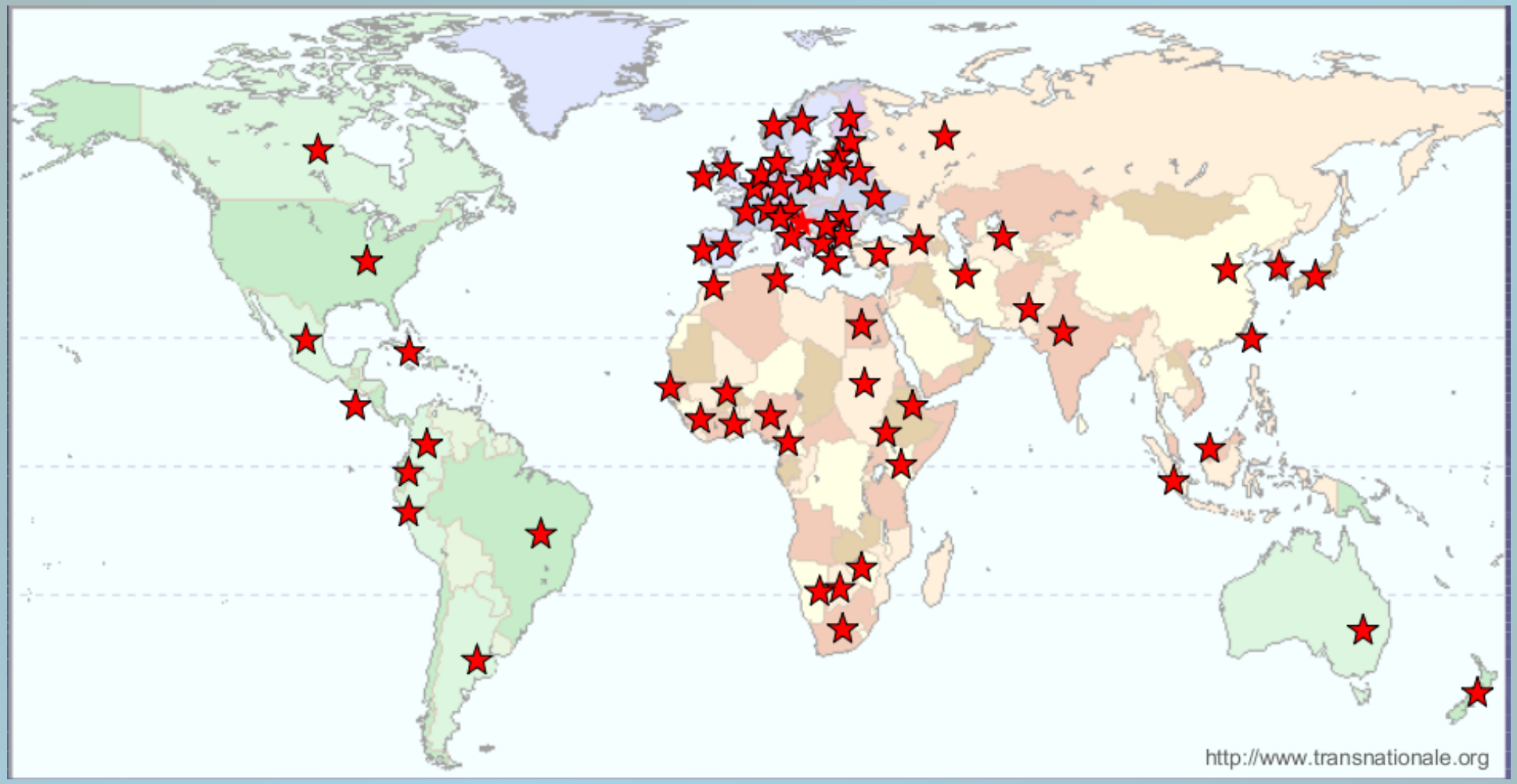
In the International Year of Physics, 2005, the 2nd IUPAP ICWIP was held in Rio de Janeiro, Brazil. The main purpose of this conference was to analyze the progress that has been made for the past 3 years and to check which strategies were successful in bringing and keeping women in physics. Besides serving as a checking point of the progress, the 2nd IUPAP ICWIP was an opportunity to share experiences gained in the process by each of the different countries. The specific feature of this conference, comparable to the 1st, was a scientific session for sharing the scientific developments of each of the participants. This stimulated scientific interaction among the participants and offered an opportunity for communicating and developing the international collaborations.

# The 3rd IUPAP International Conference on Women in Physics

October 8 - 10, 2008
Seoul, Korea

- Yale: $5000 donation and my expenses
- Brookhaven: $5000 donation
- Each $5000 donation covered the expenses for two women from developing countries

# Conference participants




- 283 participants from 57 countries
- Academic institutions, national laboratories, industry, scientific societies, national governments, granting agencies

# US Delegation

# Statistics on women in physics in the US

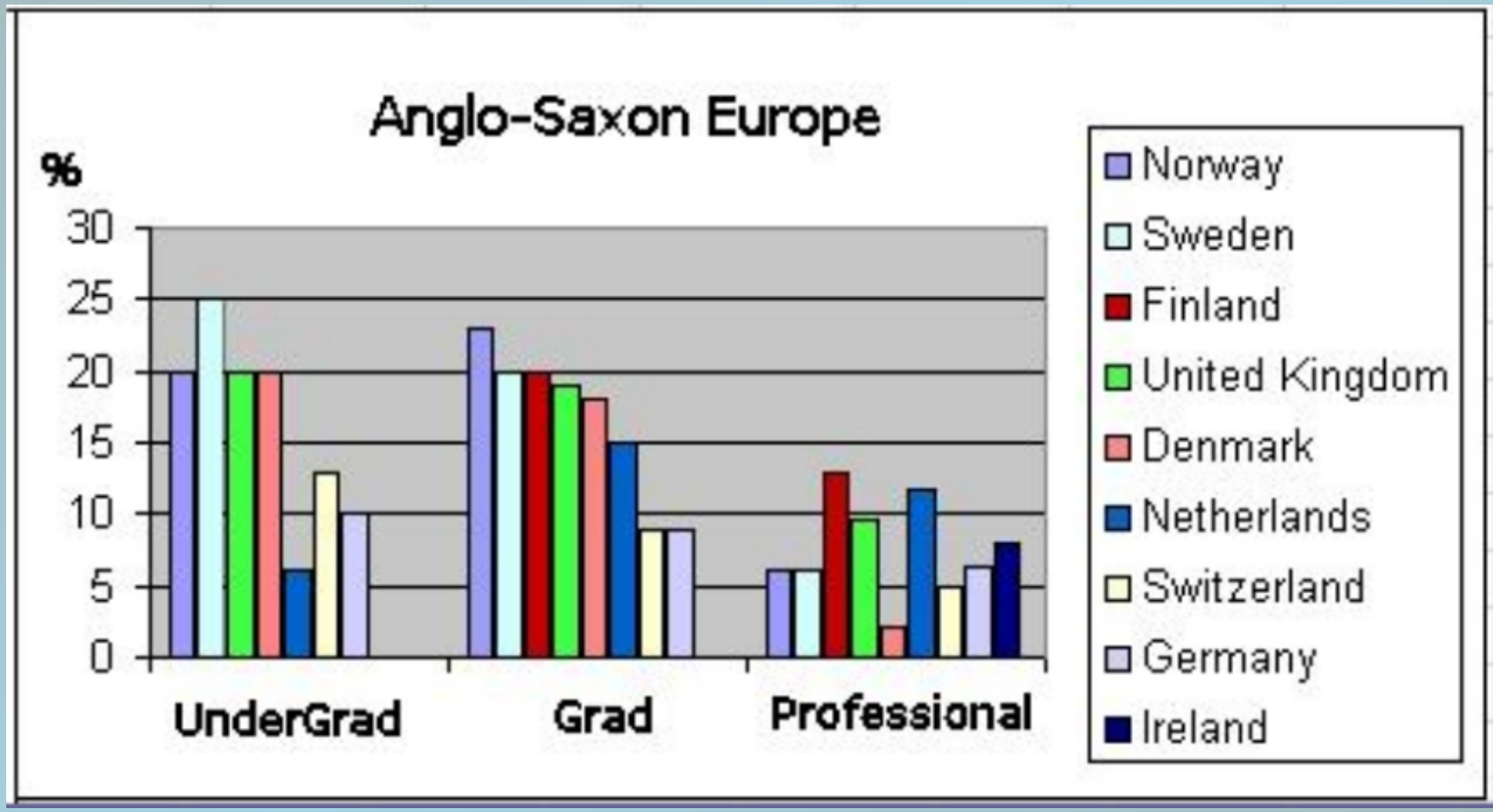
- 47% of high school students taking physics (2005)
- 21% of undergraduate majors (class of 2006)
- 17% of Ph. D.'s (class of 2006)
- 6% full professors (2006)
- 43% of all departments have no women on faculty (2006)
- < 20 departments graduate ≥ 5 women B.S.'s (1999-2003)
- 10 departments producing ≥ 5 women Ph.D's (1999-2003)

→ women are still rare in the U.S. physics departments

(minorities even more rare)

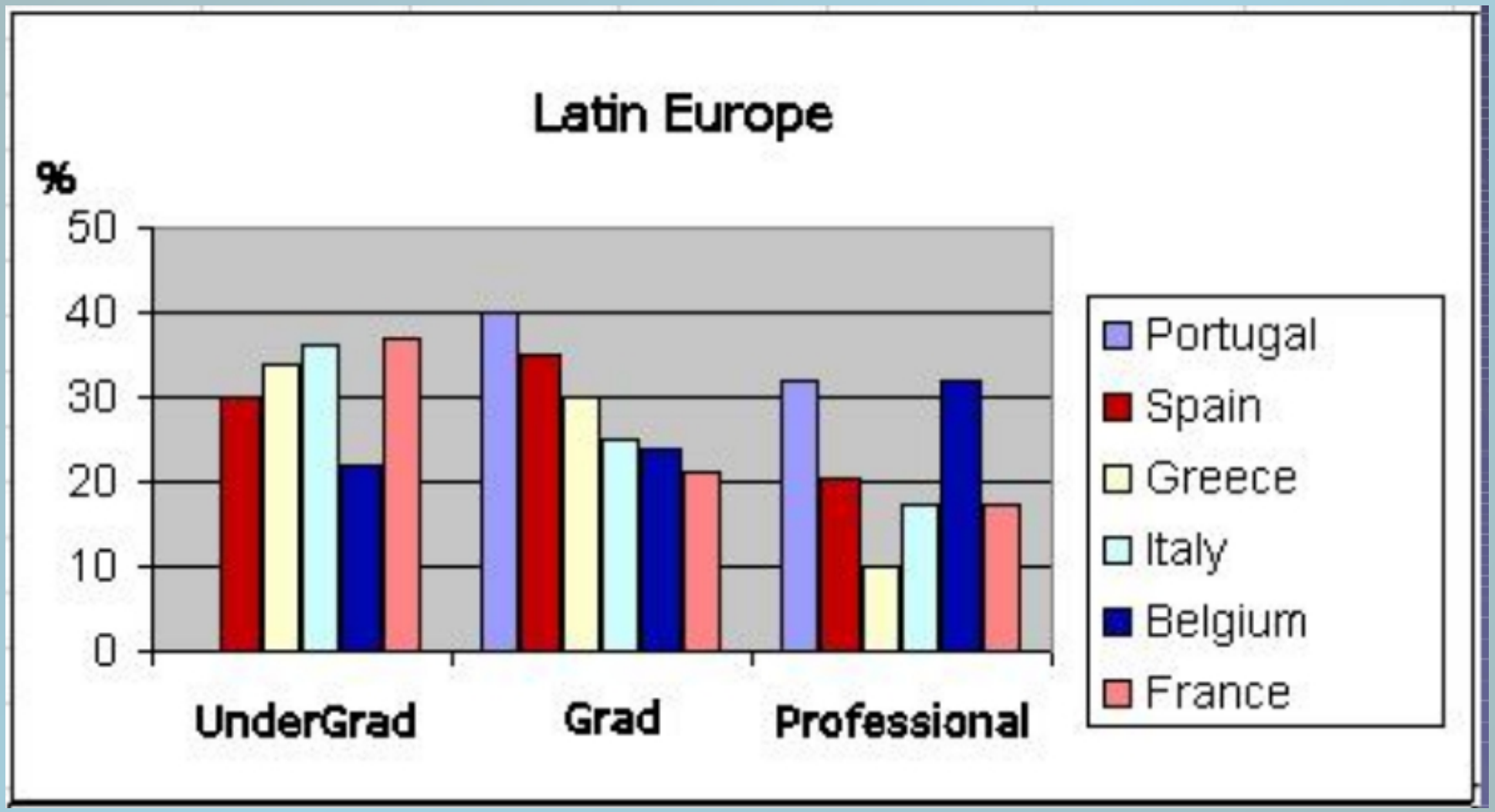
Data from AIP Reports

# Statistics on women in physics




IUPAP data, 1990-2002

# Statistics on women in physics




IUPAP data, 1990-2002

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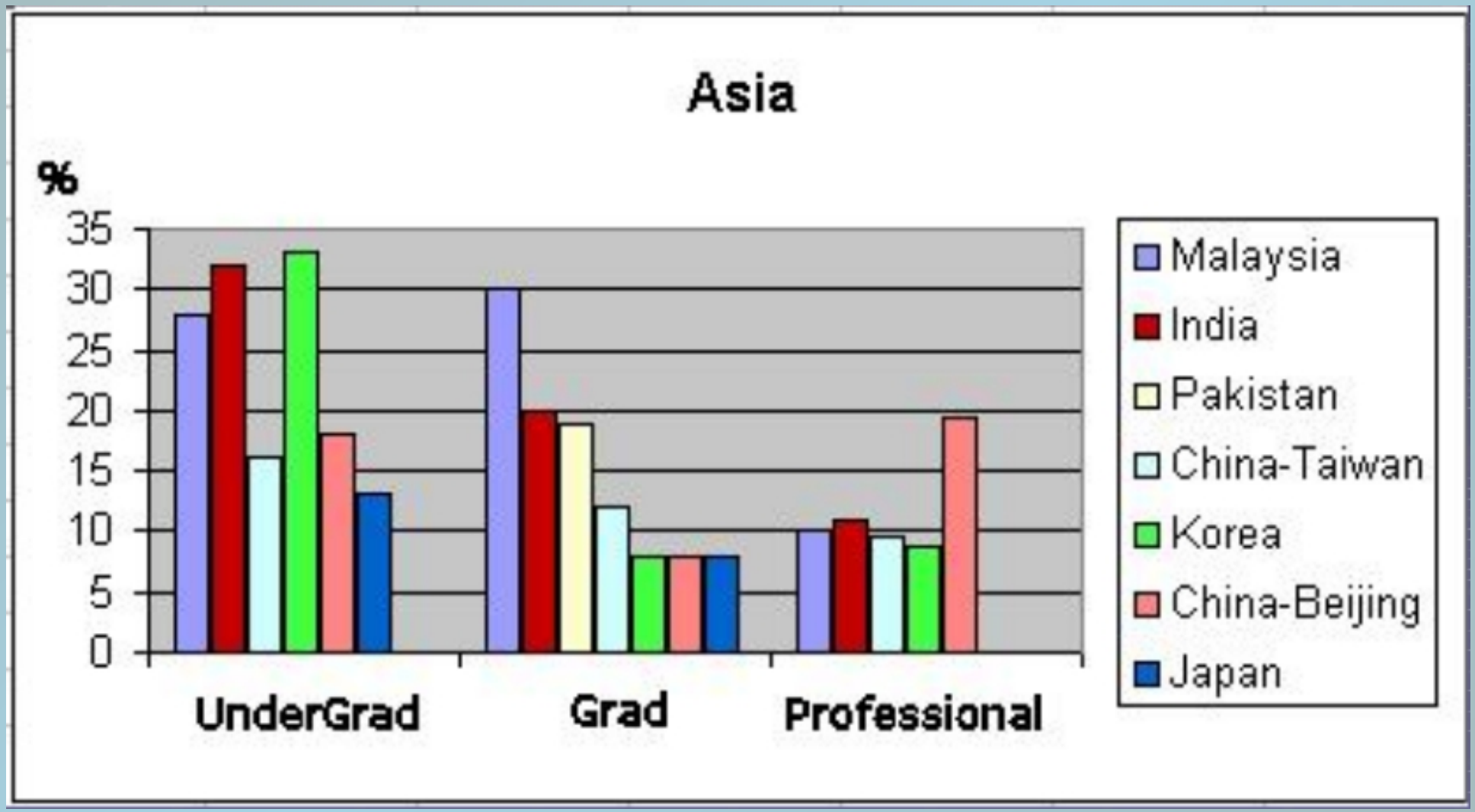


IUPAP data, 1990-2002

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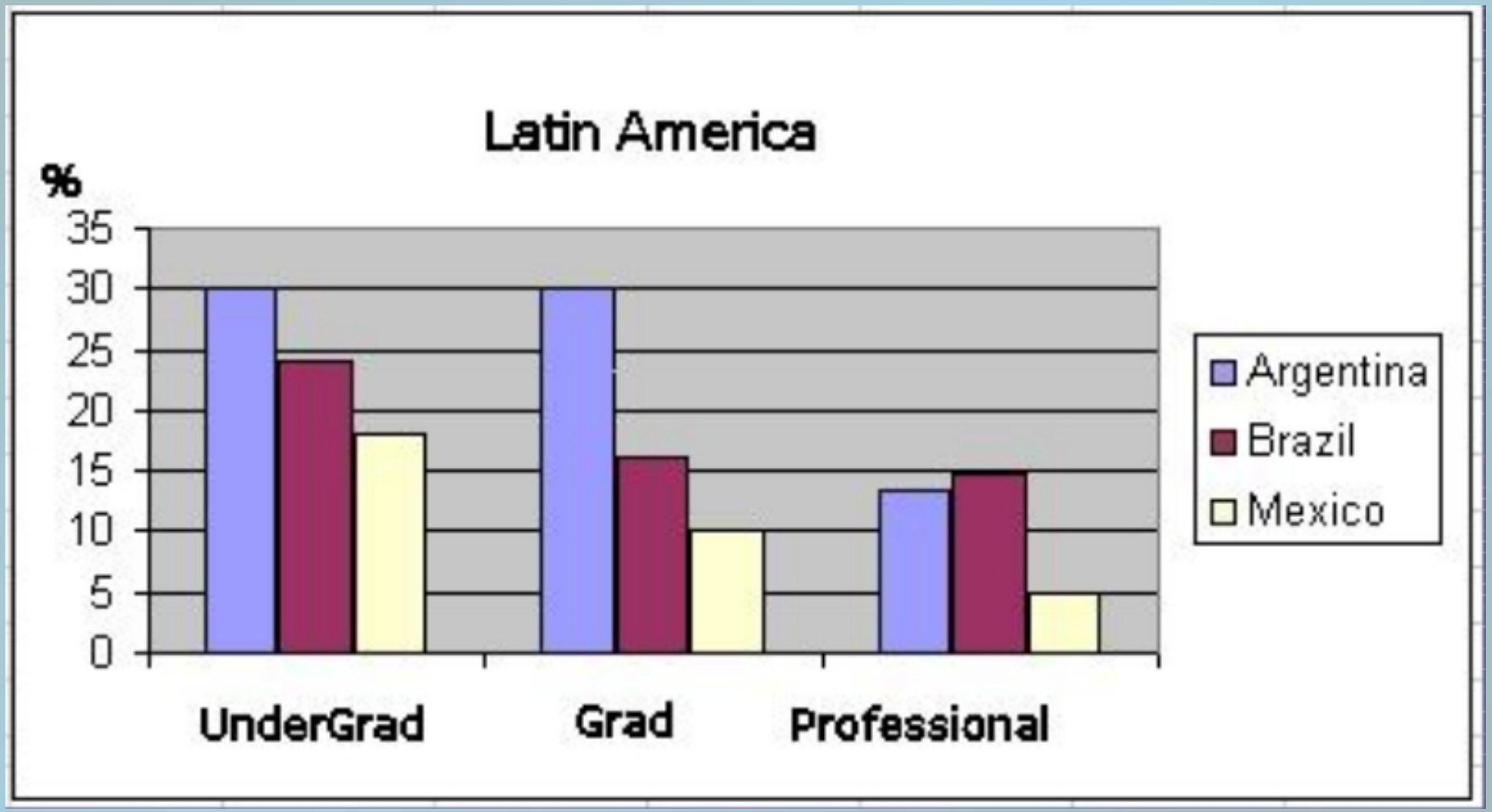


IUPAP data, 1990-2002

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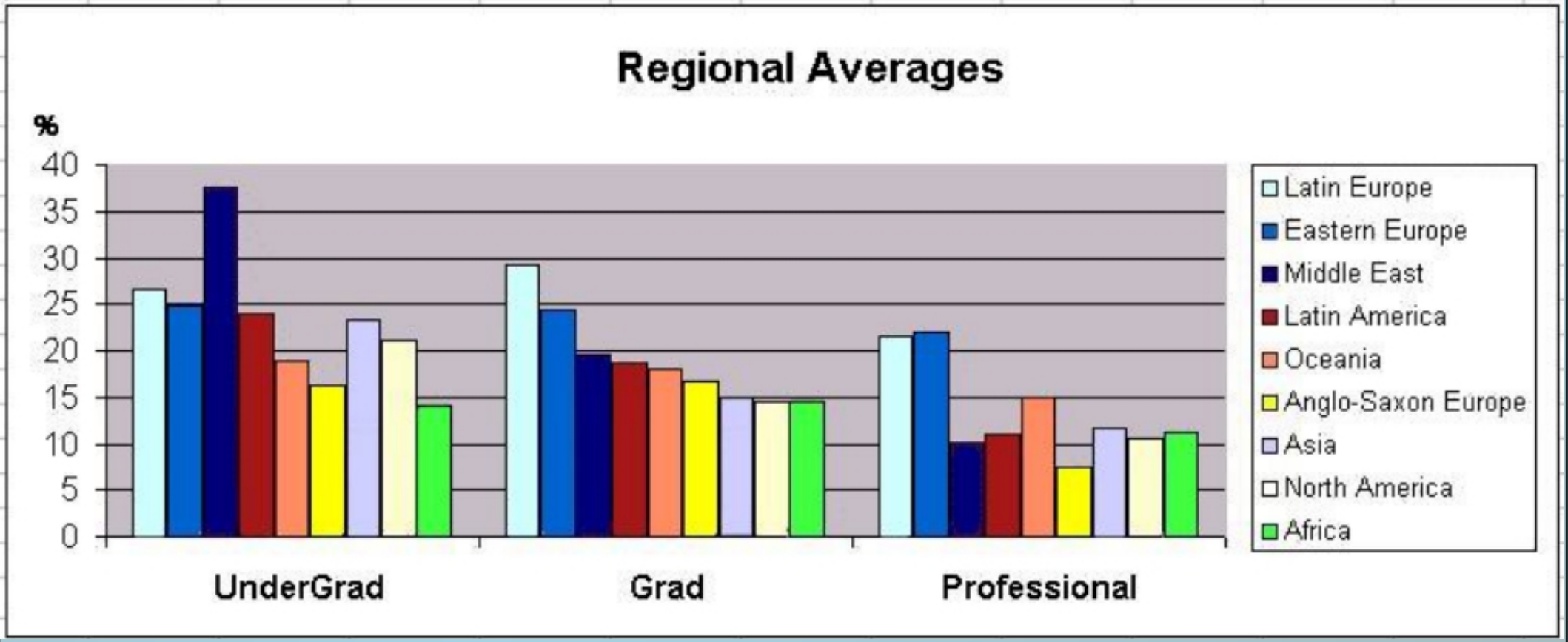


IUPAP data, 1990-2002

# Why are there fewer women in physics?

- Society and Image of a Scientist:
  - Why would I want to be a physicist: dull, nerdy, deficient in social skills?
  - Where is the HUMAN aspect in physics?
  - Not a "girly" thing to do?
  - And is there money in it?
  - Where are the role models?
- Education, Teachers, and Schools:
  - Lack of knowledgeable and enthusiastic teachers
  - Teachers perceptions and prejudices: doubting girls' abilities
  - Alienating classroom atmosphere
  - Stereotype threat
  - Textbooks and teaching methodologies that are unfriendly to women
  - Girl's perception of themselves: lacking assertiveness and self-confidence

# Why are there fewer women in physics?

- Uneven evaluation
  - Data consistently indicate there is a double standard
  - Both men and women do this
  - Over the course of a woman's career, it does significant harm

A. Budden et al, "Double-blind review favours increased representation of female authors", TRENDS in Ecology and Evolution Vol.23 No.1

Trix and Penska, "Exploring the color of glass: letters of recommendation for female and male medical faculty", Discourse Society 2003; 14; 191

Steinpreis, Anders, and Ritzke, "The Impact of Gender on the Review of the Curricula Vitae of Job Applicants and Tenure Candidates: A National Empirical Study", Sex Roles, Vol. 41, Nos. 7/8, 1999

Deaux and Emswiller, "Explanations of successful performance on sex-linked tasks: What is skill for the male is luck for the female", Journal of Personality and Social Psychology, 1974, Vol. 29, No. 1. 80-85

"A Study on the Status of Women Faculty in Science at MIT", http://web.mit.edu/fnl/women/women.html

Barres, "Does gender matter?", Nature, Vol 442, 13 July 2006

Towers, "A Case Study of Gender Bias at the Postdoctoral Level in Physics, and its Resulting Impact on the Academic Career Advancement of Females", arXiv:0804.2026

# Why are there fewer women in physics?

- Balancing family and career:
  - Dual career and trailing spouse
  - Childbearing and rearing as an additional full-time job
  - Childbearing years overlap with establishment of career
  - but...
    - Women w/o children not more successful
    - Many women in other demanding fields (e.g., biology)
    - Countries w/ strong support systems (e.g., Scandinavia) have few women in physics

# Why are there fewer women in physics?

- Role of Family:
  - Parents -- changing perceptions and prejudices :
    - Girls are potential scientists, education is not just the route to marriage, science, just as humanities, is a valid carrier path
  - Spouse:
    - Choice of a spouse is critical, support for balancing work and family responsibilities is essential
- Third World Problems:
  - Education:
    - Large classrooms, no personal attention to girls, lack of laboratory equipment - no connection to real life, low glamour for academic and teaching jobs, poor teaching
  - Society:
    - Pressure to get married rather than obtain a career, low economic status, lack of governmental financial support - science is uninteresting, unrelated to real life, useless, lack of job opportunities

# Why the concern?

- Excellence of Science:
  - excluding women weakens physics -- and all of science
- Fairness and Justice:
  - women deserve the same opportunity to have a career in physics;
  - taxpayer funded science need to benefit everyone equally
- Health of Society and Science:
  - more scientifically literate public → more support of science
- Trained Workforce
  - NAS, Beyond Bias and Barriers (2006)

# The purpose of ICWIP

I. To analyze the international status of women in physics, including recent progress in promoting their participation;

II. To provide an international arena for women in physics to share their scientific accomplishments and create scientific collaborations

III. To build each participating country's capacity to improve women's advancement in physics and related fields

# The program

- Plenary talks by women
- Poster session
- Workshops
  - Professional development
  - Attracting girls to physics
  - Site visits
  - Fund raising: successful proposals
  - Organizing Women in Physics working groups


# Excerpts from country papers and posters

- Namibia: "Physics is a man's subject, it's too difficult for the fragile girl's head to handle."
- Kenya: "Women who pursue male dominated careers, like [that of] physics, tend to develop masculine characteristics, such as hairy body, kink hair. … [Furthermore,] women become barren and …look ugly, the feminine body structure disappears."
- Senegal: Women "have the responsibility of housework and taking care of children. There is no housework sharing between men and women. Traditionally, it is forbidden [for] men to do the housework."
- Ethiopia: "The learning of physics is adding challenge to [the women's] existing challenge."
- Burkina Faso: "Women have to face multiple obstacles and barriers and have to arm themselves with a strongest willpower."

# Excerpts from country papers and posters

- Estonia: “In Estonia, women and men have equal legal rights. Women are expected to earn their living like men -- and unlike men to be the main (often the only) provider and caregiver for children.”
- Canada:”Canadian women that have higher education may not encounter gender discrimination until they encounter the so called ’maternal wall’ that hinders advancement in their professional careers.”
- Estonia: ”Physics and engineering are perceived as male areas and women active in these areas are often treated as exceptions.”

# Resolution for the IUPAP 26th General Assembly Submitted by the 3rd IUPAP International Conference on Women in Physics Seoul, Korea, October 7-10, 2008

- **Promote through the IUPAP Liaison Committees and physical societies the formation of additional regional or national working groups for women in physics.** These working groups would assist worldwide in the efforts to increase the participation of women, while being a resource to attract, retain, and advance women in physics.
- **Publicize site visits as an effective tool for improving the "climate" of physics workplaces, and encourage their implementation to help the workplaces become more supportive of both women and men.** For a site visit, an institution or physics department invites a team of physicists to assess the work environment for women and to give advice for improvements in gender equity.
- **Actively encourage organizers of IUPAP-sponsored conferences to provide, associated with the conference programme (a) professional development workshops for attendees and (b) outreach activities aimed at the public and to engage both girls and boys from an early age in the excitement of physics.**
- **Charge the IUPAP Working Group on Women in Physics (a) to oversee the administration of a global survey of physicists in 2009, (b) to continue to assess the progress of women in physics, (c) to make useful resources available globally through the internet, (d) to organize the 4th International Conference on Women in Physics in 2011, and (e) to report at the 27th IUPAP General Assembly in 2011.**
- **Urge IUPAP Liaison Committees and physical societies to take the leadership in their countries to encourage broad participation of their members in the global survey of physicists.**

http://wgwip.df.uba.ar/third_conference/resolution.php

# Why this is relevant to Brookhaven:

- Brookhaven is an international environment
- National labs have even lower percentages of women than universities

# What we can do:

- Make sure women have access to career development resources (does not have to exclude men!)
  - RHIC/AGS UEC career panels at Quark Matter 2009
  - Attempting career panels as part of STAR collaboration meetings
- Encourage women who might not get support at their home institute
- Encourage networking opportunities for women
- Be familiar with the research so we don't make the same mistakes