The 3rd IUPAP International Conference on Women in Physics

October 8 - 10, 2008
Seoul, Korea

http://www.icwip2008.org/

283 participants from 57 countries

International Union of Pure and Applied Physics

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

The beginnings...

(IUPAP)

In 1919 was formed the International Research Council "largely through the representatives of the National Academy of Sciences, Washington, and of the Royal Society, London, to co-ordinate international efforts in the different branches of sciences, under whose aegis international associations or unions in different branches of science could be formed".

In accordance with this principle, the 1922 General Assembly of the IRC convened at Brussels and a number of physicists present decided that the formation of a Physics Union was imperative.

Thirteen countries immediately announced their adherence to the new Union.

An "Executive" or steering committee of ten distinguished physicists undertook to prepare rules, regulations and activities of the organization.

The I.U.P.A.P. was launched.

http://www.iupap.org/70Years.pdf

The Thirteen

1. Belgium
2. Canada
3. Denmark
4. France
5. Holland
6. Japan
7. Norway
8. Poland
9. Spain
10. Switzerland
11. United Kingdom
12. United States of America
13. Union of South Africa

1922

The Ten

W. Bragg, president
M. Brillouin
O.M. Corbino
M. Knudsen
M. Leblanc
R.A. Millikan
H. Nagaoka
E. Van Aubel, vice-présidents
H. Abraham, secretary

http://www.iupap.org/index.html

IUPAP

The aims of the Union are: to stimulate and promote international cooperation in physics; to sponsor suitable international meetings and to assist organizing committees; to foster the preparation and the publication of abstracts of papers and tables of physical constants; to promote international agreements on other use of symbols, units, nomenclature and standards; to foster free circulation of scientists; to encourage research and education.

The first meeting was in 1923.

The Union is governed by its General Assembly which meets every three years.

At present 58 members and liaison committees

Structure

Physics communities, Liaison Committees

International Union of Pure and Applied Physics (IUPAP)

International Council for Science (ICSU).

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

At the 1999 IUPAP General Assembly, the concern was raised that women are greatly under-represented in the field of physics in most countries. Recognizing that all fields of science progress most rapidly when they draw from the complete available pool of talented people, the participants of the General Assembly passed a **resolution to form a Working Group 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 to 9, 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 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 ICWIP 2008, Oct 08-10, 2008 in Seoul, Korea

Resolutions from the ICWIP are brought to the IUPAP

At the conclusion of the three days of conference, the participants discuss and write down resolutions, which are brought to the IUPAP Assembly

Following the 3rd International Conference on Women in Physics in Korea, there was the IUPAP Assembly in Japan

IUPAP Declares 2005 "World Year of Physics"; Franz Elected Secretary-General

http://www.aps.org/publications/apsnews/200212/world-year.cfm

Judy Franz, Executive Officer of APS and Secretary General of the IUPAP

http://www.state.gov/p/io/unesco/members/48828.htm

Franz was one of several American physicists elected to IUPAP office, and she declared herself "honored" by her selection. But for her, a more personal triumph was the **passage by the IUPAP General Assembly of a Resolution on enhancing the role of women in physics.** The resolution was an outgrowth of the first International Conference on Women in Physics.

The General Assembly approved strong declarations establishing fully equal opportunity for success in physics independent of gender, in all arenas: primary and secondary schools, colleges and universities, research institutes and industry, professional societies, national governments, and funding agencies. Yet the most important provisions, according to Franz, were the **recommendations IUPAP made to itself that women be appointed to its liaison committees; that gender be a consideration in nominations to commissions and to the Council, and the statement declared that it expects that IUPAP-sponsored conferences will have women as members of their program committees**. She credits the success of the Paris conference and the reports generated for it with helping to boost broad support for women in physics issues within IUPAP's General Assembly.

The 3rd IUPAP International Conference on Women in Physics

October 8 - 10, 2008
Seoul, Korea

http://www.icwip2008.org/

283 participants from 57 countries

The Third IUPAP International Conference on Women in Physics

U.S. Delegation Application Form

Conference Dates: October 8 - 10, 2008

Seoul, Korea

United States Women in Physics
http://www.aps.org/programs/women/

Applicant Contact Information

Write two 250-word (maximum) essays in the fields provided below.

Essay 1: Describe your activities towards advancement of women in physics/science and your plans for contributing to the conference and follow-up success in the United States.

Essay 2: Describe how you expect your participation in this conference may contribute to your future career success.

Poster Type: (•) Research ( ) Gender and Physics

Poster Title: Transport Properties and Control in Low-Dimensional Quantum Many-Body Systems

US delegation

Arthur Bienenstock, Stanford; 2008 APS President

Young-Kee Kim, U.Chicago, Fermilab; Invited US Plenary Speaker; particle physics

http://uswip.org/

US Delegation Third International Conference on Women in Physics

1. *K Renee Horton (US Co-Leader), U. Alabama; Material Science Grad.student, NSBP Liaison
2. *Luz J. Martinez-Miranda (US Co-Leader), U MD, College Park, NSHP and SACNAS Liaison
3. *#Yevgeniya V. Zastavker (US Co-Leader), Olin College, APS/CSWP Liaison
4. *#Beverly Hartline, Delaware State U.; IUPAP Working Group member; AAPT Liaison
5. Nora Berrah, U. Western Mich.; invited breakout presenter on women in physics groups and gender equity in physics
6. Arthur Bienenstock, Stanford; 2008 APS President
7. Jacob Clark Blickenstaff, U. Southern Miss.; Science Education
8. Amy C. Cassidy, U. Southern California; Grad Student, physics
9. Latifa Elouadrhiri, Jefferson Lab: Researcher
10. Emily Freeland, U Wisconsin, Madison; Astronomy, Grad Student
11. Patrice Green, Delaware State University, Grad Student
12. *Rachel Ivie, AIP, Physics Statistics; Invited; international surveys
13. Hanna Jang-Condell, U MD, College Park; Astronomy; Postdoc
14. Young-Kee Kim, U.Chicago, Fermilab; Invited US Plenary Speaker; particle physics
15. Kelly Mack, UM Eastern Shore, Physiology, ADVANCE
16. Anne Maclachlan, UC Berkeley, Social Science, ADVANCE
17. Catherine A. Massey, NM, High School Teacher Las Cruces High School
18. Nergis Mavalvala, MIT & LIGO, gravity wave physics
19. Nicholas Murphy, U Wisconsin, Madison, Astronomy, Grad Student
20. Christine Natrass, Yale; Grad Student, physics
21. Bonna Newman, MIT; Grad Student, physics
22. Idalia Ramos, UPRH; electronics & physics
23. Teri Robinson, UCSB; theoretical chemistry, Postdoc
24. Molly Rossow, UC Irvine; bioengineering, grad student
25. *Juana Rudati, XRadia (industry), AMO physics
26. Lea Santos, Yeshiva U: Stern College for Women, quantum control
27. Elizabeth Simmons, Michigan State U, theoretical physics
28. Herman White, Fermilab; particle and accelerator physics

Country Paper

Women in Physics in the United States

Yevgeniya V. Zastavker,[a] Paul Gueye,[b] Kelly M. Mack,[c] Rachel Ivie,[d] Elizabeth H. Simmons,[e] Lea F. Santos,[f] Luz J. Martínez-Miranda,[g] Arthur Bienenstock,[h] Jacob Clark Blickenstaff,[i] K. Renee Horton,[j] Anne J. MacLachlan,[k] Beverly K. Hartline[l]

[a]*Olin College of Engineering,* [b]*Hampton University,* [c]*University of Maryland Eastern Shore,* [d]*American Institute of Physics,* [e]*Michigan State University,* [f]*Yeshiva University,* [g]*University of Maryland,* [h]*Stanford University/APS,* [i]*University of Southern Mississippi,* [j]*University of Alabama,* [k]*U.C. Berkley,* [l]*Delaware State University*

Abstract. The under-representation of women in physics and related fields in the U.S. remains significant despite an overall increase in doctoral degrees earned over the past 10 years. An even greater disparity in representation is seen among minority women. Recent studies have focused on a plethora of possible explanations to clarify this phenomenon. However, with increasing recognition of the significant and rising contributions of women to discovery and education in physics and related fields, the professional societies and government are pursuing efforts to promote broader inclusion, balance and gender equity. This paper references the past, current, and future directions for advocating women in physics in the U.S. since the First IUPAP/ICWIP held in Paris in 2002.

Keywords: United States, Women in Physics, Minority Women.
PACS: 01.10.Hx; 01.75.+m; 01.85.+f.

INTRODUCTION: WOMEN IN SCIENCE AND ENGINEERING IN THE U.S.

Since the 1st IUPAP Conference, several studies on the status of women in science and engineering have focused attention on women in physics [1-3]. These studies have recommended that academic institutions, professional societies, funding agencies, and Congress take steps to create "substantial and overarching reform of [the] academic enterprise" [1]. The proposed reform attempts to eliminate gender bias and bring women's participation in science and engineering to parity. In May 2008, the U.S. House of Representatives held a hearing on gender equity in science (results still pending) [4]. These initiatives have resonated within the physics community in significant ways.

RECENT TRENDS

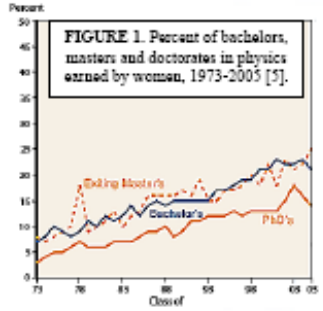

FIGURE 1. Percent of bachelors, masters and doctorates in physics earned by women, 1973-2005 [5].

The proportion of women attaining bachelor's degrees in physics has risen steadily to a high of 23% in the early 2000's [5]. Unfortunately, the percentage of women earning PhD's dropped in 2004 and 2005 to 14% after a high of 18% in 2003 (Figure 1). As shown in Table 1, only 13% of physics professors were women in 2006 [6]. However, the percentage of female professors in each faculty rank is equal to or greater than the percentage of PhDs awarded to women in the relevant years [7]. This indicates that young women have as good a chance at a physics academic position as their male peers.

Comparison with related fields shows physics lagging significantly: 42% of bachelor's degrees in astronomy and 31% of those in materials engineering were earned by women in 2005, and 31% of all science and engineering faculty were women in 2003 [8].

Women of color (WOC) continue to be under-represented in physics and related fields, and little progress has been made in recruiting or retaining them in the last decade. Fewer than 5% of faculty members in the "top 50" U.S. physics departments are from under-represented minority populations [9]. The under-representation of women and, specifically WOC, in physics and related fields has been attributed to factors including unfriendly climate, difficulties with recruitment and retention, absence of role models, unsuitable curricular and pedagogical structures, and the inherent masculinity of the scientific enterprise [1-4, 7]. Because they are so few, moreover, WOC are in demand as role models and committee members—service which takes time, but does not help in career advancement or tenure achievement [10]. This is of grave concern, since persons of color will form the majority of the U.S. population by the year 2050 [11]. Unless significant improvement is made, the overall presence of WOC may progress too little and too slowly in the next 40 years.

TABLE 1. Percent of women physics faculty [6].

Academic Rank	1998	2002	2006
Full Professor	3	5	6
Associate Professor	10	11	14
Assistant Professor	17	16	17
Instructor/Adjunct	N/A	16	19
Other Ranks	13	15	12
OVERALL	**8**	**10**	**13**

ACTIONS TO IMPROVE THE SITUATION OF WOMEN IN PHYSICS

In addition to national activities [1, 2, 4] to improve the status of women in science and engineering, the physics community has promoted focused workshops, grants, and scholarships for women. The American Physical Society (APS) Committee on the Status of Women in Physics (CSWP) and Committee on Minorities (COM) continue their site visits, workshops, and summer programs to physics departments and national laboratories to identify, intervene, and address "problems commonly experienced by minority and/or women physicists [to] help improve the climate…in the facility" [12]. Committees addressing the situation of WOC in physics include: the National Society of Black Physicists (NSBP) Women in Physics (WIP) Section and the American Association of Physicists in Medicine Minority Recruitment Sub-Committee (WMRSC). The American Association of Physics Teachers (AAPT) seeks more effective means of recruitment and retention of women in physics classes and related careers. To unite the efforts, NSBP WIP, NSHP, WMRSC, AAPT, and APS recently initiated a collaboration to advocate for women in physics. Additionally, the National Science Foundation, through its ADVANCE Program, has financed efforts to support the advancement of women in academic science and engineering careers.

Significant, yet insufficient, progress has been made in the U.S. since the 1st IUPAP Conference on Women in Physics. Women, and particularly WOC, remain under-represented in physics and related fields. Many physical societies are committed to addressing the issues. Working as a nation and in collaboration with other countries, we continue searching for ways to promote, and advance under-represented groups in physics and related fields.

ACKNOWLEDGMENTS

We are grateful for the support from the National Science Foundation, grant PHY-0824634 and many other sponsors for their generous support of the 3rd International IUPAP Conference on Women in Physics.

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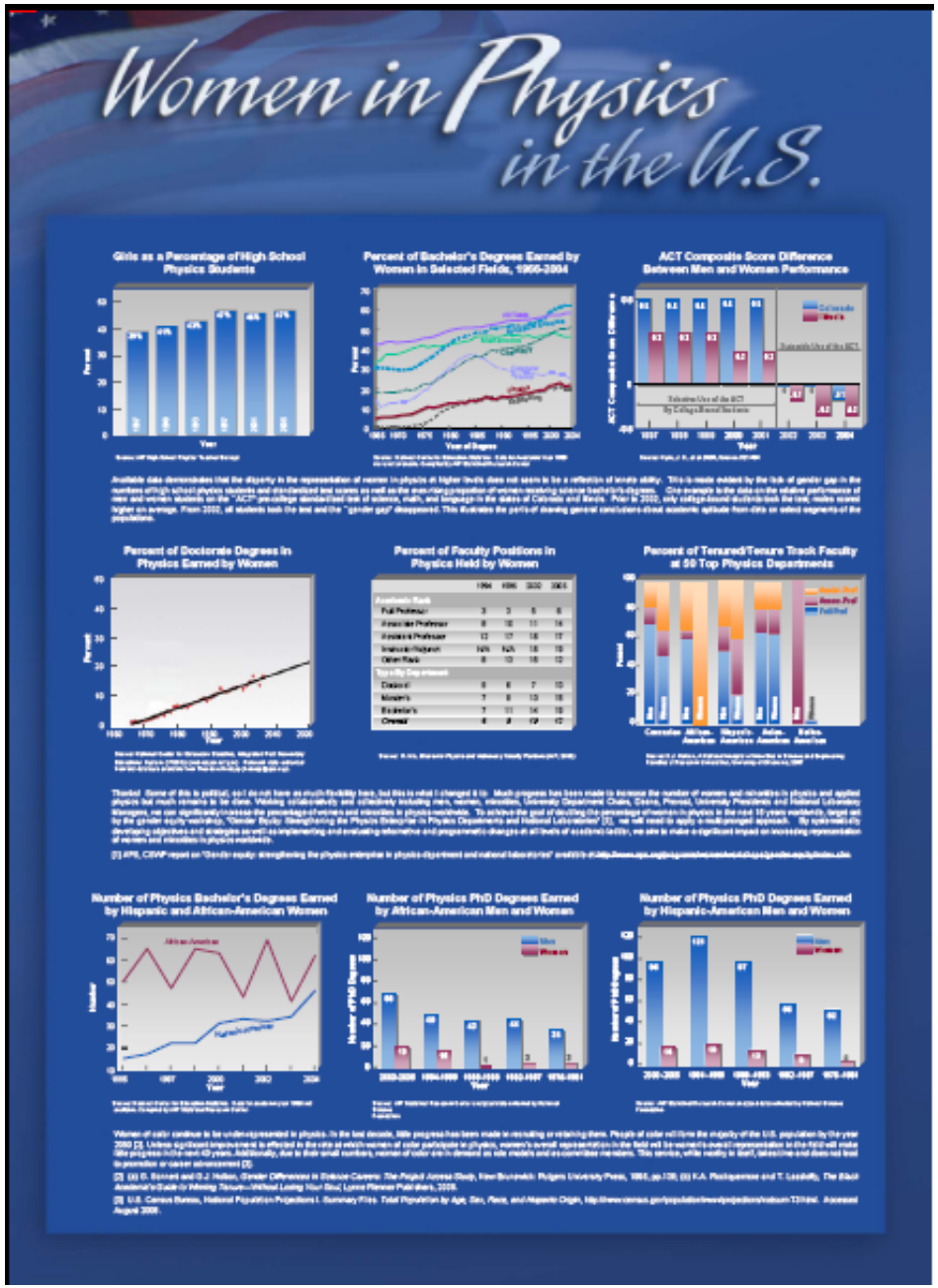
http://uswip.org/

Country Poster



http://uswip.org/

Transport and Control of Spin-1/2 Chains

Lea F. Santos

Department of Physics – Yeshiva University

OUTLINE

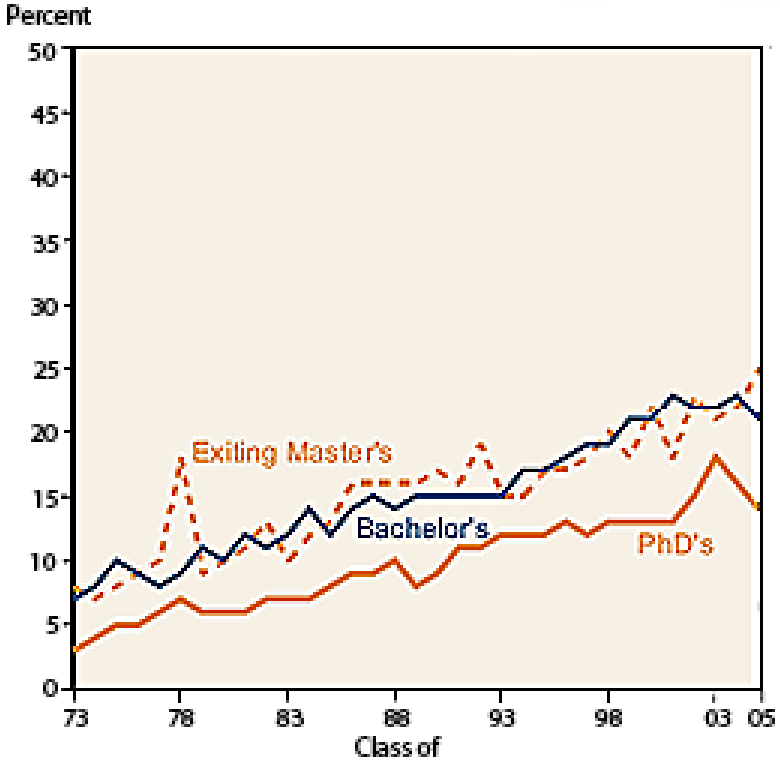
PART I

Compare **transport** behavior in spin-1/2 Heisenberg chains in the integrable and chaotic regime

PART II

Methods of quantum **coherent control** to induce desired transport behavior

Women in Physics in the US



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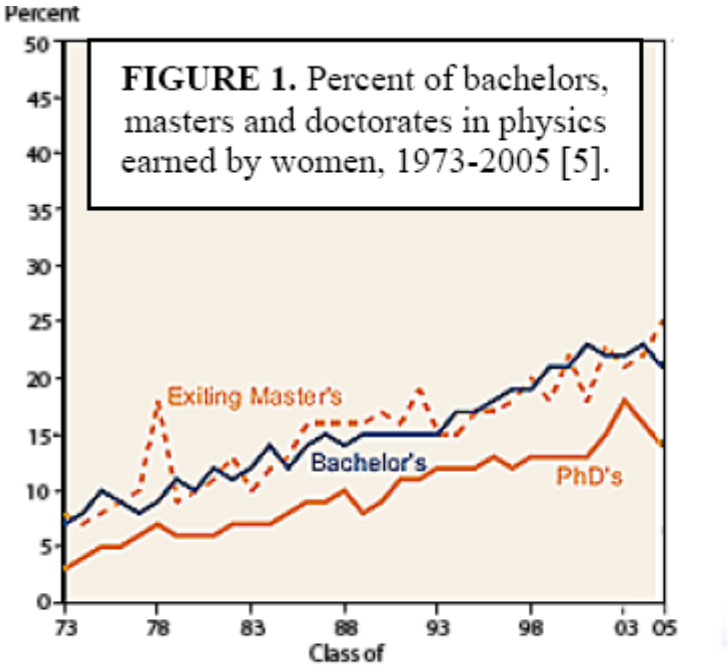
31% of all science and engineering faculty were women in 2003

the physics community has promoted focused workshops, grants, and scholarships for women, site visits

Statistics for the US



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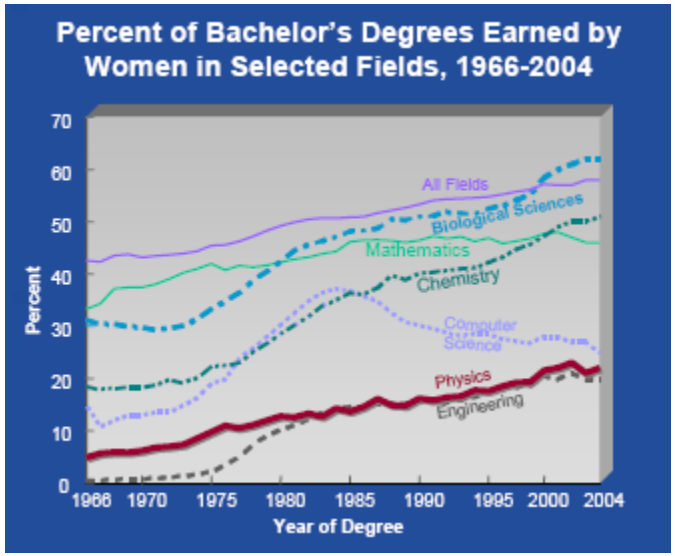
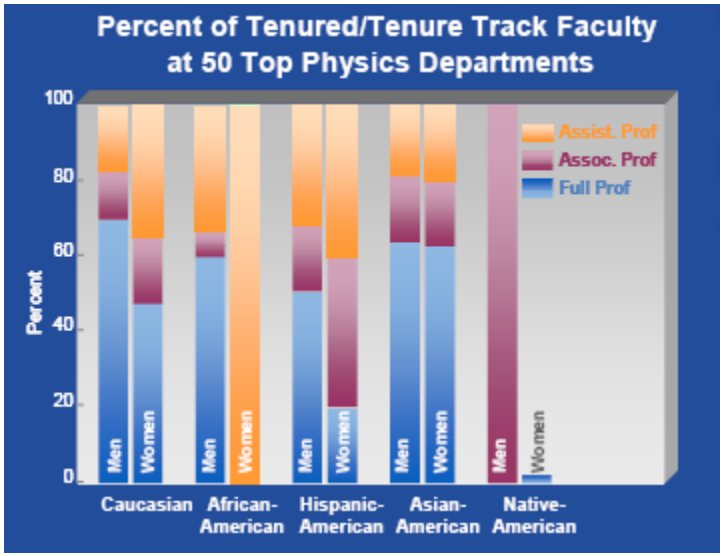
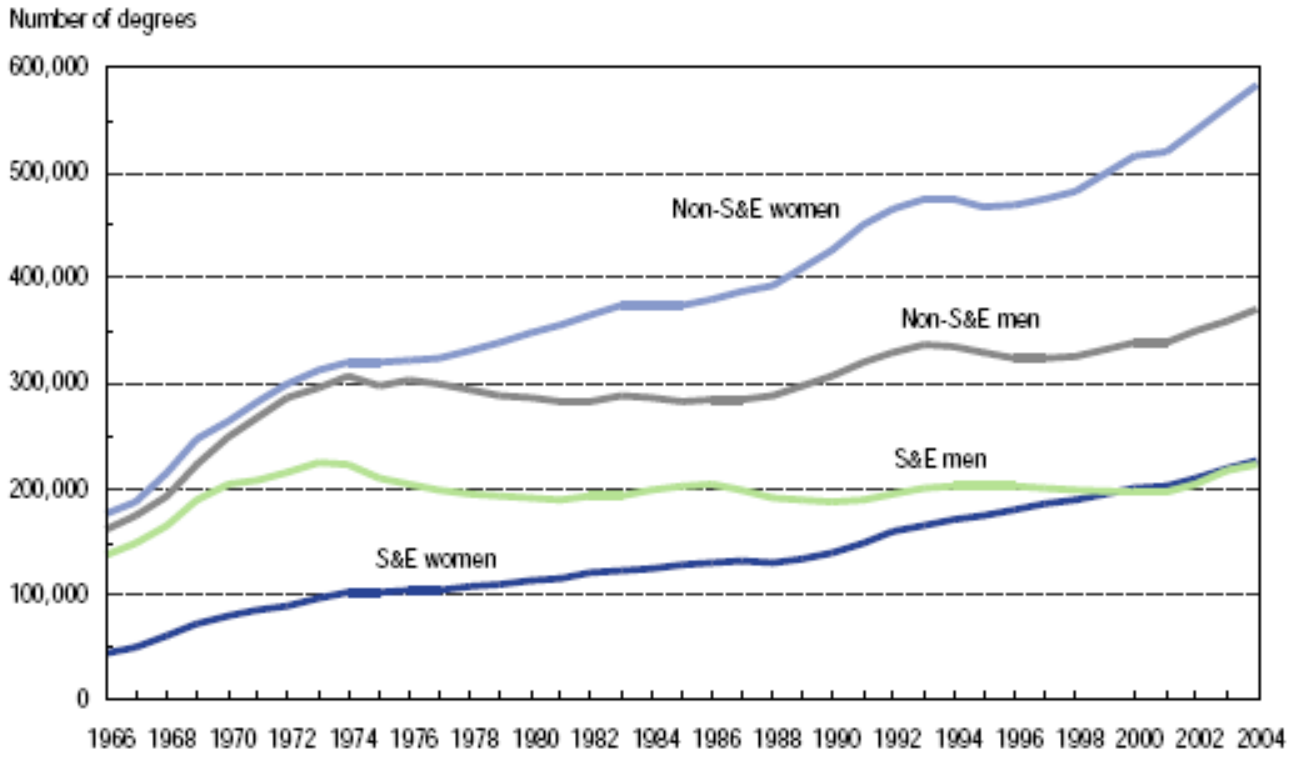




Statistics for the US

http://www.nsf.gov/statistics/wmpd/pdf/nsf07315.pdf

FIGURE C-1. Bachelor's degrees awarded in S&E and non-S&E fields, by sex: 1966–2004



Beginning in 2000, women earned more S&E bachelor's degrees than men.
Women earn substantially more bachelor's degrees in non-S&E fields than men.

Physical sciences and engineering lag behind.

Since the 1st IUPAP International Conference on Women in Physics (Paris, March 2002) and the 2nd Conference (Rio de Janeiro, May 2005) progress has continued in most countries and world regions to **attract girls to physics and advance women into leadership roles**, and many working groups have formed. The 3rd Conference (Seoul, October 2008), with 283 attendees from 57 countries, was dedicated to celebrating the physics achievements of women throughout the world, **networking** toward new international collaborations, building each participant's **capacity for career success**, and aiding the formation of active **regional working groups** to advance women in physics.

PROGRAM

Wednesday Oct/08
Morning: Plenary Talks
Early Afternoon: Poster Section – Gender & Physics
(incredible stories, but optimism -- articles available)
Late afternoon and evening: Workshops

Thursday Oct/09
Morning: Plenary Talks
Late Morning: Workshops
Early Afternoon: Poster Section – scientific posters
Late afternoon: Workshops
Evening: banquet sponsored by Seoul's mayor

Friday Oct/10
Morning: Success Stories
Late Morning and Early Afternoon: Discussions
Afternoon: tour

Saturday Oct/11: DMZ(demilitarized zone), concert, shopping, and Korean barbecue

PLENARY TALKS
(successful women – role model)

Monika Ritsch-Marte (Medizinische Universitat Innsbruck, Austria)
http://www2.i-med.ac.at/medphysik/MRM.html
Light microscopy's new jobs

Maki Kawai (The Institute of Physical and Chemical Research, Japan)
http://www.riken.go.jp/lab-www/surf-chem/maki/maki.html
Single Molecule Chemistry

Young-Kee Kim (University of Chicago and Fermilab, USA)
http://hep.uchicago.edu/~ykkim/
Extreme Physics where Small and Big Things Meet

Pratibha Jolly (Delhi University, India)
Research and Innovation in Physics Education: Transforming Classrooms, Teaching and Student Learning at the Tertiary Level

Michele Leduc (Ecole Normale Superieure, France)
http://www.phys.ens.fr/~leduc/
Laser Cooling, Trapping and Bose-Einstein Condensation of Atoms and Molecules

Thaisa Storchi Bergmann (Instituto de Fisica-UFRGS, Brazil)
http://www.if.ufrgs.br/~thaisa
Feeding the Monster

WORKSHOPS
(possibility to watch 4)

A = Personal professional development

- Navigating Life (aimed at early career people) **
- Negotiation to get what you need and want
- Transitioning into leadership positions (aimed at senior women)

B = Attracting girls to physics

- Attracting young people to physics, not losing the girls and boys
- Girl-friendly pedagogy **
- Camps, summer schools and programmes

C = Site visits assessing and improving the climate for women

D = Successful proposals and project leadership; Fund raising

- Fundraising
- Grant Writing **
- Project Leadership

E = Organising WIP Working Groups

- How to establish and keep alive a working group: networking
- Women in physics country groups: useful things to do
- What you can find out about female physicists: surveys, government database and more **

A = Personal professional development

• Navigating Life (aimed at early career people)

Gender Issues in Indian Science (Anita Mehta, India)

It's YOUR career. Take ownership to get where you want to (Beverly Hartline, USA)

MENTOR

B = Attracting girls to physics

•Girl-friendly pedagogy

LADY CATS: Physics Women Teachers in Japan

Physics in Primary Schools Project (Ann Marks, UK)

www.iop.org/pips

D = Successful proposals and project leadership; Fund raising

•Grant Writing

http://www.grants.gov

http://foundationcenter.org/ http://foundationcenter.org/getstarted/individuals/

http://marc.faseb.org/ http://www.grantwriters.org/grantwriters

http://www.grantwriters.net/ http://www.grantwriters.com/

E = Organising WIP Working Groups

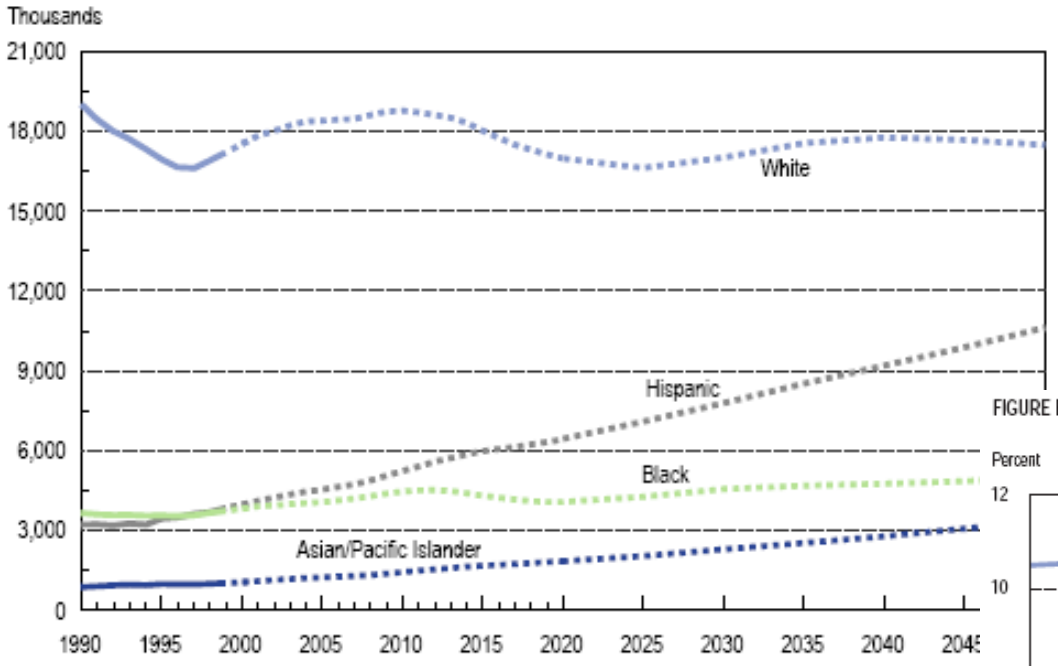
•What you can find out about female physicists: surveys, government database and more

Arthur Bienenstock – President of the APS (Stanford University)

Arthur Bienenstock – President of the APS

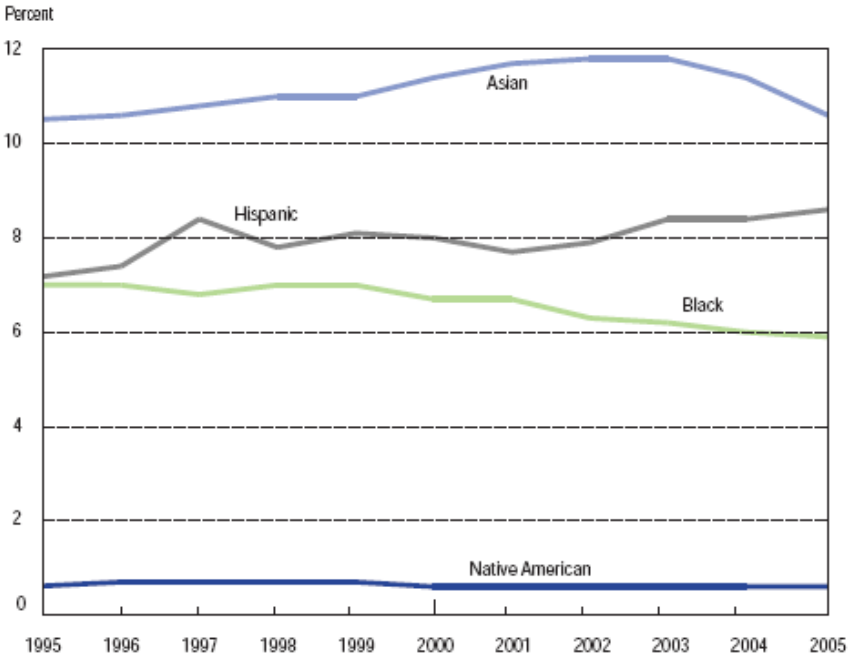
http://www.nsf.gov/statistics/wmpd/pdf/nsf07315.pdf

FIGURE A-1. U.S. population 18–24 years old, by race/ethnicity: July 1990–99 and projections to 2050



By 2050 Hispanic and Afro-americans will be the majority of the population

FIGURE B-1. Minority undergraduate engineering students, by race/ethnicity: 1995–2005



The percentage of undergraduate engineering students who are white was 69 percent in 1995 and in 2005.

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

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

American Physical Society Site

Stern should take part on these activities.

Sites visits, committees, workshop, survey, visits to schools

Women in Physics
http://www.aps.org/programs/women/index.cfm

1. Committee on the Status of Women in Physics
http://www.aps.org/about/governance/committees/cswp/index.cfm

2. Site visits
http://www.aps.org/programs/women/sitevisits/index.cfm

3. Professional development workshops for attendees of scientific conferences and outreach activities:
one-day workshops for women post-docs and tenured women physicists during the March Meeting
http://www.aps.org/programs/women/workshops/skills/index.cfm

4. National surveys
http://www.aps.org/programs/women/sitevisits/summary.cfm

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Beyond Bias and Barriers:
Fulfilling the Potential of Women in Academic Science and Engineering

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