

IUPAP Women In Physics Working Group

Report at the General Assembly, Berlin, Germany, October 2002

At the 1999 IUPAP General Assembly, the concern was raised that women are greatly under-represented in the field of physics in most countries. Because of this imbalance, many bright young people do not receive the opportunity to learn about physics and to prepare themselves for a physics career, and others are discouraged from doing so. 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. This Working Group has the following charge:

"To work with physicists in IUPAP member countries to gather information about women in physics. To analyze and report the data, identify barriers to entry into the field, and difficulties in maintaining and advancing careers for women in physics, and to recommend ways to improve the situation.

To suggest ways that IUPAP can ensure that women are fully involved in IUPAP-sponsored conferences, and to propose ways that they can become more active participants in IUPAP itself, including the Liaison Committees, the Commissions, the Council, and the General Assemblies. To report all findings at the General Assembly in 2002."

The Working Group on Women in Physics held its first meeting on June 6-7, 2000, at the American Center for Physics in College Park, Maryland. Nine of the eleven members were present: Marcia Barbosa (Brazil), Chair; Yosr Gamal (Egypt); Katharine Gebbie (USA), Beverly Hartline (USA), Elisa Molinari (Italy), Barbara Sandow (Germany), Herwig Schopper (Switzerland), Nandini Trivedi (India), Ling-An Wu (China). Two members were unable to attend: Hidetoshi Fukuyama (Japan),

Heh Jeong Moh (Korea). Judy Franz, Executive Officer of the American Physical Society, provided valuable support as IUPAP Liaison.

During that meeting, the Working Group reported on the status of women in physics in 19 countries. These reports highlighted the complexity of the problem and the difficulty in obtaining comparable data from countries with quite different

cultures and different terminologies. There were some aspects present in all countries. For instance, the percentage of women in physics decreases markedly with each step up the academic ladder and with each promotion into higher level positions.

Suggested barriers to women's participation in physics include subtle discrimination, blatant preferential treatment of men, lack of role models and mentors, higher paying jobs in other fields, uninspired teaching, the perception of scientists as antisocial nerds, and financial constraints that favor the status quo.

To highlight the under representation of women in physics and to recommend strategies for removing the barriers they face, the Working Group decided to sponsor an International Conference on Women in Physics in March of 2002. A detailed report of this meeting can be found at <http://www.if.ufrgs.br/iupap/wgwp.html>.

The second meeting of the Working Group was held on February 9-11, 2001 at CERN, Switzerland. Eight of the eleven members were present: Marcia Barbosa (Brazil), Chair; Katharine Gebbie (USA), Hidetoshi Fukuyama (Japan), Beverly Hartline (USA), Elisa Molinari (Italy), Barbara Sandow (Germany), Sumathi Rao, the new representative of India, Ling-An Wu (China). Three members were unable to attend: Yosh Gamml (Egypt), Heh Jeong Moh (Korea), Herwig Schopper (Switzerland). Judy Franz, Executive Officer of the American Physical Society, again provided valuable support as IUPAP Liaison. The Working Group planned a three day International Conference on Women in Physics that would be held at UNESCO Headquarters in Paris, France on March 7 to 9, 2002. The results of this conference would be presented at the IUPAP General Assembly in October 2002.

In preparation for the conference, the Working Group decide to undertake an international benchmarking effort to learn about the status and trends relating to women in physics in each of the 46 IUPAP member countries and elsewhere when feasible. Two surveys were developed for this purpose. The first survey assessed the population, demographics, and institutional aspects women in physics in each country. The second survey sought to characterize the educational and professional experiences of women in physics and to tap their insights regarding expectations, practices, interactions, and feedback loops that tend to welcome or exclude women asphysicists. In order to help in systematizing the data, the Working Group asked

for the counsel of Roman Czujko of the American Institute of Physics Statistical Research Center. More details of this meeting can be found <http://www.if.ufrgs.br/iupap/report2.html>.

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. Each team developed a brief report on the situation for women in physics in their country. Their findings were presented through posters that can be found at <http://www.if.ufrgs.br/posters.html>.

Philippe Busquin, Commissioner for Research of the European Union; Walter Erdelen, Assistant Director-General for Natural Sciences at UNESCO and Burton Richter, President of IUPAP each gave a speech to open the conference and welcome the participants. Eleven invited speakers described the situation, barriers, and actions from every region of the world. Discussion groups at the conference shared issues and successful practices related to six important topics for increasing women participation and success in physics: 1) attracting girls to study physics in schools and universities, 2) launching a successful career in physics, 3) improving the institutional structure and climate for women in physics, 4) getting women into the scientific leadership structure, 5) learning from regional differences, and 6) balancing family and career.

The Conference adopted eight Resolutions directed at schools, universities, research institutes, industrial laboratories, scientific societies, national governments, granting agencies and at IUPAP itself (see the full document at <http://www.if.ufrgs.br/iupap/resolutions.html>). The Resolutions emphasized the importance of:

Giving the same opportunities and encouragement to girls as to boys to learn physics. Ensuring that female students are given an opportunity for success that equals that of male students.

Promoting equity through policies and practices by establishing and publicizing transparent and fair mechanisms of recruitment and promotion of physicists and for review and approval of requests for funding.

Enabling career success by providing a family friendly environment (child-care facilities, flexible working schedules and employment opportunities for dual career families)

Including women in university and institute governance, particularly on key policy committees and in leadership positions; as well as on national planning and review committees.

Collecting, maintaining and making available statistical data, including gender.

Having scientific societies focus on increasing the number and success of women in physics (making available statistical data, identifying and publicizing role models, and appointing women to important committees and editorial boards).

The proceedings of the conference will be available at the General Assembly and will be soon linked at the webpage <http://www.if.ufrgs.br/iupap>.

The Conference received major funding from agencies and organizations around the world. A list of sponsors is given at the end of this report. We sincerely thank all of these organizations that made the Conference possible.

As a first follow up action, each country team was asked to translate the Conference Resolutions into their own language (some already did and the translated forms are at <http://www.if.ufrgs.br>). The working group is requesting IUPAP approval of the Conference Resolutions at its General Assembly in October, and then IUPAP's help in carrying them forward for implementation. In its role as the international organization of physicists, IUPAP can make sure its

own actions and processes contribute to increasing the number and success of women in physics.

The conference participants form now a network of country and even continental working groups. They are in contact with each other in order to publicize and advocate the resolutions, to monitor their implementation, and to evaluate their impact on the climate for women in physics internationally. The Working Group is maintaining and updating this network through its webpage that also contains a source of information of grants, job opportunities for women in physics, and important links.

Some results of the movement can already be felt. The next 22nd IUPAP International Statistical Physics Conference to take place in Bangalore, India will have a session on Women in Physics, coordinated by Neelima Gupte, India's team member at conference. The European Physical Society created a Working Group on Gender and Equality in Physics, coordinated by Gillian Gehring, the United Kingdom team leader at the conference. There are also new Committees on Women in Physics in Japan and Korea. The Working Group has recently launched a Unesco/Roste program to support women in underdeveloped countries to attend conferences and groups of women to have special sessions on the topic at scientific meetings. The Working Group is also working to obtain other sources of funding to maintain the program.

In order to maintain the network that has just being created and that will become a data bank of women in physics, to help ensure the Resolutions are being implemented, and to continue the momentum of the IUPAP Paris Conference, the Working Group asks for the extension of its mandate until the next General Assembly in 2005.

Marcia Barbosa

Working Group on Women in Physics

List of Sponsors

IUPAP International Union of Pure and Applied Physics

European Commission (5th Framework Programme for Research and Technological Development)

NSF National Science Foundation NSF (USA)

DOE Department of Energy (USA)

ICSU International Council of Scientific Unions

National Academy of Sciences (USA)

NASA (USA)

ROSTE UNESCO (Regional Bureau for Science in Europe)

NIST National Institute of Standards and Technology (USA)

American Physical Society

Institute of Physics (UK)

Centre National de la Recherche Scientifique (France)

The Physical Society of Japan

European Physical Society

French Ministry of Research

American Institute of Physics

ONRIFO Office of Naval Research International Field Office (USA)

Centre National de la Recherche Scientifique (France)

Japan Society of Applied Physics

ESF European Science Foundation

EPS European Physical Society

Engineering and Physical Sciences Research Council (UK)

LLNL Lawrence Livermore National Laboratory (USA)

OST Office of Science & Technology (UK)

ICTP International Centre for Theoretical Physics

KLA-Tencore - (USA)

PPARC Particle Physics & Astronomy Research Council (UK)

ONRIFO Office of Naval Research International Field Office (USA)

CLAF Centro Latinoamericano de Fisica