

Research Funding and Women in Physics

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Abstract. A round table discussion on research funding and its relation to women in physics was held during the Second IUPAP International Conference on Women in Physics. Panelists were the director of the Office of Education, Science, and Technology of the Organization of American States; the director of Programs on Women, Science, and Technology for UNESCO; the Minister of Women for Brazil; and a professor of physics from the University of Yamanashi, Japan.

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The first event after the opening ceremony of the conference was a round table discussion on research funding and its relation to women in physics. The panelists were Alice Abreu, Director of the Office of Education, Science, and Technology of the Organization of American States; Renée Clair, Director of Programs on Women, Science, and Technology for UNESCO; Nilcéa Freire, Minister of Women for Brazil; and Eiko Torikai, Professor of Physics at the University of Yamanashi, Japan. Each panelist made a presentation, then the chair of the session, Marcia Barbosa, Vice-Chair of the Institute of Physics, Federal University of Rio Grande do Sul, and Chair of the IUPAP Working Group on Women in Physics, solicited questions from the audience.

PANELIST PRESENTATIONS

Alice Abreu

Dr. Alice Abreu spoke of the mission of the Organization of American States (OAS), which is to strengthen cooperation and advance the common interests of the 34 member-countries of the western hemisphere, as well as to provide funding for technical workshops and science education fellowships.¹ OAS created the Office of Education, Science, and Technology (OEST) in September 2004. OEST organizes scientific and technical meetings and has begun to address issues of gender equity and equality at these meetings. Following the Meeting of Experts on Gender and Science and Technology in August 2004, Sophia Huyer prepared a position paper with recommendations for integrating gender perspectives into science and technology policy [1]. OEST has produced many recommendations for increasing the participation of women in science [2]. The Office recognizes that as part of its mission to create jobs, fight poverty, and stimulate democracy it must help maximize the available human resources and encourage capable women to participate in these fields. Men and women should have equal access to knowledge production and dissemination. As the OAS ministers have now approved these statements, the next step is to convince the member countries to take action.

Renée Clair

Renée Clair, who directs programs on Women, Science, and Technology for UNESCO, provided an overview of several unique initiatives that the organization has developed to aid women and enhance their participation in science. One group of UNESCO initiatives supports the development of a global network of women scientists and engineers. For example, UNESCO has established five regional chairs in Ghana, Swaziland, Argentina, Sudan, and Burkina Faso to serve as intellectual centers for promoting solidarity in the region, developing research projects, and working to improve education for girls and women in science. Another group of UNESCO initiatives works to

¹ An accompanying paper by Dr. Abreu, "Science and Technology and Gender at the OAS," immediately follows this paper.

address a key challenge facing many women: a debilitating cycle of poverty. Bringing together a network of scientists to develop programs to reduce poverty and advance women is another focus for the organization. As the budget of UNESCO continues to remain small, combining the issues of poverty with women's advancement provides the opportunity to address several challenges at once. Along these lines, UNESCO is working on a "Water, Women, and Power" initiative that will encourage involvement of women in local decision making about environmental, health, and political issues for water management.

Ms. Clair also emphasized the importance of looking for creative ways to fund new programs for women in science. In particular, she highlighted the special partnership between UNESCO and L'ORÉAL to honor annually one eminent woman scientist from each of five different regions of the world, acknowledging that the resources available to these women vary by region. Although when the program was initially proposed, several people felt that a partnership between a world governmental body and a business would be unworkable, the program has flourished and the winners provide role models for younger generations. Ms. Clair noted that the L'ORÉAL-UNESCO program serves as an example of the importance of thinking beyond traditional boundaries to fund new programs for women in science.

Eiko Torikai

Dr. Eiko Torikai gave an overview of the funding process in Japan. She explained that a typical research laboratory has annual grants of approximately 0.5 to 3 million Japanese yen (about \$5000 to \$25,000 USD). Competition for research funding is very aggressive, and most scientists learn to obtain funding by trial and error. Dr. Torikai went on to describe the physics community in Japan. The Physical Society of Japan (JPS) and the Japanese Society of Applied Physics (JSAP) are the two most prominent societies for physicists. Each has approximately 20,000 members, just 4% of whom are women. After the 2002 IUPAP International Conference on Women in Physics, the Japanese Inter-Society Liaison Association established a Committee for Promoting an Equal Participation of Men and Women in Science and Engineering (EPMEWSE). In 2003 a national survey of scientific societies [3] was conducted by the EPMEWSE committee with the goal of identifying gender disparity issues and proposing recommendations. Twenty thousand scientific society members of various disciplines responded to the survey. Of the respondents, 47% were with universities, 36% with corporations, and 11% with public research institutes. Women comprised 16% of the total survey respondents, which means almost 17,000 men participated in this survey on gender issues in science. There were 6,600 physicists among the respondents, 84% of whom were members of either JPS or JSAP.

The survey identified the central issues that women scientists face. Considerable disparity was found in the allocation of research resources, including funding. For example, 11% of men but only 3% of women have annual laboratory budgets of over 20 million yen (approximately \$180,000 USD or 150,000 euro). Many women reported unfair treatment after taking child-care leave, and remain underfunded throughout their careers. On the basis of the survey, the EPMEWSE committee issued recommendations that already seem to be having positive effects. For example, permanent positions are no longer required when applying for grants, and researchers can put a hold on research funds during a leave for child care, then restart the funding when they return to work.

Nilcéa Freire

Dr. Nilcéa Freire, Minister of Women for Brazil, spoke about Brazil's funding of programs for women. Last year the Ministry of Women organized a conference on women involving 2,000 people from all over the country, launching plans to improve the autonomy of women, provide nonsexist education, oppose violence against women, and help women succeed in the public arena. There is currently a government working group charged with carrying out these plans. As a matter of government policy, it is desirable to maximize participation of women (who are 50% of the population) in general, but especially in physics, which can be a vital field for helping to develop the country. Improving the access of women to education and careers in physics is a part of this larger plan to help Brazilian women.

HIGHLIGHTS OF THE QUESTION AND ANSWER SESSION

As a part of the round table, comments, questions, and suggestions were solicited from the conference participants. Among the issues raised were:

- The importance of having women on the committees that make funding decisions. (For example, in Russia, women are now becoming heads of science departments, but they are still not chosen to serve on grant committees.)
- The possibility of setting aside money for young women scientists.
- Funding for childcare during crucial early years. (Dr. Torikai mentioned that in Japan there is discussion about providing a means of financial support for child care within the science funding system, although no action has been taken yet.)
- Educating women about how to obtain funding, including development of a website for funding opportunities, sharing advice on how to write successful applications, and providing opportunities to practice as a graduate student or postdoc.
- The importance of women supporting each other, particularly in times of difficulty with research or funding.
- The danger that affirmative action programs cast suspicion on the reputations of talented scientists.
- Instituting travel grants to allow women to become involved in international projects.
- Acknowledgment that women know how to do successful science, but they don't always know how to work through the institutional structures to get what they need.
- The necessity of transparency in rules for getting grants.
- Encouraging women to network with other women physicists when traveling to foreign countries.
- In industry, propagating knowledge of how to make proposals attractive and advance one's career through a glass ceiling.

In the follow-up discussion, Dr. Abreu commented on the complex issues that women face at all stages of their careers. She said that the problem of a glass ceiling is universal across the globe. She said that science should be taught to students at a young age, and that perhaps the way science is taught should be changed in order to keep the interest of girls, who mature earlier than boys. She mentioned that there are ideas at the OAS about creating regional mechanisms to develop opportunities for women to participate in international research projects. Dr. Abreu also noted that while there are some regional differences in the representation of women in science at lower career levels, the problem of women advancing to the highest levels of the profession is universal. Mentoring and networking are critical to ensure that women advance at all stages of their careers.

Ms. Clair reminded us that women are *not* a minority, and that the distinctions between men and women are different than those between other groups of people that truly have minority status. She also said that women need to believe in themselves and their abilities. As an example of the exceptional things women can achieve, she said that the L'ORÉAL-UNESCO fellowship program was an idea formulated and developed by four lower-level female employees from each organization, who had a bold, innovative idea and convinced the heads of the organizations to approve of and fund the program.

Dr. Torikai extended her comments about the importance of women learning how to be successful in obtaining funding. She emphasized that women need to learn how to navigate the existing funding systems.

Dr. Freire spoke about the need to recognize that government policies do not have the same effect on women and men. The current situation in physics is analogous to the prominence of men in political careers: men learn at a young age how to compete for power and become trained to get what they want. Prejudices against affirmative action exist, but since funding currently goes primarily to men, some corrective measures may be necessary. Because it is already accepted that there are special fellowships and funding sources for young researchers, perhaps the same can be done for women in order to help speed the process of equalization. Affirmative action needn't segregate women into a separate track of opportunities, but instead provide a supplementary set of programs. For example, pregnancy requires an allowance for career interruptions in order to establish equality of opportunities. The L'ORÉAL-UNESCO recognitions are another example of positive discrimination, which in effect create regional role-models for young girls and women and may inspire them to study science. It is desirable to affirm the difference between men and women while in pursuit of equality.

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