Physics: For Women, the Last Frontier

All over the world, women are drawn to physics and practice physics for the same reasons and in the same ways as men. But women physicists are still rare, they're seen as different, and their abilities are undervalued. That's the overall impression from the International Union of Pure and Applied Physics (IUPAP)–sponsored international conference on women in physics held 7 to 9 March 2002 in Paris and from a 50-country pre-meeting survey of women in physics reported at the conference. With over 300 participants, 15 percent male, in 65 national teams, the conversation ranged widely, from putative cognitive differences (a claim heard mainly in the United States), to the benefits of a rigorous secondary school preparation (59 percent of the women present had chosen physics in high school), to the importance of arranging one's own marriage, even in cultures where this is not the norm.

No matter how many women start out in physics, a common trend across countries is their attrition in going from undergraduate and graduate studies to permanent positions. Many attributed this to the overlap of the early professional years with the peak marriage and childbearing years and/or to the requirements for frequent relocation and travel. But family issues do not seem to inhibit women in scientific disciplines that are equally demanding, such as biology and chemistry, where women are far more numerous, both absolutely and proportionately. Nor are there large numbers of women physicists in countries with strong family support mechanisms (day care and maternity leave), such as the Scandinavian nations. Rather, there appear to be small but cumulative barriers to the progress of women, such as lack of openness in recruiting, hiring, and promotion processes; subtle but nonetheless debilitating harassment and discrimination; and "fuzzy" (meaning unspecified and unquantified) standards of success. Even in countries where there are more women in physics, few are in leadership positions. Interestingly, despite these problems, three out of four respondents to the pre-meeting survey said they would choose physics again.

IUPAP Conference

Differences between developed and developing countries were smaller than one might have expected, both in the statistical report and in the small group discussions. The pluck and energy of women from developing countries stole the show: a Malaysian mother of eight, now a university dean, having combined a successful research career with administration; a Russian woman physicist for whom "24 hours in the day is a lot of time"; dozens of young East and South Asian women fully expecting to succeed in physics and mystified by the suggestion that cognitive differences could account for women's lesser participation in physics.

Indeed, the perception of physics as appropriate or inappropriate for girls and women turns out to be far from universal. Whereas in parts of Europe and North America women may have to explain or even apologize for studying physics, elsewhere women apparently choose physics freely and for the same reasons men do. Several Italian women, surprised by the question of why they chose physics, explained that in their country, studying physics opens more doors than studying engineering.

Although there was broad agreement on a set of recommendations, including relaxing the age limits in competitions for positions, grants, and fellowships to accommodate a delayed career pace, and adding women physicists' contributions to the next generation of physics textbooks, some issues, most particularly affirmative action, were hotly contested. French delegates were adamant that perceived advantages for women would backfire. But, as the German delegation pointed out, had positions not been designated for women over the past decade by the Max Planck Institutes in Germany, German women physicists would be even less well represented in research physics than they are today (3 percent at the assistant professor level, as compared to 26 percent for France).

Neither the speakers in the formal sessions nor the delegates entertained the postmodernist position that without women, science must be biased. Rather, the distinction was drawn between the conduct of science and the behavior of scientists, in this case physicists. To be sure, women need to better understand the mechanisms of hiring, funding, and promotion; that is, how to play the game. But the game itself has to be purged of cloning, patronage, and outright discrimination if transparency in hiring and promotion is to become the rule. "Excellent men have nothing to fear from transparency," concluded a French delegate. Indeed.

Sheila Tobias, Meg Urry, Aparna Venkatesan

The authors were U.S. delegates to the IUPAP conference. For more information about the conference, see www.if.ufrgs.br/~barbosa/conference.html. For the U.S. delegation's summary, see http://pantheon.yale.edu/~cmu2, and for the pre-meeting international survey results, see www.aip.org/statistics.

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