

# Women in Physics in the United States

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In the last 25 years, women in the United States have made great progress in expanding their participation in professions formerly populated almost exclusively by men. However, this progress has been much more limited in physics than in many other fields. The physics community in the United States has made slow progress in enrolling and rewarding women in physics compared with other professional communities, due in part to the belief that because science is an “objective” pursuit, the underrepresentation of women is simply an indication of their lack of interest or ability in the field, rather than an indication of discrimination or exclusion.

Thus, unlike other countries that have looked to women as a resource to increase their number of physicists, the United States could for most of the 1940s, 1950s, and 1960s accept as “natural” the tendency of women students—even those with outstanding mathematical talents—not to select physics as a subject of study. It was not until the mid-1960s, when the women’s movement exposed the disproportion of women in physics and took action to eradicate discrimination and to eliminate barriers, that anything was done to address what was until then not considered to be anyone’s problem—neither women’s nor the country’s.

There were always exceptional women physicists in the United States, as elsewhere. But here in the United States they were not just exceptional, they were rare and solitary. Even when they were “successful” by ordinary measures, they did not thrive at the same rate and to the same extent as men. Many did not marry or have children. Most remained research associates, off the professorial ladder and, if they taught at all, taught at women’s colleges. As a result, their presence in the physics world—scant and segregated as it was—did not counter the overall impression, expressed by physicist I.I. Rabi as late as 1982, that women do not have the temperament to do physics. “They may do science,” Rabi told an interviewer toward the end of his life, “but they will never do Great Science.”

Twenty years later, according to “Women in Physics, 2000,” a report from the American Institute of Physics, women remain “sorely underrepresented” in physics in the United States.<sup>1</sup> They earn fewer than 20% of the bachelor’s degrees and fewer than 12% of the Ph.D.’s, despite significant strides for women in the other sciences (50% of the bachelor’s and 30% of the Ph.D.’s in chemistry, 50% of both in biology).

Isolation for young women who do select physics is one result of this disproportion; a sense of being “out of place,” another. Only 20 departments of physics in the United States graduate five or more women physics majors per year, which means that in most universities women students are still an unusual occurrence, reinforcing stereotypical views among senior physicists and the women’s peers that women still can’t or won’t do physics.

Efforts in the United States to correct this (led by the physics community itself) have focused on three issues: the “culture” of physics in the United States, which encourages a hyper-competitive, “overly masculinized,” almost monastic approach to science; work-life issues that penalize young people (not just women) who have working partners and children; and perceived abuse, which ranges from being discounted and not taken seriously by professors, employers, and colleagues to being openly discouraged, disliked, and having one’s career intentionally derailed.

Since the 1970s, the American Physical Society (APS) has provided information and support in the struggle to increase the numbers and success of women in physics. In 1972, the society established a Committee on the Status of Women in Physics, both to study the problem and to try to do something about it. Led by senior women in the field, the committee collected and published detailed information about women in physics and made certain that women were mentioned and earned their share of APS honors, given visibility in organizing research sessions, and given high-level appointments in the society itself. The committee has also prepared materials such as posters and leaflets to help in recruiting women to physics by highlighting women's contributions to the field, and has supported in-career women by sponsoring scientific sessions and providing networking opportunities at major society meetings.

Perhaps their most far-reaching effort is the committee's well-publicized Climate for Women Site Visit Program to academic physics departments, in which teams of senior female physicists interview women students (graduate and undergraduate), professors, and other staff. Armed with their findings, the Site Visit Team then conducts an "exit interview" with the department chairman and prepares a report outlining a plan for improvement. This effort grew out of a request in the late 1980s from the chairs of physics departments for advice on how they could recruit and retain more female students and faculty. The National Science Foundation funded the initial visits and the program continues today with funding from APS. As of March 2002, 27 such visits have been conducted, including two to national laboratories and one return visit to an academic department.

Other physicists aligned with women activists have tackled:

1. The shortage of women teachers of physics at all levels of schooling in the United States
2. Problems of perception and bias in the evaluation of women's work
3. Sexual harassment
4. Physical safety for women in labs
5. The difficulty of managing marriage to a professional partner and their own professional career

A sixth issue is childcare, which in the United States is typically not supported either by the state or by the employer. Ours is a country where in-home help is uncommon in the middle classes, which leaves the burden of maintaining a household on the family itself.

Americans, like physicists elsewhere, want to see more women in physics. There is the fairness issue, but along with that there is a pressing need for talent in physics, wherever it may be found. The socialization of women and their adult roles cause them to bring fresh perspectives to the selection of research problems, to the organizing of research groups, to the teaching of physics, and to the work of physics itself.

Because the United States prepares and trains the future research faculty of many other nations, our country's ability to recruit and retain women in physics directly affects the status of women in physics elsewhere, making the questions we bring to IUPAP even more urgent: What keeps girls interested in physics? How do we counter residual bias against women in the field? What works in attracting and supporting women students and women professionals? What constitutes a critical mass, meaning a stable cadre of women physicists that will persist and prosper? And how do we get there?

## REFERENCE

1. R. Ivie and K. Stowe, "Women in Physics, 2000," AIP Publ. No. R-430 (American Institute of Physics, College Park, MD, June 2000); [www.aip.org/statistics/trends/highlite/women/women.htm](http://www.aip.org/statistics/trends/highlite/women/women.htm).