

# Women in Physics in Brazil

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The scientific community in Brazil has been growing steadily in the last 50 years. Because the history of science in the country is relatively recent, there is no national media for dissemination of science in Brazil. The overall population thus has very little knowledge about the level of the scientific research that is being undertaken in the country, and science is seen by the common citizen as something mysterious, difficult, and usually done by “unsocial” people.

There is no difference in the way an elementary or high school teacher will treat a girl or a boy in math or physics classes in Brazil. However, a majority of the children will develop an aversion to the subject itself, and the prejudice against scientists has a stronger effect on girls who, in a male-dominated society, usually look for social acceptance. Women play a very important role in the educational structure in Brazil because the mother is more involved with the education of the children, and because most of the teachers at the elementary level are women. Therefore, if the way women view science and the scientific method is not reversed, we will not be able to change the way the overall population feels about science and research.

The underrepresentation of women in science in Brazil has other contributing factors as well:

- Access of women to education is recent. During the time Brazil was a colony of Portugal (until 1822) and for the first 50 years after its independence, most of the wealthy families educated their children in Portugal, where the first schools for girls were opened in 1815 and women were not allowed into universities until 1879. Sending girls to study outside Brazil was never a priority for Brazilian families, so women actually had access to higher education only when our first university was opened in 1912. Even then, they would prefer to go into the humanities. Today the proportion of female undergraduate students in physics is only about 25%
- Women face yet another difficulty in pursuing graduate and postdoctoral studies: reconciling career and family, particularly for young physicists. It is very important for a Brazilian physicist to spend at least one year in postdoctorate studies outside the country, which is often difficult, if not impossible, for a married woman, particularly one with small children. As a result, after graduating, women will decrease their participation in science. This can be gauged by the number of study fellowships granted for physics by our national agency, CNPq: we find that female participation starts at 25% for undergraduate grants, and drops to around 11% at the postdoctoral level.
- Physicists in Brazil basically work at universities. As researchers and faculty we have a double career. Researchers can achieve national recognition through a research fellowship from CNPq, which in turn has important effects on the everyday life of the scientist: getting new grants, participating in plans, reviewing, and so on.
- Fellowships are classified into six levels, and requirements for reaching the top level are not objectively stated; they are associated with “seniority” that does not have a clear definition. Without clear rules, there is plenty of room for prejudice. The physics committee is trying to have clear or at least more openly posted rules; however, right now the situation is of grave concern, with 17% female participation at the entry level dropping to 1% at the top. Faculty members are also classified in levels, and the rules are again not completely clear. Since there are few women at the top levels of the field, committees that make the decisions are male dominated.
- Very few women have top administrative positions in our grant agencies, so the rules and decisions are made from a male perspective.

How can this situation be reversed? We need to work on the issue from two fronts: by attracting girls to physics and by making it possible for those who are in the field to pursue successful careers. We propose these strategies:

1. Improve the teaching of science at all levels, making it clear that it is not a male activity.
2. Create working groups inside the societies and at the universities that will address issues specific to women and fight against the barriers.
3. Make sure that promotions at all levels of the physics career path—decisions about grants, fellowships, and so on—are based on clear rules.