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Brazil: How Many Women in Physics?

Marília J. Caldas¹, Regina P. de Carvalho², Solange B. Cavalcanti³,
Mônica A. Cotta⁴, Jorge S. de Sá Martins⁵, and Sandra D. Prado⁶

¹⁻⁶Brazilian Physical Society-Gender Relations Committee; ¹Institute of Physics, University of São Paulo;
²Department of Physics, Federal University of Minas Gerais; ³Department of Physics,
Federal University of Alagoas; ⁴Gleb Wataghin Institute of Physics, State University of Campinas;
⁵Institute of Physics, Federal University of Fluminense; ⁶Institute of Physics,
Federal University of Rio Grande do Sul

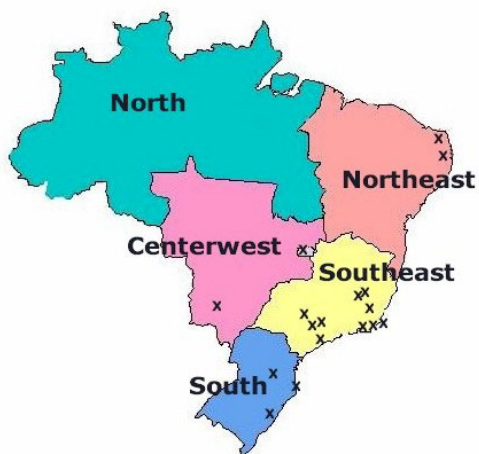


FIGURE 1. Geographical locations of the surveyed institutions in Brazil.

After the First IUPAP International Conference on Women in Physics was held in Paris in 2002, the Brazilian Physical Society created the Gender Relations Committee, composed of physicists of both genders from all regions of our country.

As its first project, the committee surveyed the occurrence of women at various levels of physics careers. Twenty of the 30 representative institutions contacted from among universities and research centers in all regions of the country completed a data form at the end of 2004. The responses covered 4000 people and illustrated the percentage of women at the admission, undergraduate, and graduate levels of physics education, as well as staff and chairs of physics institutions, in the South, Southeast, Centerwest, and Northeast regions of Brazil. The location of the surveyed institutions are indicated in Figure 1.

Brazil is a huge country, with many regional differences (Table 1). In addition to well developed regions where the population can benefit from a high level of schooling, there are underdeveloped regions where the schooling level is low. In spite of these regional differences, our data indicate that the pattern of representation of women in physics is very similar across regions where physics institutions are found.

TABLE 1. Regional Differences in Brazil

Region	Social, Economic, and Geographic Characteristics	Area (10 ⁶ km ²)	Population (10 ³)	Density (inhab/km ²)	Cities Over 500,000
North	Large forests and few large cities; farming-based economy; unpopulated	4.570	11,893	2.6	2
Northeast	Drier land in the inner region and very low incomes; tourism and some industries at the coast	0.965	46,693	48.4	9
Centerwest	Cattle- and agriculture-based economy; relatively unpopulated	1.606	9573	6.0	2
Southeast	Strong industrialization; mainly urban population	0.927	72,297	80.0	15
South	Industrialized regions; more balanced country/urban population than southeast	0.477	25,090	53.0	2

Figure 2 shows a comparison between our data (specifically in physics), and Brazilian governmental data about the proportion of women in the total population (Brazilian Institute for Geography and Statistics) and in the universities (Ministry for Culture and Education). It is seen that the proportion of women at the undergraduate level is actually higher than the proportion of women in the total population, and that women's participation lowers, albeit only slightly, as the level increases. Our results show, however, that women in physics are scarce at all levels of education and career, and that, again, the proportion of women lowers slightly as the level increases. If we compare our data with the presence of women in all university subjects, it is clear that women are attracted by academic careers, but not by physics.

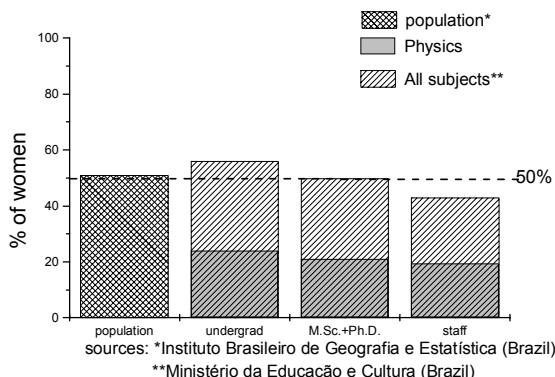


FIGURE 2. Proportion of women enrolled in physics, compared with other academic subjects. Proportion in physics studies and careers are shown as solid grey regions.

Figure 3 compares the proportion of women at the various levels of an academic career in physics in Brazil, with global averages obtained for 19 countries (Statistical Research Center, American Institute of Physics), where data are available. Figure 4 details the participation as staff, and shows the proportions of women in physics university careers in Brazil, compared with global averages. The proportion of women at the various levels of a physics career in Brazil does not stand out as unusual and is even slightly higher than global averages (except for temporary positions, which are disappearing in practice from state institutions in Brazil). The data shown in the two graphs reveal a similarity in the numbers for very different countries (different as regards economics, cultural background, dominant religion, and other factors). We reason that this points to a need to investigate the problem of low participation of women in physics from several different angles, that no “easy” answer is likely to exist.

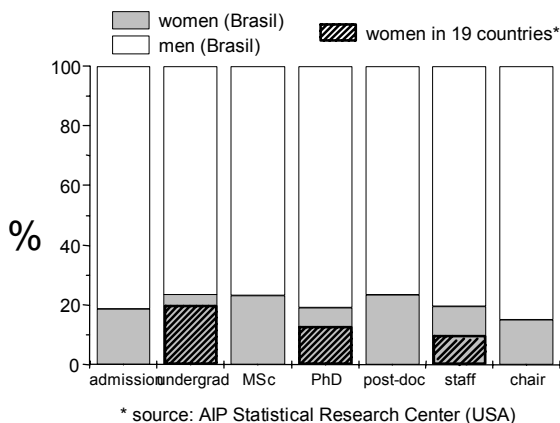


FIGURE 3. Proportion of women at various levels of a physics career in Brazil, compared with global averages, where data are available.

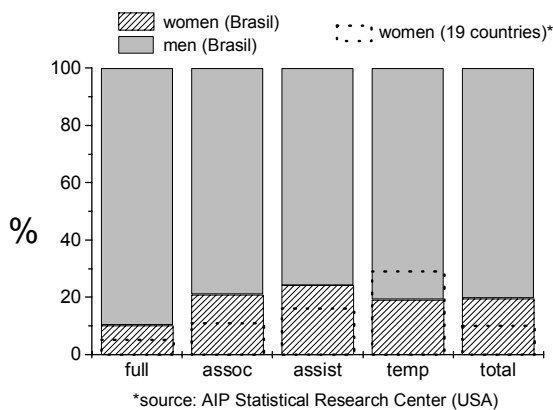


FIGURE 4. Proportion of women at various levels of a university career in Brazil, compared with global averages.