

Women in science*

Women in science comprise only a small percentage of the total number of working women in India. Although there is no explicit discrimination against women in enrollment and recruitment at the college, university or faculty levels, attitudinal biases and absence of supportive institutional/social structures have, over the years, operated as powerful forces preventing talented women to reach their full potential in the pursuit of a career in science. It does not appear that there is a societal perception in India of women being incapable of intellectual attainment in science, since women students are not in short supply at the undergraduate and postgraduate levels in science. Many of these university women students are gold medalists, and a large fraction enters the Ph D programmes as well. However, their numbers drop in faculty positions with the increasing level in hierarchy and decision-making. This under-representation of women in science has become a serious cause of concern for women scientists and science-policy planners.

In 2002, the Indian National Science Academy (INSA), New Delhi constituted a committee to examine the issue and suggest corrective measures. In its report, the committee had given comprehensive recommendations on how best to encourage girls to take up science, and provide opportunities to working women scientists to attain greater heights. Various initiatives have been launched by the Department of Science and Technology (DST) and Department of Biotechnology, New Delhi, the latest being the formation of the DST Task Force for women in science and its activities (http://dst.gov.in/about_us/ar05-06/st-women.htm).

There is a need to make people aware of the feasibility of science as a career option for women. It is becoming increasingly evident that if women have to be successful in science we need to create, at all levels, support structures for, and positive attitudes about, a science career for women. The pressure for change has

to come from within the scientific community, not just from women, but from all those who believe that the practice of science cannot be built on a foundation of iniquity.

The seminar was a part of the 'Role Model Programme' of the Women in Science Panel of the Indian Academy of Sciences (IASc), Bangalore. The Council of the IASc had in January 2003 constituted a committee on 'Women in Science' to look into issues of women scientists. This led to the formation of a Panel for 'Women in Science' (WiS) (<http://www.ias.ac.in/womeninscience/>), currently chaired by Rohini Godbole, Centre for High Energy Physics, IISc, Bangalore.

This was the inaugural event of a series of seminars which are expected to have presentations by women scientists, of the latest developments in their areas of activity, to showcase the work done by women scientists, for an audience of both genders. The aims are (1) to inspire and motivate young women to take up a career in science, (2) to create awareness on various career options available to young women scientists and (3) to explore avenues for entrepreneur development for women through science. To rephrase in less formal terms, the aim of this initiative is to inspire more participation by girl students in science at all levels. More importantly, to bring home the fact that women can 'do' science and that a 'scientist' could be of either gender.

The seminar had 197 registered participants comprising students, research scholars, school teachers, faculty from colleges and universities, and also from nearby research institutions.

Mythily Ramaswamy (TIFR Centre, IISc Campus, Bangalore) spoke about 'Some new trends in differential equations'. Aruna Dhathatreya (CLRI, Chennai) spoke about 'Properties of molecular organized assemblies at interfaces'. Usha Vijayraghavan (IISc, Bangalore) enthused the audience about 'The making of a flowering stem: Lessons from molecular genetic analysis of flowering plants'. Rama Govindarajan (JNCASR, Bangalore) covered developments in 'Flow instabilities and other challenges in fluid

mechanics'. Neelima Gupte (IIT, Madras) spoke about her work on 'Transport, congestion and traps in a communication network'. All of them pointed out the linkages in all their works, bringing out the universality of the scientific methodology. On the other hand, Geetha Ramkumar (VSSC, Thiruvananthapuram) took a slightly different approach. Instead of talking about technical work, she covered the aspects of women's participation in space science, in a lecture entitled 'Women power in space science'.

The seminar concluded with a panel discussion moderated by Rohini Godbole. The panel included, in addition to the speakers, Archana Bhattacharyya (Indian Institute of Geomagnetism, Navi Mumbai), K. G. Nair (CUSAT) and A. Vijaykumar (CUSAT).

Godbole began the discussion with a definition of the problem – women do not participate at all levels in science. There is a drop in the numbers of girl students from the graduate to the doctoral level, and more drastically so after the doctoral programme. In most of our high-profile institutions the number of women scientists and faculty members is small. While several policy changes have already been made and several more are in the pipeline, it is evident that a social change is required. These seminars are efforts towards that.

Godbole also appraised the gathering of the Panel on WiS initiative to compile a databank of all women doctorates in India with special categorization into four groups: (a) whether engaged in research, (b) whether engaged in teaching, (c) whether engaged in industry, or (d) whether discontinued and if so, the reason. The databank is to be analysed by both scientists as well as social scientists doing gender studies, so as to understand what causes the loss of scientific women power and indicate measures to stop the same.

Archana Bhattacharyya expressed the opinion that there are several challenging problems in science of a multidisciplinary nature. She stressed upon the fact that women need not necessarily do research only in well-established fields, but perhaps could maintain flexibility or

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switch from one area of specialization to another, so as to fine-tune research to accommodate any possible break in their careers. She mentioned fellowship programmes offered by DST, which could facilitate return to active research for women scientists who could not avoid a break in their careers. Bhattacharya also felt that there was a pressing need for change in the mindset of men, so that contributions of women are better appreciated and valued the same as those of men.

Vijaykumar posed the rhetorical question as to why men dominate science. He mentioned that women appeared to do better in certain countries like Sweden, where equal opportunities are provided for men and women. He remarked that in several cases, career choices are influenced by parental decisions. He also mentioned that the best way to attract students to a career in science is by instilling a love for science in the formative years, by paying greater attention to the teaching of science in schools and make special efforts so that girl students and their parents become aware of this.

Nair bemoaned the lack of basic infrastructural facilities and amenities such as restrooms and clean toilets in most institutions. He mentioned that the UGC had awarded a sum of rupees one crore to each university for the setting up of such infrastructural facilities for women. He appraised the participants on the activi-

ties of the Science in Society Cell at CUSAT and its initiatives for women.

Neelima Gupte maintained that in several discussions, marriage and family usually appear as roadblocks in the career path of women scientists. Contrary to this belief, in many cases, the family can be a source of strength, helping the women scientists achieve greater heights. She expressed the opinion that although several government and institutional policies may exist to help a woman scientist to either avoid a break in her career or to return to the laboratory-bench after a break, ultimately it is equally necessary for all of us to work towards making our own laboratory or institution more friendly and supportive of the women scientist.

Usha Vijayraghavan emphasized that in science, a break in career cannot be the norm. In most instances, a break in career makes it inordinately difficult to come back. Thus infrastructural support should be made available to the scientist to prevent the necessity for a break in career.

Aruna Dhathatreyan mentioned that she had been a member of the selection panel for award of fellowships under the DST schemes for women who have had a break in career, and emphasized that the selection process is rigorous and women with the requisite attitude and determination alone are selected.

Rama Govindarajan and Mythily Ramaswamy felt that there was a need to

de-emphasize differences between men and women, and strive towards gender parity. The panel emphasized that it is important for women to develop proper attitude and to prove scientific caliber, so that performance should be the main criteria for career advancement.

Geetha Ramkumar mentioned that infrastructural support is important for women to work long hours in the laboratory, and was happy to inform the audience of the support received by ISRO staff.

The seminar brought home the need for social and institutional support if women are to 'do' science. The participants appreciated the seminar for its attempt to sensitize students and scientists of both genders to the need for gender parity in science practice. To quote V. L. Chopra (Member, Planning Commission) '... this seminar is a laudable initiative of highlighting the need of women scientists being visible as major contributors to science practice and promotion. This should be viewed more as a "rights" than a "favour" proposition. ...'

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