

## Women in Science and Technology: A conference report

A one day conference on 'Women in science and technology' was held in conjunction with the PAN-IIT convention held at IIT Madras on December 20th, 2008. This report summarises the background and proceedings of this conference, and also lists the recommendations that came out of this.

### The background

This conference intended to address the issue of the serious underrepresentation of women at all levels of science and technology education and research. Given the serious underrepresentation of women, both as faculty and students in the IIT-s themselves, and the fact that the alumni of the Indian Institutes of Technology, both men and women have gravitated towards leadership roles in their own science and technology communities, PANIIT 2008 was a natural forum to discuss these issues.

### The morning session:

The program for the day was as follows. The inaugural session was addressed by Prof. S. Shanthakumar, Dean, Academic courses, IIT Madras, by Prof. Rohini Godbole who represented the Women in Science panel, and by Prof. P.C. Deshmukh, the Head of the Physics department. Here, Prof. Shanthakumar specifically mentioned the IIT Madras initiatives towards supporting women in science and engineering, such as the recent increase in the number of women faculty, and the IIT Madras women's post-doctoral fellowships to get women back to science. Prof. Rohini Godbole mentioned the WiS initiatives such as the 'Career in Science' role model seminars, and the book Lilavati's daughters. Prof. Deshmukh mentioned some of the difficulties faced by the women in his own family in the pursuit of scientific careers.

After this the morning session got under way. Dr. Shobhana Narasimhan who works at the Jawaharlal Nehru Center for Advanced Scientific Research gave a talk on 'Equity, science and technology'. This focussed on the important but unrecognised central issue that while science was equitable to all, the practice of science was not, and was seriously skewed against populations of several types, such as women, minorities and people from underdeveloped countries. She also showed detailed statistics which upset several

preconcieved notions about where contributions to the scientific pool and the wealth of nations came from. This made the talk a true eye-opener!

The second talk of the day was from Dr. Sumathi Rao from the Harishchandra Research Institute, who discussed various initiatives undertaken by the 'Women in Physics' panel of the International Union of Pure and Applied Physics, of which she is a member. These included the Women in Physics international conferences, and their recommendations, and the way in which these had helped to seed concrete initiatives to make the practice of science inclusive in India and in many other countries.

The third talk was from Dr. Krishna Athreya, who is the chair of the EngineeringLeadership program at Iowa state university. As the chair of a program that promotes engineering leadership for both men and women, she had harvested a perspective that was quite distinct from that of other speakers. The most important point that she made was that women not only needed societal support to progress in scientific and engineering fields, they needed to feel that their endeavours had a beneficial impact on society to provide them with an incentive to excel their chosen areas.

#### **The PAN-IIT panel discussion: Women in Technical Education**

The second part of the program, was a part of the Education track of the main PANIIT 2008 program. This session was a panel discussion entitled 'Attracting women faculty and students to technical education' or Women in Technical education but went way beyond this in discussing a range of topics which encompassed the entire gamut of experience of women who have studied and worked in science and technology. The session started with a keynote address by Prof. Rohini Godbole of the Indian Institute of Science who addressed both the problems faced by women in science and technology supported by hard data taken from INSA and UGC studies, as well as existing initiatives by bodies such as the academies, and the department of science and tech nology to redress these problems. She said that mentorship programmes could play a very important role in promoting the participation and success of women in the scientific work-force. Dr. Krishna Athreya spoke next, and made a crucial point. She said that a diversity of view points contributes to excellence in science and technology, hence the loss of the pool of women scientists is a cause for concern, from the technical as well as the economic point of view. She said that despite the dramatic rise in the numbers of women graduating with engineering degrees in India, this

talent pool is significantly under utilised. Dr. Sumathi Rao spoke next, and discussed the two body problem faced by working couples, as well as initiatives that tried to attract girls to science in other countries, and how they could be translated to India. She said that non-confrontational styles of women could be regarded as a lack of confidence, and come in the way of their advancement. The next speaker was Dr. Meera Chandrasekhar, of the University of Missouri. The panel discussion had originally been Meera's idea, as an ex-alumna (in fact, a Distinguished Alumna) of IIT Madras. Her speech was a read out as she could not attend the session due to serious health problems. The speech contained ideas which were completely new to the audience and extremely relevant to the subject (furious note-taking was seen while this talk was on!). She used well documented studies from the social sciences to identify, as well as quantify, the problems faced by women in science in being hired, promoted and considered as leaders in their subject due to societal perceptions of their capability and roles. These included the shocking statistic that many more women were hired by an orchestra if they performed behind a screen so that their gender was not known, and that the same CV was considered far superior by two-thirds of the people who saw it, if it belonged to 'Brian', than if it belonged to 'Sarah', and that a one percent gender bias in an eight hierarchy system translated into a 65 percent imbalance by the time the top-most level was reached. She also gave a very clear set of guide-lines which could address this imbalance. The last presentation in this session provoked fireworks, and caught the attention of the press. This was Dr. Shobhana Narasimhan, who used anecdotal evidence from her own experience as well as that of others, over a long period of time, to indicate that the IIT experience was very hard on women students, and both students and faculty needed to accept their share of responsibility towards this. She identified the atmosphere of isolation, as well as the abnormal influence of intensive coaching at the pre-IIT stage as being factors that contributed to this unpleasant experience. She also said that systematic effort towards protecting women students from vicious gossip and personal attacks was required. A full video of this session can be found at the web-site ([www.chennaionline.com/paniit08](http://www.chennaionline.com/paniit08)).

At this point the session was thrown open to the audience and the questions came pouring in. These ranged from 'my wife wants my daughter to learn the arts, and I want her to study science, what should I do?' , (the answer from the panel was 'expose your daughter to both, and let her make the choice'), to what was the panel's feeling about reservations in jobs for

women (this was never answered, but a graduated target of percentage of employment could be better than a strict quota), to the balance between work and family. The session went well over time, and had to be stopped though everyone was fully engaged as the next PAN-IIT session was about to begin. An important suggestion from the floor was that this session should be a plenary session in the next PAN-IIT.

#### **The second panel discussion: The IIT Madras story:**

The last part of the program was a panel discussion specific to IIT Madras. The discussion was opened by Dr. Nandita Dasgupta, of the department of electrical engineering, who outlined the statistics of the employment of women faculty in IIT Madras, as well as the statistics of students who cleared the GATE and JEE examinations. She also discussed the reasons why girls might do less well in exams as competitive as these. Dr. Anuradha Bannerjee from the department of applied mechanics, related her experiences as a young B. Tech student as well as those as a young member of the faculty. The upshot was that while the IIT infrastructure was good, and therefore friendly to families and women, in-grained attitudes among the students and staff could benefit from some gender sensitisation. Then came a talk which was a revelation, a talk from Ms. R.B. Rakhi, a young research scholar of the physics department. She outlined very clearly the trials, tribulations and triumphs of a woman research scholar, especially one with a family. Her conclusion was illuminating: all institutions should be urged to do as much as is possible from every point of view (infrastructure and attitudinal changes), but the final outcome is decided by the resilience, competence, confidence and persistence of the woman scholar herself! Ms. Sumathy, a member of the technical staff, discussed the special problems faced by women technical staff. The most severe problem, from their point of view, is that of their qualifications and potential being seriously underutilised. This problem may well be the main issue in other places.

To summarise, the one day conference was a success. The success of this conference came from drawing on an audience which was very diverse in terms of employment, but had a common background in education. It was also useful to have the programme divided into several segments with a distinct target audience for each segment. A lot of useful suggestions and recommendations came out of the talks and the panel discussions. These are attached separately at the end of this report. These suggestions have also

been sent to the host institute and to PAN-IIT for their consideration and further implementation.

Finally, we take the opportunity to thank all the speakers for their participation and thoughtful talks, the WiS panel of the Indian Academy of Sciences, IIT Madras, and the PAN-IIT organisation for financial and infrastructural support, and the staff and students of the IITM physics and civil engineering departments for enthusiastic participation.

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