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# The Canadian Challenge: Attracting and Retaining Women in Physics

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Canada continues to face a challenge in attracting women and retaining them in physics-related positions. There are a large number of studies of women's representation in the workplace<sup>1-4</sup> and a number of recommendations have been provided, but there has been little enthusiasm to implement many of these recommendations in order to evoke real change. Canada has in place a number of programs, including paid maternity leave, affirmative action programs, and awareness programs of various kinds, but, nonetheless, the representation of women, especially in the sciences, remains discouragingly small. Reasons for this remain a matter of debate; factors clearly playing a role are the "two-body" problem arising in the career development of the two-scientist family, the lack of female role models to influence girls and young women in schools and universities, the continued perception among young people that science, and physics in particular, is "difficult" and not very interesting, and the fact that child care remains primarily the responsibility of the woman.

A decade ago, an international study on gender distribution in physics departments<sup>5</sup> showed that the representation of women in North American physics departments was of the order of 4%, compared with 23–47% in Western and Eastern Europe. In 1995, the Committee to Encourage Women in Physics of the Canadian Association of Physicists sponsored a survey of physics departments in Canadian colleges and universities to obtain data on women in physics. The findings showed that although women obtained 18% of the B.Sc. degrees in physics and 13% of the Ph.D. degrees, only 5% of faculty members and 2% of tenured faculty members were women.<sup>6</sup> At the time, 11% of faculty positions were tenure-stream positions and women held 28% of these positions.

The numbers gathered six years ago painted a rather bleak picture in which 80% of the 40 Canadian institutions that responded to the survey had either one or no woman on staff. The results of a new survey being conducted in 2001 will be presented in the poster of this Conference. The indication from a Statistics Canada Labour Force survey is that in 2000 only 2.8% of women worked in the natural sciences, engineering, and mathematics fields, compared with 1.8% in 1987.

A number of programs have been implemented to help improve the Canadian environment for women in physics. In 1997, the Canadian government announced that, through NSERC (the Natural Sciences and Engineering Research Council), it would fund five new Chairs for Women in Engineering and Science designed to encourage the participation of women. The chairholders, chosen from different Canadian regions and scientific disciplines, were specifically mandated to develop strategies to encourage female students in elementary and secondary schools to consider careers in science or engineering, as well as to sensitize faculties on how to improve and promote the integration of women students and professionals.

NSERC also instituted a University Faculty Awards Program for women who would like to remain in or return to a Canadian university research environment. The program offers five years of salary support at the assistant professor level, a guaranteed research grant, and a tenured or tenure-track position at the end. The goal of the University Faculty Awards Program is to decrease the underrepresentation of women and Aboriginal peoples in faculty positions in the natural sciences and engineering by encouraging Canadian universities to appoint very promising researchers in those groups to tenure-track or tenured positions in science and engineering.

An example of a program to promote scientific leadership among undergraduate female students is the Women in Engineering and Science Program launched by the National Research Council of Canada (NRC) in 1991. Each year this program provides 25 new fellowships allowing the best female undergraduates in science and engineering to work in NRC's laboratories for three consecutive summers. The program has been structured such that each student is provided with a mentor who can help in the selection of a summer research project and a project supervisor. The

students are also required to develop their leadership and communications skills by introducing the program to first-year undergraduates at their respective universities. This program has helped introduce female undergraduate students to the challenges of a research career, and encouraged them to continue on to graduate studies. Undergraduate summer and co-op employment programs in university, industry, and government laboratories have also contributed by offering women research experiences in different settings.

One of the programs that provides role models to school children as well as professional development support to science teachers is the Let's Talk Science Program. This national award-winning program matches graduate student volunteers in science disciplines with elementary-school and high-school teachers in one-on-one science partnerships. These partnerships benefit the volunteers, who hone their science communication skills, the teachers, who can enhance the science learning experience in the classroom, and the students, who get to meet graduate students pursuing a career in science. Currently 14 program sites exist across Canada.

The goals of Let's Talk Science are to interest young people in science, improve the confidence and competence of science teachers, and encourage participants to continue in a lifelong journey of learning science. This program is especially important to young women whose interest in science needs to be captured early by appropriate role models. Prominent role models have been played by the Canadian female astronauts Roberta Bondar and Julie Payette, who have inspired young women to pursue undergraduate and graduate studies in science and engineering. Last year, Dr. Payette lent her name to a scholarship for male and female graduate students showing outstanding academic excellence, research ability and potential, and leadership and communication skills.

It is clear that much remains to be done to empower girls and young women to take up physics. While progress is being made, there is still a problem with women dropping out of physics programs at each level and there is a very low representation of women at the most senior levels in universities, industries, and government laboratories.

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