Launching a Successful Physics Career: Mentoring, Evaluation, Different Career Paths, Visibility, Developing a Reputation

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Abstract. Launching a successful career encompasses many issues related to creating appropriate conditions for development, such as providing training and resources for research. Since the First IUPAP International Conference on Women in Physics in 2002, some countries have made excellent progress on some issues, but overall results are mixed. Discussions focused on developing SMART (i.e., Specific, Measurable, Achievable, Realistic, Timed) recommendations, and on spreading the word about proven successful approaches and practices implemented in some countries and institutions. Recommendations include a call for increased networking at all levels, suggestions for national physical societies and employers, personal development training for women physicists, and advice for individuals.

Keywords: women in physics, career development, self-development, mentoring

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THE PROCESS

Like the other discussion groups, this one met on each of the three days of the conference. It was attended by 30–40 people and so attracted a broad range of input. Some periods were spent with the whole group working together, and other times we split into two subgroups. We started by reviewing the recommendations made at the Paris Conference (First IUPAP International Conference on Women in Physics, Paris, 2002). These related to networking, transparent decision-making processes, representation of women on decision-making bodies, and opportunities for participation in physics research. For each recommendation we asked:

- Is this happening or not?
- If so, is it being effective?
- If it is happening but not being effective, why not?
- If it is not happening, why not?
- How can we make it happen?

We also allowed the discussion to broaden and asked what new recommendations should be made. It was agreed that launching a successful career encompasses many issues related to creating appropriate conditions for development, such as providing training and resources for research.

OUTCOMES

We found that progress had been patchy, with some areas of excellent progress. Some of the successes were:

- Networking in South Africa, Slovenia and Canada;
- Improved European Union employment legislation;
- Some support in the UK, China, Brazil, and Canada for dual-career couples; and
- The U.S. MentorNet scheme.

There are also many areas where things have stood still or even gone backward. We will not attempt to summarize the progress that each country has made against each of the 13 recommendations from the Paris
conference—this is presented better in the country papers, and in any case was not comprehensively covered in our discussions.

We found that one of the hindrances to implementing the recommendations was that, the way they were posed, many of the 13 Paris recommendations were not SMART, i.e., Specific, Measurable, Achievable, Realistic, Timed. The recommendations were therefore difficult to tackle or to measure. In the discussions, which were informed and inspired by the excellent plenary presentations, many suggestions were made as to what practical measures could be taken to support the implementation of the Paris recommendations. These fell into five main areas of activity, four of which could be instigated or supported by the IUPAP Working Group on Women in Physics (WIP) and other physical societies, and one addressing what women can do for themselves right now.

**ISSUES AND RECOMMENDATIONS**

**Spreading the Word**

A strong theme emerging throughout the discussions was that there already exists a wealth of information and good practice, especially in the wealthier countries, and that these could be made more widely available.

What is required is a much more coordinated and focused approach internationally and nationally, with a clear allocation of roles and responsibilities and established channels of communication. It was agreed that IUPAP, WIP, and the national physical societies could all play vital roles in raising awareness of the problems, promoting the benefits of increased female participation in physics, gathering and disseminating best practice, supporting international networking, lobbying funding bodies to direct funds where required, and generally supporting, but also harnessing the efforts of, all of the many institutions worldwide that employ women physicists.

For each of the four areas a brief summary of the issues is given followed by specific recommendations.

**Recommendations**

**National Physical Societies**—Where they haven’t already, each physical society should identify an individual, committee, or working group with specific responsibility for monitoring and progressing issues related to women in physics. Encourage women’s memberships by, for example, giving discounted membership for women with low incomes, as many are underpaid and underprivileged.

**IUPAP Working Group on Women in Physics**—Create subcommittees/working groups on major issues such as site visits and mentoring, to collect and make available best practice.

**Networking**

Networking is a key issue and came up repeatedly at the conference. To be fully effective it needs to exist at every level—between individuals working in close proximity to each other, within institutions, between institutions, within a country, and internationally.

**Recommendations**

**National Physical Societies**—Support networking with a well maintained and promoted database of women physicists in each country with name, contact details, geographic location, discipline/field, and other details such as willingness to give talks/interviews, willingness to act as a mentor, links to personal web pages, and a photograph.

**IUPAP Working Group on Women in Physics**—Create and support an international hub for all of this information from the physical societies around the world. Provide links to information about site visits, mentoring, evaluation, etc., on the WIP website. Create e-mail discussion groups for issues faced by women in physics.

**Best Practice for Employers**

It was agreed that the site visit programs in the U.S., UK, and elsewhere have yielded benefits to institutions and the women who work for them and should be carried out more widely. Information on how to plan and carry out site visits and how to constructively communicate the outcomes in order to maximize the benefits should be made widely available.
Furthermore, we felt that there was already a wealth of information available concerning what is good practice for trainers and employers of physicists and that this could form the basis of a best practice guide for employers to adapt as suited their national situation. Most of this good-practice information is not gender specific but relates to the provision of good training and support structures, such as:

- Induction and training for young/early career physicists built into undergraduate and PhD programs, to include training on general communication and presentation skills, technical writing, writing research grant proposals, interview skills, negotiating, teamwork and how to build up research collaborations, and project management.
- Ongoing personal development training for professional physicists at the different career paths, to include periodic refreshers of the above and the development of more advanced skills such as conducting interviews and leading teams.
- Awareness and training for employers and decision makers, to include sensitivity training on gender and diversity, how to develop and implement fair and transparent policies and procedures for selection and promotion, and how to develop support structures such as mentoring schemes for female/young/minority physicists.

Recommendations

Physical Societies—Working Groups should implement site visits to universities, laboratories, industry, and business. They should promote the benefits of having site visits, giving examples of what some others are doing, and taking advantage of similar programs in which the physical society may be involved, such as those organized by educational committees. Encourage funding agencies to give incentives to those departments/labs/industries that are supportive of women in physics.

IUPAP Working Group on Women in Physics—Create a subcommittee/working group on this issue to establish best practice in site visits, including a checklist on employment, working conditions, and needs of women in physics, and a common scoring system covering exemplary, desirable, and substandard. Develop a best practice guide for employers based on the existing wealth of information that has already come out of site visits in the U.S., UK, and elsewhere and make this widely available.

Personal Development Training for Women Physicists

As we have seen, improved training is required for both genders at all levels. It is important that this is fully accessible to women, as regards both the practical considerations and the cultural/intangible aspects. In addition, we agreed that there is still a need for women-only career development training, as has been successfully delivered in the format of one-day workshops in the U.S., UK, and elsewhere and could also be delivered via short summer schools or other mini-course formats.

Networking, interaction, and role play have all been key elements of successful women-only career development training. The training has covered topics such as such general career awareness, life-planning skills, and time management, which are widely accepted to be quite different for women. It has also successfully addressed topics such as assertiveness and personal style and presentation, for which women generally have no or few role models, and can benefit from guidance in developing their own approaches.

Good examples of existing programs include the “FORWARD to Professorship” workshop in the U.S. and the “Initiative sur le leadership des femmes pour le Développement et la Démocratie,” an international collaboration between Senegal and the U.S. The FORWARD to Professorship program is partially funded by an ADVANCE grant from the National Science Foundation (this), which provides money for projects that contribute to institutional change for increasing the presence of women in science.

Recommendation

IUPAP Working Group on Women in Physics—Support personal development training worldwide by designing a suite of one-day personal development workshops that would be specified to a high level of detail, including format, timing, sources of material, role-play exercises, etc., and made available for each country to source funding and providers of training as appropriate.
What Can Women Do For Themselves?

- Actively support other women—too many of us have had the experience of being undermined by other women, or have even found ourselves undermining others!
- Critically review your own attitudes and behavior—are you making it easy for others to respect you and to help you?
- Challenge improper attitudes or behavior. Sometimes those displaying these are unaware and are happy to change. In some cases it will take a longer, more gradual process of education and persuasion.
- Be realistic about what you can put into a role or project. Agree on expectations in advance, such as your ability/willingness to work evenings or travel abroad.
- Make full use of existing resources, such as websites, guidance services, and physical societies. Plenty information, support, and guidance can be found if you just look for it!
- Ask for support from those who can provide it—your partner, employer, workplace counselors, physical societies.
- Use existing events as a focus for networking. For example, when you attend a conference or other event, invite all of the female attendees for coffee/drinks.
- Create opportunities for networking—communicate via newsletters, or organize a talk by a woman physicist at your workplace and invite other women physicists to attend.
- Seek out opportunities to establish cooperative ventures with women working at other laboratories and research institutions.
- Promote yourself and other women physicists—write for newsletters, physical society publications, and journals. Encourage the public relations departments of your university and physical society to actively promote women working in physics. Visibility is very important to break isolation and give you a place in the community.
- Make sure you get credit for your achievements—don’t let others plagiarize your work. This will not only develop your reputation, but will be fair.
- Find yourself a mentor, or offer to be one.

REFERENCE