

CSWP GAZETTE

*A Newsletter of the Committee on the Status of Women
in Physics of the American Physical Society*

November 1987

Volume 7, Issue 3

CONFERENCE REPORT: WOMEN IN SCIENCE AND ENGINEERING

**Women in Science and Engineering:
(WISE) Changing Vision to Reality
University of Michigan—Ann Arbor
29–31 July 1987**

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Representing CSWP, I recently participated in this very stimulating conference which was organized by Marsha Lakes Matyas and Shirley M. Malcom of the American Association for the Advancement of Science, and sponsored by the AAAS Office of Oppor-

tunities in Science. About 200 people attended the 2½-day conference, the majority of whom were involved in science education and/or with intervention programs to increase the participation of girls and women in science. In this report I shall attempt to summarize the contents of the conference. While the emphasis will be on those aspects which I perceived to be most relevant to women in physics, there will be an additional bias toward the particular presentations which I personally found the most interesting.

The WISE conference began at lunchtime on 29 July with an "International Panel Debate: Gender and Science Issues," held in conjunction with the Fourth International Conference on Girls and Science and Technology (GASAT). GASAT, which had been held in the same location just preceding the national WISE conference, was attended by 131 participants representing 24 nations.

Leslie Parker of the Secondary Education Authority of Western Australia started the joint session with a synopsis of recent advances in feminist analysis of the institutional patterns of science, as it is currently practiced, which inhibit the participation of girls and women. This is an approach which has not been pursued extensively in this country, but which appears to be the underlying theme of the international community. They tend to focus on the question "What's wrong with science that makes girls not like it?", rather than "What's wrong with girls that they don't like science?" In other words, the approach in the U.S. has more frequently been to help women fit into the existing structure of science, rather than an attempt to change the structure of science so that it meshes better with women's interests and lifestyles.

Some of the examples given by Leslie Parker of the ways in which the struc-

ture of science may be seen to reflect the historical restriction of science to people socialized along masculine tracks (i.e., men) are:

*Science is usually taught, and often practiced, as if social context and social impact do not exist.

*Scientific models are often dualistic, considering only two possible choices, and acknowledging only "right" or "wrong" answers, rather than allowing for a diversity of answers and approaches.

*Similarly, scientific models are usually hierarchical, not allowing for diversity on an equal footing.

*Scientific principles are presented as isolated abstractions that focus on control and domination of nature, rather than as an aid to understanding the role of one piece as part of an interactive whole.

*Scientists often confuse the cognitive tools used to model a system with the system itself. For example, just because we choose to analyze a system in a dualistic (or hierarchical) framework, that does not mean that the system itself has an inherently dualistic (or hierarchical) nature.

*Science as taught in schools tends to isolate subject matter by disciplines, stressing what is different about each area, rather than focusing on the commonality and interrelatedness of all areas of science.

A second talk on a similar topic was presented by Jan Harding of Chelsea College, U.K. She pointed out that science (especially physics) is presented in terms of attributes and interests in tune with the socialization of boys, but not with that of girls. Girls are trained to value interactive, socially relevant and socially constructive activities, and tend to choose fields which have a reputation of being people oriented, socially relevant, and helpful. The presentation of science

The editor for this issue is Patricia Dehmer.

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The "CSWP GAZETTE," a quarterly newsletter of the American Physical Society Committee on the Status of Women in Physics (CSWP), is mailed free of charge to all women listed on the computerized "Roster of Women in Physics," all US physics department chairs, and others on request. Because editorial responsibility rotates among CSWP members, please address all correspondence to: "CSWP Gazette," The American Physical Society, 335 East 45 St., New York, NY 10017.

has unnecessarily played down these aspects, and has stressed instead the isolation of effects, a total autonomy from social issues, and an object rather than people related orientation. Likewise, scientists have traditionally been characterized in Western cultures as people who exhibit strong abilities in the areas of objective, abstract and analytical thinking, attributes historically associated with males. In fact, to do good science, one must have abilities that span the whole range of human attributes, including creativity, intuition, and good interpersonal skills, to name a few characteristics commonly associated with females in Western societies.

Jan Harding also stressed that the very way in which a problem is stated can affect the relative level of interest on the part of girls and boys. For example, are you looking for a technical "fix" to an abstract problem, dissociated from its origin and social context, or are you trying to find solutions to a

problem with social significance, whose outcome will affect real people?

The final talk of the lunch session was presented by Lili S. Hornig of Higher Education Resource Services, and Wellesley College Center for Research on Women. She suggested that some interesting tests of these ideas might be possible by making comparisons with other professional fields which women have entered in large numbers, e.g., law and medicine, etc. She also brought up the issue of inherent gender differences in cognitive style, pointing out that if such differences exist, then the structure of science must also reflect a one-sided approach in this area.

The first afternoon session, entitled "Defining the Problem," included presentations by Shirley Malcom of AAAS, Betty M. Vetter of the Commission on Professionals in Science and Technology, and John H. Moore of NSF. Some of the major points made by these speakers included:

*The U.S. is rapidly losing its ability to compete technically with the rest of the world. This is due to an overall drop in the level of scientific literacy of our population, and to a declining number of highly trained people graduating in scientific fields.

*These problems can only be expected to intensify if ignored. The baby boom has peaked, so the total university age population is dropping. Fewer white males, historically the source of most scientists in our country, are choosing to study science, and they also represent an ever diminishing fraction of the population. Finally, the teaching resources of our country, in terms of the number of trained science teachers and the level of instrumentation available to schools, have been allowed to deteriorate to a deplorable degree.

*Meanwhile women and minority groups remain highly underrepresented in science and engineering, especially in the physical sciences, and thus are an important untapped resource. All 3 speakers stressed that efforts to increase the participation of women and minorities in science can no longer be viewed solely as an issue of equity and fairness, the success of these efforts has become a matter of *national survival*.

*The differences in fields selected by

men and women cannot be considered merely a manifestation of free will. Strong social and institutional barriers remain which inhibit full participation of women in science. Science has evolved in a manner consistent with the lifestyles of white males in our society, without regard for the biological and social agenda of women.

*Finally, it is important to remember that we are not discussing *equity versus excellence*, but *excellence through equity*!

The second session of the afternoon was focused on "Policy Responses to the Challenge," and included talks by individuals representing the U.S. Congress Office of Technology Assessment, a state board of regents, 2 state university systems, and a county public school system. Daryl E. Chubin of OTA discussed a recent assessment of the education and employment of scientists in the U.S. which examined differences by race, gender, field, and institution. The 2 speakers from state university systems talked about recent task forces which had studied various aspects of the crisis in science education. However, none of these speakers was able to give a very optimistic report on any actions taken to increase the participation of women in science as a result of these studies. Part of the problem is that task forces and assessment studies do not, in general, have the power to bring about the implementation of their recommendations. In contrast, Michael Hickey, School Superintendent of the Howard County Public School System, reported on a wide variety of intervention programs at the primary and secondary school levels which had been successfully implemented following an evaluation of the school system that examined the science curriculum, teacher training, and participation by female and minority students. These projects include programs aimed at teacher training and equity sensitization, changes in the curriculum to include more hands-on experiences and a greater emphasis on the contributions of outstanding female and minority scientists, and workshops to encourage the participation of female and minority students.

A dinner panel, "International Perspectives—Parallels and Differences,"

provided additional perspectives on educational systems and intervention strategies in other countries. One of the main differences in the international arena is an emphasis on programs that will impact *all* students, not just the scientifically gifted ones. Efforts in the U.S. have often emphasized the importance of helping outstanding women to pursue careers in science. In contrast, the international community has focused more on the need to increase the participation of women in science and technology at all levels. Another area more frequently examined outside the U.S. than within is that of reentry and retraining. (Joan Kowalski is currently organizing a CSWP symposium on this topic to be held at the 1988 APS March Meeting.) Later that evening conference participants gathered for informal discussions at a reception. Various written resources brought by participants were made available at this time. Some references to this literature, along with instructions for obtaining copies, are provided at the end of this report.

For the second day of the conference, 3 parallel sessions were held which focused on precollege, undergraduate, and graduate/professional issues, respectively. I attended the latter sessions, in which graduate issues were discussed in the morning, and professional issues in the afternoon. For both parts of the day, the program started with formal presentations on these issues, followed by discussion periods in which we were further split into small groups numbering about 15 people. Our charge during the small group discussions was to generate a list of recommendations for action in terms of (a) future research, (b) intervention programs, and (c) policy changes. I acted as a moderator for one of the afternoon groups. The recommendations generated by the discussion groups in the 3 parallel sessions were summarized for all participants during the closing session of the conference.

During the morning's formal session we heard 3 talks on Graduate Issues. (There was to have been a fourth talk on "Minority Women Graduate Students," but the speaker was, unfortunately, taken ill.) First Lili Hornig gave a talk on "Enrollment and Retention." She noted that there is still little effort made to recruit female graduate

students. For example, many of the brochures make no reference to women students or faculty. Significant qualitative differences also still exist between the letters of reference written for female and male applicants. The former often stress appearance and personality, with little attention given to scientific ability and potential. Possibly many professors still have difficulty considering female students as future professional colleagues. Female candidates' grade point averages are significantly higher on the average, but their Graduate Record Exam scores are slightly lower. Thus acceptance rates for male and female applicants to graduate school depend on how these various assessments are weighed at any particular institution. The recipient to applicant rate for NSF Fellowships remains lower for women than for men. The retention rate for female graduate students in the physical sciences is 0.75-0.77.

The second talk by Susan Coyle of the National Research Council on "Sex and Race differences in Financial Aid Patterns," provided some interesting information on recent changes in funding patterns for men and women graduate students. There are three main sources of graduate support; funds administered by the institution (primarily through research and teaching assistantships), direct Federal funding to the student (for example, NSF Fellowships), and self-support (mainly savings, assistance from relatives, and concurrent outside employment.) A larger fraction of the men receive university-administered funding than is true for women, and this gap is growing. Women are more likely than men to be self-supporting and/or to receive direct Federal funding, although the latter gap is shrinking. Thus the current decline in direct Federal funding programs is having a disproportionate impact on women. There is also cause for concern as a larger fraction of the available funds are administered at the discretion of individual professors, predominantly male, who are selecting students to work with them. Given the inherently personal and subjective nature of these selections, the inequitable effects of subjective biases may increase concomitantly, thus perpetuating the skewed proportions of men and women professionals in science.

An interesting correlation between the rate at which students receive university-administered funds and their marital status has been noted. The rates decrease in the order: single men, married men, single women, married women. The rates for self-support are in exactly the reverse order. At the time the Ph.D. is granted, 45% of the women and 60% of the men are married.

A strong correlation has been found between the type of graduate support and the length of time to the Ph.D. Students receiving university-administered funds take the shortest time, followed by those receiving direct Federal funding. This discrepancy may reflect an increased personal interest on the part of the professor toward students supported on his/her own grant monies. After all, the success of the next grant application depends directly on the progress of the projects these students have been hired to work on. When a student on fellowship joins the group, the professor can afford to be more laid back about the rate of progress. Self-supporting students take the longest, on the average 2-4 more years are required. Women supporting themselves through outside employment take longer than the equivalent group of men. Perhaps the lower salaries earned by women require them to work more hours for the same level of income.

Carolyn M. Jackson of Purdue University described a fascinating demographic study of men and women engineers. The study showed that discrepancies in salary, job satisfaction, and promotion to management positions become exaggerated after 6 years of professional experience, and that these discrepancies cannot be attributed to differences in education, self-confidence levels, or career breaks. A disturbing note: More than half of the surveyed male engineers, in *each* age bracket, did not agree with the statement "Women with small children can be as good on the job."

During lunch, (I think they scheduled almost every minute of this 2½-day conference), Gertrude Scharff-Goldhaber of Brookhaven National Laboratory presented a lecture entitled "Eminent Women Scientists of the Last Two Centuries: What Can We

Learn from Their Lives and Achievements?" This uplifting talk by Dr. Scharff-Goldhaber, herself an eminent physicist, described the remarkable contributions made by some of these exceptional women. In describing the perverse conditions under which they worked, she also reminded us implicitly of how far we have come toward full equity of opportunity for women.

The afternoon's formal session of the graduate/professional section focused on professional issues. Marie Cassidy of George Washington University Medical School started the session with a discussion of "Academic Career Patterns." She characterized the main barriers to a successful academic career as first, gaining access (earning a Ph.D. and getting a job); second, attaining tenure; and third, achieving a powerful position within the institution. While women have had a difficult time surmounting each of these barriers in significant numbers, she noted that the structure of academic science appears to be changing, with more value placed on good interpersonal skills, for example. Next, Howard P. Tuckerman of Memphis State University spoke on some studies he has carried out on patterns of part-time faculty careers. Part-time employment by both men and women has been expanding, but not always because it is the desired work status. Currently about 40% of the women and 70% of the men in part-time work are seeking full-time employment. He ended his presentation with a strong statement that part-timers continue to experience discrimination in benefits received, and more often than not find their jobs to be a dead-end road, offering little opportunity for professional advancement.

The third talk by Lois Peters, Rensselaer Polytechnic Institute, focused on "Women Scientists in Industry." There is little data on this subject, even though about 73% of all R&D takes place in industry. In the industrial sector, women constitute approximately 25% of all scientists and engineers, and 11% of all physical scientists. Nevertheless, only 6 out of the 609 members of the Industrial Research Institute—consisting of the top technical people of major corporations—are women. Polling women themselves, she found that those who have recently entered industry are generally happy

with their work situations, and do not perceive any barriers to their career plans. Women at the middle management levels, on the other hand, are frequently angry with the inequitable treatment they have received to date, but are still not discouraged about prospects for their future in the company.

Some statistics on women in academe were provided by Gretchen Klein of NSF. She noted that women still lag men considerably in tenure attainment. While 63% of the men on U.S. Science and Engineering faculty have tenure, only 37% of the women do. On the other side of the coin, 31% of women are in non-tenure track positions, while only 14% of the men are. Even when these figures are corrected for field, quality of the Ph.D. institution, and years of professional employment since the Ph.D. inequalities still remain. Women are also less likely than men to be principal investigators on NSF grants.

Gretchen Klein also presented a summary of existing NSF programs for women. The revised Research Opportunities for Women (ROW) Program contains 3 parts: Research Initiation Grants (equivalent to the original ROW Program, these are research grants for women who have not previously been principal investigators); Research Planning Grants (for support while a grant proposal is being drafted); and Career Advancement Awards (for support while making a career change to an adjacent field). The ratio of awards to proposals last year was 160/711, with a total of \$7.2 million being awarded. The Visiting Professorships for Women (VPW) Grants are also still available from NSF. I noted from a breakdown of the fields, that only 1 of the 24 VPW awards granted this year was in physics. Apparently we need more strong applicants for this program.

The final talk in this session by Mary Frank Fox of the University of Michigan provided some data on publication records of male and female scientists as a measure of professional productivity. She noted that while women publish at only about one-half the rate of men, this discrepancy is not due to differences in IQ, institution of degree, or marriage/parenthood patterns. In fact, married women publish

more than single women, and the presence of children does not affect publication records. The strongest correlation is found to be with the prestige of the institution where the person is employed. In addition, there is some indication that the causal direction of this effect is that publication records conform to the local environment, rather than that frequent publishers tend to be offered employment at these prestigious institutions.

The final morning of the conference started with a plenary session in which Heidi I. Hartmann of the National Research Council discussed a recent NRC study on the effects of computer technology on women's employment. The results showed that while the advancement of computer technology enhances the level of many jobs by taking over drudgery and mindless activities, it also dehumanizes others. In general it is the higher-level, more powerful positions which are enhanced, and the lower-level, and clerical positions which become less interesting and more removed from human interactions. Since women tend to be in less powerful positions, they are more frequently adversely affected by these technological advances than men are. In addition, women are less likely to be involved in the design of the new technologies, the stage at which some of these deleterious effects could be taken into account and avoided. Minority women in clerical jobs, who are less likely than white women to be assigned work involving human interactions, are especially vulnerable to the dehumanizing effects.

The recommendations generated during the previous day's small group discussions were reported back to the full conference during the final session. In the area of research programs and information dissemination, the following proposals were made:

- *Studies of women students' self-confidence.
- *The impact on women students of the increase in foreign nationals as graduate students and faculty members.
- *A determination of the reasons some schools are more successful than others in producing women graduates in science.
- *The establishment of a centralized data base covering previous research

and intervention programs. (To some extent, CASET, the Center for the Advancement of Science, Engineering, and Technology of Hutson-Tillotson College, offers this capability.)

*More follow-up studies on the effectiveness of intervention programs.

Many intervention programs were suggested, along with a plea to place a stronger focus on the evaluation and dissemination of program results, and to continue those programs with proven effectiveness. Suggestions for precollege programs included:

*More career awareness through college orientation programs, teachers, and parents.

*Outreach programs at meetings of professional organizations.

*Out of school science programs.

*Undergraduate science majors acting as role models for grade school and high school students.

*Intervention programs for *all* students, not just for the particularly bright ones, to increase the general interest in science, and thus the level of science literacy in our country.

*Better science training as part of the teacher education curriculum, and more in-service programs to increase science knowledge of practicing teachers.

*Evaluation of teachers to include their sensitivity to equity issues.

*In-service programs for teachers to increase their sensitivity to equity issues and to a diversity of learning styles.

*Text book evaluation vis-à-vis equity issues.

The following suggestions were made for intervention programs at the undergraduate level:

*More career literature.

*Programs to sensitize male faculty to the importance of mentoring female students.

*Offer single-sex classes.

*Replications of effective programs at more schools. (For example, the highly successful Purdue University program for engineering students could be adopted by other schools.)

Finally, the following recommendations were made for programs at the graduate and professional levels:

*Intra- and inter-institution support groups for isolated female graduate students, researchers, and faculty.

*Assertiveness training.

*Encourage mentoring of non-tenured female faculty by tenured faculty, male and female.

*More outreach programs by corporations.

*Make university deans more aware of the severe national impact of decreasing science enrollments.

*Make department chairs more answerable for the ratio of male to female faculty.

*Encourage dialogues on sexism between students and faculty.

*Workshops on sexual harassment.

*Reward faculty mentoring activities more highly.

*Workshops for graduate students and young professionals on how the "system" works — how to get through school with a degree, how to get a job, how to get promoted, how to negotiate the industrial and academic environments, etc.

Sue Kemnitzer summarized the recommendations related to policy and funding changes. One of the repeated suggestions was for longer funding cycles for intervention programs, and the continued funding of existing programs with proven effectiveness. (At the current time funds are much more readily available to experiment with "new" programs and ideas than to repeat "old" programs with a new group of people.) It was also noted that the Commission on Professionals in Science and Technology is suffering a severe funding shortage. Since this organization is the sole source of many of the statistics on women and minorities in science and engineering, there was a strong consensus that it should be funded on a more consistent basis, rather than having to rely on short-term grants. Other specific suggestions generated by the small groups in the area of policy issues included:

*Stronger efforts to enforce existing EEO laws and policies.

*More funding for undergraduate research.

*Enhanced access to capital for female and minority entrepreneurs.

*Requirement of specific plans to utilize underrepresented groups as part

of proposals for (and evaluation of) research grants, government-supported centers, etc.

*More support for summer science programs for underrepresented groups.

*Funding for programs to assist women and minorities in preparing research grant proposals, and to write papers in preparation for tenure evaluation.

*National policies to support day care and parental leave, and national goals for equity in science and engineering.

Finally, using the example of the Federal Task Force on Women, Minorities, and the Handicapped in Science and Technology, of which she is the chair, Sue Kemnitzer stressed how important it is to include as part of any panel those people who have the power to *implement* recommendations that are generated.

A full proceedings of the conference will be available from AAAS. Contact Marsha Lakes Matyas, AAAS Office of Opportunities in Science, 1333H Street, NW, Washington, D.C. 20005.

Related Literature

The following publications were among those brought to the attention of conference participants:

Science, Technology and Women: A World Perspective. (1985) AAAS Publication 85-14.

Partial List of Precollege Mathematics and Science Programs for Minority and/or Female Students by State. (1987) Compiled by the AAAS Office of Opportunities in Science.

Equity and Excellence: Compatible Goals. (1984) AAAS Publication 84-14.

Problems and Solutions in the Education Employment and Personal Choices of Minority Women in Science by Paula Quick Hall. (1981) Available from AAAS Office of Opportunities in Science.

Associations and Committees of or for Women in Science, Engineering, Mathematics and Medicine. (1986) Available from AAAS Office of Opportunities in Science. (1987 edition currently in preparation.)

Other publications associated with ma-

terial presented at the conference:

Engineering Careers: Women in a Male-Dominated Field, Carolyn M. Jagacinski, *Psych. of Women Quarterly*, **11**, 97 (1987).

Comparison of Women and Men in the Engineering Work Force, Carolyn M. Jagacinski and William K. LeBold, *IEEE Trans. in Ed.*, **E-28**, 204 (1985).

Computer Chips and Paper Clips, Editors: Heidi I. Hartmann, Robert E. Kraut and Louise A. Tilly, 1986, National Academic Press, Washington. (NRC study on the impact of computer technology on women's employment.)

Women in Pure and Applied Science, a Bibliography, compiled in 1987 by Sheila Bertram, Faculty of Library Science, Univ. of Alberta, Edmonton, Alberta, Canada.

PUBLICATIONS OF INTEREST

"Women in Science and Engineering" is the topic covered in the Spring 1987 (Volume 18, Number 1) issue of the National Science Foundation's *Mosaic* magazine. In the lead article entitled "Women's Progress," author Betty Vetter writes "Despite evidence of some continuing inequality for women students—and particularly for women who have entered the science community—as shown by unemployment rates, academic rank and tenure status, and salary levels, women have made real strides in increasing their participation in science and engineering over the past decade at every degree level, and in every field and employment sector. However, their increase in science and engineering degree awards appears to have been primarily related to their increased participation in higher education. The rapid increases in number and proportion of these degree awards to women that have marked the past decade appear to be ending well before women's participation in these fields match their proportion of the population. Bachelor's degree awards to women in several science and engineering fields already are leveling off, and recent survey of freshman-class women indicate a decrease in interest in these fields. Although some continuing increases in the participation of women in science at the graduate level are probable, future increases are not assured, and

some gains of the past decade may not last."

A limited number of copies of this issue of *Mosaic* are available from the National Science Foundation. Write Distribution, *Mosaic* (527), NSF, Washington, D.C. 20550.

CSWP SYMPOSIUM AND TEA CRYSTAL CITY, VA 25 JANUARY 1988

The CSWP is sponsoring a tea and a symposium entitled "Career Reentry in Physics — What Physics Teachers Can Do for Themselves and for Others" at the 1988 Annual Joint Meeting of the American Physical Society and the American Association of Physics Teachers to be held in Crystal City, Virginia, 25–28 January 1988. The CSWP symposium will be held on Monday afternoon, 25 January, and will be followed immediately by the tea. Talks will include discussions of demographics and problems of reentry at both the B.S. and Ph.D. levels. A complete list of invited speakers will be presented in the next issue of the *Gazette*.

Other highlights at the Joint APS/AAPT Meeting include plenary sessions on Superconductivity, DEW/SDI, and Supernova. In addition, the American Institute of Physics is organizing their annual placement center during the meeting, where interviews will be arranged between employers and prospective employees.

Forms for both meeting preregistration and hotel reservations were published in the October issue of the *Bulletin of the American Physical Society*.

NSF PRESIDENTIAL YOUNG INVESTIGATOR AWARD ANNOUNCED

Jacqueline Krim, assistant professor of physics, is one of 200 engineers and scientists nationwide to receive a Presidential Young Investigators (PYI) Award from the National Science Foundation.

The awards, which fund research by faculty members near the beginning of their careers, are intended to help universities attract and retain outstanding young Ph.D.'s who might otherwise pursue non-teaching careers, according to an NSF spokesman.

Krim, who has been at Northeastern since the fall of 1985, conducts research in low temperature surface physics. She is investigating ways to predict, theoretically, how films grow on surfaces. The research holds potential wide-range industrial applications.

The Presidential Young Investigator awards carry an annual base grant from NSF of \$25,000 for five years. In addition, NSF will provide up to \$37,500 per year to match industrial support to individual researchers, bringing the possible total fund to \$100,000 per year.

Krim and the other award recipients were selected from a field of 1,122 nominations from 197 institutions. Other women PYI recipients whose work is in physics-related areas are: **Susan L. Brantley** (Pennsylvania State University), **Dee Denice Denton** (MIT), **Ellen C. Hildreth** (MIT), **Marjorie A. Olmstead** (Berkeley), **Jane Selverstone** (Harvard), and **Lynne D. Talley** (Scripps Institute of Oceanography).

ROSTER OF WOMEN IN PHYSICS QUESTIONNAIRE

This issue of the *Gazette* includes the new questionnaire for the Roster of Women in Physics, the data base on women physicists maintained by CSWP. The format is slightly different, and there are a couple of additional questions reflecting the increased capabilities of the new software system. Please return the form to update your entry, showing CHANGES IN RED. Also, we have run into some difficulty accessing the data on the institutions from which people received their degrees, so please take the time to COMPLETE THE SECTION ON DEGREE INSTITUTIONS.

As described in the last issue, the Roster now resides on a PC at APS headquarters in New York, where it is more readily accessible. In fact, we hope to work much more aggressively on expanding the data base so that it can be used for meaningful demographic studies. If you know other women working as physicists and/or holding degrees in physics who may not yet be listed in the Roster, please pass along

(continued on page 11)

ROSTER QUESTIONNAIRE PAGE 2

YEARS OF PROFESSIONAL EXPERIENCE SINCE HIGHEST DEGREE: ____ TOTAL YEARS OF PROFESSIONAL EXPERIENCE: ____
(include postdoc, if any, exclude study time towards degrees)

Are you interested in receiving information on employment opportunities? __Yes __No (If you check no, you will be excluded from mailing lists generated when the Roster is searched to identify potential candidates for professional employment opportunities that have been brought to the attention of CSWP.)

Are you an APS member? __Yes __No. If not, check here if you wish to receive an application:

If you are an APS member, please provide your membership number, if available, from the top left of an APS mailing label:
(3 letters) (6 numbers)

TODAY'S DATE / /
(month) (day) (year)

COMMENTS: _____

Thank you for your participation. The information you have provided will be kept strictly confidential, and will be made available only to CSWP members. Please fold the form into thirds and fasten it so that the return address is visible on the front and the back is blank, attach a stamp, and place it in the mail.

The Roster of Women in Physics is compiled by the American Physical Society Committee on the Status of Women in Physics. (BAW for CSWP 9/14/87)

FOLD

FOLD

RETURN ADDRESS:

AFFIX
STAMP
HERE

Dr. Miriam Forman
American Physical Society
335 East 45th Street
New York, NY 10017

The American Physical Society

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APPLICATION FOR APS MEMBERSHIP

I, _____ on _____,
(Signature) (Date)

My degrees and positions: _____

apply for:

- REGULAR MEMBERSHIP
- LIFE MEMBERSHIP
- STUDENT MEMBERSHIP

- I have previously been an APS member.
- I wish to be listed in the Roster of Women in Physics.

Application for STUDENT MEMBERSHIP requires the following certification

I certify that the above named applicant is a full-time student attending _____
(Name of Institution)

(Signature of Dept. Head or Faculty Member) Date

My mailing address is:

Name: _____
Last Name First & Middle Names

Address: _____

City: _____ State or Province: _____ Country: _____ Zip Code: _____

My telephone number, to be listed in the APS Directory is () _____

SEE REVERSE FOR DETAILS ABOUT MEMBERSHIP BENEFITS, SECTIONS, DIVISIONS, TOPICAL GROUPS, AND RATES FOR PERSONAL SUBSCRIPTIONS. WHEN FILLING IN AMOUNT, SELECT RATE APPROPRIATE TO MAIL DELIVERY DESIRED.

FOR OFFICE USE ONLY	DUES: Regular \$50; Life Member \$600; Student \$10; Student with SPS membership \$16.	\$
Membership Approved by: _____ Date _____	PHYSICAL REVIEW ABSTRACTS will be sent only if you confirm that you wish to receive it by checking here. <input type="checkbox"/>	No Charge
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a copy of the questionnaire. Be sure to include BOTH SIDES.

WOMEN AND THE NATURAL SCIENCES: A CONFERENCE AT BARNARD COLLEGE (14 NOVEMBER 1987)

This fall the Barnard Center for Research on Women is presenting an evening lecture series and a one-day conference on "Women and The Natural Sciences." The lecture series consisted of four evening conversa-

tions 16 September, 14 October, 28 October, and 4 November, where practicing women scientists talked about their work. The lectures will culminate in a one-day conference on 14 November. The morning session will be opened by Professor Evelyn Fox-Keller, author of *Gender and Science*, and will focus on Feminist Theory and Science. The afternoon will be introduced by Prof. Judy Young, an astrophysicist at the University of Amherst, and Betty Vetter, Executive Director of the Commission on Professionals in

Science and Technologies, and will discuss Developmental Stages of Women in the Sciences. All events are free and open to the public; lunch may be purchased at the conference for \$8. The Barnard Center for Research on Women is located at 101 Barnard Hall, at 117th and Broadway.

For further information, please call Dr. Temma Kaplan, Director of the Barnard Center for Research on Women, at (212) 280-2067.

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