

CSWP GAZETTE

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

July 1986

Volume 6, Issue 2

FOREWORD TO OUR READERS

During the past few years requests have come to the editorial staff from Physics Departments throughout the United States to advertise positions in their departments. The number of such requests has increased dramatically this past year. The CSWP maintains a Roster of women in physics and allied fields, which it uses as a data base for some studies, as a mailing list for the CSWP *Gazette*, and for other networking communications.

Although the Roster is not a list of persons available for employment, the CSWP will be glad to assist Physics Departments in using this data base to inform qualified women physicists of faculty openings, and will mail notices of such openings as postage-prepaid items to those members of the Roster who fulfill specified criteria. The CSWP will generate, apply address labels, and mail the items. There is a fee for this service. For further information contact

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Fairfax, Virginia 22030
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A questionnaire for collecting data for the Roster of Women in Physics is enclosed. If any *Gazette* reader has not sent in a completed questionnaire with updated information please take time to fill this one out and send it in. If you are already on the Roster, your Roster number is on the upper right-hand corner of the mailing label on the *Gazette*. Supplying this number on the questionnaire will help to expedite the data processing. Chairs of departments who receive the *Gazette* can greatly assist the CSWP to enlarge our pool of female readers by duplicating the questionnaire and encouraging all female staff—faculty, graduate students, and senior undergraduates—to send in a questionnaire. Although only names and mailing addresses are necessary, the other data are highly desirable. Information on the questionnaire is kept confidential.

Joan Kowalski, Editor

Please send your Roster information and any other requests, letters, or suggestions to Dr. Miriam Forman, APS, 335 East 45th Street, New York, NY 10017. The information will then be forwarded to the appropriate CSWP member.

SCHOLARSHIP FUND TO BENEFIT FEMALE SCIENCE STUDENTS

The Brookhaven Women in Science (WIS) has established the Renate W. Chasman Scholarship for Long Island women undergraduates in their last two years, or women graduates who have returned to college full-time to resume their studies in the sciences or technical fields. The scholarship makes one-time awards of \$1,000 and its objective is to encourage girls and young women to consider science, mathematics, and engineering as possible careers and to provide female scientist role models.

The scholarship fund was established to honor the memory of Renate W. Chasman, a Brookhaven woman scientist who contributed

to the design of particle accelerators at Brookhaven. She died of cancer in 1977.

1986 NATIONAL COUNCIL ELECTIONS

Listed following are women who have been elected Councillors or Associate Councillors to the 1986–87 SPS National Council.

Dr. Julia A. Thompson, University of Pittsburgh, Councillor, Zone 3
Ms. Trina Christian, Hampton University, Associate Councillor, Zone 4
Ms. Carol Lynn Jarvis, Tennessee Technological University, Associate Councillor, Zone 5
Ms. Melissa J. Beuoy, Ball State University, Associate Councillor, Zone 8
Ms. Diandra Leslie-Pelecky, North Texas State University, Associate Councillor, Zone 10

WOMEN IN LASERS

Holly Bigelow and Susan Lamping undertook a search to locate prominent women in the laser field and reported their findings in "Lasers and Applications," January 1986. There follows a list of some women in the field and a brief description of their achievements.

Elsa Garmire is credited with inventing the concept of self-focusing and was among those who first observed stimulated Brillouin scattering. She is director of the Center for Laser Studies at the University of Southern California.

Jean Bennett has spent 18 years doing research at the Naval Weapons Center in China Lake, California, working on surface characterization for very high quality optical surfaces that are used in ring laser gyros, high power lasers, and other hardware. She was recently elected president of the Optical Society of America.

Mary Spaeth contributed to the success of AVLIS, the atomic vapor laser isotope separation program at Lawrence Livermore National Laboratory, a technology that was recently chosen by the Department of Energy for future uranium processing. She has a patent for a resonant reflector that was used in most of the commercial ruby rangefinders made by Hughes Aircraft Co. in Culver City, California, pioneered research on passive Q switches, and conceived of and operated a tunable dye laser pumped by a ruby laser.

Janet Fender is chief of the Phased-Array Branch at the Air Force Weapons Laboratory in Albuquerque, New Mexico. She got her start in optics working as an astronomer at the Kitt Peak National Observatory near Tucson, Arizona. She has also worked with NASA and the Environmental Protection Agency.

Sandra Reynolds is vice-president of marketing at Photon Kinetics, Inc. of Beaverton, Oregon, a fiberoptic equipment manufacturer. Reynolds has a degree in electronic engineering and has worked in

the test and measurement industry since 1971. More recently her interest and involvement in test equipment for the optical fiber market has brought her company's OTDR to a leading position in the market.

Suzanne Nagel is head of Glass Research and Development, AT&T Bell Laboratories. She has worked on the scale-up and improvement of modified chemical vapor deposition processing of glass fibers and on higher-rate practical manufacturing approaches. She holds one lightguide fabrication patent.

Gisela Eckhardt, along with Eric Woodbury discovered the Raman effect in a replica of Ted Maiman's ruby laser at Hughes Aircraft Corp., Culver City, California. Eckhardt is now a business woman in the Los Angeles area.

Lee Buschor began her career in the laser business out of necessity. She helped her husband start "Laser Letter," which later became "Laser Focus." As associate editor and business manager of the publication she learned much about the laser business. Despite the fact that she has no technical training she has been working in military laser sales since 1974.

The previous list is not an exhaustive list of women in the laser field. Bigelow and Lamping's investigation found that women are represented in the field and that they have made pioneering contributions in the scientific and technical world of lasers.

"MY DAUGHTER, THE SCIENTIST"—AN EXHIBIT

An exhibit of a dozen scientists and engineers created at the Museum of Science and Industry in Chicago features three women scientists—Estelle Rubin Ramey, professor of physiology and biophysics at Georgetown University School of Medicine in Washington, D.C.; Joanne Gerould Simpson, head of the Severe Storms Branch of the Goddard Space Flight Center in Greenbelt, MD; and Mildred Spiewak Dresselhaus, a professor at the Massachusetts Institute of Technology in Cambridge, MA. The exhibit may be seen in science museums in the following cities: Fort Worth, TX (June–August, 1986); Philadelphia, PA (October–December, 1986); Charlotte, NC (February–April, 1987); Columbus, OH (June–August, 1987); Boston, MA (October–December, 1987).

WE HEAR THAT . . .

Seven women were among the ninety young scientists that were awarded \$25,000 Sloan Research Fellowships. The awards help young scientists who teach at American colleges and universities to carry on research along with their teaching duties. Following are the female winners, their areas of study, and the institutions where they will work: **Marianne Bronner-Fraser**, Neuroscience, University of California at Irvine; **Sylvia T. Cever**, Chemistry, Massachusetts Institute of Technology; **Carol E. Heim**, Economics, University of Massachusetts; **Johanna Stachel**, Physics, State University of New York at Stony Brook; **Nancy S. True**, Chemistry, University of California at Davis; **Janis C. Weeks**, Neuroscience, University of California at Berkeley; and **Judith S. Young**, Physics, University of Massachusetts.

Caroline Herzenberg, member and former AWIS-CAC president will serve as president-elect for National AWIS during 1986–87. After this term she assumes the duties of president.

Margaret L. A. MacVicar, a full professor of physical science at Massachusetts Institute of Technology, recently assumed the office of Dean for Undergraduate Education at MIT. In her new assign-

ment she will "ask questions about the kind of education undergraduates are getting. MIT must look beyond preparing people for entry-level technical jobs," said MacVicar. "We want to prepare them for leadership 10 and 20 years from now." She is involved in the examination of MIT's undergraduate core degree requirements, in a review of the MIT engineering program, and in consideration of a new liberal arts curriculum integrated with technological content. MacVicar also serves on Exxon's board as one of eleven nonemployee directors.

Bunny Kay Cowan Clark, associate professor of physics at Ohio State University, has been named the first Outstanding Scientist of the Year by the Association for Women in Science of Central Ohio (AWISCO). The award was given to Prof. Clark for her "excellence in theoretical nuclear physics and her encouragement and humane support to others."

Dr. Gertrude Neumark has become a regular professor of Materials Science in the Division of Metallurgy and Materials Science of the Henry Krumb School of Mines of Columbia University, New York. Dr. Neumark had been a senior member of the research staff of Phillips Research Labs of North American Phillips Co. in Briarcliff Manor, NY. She originally joined the Columbia faculty as a Visiting Professor during the 1982–83 academic year under the sponsorship of the National Science Foundation Visiting Professorships for Women Program. Dr. Neumark was one of the first recipients of a Visiting Professorship award in that program.

Andrea K. Dupree of the Harvard-Smithsonian Center for Astrophysics has been elected 1986 vice-president of the American Astronomical Society.

FEATURE ARTICLE

Dear Colleague:

In the last few years I have become increasingly concerned about certain negative attitudes toward science and mathematics (I will often include mathematics and computer science in the term "science.") developing in so-called feminist circles. My two years at the Bunting Institute, where I had a great deal of contact with non-scientist professional women, convinced me that the situation is more serious than many of you may realize. I am particularly concerned that a few very vocal and visible sociologists are succeeding in promulgating opinions that are detrimental to the advancement of women in science. Let me give some specific examples.

The attitudes expressed by Dr. Mary Poplin in a July 1985 interview with the Boston Globe typify my concerns. Dr. Poplin, a faculty member in the school of education at Claremont College, discussed a recent research project on computer aptitude. The Claremont researchers concluded that women and men had the same aptitude for computer science, but that women had significantly lower interest in computers and related topics. So far, so good. But instead of being concerned that women with an aptitude for computing, science, and mathematics were going into other fields, she seemed delighted. To explain her position she invoked a number of stereotypical misconceptions about science. She stated that women were not interested in working with quantification and that they did not want to go ". . . into science and academic fields that use numbers as their whole means of discovery." She continued ". . . and that's the other explanation about why women are not interested in science—because it doesn't deal with subtleties." She concluded with ". . . Gilligan is women scientists' hope for coming up with a model on which we can conduct research without reducing things to numbers. That's what everyone in the workshop feels." (Poplin was participating in a workshop organized by Dr. Carol Gilligan, a Harvard psychologist noted for her work on

QUESTIONNAIRE FOR THE ROSTER OF WOMEN IN PHYSICS
COMMITTEE ON THE STATUS OF WOMEN IN PHYSICS
THE AMERICAN PHYSICAL SOCIETY

The information from this questionnaire will be used to compile rosters of women in physics, to form a mailing list for the CSWP Gazette, to select women to receive announcements of probable interest to them, and to compile demographic data on women physicists. This information will not be made available to commercial or political organizations as a mailing list. Being listed on the roster only identifies the woman as a physicist and does not imply agreement with or support for the activities of the Committee on the Status of Women in Physics.

INSTRUCTIONS: Please indicate your responses to the following by printing one character within each pair of tick marks. Abbreviate as necessary.

NAME: _____
1 (last) 16 1 (first) 14
1 (middle) 14 1 optional: (maiden) 16

My Roster of Women in Physics data provided is:

- A new entry A revised/updated entry I don't know which

If this is a revised/updated entry, please provide your Roster Registration number, if known _____

(Your Roster Registration number appears in the upper right hand of mailing labels produced from the Roster.)

On the following line, please enter your full name and title exactly as you wish it to appear on your mailing label.

_____ 30

Please enter the address and phone number at which you prefer to be contacted and indicate whether: Home or Business

ADDRESS line 1: _____ 28

Address line 2: _____ 28

Address line 3: _____ 28

City/State/Zip: _____ 1 (city) 19 (state) (zip)

Primary phone: _____ / _____ (area) (number) Alternate phone: _____ / _____ (area) (number)

DEGREES	YEAR received or expected	INSTITUTION
BA/BS	_____	_____ <small>28</small>
MA/MS	_____	_____ <small>28</small>
PhD	_____	_____ <small>28</small>
THESIS TOPIC (highest degree)		_____ <small>28</small>
(continue if necessary)		_____ <small>28</small>
EMPLOYER NAME:		_____ <small>28</small>
DEPT/DIV ETC:		_____ <small>28</small>
POSITION TITLE:		_____ <small>28</small>
COMMENTS:		_____ <small>28</small>

- Highest Degree (check one) **FIELD OF PHYSICS**
- 1 ___ Astronomy & Astrophysics
 - 2 ___ Acoustics
 - 3 ___ Atomic & Molecular Physics
 - 4 ___ Biophysics
 - 5 ___ Chemical Physics
 - 6 ___ Education
 - 7 ___ Electromagnetism
 - 8 ___ Electronics
 - 9 ___ Elementary Particles & Fields
 - 10 ___ Geophysics
 - 11 ___ High Polymer Physics
 - 12 ___ Low Temperature Physics
 - 13 ___ Mathematical Physics
 - 14 ___ Mechanics
 - 15 ___ Medical Physics
 - 16 ___ Nuclear Physics
 - 17 ___ Optics
 - 18 ___ Plasma Physics
 - 19 ___ Physics of Fluids
 - 20 ___ Thermal Physics
 - 21 ___ Solid State Physics
 - 22 ___ General
 - 23 ___ Condensed Matter Physics
 - 24 ___ Space Physics
 - 25 ___ Other (please specify below)

- Current Interest (check one)
- 1 ___
 - 2 ___
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- CURRENT WORK STATUS**
 (Please check one or more as applicable)
- 1 ___ Student
 - 2 ___ Post Doc/Res Assoc
 - 3 ___ Unemployed
 - 4 ___ Retired
 - 5 ___ Employed
 - 6 ___ Self-employed
 - 7 ___ Full time
 - 8 ___ Part time
- FOR HIGHEST DEGREE** (Please check one)
- 1 ___ Theoretical
 - 2 ___ Experimental
 - 3 ___ Both
 - 4 ___ Neither (please explain below)
- _____
- TYPE OF WORKPLACE FOR CURRENT OR LAST WORK** (Please check one or more)
- 1 ___ University
 - 2 ___ College—4 year
 - 3 ___ College—2 year
 - 4 ___ Secondary School
 - 5 ___ Government
 - 6 ___ National Laboratory
 - 7 ___ Industry
 - 8 ___ Non-Profit Institution
 - 9 ___ Consultant
 - 10 ___ Other (please specify below)
- _____

- TYPE OF ACTIVITY**
 (Please enter a 1 for the activity in which you engage most frequently, 2 for the second most frequent, etc. for all significant aspects of your current or last work)
- 1 ___ Basic Research
 - 2 ___ Applied Research
 - 3 ___ Development and/or Design
 - 4 ___ Engineering
 - 5 ___ Manufacturing
 - 6 ___ Technical Sales
 - 7 ___ Administration/Management
 - 8 ___ Writing/Editing
 - 9 ___ Teaching—Undergraduate
 - 10 ___ Teaching—Graduate
 - 11 ___ Teaching—Secondary School
 - 12 ___ Committees/Professional Org.
 - 13 ___ Proposal Preparation
 - 14 ___ Other (please specify below)
- _____

Thank you for your participation.
 Please return the questionnaire to:
Dr. Miriam Forman
American Physical Society
335 East 45th Street
New York, NY 10017

Are you interested in receiving information on employment opportunities? Yes No

gender differences.) After reading the entire article, I could only wonder if Poplin had ever actually met a real woman scientist.

The public prominence of some sociologists is exemplified by an article in the December 2, 1985 issue of *Newsweek* entitled "Liberation in the Lab." Although the article purports to discuss the opinions of women scientists, it does not quote a single, practicing woman scientist. All of the women quoted work in the social sciences although a few do have scientific backgrounds. A picture of nobel laureate Barbara McClintock and related discussion gives a particularly misleading impression. The discussion is based entirely on Dr. Evelyn Fox Keller's biography; McClintock herself does not appear to even have been interviewed by *Newsweek*. Indeed, most of the article appears to be an exposition of Keller's views on gender and science. However, several non-scientists who discussed the article with me assumed that it was an accurate representation of the predominate thinking of women scientists. Regardless of what one thinks of Keller's work, it should not be represented to the public as the opinion of women scientists.

The *Newsweek* article also contains some rather disturbing remarks by the sociologist, Dr. Sherry Turkle, noted for her book "The Second Self: Computers and the Human Spirit." She claims that by age ten girls and boys have different programming styles; that girls prefer the interactive approach which she refers to as female, artistic, and "soft mastery"; while boys prefer to plan ahead, an approach she refers to as male and "hard mastery." This theme of gender differences in computer science pervades her book very heavily. Other remarks suggest that she does not consider extensive planning of programs to be either necessary or desirable. Although she acknowledges that the interactive approach may produce more bugs, she does not regard this as significant—she even describes one bug in rather favorable terms.

Although it is not necessarily gender-related, I cannot resist commenting on a side issue raised by Turkle's dichotomous distinction between the "artistic" and "planning" approaches. This terminology shows a complete failure to recognize that computer science, like other scientific fields, is ultimately a creative endeavor. She does not seem to understand that the creativity, i.e., the art, does not lie in the programming, which is really a routine process, or in the pictures on the terminal screen. Rather, the really creative part is the study and development of the underlying algorithms, something she seems to consider as technical and unartistic. Thus, Turkle shows great appreciation for the visual artistry of a student programmer, Anne, but does not acknowledge that Anne's invention of a new data structure, a "screened bird," is also a significant *creative* achievement. Turkle, by looking for art in the superficial programming aspect of computers, seems to me like a painter who, when confronted with the score of Beethoven's fifth symphony, claims that it is not artistic because it is not visually attractive. Many of my non-scientific colleagues at Bunting were surprised to learn that scientists consider themselves creative and artistic; they were amazed that I used words like beautiful and elegant to describe theorems and proofs. I fear that such misunderstandings promote negative attitudes toward science which discourage young women from scientific careers.

Returning to my main topic, I would like to discuss the feature article in the March 1985 issue of the Radcliffe alumnae magazine. It is entitled "Women who could rule America," and contains statements by possible candidates for cabinet level positions. Curiously, although there were no candidates for several significant positions—such as secretary of state, the article contains not one, but three(!) candidates for the Director of NSF. Now I would have little difficulty in coming up with the names of several women scientists who would make excellent directors of NSF. However, none of the three Radcliffe candidates is a practicing woman scientist. All three are women with scientific backgrounds who now work in public policy or social science areas. One of the three, former biologist Dr. Dorothy Zinberg, did present an excellent

statement which showed considerable understanding of both the problems facing NSF and the funding of basic research. However, the other two, Dr. Evelyn Fox Keller and Dr. Shirley M. Malcom, presented a joint statement so devoid of insight into the relevant issues that I consider it totally unacceptable for a potential director of NSF. The article also contains two candidates for Secretary of Health and Human Services, only one of whom even mentioned NIH and related issues involving biomedical research in her statement. Even if one found some of these candidates more acceptable than I do, the failure to propose even a single active scientist from so many candidates sustains the public misconception that qualified women scientists do not exist.

My final example concerns an article by Dr. Sheila Tobias in the June 1985 issue of *Physics Today* in which she attempts to extend her theories on math anxiety to "physics anxiety" and possibly even "science anxiety." Although I missed this article when it first appeared, my attention was drawn to it through a subsequent series of offensive letters by men vehemently opposed to Tobias' views. After reading the article, I realized that, although I still found the tone of the men's letters offensive, I shared many of their underlying concerns. Although the article has some useful insights, Tobias makes no distinction between women who really have fundamental difficulties with basic mathematics, capable women who do not have the proper mathematics background for studying physics, and capable, well-prepared women who choose to go to law, medical, or business school rather than pursue scientific careers. Thus, the article left the male letter-writers with the impression that most women cannot succeed in physics courses with the traditional high standards, and that more women will pursue careers in the physical sciences only if we promote special introductory programs, remedial courses, and spoon-feeding. Her rebuttal does nothing to dispel this view. She objects to the view that physics and mathematics require special talent and ability as an elitist one that keeps women out of the physical sciences; she does not seem to consider the possibility that mathematics and physics do require special ability but that many women, as well as men, do possess the necessary talent to pursue careers in the physical sciences.

Although Tobias devotes a great deal of attention to "cures" for physics anxiety, she does not mention the prophylactic effect of proper math preparation. Neither the importance of encouraging women to take the necessary math courses in high school, nor the value of stimulating programs to encourage the talented, are discussed in her article. On the contrary, she seems to feel that students with only 3 years of high school math are well-prepared for calculus, physics, and engineering. Women students who disagree merely "think" that they are inadequately prepared! In some ways, Tobias' ideas resemble those of Turkle, who also seems to feel that the subject must change in fundamental ways in order to accommodate women. In particular, Turkle seems to feel that we should not insist upon teaching women students to *plan* their computer programs. Instead Turkle feels that the field should change to accept the less-structured interactive and "artistic" approach that she considers feminine.

One recurrent idea in many articles of this type is that women are more intuitive than men, where intuition and logic are perceived of as opposites. In this context the notion that women are more intuitive seems suspiciously like a rewording of the old bigoted male accusation that women can't think logically. Another distressing theme, which did not surface in the examples above, is that women are naturally more inclined to the biological sciences because of their "nurturing" instincts. I am particularly sensitive to this misconception because, as a young graduate student in chemistry, I was told that women should study biochemistry rather than physical chemistry. (Undeterred, I wrote my thesis on a mathematical problem in quantum chemistry, beginning a continuous transformation to mathematical physics.)

Although I would like to dismiss such opinions as belonging to a

misinformed minority, I fear that they are actually the tip of a very serious iceberg. As the examples from *Newsweek* and *The Boston Globe* illustrate, these women have succeeded in attracting a great deal of attention and publicity to themselves and their views. They are frequently perceived of as women scientists and as *spokespersons* for women scientists. Non-scientists, particularly feminist academics, assume that their views represent the majority opinion of women scientists.

That non-scientists do regard the views of this vocal minority as orthodox was impressed upon me during my stay at the Bunting Institute. Most of the women I met at Bunting ordinarily had little or no contact with women scientists, whom they assume to be far rarer and more isolated than we actually are. (One seemed surprised to learn that I actually knew other women physicists and mathematicians.) Their attitudes toward science ranged from enthusiastic amateur to severe anxiety and avoidance. But most of them, regardless of attitude, received their information about women scientists from sociologists, some of whom they regarded as scientists. (One considered Sheila Tobias to be the quintessential woman mathematician.) As a result, their views about science and women scientists were often quite distorted. Furthermore, because the social scientists in question are widely regarded as staunch feminists, dissenting views are sometimes regarded as non-feminist.

Having, I hope, convinced you that there is cause for concern, I now come to the problem of what to do about it. Frankly, I don't

know. Obviously, we should speak out whenever possible. Because of the disturbing tendency to dismiss individuals who hold opposing views on these issues as "non-feminist," I feel that it is particularly important for organizations, such as the CSWP, to take a stand. In order to do this effectively we need to find ways of increasing our visibility. Ideally, news agencies seeking commentary on such issues should seek out representatives of CSWP and similar organizations, rather than social scientists. We need to find mechanisms that facilitate and encourage this. Perhaps the APS office could assist us.

Nor do I mean to condemn all social scientists. Many of them do excellent and important work. But we do need to be aware of, and deal effectively with, those whose work affects the progress of women in science. I think that we also need to find more ways to communicate informally with non-scientists. We should take advantage of hidden opportunities, as might occur when one serves on a university-wide committee, to interact with non-scientists.

I hope that those of you who have persevered in reading this rather long article found it stimulating. I would appreciate your comments and suggestions.

Sincerely,
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