

CSWP Gazette

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

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Letter from the Editor

By Neal B. Abraham, Vice President for Academic Affairs and Dean of the Faculty, DePauw University



Dear Colleagues: I have enjoyed the opportunity to preview the articles and materials while assembling this issue of the CSWP Gazette. Among them are strong evidence of the lively scholarship of women in physics and the continuing interest of men and women in expanding the opportunities for more women to succeed in their studies and careers in physics.

Noting that the articles here indicate wide differences in the progress of women in physics in different countries

and different institutions, we should all remember how hard it is to generalize about opportunities and barriers. Many difficulties remain, but they are not always the same. Fortunately there is an increasing amount of resource literature and an increasing number of mentors to help with solving the most pressing problems that remain in local situations.

We encourage all readers of the Gazette to share with us stories of the progress made by women physicists in colleges and universities, in government and industry. We are particularly grateful to the volunteer authors of the many articles included in this issue. There are many other stories yet to be told. It is important that we all continue to contribute to this shared enterprise.

CSWP and FIAP to Co-Sponsor Women's Networking Breakfast at Minneapolis Meeting

For the fifth year, the APS Committee on the Status of Women in Physics (CSWP) and the Forum on Industrial and Applied Physics (FIAP) will sponsor a Networking Breakfast for Women Physicists in Industry on Monday, March 20, 2000, from 7:00 to 9:00 a.m. The breakfast will take place in the Minneapolis Hilton & Towers / Duluth Room. The following is a tentative agenda for the breakfast:

7:00-7:30 am Buffet breakfast
7:30-8:15 am Program
Welcome: Dr. Judy Franz, APS
 Dr. Laura Smoliar, 3D Technology Laboratories
 Dr. Beverly Berger, Chair, Committee on the Status of Women in Physics
Keynote Speaker: Dr. Cynthia Hipwell, Manager of Advanced Mechanical Integration at Seagate Technology, "Making Tracks in the Silicon Snowbank"
8:15-9:00 am Informal Discussion/Networking time

All with an interest in issues pertaining to women in Industrial and Applied Physics are welcome, particularly women working in these fields. The cost for this breakfast is \$15 and preregistration is highly recommended.

You may register on the web at <http://www.aps.org/educ/cswp/breakreg.htm> and then mail your check to the address below.

Checks should be made payable to the American Physical Society and sent to:

Sue Otwell
 American Physical Society
 Education and Outreach Department
 One Physics Ellipse
 College Park, MD 20740
 Tel: 301-209-3231

Registration is on a first-come first-served basis. Tickets will be held at the door. See you there!

**Register for the Breakfast
 online at:
[www.aps.org/educ/cswp/
 breakreg.htm](http://www.aps.org/educ/cswp/breakreg.htm)**

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COM Special Session & COM/CSWP Joint Reception

You are cordially invited to attend a special session sponsored by the APS Committee on Minorities in Physics (COM) from **5:30 – 6:00 pm** at the APS March Meeting in Minneapolis. In this session, Dr. James H. Stith, Director of Physics Programs, American Institute of Physics, will give a talk entitled, "Increasing the Numbers, A Partial Success Story," which will describe some of AIP's efforts to work with the physics community to attract and retain members of under-represented groups in physics. Following this session, please join us for a joint reception sponsored by COM and the Committee on the Status of Women in Physics (CSWP) from **6:00 – 7:30 pm**. COM Chair, Lawrence Norris (Northwestern University, Chicago, IL), and CSWP Chair, Beverly Berger (Oakland University, Rochester, MI), will

host this reception. Not only will this event give you an opportunity to network with your colleagues, but you will also have the chance to talk with the committee chairs and let them know what efforts you think the APS should undertake regarding women and minorities in physics.

Committee newsletters, colloquium speakers lists and other publications will be available. Wine and light hors d'oeuvres will be served.

Sunday, 19 March 2000, 5:30 to 7:30 p.m.
 Minneapolis Hilton & Towers
Special Session: Marquette Room
Joint COM/CSWP Reception: LaSalle Room

CSWP Activities at APS Meetings

The CSWP plans to continue its tradition of organizing sessions at the March and April American Physical Society Meetings. For the March Meeting, at 2:30 pm on Tuesday, March 21 at the Minneapolis Convention Center, the CSWP session will be on the theme "How to succeed in physics: pitfalls and strategies." Speakers and their titles are:

TUESDAY, MARCH 21

Mildred Dresselhaus (MIT):
 "Climate for Women in the Physics Department: the CSWP Site Visit Program"

Tari Alper (Purdue):
 "Solving the 2-body Problem: the Spousal Relocation Program at Purdue University"

Meera Chandrasekhar (U. of Missouri):
 "Attracting Young Women to the Physical Sciences: The Newton Summer Science Academy and Other Extra Curricular Programs"

Chang Shu (Xerox):
 "Climate for Women in Industry: the Xerox Approach"

Robert Birgeneau (MIT):
 "Women in Science at MIT: a Quiet Revolution?"

In addition, Dr. Dresselhaus will also present a lecture as co-recipient of the Nicholson Medal for Humanitarian Service. Dr. Birgeneau will present the Lillienfeld Prize lecture in a separate session.

Other CSWP activities include a reception held jointly with the Committee on Minorities and a networking breakfast for women in industry featuring Dr. M. Cynthia Hipwell of Seagate Technology who will speak on "Making Tracks in the Silicon Snowbank."

At the April Meeting in Long Beach, California, CSWP will sponsor two sessions. The first session, on Monday, May 1, in collaboration with the Forum on Physics and Society and the Division of Nuclear Physics, will repeat the theme of the March Meeting session. The speakers include:

MONDAY, MAY 1

Bunny Clark (Ohio State):
 "Climate for Women in Research Departments: the CSWP Site Visit Program"

Kristine Lang (Berkeley):
 "Society for Women in the Physical Sciences: a Successful Mentoring Program"

Lisa Wolf-Wendall (U. of Kansas):
 "Dual Career Couples: How Institutions are Keeping Them Together"

In addition on Tuesday morning, May 2, Virginia Trimble has organized a joint session sponsored by CSWP and the Division of Astrophysics on the role of women in the development of 20th century stellar astronomy. The speakers are:

TUESDAY, MAY 2

Dorrit Hoffleit on
 "Fleming, Cannon, and the Classification of Stars"

Kathy Gaposchkin Haramundanis on
 "Cecilia Payne and the Composition of Stars"

Martha Hazen on
 "Unsung Heroines"

Barbara Anthony-Twarog on
 "Tinsley and Assembling Stars into Galaxies"

Meg Urry on
 "Stellar Women Today."

CSWP and the Committee on Minorities will host a reception on April 29 at the April meeting. For the first time, on May 1, CSWP will sponsor a networking breakfast for women in academia. Details will be available on the APS website and on the WIPHYS list serve. We welcome all of you to join us at our sessions, breakfasts, and receptions at the March or April Meeting. For meeting information and scheduling details please see <http://www.aps.org/meet/>.

1999 Women Fellows of the APS

BARBARA ABRAHAM-SHRAUNER

Washington University

Plasma Physics

For important theoretical contributions to a broad range of plasma topics, including: space plasmas, nonlinear dynamics, and plasma processing.

NORA BERRAH

Western Michigan University

DAMOP (Atomic, Molecular, Optical)

For high-resolution work on few and many electron systems using lasers and synchrotron radiation leading to a better understanding of the interaction of light with matter.

AVIVA BRECHER

Volpe National Transportation Sys. Ctr

Forum on Physics & Society

For her many contributions to society in the areas of transportation research, environmental mitigation and strategic arms control.

RENEE DIEHL

Pennsylvania State University

DCMP (Condensed Matter)

For structural studies of weakly-absorbed species on surfaces

MARY E. GALVIN

University of Delaware

High Polymer Physics

For her contributions to the synthesis, structural understanding, and property optimization of electroluminescent polymers.

SHARON LEE HAGOPIAN

Florida State University

Particles & Fields

For contributions to large collider experiments, developing and using graphical on-line displays and for searches of new states of matter linking quarks and leptons.

JULIA A. KORNFIELD

California Institute of Technology

High Polymer Physics

For outstanding investigations of the order and dynamics of copolymers, liquid-crystalline polymers, blends, and thin films.

JACQUELINE KRIM

North Carolina State University

Materials Physics

For her pioneering contributions to surface science and nanotribology, especially studies of kinetic roughening and the development of quartz crystal microbalance as a major tool for probing atomic-scale friction.

ELISA MOLINARI

University di Modena

Forum on International Physics

For her contribution to the theory of semiconductors and their interfaces, in particular, her fundamental work on electron-photon interaction in nanostructures; and for her involvement in the training of young theorists from many countries and the organization of international conferences.

HEIDI MARIE SCHELLMAN

Northwestern University

Particles & Fields

For her leadership in QCD physics and as spokesperson of E-665, the Tevatron muon scattering experiment.

BEVERLY TAYLOR

Miami University

Forum on Education

For designing educational materials used effectively by K-12 science teachers, and particularly for developing and publicizing the physics of toys.

PATRICIA THIEL

Iowa State University

Chemical Physics

For pioneering work on the surface structures, stabilities, and other properties of metal films and quasicrystals; also for elucidation of surface structure and chemistry of water on metals.

LINDA YOUNG

Argonne National Laboratory

DAMOP (Atomic, Molecular, Optical)

For precision measurements in atomic structure and the development of laser-driven polarized hydrogen and deuterium sources.

Her first paper, written while an undergraduate in 1987, was in 1991 voted "One of the 50 Most Memorable Papers".

2000 Maria Goppert Mayer Award to Sharon Glotzer



"For her ingenious use of computational physics to probe a wide range of novel materials under different conditions, and for demonstrating the existence and nature of spatially-correlated dynamic heterogeneities in glass-forming liquids."

Dr. Sharon C. Glotzer is a physicist in the Polymers Division of the Materials Science and Engineering Laboratory at NIST, and the cofounder and director of the NIST Center for Theoretical and Computational Materials Sci-

ence. She received a B.S. in Physics from UCLA in 1987, and a Ph.D. in Physics from Boston University in 1993 with Professor H. Eugene Stanley.

Dr. Glotzer joined NIST in 1993 as a National Research Council postdoctoral fellow in the Polymers Division. Dr. Glotzer's research focuses on the theoretical and computational study of the structure and dynamics of soft materials, including polymers, dense liquids, glasses, colloids, liquid crystals and granular materials. Current interests include characterization of emergent spatial patterns in slow dynamics of disordered structures; filled polymers and nanocomposites; controlling fabrication and processing of

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Barbara Hope Cooper was the first female Professor of Physics at Cornell

Barbara Cooper

By Peter J. Feibelman, Sandia National Laboratories, Albuquerque, NM

Barbara Hope Cooper, the first female Professor of Physics at Cornell, died Aug. 7 of lung cancer at age 45. Cooper received her Ph.D. in 1982 from Caltech, and was a postdoc there till recruited by Cornell in 1983. A dedicated, enthusiastic and successful scholar, cherished mentor to a host of students, many of them women, mother to 8-year old Katie and wife to physicist Chris Myers, Barb will be missed by family and countless friends, colleagues and students.

Though she had recently extended her research to ion erosion and metal film growth using atomic-resolution microscopy and X-ray diffraction, Cooper is best known for detailed studies of charge exchange in low-energy ion-surface scattering. This phenomenon has practical implications, e.g., for surface chemistry and plasma etching, and also provides a unique window into basic many-electron phenomena, like the Coulomb blockade and the Kondo effect. Starting from an empty lab and no experience in surface science, Cooper and her students built ion-beam lines and instrumentation, wrote scattering-theory codes and stimulated efforts in basic theory. The result was an ability to account for observations of

inherently complicated dynamical phenomena, and increasing excitement over chances to extract basic information concerning electron-electron correlations. The Dynamics of Charge Transfer at Surfaces symposium at this year's March APS meeting will testify to the increasing impact of Cooper's work.



Photo courtesy of Josh Pomeroy, Cornell University

As a grad student, Barb was the proud recipient of a Bell Labs GRPW award (www.bell-labs.com/fellowships/GRPW). At Cornell, she was an NSF Presidential Young Investigator (1985-1989) and received faculty development awards from IBM and AT&T. APS recognized Cooper's outstanding early career achievements with the 1992, Maria Goeppert-Mayer Award. Her untimely death is unspeakably dispiriting.

Clasine van Winter Retires

by Peter Hislop, Mathematics Dept., University of Kentucky, Lexington, KY

Clasine van Winter retired in January 2000 from a joint Professorship in the Departments of Mathematics and Physics and Astronomy at the University of Kentucky. She joined the faculty as a full professor in 1968. Clasine received her PhD from the University of Groningen, The Netherlands, in 1957. She has held positions at the University of Birmingham, England, the Niels Bohr Institute in Denmark, Indiana University, the Mittag-Leffler Institute in Sweden, and at the Argonne National Laboratory. She was awarded a prestigious University Research Professorship at the University of Kentucky for the academic year 1981-82. Her research has been devoted to the study of the spectral and scattering theory of N-body Schrodinger operators and resonances in quantum systems. She independently proved the result, now referred to as the HVZ Theorem for Hunziker, van Winter, and Zhislin (Reed and Simon, volume 4), on the location of the bottom of the essential spectrum of N-body operators, in 1964.

Another of her contributions, the Weinberg-van Winter equations, expresses the resolvent of an N-body operator in terms of the resolvents of 2-body subsystems.

Many of Clasine's papers are dedicated to the study of the analytic properties of Green's functions and the wave operators for quantum systems. Consequently, Clasine developed enormous expertise in the theory of Hilbert spaces of analytic functions and analytic Fredholm theory. She formulated the N-body problem with analytic interactions on Hilbert spaces of analytic functions, and used this formulation to prove the existence of the meromorphic continuation of matrix elements of the resolvent. She identified the isolated poles of the continuation as resonances of the

scattering matrix. Clasine studied in detail the wave operators and their continuation for three-body systems with dilation-analytic potentials. Her most recent papers deal with irreversibility and chaos in quantum mechanics.

Note: by Beth Ruskai, Department of Mathematics, University of Massachusetts, Lowell, on the HVZ Theorem:

In its simplest form, the HVZ theorem states that the continuous spectrum of an atom with N electrons begins at the ground state energy for an atom with N-1 electrons. This result can be extended to other multiparticle systems, but a precise statement is rather technical.

To appreciate its significance, one can go back to a (now celebrated) 1951 Trans. AMS paper of T. Kato which is often cited as having proved that the Hamiltonian for a Helium atom has an infinite discrete spectrum. Although Kato did, in essence, prove this result, he could only state the existence of a "very large number" of eigenvalues because the HVZ theorem had not yet been proved. In 1960, Zhislin proved the atomic result. In 1964, van Winter, using a completely different method based on the so-called Weinberg-vanWinter equations, proved the HVZ theorem for a much larger class of Hamiltonians.

The Weinberg-vanWinter equations were developed independently by van Winter and Steven Weinberg and have played an important role in N-body scattering theory. For additional information, see Section XIII.5 of "Methods of Mathematical Physics" by M. Reed and B. Simon Vol. IV "Analysis of Operators" (Academic Press, 1978) pp. 120-135 and the historical notes on p. 343.

Addressing Inadequate Measures for Work and Family Balance in Graduate School

by Elizabeth A. MacDonald

Pursuing a graduate Physics degree requires dedication, long hours, excellence, and sheer will. Also requiring these qualities are the demands a new baby places on both parents. However, despite the fact that most first-time parents are the same age as most graduate students, the two are meant to be mutually exclusive for scientists and this means balancing work and family is extremely difficult. The problem begins with acutely insufficient maternity and parental leave policies for graduate students, which reflect an overall lack of support for family responsibilities. These inadequacies, coupled with the hectic pace of a scientific career, may be particularly detrimental to graduate student women. It is of utmost importance to the future of our field to ensure that current practices are not actively hindering or preventing increased numbers and high achievement of able women in doctoral level Physics. Fortunately, it is not very difficult to make changes in our departments that can greatly ameliorate the current shortcomings and benefit all graduate students.

For most people, graduate school, post-doctorate positions, and crucial pre-tenure faculty time coincide exclusively with childbearing years. The scientific career development process is ill-equipped to deal with pregnancy, childcare, and family issues. This is because the existing academic scientific structure was based upon the helpmate-in-the-background model described by Pearl et al. (1990), in which the male worked long hours at the lab and his wife did everything else including housework and raising their children. This model is clearly outdated by decades. The majority of scientists no longer have a nonworking partner to rely upon, yet the work schedule demanded for success still leaves no time for parental responsibilities.

The University of Washington is a large, Research I institution with leave policies typical of academia. Faculty have standardized leave policies (paid disability leave for maternity) for both parents including an extension of the pre-tenure time due to family responsibilities during the tenure review years.^[1] This recognizes the lower productivity to be expected from new parents and ensures pregnancy is not a discriminating factor in the tenure review process. However, graduate students have no official parental leave policies and do not receive even the minimum benefits outlined in the Family and Medical Leave Act of 1993 because they are considered less than part-time employees. They dedicate themselves for several years in occupational training while performing valuable services for the University, yet feel forced to postpone having children because of the significant time commitment involved. If students become parents, they are at a disadvantage because of inconsistent, unfair, and inflexible practices.

Establishing a graduate student parent policy at the departmental level will acknowledge that parenting is a valued decision and start changing the stigma that a student with a family is less committed or serious. It will also ensure that having a family does not adversely affect any graduate student's career and future prospects. A successful graduate student parent policy could be modeled on that of the U. C. Berkeley Electrical Engineering and Computer Science Department.^[2] It is inexpensive, clear, and flexible and has encouraged the col-

lege-wide adoption of a graduate student parent policy at Berkeley.^[3] Of foremost importance is allowing additional flexibility in deadlines for passing exams and total time to degree completion due to new parenting demands on either parent. While encouraging students to take exams as soon as possible, making an extension an official option is important because it verifies that student parenting is not merely an exception to the rule. Students may take leave without fear of rejection or lowered status from advisors and senior colleagues. In addition, the department should be as generous as possible in offering any pregnant graduate student (teaching or research assistant) a period of departmentally supported leave around the time of childbirth. The department should allow reduced academic and service requirements during the pregnancy and encourage alternate coverage of student responsibilities.

Considering the percentage of the few female graduate students in the typical Physics department who may need this type of support, the estimated cost to the department is low. In fact, because departments support most students through TA or RA appointments, it is more cost-effective to protect an investment in those few women than risk higher attrition. Also, as resources permit, graduate student parents with documented financial need should be eligible to receive childcare supplements in addition to their normal salaries. Other considerations include providing adequate access to childcare, limiting weekend and after-hours meetings, providing a parents' office (space to accommodate parents who may need to bring their children to school on occasion), and offering flexible paid or unpaid leave to fathers and adoptive parents.

Physics departments should act because it is in their immediate interest to improve the welfare of their graduate students (especially in regards to retaining the small numbers of women). A family friendly reputation will give any department an edge in recruiting top-quality students, particularly women. Responsible parenting policies are part of a larger matter facing the scientific community today. A successful department policy may be seen as a pilot for change at the graduate school administration level. Waiting for graduate students to unionize or for the U.S. to improve its health care coverage will be harmfully slow. Without adequate policies women are hurt the most, which is critical because they are seriously under-represented already. Ignoring this problem will continue to send the wrong message to today's students about who belongs in Physics.

References:

Pearl, A., Pollack, M. E., Riskin, E., Thomas, B., Wolf, E., & Wu, A. (1990). *Becoming a computer scientist: a report by the ACM committee on the status of women in computing science*. Communications of the Association for Computing Machinery (ACM), 33(11), 47-58. ^[1]A one year extension is automatic for a leave of greater than six months and possible for shorter absences. ^[2]See http://hera.eecs.berkeley.edu/~humphrys/parent_policy2.html. ^[3]See <http://www.gradberkeley.edu/events/gdmemo/parepoli.htm>

Elizabeth MacDonald is a graduate student in Physics at the University of New Hampshire. A 1999 graduate of the University of Washington, she developed the article from participation in a course examining issues for women and minorities in Science and Engineering.

For most people, graduate school, post-doctorate positions, and crucial pre-tenure faculty time coincide with childbearing years.

Reviews

We are drawn into the lives of these women through details and anecdotes that show us their determination, humor, fears, and triumphs.

Their Day in the Sun: Women of the Manhattan Project

Ruth H. Howes and Caroline L. Herzenberg, Temple University Press, Philadelphia 1999

Review by Laura Lising Postdoctoral Fellow at the National Institute of Standards and Technology in Gaithersburg, MD

This new book represents an impressive feat of detective work. Howes and Herzenberg have unearthed details of the lives and contributions of hundreds of women working on the Manhattan Project. Of these, over 300 were involved in technical work, although the authors emphasize that this is definitely not a complete listing. Information on the women and their activities was often scarce, yet the authors manage to paint a vivid picture of the scope of their subjects' involvement. We are drawn into the lives of these women through details and anecdotes that show us their determination, humor, fears, and triumphs. The book begins with a brief history of the Manhattan Project's formation and a description of the five women who were instrumental in laying the foundations of nuclear physics: Marie Curie, Irene Joliot-Curie, Mileva Maric, Ida Noddack, and Lise Meitner. As the prospect of an atomic weapon solidified, the project developed an enormous need for physicists, chemists, mathematicians, medical and biological personnel, technicians, and support staff. The wartime shortage of technical workers spurred the project leaders to recruit women to fill some of the escalating number of openings.

Some of the female scientists were lured from academic and industry jobs by recruiters, some were plucked from graduate studies, and others followed husbands to the sites and later joined the teams. Many women at universities were confused by the mysterious disappearance of their male colleagues until they, too, got the offer to relocate. Wives on-site were heavily recruited to join the project, especially at Los Alamos, and any hint of technical aptitude brought them into technical sectors. Women who had never considered scientific work were strongly encouraged to do so, and in some places were trained from scratch.

Once active in the laboratories, the women found the work exciting. The hours were long, the late night shifts arduous, the work often dangerous, the tight security posed numerous inconveniences, and the living conditions were difficult, yet these women were carried along by a pride in their contribution to the war effort and by the strong sense of camaraderie in the workplace. The secrecy, however, served to isolate the women from each other. Each technical project's personnel worked without contact with or knowledge of the projects linked to theirs. A solitary woman in an otherwise male group often encountered few other women since there were few women in the leadership. This fact, as well as name changes after marriage, posed difficulties in the identification of many female project workers. In addition, many women had titles that misrepresented their activities. For example, the women working as low-ranking technicians in the isotope separation lab at Berkeley were often experienced analytical chemists who had to train their young male bosses.

The range of the women's participation was as broad as the project itself. Among the physicists, several women, such as Leona Woods Marshall and Nancy Wood, were expert at construction and testing of particle detectors. Female physicists also did theoretical calculations and modeling, conducted radiation and safety research, and worked on reactor design. Chemists, medical researchers, and technical workers also had opportunities that were rare for women at that time. Frances Dunne, for example, was the only woman and the only civilian in the group that tested the detonation explosives. She assembled the delicate triggers and served as the group supervisor.

After the war, some of the women persevered with scientific and technical careers, returning to their academic and industrial positions or remaining at the newly formed national laboratories at Argonne, Oak Ridge, and Los Alamos. Many of the female scientists became active in the advocacy of responsible use of nuclear power. The majority of the project women, however, were forced to relinquish their jobs to returning veterans and resume traditional roles.

The story of these remarkable women offers a lesson that is particularly important for us today. The needs of the war created a temporary crisis in which technical skills were in great demand. Had there been more women with technical training, the progress on the project would have been more rapid. Today we are just beginning to feel the same technical skills pinch as our industries become more technologically sophisticated. Sadly, most of the progress made during the war was carelessly thrown away in the following years and the numbers of women in the hard sciences has remained dangerously low. Minority representation is even worse. Will we soon finally recognize our need?

This volume gives a complete look at the substantial role of women in the Manhattan Project and how the project changed their lives. It serves as irrefutable evidence of what women have to offer science. *Their Day in the Sun* is both personal and comprehensive, including sixteen pages of photographs, an index of female project workers, and a timeline of project-related events. The reader may find the fragmentary organization of the text a bit confusing. The book chronicles the contributions at four major laboratories of hundreds of women for whom the amount of available information varies from extensive to almost nonexistent. Why was this such an important effort to make? This story is fascinating to be sure, but it is much more than that. It is a tribute to women whose contributions were often unnoticed or forgotten. It is a tale of courage and determination. And it is a belated lifting of the barriers in the project that isolated women from each other. Ellen Weaver, in her foreword, thanks the authors for helping the women of the project to meet one another at last and swap stories.

Women's Science: Learning and Succeeding from the Margins

By Margaret A. Eisenhart and Elizabeth Finkel (University of Chicago Press, Chicago, 1998)

Review by Kimberly A. Shaw, Southern Illinois University, Edwardsville

Women's Science: Learning and Succeeding from the Margins asks a different question than do other studies of women in science. Rather than ask why there are so few women in academic (or elite) sites of science, the authors performed case studies at nontraditional scientific sites where women are present and successful in larger numbers, and ask why these women are doing well.

Chapters 1-2 discuss theories of women's representation across scientific sites of practice. Chapters 3-6 present the case studies: a high school genetics course, an engineering design class focusing on teamwork for a client, an environmental action group, and a land conservation corporation. These case studies were performed in terms of situated learning theory, which treats learning as a social phenomenon that depends on social practices where knowledge is available. The case studies ask the questions: What forms of science and engineering are practiced? What meanings of science and scientist are produced? What relationships of power are organized here? How do women participate and fare here? The answers are compared with the answers traditionally associated with elite science. Chapter 7 is a discussion of the culture of gender neutrality found at these and other sites. Chapter 8 describes the cultural development of power structures. Chapter 9 is a too-brief discussion of the implications of these case studies potential for reforms in schools.

The case studies reveal some commonalities: the science is characterized by workers as relevant; the definition of how science is performed is broadly drawn; and there is more interaction with nonscientists than in typical elite scientific sites. However, the programs reviewed in these case studies typically offered lower pay scales, less job stability, and less status. Women were interested in and successful in science precisely when the activities encouraged broader, more flexible commitments of time, thought and energy than the "greedy" activities of elite science. They tend to be found in greater numbers when their activities are seen to be meaningful and relevant. As a colleague recently asked, "Who said that to be a good scientist you have to work 80 hours a week? Who set up that standard?"

continued from page 3

mesoscale structure in blends; deformation and flow of amorphous structures and bulk metallic glasses; emergence of nanoscale structure and self-assembly in soft materials; multiscale modeling, acceleration algorithms, and massively parallel simulation of soft materials; molecular dynamics, Monte Carlo, and time-dependent Ginzburg-Landau methods; computational materials science techniques, tools and applications to soft materials.

Dr. Glotzer is a recipient of the 1998 Presidential Early Career Award for Scientists and Engineers, the 1997 Department of Commerce Bronze Medal, a 1996 Senior Visiting Fellowship Award at the Centre for Chemical Physics,

The discourse on gender neutrality is defined by the authors as a social and cultural way of talking and acting about work, defining good work in terms which are agreed to be gender neutral, but which in fact confer legitimacy on women's contributions when they act like "prototypical" men. The working definition of gender neutral tends toward the definition created by the old establishment. It favors those who can follow the behavior described as "prototypically white male", fitting social and personal concerns around work responsibilities. This discourse on gender neutrality in these workplaces renders women's circumstances, such as the concern for safety issues or the need for childcare, invisible, irrelevant, or inappropriate for the workplace. When these needs are accommodated, they are often viewed as special treatment. Most women in the case studies dismissed this concern about gender neutrality as irrelevant, but the authors' observations indicate that most women, and those men who wish to assume "culturally female" roles such as childcare, are disadvantaged in such a system, either in their work life or in their personal life.

Current school reform theories suggest that relevance may be the key to motivation, but that practical problems are too complicated for the classroom. Yet solving practical, real world problems is precisely the type of science in which women are found to be most interested and successful. Studies have shown that the apparent lack of interest and ability in science is produced more consistently by unappealing school science than by the effects of socialized abilities or by overt gender discrimination. The authors conclude that reform efforts that focus on conventional methods and improve only content will fail because methods which stress abstract laboratory science without relevance or application will continue to alienate the students targeted by the reform effort. It is not enough to replace lectures with approximations of authentic practice. Schools should afford a time and place for learning more robust and complex understandings of science – the content and processes – and for learning to use science's strengths and limitations in debates about important social issues. They must not force people to choose between science and other activities.

Whether you agree with the conclusions of Eisenhart and Finkel, this book is an interesting and thought-provoking read.

University of Western Ontario, an NRC Postdoctoral Fellowship Award from 1993-1995, a TRW Graduate Fellowship Award from 1987-1992, and the 1986 Sigma Delta Epsilon Society of Graduate Women in Science Scholarship Award for Exceptional Promise in Science. Her first paper, written while an undergraduate in 1987, was in 1991 voted "One of the 50 Most Memorable Papers," published in the American Journal of Physics. Dr. Glotzer has served the APS Division of Computational Physics as a member of the Nomination Committee and in vice-chairing the Metropolis Award committee. She is also a member of MRS, ACS, AICHE, and AAAS.

For more information and a free copy of the Speakers List go to www.aps.org/educ/womenspeaker.html

The American Physical Society 1999-2000 Travel Grants for Women Speakers Program

The APS Committee on the Status of Women in Physics (CSWP) is pleased to announce that the "Travel Grants for Women Speakers" Program is entering its seventh year. This program is designed to increase the recognition of women physicists.



Purpose The program is intended to expand the opportunity for physics departments to invite women colloquium/seminar speakers who can serve as role models for women undergraduates, graduate students and faculty. The program also recognizes the scientific accomplishments and contributions of these women physicists.

Grant The program will reimburse U.S. colleges and universities for up to \$500 for travel expenses for one of two women colloquium/seminar speakers invited during the 1999-2000 academic year.

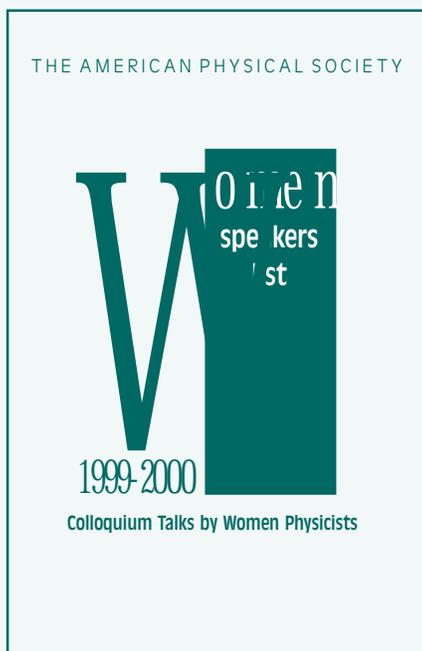
Qualifications All physics and/or science departments in the United States are encouraged to apply. Canadian and Mexican colleges and universities are also eligible, provided that the speakers they invite are currently employed by U.S. institutions. Invited women speakers should be physicists or in a closely related field, such as astronomy. Speakers should be currently in the U.S. The APS maintains the Women Speakers List which is available online (www.aps.org/educ/women-speaker.html) or from the APS. However, selection of the speaker need not be limited to this list. Neither of the two speakers may be a faculty member of the host institution.

Guidelines Reimbursement is for travel and lodging expenses only. Honoraria or extraneous expenses at the colloquium itself, such as refreshments, will not be reimbursed.

Application The Travel Grants for Women Speakers Application Form (www.aps.org/educ/women-app.html) should be submitted to APS identifying the institution, the names of the two speakers to be invited and the possible dates of their talks. Please note that funds for the program are limited. The Travel Grants for Women Speakers Application Form should be submitted as early as possible, even if speakers and dates are tentative, or if the speakers are scheduled for the spring semester. The application form will be reviewed by APS, and the institutions will be notified of approval or rejection of their application within two weeks. Institutions whose applications have been approved will receive a Travel and Expense Report Form to submit for reimbursement.

For Further Information: *Travel Grants for Women Speakers Program*

Attn: Arlene Modeste Knowles
The American Physical Society
One Physics Ellipse • College Park, MD 20740-3844
Tel: (301) 209-3232 • Fax: (301) 209-0865 • Email: travelgrant@aps.org



The 1999-2000 Women Speakers List (WSL) of Women in Physics (pictured to the left) is published by The American Physical Society. This list, compiled by the Committee on the Status of Women in Physics, contains the names of over 200 women physicists who are willing to give colloquium or seminar talks. The WSL serves as a resource for middle school, high school, university and general audiences. Information on the speakers is listed by state and by field for easy reference. To receive your free copy, please complete this form and return it to APS, or access the forms on-line (www.aps.org/educ/women-speaker.html.)

Name: _____

Institution: _____

Address: _____

City: _____

State: _____ Zip: _____

Phone: _____

Email: _____

Women Speakers List (WSL)

Enrollment/Modification Form 1999-2000

Additions/Modifications may also be made on the Internet at www.aps.org/educ/cslwip.html
An online copy of the WSL is available at www.aps.org/educ/women-speaker.html

The *Women Speakers List* is compiled by The American Physical Society Committee on the Status in Physics (CSWP). The list is updated continuously online and published each summer. Comments, questions and entries should be addressed to:

Women Speakers List · APS · One Physics Ellipse · College Park, MD 20740-3844 · (301) 209-3232

To enroll or update your current entry, please fill out this form completely and return it to the address above. Please print clearly or type.

Title/ Name Dr. Prof. Mrs. Ms. _____ **Date** _____

Institution _____ **Telephone** _____

Address _____ **Fax** _____

_____ **Email** _____

City _____ **State** _____ **Zip Code** _____

If you have moved out of state, list previous state: _____

New Entry **Modification**

For which audiences are you willing to speak? (Please check all that apply)

Middle school High school General Audiences Colloquium

To register a new title, give the title as you want it to appear in the left column below. Then check the section(s) where it is to be inserted. To delete a title, indicate the title and check the appropriate box below. A limit of four total entries will be imposed. You may use additional pages if you are submitting more than four modifications. **PLEASE TYPE OR PRINT LEGIBLY PAYING PARTICULAR ATTENTION TO FORMULAS. WE REGRET THAT WE ARE UNABLE TO INCLUDE ILLEGIBLE ENTRIES.**

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AMERICAN PHYSICAL SOCIETY

Committee on the Status of Women in Physics

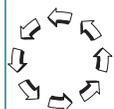
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