CSWP GAZETTE

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

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REPORT ON THE JANUARY 1988 CSWP SYMPOSIUM

In January the Committee on the Status of Women in Physics and the Committee on Opportunities in Physics presented a symposium on "Career Re-entry/Retraining: Opportunities for the Midlife Physicist in Transition" at the Joint Meeting of the American Physical Society (APS) and the American Association of Physics Teachers (AAPT). Joan S. Kowalski of George Mason University chaired the session and presented an overview of the topics to be discussed. According to Dr. Kowalski, the number of students between 18 and 22 years old will decline through the year 2000. Offsetting this decline are women returning to the work force, older students, and foreign students. The purpose of the symposium was to provide information that would aid these groups to establish or continue a career in physics.

Israel S. Jacobs of General Electric reviewed information about the job opportunities and workforce statistics pertinent to new and re-entrant midlife physicists. The statistics presented were based on surveys of members of APS and AAPT. Of these members, 5% of APS members are women vs. 7.5% of AAPT members. Dr. Jacobs first described the backgrounds of members of both organizations. Surveys show that APS members:

- hold Ph.D.s (89%),
- work for academic (42%) or industrial (31%) organizations,
- consider their primary work activity to be basic research (30%), teaching (20%), applied research (21%), design/development (11%), or administrative/other (18%),
- consider their field of work to be physics (71%), engineering (12%), or other science (12%).

AAPT members:

- hold as their highest degree, a Ph.D. (58%) or M.S. (35%),
- work for universities (33%), four-year colleges (18%), junior colleges (10%), secondary schools (25%),
- consider their primary work activity to be basic research (6%), teaching (73%), applied research (4%), design/development (8%), administrative/other (12%).

Areas of concern and factors affecting the demand, supply, and type of physics jobs available are as follows:

- fewer disadvantaged students are continuing their educations,
- 40% of physics graduate students are foreign students,
- relatively more women and minorities favor theoretical specialities than men,
- more experimental physics jobs are available than theoretical (79% of industrial jobs are experimental); experimental specialties having more jobs include condensed matter, atomic, molecular, optical, and plasma physics,
- only 57.9% of physics/astronomy graduates continue to work in physics or astronomy (low in comparison with other fields),
- the retention rate for physics subfields ranges from mathematical physics (26%) to medical physics/optics (91%),
- the median age of physicists is 45 (42 years of age for industry and 47 for university),
- a shortage of secondary physics teachers exists today,
- higher admission standards for universities have an adverse effect on the supply of physicists.

Current projections indicate that the overall demand for physicists should exceed supply in the 1990s. In general, the demand for physicists will be concentrated in experimental fields.

The second speaker was Marie Machacek of Northeastern University (N.U.) who described programs N.U. has for upgrading and retraining women and men for physics, chemistry, engineering, and information systems. The programs described were developed to address the declining and inadequate number of well-trained and skilled people available in the job market. To remedy this situation, Northeastern has focused more attention on older students and their needs.

The editor for this issue is Patricia M. Dehmer; assistant editor is Amy Halsted.

In This Issue:

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.

In the early 1980s, the National Science Foundation (NSF) funded a pilot program to facilitate women's entry into chemistry and physics. The program combined a set of refresher mini-courses in math and science with the usual university program. The pilot program was completed in 1983. Overall, the program was successful. All twenty-five people admitted to the program (out of 400 applicants) completed the requirements. Evaluation of the pilot found that the women tended to lack confidence after being out of school a few years and needed re-training in academic/study skills. In addition, they needed to budget their time and make family adjustments to meet the demands of the program. Participants possessed certain advantages. They had a high level of motivation, focused on goals, interacted well with faculty, and adjusted quickly to the demands of the program.

The curriculum was judged to have been flexible enough to meet individual needs, but the math and science refresher courses were too short. The program did provide valuable hands-on experience with computers, electronics, laboratory work, and design projects. One essential component of the program was the availability of financial aid. Career counseling was available to participants but was seldom used. Areas for improvement included standardization of requirements and improvement of job placement.

Additional programs exist to help men and women obtain advanced education in engineering and information systems. These programs were oriented toward meeting the needs of local business, and in the case of the information systems department included a work/study program.

Two women spoke about "What the Physicist in Transition Can Do for Herself." Jean Toth-Allen of George Mason University addressed re-entry issues. Dr. Toth-Allen had earned a Ph.D. in biophysics but left her field to raise a family when research money became scarce. Re-entry into physics was further delayed by job transfers relating to her husband's career.

After several years out of the job market, Dr. Toth-Allen's concerns included the currentness of her training, the difficulty in learning about job opportunities in her field, and the challenge of convincing an employer to hire someone who has been out of the job market. In her efforts to find a position in her field, Dr. Toth-Allen tried the traditional strategies of networking and job placement services.

The step she took that resulted in her current position at George Mason University was not a traditional one. Dr. Toth-Allen attended a job re-entry program offered in Fairfax County, Va. In this program, she was advised to attend a workshop at which she made a contact which led to part-time employment in the George Mason University Physics Department. The opportunity to get involved in teaching provided a good re-orientation to her field, helped her rebuild her confidence and eventually led to a permanent position with the school.

The final speaker discussed her experiences in making the transition to physics after having established a career in a different field. Margot Durrett of AT&T Bell Laboratories described how she arrived at the decision to go back to school and pursue a physics career. The decision-making process included the identification of personal and family goals, job opportunities, and career-related issues that determined her level of interest in physics, the sacrifices she was willing to make, and the risks she was willing to take. An important component to planning a physics career is to set short-term, intermediate, and long-term goals which are re-examined and adjusted as circumstances change.

Ms. Durrett described the steps she took and the help received from various sources. These included: researching information about physics careers in existing literature, speaking with physics professors and scientists who were willing to describe their experiences, and joining professional societies which provided a forum for meeting physicists and getting involved in the field.

Obstacles to making a mid-career transition to physics include the small number of women in physics, the difficulty of combining work and school, and the sense of isolation felt when taking courses part-time and not living on campus. Ms. Durrett ended by emphasizing the importance of career planning, setting goals, and periodically revising objectives to reflect changing circumstances.

The session on Re-entry and Retraining concluded with a reception which encouraged discussion between participants and members of the audience.

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LETTERS TO THE EDITOR

Dear Dr. Forman:

I am impelled to answer Laura M. Hinkelman's letter (December 1987)

because it is so important that women with a conscience *not* drop out of physics. One reason among others for the diversion of physics away from socially useful applications is the scarcity of physicists with a strong moral sense. Our culture of a war economy saddled by greed forces applications of science which Ms. Hinkelman cannot approve. Physics is not alone. Biology and chemistry serve military purposes; the space program has been diverted from its scientific goals, Star Wars consumes excessive amounts of money and scientific personnel. Even the great technology of television is used mainly for the stupifaction of the populace and the brutalization of children.

Recognition of all this need not lead to despair. Moral action *can* influence events. Television has its *Sesame Street,* biology its medical applications, chemistry its betterment of living. What one can do, as a physicist, depends on how quickly one wants to see results. In the same December issue there is an appeal for APS Congressional Scientist Fellows. Informed congressmen can help turn things around. Another worthwhile endeavor is helping the general public through education in physics, to judge issues in which their fate is involved. So is research in areas which defend the ecology, promote health, seek new energy sources. To stay in pure physics may be harder to defend, except that the better one's training, the more one's influence.

My generation of physicists was forced to grapple with this problem after Hiroshima. A few of us left physics; most stayed. Physicists then fought to keep atomic energy in civilian hands. Every physicist of conscience who leaves the field weakens the forces for good. Profound issues are at stake; they cannot be left to the indifferent and the unknowing.

Sincerely,
Selma Blazer Brody
Ph.D. 1942

19 April 1988

Dear Editor:

This is in response to a letter from Laura M. Hinkelman which appeared in the December 1987 issue of the *CSWP Gazette.* She expresses concern about the moral issues in certain physics jobs. For individuals who feel they would like to use their physics backgrounds to directly benefit humanity I believe the field of Medical Physics is worth serious consideration. This rapidly growing field needs dedicated people with strong physics backgrounds. There are research-type jobs that involve little direct communication with patients and other jobs that are strongly clinically oriented. Training in Medical Physics for people who already have physics degrees is available at a number of institutions, many of which advertise in *Physics Today.* Interested parties could contact the American Association of Physicists in Medicine at 335 East 45 St., New York, NY 10017.

Sincerely yours,
Dr. Arlene J. Lennox
Department Head
Fermilab Neutron Therapy Facility

25 February 1988

Dear Editor:

In response to the letter from Laura M. Hinkelman, "Careers in Physics: Ethical Choices," (Volume 7, Issue 4, December 1987), I would like to bring to her attention a publication by Professor Charles Schwarz of the University of California at Berkeley. Professor Schwarz has published a booklet, "Career Information for the Socially Responsible Physics Student" which might be useful to Laura and all of us who wrestle with the problem of guiding science and engineering students to careers that are compatible with their value choices. It is a publication that helps to inform people about the extent of military research in science and technology, even in academic institutions, and can be obtained from:

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Thank you.

Sincerely,
Indira Nair
Associate Department Head
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Carnegie-Mellon University
Pittsburgh, Pennsylvania

9 February 1988

Dear Editor:

Some time ago there was a suggestion in the *CSWP Gazette* that women who had left the workplace and later returned write of their experiences. I didn't get to it then, but recently I received an inquiry from a young (30) woman who had read the brief biography accompanying a paper on which I was a coauthor and wondered how I "did it." So I'm revising my response for you.

After receiving my M.S. in Physics I worked for ten years in the Solid State Division at the Naval Ordnance (now Surface Weapons) Laboratory and then left to be married. When I decided to go back to work after 18 years I considered several different things, but soon realized that something technical was the only field that I wouldn't find boring and would suit me. Local branches of companies like IBM and HP weren't interested so I concentrated on the Bureau of Standards since I had "status" (previous time) with the government. After nearly a year and frequent trips to the personnel office an opening turned up, there were hardly any openings for physicists during that time. Since neither they nor I really knew what I could do, I started in a temporary appointment at the same grade level at which I started after receiving my M.S.

There certainly had been a lot of developments since I resigned, in fact, the Josephson effect was discovered about the time I quit, and computers were just coming into general use. So there were lots of new things to learn. Although I haven't done very well with the theory of Josephson junctions and the associated cryoelectronic circuits, I do seem to get along well in the laboratory and that is what was, and still is, needed. I've learned to help design and layout patterns using a computer program, make masks, use photolithography and run vacuum systems to fabricate multilayer superconducting chips of a lot of different types of circuits. For the last several years I've worked on the new 1 volt voltage standard (and a 10 volt standard is coming along). I've also helped with testing on occasion. So it's been satisfying to be able to see things through from start to finish and, being the main person doing fabrication, my name has appeared on quite a few papers.

I've never worried about "equal rights," but actually, being a woman was some help in obtaining this job and retaining (thanks to EEO) my previous one when there was a large RIF. Even now I

would think women have an advantage if they leave the working world to stay home with their children as raising children is an acceptable reason for being "unemployed" for a sizable period of time. It also seems to me that if one has the inclination and education for scientific work that it is easy to "restart" though it may take some time to feel reestablished. I was asked several times if I minded doing something different than I had before, as it turns out, I like this work better. My only regret is that I haven't made more effort to understand the physics of this field, my math failed me and the lunchtime review course I took wasn't enough. Actually, though, I've had plenty to keep me busy. Now I'm planning to retire in about a year (after I sell my house!).

I do feel that I was fortunate to find a satisfying job I could do and to work with a very nice group of people who seem to appreciate my efforts (and have given me promotions).

I enjoy reading the *CSWP Gazette* and when I retire I will send you my new address in hopes that you will continue to send it.

Sincerely,
Frances L. Lloyd
National Bureau of Standards
Boulder, Colorado

12 January 1988

Dear Editor:

I was interested to read Barbara Wilson's report on the WISE conference in the November 1987 *Gazette,* in particular the comments by Leslie Parker of the Secondary Education Authority of Western Australia.

I suspect the U.S. is fortunate that, in attempting to increase the participation of girls and women in science, it has adopted a different approach to that outlined by Leslie Parker. The premise that the structure of science requires modification to accommodate the "interests and lifestyles" of women appears to be gaining credence among educationalists, but most women scientists I have spoken to have very little patience with the idea. The examples given by Leslie Parker to illustrate the "masculinized" structure of science do not appear to be inherently more appealing to one particular sex.

In my opinion, the major impediment to the full participation of girls in science at the tertiary level is the lack of appropriate grounding in high school. Girls still are not making the right subject choices early on, and recent changes to the high school system in Western Australia (which are designed to allow a much wider subject choice) will only exacerbate the situation. Girls do not give up science because they find the structure of science too masculine—they never take it up in the first place!

I believe the only way to overcome the apparent fear girls have of science is to increase their exposure to it, by making science (particularly physics and chemistry) and mathematics compulsory subjects in high schools. Then at least they will be able to make an informed decision about whether or not science is for them. It would also have the added benefit (in line with the stated aims of many governments) of increasing the scientific and technical literacy of the populace.

Yours sincerely,
Dr. Birgit Lohmann
Physics Programme
Murdoch University
Western Australia

17 February 1988

Dear Editor:

I am responding to your request for comments concerning companies arrangements for parental leave and child care. I think it is an excellent idea to collect and disseminate this information. Perhaps when we unite and become a strong voice more companies will be responsive to the needs of women scientists and engineers.

I work for Texas Instruments in Dallas, Texas. There is no company provision for day care. In fact, children under the age of 12 are not permitted on the work site. There is no company set paternity leave policy. Maternity leave is treated as a medical leave of absence. Up to eight weeks of leave, either totally or partially paid (depending on how long one has been with the company) are given. Time taken off before the birth of a child is regarded as personal leave and is unpaid. An employee is guaranteed a job of similar status, pay, and seniority on returning from a maternity leave.

There is some flexibility for professionals in the research laboratory in terms of the times which they come in and leave. A professional is pretty free to come in any time between 7 and 9 a.m. and leave anytime between 4 and 6 p.m. In production and manufacturing areas, professionals have the flexibility of perhaps finding a position on a different work shift. In this way, a mother and a father could work on different shifts and therefore limit the need for paid child care.

In general, my experience has been that industry is fairly slow to respond to the needs of women scientists and engineers. This is largely because while there is an increasing number of women engineers and scientists employed by industry, most women are congregated in low entry-level positions and not in managerial or policy-making positions.

I would be very interested in learning how other women engineers and scientists respond to this question. I understand that CATALYST has compiled quite a bit of information on employees who provide on-site and off-site day care benefits.

Name withheld by request.

THE BOTTOM LINE

Last February CSWP received the following letter from a valiant woman physics student, who ran into a Catch-22 in pursuing her studies:

"I am currently enrolled as a physics major at —— State University. I am a returning adult student, being of age 40. At present I have junior status. Last year I received an Honors Scholarship for the sum of $1000. I so far have been able to maintain all A's. One of the conditions I must meet in order to retain the scholarship is to carry a minimum of 25 semester hours a year. I have found this impossible to do, and continue to do the quality of work I am capable of. I am married and have three children still at home and must drive a good distance to campus. Trying to make all of this work has proved to be unrealistic. I therefore must cut back my course load to 10 hours this semester. Of course this means I will forfeit my scholarship. I am hoping there is money available to me from other sources my college financial aid office is not aware of. My plan is to continue on to graduate work, but I feel I must pace myself reasonably so as not

(*continued on page 5*)

PHYSICS COLLOQUIUM SPEAKERS LIST

compiled by the

COMMITTEE ON THE STATUS OF WOMEN IN PHYSICS

April 24, 1988

Sec. I: **Speakers by geographic area, with address and phone numbers.**

Sec. II: **Talk titles by physics subfield, with speakers' names and affiliations.**

I. PHYSICS COLLOQUIUM SPEAKER INFORMATION, 1988/1989

This first section lists speakers, with addresses and phones, by geographic area (alphabetically within each subsection), together with references to the sections where talk titles appear. The '*' identifies those listed in the section for GENERAL AUDIENCES. The section abbreviations in brackets are used for reference in the second section.

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ENVIRONMENTAL & ENERGY PHYSICS

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ASTROPHYSICS

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CHEMICAL AND STATISTICAL PHYSICS
CONDENSED MATTER PHYSICS

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INTERFACE AND DEVICE PHYSICS

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CONDENSED MATTER PHYSICS
INTERFACE AND DEVICE PHYSICS
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*Dr. Bel Campbell
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CHEMICAL AND STATISTICAL PHYSICS

Prof. Mary Beth Stearns
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*Dr. Renee D. Diehl
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II. COLLOQUIUM TITLES BY FIELD

This second section lists the speakers and titles, grouped by physics subfield and alphabetically by speaker within each group. Refer to the first section for address and phone information on the speakers. The two-character abbreviation after each name refers to a geographic region in the first section.

ASTROPHYSICS

Dr. Sheila Bailey, NASA [MW]
1. Advances in photovoltaics
2. Space photovoltaics

Dr. Bonnie J. Buratti, Caltech/JPL [SW]
1. The icy satellites of Jupiter and Saturn
2. The Mars observer mission: Return to the red planet

Dr. Bel Campbell, Univ. of NM [SW]
1. Disks and jets in star formation

Dr. Lynn R. Cominsky, Sonoma State Univ. [SW]
1. Discovery of eclipses from an x-ray burst source
2. X-ray and x-ray reprocessing
3. The extreme ultra-violet explorer satellite

Dr. Carol Jo Crannell, NASA [EC]
1. Imaging high-energy emissions from solar flares
2. Using balloon-borne platforms for observations of solar flares
3. The physics of high-energy solar processes in solar flares

Dr. Katherine Freese, UCSB [SW]
1. Fundamental physics and dark matter
2. Baryogenesis: An explanation of the matter/antimatter content of the universe
3. Magnetic Monopoles and cosmology

Dr. Martha P. Haynes, Cornell Univ. [NE]
1. Extragalactic sociology: Environmental effects on galaxy evolution
2. Large-scale structure in the universe

Dr. Christine Jones, Harvard [NE]
1. Hot Gas in early type galaxies
2. Einstein x-ray images of the structure of clusters of galaxies

Dr. Karie Meyers, Occidental College [SW]
1. Variability in Seyfert Galaxies

Dr. Nancy D. Morrison, U. of Toledo [MW]
1. The fundamental properties of massive stars

Dr. Anneila Sargent, Caltech [SW]
1. Star formation
2. Millimeter wave interferometry of star-forming regions

Dr. Virginia Trimble, USC [SW]
1. Existence and nature of dark matter in the universe
2. Supernova: Bigger and better bangs
3. A field guide to the binary stars

BIOLOGICAL AND MEDICAL PHYSICS

Dr. Beverly S. Cohen, NYU Med. Ctr [NE]
1. Deposition of ultrafine particles on the human tracheobronchial tree: A determinant of the dose from radon daughters
2. Sampling airborne particles for estimation of inhalation exposure

Dr. Suzanne Gronemeyer, Siemens Med. Sys. [MW]
1. Clinical magnetic resonance imaging

Dr. Arlene J. Lennox, [MW]
1. Neutrons against cancer: The clinical experience at Fermilab

Dr. Carmay Lim, Harvard [NE]
1. Enzyme catalysis: Mechanism of ribonuclease A

Prof. Eugenie V. Mielczarek, George Mason U. [EC]
1. Iron transport and storage compounds in living systems: Mossbauer spectroscopy

Prof. Geraldine L. Richmond, Univ. of OR [NW]
1. The spectroscopy of metal ions bound to proteins and polymers

Dr. Petra Schmalbrock, Ohio State [MW]
1. Magnetic resonance imaging and spectroscopy
2. Investigations of flow with magnetic resonance
3. Pulse sequence development for magnetic resonance imaging

Dr. Sara A. Solla, AT&T [NE]
1. Statistical mechanics of neural networks

Dr. Audrey V. Wegst, [MW]
1. Medical physics in diagnostic radiology
2. Quality control in nuclear medicine and diagnostic radiology
3. Placental transfer of radionuclides and fetal radiation dose

CHEMICAL AND STATISTICAL PHYSICS

Dr. Nancy J. Brown, Lawrence Berkeley Lab. [SW]
1. Theoretical and experimental chemical kinetics
2. Energy transfer

Dr. Sandra C. Greer, Univ. of MD [EC]
1. Chemical reactions and critical points
2. Equilibrium polymerization as a phase transition

Dr. Juliette W. Ioup, Univ. of New Orleans [SE]
1. The always-convergent iterative technique of deconvolution

Dr. Marsha I. Lester, Univ. of PA [EC]
1. Photodissociation and photoionization of van der Waals complexes

Dr. Carmay Lim, Harvard [NE]
1. Nonequilibrium effects in chemical kinetics
2. Dynamics of gas-surface interactions

Dr. Susan R. McKay, Univ. of ME [NE]
1. The random field problem: Phase diagrams and thermodynamics
2. Spin glasses and chaos
3. Renormalization group methods and exactly-solvable models of phase transitions

Dr. Kathie Newman, Notre Dame [MW]
1. Ordering transitions in semiconductors

Dr. Roberta P. Saxon, [SW]
1. Theoretical studies of multiphoton processes

Prof. Jodye Selco, Univ. of Redlands [SW]
1. Spectroscopy and kinetics of transient species

Dr. Sara A. Solla, AT&T [NE]
1. A statistical mechanics approach to optimization problems
2. Statistical mechanics of neural networks

CONDENSED MATTER PHYSICS

Prof. Jill C. Bonner, Univ. of RI [NE]
1. Spin-Peierls transitions
2. Quantum effects in spin dynamics

Dr. Meera Chandrasekhar, Univ. of MO [MW]
1. Quantum wells under hydrostatic pressure

Dr. Shirley Chiang, IBM [SW]
1. Scanning tunnelling microscopy of metals on semiconductors
2. Atomic force microscopy

Dr. Deborah D. L. Chung, SUNY [NE]
1. Intercalation and exfoliation of graphite
2. Carbon composites
3. Structure of metal contacts to GaAs

Dr. Esther Conwell, Xerox [NE]
1. Solitons and polarons in polyacetylene
2. Differences between one- and three-dimensional semiconductors
3. Metal-insulator transition in doped trans-polyacetylene

Dr. Denice Denton, Univ. of Wisconsin [MW]
1. Effects of moisture on the electrical properties of polyimide films

Dr. Stephanie B. DiCenzo, AT&T [NE]
1. Photoelectron spectroscopy of supported metal clusters: The molecular-metallic transition

Dr. Renee D. Diehl, Univ. of Liverpool [FO]
1. LEED studies of alkali metals adsorbed on transition metals

Dr. Flonnie Dowell, Los Alamos [SW]
1. Molecular modeling of complex materials
2. New phase and molecule predictions for partially-ordered chains

Dr. Mildred Dresselhaus, MIT [NE]
1. Intercalation and superlattices
2. Liquid carbon

Dr. Georgia Fisanick, AT&T [NE]
1. Periodic Structures in laser-materials interactions

Dr. Judy R. Franz, West Virginia Univ. [EC]
1. Do Coulomb gaps exist?
2. Metal-nonmetal transitions in expanded liquid mercury

Dr. Laura H. Greene, Bellcore [NE]
1. High Tc oxide superconductors
2. Heavy fermion (CeCu6)/Nb multilayers: Proximity effects
3. Metallic superlattices

Prof. Judith Herzfeld, Brandeis Univ. [NE]
1. Liquid crystalline phases in reversible assembling systems: Nonideality and growth

Dr. Juliette W. Ioup, Univ. of New Orleans [SE]
1. Orthogonality of measured normal modes in underwater acoustics

Dr. Deborah Jackson, Hughes Research [SW]
1. Teaching old atoms new tricks
2. Interference effects between different optical harmonics

Dr. Shirley A. Jackson, AT&T [NE]
1. Magnetic polarons in diluted magnetic semiconductor superlattices
2. Zone-folding and quasi-direct optical transitions in semiconductor superlattices
3. Excitonic magnetic polaron effects in stressed diluted magnetic semiconductors

Dr. Barbara A. Jones, Harvard [NE]
1. The two-impurity Kondo model: Numerical renormalization group study

Dr. Kathleen Kash, Bellcore [NE]
1. Optical properties of microstructures

Prof. Jacqueline Krim, Northeastern Univ. [NE]
1. Wetting and nonwetting of solid rare-gas films on metal and graphite surfaces

Dr. Rosemary A. MacDonald, NBS [EC]
1. Thermophysical properties of cubic metals
2. Heat capacity of coal

Dr. Susan R. McKay, Univ. of ME [NE]
1. The random field problem: Phase diagrams and thermodynamics
2. Spin glasses and chaos
3. Renormalization group methods and exactly-solvable models of phase transitions
4. Phase diagrams and models of chalcogens adsorbed on nickel surfaces

Dr. Laurie E. McNeil, Univ. of NC [EC]
1. Delight in disorder: Structural studies of chalcogenide glasses

Dr. Patricia M. Mooney, IBM [NE]
1. Deep level defects in III-V semiconductors
2. DX centers in III-V semiconductor alloys
3. Influence of DX centers on heterojunction device characteristics

Dr. Cherry A. Murray, AT&T [NE]
1. Surface enhanced Raman scattering
2. Colloidal crystals
3. Two-stage melting in two-dimensional colloidal crystals

Prof. Gertrude F. Neumark, Columbia Univ. [NE]
1. Luminescence characterization of materials: ZnSe
2. Properties and role of alkalai metal impurities in ZnSe

Dr. Kathie Newman, Notre Dame [MW]
1. Ordering transitions in semiconductors

Dr. Marjorie Olmstead, UCB [SW]
1. Formation of the interface between a polar insulator and a non-polar semiconductor
2. Initial stages of semiconductor interface formation

Dr. Mary Jo Ondrechen, Northeastern Univ. [NE]
1. Predicting the spectroscopic properties of discrete mixed-valence systems

Dr. Carmen Ortiz, IBM [SW]
1. Physics of magnetic thin films

Dr. Elga Pakulis, IBM [NE]
1. Electronic phase transitions in a semiconductor heterojunction
2. Optically-detected cyclotron resonance studies of semiconductors

Dr. Talat S. Rahman, Kansas St. Univ. [MW]
1. Dynamics of ordered overlayers on metals
2. Surface reconstruction and surface phonon dispersion - a lattice dynamical study
3. Surface lattice dynamics and electron energy loss spectroscopy

Prof. Geraldine L. Richmond, Univ. of OR [NW]
1. Nonlinear optics as a probe of solid/liquid interfaces

Dr. Lynn F. Schneemeyer, AT&T [NE]
1. High temperature superconductors

Prof. Mary Beth Stearns, Ariz. St. Univ. [SW]
1. Origin of magnetism in 3D metals
2. Structural and magnetic behavior of multilayered films

Dr. Judith A. Todd, USC [SW]
1. Microstructure-mechanical property relationships in advanced structural materials

Dr. Gwo-Ching Wang, RPI [NE]
1. Two-dimensional phase transitions studied by low-energy electron diffraction

Dr. Alice E. White, AT&T [NE]
1. Mesotaxy: Single-crystal growth of buried silicide layers by ion implantation
2. Mechanisms of formation of buried oxide layers by ion implantation

Dr. Barbara A. Wilson, AT&T [NE]
1. Novel semiconductor heterostructures
2. Optical properties of heteroepitaxial III-V and II-VI materials
3. Recombination mechanisms in Type II heterostructures

Dr. Jane E. Zucker, AT&T [NE]
1. Spectroscopy of excitons and phonons in quantum wells
2. Nonlinear optics below the band edge in quantum wells

ENVIRONMENTAL & ENERGY PHYSICS

Dr. Nancy J. Brown, Lawrence Berkeley Lab. [SW]
1. Combustion-generated air pollutants

Prof. Janice Button-Shafer, Univ. of MA [NE]
1. Physicists' views of the strategic defense initiative

Dr. Beverly S. Cohen, NYU Med. Ctr [NE]
1. Deposition of ultrafine particles on the human tracheobronchial tree: A determinant of the dose from radon daughters
2. Sampling airborne particles for estimation of inhalation exposure

Dr. Joanne K. Fink, Argonne [MW]
1. Characterization of fission products released from experiments that simulate hypothetical severe reactor accidents
2. The final stage of a postulated reactor meltdown: Interaction of a molten core with concrete

Dr. Luisa F. Hansen, Lawrence Livermore [SW]
1. Neutron and gamma-ray transport through materials of interest to fusion reactors

B. K. Lunde, [MW]
1. Capital costs of building design

Dr. Rosemary A. MacDonald, NBS [EC]
1. Heat capacity of coal

FLUID AND PLASMA PHYSICS

Dr. Mary L. Brake, Univ. of MI [MW]
1. Unusual light emission in relativistic electron beam pumped gases

Dr. Martha H. Redi, Princeton [NE]
1. Transport simulations of TFTR experiments
2. Transport simulations of pellet injection on TFTR, ASDEX, and ALCATOR-C

Dr. Helen L. Reed, Arizona St. Univ. [SW]
1. Stability and transition of laminar viscous flows

GEOPHYSICS

Dr. Prabha Durgapal, Welex [SW]
1. An analytic model for electromagnetic wireline tools for geophysical exploration

Dr. Juliette W. Ioup, Univ. of New Orleans [SE]
1. Inversion of seismic data using Fourier coefficients
2. The modified image method for airborne electromagnetics

Dr. Sara A. Solla, AT&T [NE]
1. A scaling model for crack propagation and fracture

INTERFACE AND DEVICE PHYSICS

Dr. Susan D. Allen, Univ. of Iowa [MW]
1. Laser deposition and etching
2. Laser induced desorption analysis of surface defects and contamination

Dr. Sheila Bailey, NASA [MW]
1. Advances in photovoltaics

Dr. Meera Chandrasekhar, Univ. of MO [MW]
1. Quantum wells under hydrostatic pressure

Dr. Shirley Chiang, IBM [SW]
1. Scanning tunnelling microscopy of metals on semiconductors
2. Atomic force microscopy

Dr. Deborah D. L. Chung, SUNY [NE]
1. Structure of metal contacts to GaAs

Dr. Mildred Dresselhaus, MIT [NE]
1. Intercalation and superlattices

Dr. Laura H. Greene, Bellcore [NE]
1. Heavy fermion
2. Cu6)/Nb multilayers: proximity effects
3. Metallic superlattices

Dr. Deborah Jackson, Hughes Research [SW]
1. Lightwave technology

Dr. Shirley A. Jackson, AT&T [NE]
1. Magnetic polarons in diluted magnetic semiconductor superlattices
2. Zone-folding and quasi-direct optical transitions in semiconductor superlattices

Dr. Kathleen Kash, Bellcore [NE]
1. Optical properties of microstructures

Prof. Jacqueline Krim, Northeastern Univ. [NE]
1. Wetting and nonwetting of solid rare-gas films on metal and graphite surfaces

Dr. Carmay Lim, Harvard [NE]
1. Dynamics of gas-surface interactions

Dr. Patricia M. Mooney, IBM [NE]
1. Influence of DX centers on heterojunction device characteristics

Dr. Cherry A. Murray, AT&T [NE]
1. Surface enhanced Raman scattering
2. Two-stage melting in two dimensional colloidal crystals

Dr. Marjorie Olmstead, UCB [SW]
1. Formation of the interface between a polar insulator and a non-polar semiconductor
2. Initial stages of semiconductor interface formation

Dr. Carmen Ortiz, IBM [SW]
1. Physics of magnetic thin films
2. Physics of thin films for optical storage

Dr. Elga Pakulis, IBM [NE]
1. Electronic phase transitions in a semiconductor heterojunction

Dr. Talat S. Rahman, Kansas St. Univ. [MW]
1. Dynamics of ordered overlayers on metals
2. Surface reconstruction and surface phonon dispersion - a lattice dynamical study
3. Surface lattice dynamics and electron energy loss spectroscopy
4. Dynamics of associative desorption of hydrogen from metal surfaces

Prof. Geraldine L. Richmond, Univ. of OR [NW]
1. Nonlinear optics as a probe of solid/liquid interfaces

Prof. Mary Beth Stearns, Ariz. St. Univ. [SW]
1. Structural and magnetic behavior of multilayered films

Dr. Gwo-Ching Wang, RPI [NE]
1. Two-dimensional phase transitions studied by low-energy electron diffraction
2. Kinetics of 2D ordering studied by high resolution low energy electron diffraction
3. Growth of large lattice mismatch metal-semiconductor heteroepitaxy thin films by MBE

Dr. Margaret H. Weiler, Raytheon [NE]
1. Semiconductor devices for high frequencies

Dr. Alice E. White, AT&T [NE]
1. Mesotaxy: Single-crystal growth of buried silicide layers by ion implantation
2. Mechanisms of formation of buried oxide layers by ion implantation

Dr. Barbara A. Wilson, AT&T [NE]
1. Novel semiconductor heterostructures
2. Optical properties of heteroepitaxial III-V and II-VI materials
3. Recombination mechanisms in Type II heterostructures

Dr. Jane E. Zucker, AT&T [NE]
1. Spectroscopy of excitons and phonons in quantum wells
2. Nonlinear optics below the band edge in quantum wells

MOLECULAR AND POLYMER PHYSICS

Dr. Flonnie Dowell, Los Alamos [SW]
1. Molecular modeling of complex materials
2. Molecular theories for polymers
3. New phase and molecule predictions for partially-ordered chains

Dr. Sandra C. Greer, Univ. of MD [EC]
1. Equilibrium polymerization as a phase transition

Dr. Sonja Krause, RPI [NE]
1. Elastic small-angle neutron scattering of multi-block copolymers and crosslink labeled gels
2. Equilibrium thermodynamics of homogeneous and microphase separated block copolymers

Prof. Geraldine L. Richmond, Univ. of OR [NW]
1. The spectroscopy of metal ions bound to proteins and polymers

NUCLEAR AND PARTICLE PHYSICS

Prof. Karen Barad, Barnard College [NE]
1. Numerical simulations of quantum chromodynamics

Dr. Eva Bozoki, Brookhaven [NE]
1. Synchrotron radiation and its use

Prof. Janice Button-Shafer, Univ. of MA [NE]
1. Utilization of polarized targets and polarized beams in nuclear and particle physics

Dr. Ling-Lie Chau, Brookhaven [NE]
1. Frontiers of particle physics

Prof. Jolie A. Cizewski, Rutgers Univ. [NE]
1. Symmetry in heavy nuclei
2. Onset of deformation in heavy nuclei

Dr. Bunny C. Clark, Ohio State Univ. [MW]
1. Relativistic effects in nuclear physics

Dr. Luisa F. Hansen, Lawrence Livermore [SW]
1. Microscopic optical model potentials in the analysis of nucleon-nucleus scattering
2. The transport of 14-MeV neutrons through materials of interest to fusion reactors

Dr. Gail G. Hanson, SLAC [SW]
1. Physics of the neutral weak vector boson Z0

Dr. Lorella M. Jones, Univ. of IL [MW]
1. Quark and gluon jets - traces of color in a colorless world

Dr. Deborah A. Konkowski, [SW]
1. The nature of singularities in general relativity
2. Equivalent Lagrangians in physics

Prof. June L. Matthews, MIT [NE]
1. Probing the nucleus with high-energy photons
2. How many nucleons does it take to scatter a pion?

Dr. Marilyn E. Noz, NYU [NE]
1. Group theoretical examples in relativistic quantum mechanics
2. Local area networks in an imaging environment

Dr. Sathyavathi Ramavataram, Brookhaven [NE]
1. Nuclear shell models
2. Continuum theories of nuclear reactions
3. Polarization phenomena in nuclear reactions
4. Model calculations at intermediate and high energies

Dr. Elizabeth A. Rauscher, Tecnic Research [SW]
1. S-matrix of decay in light and heavy elements
2. Cosmology models, strings, and particle physics

Dr. Junko Shigenitsu, Ohio State [MW]
1. Uses of lattices in elementary particle physics

Dr. Julia A. Thompson, U. of Pittsburgh [EC]
1. Direct photon production at the CERN ISR
2. Anomalous electron production at low transverse momentum
3. Relativistic heavy ions and close-packed quarks
4. Direct Υs: Shedding light on quarks and gluons-a review of present knowledge

Dr. Reeta Vyas, Univ. of Arkansas [SE]
1. Two-body effects in photodisintegration of deuteron and triton
2. A trip to nuclear world. (for undergraduate students.)
3. Delay time distribution of quantum fields

Dr. Sallie A. Watkins, [MW]
1. The beta ray work of Lise Meitner

TALKS FOR GENERAL AUDIENCES

Dr. Sheila Bailey, NASA [MW]
1. Solar power in space

Prof. Karen Barad, Barnard College [NE]
1. Quarks and supercomputers

Dr. Eva Bozoki, Brookhaven [NE]
1. Synchrotron radiation and its use

Dr. Mary L. Brake, Univ. of MI [MW]
1. Plasmas that glow in the dark

Dr. Bonnie J. Buratti, Caltech/JPL [SW]
1. The exploration of Mars
2. Voyager encounters Jupiter and Saturn
3. Rendezvous with a comet

Prof. Janice Button-Shafer, Univ. of MA [NE]
1. The Strategic Defense Initiative - physicists' views

Dr. Bel Campbell, Univ. of NM [SW]
1. Star formation: The sound and the fury
2. Does astronomy matter?

Dr. Shirley Chiang, IBM [SW]
1. The scanning tunnelling microscope: A microscope that sees atoms

Dr. Deborah D. L. Chung, SUNY [NE]
1. Aerospace materials
2. Carbon
3. Ceramics

Dr. Beverly S. Cohen, NYU Med. Ctr [NE]
1. The radon problem: An overview

Dr. Lynn R. Cominsky, Sonoma State Univ. [SW]
1. X-ray visions from the edges of the universe - black holes and quasars

Dr. Denice Denton, Univ. of Wisconsin [MW]
1. The fundamental aspects of microfabrication of integrated circuits

Dr. Renee D. Diehl, Univ. of Liverpool [FO]
1. Physics education in Britain

Dr. Suzanne Gronemeyer, Siemens Med. Sys. [MW]
1. Clinical magnetic resonance imaging

Dr. Martha P. Haynes, Cornell Univ. [NE]
1. Extragalactic sociology: Environmental effects on galaxy formation
2. Large-scale structure in the universe

Dr. Caroline L. Herzenberg, Argonne [MW]
1. Women scientists and engineers of antiquity and the Middle Ages

Dr. Sonja Krause, RPI [NE]
1. Introduction to polymers

Dr. Arlene J. Lennox, [MW]
1. Neutrons against cancer: The clinical experience at Fermilab
2. A woman's career in physics

B. K. Lunde, [MW]
1. Use of fiber optics by the telephone company
2. Development and marketing of a technical product

Dr. Elizabeth A. Rauscher, Tecnic Research [SW]
1. Nature and the art of photography
2. Ambient superconductors: Are they for real?

Dr. Petra Schmalbrock, Ohio State [MW]
1. The basics of magnetic resonance imaging and spectroscopy

Dr. Lynn F. Schneemeyer, AT&T [NE]
1. High temperature superconductors

Dr. Judith A. Todd, USC [SW]
1. The earliest metals smelting in Europe
2. Studies of the African Iron Age

Dr. Virginia Trimble, USC [SW]
1. Cosmology: Man's place in the universe
2. Your lucky stars: An introduction to stellar evolution

Dr. Reeta Vyas, Univ. of Arkansas [SE]
1. A trip to nuclear world. (For undergraduate students.)

Dr. Sallie A. Watkins, [MW]
1. A woman's place in early twentieth century physics
2. Two discoveries, two responses
3. The making of a physicist: Lise Meitner

Dr. Audrey V. Wegst, [MW]
1. Experiences in the developing countries using nuclear medicine: 2 years with the IAEA

Dr. Alice E. White, AT&T [NE]
1. Materials modification using ion beams

Dr. Barbara A. Wilson, AT&T [NE]
1. Women in physics: An international perspective

The PHYSICS COLLOQUIUM SPEAKERS LIST is compiled annually by the American Physical Society Committee on the Status of Women in Physics. Comments or questions on the 1988/89 CSL should be addressed to Ken Lyons, AT&T Bell Laboratories, 1A126, 600 Mountain Ave., Murray Hill, NJ 07974.

To modify an existing entry, or to make a new one, please complete a copy of the form on the back of this page and return to Ken Lyons at the address given there.

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To cancel a listed talk, give the title as it appears in the list and the section(s) where it is to be cancelled. If you wish to delete all old entries, just enter "ALL", and register the new titles in the next section. Use an additional sheet if necessary:

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1. ☐ CORRECTION

☐ Astrophysics ☐ Bio/Medical ☐ Chem/Statistical
☐ Cond. Matter ☐ Env/Energy ☐ Fluid/Plasma
☐ Geophysics ☐ Interface/Device ☐ Molec/Polymer
☐ Nuclear/Particle ☐ Talks for General Audiences

Title
2. ☐ CORRECTION

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Title
3. ☐ CORRECTION

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Title
4. ☐ CORRECTION

☐ Astrophysics ☐ Bio/Medical ☐ Chem/Statistical
☐ Cond. Matter ☐ Env/Energy ☐ Fluid/Plasma
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☐ Nuclear/Particle ☐ Talks for General Audiences

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to sacrifice my health, grades, or the quality of my family life. The loss of the scholarship is going to cause great financial stress. If your organization can point me in any direction for resources I would be very thankful."

Fortunately, in a subsequent letter, we learned that her financial aid office changed the title of her scholarship, and it is secure through next year. She writes:

"I thoroughly enjoyed the reading material you sent me along with the contact names and addresses. It is very gratifying to know there is such an active support group. There are many days when I think I am pursuing a lost cause. I am concerned at times about my age and how far I have to go. I wonder often if and when I finally do achieve the degree I long for, will there be a place for me in the physics community? Perhaps there is information your group can give me that will allow me hope. It is a huge undertaking but I feel compelled to go on. To stop is not an alternative.

"I wonder though, how many others are in the situation I was in and are unable to find a solution?"

Her question is sobering, and her situation is disturbing to anyone concerned with the status of women in physics. The *Gazette* welcomes comments and suggestions, from those who are or have been in similar situations.

APS COUNCIL ADOPTS STATEMENT ON DEMEANING GRAPHIC MATERIAL IN THE WORKPLACE

In response to an initiative from the CSWP, the APS Council adopted the following statement on the display of demeaning graphic material in the workplace. While the statement has no regulatory force, it offers support to individuals who wish to take a stand on the display of sexually offensive material in the work environment.

"The Council of the American Physical Society has long been concerned with the serious underrepresentation of women and minorities in the profession of physics and, over the years, has established a number of programs that attempt to counter this trend. The Council now urges each member of the Society to help in this effort by being sensitive to all matters that affect the atmosphere of the physics workplace.

"In particular, actions that create a hostile, intimidating, or offensive work environment for any group undermine the affirmation action efforts of the Society and should be eliminated. These actions include the public posting of materials that are insulting, derogatory, or exclusionary to a particular group.

"We call upon all members of the Society to help ensure that persons of every race, gender, and ethnic origin may feel a welcome part of the physics community."

1988 LAURA EISENSTEIN AWARD

The Laura Eisenstein Award was established in 1986 by the Department of Physics of the University of Illinois at Urbana-Champaign, in cooperation with the CSWP, to encourage women to undertake studies leading toward a degree in physics. The award recognizes a University of Illinois woman who has achieved academic excellence in undergraduate studies or who has distinguished herself in teaching or research while pursuing a graduate degree.

This year's recipient is Julie A. Borchers, a graduate student who has distinguished herself in her thesis research as well as in her course work. According to her advisor, Professor M. B. Salamon, she has eight papers to her credit and has done a superb job at the National Bureau of Standards where she has conducted neutron scattering experiments on superlattices.

CSWP joins the University of Illinois in congratulating Ms. Borchers, and recognizes her potential of becoming an outstanding physicist.

GRADUATE OPPORTUNITIES FOR WOMEN

Dear Colleague:

The University of California, Santa Barbara, is actively recruiting and offering financial support for women seeking graduate degrees in the fields of mathematics, the physical sciences, and engineering. The Graduate Division at UCSB is firmly committed to increasing the quality and quantity of female graduate students in these disciplines and has various fellowships and financial assistance available for qualified women.

If you are seeking information on strong graduate programs in these areas, we will be pleased to offer any assistance necessary. We can facilitate the application process and act as referrals for individual departments. Questions may be directed to Karen Nelson, Director of Graduate Admission, (805) 961-4342, or Dorothy Nagaran, Affirmative Action Coordinator, (805) 961-3803. Write to Graduate Division, Cheadle Hall, University of California, Santa Barbara, CA 93106.

Richard Duran
Associate Dean
UCSB, Graduate Division

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*The Questionnaire is also printed in the APS Membership Directory

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