

IEEE WIE DECEMBER 1998 NEWSLETTER

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IEEE BOARD OF DIRECTORS ELECTIONS RESULTS

The IEEE Assembly has elected members of the IEEE Board of Directors for 1999 during the meeting of the Assembly and the Board in New Brunswick, NJ

Re-elected for their second one-year term were Arthur Winston, vice president, Educational Activities and Daniel Benigni, vice president, Regional Activities.

Newly elected IEEE Board members are Lloyd "Pete" Morley -- vice president, Publishing Activities; Donald Loughry, vice president, Standards; Maurice Papo, secretary; and David Conner, treasurer. The officers will begin their term on 1 Jan 1999 led by 1999 IEEE President Kenneth Laker.

The IEEE Board of Directors has nominated four candidates for 1999 President-Elect. They are Raymond D. Findlay, professor of electrical and computer engineering, McMaster University, Hamilton, Ontario; Lloyd "Pete" Morley, professor of electrical engineering, University of Alabama; Edward A. Parrish, President, Worcester Polytechnic Institute, Worcester, Mass.; and Joel B. Snyder, consulting engineer, Snyder Associates, Plainview, N.Y., and senior industry professor, Polytechnic University, Brooklyn, N.Y.

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WIE RECEPTION AT IEEE TECHNICAL CONFERENCE
**IEEE IDEM CONFERENCE, Tuesday, 8 December 1998

There will be a Networking Gathering for Women on Tuesday, 8 December 1998 from 5:30 PM to 7:30 PM at Union Square 322, San Francisco Hilton & Towers, San Francisco, California. The room will be announced at the Conference Registration Desk.

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IEEE THE INSTITUTE COLUMN:
NEXT CHALLENGE: ENOUGH ENGINEERS BY DIANA BENDZ

Since the beginnings of recorded history, we humans have shown a determination to solve problems, move mountains, or go where no one's been. From rolling the first wheel many millennia ago to roving on Mars just last year, every technical achievement has had a dreamer or two behind it with the will to see it through.

IMPACT IS EVERYWHERE--Today we call such dreamers engineers, and their impact is all around us. The pyramids, Great Wall of China, Panama Canal, Chunnel-- these are astounding feats of engineering on a grand scale. But many engineering marvels are so common today we take them for granted. Every time you access a chat room, take a flight, microwave popcorn, or slip on your high-tech sneakers, you can thank engineers who saw an opportunity, dreamed big and then went to work.

But as we approach the next century, engineering in the U.S. is facing an acute challenge: a very real shortage of young people heading into college engineering. Today, the U.S. employs nearly two million engineers, making it the second largest profession behind teaching. However, it is believed we will need another million engineers by the year 2005.

The Information Technology (IT) industry demonstrates the problem's severity. A recent survey of mid- and large-size U.S. companies by the Information Technology Association of America concluded an astounding 346,000 IT jobs remain unfilled in this country due to a shortage of qualified workers. According to the U.S. Department of Commerce, our country alone will require an average of 95,000 new computer scientists, engineers, analysts and programmers each year for the next seven years. Yet as of the mid-1990s, our four-year education system was producing just over a quarter of that target.

DISTURBING TRENDS. For women and minorities, trends are equally disturbing. For example, women account for only 19 percent of all BS and MS engineering degrees, while minorities receive 11 percent of all U.S. undergrad engineering degrees. What untapped resources! Such shortages are all the more reason to consider the vital contributions of females and minorities from our talented, diverse population.

Clearly, the graduating classes of 2000 and beyond have an enormous task ahead. But with this challenge lies an opportunity to benefit their future, and ultimately everyone's. A proven solution is providing our schools with adequate computer technology needed for the coming wired world. Computers and the Internet -- when properly used to enhance the education process -- can have a profound impact. With them, students can explore, speculate, collaborate across the ocean, research vast archives ... all things that engineers do to turn their ideas into reality.

Some progress is being made. The computer industry currently is working in partnership with many school districts to provide technology solutions. Admittedly, industry has not always done this well; every need cannot be met at once, and our dedicated educators need a voice in technology planning and use. But as recent successes such as wiring hundreds of schools across the country for the Internet have shown, industry working with schools toward a common goal generates powerful results--for students. Which brings me to the point, and I want to challenge two groups of readers.

To my engineering colleagues: We must encourage and help create new engineers by instilling in young people an interest in the profession, and by passing along a lifelong zest for learning. If you've never given an engineering presentation to a classroom, or mentored a young person in some way, please consider getting involved through the IEEE or any of the engineering professional societies. To those of you actively participating, we salute your **efforts**. **You are our finest ambassadors.**

To students: Engineering can open a tremendous window of opportunity in terms of immediate placement and ultimate job satisfaction, especially for women and minorities. Whatever your passion -- helping the environment, computer programming, designing electronics -- you can make a difference and be highly rewarded as well. By choosing engineering, someday our young people will turn their ideas into realities that can make the world a better place.

Diana Bendz is IBM Endicott's Senior Location Executive, and director of Environmentally Conscious Products, IBM Corporate. She is a chemical engineer, member of the IBM Academy of Technology, and last year was named an IEEE Fellow for outstanding contributions to electronics manufacturing and environmental policy.

To contact the IEEE Women in Engineering Committee:
e-mail women@ieee.org or access the Web site at www.ieee.org/women

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NATIONAL SCIENCE FOUNDATION (NSF) AWARDS CAREER DEVELOPMENT GRANTS TO WOMEN

The National Science Foundation (NSF) has honored 206 outstanding women nationwide this year with \$13.7 million in awards through its Professional Opportunities for Women in Research and Education (POWRE) program.

These awards, one of NSF's investments in women scientists and engineers, promote the development of scholarly and institutional leaders in research and education in fields ranging from atomic physics to zoology and lead to enhanced positions of leadership.

NSF established POWRE in 1997 to help ensure the vitality, quality, distribution and effectiveness of the nation's human resource base in science and engineering, and to help overcome the underrepresentation of women in these fields. NSF's POWRE program supports efforts to facilitate the full participation of women in the science and engineering mainstream.

Awardees were selected from among 773 applicants. POWRE grants last between 12 and 18 months and range from \$13,000 to \$150,000 each. "This year's grants exhibit a broad range of research and education projects," said POWRE program director Priscilla Nelson. This is especially true for fields in which women are underrepresented, she indicated.

By providing opportunities for career advancement, professional growth and increased stature of women in science and engineering, the POWRE program encourages women to pursue careers and achieve leadership positions in science and engineering. "At the same time, women scientists and engineers will obtain greater visibility and influence not only in academic institutions but in industry as well," said Nelson.

The POWRE program encompasses all areas of NSF-supported research and education in science and engineering and was developed to merge the previous targeted women's programs into one overall program. The programs incorporated into POWRE include the Career Advancement Award, Research Planning Grant, Faculty Award for Women, and Visiting Professorship for Women.

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SELECTED 1998 POWRE AWARDS BY THE NATIONAL SCIENCE FOUNDATION

Use the grant numbers below to find more details on the world-wide web at <http://www.nsf.gov/verity/srchawdf.htm>.

Nancy Berner, University of the South
nberner@seraph1.sewanee.edu
Biological Sciences: grant #9805808

Learning and Application of New Methods to the Study of Mitochondrial Heat Generating Mechanisms in Endothermic and Ectothermic Vertebrates

The researcher's ongoing project compares cellular and subcellular heat generation in endothermic ("warm-blooded") and ectothermic ("cold-blooded") vertebrates. The POWRE award is allowing Berner to learn new laboratory methods to broaden the scope of the project already in progress, increasing the number of questions that can be investigated.

Amy Briggs, Middlebury College

briggs@middlebury.edu

Computer & Information Science & Engineering: grant #9806108

Geometric Algorithms for Landmark-based Mobile Robot Navigation

This young researcher at a small liberal arts college will develop a research program in a promising new domain of robot navigation. The objective is to develop efficient new geometric algorithms that allow a robot to find its way in an unknown environment using visual landmarks. The long-term goals of the research include the development of task-level strategies for robot navigation in an environment without the aid of a global map.

Carol Dieckmann, Univ. of Arizona-Tucson
Univ. of Mass. Med. School-Worcester, 508-856-2443)
Biological Sciences: grant #9806135

Eyespot Assembly in Chlamydomonas

Even some primitive single-celled organisms are complex enough to react to light. Yet little is known about the origin and function of the eyespot in the unicellular green alga Chlamydomonas. This organism is free-swimming and phototactic, using its eyespot to detect light. Dieckmann will research the light sensitivity and associated functional capabilities of this organism.

Diane Dutkevitch, Northwestern University
dutkevitch@nwu.edu
Education and Human Resources: grant #9806304

The Web as a Laboratory: Hands-On Astronomy in Large Lecture Courses

This project aims to incorporate rigorous, but fun, hands-on experience into introductory science courses for non-science majors. Labs using the world-wide web and custom software will present interactive astronomical images, allowing students to magnify and process the pictures, make measurements and learn how professional astronomers tackle critical questions. The labs will encourage exploration and creative thinking and allow students to discover for themselves the strengths and limitations of a variety of telescopes and instruments.

Robin Garrell, Univ. of California-Los Angeles
rlg@chem.ucla.edu
Mathematical and Physical Sciences: grant #9806151

Novel Inorganic Self-Assembled Monolayers: Boranes and Gold

The research aims to design and fabricate new types of inorganic self-assembled monolayers (SAMs) on noble metal and oxide surfaces. This work could ultimately benefit the manufacture of electronics, sensors and ultrathin coatings for use in harsh environments.

Morton Gernsbacher, Univ. of Wisconsin-Madison
magersnb@facstaff.wisc.edu
Social, Behavioral and Economic Sciences: grant #9806076

Testing the Structure Building Framework Using Functional Imaging

The investigator will incorporate functional magnetic resonance imaging (fMRI) into behavioral studies, in order to further explore the cognitive processes and mechanisms underlying language comprehension. Training skilled behavioral-cognitive-psychological researchers to use more complex, neuro-imaging techniques will allow the field to answer more complex questions about brain activities that govern language.

Andrea Koziol, University of Dayton, Ohio
koziol@neelix.udayton.edu

Geosciences: grant #9805873

Experimental Studies of Fe-Mg Carbonates and Their Role in Petrogenesis

This research will help geologists understand the conditions of formation of a number of unusual and interesting rocks. The objectives are to determine how the minerals siderite (FeCO₃) and magnesite (MgCO₃) act and react under a variety of conditions of high pressure and temperature. These studies will provide tight constraints on how CO₂ fluid behaves deep in the earth and provide information on oxidation state of the mantle and a better understanding of diamond formation.

Jennifer Miller, University of Nebraska-Lincoln

jamiller@unlinfo.unl.edu

Engineering: grant #9870435

Combined Corrosion Assessment Techniques for Evaluating the Effect of Free Chlorine on Aged Cast Iron Water Distribution System Pipes

To make water safer to drink, disinfectants such as free chlorine are routinely added to drinking water. But free chlorine can greatly increase corrosion of pipes. This project will use traditional and newer corrosion assessment techniques to study iron corrosion and allow the researcher to learn the use of analytical techniques not traditionally applied to the study of pipe corrosion.

The above document (pr9885) is now available from the NSF Online Document System

Title: NSF Awards Career Development Grants to Women

Type: News Releases

Subtype: Engineering, NSF-wide

<http://www.nsf.gov/cgi-bin/getpub?pr9885>

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<http://www.nsf.gov/home/cns/start.htm>

Please send questions and comments to webmaster@nsf.gov

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Priscilla Nelson

(703) 306-1361

pnelson@nsf.gov

Editors: For a complete list of fiscal 1998 POWRE award recipients, including their institutions and their project descriptions, see: <http://www.nsf.gov/home/crssprgm/powre/start.htm>

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CALL FOR PAPERS ISSUED BY VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY,
JOURNAL OF WOMEN AND MINORITIES IN SCIENCE AND ENGINEERING CENTER FOR
INTERDISCIPLINARY STUDIES

Carol J. Burger, Ph.D., Editor-in-Chief of The Virginia Polytechnic Institute and State University Journal of Women and Minorities in Science and Engineering Center for Interdisciplinary Studies is now welcoming submissions for Volume 6, the Journal of Women and Minorities in Science and Engineering. The Journal publishes original, peer-reviewed papers that report innovative ideas and programs, scientific studies, and formulation of concepts related to the education, recruitment, and retention of underrepresented groups in science and engineering. Issues related to

women and minorities in science and engineering are consolidated to address the entire professional and educational environment.

Subjects for papers submitted can include:

Empirical studies of current qualitative or quantitative research; historical investigations of how minority status impacts science and engineering; original theoretical or conceptual analyses of science from feminist racial, and ethnic perspectives reviews of literature to help develop new ideas and directions for future research; explorations of feminist teaching methods, minority student/white teacher interactions; cultural phenomena that affect the classroom climate.

To receive guidelines for manuscript preparation or to submit a curriculum vitae, or if you are interested in reviewing papers for the journal contact:

Editorial Assistant
Journal of Women and Minorities in Science and Engineering
Center for Interdisciplinary Studies
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061-0227
Phone: 540-231-6296
Fax: 540-231-7013
E-mail: JRLWMSE@VT.EDU

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WIE JOBS FILE FOR DECEMBER 1998

WIE has initiated a WIE Job Posting File with job postings that have been forwarded to us, unsolicited. If you would like to subscribe to this monthly posting file, send a message to majordomo@ieee.org and type: subscribe women-jobs. This file will be maintained on a monthly basis. If you have any comments on the file, or would like to submit posting information, please submit to WIE at: women@ieee.org.

We are pleased to offer other IEEE sites that contains job listings:

The IEEE USA Jobs Listing Service on the www at:
<<http://www.ieee.org/usab/DOCUMENTS/EMPLOYMENT/employment.menu.html>

The IEEE Careers & Education Web Site: "Careers & Education, Enabling Careers through Life-long Learning" can be accessed at <<http://www.ieee.org/eab/>.

//////////////////////////////////// THE NEW YORK INFORMATION TECHNOLOGY CENTER
PRESENTS "LUNCHTIME AT THE WALL"

Timothy Druckrey, an independent curator, critic and writer who is concerned with issues of cultural history, representation, and technology, presents a range of work from his travels to recent European electronic art festivals such as Ars Electronica (Austria), DEAF98 (Netherlands), World Wide Video Festival (Amsterdam), Steirischer Herbst (Graz), SEAFair (Skopje) and others. Druckrey edited the recently published Electronic Culture: Technology and Visual York Information Technology held on Tuesday, December 15, 1998 at 12:30 PM at The New Information Technology Center, 55 Broad Street, New York, NY.

For more information:
email: tgulch@artswire.org
<http://www.thundergulch.org>

NYC Webgrrls... where it all began
For more information
mailto: nyc@webgrrls.com

Or call our hotline at 212-642-8012
Eileen Shulock, Director

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US PARTICLE ACCELERATOR SCHOOL AT VANDERBILT UNIVERSITY, NASHVILLE TENNESSEE

The next US Particle Accelerator School will be held at Vanderbilt University in Nashville Tennessee from January 18-29, 1999. You can find complete course descriptions at their web site: <http://fnalpubs.fnal.gov/uspas>

Students successfully completing a course will earn credit from Vanderbilt University. Please note that they offer financial support to students. For further information, you can contact: uspas@fnal.gov SY Lee, Director, USPAS

Listed below you will find a couple of particularly interesting courses:

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Accelerator Fundamentals, Michael Syphers (BNL)

Introduction to particle accelerator fundamentals and basic beam physics. Emphasis will be on design and operation of circular accelerators. Comparisons with other accelerators will be given. The basic underlying physics of phenomena studied and the techniques for calculation will be stressed, including the use of personal computers. Topics will be divided into three categories: (1) magnets, optics and lattice design, betatron oscillations and tune; (2) RF systems, synchrotron oscillations; (3) other more specialized topics such as correction systems, beam transfers, space charge effects, and beam instabilities. Measurement techniques of accelerator and beam properties will also be given. Prerequisites: Introductory college physics and first year calculus. Familiarity with personal computers is useful, but not mandatory.

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Introduction to Particle Accelerators, Stephen Holmes (Fermilab)

This course will introduce the operating principles and performance limitations of high-energy particle accelerators. Representative topics to be covered include: historical development of particle accelerators, single particle transverse and longitudinal motion, beam emittance, collective effects, resonance and other non-linear effects, effects of magnetic imperfections, beam diagnostic devices, synchrotron radiation, and accelerator design strategies. Prerequisites: Classical mechanics and electromagnetism.

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Muon Collider Technology and Beam Physics, Robert Palmer, Richard Fernow, (BNL)

The course will give an introduction to the technology of muon colliders, with discussions of the beam physics of selected subjects involved. Areas covered will include: proton driver (space charge tune shifts), target, pion decay channel, polarization, ionization cooling (cooling, solenoid focussing), wedge emittance exchange (bent solenoids), fast acceleration, collider ring (low beta lattice, impedance), background shielding, neutrino radiation. Possible advanced techniques. Comparisons with other collider technologies. Prerequisite: a prior knowledge of basic beam physics will be helpful, but not required.

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IEEE MEMBERSHIP INFORMATION: SENIOR MEMBER

Senior Member is the highest IEEE membership grade that may be obtained by application.

Why Apply?

- for recognition of accomplishment by peers
- for professional advancement
- for personal satisfaction

Who should apply?

- Engineers, scientists, educators, technical executives or those in IEEE designated fields who have
- at least ten years active professional practice, with five or more years of significant performance,

- accomplishments in engineering, publications, management, education or professional contributions.

We highly recommend all qualified IEEE members to apply for Senior Membership. Another reason to apply for Senior Member grade is that Senior Member grade is required before one is eligible for IEEE Fellow nomination.

To obtain Senior Member Application forms, please contact:

IEEE Operations Center
Admission and Advancement Committee
445 Hoes Lane
PO Box 1331
Piscataway, NJ 08855-1331
Tel: (732)562-5502 / Fax: (732)981-0225
E-mail: rab.aa@ieee.org

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WIE COMMITTEE SCOPES OF INTEREST:

Scope 1:

Gather and disseminate information regarding the status of women and initiatives for, by and on behalf of women in engineering and science.

Scope 2:

Enable mentoring and education programs within IEEE. Make available information regarding gender-related educational issues which may improve the entry and retention of women in engineering programs.

Scope 3:

Increase the participation and membership of women within IEEE.

Scope 4:

Address ways to improve the climate for women in IEEE and the workplace.

IEEE Women in Engineering Committee
445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331
URL: www.ieee.org/women/ E-mail: "women@ieee.org"