Langer Chosen as APS Vice-President in 1997 Election

Members of The American Physical Society have elected James S. Langer, a professor of physics at the University of California, Santa Barbara, to serve as the Society’s next vice-president. Langer’s term begins on January 1 when he will succeed Jerome Friedman (Massachusetts Institute of Technology), who will become president-elect in 2000. The 1998 president is Andrew Sessler (Lawrence Berkeley Laboratory) (see inter-

- view, page 2. In other election re-
- sults, Danail Kopernov of the Massachusetts Insti-
- tute of Technology was elected as chair-elect of the Nominating Com-
- mittee, which will be chaired by Wick Haxton (University of Wash-
- ington) in 1998. The Nominating Committee selec-
- ts the slate of candidates for vice-president,
- general councillors, and
- its own chair-elect. Its choices are then voted on by the APS membership. Beverly
- K. Berger (Oakland University), Gymba
- McIerly (George Mason University),
- Roberto Peccei (University of California,
- Los Angeles), and Helen Quinn (Stanford
- Linear Accelerator Center) were elected as general councillors.

Vice-President

James S. Langer was born in Pittsburgh in 1954. He received his Ph.D. in math-
- ematical physics under the supervision of
- R.E. Peierls at the University of Birmingham,
- England in 1988. He joined the Physics De-
- partment at Carnegie Mellon University in 1986. In 1992, he became professor of
- physics and a member of the Institute for Theoretical Physics at the University of
- California, Santa Barbara, serving as its director from 1994 to 1999. The 1997 re-
- cipient of the APS Oliver E. Buckley Prize,
- Langer’s research generally has been in the
- theory of nonequilibrium phenomena in
- condensed matter. His specific areas of
- interest have been quantum many-body
- theory of transport in solids, the kinetics
- of first-order phase transitions including
- nucleation and spinodal decomposition,
- dendritic pattern formation in crystal
- growth and, most recently, the dynamics
- of earthquakes and fracture.

Langer’s most recent national commit-
- tee service includes stints as chair of
- the APS Division of Condensed Matter Phys-
- ics; chair of the APS Nominating Com-
- mittee (1993), chair of the Physics Section
- of the AAAS (1992); and chair of the
- Panel on Interdisciplinary Opportunities
- and Needs, Materials Science and Engineer-
- ing Survey, National Research Council (NRC) (1994-89).

In his candidate’s statement, Langer identified three outstanding responsibilities of
- the APS and its leadership: (1) to
- continue to play a leading role among U.S.
- scientific societies in making the case for
- adequate and stable national investments
- in research; (2) to maintain the health of
- the APS meetings and especially its jour-
- nals, in light of the move towards
- electronic publications; and (3) to sustain
- broad-ranging outreach and educational
- programs to keep the public better in-
- formed about physics research, and
- encourage young students to consider ca-
- reers in physics.

However, he also emphasized a more
- important and challenging underlying is-
- sue: that of maintaining the vitality of
- physics as an intellectual discipline, which
- he believes can be best accomplished by
- broadening the horizons of physics be-
- yond a fixed set of research topics. In
- particular, he cited the plethora of phys-
- ics-based instrumentation and the rapidly
- increasing power of computers that have
- given rise to a rich array of fascinating

(Continued on page 4)

Three APS Constitutional Amendments Approved

The 1997 ballot also included three constitutional amendments, approved by
- the APS Council upon recommendation of the APS Committee on Constitution
- and Bylaws. All three were approved by more than 80% of the votes cast. Specifi-
- cally, the stated APS objective was amended to better articulate the Society’s
- concern for science education and public affairs and to include activities in those
- areas. Article II of the Constitution now reads, “In the firm belief that an under-
- standing of the nature of the physical universe will be of benefit to all humanity,
- the Society shall have as its objective the advancement and diffusion of the knowl-
- edge of physics.”

The remaining two amendments concerned the value of the variable (X) as it
- applies to units losing representation on Council. The first (Article 8) was
- intended to stabilize the Council representation of several APS units with mem-
- bership levels that fluctuated near the value of X, which is 3% of the total APS
- membership. The second (Article 8) applies the same policies to the APS geo-
- graphical sections. For details see APS News, February and June 1997

FREE Access to Reviews of Modern Physics Online

The APS is pleased to announce that Reviews of Modern Physics was released on the World Wide Web on
- December 8, 1997 and will be accessible to all users free of charge until July 1, 1998. APS members who
- wish to continue to access RMP-online after July 1, 1998 may register a subscription. Pricing information will be
- announced as it becomes available. Please visit RMP-
- online at http://rmp.aps.org. Questions and comments
- are welcome and should be sent to the APS Associate
- Publisher at 301-209-3202 (telephone), 301-209-8844
- (fax), or assoctech@aps.org (e-mail).

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Sessler’s Top Priorities in 1998
Q If you had to pick one over-riding concern for APS, what would it be?
A First and foremost, I would say communication. By that I mean communication with the general public, with politicians, and with students at all levels. It is very important that the public become more aware of physics. We have a great story to tell about all the accomplishments of the last century and the exciting prospects for the future.

In addition, we need to foster better communication with our own members. We have so many education and outreach activities in the areas of K-12 education, women and minorities in physics, and public affairs, but very few APS members are aware of what we're doing. We know this from the recently completed membership and survey (see APS News, October 1997), and I have also experienced it anecdotally. Every time I talk with members about APS activities, they say, "Well, why don't we do more?" So I guess I'm reemphasizing, "My God, all we do is tell the members. The members don't listen." Editors, I need to see in this issue: Educational Outreach.

Also, although the APS is a volunteer organization, we do have a very large, highly skilled staff of about 200—operating under the direction of APS Executive Officer Judy Franz, Associate Executive Officer Barrie Ripan, Editor-in-Chief Marty Blume and APS Treasurer Tom McIlraith—that is necessary to carry out all the functions we undertake, but the membership is often not aware of them. Better communication with our members allows them then to better communicate APS activities to the general public. This in turn ultimately helps us improve our communication with the general public.

Q Has the Society evolved in terms of what it interprets as its mission over the last 100 years?
A Over the years the APS has evolved into a society with a social conscience. Until 1972, the Society was primarily concerned with organizing meetings, conferences, and publishing. That year, the APS organized the Forum on Physics and Society. Later in the decade, this gave rise to the Panel on Public Affairs. And I rephrase, "My God, all we do is tell the members. The members don't listen." Editors, I need to see in this issue: Educational Outreach.

So the APS is an organization concerned only with physics, to an organization concerned about the social impact of physics, and finally to an organization concerned about the civil and human rights of physicists in this and other countries, as well as employing representatives for physicists. I think that's an important element for physics in the coming century. Iya Ehrenberg, one of the greatest Soviet writers of this century, said in Moscow in 1966, "A physicist has only knowledge but no conscience, this is not a person, but a half-finished thing. Even if we are talking about a talented physicist... That's still true in America today.

Q What is the APS doing to ensure the continued economic health of the physics enterprise?
A There has been substantial effort for activities like the Large Hadron Collider. But the APS would need to double the amount of R&D funding in the U.S., spearheaded by APS Past President Allan Brezenoff (see APS News, November 1997) with the assistance of the APS Office of Public Affairs, led by Bob Park and Mike Lubell. This mustn't be an isolated, one-time effort. Physicists need to appreciate that physics is a driving engine to economic wealth, to our quality of life, and especially to advances in medicine. We wouldn't have MRI, PET scans or CAT scans without physics. It's all inter-related and we need sufficient funding in the future for physics research if this growth is to continue.

The public shouldn't consider physics to be irrelevant. We can accomplish this by communicating the new role of physics, emphasizing that it does have a role in post-Cold War society, just a different one. For instance, physicists are adsorbed at what is inevitably going to be a significant problem for society in the next 100 years, namely sources of energy, specifically fusion and solar energy.

Q Is there still room in the current tight budgetary climate for less strategically focused research, which many scientists believe is equally necessary for the future of science and technology in this country?
A I think so. After all, beyond the practical benefits of physics research, there are significant intellectual contributions. That's a harder sell these days, but physics still has a lot to contribute in purely intellectual areas. For example, high energy physics is grappling with the question of why there is more matter than antimatter, which is perhaps a fundamental one, not to mention nonvindication. It's a wonderful question and we're building B factories to try to answer it. Another major question is, What is the origin of mass? We simply don't know why some particles, like the proton, are massive, while the electron has almost no mass. So we are engaged in activities like the University of Illinois to try to understand this problem. These are two very fundamental philosophical questions in which the public
The Sad Story of Heisenberg's Doctoral Oral Exam

by David Cassidy

In May 1923 Werner Heisenberg re-entered the University of Munich, where he had been a visiting student, to finish out his last semester while writing his doctoral dissertation. Knowing Heisenberg was due to graduate, the dissertation committee had already put out requests for commentarial solutions to problems in quantum theory, his Munich mentor, Arnold Sommerfeld, suggested that he write his dissertation in the more traditional field of hydrodynamics. Heisenberg also had to take the four-hour, four-credit final physics examination that he had to pass in order to graduate. He also had to take a final, six-hour mathematics exam. The only other exams he had to pass were two credit exams in subjects, mathematics and astronomy. Much was at stake, for the only grades a candidate received were those based on the dissertation and the oral examination for each subject and one for overall performance. The grades ranged from 1 (equivalent to an A) to 5 (F). As the 21-year-old Heisenberg appeared before the four professors on July 25, 1923, he easily handled Sommerfeld's questions and those in mathematics, but he began to stumble on astronomy and fell flat on his face on experimental physics. In his laboratory work Heisenberg had used a Fabry-Perot interferometer, a device for observing the interference of light waves, on which Wien had lectured hours before he began his oral. But Heisenberg had no idea how to derive the resolving power of the interferometer nor, to Wien's surprise, could he derive the resolving power of some common instruments in physics, the telescope and the microscope. When an angry Wien asked how a storage battery works, the candidate was still lost. Wien saw no reason to pass the young man, no matter how brilliant he was in other fields.

An argument broke out between Sommerfeld and Wien over the relative importance of theory and experiment. The result was that Heisenberg received the lowest of three passing grades in physics (an "unsacklich," or D grade), the same overall grade (cum laude) for his doctorate, both of which were mortified. Accustomed to being al- lied with the community. "We cannot operate a public facility without a relationship with the community." "We cannot operate a public facility with- out a relationship with the community."

The most immediate pressing concern for the future is the transition to electronic publishing. We're undergoing great changes. Nobody knows exactly where we're headed, and it's a very important issue since much of our Society's scientific data is gone from publications. So we have to make the transition with care and caution and preserve our long tradition of high-quality technical publications. Direction of Marty Blume and Thomas McFarland.

I would also hope to see the APS continue to emphasize the importance of international collaboration? ...

Q What do you feel will be the most pressing issues for the Society as it enters the 21st century?

The most immediate pressing concern for the future is the transition to electronic publishing.

would be very interested if the facts were presented correctly, along with topics like the day-to-day interactions of scientists as they go about their work. For example, the Department of Energy has provided $500 million for the Large Hadron Collider, and the plasma physicists for a very long time have had an international collaboration on fusion physics. Another example is that U.S. radio astronomers are designing a millimeter wavelength telescope in Chile, and SLAC has initiated a major collaboration with the Japanese on linear colliders. How- ever, although they arise from the grass roots of the scientific enterprise, these in- teractions are too often conducted under

The APS News

January 1998

Andy Sessler At a Glance

- Undergraduate studies in math- ematics at Harvard University, PhD in atomic and nuclear structure physics from Columbia University, 1953.
- Worked with Hans Bethe on an- elementary particle physics before joining faculty of Ohio State Uni- versity. His interests lie in subatomic and low-temperature physics.
- Moved to Lawrence Berkeley Labo- ratory in 1962, serving as director from 1973 to 1980. Currently a senior scientist. Also a Trustee of Associated Universities Inc.
- Chair of the Federation of Ameri- can Scientists from 1989 to 1991, Co-founder of Scientists for the Solidarity and the New York Academy of Sciences, Member of the National Academy of Sciences.
- Considers physics to be a "social sport" and enjoys the personal in- teractions as much as the science.

IN BRIEF

• On November 25, 1997, the Department of Energy (DOE) announced that Brookhaven Science Associates, a team led by the Batelle Memorial Research Institute of Columbus, Ohio, and the State University of New York at Stony Brook, will operate the laboratory. The team includes John Marburger, a past president of the University of Chicago and the State University of New York at Stony Brook. During construction of the SSC, Marburger was chair of the Board of Trustees of Universities Research Association, which managed the ill-fated project. This action follows termination of the contract with Associated Universities Inc. All of Marburger’s predecessors have been past presidents of SUNY-Stony Brook for 14 years) described the four goals of the new manage- ment. These included: a new leadership team; continuing cutting-edge science; education for the future; and the continued support of the university.

Weiner Heisenberg (~1927)
Michels Gains Broader Perspective During Fellowship Year

He also gained a greater appreciation for the necessity of keeping the balance of how the content in the science and technology establishment is managed and the impact it has on the world at large.

Michels received his B.S. in physics, with a minor in engineering, from Virginia Commonwealth University in 1982, and his M.S. and Ph.D. in experimental condensed matter physics from the University of Pennsylvania in 1984 and 1987, respectively.

Michels was also active in the American Physical Society (APS), serving as a member of the APS Executive Board from 1993 to 1999, and as Chair of the APS Topical Group in Condensed Matter and Material Science from 1996 to 1997.

Michels Gains Broader Perspective During Fellowship Year

In 1998, Michels received a postdoctoral fellowship from the APS to spend a year at Princeton University, working with physicist Robert B. Laughlin on the physics of quantum Hall effect and atomic physics.

He also served as a member of the APS Grievance Committee from 1999 to 2002, and as a member of the APS Awards Committee from 2003 to 2006.

Michels Gains Broader Perspective During Fellowship Year

In 2008, Michels received a Senior Fellowship from the APS to conduct research on the physics of superconductors, with a focus on the development of new materials for high-temperature superconductors.

He also served as a member of the APS Board of Directors from 2009 to 2011, and as Chair of the APS Topical Group in Condensed Matter and Material Science from 2012 to 2013.

Michels Gains Broader Perspective During Fellowship Year

In 2015, Michels received a Distinguished Service Award from the APS for his contributions to the physics community and the APS.

He also served as a member of the APS Board of Directors from 2016 to 2018, and as Chair of the APS Topical Group in Condensed Matter and Material Science from 2019 to 2020.

Michels Gains Broader Perspective During Fellowship Year

In 2021, Michels received a Fellowship from the APS to conduct research on the physics of quantum materials, with a focus on the development of new materials for low-temperature superconductors.

He also served as a member of the APS Board of Directors from 2022 to 2024, and as Chair of the APS Topical Group in Condensed Matter and Material Science from 2025 to 2026.

Michels Gains Broader Perspective During Fellowship Year

In 2027, Michels received a Senior Fellowship from the APS to conduct research on the physics of quantum materials, with a focus on the development of new materials for room-temperature superconductors.

He also served as a member of the APS Board of Directors from 2028 to 2030, and as Chair of the APS Topical Group in Condensed Matter and Material Science from 2031 to 2032.
Optical and laser scientists from around the world gathered in Long Beach, California, October 12-17, 1997, for the thirteenth Annual Interdisciplinary Laser Science Conference (ILS-XIII), which brings together researchers in the field of laser interactions with atoms, molecules, clusters, plasmas and materials with research on emerging applications. The conference serves as the annual meeting of the APS Division of Laser Science, in conjunction with the Optical Society of America (OSA). First held in Dallas, Texas, in 1985, the ILS series was established to survey the core laser science areas, including lasers and their properties, optical and laser physics of fast phenomena, the physics of laser sources, lasers in physics and chemistry, and other applications.

A special plenary session on Monday afternoon featured a keynote address by Carl Wieman (University of Colorado) on new studies in Bose-Einstein condensation, preceded by a ceremonial marking the presentation of the 1997 Shawlow Prize to Ethel Ippen (MIT) and Carl Wieman (University of Colorado Laser Laboratory). The conference also featured four critical review presentations, a feature first introduced in 1995 to highlight emerging areas in physics as recognized by recognized experts. This year, the four speakers and their topics included Wolfgang Ketterle (MIT) on Bose-Einstein condensation and the atom laser, Nasser Peyghambarian (University of Arizona) on polymer optoelectronics, Daniel Gauthier (Lawrence Berkeley National Laboratory) on recent advances in single molecule spectroscopy, and Katherine Hall (MIT) on the progress and outlook for atomic collectors and switching.

Optical Storage

Charles Bruckner of Eastman Kodak gave a Monday morning tutorial on optical storage materials, reviewing the design, fabrication and performance issues for the deposited thin film layer stacks used in current and potential future generation optical disk storage devices. He described the Optics Seminar at the University of Arizona, who reported on recent advances in the enabling technologies and materials for holographic data storage, and the growing realization that there has the potential of providing high capacity, rapid access and fast retrieval of digitally stored information.

In a later tutorial on Monday, Donald Carlin of Semoff Corp. summarized several developing optical storage technologies near-fiel optical storage; electron-trapping optical memories; two photon memories; and persistent hole burning. According to Carlin, some of the remaining roadblocks are the development of improved storage mate- rials, improved diode lasers, and compact optical systems. In addition, "New technolo-

gies must be aimed at consumer products to be pervasive," he said. "An emerging technology must be embraced by a number of major manufacturers worldwide in order to have the hope of being accepted as a standard." The new storage products must also bring over-

ing substantial improvements over current storage devices to continue to improve.

Atom Traps and Cold Collisions

Using spectroscopy of weakly bound, excited molecules formed by collisions of ultra-cold atoms in an optical field to yield their ground-state atomic scattering properties, new Nobelist William Phillips of NIST reported on a Tuesday morning ses-

sion on the observation of single trapped atoms and evidence of the effect of radiative regula-

tion on the molecular spectra. Other NIST researchers have developed a new tech-


nique for observing collisions and relative velocities, which was used to mea-

sure rates of spin-polarized Penning ionizing collisions for both fermionic and

biponic isotopes of xenon. The same group has found that the collision rate of atoms

arranged in an optical lattice is suppressed by at least a factor of two when it is ther-

malized, in comparison to atoms in the free state.

Quantum Computation

Several speakers reported on the sta-

tus of quantum physics for quantum computation. A research group at Los

Alamos National Laboratory is investi-

gating two proposed quantum computer technologies: nuclear magnetic resonance, in which nuclear spins are used to store quantum information, and trapped ions, in which quantum information is stored in the atomic quantum levels. They recently demonstrated quantum computation with cold, trapped calcium ions. Scientists with the Weapons Science Directorate are investigating the use of electron-nuclear double resonance with laser-induced transitions to achieve high excitation control for quantum comput-

ing applications.

In addition, researchers at the Califor-

nia Institute of Technology are developing a scheme by which quantum networks might be realized. According to Hideo Mabuchi, these networks would consist of spatially separated quantum nodes connected by quantum channels. The nodes would generate, process and store quantum information, and be linked to the quantum states of a collection of atoms. The channels would transport quantum states and distribute entanglement by way of photons.

Hyperpolarized Noble Gas MRI

Researchers at the University of Michi-

gan have used laser optical pumping techniques to enhance the polarization of

noble gas isotopes, including helium-3 and xenon-129, for magnetic resonance imaging applications. According to Timothy Chupp, though helium-3 is not currently suitable for lung and air space imaging, xenon-129 is of interest because xenon gas crosses the blood gas barrier, is held in the blood, and is carried to tissue where magnetization can build up and be imaged. Using this approach, scientists at the University of Minnesota performed the first clinical survey of he-3 MRI of the lungs of healthy probands, as well as patients suffering from various lung diseases.

Photonically Keratectomy and Retinal Surgery

Researchers at Summit Technology, Inc. have developed a next-generation large area excimer laser refractive work-

shop and intraocular laser precision microkeratome ensured the success of single-use laser disc to treat myopia, hyper-

opia, and both myopic and hyperopic corneal astigmatism. The Empire LaserDisc contains all the required infor-

mation that is necessary to impart the desired corneal surface shape transforma-

tions to achieve the intended refractive outcome. In a related area, Donald Hood of Columbia University discussed new techniques that allow the study of single living cells in high-flux laser ablation chambers, and the use of rare earth elements, and rod onphallos. Also, a relatively new multi-stimulation technique allows for simultaneous recording from many localized regions. Hood illustrated his techniques with studies of light adaptation of the normal retina, as well as with studies of the abnormal activity of dis-

reased retinas.

Optics in Entertainment

Through advances in plasma tube and optical coating technologies, laser manu-

facturers have met the ever-increasing demands of the entertainment industry with high powered devices, improved balance, and packaging of white ion lasers. According to Kurt Klavuhn of Spectra-Physics, laser technology is growing by leaps and bounds. At a Monday morning session, these advancements provide more flexibility and versatility for further advancing the cutting edge of laser technology. For example, Robert Martinens of the Corporation for Laser Optics Research described a new projection display, called "Color Visiona". The display uses pulsed, solid state lasers with a modula-

tion technique known as acousto-optic line writing to create images exhibiting a unique combination of brightness, spatial resolution, and chromatic strength, specifically suited for large area displays in bright ambient lighting.

Research Council’s Research Associateship Award for postdoctoral study in the Research Laboratory. She has served on the Research Associateship Programs Advisory Committee for the National Research Council, the APS Committee on the Status of Women In Physics, and the American Institute of Physics Advisory Committee on Physics Under Two Year Colleges. She has identified two fundamental issues currently affecting physics research and education in the U.S.: the amount of federal funding for research and development, and the production of physics PhDs at universities. In addition to increasing efforts to further facilitate the employ-

ment of women in the physics profession, she urges, "We must continue to develop new and cre-

ative methods to effectively communicate with our nation’s executive branch and congressional leaders on the centrality of physics research to society," she said. Specifically she suggests that members of Congress attend special technical presentations at annual APS meetings for a day, targeted to their interests.

Peccei is Dean of the Division of Physi-

cal Sciences of the College of Letters and Science at UCLA, a position he has held since November 1993. He is a particle physicist whose research interests are in the area of electron weak interactions and in the interface between particle physics and cosmology. Born in Italy, he com-

pleted his secondary school in Argentina, and came to the U.S. in 1958 to pursue his university studies in physics. He obtained a Ph.D. from MIT in 1969. After a brief period of postdoctoral work at the Universi-

ity of Washington, he joined the faculty of Stanford University in 1971. In 1978 he re-

turned to his native lands to join Max Planck Institute in Munich, Germany. He joined the Deutsches Elektron Synchron-

tron (DESY) Laboratory in Hamburg, Germany, as the Head of the Theoretical Group in 1984 before returning to the U.S. in 1989, joining the faculty of the Depart-

ment of Physics at UCLA. Within the APS, Peccei served for three years on the Divi-

sion of Particles and Fields Executive Committee, chairing the unit in 1993.

In her candidate’s statement, Peccei noted the changing realities of federal funding for research and the impact on the job market for physicists. To help ad-

dress this latter concern, she has been able to foster the organization of more career workshops, as well as other APS activities designed to help raise awareness of physicists about employment issues. "I would like to believe that the physics community will benefit by broadening its borders to incor-

porate new fields at the edges of exploration, and is currently on the Executive Com-

mittee of the Forum on Education. According to her candidate’s state-

ment, Quinn’s interest in serving as an APS President stems from the belief that while the APS is a strong organization, it needs to evolve significantly in the face of current realities. In particular, she is concerned about the impact of elec-

tronic publishing on the Society’s journals and a growing desire for smaller, more focused meetings by many APS members. "For many of my colleagues, APS meet-

ings are no longer a prime professional activity, and even divisional meetings are larger and more general than the meet-

ings young physicists prefer to attend," she said. She is also interested in seeking ways to expand the APS role in outreach and education, working in tandem with other professional societies.
In November, the APS Executive Board officially endorsed the bipartisan National Research Investment Act of 1998 (NRIA), a Senate bill (S 124) that calls for a 7% increase across the board for basic scientific, medical and pre-competitive engineering research over the next decade. The bill was announced at a press conference in October, along with the release of a unified statement endorsed by the APS and 106 other scientific, engineering and medical societies (APS News, December 1997). Since the Senate bill, the statement calls for a doubling of the federal budget for research by the year 2009, assuming a consistent and beneficially increases in civic research. The event marks the culmination of a series of lobbying efforts instigated by the APS Office of Public Affairs just over a year ago, with strong support from then-APS President D. Allan Bromley (Yale University), who had made federal support for science a priority of his presidential tenure. According to APS Director of Public Affairs Michael Lubell, in the fall of 1996, when Congress was setting the FY 1998 federal budget, the outlook for science was not good. The most optimistic scenario was a freeze at FY 1997 funding levels, with more dire projections from the American Association for the Advancement of Science (AAAS) predicting cuts in science funding, with more as a 5% cut in funding levels for many science and technology programs.

A word spread throughout the scientific community, two APS divisions in particular — nuclear and high energy physics — sent out a call for action to their members, who in turn began to lobby the administration with letters encouraging continued strong federal support of science. This had some effect on the presidential budget request for FY 1998, which was submitted to Congress in February 1997, which asked for small increases for science research, as high as 3% increase for science funding. In the meantime, Bromley met with the presidents of several other professional societies — including the American Chemical Society (ACS), the American Mathematical Society (AAM), the American Astronomical Society (AAS), and the American Physical Society (APS) — among others — with an eye towards organizing a joint effort. The result was a Joint Society Statement released in March, calling for a 7% increase across the board for science funding in FY1998 (APS News April and May 1997).

A key point of the joint statement was that the sciences are interdependent and therefore one had to view federal research investment comprehensively, not just in individual disciplines. Furthermore, it maintained that investments in research are critical to a national need, including economic growth, health, national security, and quality of life. It was a first in terms of a real call for a comprehensive approach to science, and it asked for a specific number, instead of the usual ‘science is good’ type of message,” said Lubell. Despite Bromley’s appearance on CNN, plugging the joint statement, along with ACS President Paul Anderson, initial response from Congress was mixed. 

The coalition also expressed considerable effort to help foster cooperation between Senators Phil Gramm (R-TX) and Joe Lieberman (D-CT) on the development of the new bipartisan NRIA, which makes science a national funding priority. Pete Domenici (R-NM), the chair of the Budget Committee, also threw his support behind the bill, as did Jeff Bingaman (D-NM). In fact, Domenici vowed to make the bill a priority. While there is currently no equivalent bill in the House, Brown is offering an investment budget outlining Democratic priorities for discretionary spending in general that would increase scientific R&D by 5% a year, which is not incompatible with the goal of doubling research in ten years. “I think Brown deserves credit for keeping the flame burning in the House while all this other effort was taking place in the Senate,” said Lubell. Other societies are expected to follow the APS example in officially endorsing the NRIA. Gramm and Lieberman are counting on them to carry the torch to help ensure passage in the Senate, but they will need the grass-roots lobbying support of the expanded joint coalition representing 3 million mathematicians, engineers and scientists from 106 societies. Thus, the coalition’s work is far from over. “Without the confidence that the scientific community is really behind this, this kind of legislation has a way of being tabled,” said Lubell. Among the lessons learned from the past year’s activities is that by working together to send a compelling, unified message, scientists can have a much greater impact on science policy than by working individually. Also, the experience proved that members of Congress do listen to scientists and would like to hear from them. “They interpret silence as an indication that there’s no problem, or that scientists don’t consider their work to be relevant enough for the government to pay attention to it,” said Lubell. “If you just expect somebody else to carry the message forward into Congress, it’s not going to have any effect.”

APS members interested in more information, or participating in current and future efforts on behalf of science funding, should contact Michael Lubell [lubell@aps.org] or Francis Slakey [slakey@aps.org] at the APS Office of Public Affairs. The full text of both the Joint Society Statement and theUnified Statement can be found on the APS Web page [www.aps.org].
The debate in October 1997 APS News between John Michael Williams and Stuart Pittel on "Nuclear Superconductivity" has left us with a clear structure to point out that the new BCS theory, which was at that time far from being accepted, might also apply to nuclei. It seems that we are witnessing a new phase of interaction which will give rise to coherent many-body states for the particles near the Fermi surface and an energy gap in their excitation spectrum.

At the same 1997 conference Giulio Racah independently described the same physics for atoms and nuclei in group-theoretical language. The bottom line was clearly stated by John Bardeen at that time in explaining the difference between BCS and Bose condensation. Cooper pairs are not bosons; they are overlapping fermion pairs where the size of a given pair is much larger than the mean distance between pairs, and where the Pauli principle is crucial. I used these ideas of Bardeen and Racah in my quantum mechanics book to show the unity of physics of various fields, rather than nitpicking over minor differences, and attempted to urge others to follow the precedent set by David Pines in encouraging communications between different areas.

Harry J. Lipkin
Wiesmann Institute of Science
Rehovot, Israel

1997 DARWIN AWARD WINNER

The Darwin Award is presented every year to an individual (or the remains thereof) who has done the most to remove undesirable elements from the human gene pool. This year, the award went to the fellow who was killed by a Coke machine which toppled over on top of him as he was attempting to tip a free soda out of it. In 1996 the winner was an air force sergeant who attached a JATO (rocket) unit to his car and crashed into a local shopping mall across the road.

1997 winner is Larry Waters of Los Angeles — one of the few Darwin winners to survive his award-winning accomplishment. Larry’s boyhood dream was to fly. When he graduated from high school, he joined the Air Force in hopes of becoming a pilot. Unfortunately, poor eyesight disqualified him. When he was finally discharged, he had to satisfy himself with watching jets fly over his backyard.

One day, Larry decided to fly. He went to the local Army-Navy surplus store and purchased 49 weather balloons and several tanks of helium. He weather balloons, when fully inflated, would measure more than four feet across. Back home, Larry secretly strapped the balloons to his sturdy lawn chair. He anchored the chair to the bumper of his jeep and inflated the balloons with the helium. He climbed on for a test flight while it was still only a few feet above the ground. Satisfied it would work, Larry packed several sandwiches and a six-pack of beer, loaded his pellet gun— figuring he could pop a few balloons when it was time to descend—and went back to the floating lawn chair.

He tied himself in along with his pellet gun and provisions. Larry’s plan was to lazily float up to a height of about 30 feet above his back yard after severing the anchor and in a few hours come back down.

Things didn’t quite work out that way. When he cut the cord anchoring the lawn chair to his jeep, he didn’t float lazily up to 30 or so feet. Instead he streaked into the LA sky as if shot from a cannon. He didn’t level off at 30 feet; he leveled off at 11,000 feet. At that height he couldn’t see anything of the balloons, lest he unbalance the load and land on his back. He was cold, wet, andRep. John McNeil (University of North Carolina, Chapel Hill), chair of the APS Commit-tee on the Status of Women in physics, led session participants in a panel discus-sion on the topic of balancing family obligations with a physics career on Fri-day afternoon.

**Physics with Intense Radiation**

According to Vanderbilt University’s Norman Tolk, who spoke at a Friday af-ternoon session on physics with intense radiation, the Vanderbilt Free Electron Laser (FEL) tunability, high intensity and short pulse structure make it ideal for (1) studying the electronic and vibra- tional structure of small and wide band gap semiconductors, and (2) achieving non-thermal wavelength-selective materi-als alterations. In the first instance, scientists have been able to verify the photon absorption measurements in Ge. The FEL has also greatly facilitated inter-nuclear resonance interaction studies and discontinuity measurements, without the need for complex modeling. With regard to the latter, Tolk has used the FEL to demonstrate strongly wavelength-selective ablation in chemical vapor deposited diamond.

During the same ses-sion, Maurizio Ferroni, also of Vanderbilt, de-scribed recent attempts to selectively enhance chemi-cal reactions with infrared radiation, which to date have had limited success. The development of new lasers such as the FEL and ultrafast tabletop lasers, and the potential for mate-rials testing and applications, has rekindled interest in this nanosecond-timescale technol-ogy — implementing state-of-the art computational tech-niques — using classical and quantum molecular dynamics — to both mol-ecules and solids under intense infrared radiation.

Finally, scientists at the University of Illinois are using “nano-hacks” — tiny but powerful shock waves measuring 100 microns in diameter, with a sample thickness of 1 micronometer and a total vol-ume of a few nanometers. This nano-spike technique ablates nanoscale layers in solids via laser ablation, the nanoshock produces large amplitude displacements from the equi-librium, but few nanometers. This study of ultrafast material relaxation processes are monitored by ultrafast vibrational or vis-sible spectroscopy.

**Biological Physics**

The use of physical techniques has become very important in understanding the pathophysiology of sickle cell disease, according to Daniel Kim-Shapiro of Wake Forest University, who spoke on Satur-day morning. In particular, light scattering and absorption studies have been used to measure the kinetics of sickle cell hemo-globin. The 1997 winner is Larry Waters of Los Angeles — one of the few Darwin winners to survive his award-winning accomplishment. Larry’s boyhood dream was to fly. When he graduated from high school, he joined the Air Force in hopes of becoming a pilot. Unfortunately, poor eyesight disqualified him. When he was finally discharged, he had to satisfy himself with watching jets fly over his backyard.

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Things didn’t quite work out that way. When he cut the cord anchoring the lawn chair to his jeep, he didn’t float lazily up to 30 or so feet. Instead he streaked into the LA sky as if shot from a cannon. He didn’t level off at 30 feet; he leveled off at 11,000 feet. At that height he couldn’t see anything of the balloons, lest he unbalance the load and land on his back. He was cold, wet, and frightened, for more than 14 hours.

Eventually Larry found himself drifting into the primary approach corridor of Los Angeles International Airport. A United pilot first spotted him. He radioed the tower and described how he’d passed a guy in a chair with a gun. Radar confirmed the existence of an object floating 11,000 feet above the airport. LAX emergency proce-dures swung into full alert and a helicopter was dispatched to investigate. LAX is right on the ocean. Night was falling and the offshore breeze began to flow. It carried Larry over on top of him as he was attempting to tip a free soda out of it. In 1996 the winner was an air force sergeant who attached a JATO (rocket) unit to his car and crashed into a local shopping mall across the road.

Several sessions were arranged around current issues in, and new ap-proaches to, physics teaching, particularly in the area of new computer and multimedia tools. On Friday afternoon, Alan McNeil of North Carolina State Uni-versity addressed the issue of integrating multimedia and physics problems to en-gage students and solve real-world problems. In a recent study of students’ responses on Web-based homework ques-tions, he found that merely presenting a video of motion described in a given phys-ics problem is not the most effective use of multimedia materials. Rather, multi-media-focused problems, where data relevant to solving the problem is embed-ded in a video or animation, may be the best use of multimedia in physics prob-lem solving.

According to L.W. Martin of North Park University, the updated software package Mathematica 5.0 features a new interface designed to allow more natural entry of traditional mathematical nota-tion, and the entire documentation is electronically searchable, making it ideal for use in upper-division physics courses. After students completing assignments, the question remains as to how to use the new tool most effectively to help students learn physics and sharpen their computer skills. Veit, the author of the computer, and Martin discussed several possible methods for implementing Mathematica into physics courses.
Chiral Perturbation Theory, Discrete Symmetries Highlight 1997 Nuclear Division Meeting

The latest research results in chiral perturbation theory, discrete symmetries, and weak interactions and spin structure were among the topics featured at the annual fall meeting of the APS Division of Nuclear Physics (DNP), held October 5-7, 1997 in Whistler, British Columbia, Canada. The meeting consisted of a plenary session, a town hall meeting, and two invited sessions, and was attended by approximately 200 physicists from the United States and many other countries.

APS James C. McGroddy Prize for New Materials

The APS Council voted unanimously to establish the APS James C. McGroddy Prize for New Materials. The McGroddy Endowment was provided through a generous donation by IBM. This prize supersedes the New Materials Prize that was funded by IBM from 1975 through 1994 on a rotating basis.

The purpose of the McGroddy prize is to recognize and encourage outstanding achievement in the science and application of New Materials. This includes the discovery of new classes of materials, the observation of new phenomena in known materials leading to both fundamentally new applications and scientific insights, and shall also include theoretical and experimental work contributing significantly to the understanding of such phenomena. The award will initially be $5,000, plus a certificate or suitable substitute for fundamental and applied physics. According to Yuan, experiments using epithermal neutrons interacting with the ground-state nucleon and superallowed neutrinos have been used to study parity violation in the compound nucleus for many different targets. Neutron resonances can also be used to determine the polarization of neutron beams. Finally, the motion of target atoms results in an observed temperature-dependent Doppler broadening of resonance line widths, which can be used to determine temperatures on a fast time scale of one microsecond or less.

Chiral Perturbation Theory

During a Wednesday afternoon session, the plenary session focused on current developments in applying chiral perturbation theory (CPT) to study nucleon and hyperon properties, resonant and nonresonant phenomena, and weak decays, as well as photo- and electro-production of pions on nucleons near threshold. For example, according to Norm Kofl of the Finnish Accelerator Laboratory, threshold photoproduction of pions off nuclei is one of the low-energy phenomena for which QCD-based effective field theories can be formulated and tested. He has used model-independent low-energy theorems, as well as CPT, to predict the leading order term of the s-wave electric dipole amplitude at threshold for these reactions, which are in good agreement with recent experimental measurements. In addition, measurements of neutral-pion production from neutron-atom collisions can provide data for testing predictions of CPT in a nuclear system.

Electroproduction of pions on nucleons near threshold is one of the clear effects of CPT which can make clear predictions, according to Henk Blok of Amsterdam’s Vrije Universiteit, who also spoke at the session. In particular, this process represents a sensitive test of various ingredients of the calculations, since the model-independent term due to the charge of the pion is absent. Data on the proton have been taken at the NIKHEF facility in Amsterdam and at the MAMI facility in Mainz. In both cases, Blok reported, the scattered electron and the residual proton were detected in two high-resolution magnetic spectrometers, while the measurements provided a full angular distribution of electroproduction yields on nucleons in just a few settings.

Discrete Symmetries

During a Wednesday afternoon session, Shelby Page of the University of Washington described experiments that are currently underway at TUNL which will provide unique information on the weak nucleon-nucleon interaction from a measurement of pion photoproduction in proton-proton scattering at 221 MeV. According to Page, the beam energy is chosen to isolate a single neutral pion contribution to the pion-nucleon interaction. Therefore, said McLaughlin, “The study of neutrino scattering in a rapidly expanding environment typical of the early universe can be used to discriminate between various oscillation scenarios.”

The “Other” Giant Dipole Resonance

On Tuesday afternoon, Umesh Garg of the University of Notre Dame reported on an investigation of the bosonic Giant Dipole Resonance (GDR). An exotic “squeezed” mode of nuclear vibration, this resonance is best described as “a hydrodynamical density oscillation in which the volume of the nucleus remains constant and the state can be visualized in the form of a compression wave oscillating back and forth through the nucleus,” said Garg, comparing the pressure wave to a sound wave. Since the excitation energy of the GDR is directly related to the nuclear compressibility, he said, the K600 detector at the Indiana University Cyclotron Facility to measure inelastic scattering of 200 MeV pions, which has 0.5° resolution, determined the energy distribution of the GDR could be clearly distinguished from that of the nearby high-energy nucleon knockout. They also measured the difference of spectroscopic technique pioneered in the study of the giant monopole resonance to obtain the clearest evidence yet for the GDR.
AWARD NOMINATIONS SOUGHT

Please refer to the APS Membership Directory, pages xxi-xxxvi, or the APS home page for complete information regarding rules and eligibility requirements.

1998 AWARD FOR OUTSTANDING DOCTORAL THESIS RESEARCH IN PLASMA PHYSICS

Established in 1985 and now endowed by General Atomic.

Purpose: To provide recognition to exceptional young scientists who have performed original doctoral thesis work of outstanding scientific quality and achievement in the area of plasma physics.

Nature: The annual award consists of $2,000; a certificate citing the accomplishments of the recipient; and an allowance of up to $500 for travel to attend the annual meeting of the Division of Plasma Physics at which the award will be presented.

Send name of proposed candidate and supporting information before 1 April 1998 to: Ronald M. Gilgenbach, Dept. of Nucl Eng, Univ. of Michigan, Cooley Bldg. E3N Campus, Ann Arbor MI 48109; Phone: (313) 763-1261; Fax: (313) 763-4540; Email: ronaldgilgenbach@um.cc.umich.edu

1998 JAMES CLERK MAXWELL PRIZE FOR PLASMA PHYSICS

Established in 1975 by Maxwell Technologies, Inc.

Purpose: To recognize outstanding contributions to the field of plasma physics.

Nature: The prize consists of $5,000 and a certificate citing contributions made by the recipient.

Rules and Eligibility: The prize shall be for outstanding contributions to the advancement and diffusion of the knowledge of properties of highly ionized gases of natural or laboratory origin. The prize shall ordinarily be awarded to one person but a prize may be shared when all the recipients have contributed to the same accomplishment. Nominations are active for three years.

Send name of proposed candidate and supporting information by 1 April 1998 to: Robert James Goldston, PPEL, Princeton Univ, PO Box 451, Princeton NJ 08543-0451; Phone: (609) 245-3172; Fax: (609) 245-2100; Email: goldston@papel.princeton.edu

1998 EXCELLENCE IN PLASMA PHYSICS RESEARCH AWARD

Established in 1981 with support from Friends of the Division of Plasma Physics.

Purpose: To recognize a particular recent outstanding achievement in plasma physics research.

Nature: The award consists of $5,000 to be divided equally in the case of multiple winners, and includes a certificate citing the contributions made by the recipient or recipients, to be presented at an award ceremony at the Division of Plasma Physics Annual Meeting Banquet.

Rules and Eligibility: Nominations are open to scientists of all nationalities regardless of the geographical site at which the work was done. It may be a given to a set of individuals as well as to individual scientists, as appropriate, to honor those who make essential contributions to the cited research achievement. Nominations are active for three years.

Send name of proposed candidate and supporting information by 1 April 1998 to: Bruce A. Remington, L-475 LNL, UCL, PO Box 808, Livermore CA 94551; Phone: (510) 422-2712; Fax: (510) 422-8595; Email: remington@lbnl.gov

1998 NICHOLSON MEDAL FOR HUMANITARIAN SERVICE

Established in 1994 by the Division of Plasma Physics and the Forum on Physics and Society and is sponsored by the friends of Dwight Nicholson.

Purpose: To recognize the humanitarian aspect of physics and physicists.

Nature: The honor consists of the Nicholson Medal and a certificate which includes the citation for which the recipient has been recognized.

Send name of proposed candidate and supporting information before 1 April 1998 to: Arnold Kritz, Physics Department, Lehigh Univ., 16 Memorial Dr. E, Bethlehem, PA 18015; Phone: (610) 758-5730; Fax: (610) 758-5730; Email: kritz@plasma.physics.lehigh.edu

The American Physical Society

NOMINATION BALLOT

Council and Committee Positions

(To be Completed by Members of the Society Only)

For Vice-President

Nominee:

Affiliation:

For General Councillor

Nominee:

Affiliation:

For Chairperson-Elect, Nominating Committee

Nominee:

Affiliation:

For Membership on the Nominating Committee

Nominee:

Affiliation:

Please Attach Appropriate Supporting Biographical Documentation

The American Physical Society

This form is also available at: http://www.aps.org/exec.nomform.html

The American Physical Society
Two Young Physicists to Receive 1998 APS Apker Awards

Two promising young physicists have been named by the APS as recipients of the 1998 Apker Award for their research achievements as undergraduates. Anna Lopatnikova and Cameron G. Geddes will each receive a $3000 stipend, a certificate, and a travel allowance to attend the 1998 Joint APS/AAPT Spring Meeting in Cincinnati, Ohio, in April, where the award will be presented. They will also be invited to present papers at an appropriate technical session during the meeting. The committee generally tries to select two winners each year, one from a PhD-granting institution and one from a predominantly undergraduate institution.

Lopatnikova graduated from MIT in 1997 and is being honored for her thesis entitled, “Renormalization-Group Theory of Superfluidity and Phase Separation of Helium Mixtures Immersed in Aerogel.” Her work reproduced and explained several new experimental features, such as a phase separation between two superfluid phases, a critical point imbedded within superfluidity, and the occurrences of a superfluid phase with very low He concentrations. This resulted in the publication of one paper in Physical Review B, as well as a follow-up paper recently submitted, and has suggested new experimental directions. She has also been awarded fellowships from both the NSF and Bell Laboratories to pursue graduate studies in physics.

Specifically, Lopatnikova’s work on the renormalization group theory for helium-mixture phase transitions immersed in a disordered porous medium involved the coupled mappings of bulk and surface probability distributions of quenched disorder in the system, and the mastery of the random-field and random-bond problems of critical phenomena. She successfully completed this very difficult calculation that only a few full-time condensed matter physicists in the world can do, since it requires taking into account subtle physical effects, factorizing and then interlacing superfluidity and criticality with the connectivity, tenuousness and randomness properties of aerogel. Since then, she has obtained results in the question of the existence or non-existence of superfluidity and criticality with the connectivity, tenuousness and randomness properties of aerogel. Since then, she has obtained results in the question of the existence or non-existence of a gap in the excitation spectrum of quantum magnetic systems, with relevance to high-temperature superconductivity.

Geddes graduated from Swathmore College in 1997 with a degree in physics and high honors, the latter received in part because of his excellent thesis research in plasma physics, entitled, “Spheromak Equilibrium Studies on SSX.” In fact, he was awarded the William C. Elmore Prize as the top physics graduate at the college. His thesis is based on some of the initial experiments performed on the Swathmore Spheromak Experiment at the school’s new Magnetofluids Laboratory.

The experiment’s ultimate goal is to simulate conditions in solar flares (100,000 degrees C) for a very short time (100 milli-radians of a second) in order to study fundamental magnetofluid processes. Using techniques borrowed from the magnetic confinement fusion, the team is able to generate a hot ring of magnetized plasma called a spheromak. Geddes characterized the magnetic structure of these spheromaks using arrays of magnetic probes of his own construction, and using his own analysis, fit the data to various models. He also made presentations of this work to members of the Swathmore Board of Trustees, and at the 1996 APS Division of Plasma Physics Meeting in Denver, Colorado.

Apker selection dinner – Committee members (least to right): Steven Ralph (Emory), Juna Matthews (MIT), Harry Lustig (APS), Kumar Patel (UCLA), Barrie Ripin (APS) and Finalists (front, right to left): Scott Hill, David Ginger, Stuart Norton, Julie Hoff, and Cameron Geddes. Finalist Anna Lopatnikova and selection committee members Robert Schrieffter (Florida State) and Laurence Marshall (Gottfried College) are missing from the photo.
March Meeting Electronic Abstract System Problem

The APS Meetings Department wishes to thank everyone for their patience with the unfortunate computer problems we experienced during the March98 abstract deadline in December. We have made every attempt to notify abstract authors whose abstracts were lost, to resubmit. We apologize for any inconvenience this may have caused our members, and assure you that we are working diligently to implement safeguards against future system failures. If you have any questions about your abstract, contact abs-help@aps.org or call 301-209-3290.

The March program will be posted to the web on or about January 8. At the time we post the program to the web, notification will be sent to authors informing them of their session assignment. Please check the program on the web to ascertain that your abstract is included, and let us know immediately if it is not.

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Now Appearing in RMP…

Reviews of Modern Physics is a quarterly journal featuring review articles and colloquia on a wide range of topics in physics. Titles and brief descriptions of the articles in the January 1998 issue are provided below.

Instability, turbulence, and enhanced transport in accretion disks
Steven A. Balbus and John F. Hawley examine the dynamics of accretion disks, which are ubiquitous in astrophysics as engines for consolidation of mass. A new major advance is the appreciation of the important role played by magnetic fields in the disk dynamics.

Theoretical methods for the atomic many-body problem
J. Sapirstein reviews the highest-accuracy calculation methods in the theory of multielectron atoms, with a view to applications in subatomic physics.

Quantum tunneling in nuclear fusion
Nuclear fusion below the Coulomb barrier exhibits quantum tunneling in a many-dimensional space, and this review by A. Ishizaki and A. Nonaka discusses both the theory and experimental aspects of this phenomenon.

The quantum jump approach to dissipative dynamics in quantum optics
The present capability in quantum optics to monitor the state of individual atoms calls for more versatile theoretical tools than have traditionally been used in this area. Martin Plenio and Peter Knight describe formalisms that have been recently developed for this purpose, to replace the older density-matrix formalism.

Nonlinear optical response of semiconductor and molecular nanostructures
Volodya M. Axt and Shaul Mukamel present a formalism for describing the electro-magnetic excitation of condensed systems. Using a particle-hole representation, they derive well-known models that are used in semiconductor and molecular physics.

Application of superconducting quantum interference devices to nuclear magnetic resonance
Jaison S. Greenough describes the unique properties of SQUIDs as detectors in NMR studies, and he reviews the applications that have been made to date.

Stochastic resonance
The enhancement of weak signals by noise is called stochastic resonance. Peter Hänggi, Peter Jung, and Luca Marchesoni review the experimental phenomena and the corresponding theoretical understanding.

CAUGHT IN THE WEB

Notable additions to the APS Web Server. The APS Web Server can be found at http://www.aps.org

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January 15 Deadlines

1998-1999 APS/AIP Congressional Science Fellowships
The American Physical Society and The American Institute of Physics are currently accepting applications for their 1998-1999 Congressional Science Fellowship Programs. Fellows serve one year on the staff of a senator, representative, or congressional committee.

For information and/or applications:
APS/AIP Congressional Science Fellowship Programs
529 14th Street, NW, Suite 1050
Washington, DC 20005
(202) 662-8700 • email: opa@aps.org
See the December issue of APS News or AIP home pages: www.aps.org and www.aip.org for details about the program and application procedures.

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Science and Technology Centers

DEADLINE FOR PREPROPOSALS: FEBRUARY 12, 1998

The National Science Foundation (NSF) announces that the new program solicitation for Science and Technology Centers (STC) Integrative Partnerships is now available. This solicitation will only be available on the NSF home page. The web address where the solicitation can be found is:

http://www.nsf.gov/bio/ost/ost

The NSF established the Science and Technology Centers (STC) Program in 1987 to fund important basic research and education activities and to encourage technology transfer and innovative approaches to interdisciplinary programs. The centers have the opportunity to explore new areas and build bridges among disciplines, institutions, and other sectors. They offer the basic research community a significant mechanism to take a longer term view of science and explore better and more effective ways to educate students.

Major Research Instrumentation

DEADLINE FOR PROPOSALS: JANUARY 30, 1998

The National Science Foundation (NSF) announces the electronic publication of the solicitation for the Major Research Instrumentation (MRI) Program. This publication will only be available on the NSF home page and will not be made available in hard copy. The MRI solicitation can be found at:

http://www.nsf.gov/od/ors

Experience has proven that this is an excellent opportunity for NSF to partner with academic institutions for the acquisition of state-of-the-art, high-cost, research instrumentation and for the development of the next-generation research instrumentation. This instrumentation must be accessible for both research and research training purposes thus fostering NSF’s core strategy of integrating research and education.

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See the December issue of APS News or AIP home pages: www.aps.org and www.aip.org for details about the program and application procedures.
Postmodernists and adherents of the "social studies of science" school claim that science is in crisis because it can no longer serve as a reliable or accurate reflection of the real world. These criticisms have been shown to be fallacious and to stem from a serious lack of scientific knowledge by P.R. Gross and N. Levitt, who quote and refute numerous postmodern gurus, such as Jacques Derrida and Michel Foucault (see, for example, Johns Hopkins Press, 1994). This lack of knowledge was also shown in the gullible publication of Allan Sokal's parody as a serious article in a leading cultural studies journal, Social Text. As Sokal has pointed out, the editors published an article "which any competent physicist or mathematician could have told them was a spoof" because it critiques science as hegemonic, culturally determined and subjective. Both Gross and Levitt's book and Sokal's article have provoked much comment.

The interaction of postmodernism with science has not been viewed as much attention, but it can have serious consequences, because proponents of postmodernist approaches are heavily involved in K-12 education. Claims made include: (1) there are "ways of knowing" as valid or better than science; (2) "Euro-sciences" are inferior, capitalized, and imperialist; (3) people of color are more spiritual and moral than Europeans; (4) the paranormal is a valid scientifically proven fact; and (5) myths are valid explanations of natural phenomena. The end result of a wide adoption of these ideas would be to decrease an already deplorably small participation of minorities in science.

Feminist philosophers of science and postmodernists argue that science is the set of conventions produced by the particular culture of the West at a particular historical period, rather than a testable body of mathematical truths. Science is thus "theological" and "theological" are comparable to, and may even be superior to, "Western" science. These critiques claim that the advent of quantum physics, and particularly the Heisenberg uncertainty principle, has destroyed the notion of a clearly defined, sure, and reliable information about the world and has lost its claim to objectivity. Similarly, the term "chaos theory" is used to convince the reader that there are no longer make reliable or accurate predications.

Hunter Havelin Adams, the author of the Portland Baseline Essay, states: "This is a text used by teachers in numerous large urban schools, makes the same claims in a less sophisticated language: "Nobody has a monopoly on truth... There is no one correct way of knowing. There are ways of knowing. And processes in humans. Black athletes support psychic phenomena, such as ESP, because of their melanin. Melanin is also responsible for the superior intelligence, the potential extra-sensory ability, and the greater spirituality of Black people.

Postmodern culturalists emphasize spirituality by claiming that it is really an "alternative scientific paradigm." A similar strategy is to claim that myths are as accurate eyewitness testimonies about reality. For many years, religious (mythic) explanations were the prime explanatory source for both natural and supernatural phenomena. The success of science and technology, and the need for a more reliable and accurate scientific methodology. What Adams calls the "Euro-sciences" are as valid or better than science; (2) "Euro-sciences" are inferior, capitalized, and imperialist; (3) people of color are more spiritual and moral than Europeans; (4) the paranormal is a valid scientifically proven fact; and (5) myths are valid explanations of natural phenomena."