William Brinkman Elected APS Vice President

In October, the 1999 Nobel Prize for Physics was awarded to Gerardus 't Hooft of the University of Utrecht and Martinus Veltman, formerly of the University of Michigan and now retired, "for their work toward deriving a unified framework for all the physical forces. Their efforts, part of a tradition going back to the 19th century, centers around the search for underlying similarities or symmetries among disparate phenomena, and the formulation of these relations in a complex but elegant mathematical language. A past example would be James Clerk Maxwell's demonstration that electricity and magnetism are two aspects of a single electromotive force. Naturally this unification enterprise has many paths and is sometimes criticized as a look toward the search for underlying similarities or symmetries among disparate phenomena, and the formulation of these relations in a complex but elegant mathematical language. 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To Advance & Diffuse the Knowledge of Physics

100 Years of the American Physical Society

Excerpts from an exhibit displayed at the APS Centennial Meeting. Curator: Sara Schechter, Gnomon Research Exhibit Director: Barrett Ripin With contributions by Harry L. Juday, R. Mark Wilson, and others.

Science without Borders

In November 1944, three months after the end of the war, the APS Council voted to treat German and Japanese members the same as other foreign members. Gifts of wartime and postwar issues of the Physical Review and reviews of Modern Physics were sent to German and Japanese universities in 1948. Such actions led McCarthyites to view many physicists with suspicion during the Cold War. Former APS presidents Edward T. Condon and Robert Oppenheimer were among those blacklisted.

Seeking Truth without Regard to Politics

In 1990, APS encouraged the U.S. Congress to set up the National Bureau of Standards. In 1993, APS again came to the Bureau’s support when its director, Allen V. Astin, resigned under pressure from the Secretary of Commerce. At issue was a battery additive that NBS had tested and found did not extend battery life as advertised by the manufacturer. Astin was eventually reinstated.

Public Affairs

Until recently, the American Physical Society prided itself on its aloofness from matters of public policy. It saw itself as an organization devoted exclusively to the affairs of pure science. The archival record tells another story, and one of which the Society might equally be proud.

Time and again the Society entered the field of politics—with petitions to Congress, telegrams to news agencies, and well-placed letters—in order to defend the scientific integrity, freedom, and loyalty of its members. During the war years, the APS was responsive to the needs of national security without losing sight of the long-term goals of international cooperation.

Next Month: Consciousness Rising: Turbulent 60s

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New Faces at APS Headquarters

Two new people joined APS staff's College Park, MD, headquarters in October: Barbara Hicks joined the Society as associate publisher replacing China Chung, and Suzanne Otwell is the new education programs administrator, replacing long-time APS employee Tam McLaughlin who now works for the American Psychiatric Association.

Hicks comes to the APS after 18 years with the American Society for Testing and Materials (OSA), initially as director of meetings and conferences, and later as part of OSA's marketing program in its development and business strategies department. The focus of her work with APSis to assist in maintaining the Society's non-member subscriptions.

Suzanne Otwell

A graduate of Smith College, Otwell came to the APS from ASPEN, a medical and scientific association. She will be supporting the APS Committee on Education and its work on women's issues through the APS Committee on Status of Women in Physics.

IN BRIEF

Townes Receives Annunzio Award

In October, the second annual $100,000 Frank Annunzio Award, established by the Christopher Columbus Foundation, was awarded to Charles Hard Townes, inventor of the laser. Townes is a professor of physics at the University of California at Berkeley, a fellow of the APS, and was awarded the APS Flyer Prize in 1997 and the Nobel Prize in Physics in 1964. The laser was developed out of his microwave work on molecules at Bell Telephone Labs in the early 1950s. Townes is trying to produce a wavelength shorter than a few millimeters in order to extend his spectroscopic studies. The concept on how to accomplish this came to him early one morning in 1951 while sitting on a park bench. Townes envisioned using radiation to stimulate a molecule or atom to give up energy, thus increasing the radiation intensity. This was the invention of the MASER Microwave Amplification by Stimulated Emission of Radiation, which was the basic idea behind the LASER which uses light amplification.

The Frank Annunzio Award is presented to a living American whose innovative thinking has had a significant and beneficial impact on society. It is named for the Honorable Frank Annunzio who served as a Member of Congress from the State of Illinois for 28 years, and was the visionary behind the establishment of the Christopher Columbus Foundation. The Christopher Columbus Fellowship Foundation is an independent Federal government agency established by Congress to encourage and support research, study and labor designed to produce new discoveries in all fields of endeavor for the benefit of mankind.

DNP Establishes Junior Investigator Program

The APS Division of Nuclear Physics and the DOE have announced the initiation of a new Junior Investigator Program to support the development of individual research programs of outstanding scientists early in their careers. Grant applications for support are invited from tenure-track faculty currently involved in experimental or theoretical nuclear physics research falling within the full range of activities currently supported by the Division of Nuclear Physics and the DOE. The deadline is November 16, 1999. For complete information see the web page at the URL http://www.er.doe.gov/prod/portal/grunds/599/20104/Govt/Dr_G._Kovar.Division_of_Nuclear_Physics.SC-23 (GTN), U.S. Department of Energy, 19901 Germantown Road, Germantown, Maryland 20874-1290, Telephone: (301) 903-3633, Fax: (301) 903-3833.

APS Division Gets Off Its "High" Horse

The APS Division of High Polymer Physics — the second-oldest division within the Society, having been established in 1944 — has voted to change its name to the APS Division of Polymer Physics (DPOLY). According to Andrew Lovinger (National Science Foundation, the division's councilor), the use of "High Polymer" in the division's name stemmed from the original German terminology for those new materials whose high molecular weight was responsible for their unique properties. [A low molecular weight polymer would have the properties of a liquid or a wax.] However, only recently did scientists discover that the high molecular weight aspects of polymers have been taken for granted, and a new term, "ultrapolymer," is used to describe low molecular weight polymers, making the modifier "high" redundant. Also, the terminology led to the question of whether polymers have high physics and low chemistry, or vice versa, says Lovinger. "A majority of the division members felt that a change of name would not only more accurately reflect the interests of the division, but would attract additional membership." The division members voted for the name change and the APS Council has approved it last May.

Physics In Popular Culture

Physics has been making cameo appearances in mass media culture during the APS Centennial Year. In September, an article on Josephson depicted a category of Quantum Physics, which even mentioned the APS/CN according to him. And novelist Thomas Harris' new thriller, Hannibal, - the sequel to his best-selling Silence of the Lambs, - contains several Objective C citizen who are on Education reference of its own. On page 263 of the hardcover version, FBI agent Clarice Starling is attempting to track serial killer Hannibal “the cannibal” Lecter by cross-checking new subscription to various cultural journals Lecter has subscribed to in the past. The only one mentioned by name is "The Physical Review."
International Collaboration: Cost Effective or a Give-Away?
by Irving A. Lerch, APS International Affairs

It is estimated that from 70% to as much as 80% in the expansion of our economy is technology-driven, derived from the most productive system of scientific innovation in the world. This is also true of our national security. Science is indispensable to the development and maintenance of the nation’s arsenal. The Department of Energy’s Nuclear Stockpile Stewardship Program is central to the safety and reliability of American nuclear weapons and to our hope for a worldwide ban on nuclear tests. But this program will fail without a continuous intense development effort based on cutting-edge science. And a great deal of the science needed is being pursued in fundamental non-weapons-related research around the world.

Science expresses the collective intelligence of humankind and it cannot be impounded by any nation. As is true of the world’s economy, so is science. Any impediment to the exchange of ideas serves only to isolate the nation’s intelligence of humankind and it cannot be impounded by any nation. As is true of the world’s economy, so is science. Any impediment to the exchange of ideas serves only to isolate the nation’s intelligence of humankind and it cannot be impounded by any nation.

If we ask ourselves what’s at stake in this debate over the value of our investments in international cooperation, we can make a relatively simple back-of-the-envelope calculation. In a recent study of organizational complexity, Barbara Drossel of the University of Manchester invoked a model for productivity dependent upon the numbers of partners in a group and impededness to communication. Drossel assumes that group productivity per member is reduced by the costs of maintaining connectivity within the group. This yields a very simple model where the productivity gain of a group per member is proportional to the number of members and is reduced by the square of the number of members. So long as the cost of maintaining the group is very much smaller than the costs of communication, group productivity will climb as members are added, eventually reaching a peak and plunging negative as more and more of the group’s resources go into maintenance.

As the cost of maintaining the group... Continued on page 5

Happer to Remain on Princeton Team
In a letter to APS News, Dan Kleppinger pointed out that a recent article on MRI research being carried out to measure the brain’s atomic secrets was conceived and developed by William Happer of Yale University. It fails to me to correct the recorder: Will Happer is a member of the Physics Department of Princeton University and we have no intention of himing to Yale! Curtis G. Callan, Jr., Princeton University, Princeton, New Jersey

Readers Reply to Chodos Regarding Foreign Students
In his back page article (APS News, October 1999), Alan Chodos claims that “the ability of change this [perceived shortage of American physicists] rests very little with professors in universities.” But professors can do a lot, because declining interest in physics programs has largely been a faculty change. How to change the promotion and tenure of essentially every faculty member at PhD-granting departments is based nearly exclusively on research. Most departments are eager to hire promising research-ers, regardless of teaching skills. This imbalance has implications for K-12 education, for American universities’ scientific attractiveness, and for the much-mentioned problem of diversity. Here at the University of Arkansas, we have demonstrated that attention to students can have big payoffs. We have added two new applied BS tracks geared toward immediate employment, broken our large introductory course into smaller sections that combine lecture and lab, and added a BA physics degree for students hoping for careers in such non-physics fields as business and law, expanded our course for non-scientists, added two applied interdisciplinary MS programs and an MA degree for teaching, and can attract a great number of students. The result? Physics course enrollments are up, the number of physics majors is up, and the physics baccalaureate graduate rate is up from an average of 2.5 per year during 1999-1997 to 12 in 1998, 13 in 1999 and 16 on track for 2000.

Bill P. Curry, Ph.D., EMBC/TEC Consulting Co.

New DOE Polygraph Rules Don’t Protect National Security
The Department of Energy’s proposed new polygraph policy should be of concern to many physicists. All APS members in particular should realize that polygraph examinations are a gross violation of a physicist’s atomic secrets. The following sources should make this clear:

Drew C. Richardson, testimony to the Senate Committee on the Judiciary, http://www.nopolygraph.com/drewtest.htm

Charles R. Honts, “Counterintelligence Scope Polygraph Test Found to be Poor Discriminator,” Forensic Reports, 5 (1992), pp. 21-28


By substituting cheaper polygraph exams for more expensive background in- vestigations, the DOE is shirking its legal and moral obligations to protect America’s atomic secrets. The proposed rules fail to protect both national security interests and employees; and I urge the DOE to rescind its proposed polygraph rules and to use its discretionary authority to halt all polygraph screening of DOE and contractor employees. For an account of my personal experience with the polygraph — I was falsely accused of being a spy — see http://www.nopolygraph.com/captain_jones.htm

George W. Maschke, University of California, Los Angeles
Beginning in the 1990s, concern began to be expressed as to the underenrollment of university students in science and engineering. Today, many students can switch in and out of majors throughout their course of study, failure to do so seems to go directly into industry, as terminal BS or BA degree holders they are housed in research labs as techies. There is of course the MBA or law option. But for many of the students we are eager to serve, such post-graduate options cause them to have to reinvent themselves as law or business students, and to compete with students who, while not well-schooled in mathematics or science, are able to compete with them in the arts of advocacy and/or marketing.

Thus, the professional MS in science and mathematics is characterized not only by new subject matter, but also by new pedagogies and new means of evaluating applicants for admission and matriculation. The new professional MS degree programs are not identical. Some involve an emerging new field, such as bioinformatics; others interdisciplinary study, such as computational sciences; still others, science/mathematics “plus” business, law, organizational theory and communication. New pedagogies are also being discussed, such as an innovative student-centered model at the Keck Graduate Institute; a lab rotation through a variety of cutting-edge research fields at the University of Arizona; and, at Michigan State University, a series of “business for business” weekend short courses tailored made for the background and mindset of science/mathematics students.

Like the MBA, which took nearly 40 years to sell to students and employers, these programs must be packaged and sold. What we are after is a high-level education in the science/mathematics underpinnings of today’s and tomorrow’s technologies. The core of the program is the development of flexible careers at the interface of R&D, product development, regulatory affairs, intellectual property issues, marketing, financial management. Let us hope students will perceive these opportunities the way we do and that employers will provide innovative career pathways once they are in the work force.

Sonia Tobias is the author or co-author of eight books on physics, physics education, mathematics and science teaching and learning among them: They’re Not Dumb, They’re Different (1990), Breaking the Science Barrier (1992), and Thinking Science as a Career (1995). A version of this article appeared in the November 1999 issue of The Physics Teacher. For more information about Sloan-sponsored professional MS programs can be found online at www.ScienceMasters.com.
Sinking the Test Ban Treaty

by Michael S. Lubell

Politics generally follows a well-defined set of rules, but when hatred, mistrust and partisanship dominate the scene, the rules get washed away like tiny grains of sand in a pounding surf.

The demise of the Comprehensive Test Ban Treaty (CTBT) is a perfect example of this. In the past few months, those rules got washed away like tiny grains of sand in a pounding surf.

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The APS voted against the CTBT (48-51) on Tuesday, October 12. The text of the Gerhard Schroder (Germany). The APS Council statement on the Comprehensive

The APS Council statement on the Comprehensive

Treaty (CTBT). APS President Jerome Friedman organized a letter signed by 32 physics Nobel Laureates, calling the treaty “central to future efforts to halt the spread of nuclear weapons.” Their sentiments were echoed in the New York Times on October 8 by world leaders Jacques Chirac (France), Tony Blair (England) and

Michael S. Lubell

and Monday evening’s banquet featured a lecture by Richard Voss of Florida State

A Washington Analysis

University on fractals and scaling in nature, culture and finance. [Image 655x991 to 734x1096]
Herzog Navigates Hectic Waters of Congressional Life on the Hill

Antonia Herzog

Nothing brought the reality of the world of the U.S. Congress into sharper focus for APS Congressional Fellow Antonia Herzog as much as the day she was asked to draft a rationale for an upcoming vote on the Senate floor a mere 15 minutes before the voting was scheduled to take place — concerning a proposed amendment she knew nothing about. “It’s so important for members of Congress to make every floor vote,” she says of what she learned from the experience. “Their schedules are basically ruled by when votes are going to occur which is necessarily constant until the last minute.”

Fortunately, not every day of her fellowship year featured such last-minute scrambling, although she admits, “Things do operate constantly in crisis mode.” Herzog spent the last year as a special legislative assistant to the Congressional office of Senator John D. Rockefeller IV (D-WV), juggling such varied duties as preparing for hearings, organizing meetings, writing statements to be read from the floor, building support for pending legislation, and meeting with constituents and lobbyists. “It’s not that you actually figure out how Congress works in a single year, but you do walk away with a much better understanding of how our country runs, and how to have an impact on the process,” she says. “And that type of knowledge is useful no matter what you end up doing.”

Herzog chose to work in Rockefeller’s office in part because of his longstanding interest in science and technology issues. At the time, he was the ranking Democrat on the Commerce Committee’s Science, Technology & Space Subcommittee, and he is currently the ranking member of the Aviation Subcommittee. But she also admired his idealistic decision to move to West Virginia some 30 years ago, despite his privileged background, with hopes of assisting the population of this predominantly poor region. In particular, she worked on legislation involving authorized funding increases for R&D, and to streamline the technology transfer process from government labs to the private sector, although none of her projects were voted into law. “My year was about small victories, moving things forward and raising people’s awareness about issues I felt were important,” she says, citing R&D funding and availability of federal research and development grants as her main accomplishments. 

Herzog came to the APS fellowship from the American Association for the Advancement of Science (AAAS), where she served as a consultant. The experience introduced her to the various issues related to the ethics of science, the role of science and technology, and convinced her that she wanted to make science policy her career.

It was a hot year on the Hill this year, but she still considers science policy follows a necessary asset to Congress. “What proved crucial was having an understanding of the science and appreciation of how scientific process and enterprise, which few of the many lawyers on the Hill possess,” she says. For her part, she appreciated the network of fellow scientists currently working worldwide, government, academia and the private sector, and while her future plans are not yet final, she ultimately hopes to remain in science policy, possibly working for a non-profit science policy organization. “I firmly believe that the best years of my scientific life may lie this year will continue to have a profound impact on it,” she concludes.

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Creating Art from Classical and Quantum Chaos

A series of prints depicting images derived from classical and quantum chaos is currently on exhibit in the cafeteria at the American Center for Physics in College Park, MD. Created by Eric Heller, a physicist at Harvard university, the exhibit was originally displayed as part of the APS Centennial meeting and Festival of Physics in March in Atlanta, GA. The prints were produced on an Epson 3000 inkjet printer from computer data generated in Fortran, Matlab and Mathematica.

Heller's interest in the field of chaos began with his investigation of standing quantum waves in a stadium shaped box, specifically the periodic orbit orbits generated by a classical particle bouncing around the box. This “stadium billiard table” is shown on page 1. The image Heller is standing beside in the photo above depicts a Westerfeld resonator, in which a plane wave impinges from below on a wall with a small slit. Beyond the wall is a circular mirror which causes narrow resonances to occur, which are analogous to the eigenvalues of the problem. The hole in this system is slightly off center, this resonance wavefunction has an asymmetrical shape.

Festival Profile: Fractals, continued from page 3

to improve the diagnostic ability of radiologists, particularly in the early detection of breast cancer. This is an area where early diagnosis has particular importance in terms of the patient's life expectancy, but to date the diagnosis of breast cancer from X-ray mammograms has proven to be an extremely difficult perceptual process.

Another group argued that there was a political advantage to be gained by forcing the vote. This group pointed to the outcome as a “win-win” situation. In the unlikely event that the treaty passed, the President would claim credit. If the more probable scenario of treaty defeat became the reality, the Democrats would have a prime issue for the 2000 campaign.

A third group, bolstered by outside non-proliferation advocates, argued in favor of a vote, because they genuinely believed that they could win it, even though the White House had done little spade work and Senate Republicans were loathe to give the President credit for anything if they could help it. Mammograms

Inside the Beltway, continued from page 6

planners at the other end of Pennsylvania Avenue had different thoughts.

For one thing, according to White House insiders, presidential advisors had been split on how to handle the treaty. One group urged delay, possibly until after the next election, when the GOP's visceral hatred of the White House occupant would be not the dominant factor.

Another group argued that there was a political advantage to be gained by forcing the vote. This group pointed to the outcome as a “win-win” situation. In the unlikely event that the treaty passed, the President would claim credit. If the more probable scenario of treaty defeat became the reality, the Democrats would have a prime issue for the 2000 campaign.

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Mammograms
the necessary qualities of intellect, energy, determination, and community in general. "Finding people with the right combination of these traits is a challenge," he said. "Finding people with the right technology to national security problems."

In his candidate's statement, Callan cited the development of professional exchanges as a key to previous advances, and prompting a reassessment of the role of the APS in fostering this growing international collaboration. "I believe the APS faces a unique and exciting opportunity to help physicists understand the nature of the universe. "I believe the APS should embrace diversification and make a conscious effort to use education with a group of judges and decision-makers, for such evolution does not necessarily lead to the most advanced research in the world. It is true that much of the research is not yet known to the public, but it is still vital to the survival of physicists and physicists' education," she wrote. "In order to believe that the physics community will begin to realize that diversification is at the very foundation of fundamental research, and that the study of physics could not have progressed to today's levels of understanding without such diversification in the past."

In his candidate's statement, Callan discussed the enormous changes both in the intellectual content of the science itself, and in the societal and funding context in which physicists work. He called the challenges of the APS and the physics community in general. "Finding people with the necessary qualities of intellect, energy, and judgement to lead the APS and convincing them to stand for office, is more critical today than it ever has been," he said. "The future health of our society is dependent on the judgement and activism of today's Nominating Committee."

GENERAL COUNCILLORS

JIN-JOOG SONG
Oklahoma State University

Born in Seoul, Korea, Song received her PhD in experimental solid-state physics and quantum electronics from Yale University in 1974. She worked at MIT and IBM, was a research associate, and later was on the faculty of the University of Southern California. In 1987, Song moved to Oklahoma State University where she now holds the positions of Regents Professor of Physics and Nobel Professor of Photonics, as well as Director of the Interdisciplinary Center for Laser and Photonic Research. Song was the first woman to hold a professorship at the University of California at Berkeley and first woman president of the Association of Asian Physicists in America. Her research interests include nanotechnology and ultradian phenomena, especially wideband semiconductor quantum structures, epipolar growth, characterization, and device fabrication.

In her candidate's statement, Song cited the growing internationalization of the Society, and the continual advancement of information technology that is accelerating the development of professional exchanges to a level previously inconceivable, and prompting a reassessment of the role of the APS in fostering this growing international collaboration. "In my view, one of the biggest challenges the APS faces is that of making physicists and physicists more relevant to society while preserving the pursuit of the most fundamental understanding of the nature of the physical universe. "I believe the APS should embrace diversification and make conscious efforts in physics education with a group of judges and decision-makers, for such evolution does not necessarily lead to the most advanced research in the world. It is true that much of the research is not yet known to the public, but it is still vital to the survival of physicists and physicists' education," she wrote. "In order to believe that the physics community will begin to realize that diversification is at the very foundation of fundamental research, and that the study of physics could not have progressed to today's levels of understanding without such diversification in the past."

PHILIP PHILLIPS
University of Illinois, Urbana-Champaign

Born in Scarborough, Toronto, Canada, Phillips received his PhD from the University of Washington in 1971. After two years at the University of California at Berkeley, he joined the faculty in the chemistry department at MIT until 1993, when he moved to the University of Illinois at Urbana-Champaign. His research is in theoretical condensed matter physics with a special emphasis on explaining experimental observations that challenge the standard paradigm of transport and magnetism in disordered and correlated electronic systems. While he has worked on numerous problems such as the size and disorder dependence of the Kondo effect, bi-critical phenomena, and pair-tunneling, in recent years Phillips' efforts have been devoted to explaining the origin of the new conducting phase found in a dilute electron gas in bilayer graphene.

In his candidate's statement, Phillips cited three areas he believes merits particular attention by the APS, its officers and elected representatives, because of their potential for concrete action. These include the need for diversity in the physics community; the education of students to the notion that a physics major opens more doors than it closes; and a need for efficient lobbying to increase the level of research funding for condensed matter physics, particularly theory.

MARGARET M. MURNANE
University of Colorado, Boulder

Murnane joined JILA and the Department of Physics at the University of Colorado in 1999. Prof. Murnane received her BS and MS degrees from University College Cork, Ireland, and her PhD degree in physics from the University of California at Berkeley in 1990. She remained at Berkeley for one year as a postdoctoral fellow, before joining the faculty of physics at Washington State University in 1991. In 1996, Professor Murnane moved to the University of Michigan. Prof. Murnane's research interests have been in ultradilut optical science. In particular, her research has focused on the possible generation visible and x-ray pulses of a few cycles in duration, using extreme nonlinear optical interactions. She is a past recipient of the APS Simon Ramo Award.

In her candidate's statement, Murnane looked to the 21st Century and the many opportunities for physicists to impact the science and technology of the new millennium, including advances in nanoscience structures, laser manipulation of matter, and computation. She supported the APS's role in public policy meetings in rapidly changing fields, by providing new opportunities for multidisciplinary meetings, by advertising new discoveries and their impact on society as much as possible, and by supporting increased participation of industry to broaden career choices for students. She also supports converting the Society's efforts to articulate the breadth and diversity of physics, and to boast the important role of physics to the general public.

DR. STEPHEN J. FREEDMAN
University of California at Berkeley

Lawrence Berkeley National Laboratory

Freedman is an experimental particle physicist, currently working in areas of nuclear and particle physics. He has been a professor of physics at Berkeley since 1977. Freedman received his PhD in 1972 from Berkeley for his experimental test of Bell's inequality with a two-photon cascade in atomic calcium. He is an instructor in nuclear physics at Princeton University and in 1984 he became assistant professor at Stanford University. He joined the Argonne Physics Division of the APS in 1989. He is currently a member of the APS in fostering this growing international collaboration. He also supports the growing internationalization of the Society; the relationship to society, and the character of basic research are changing dramatically. He cited two challenges in particular facing the APS's public education and outreach, and globalization. A scientifically literate society is not only appropriate for the 21st Century, and the APS should strengthen its resolve for effectively advocating a sensible scientific component in the education for every young American; freedman wrote. "Similarly, scientific communication technologies and the emerging global economy provide us with the opportunity of creating a truly international community of scientists and scientific research, and we should take a leading role toward insisting that physics continues to develop as an international enterprise.

LBI Scientists Invent New Microscope for Characterizing Materials

Researchers at Lawrence Berkeley National Laboratory (LBL) have developed a new thumb-sized microscope that works on the same principles as a CD-player, using microwaves rather than visible light. Dubbed a Scanning Evanescent Microwave Probe (SEMP), this unique new instrument can be used to simultaneously characterize critical electronic properties along with the electronic structure of complex materials. Xiao-Dong Xiang, a physicist in LBL's Materials Sciences Division, presented the instrument in a paper he delivered at the APS Centennial meeting in Atlanta last March.

The SEMP uses near-field microwaves to measure the electrical impedance of materials with submicron resolution — a critical property for the electronics industry. By measuring the interaction between evanescent microwaves generated at an ultra-sharp tipped probe and the surface of the material, Xiang and his colleagues can not only measure the electrical impedance across the face of the material, they can simultaneously map the topography of its surface, another critical factor for manufacturing chips and other electronic devices. The SEMP's probe is connected to a high quality-factor microwave resonator equipped with a thin metal shield designed to screen out all but the evanescent microwaves from being generated at its tip. "This feature is crucial for high quality imaging," Xiang says. "If both evanescent and propagating microwaves had to be considered and calculated, as is the case for all other types of microwave probes, the quantitative microscopy would be impossible." The interaction between the evanescent microwave field and the sample surface gives rise to a resonance frequency and quality-factor changes in the resonator that are recorded as signals. These signals can be measured, and the measurements plugged into equations that translate them into a measurement of the sample's complex electrical properties with a spatial resolution of 100 nanometers. The SEMP can be used on conductors and insulators as well as semiconductors, and in any situation in which there is a need to characterize a material's electrical properties as a function of electric field strength, optical illumination, or temperature variations. The basic technology has been licensed to Ariel Technologies, but Xiang and his colleagues are continuing to refine the device, and are currently building a low-temperature version to enable them to study superconductors.
Announcements

APS/AIP CONGRESSIONAL SCIENCE FELLOWSHIP PROGRAM

The American Physical Society and the American Institute of Physics are accepting applications for their 2000-2001 Congressional Science Fellowship Programs. Fellows will serve one year on the staff of a Member of Congress or congressional committee, learning the legislative process while they lend scientific expertise to public policy issues.

Qualifications include a PhD or equivalent research experience in physics or a closely related field. Fellows are required to be U.S. citizens and, for the AIP Fellowship, member of 1 or more of the AIP Member Societies. A stipend of up to $49,000 is offered, in addition to allowances for relocation, in-service travel, and health insurance premiums. Applications should consist of a letter of intent, a 2-page resume, and 3 letters of recommendation.

Please see our website (www.aip.org/pubinfo or http://www.aips.org/public_affairs/fellow.html) for detailed information on applying. If qualified, applicants will be considered for both programs. All application materials must be postmarked by January 15, 2000, and sent to: APS/AIP Congressional Science Fellowship Programs, c/o Erika Ridgeway/AIPS Executive Office One Physics Ellipse, College Park, MD 20740-3841.

Y2K MARCH MEETING TUTORIALS, WORKSHOPS & SHORT COURSES

TUTORIALS
The following eight half-day tutorials will be offered on Sunday, March 19, 2000, just prior to the APS March Meeting in Minneapolis, MN:
8:30 AM - 12:30 PM
T1 Cellular Automata Simulations with Mathematica
T2 High Temperature Superconducting Power Applications
T3 Physics of Optical Communications
T4 Biological Fluorescence Imaging
1:30 PM - 5:30 PM
T5 Achieving High Performance in Numerical Computations on RISC Workstations and Parallel Systems
T6 Silicon Quantum Dots: Fundamentals and Application to Advanced and Future Nanoelectronic Devices
T7 Advanced Magnetic Resonance Technologies in New Frontiers of Science
T8 The Changing Roles of Researchers in Industrial and Applied Physics

CAREER WORKSHOPS
Sunday evening, March 19, 6:00pm - 9:00pm, the APS will offer a free Career Workshop run by the Career Services Division of AIP.

DPOLY SHORT COURSE TO FOCUS ON POLYMER THIN FILMS

The APS Division of Polymer Physics (DPOLY) will hold a short course on adhesion and other issues in polymer thin films and coatings as part of the 2000 APS March Meeting, to be held on Saturday and on Sunday morning, March 18-19 in Minneapolis, MN. The science and engineering of polymer thin films and coatings has numerous industrial applications, including adhesives, composites, fillers, and tissue implants. The course will provide an overview of recent developments in this area, such as polymer-surface dynamics and interfacial rheology; macromolecular physics of biological surface interactions; the glass transition of thin films; simulation methods and other issues in polymer thin films and coatings as part of the 2000 APS March Meeting in Minneapolis, MN:

Future Nanoelectronic Devices
Achieved in 2000 APS March Meeting, to be held on Saturday and on Sunday morning, March 18-19 in Minneapolis, MN. The science and engineering of polymer thin films and coatings has numerous industrial applications, including adhesives, composites, fillers, and tissue implants. The course will provide an overview of recent developments in this area, such as polymer-surface dynamics and interfacial rheology; macromolecular physics of biological surface interactions; the glass transition of thin films; simulation methods and other issues in polymer thin films and coatings as part of the 2000 APS March Meeting in Minneapolis, MN:

See Meeting Announcements for more information and enrollment instructions.

Prize and Award Nominations

OTTO LAPORTE AWARD
Endowed by the friends of Otto Laporte and the Division of Fluid Dynamics. Send five (5) copies of the nomination package with the name of proposed candidate and supporting information to: Joel Kopeikin; Lectiv Inst T-1 M; CONY-CUNY; 130th St & Convent Ave; New York NY 10031. Phone (212) 650-4816; Fax (212) 650-6925; email jkopeik@cony-cuny.cuny.edu
Deadline: January 15, 2000

FLUID DYNAMICS PRIZE
Supported by the friends of the Division of Fluid Dynamics and the American Institute of Physics Journal of Fluids Physics. Send five (5) copies of the nomination package with the name of proposed candidate and supporting information to: Todd Ireland; MIT; Room 24-109; Cambridge, MA 02139. Phone (617) 253-8670; Fax (617) 257-7437; Email jpfreid@mit.edu
Deadline: January 18, 2000

JAMES CLEARK MERRELL PRIZE IN PLASMA PHYSICS
Sponsored by Maxwell Technologies, Inc. Send five (5) copies of the nomination package with the name of proposed candidate and supporting information to: Jeffrey Friedenberg; Dept Of Nuclear Engineering; MIT; Room 24-107; Cambridge, MA 02139. Phone (617) 253-4545; Fax (617) 253-6027; Email jcm@mit.edu
Deadline: January 1, 2000

AWARD FOR EXCELLENCE IN PLASMA PHYSICS RESEARCH
Established with support from friends of the Division of Plasma Physics. Send five (5) copies of the nomination package with the name of proposed candidate and supporting information to: Earl Mamar; NW17-119; MIT; 77 Massachusetts Ave; Cambridge MA 02139. Phone (617) 253-8670; Fax (617) 253-6027; Email mamar@mit.edu
Deadline: April 1, 2000

NICHOLSON MEDAL FOR HUMANITARIAN SERVICE
Sponsored by friends of Dwight Nicholson. Send five (5) copies of the nomination package with the name of proposed candidate and supporting information to: Herbert L. Berk; RLM 11.326 Dept of Phys; University of Texas, Institute for Plasma Studies; Dean Kenton & Speechley; Austin, TX 78712. Phone (512) 471-1346; Fax (512) 471-6715; Email: berk@peaches.ph.utexas.edu
Deadline: April 1, 2000
CAUGHT IN THE WEB
Notable information on the World Wide Web
March Meeting: www.aps.org/meet/MAR00
April Meeting: www.aps.org/meet/APR00
Prize & Award Recipients: www.aps.org/praw/
New APS Fellows: www.aps.org/fellowship/
Fractal Gallery: sprott.physics.wisc.edu/fractals.htm
A Century of Physics timeline: timeline.aps.org
Playground Physics: www.aps.org/playground.html
Phys. Rev. Focus: focus.aps.org
Physics Limericks: www.aps.org/apnews/limericks.html
Amazon Books: www.aps.org/memb/amazon
100 Years of the APS - Exhibit & History: www.aps.org/apnews/history.html
Wacky Patents: colitz.com/site/wacky.htm

Y2K APS Fellowship Nomination Deadlines

**DIVISIONS**
- Astrophysics 05/01/2000
- Atomic, Molecular, Optical 02/15/2000
- Biological Physics 04/01/2000
- Chemical Physics 02/15/2000
- Computational Physics 03/15/2000
- Condensed Matter 01/30/2000
- Fluid Dynamics 02/15/2000
- Polymer Physics 04/15/2000
- Laser Science 04/01/2000
- Materials Physics 02/15/2000
- Nuclear Physics 04/01/2000
- Particles & Fields 04/01/2000
- Physics of Beams 03/15/2000
- Plasma Physics 04/01/2000

**FORUMS**
- Physics & Society 04/01/2000
- History of Physics 04/01/2000
- APS GENERAL 06/01/2000

Announcements

Volunteers Sought for APS Initiative on Inter-American Cooperation in Physics

The APS jointly through its Office of International Affairs, The APS Committee on International Scientific Affairs (CISA), and the Forum on International Physics (FIP) is presently pursuing an initiative designed to promote increased Inter-American cooperation in physics.

As one component of the overall Inter-American physics cooperation effort, the APS is currently seeking to identify volunteers who are interested in making contacts and establishing collaborations and working relationships with physicists in Latin America and Caribbean. A list of such volunteers is now being compiled that will be available as a Directory both on the APS Web site and as a hard-copy form that will be directly distributed to physics departments in Latin America and the Caribbean.

The purpose of the new directory is to provide initial contact information that can be used by Latin American and Caribbean physicists for the purpose of identifying potential lecturers, research collaborators, teachers, students, etc. who would be willing to visit and work for varying periods of time in a host country. Naturally, any details involving partial or full support of travel and living expenses in the host country would be arranged on an individual basis directly between the prospective visitors and their hosts without any involvement on the part of the APS. Additionally, while there is an emphasis on identifying individuals with Spanish or Portuguese language skills, individuals who do not possess such skills but who are personally motivated to interact with Latin American and Caribbean physicists is still encouraged to complete and submit the form for inclusion in the Directory.

All APS members who are interested in being included in this directory of potential scientific collaborators with Latin American and Caribbean counterparts are requested to provide the following information:

- **FAMILY NAME __________________________________________**
- **FIRST NAME __________________ MIDDLE INITIAL _______**
- **ORGANIZATION ______________________________________**
- **DEPARTMENT __________________ MAIL STOP _______**
- **ADDRESS __________________________________________**
- **CITY ______ STATE ______ POSTAL CODE __________**
- **COUNTRY __________________________________________**
- **PHONE __________________ FAX __________________**
- **E-MAIL ____________________________________________**
- **WEB PAGE URL (IF AVAILABLE) __________________**
- **PRESENT POSITION ______________________________**
- **DEGREES HELD __________________________________**
- **FLUENT IN? SPANISH ______ PORTUGUESE ______ OTHER______**

Please return the completed form or email the information to: Michele Irwin, International Programs Assistant, Office of International Affairs; American Physical Society; One Physics Ellipse; College Park, MD 20740; fax: 301-209-0865, email: mirew@aps.org

**Take $100 Off a New Life APS Membership**

In celebration of the Centennial, the APS has initiated a $100 discount off new life memberships between March 1, 1999 and February 29, 2000. A life membership, which ordinarily costs 15 times the regular current annual dues rate, includes a free life membership in one dues-requiring unit. To take advantage of this special offer, look for details in your next invoice renewal packet. The offer is not valid on an existing or previously purchased Life membership. Questions may be directed to the APS Membership Department at 301-209-3280 or membership@aps.org.

**Discounted Auto Insurance Added to Member Benefits**

The APS has entered into an agreement with GEICO, a leading auto insurer, to provide members with a preferred rate. With a current or new GEICO Preferred auto insurance policy, mention your APS membership number (listed on the first line of your APS News mailing label) and, in most states, GEICO will give you an extra 8% discount.* The savings will cover the cost of annual APS dues in most cases. In addition to savings, GEICO offers convenient 24-hour service from a professional representative for rate quotes, claims, or questions. When you qualify, you’ll get coverage tailored to your needs and a choice of payment plans.

All it takes is a quick call to GEICO Preferred at 1-800-368-2734 or a visit to their web site at: www.geico.com.

*Discount is 10% in CA, DC, and IL, 5% in NY; not available in all states. Discount is not available in GEICO Indemnity Company or GEICO Casualty Company. One group discount applicable per policy. Government Employees Insurance Co. GEICO General Insurance Co. GEICO Indemnity Co. GEICO Casualty Co. These shareholder-owned companies are not affiliated with the U.S. Government. GEICO Auto Insurance is not available in MA, NJ or outside the U.S.

**APS SEEKS ASSOCIATE EXECUTIVE OFFICER**

The American Physical Society is seeking applications and nominations for the position of Associate Executive Officer. The primary responsibility of the Associate Executive Officer is to work with the Executive Officer to coordinate and enhance APS programs and activities. It is expected that the person selected will play a leadership role in APS efforts to communicate with the public and with APS members and act as editor of APS News; both paper and online versions. Other responsibilities may include the administration of APS awards and fellowship programs, working with APS divisions, sections, forums and topical groups, and initiating new programs to serve APS member needs. Qualifications for the position include a PhD in physics or a related field, extensive familiarity with the physics community, and excellent communication skills. APS offers a competitive salary and an outstanding benefits packet. For consideration, send a cover letter, resume, and professional references to Judy Franz, Executive Officer, APS, One Physics Ellipse, College Park, MD 20740, fax: 301-209-0865, email: franz@aps.org. For further information, don’t hesitate to send an email message or call: 301-209-3270.
Festive Formula

For those who like to plan their Christmas in advance, here is a little formula that can reveal the day of the week for any day in the coming year. Begin by dividing the date, on any day (including leap years) after 1600.

1. Write down the year you’re interested in, e.g., 1998. Split this number into its century number C (19) and its year number Y (98).

2. Now divide C by 4 and keep just the whole-number part of the result, K. In this case K=19 (div 4 = 4.75, which is rounded off to 4).

3. Do the same for Y, giving a new figure, G. [G = 98 (div 4 = 24.5, rounded off to 24)]

4. Now work out the value of D, using the formula D = 50 + Y

\[D = 50 + 98 = 148 \div 4 = 37 \text{ (mod 7)} = 3\]

5. To work out the day of the week, divide D by 7 and take the remainder. R. [138 (div 7 = 19 with a remainder of 5, or Friday] Use the following table to determine the day of the week:

<table>
<thead>
<tr>
<th>0</th>
<th>Sunday</th>
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<tbody>
<tr>
<td>1</td>
<td>Monday</td>
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<td>2</td>
<td>Tuesday</td>
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<tr>
<td>3</td>
<td>Wednesday</td>
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<td>4</td>
<td>Thursday</td>
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<tr>
<td>5</td>
<td>Friday</td>
</tr>
<tr>
<td>6</td>
<td>Saturday</td>
</tr>
</tbody>
</table>

All the while the old certainties seemed certain, and it had been squashed, killed, in the head of the industrial scheme for the use of hallucinogenic toadstool in traditional rituals. I can add that Santa was born with a genetic predisposition to become obese and now suffers from diabetes. He does not live at the North Pole, per se, but at a range of places. The many depictions of the fat man with a white beard.

The subject, I was unprepared for the depth of the winter and the cold that would eventually emerge. Take those flying reindeer; Santa’s red and white color scheme and his jolly disposition, for example. They are designed to the use of hallucinogenic toadstool in ancient rituals. I can add that Santa was born with a genetic predisposition to become obese and now suffers from diabetes. He does not live at the North Pole, per se, but at a range of places. The many depictions of the fat man with a white beard.

... Saturday
... Sunday
... Monday
... Tuesday
... Wednesday
... Thursday
... Friday
... Saturday...