

DIVISION OF ATOMIC, MOLECULAR AND OPTICAL PHYSICS NEWSLETTER

A Division of The American Physical Society

March 2005

JIM McGUIRE, Chair
Department of Physics
Tulane University
New Orleans, LA 70118-5698
Phone: (504) 862-5520
FAX: (504) 862-8702
m McGuire@tulane.edu

CHARLES CLARK, Chair-Elect
Electron and Optical Physics Division
National Institute of Standards and Technology
B100 Radiation Physics Bldg.
100 Bureau Drive, Stop 8410
Gaithersburg, MD 20899-8410
Phone(301)975-3709
FAX: (301) 208-6937
charles.clark@nist.gov

TIMOTHY J. GAY, Vice Chair
Behelen Laboratory of Physics
University of Nebraska
Lincoln, NE 68588-011
Phone(402) 472-2773
FAX: (402) 472-2879
tgay1@unl.gov

LEW COCKE, Secretary/Treasurer
Physics Department
Kansas State University
Manhattan, KS 66506
Phone: (785) 532-1609
FAX: (785) 532-6806
cocke@phys.ksu.edu

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FROM THE CHAIR

Jim McGuire

Recently I visited Lincoln, Nebraska to prepare for our annual DAMOP meeting May 17 – 21. The timing for this trip could not have been any worse. The visit was scheduled in early February during Mardi Gras weekend here at my home in New Orleans. But hey my business is physics. Right? Wrong! I like comfortable hotels, good food and fun. So I thought that this was part of my just punishment for agreeing to serve in DAMOP. And I was wrong again. The Cornhusker (mascot of Nebraska football and a favorite of Tim Gay – the physics of football guy and Tony Starace – ask him about his Wildcorn tee shirt) hotel, the site of our meeting, is one of the best I have ever seen for a conference. It is elegant and spacious. And even to this New Orleans food critic, the food was good. I think that this site will be remembered for some time to come. The program is also exciting. There is a special Einstein Symposium designed to attract high school students with some excellent, well known speakers. The number of abstracts received indicates that this meeting will be well attended. And there are some real gems in both the invited and contributed sessions. So be ready to have a good time and get a lot of physics done. As we say in New Orleans, *laissez les bons temps rouler* !

Now to another matter. Personally I believe that science in general is under siege. Our culture in this country is changing, and support for science is dropping. Not only are we given less coverage in newspapers and on TV (especially locally, where each of us can have an impact!), but also science is under direct attack, e.g. teaching of evolution and of the big bang. Science budgets are being reduced and there is a possibility that physics may become optional for engineering students. *Per se*, it does us no harm to consider new cultural values where science is relatively unimportant. It is quite possible that the new values we acquire in the 21st century will be better without so much science. But I don't believe that. I believe that science has something of value to offer and that physics can and should be a significant component of the science and technology that will emerge. Science is an investment in our future -- more reliable than Social Security.

It is not likely that science will remain strong without discussion, debate and dialogue. This discourse has both external (e.g. outreach) and internal components. While the popular trend toward small topical conferences has some advantages, larger meetings provide a opportunity for broader interactions on physics, and an opportunity to explore how we can make the work we do more effective in new areas. This is good for our students as well as ourselves. Big conferences provide strength in numbers and a louder voice to be heard on issues of common cause, including the need to support science. Meetings such as the March meeting are large enough to attract some of those that direct the flow of money (e.g. members of the President's Council, members of the House and Senate, and reporters).

For some time DAMOP has been resistive to the idea of joining from time to time larger meetings such as the March meeting of APS, which is about ten times bigger than our DAMOP meeting. If the DAMOP meeting were to join the March meeting, which is now attracting significant and growing numbers of DAMOP members, APS

has indicated that we could reserve a part of the conference site for DAMOP, so we are not dispersed. Even now we have significant and growing overlap with the divisions of condensed matter physics and materials science, e.g. in quantum information and computing as well as Bose Einstein condensation. I believe that it would be wise for DAMOP to hold our annual meeting jointly with the March meeting, at least once every three years, to expand our influence both scientifically and politically. I hope you will give this some thought.

DAMOP 2005

Lincoln, Nebraska, 17-21 May

<http://damop2005.unl.edu>

Timothy J. Gay and Anthony F. Starace, Local Co-Chairs

We look forward to welcoming the AMO community to Nebraska's capital city, Lincoln, for a stimulating DAMOP meeting, which will take place Tuesday – Saturday, 17-21 May 2005. As of the registration deadline, nearly 600 contributed abstracts have been submitted for oral and poster presentations. In addition, there are 65 invited presentations, which have been organized by the DAMOP Program Committee in the following invited sessions:

- Plenary Prize Session
- Matter Optics and Atom Chips
- Applications of AMO Science to Astrophysics
- Interactions of Slow Electrons with Biomolecules
- Precision Tests of Relativity and Gravitation
- Ultra Short Pulse Physics (Attosecond, Femtosecond)
- Electron Driven Processes and Their Applications
- Direct Measurement of Electron Correlation in Atoms
- Quantum Control of AMO Processes
- Attosecond and High Energy Density Physics
- The BCS-BEC Crossover in Trapped Fermi Gases
- Quantum Information
- Synchrotron Radiation and Novel Photon Sources
- Hot Topics Session
- Thesis Prize Session
- Public Symposium on the Einstein Centennial

On Tuesday, 17 May, three workshops are planned. The *Tutorial Workshop on Modern Laser Technology*, which is intended for students and postdoctoral researchers, will be held from 1:00 p.m. to 5:00 p.m. It features tutorial lectures by **Henry C. Kapteyn** (University of Colorado – Boulder) on harmonic generation and attosecond pulses and **Ronald L. Walsworth** (Harvard-Smithsonian Center for Astrophysics) on slowing (and stopping) light. These lectures will be followed by a hands-on session on laser pulse dynamics led by the workshop organizers, **Herman Batelaan** and **Cornelis J. Uiterwaal** (both of the University of Nebraska). Participants must register separately for this tutorial workshop via the conference web page. Some financial support is available to enable students to attend. See

<http://damop2005.unl.edu/lasers.html>.

Also on Tuesday afternoon, a workshop on *New Pedagogy in Introductory Physics and Upper-Level AMO Courses* will be held from 2:00 p.m. to 5:00 p.m. Speakers include **Carl Wieman** (University of Colorado-Boulder), **Enrique Galvez** (Colgate University), **David Pritchard** (M.I.T.), **Steve Reaser** (North Carolina State University), and **Roger Kirby** (University of Nebraska).

The third workshop, held from 9:00 a.m. to 12 noon on Tuesday morning, is exclusively for faculty who have already participated in APS/AAPT workshops for new physics and astronomy faculty; these faculty are invited to discuss how they and their departments are enhancing the teaching of physics and astronomy.

Further information on either of the two teaching workshops can be obtained from the conference web site or from the organizer of both workshops, **Robert C. Hilborn** (Amherst College), whose email address is: rchilborn@amherst.edu

The plenary prize session on Wednesday morning, 18 May, will honor three of our members: **Deborah Jin** (NIST, JILA, and University of Colorado-Boulder), who won the 2005 I.I. Rabi Prize; **Murtadha A. Khakoo** (California State University – Fullerton), who won the 2005 Prize for Research in an Undergraduate Institution; and **Ronald L. Walsworth** (Harvard-Smithsonian Center for Astrophysics), who won the 2005 Francis M. Pipkin Award.

On Wednesday evening, **Susan Marie Frontczak** will give a special performance of *Manya, A Living History of Marie Curie* <http://www.storysmith.org/manya/index.html> . Conference participants are invited to experience the riveting life story of one of the most famous women in science. An admission ticket to this event will be provided to each conference registrant.

On Thursday evening, all DAMOP participants are invited to attend two **open houses** on the university campus: The Sheldon Memorial Art Gallery, designed by Philip C. Johnson, will be open for viewing of its collection of American art. Also, the AMO labs in the Department of Physics and Astronomy will be open for visitors.

The after-dinner speaker at the annual banquet on Friday evening is **John H. Marburger, III**, Science Advisor to the President and Director of the Office of Science and Technology Policy. During his long career as a scientist-administrator, Marburger co-founded the Center for Laser Studies at USC, served as the third President of the State University of New York at Stony Brook from 1980-1994, and as Director of Brookhaven National Laboratory from 1998 until he took up his present appointment.

On Saturday morning a public symposium on Einstein has been organized as part of the World Year of Physics 2005. It will feature noted science historians discussing key milestones in Einstein's career: **John Rigden** (Washington University) will speak on "Einstein and 1905"; **Roger Stuewer** (University of Minnesota) will speak on "Einstein's Revolutionary Light-Quantum Hypothesis"; **Michael Janssen** (University

of Minnesota) will speak on “Emergence and Interpretation of Lorentz Invariance”; and **Kameshwar C. Wali** (Syracuse University) will speak on “Einstein, Bose, and Bose-Einstein Statistics.”

The Local Committee is planning a program of daytime activities for **accompanying persons** on Wednesday, Thursday, and Friday. Possible activities may be viewed on the conference web page (<http://damop2005.unl.edu>) by clicking on “Special Events” and then on the accompanying persons links at the bottom of that page. Advance expressions of interest are welcome and may be made via the online forms.

Regarding **accommodations**, the conference will be held in the Burnham Yates Conference Center, which is adjacent to the main conference hotel, The Cornhusker Hotel (www.thecornhusker.com). Details on this and other hotels within walking distance of the conference location are posted on the conference web page. Note that the Local Committee has secured particularly advantageous rates for **students** for accommodation in new dormitories on the University of Nebraska campus, a 10 minute walk from the Burnham Yates Conference Center. Rates are as low as \$18.50/day for room and board with double occupancy. This rate includes free parking. Owing to limited space, these dormitory accommodations are available only for students, who must sign up for them online on the Lodging page of the conference web site. Note that prior to the Thursday evening open houses on the University campus, students will be treated to a picnic supper on the campus lawn near the Sheldon Gallery.

A detailed discussion of **travel options** is given on the conference web page. We note here that if you fly to Lincoln on United Airlines you should give United (or your travel agent) the **Meeting ID Number 529CD** to obtain discounted airfares. Maximum discounts are given if you book your travel more than 30 days in advance.

When **planning your trip**, please note that the average high/low temperature in Lincoln during May is 74/52 F (23/11 C). However, owing to the fickleness of the jet stream, there may be significant fluctuations about these averages. In any case, do bring a warm sweater or jacket for evenings. As for rain, on average there are 7 days in May with measurable precipitation. Note also that most of the conference hotels have swimming facilities; so you may wish to bring a bathing suit. For those who are serious about getting their exercise, a pass to the university’s Campus Recreation Center (CRC) for the duration of the meeting may be purchased for \$13 at the CRC front office upon showing one’s DAMOP badge.

Finally, we note that within walking distance of the conference location are several interesting **sights**, including the *Nebraska State Capitol*, which was designed by Bertram Goodhue and which houses the only unicameral legislature in the U.S.A.; the *Historic Haymarket* district, with its many restaurants, bars, and art galleries; and a number of excellent museums, either on or near the university campus. Conferees will receive a Visitor’s Guide to Lincoln with their registration packet.

DEADLINE SUMMARY

REMINDER FOR STUDENTS (AND THEIR PROFESSORS):

You have submitted your abstract and think you now just have to wait until a few weeks from the meeting to think about the conference again. Right?

Wrong! Other deadlines are coming up soon:

For requesting student travel support to DAMOP , deadline March 28, 2005. Go to <http://www.aps.org/units/damop/student.cfm>.

Early registration for DAMOP ends April 1, and economy housing often fills up early. Go to <http://damop2005.unl.edu/registration.html>.

For registration for the *Tutorial Workshop on Modern Laser Technology* and requesting financial support for that event, go to <http://damop2005.unl.edu/lasers.html>.

THE WASHINGTON CLIMATE- A PERFECT STORM

Michael S. Lubell, APS Director of Public Affairs

WASHINGTON, DC, March 2005

Well before February 7, when the President released his budget request for Fiscal Year 2006, the forecast was gloomy – not only for science but for almost all domestic programs. The White House did not disappoint.

The presidential budget calls for cuts to most federal activities, except for the Department of Homeland Security, NASA's Moon-Mars Initiative and the NIST laboratories. But NIST's Advanced Technology Program would be zeroed out, without any provision made for the closeout costs of existing grants. And even education, the President's signature issue, would get socked. Here are a few highlights.

After discounting for the transfer of a Coast Guard program into the National Science Foundation portfolio, NSF's budget would rise less than 1.5 percent, well below inflation – this following last year's 2 percent reduction.

The DOD basic and applied research programs (6.1 and 6.2) would shrink by 12 percent.

The DOE's Office of Science would lose 3.8 percent.

The Relativistic Heavy Ion Collider, one of our nation's few remaining large scientific facilities would be reduced to operating every other year, and the only other significant nuclear physics facility, Thomas Jefferson Laboratory, would see its running time cut by a third.

Overall, the DOE's facilities operations budget would fall about \$100 million short of the level needed to achieve full utilization.

The JLab upgrade would also be put on hold, and FermiLab's BTev project would be canceled.

Even though NASA would see its budget rise by about 5 percent, all of the increase and more would be devoted to the Moon-Mars Initiative.

The Hubble Space Telescope, perhaps NASA's most successful scientific mission in its half-century of programming, would have its death warrant signed.

It might be possible to tolerate such draconian measures for a year, without crippling the scientific enterprise. But the Administration also forecasts similar cuts for the next three years.

To put this into context, consider the results of an analysis performed by the Department of Commerce for the National Institutes of Health, which shows that research costs rise about 1.5 percent faster than the Consumer Price Index. (That's not surprising, given the large role that wage and energy costs play in the research arena.) If the Administration's out-year projections hold firm, the United States will lose about 20 percent of its scientific capacity by the time President Bush leaves office.

This comes at a time when our nation can ill afford it. As a recent study carried out by the Task Force on the Future of American Innovation shows, the U.S. high-tech sector is rapidly being overtaken by other nations (www.futureofinnovation.org).

It's no accident that scientific research is on the cutting board. But it has nothing to do with the soured relations that existed between the Bush Administration and elements of the science community during the 2004 election. It has everything to do with deficits and taxes.

Economists on the left, on the right and in the center have been warning the Administration for some time that the nation was heading for a disaster. Here are the facts.

First, let's understand that Social Security, which is running a surplus, is simply an investor in government securities, just like anyone who buys a government bond or treasury note. This fiscal year (FY 05), Social Security will buy about \$226 billion worth. Therefore the true federal deficit estimated for FY 05, as shown in the Historical Tables of the "Fiscal Year 2006 Budget of the U.S. Government," is \$653 billion or 4.6 percent of the Gross Domestic Product (GDP), not \$427 billion, as advertised by the White House.

Second, our current account (trade) balance is running \$60 billion a month in the red. How is that possible? Are we selling off the gold in Fort Knox to make up for it? No, foreign investors, mostly China, South Korea and Japan are buying up our debt, about 90 percent of what Social Security doesn't.

In the long term, we cannot sustain such a current account deficit, since foreign investors eventually will become skittish and begin to diversify their holdings. When South Korea recently hinted it might do just that, the Dow Jones Average suffered a one-day loss of almost 200 points. (It recovered after South Korea recanted.)

The only remedy is to cut the budget deficit, so that foreign nations will not be able to plow their money into the U.S. treasury. The price of foreign goods would rise, and

the value of the dollar would slowly sink, as Economics 101 tells you. But that's far better than a total dollar collapse.

There are two ways to cut the deficit: increase revenues or cut spending. The Bush Administration is focusing only on the latter, since Politics 101 tells you that the public will vote you out of office if you raise taxes. That's the sad bipartisan experience of the last 20 years.

Lest you wonder why revenues are falling short, here is one final fact. Before the tax cuts enacted during President Bush's first year in office, the federal government collected 20.7 percent of the GDP. In FY 04, the fraction had fallen to 16.3 percent. That differential is worth about \$500 billion today, almost enough to cover the current structural shortfall.

So why not simply allow the tax cuts to sunset, as written into the original legislation? That, according to many politicians, the public would regard as a tax hike. It's a loser!

So can we achieve fiscal solvency simply by cutting spending, unless we gut defense spending and skedaddle out of Iraq? No. But our elected officials are sure going to try.

PUBLICATIONS

Physical Review A

Bernd Crasemann

In Memoriam: Asher Peres

Quantum information lost one of its founding fathers when Asher Peres died on 1 January 2005, at the age of 70. Asher was a sage and incisive adviser for us, whose analyses were marked by surprising simplicity and unbeatable originality. During his terms as a member of the Physical Review A Editorial Board and in many discussions, Asher with his uncompromising and deep understanding of fundamental issues helped create our refreshing editorial principle that "new physics" is essential in scientific papers so that, for example, tests of local realism have "no interest whatsoever in physics: they tell us nothing on the properties of nature." Asher's co-workers in the Technion-Israel Institute of Technology and elsewhere and many acquaintances across the world have lost, in the words of Natanel Lindner, Petra Scudo and Danny Terno, not only a valued colleague but also a dear friend and mentor.

Status

The seemingly inexorable growth of the Journal is continuing. Preliminary statistics for submittals in '04 are up 4% over '03, of which 80% originated abroad; the rejection rate is up to 47% and the number of published pages increased by 7%, while the number of published articles went up 2%. Increased use of electronic editorial processing and exceedingly hard work by staff and editors have cut the median

interval from receipt to acceptance from 95 to 78 days.

New PRA Associate Editors, Board Members

Mark Hillery was appointed PRA Associate Editor in January, 2004. Mark is on the faculty of Hunter College of CUNY in New York. He works in quantum optics, quantum information, nonlinear optics and quantum electrodynamics and over the past year has been of great help in these areas. Gordon W F Drake of the University of Windsor was appointed Associate Editor of Physical Review A as of 1 January 2005. He is a widely known theoretician working on quantum electrodynamics in few-electron atoms and has been Editor of the Canadian Journal of Physics. Gordon is currently a member of the APS Editorial Oversight Committee. We much look forward to his contributions to the tasks of our hard-pressed team. The PRA **Editorial Board** has been fortunate to have the following new members agree to accept three-year terms: Vladimir Buzek, Slovakia (quantum information), Luiz Davidovich, Brazil (Quantum Optics), Andrew Doherty, Australia (Foundations of Quantum Mechanics), Mikhail Fedorov, Russia (Atomic Physics), Martin Plenio, UK (Quantum Information), W P Reinhardt, Washington (Atomic Theory), and Jonathan Sapirstein, Notre Dame (Atomic Theory). The 2005 Board is comprised of 23 members, of whom 14 reside abroad (taking partial account of the fact that 80% of submittals currently originate outside the U. S.).

Physical Review Letters

George Basbas

Physical Review Letters continues to thrive and grow. The 9745 receipts in 2004 exceeded those in 2003 by 6.8%, about 2/3 of what one editor can handle. The growth comes from outside of the U.S. (as judged by the address of the corresponding author). Papers from the U.S. now constitute about 25% of submissions. About one in three are published in PRL. To help stay abreast we hired two new editors last year, Daniel Ucko, a condensed matter physicist, and Deniz van Heijnsbergen, a chemical physicist. We expect to hire another editor this year.

AMO physics, broadly defined, constitutes about 10% of the journal; about two out of five submitted are published. George Basbas, Deniz van Heijnsbergen, and Frank Narducci (Naval Air Systems Command) handle AMO papers, with crucial assistance from Brant Johnson (BNL). Robert Garisto handles quantum information and foundations of quantum mechanics.

We have recently added editorial board members (who in PRL are called Divisional Associate Editors): Wayne Itano (NIST), Joe Macek (Tenn.), Gerard Nienhuis (Leiden), Henk Stoof (Utrecht), and John Thomas (Duke). Their basic assignment is to read appeals from authors about rejections, and advise the editor.

The PRL Review Committee, consisting of outside reviewers from the larger community, including Eric Cornell, has submitted its report to the APS Publication Oversight Committee. Among its points is expected to be a recommendation to reject

more papers summarily (without review) based on the editor's judgment that, validity aside, the results reported in the paper are too specialized to warrant the attention of the broad PRL readership. A second point which might be considered is the suggestion to accompany Letters published in PRL with a short summary aimed at the PRL readers who are not expert in the area of a paper. The editors look forward to receiving the report and considering the assessment of the Committee.

DAMOP PRIZES

2006 Allis Prize:

Call for nominations

Nominations are now open for the 2006 Will Allis Prize for the Study of Ionized Gases. The prize was established in 1989 by contributions from American Telephone and Telegraph, General Electric, General Telephone and Electronics, International Business Machines, and Xerox Corporations in recognition of the outstanding contributions of Will Allis to the study of ionized gases. The deadline for submission of nominations is July 1, 2005. Nominations should be submitted to the chair of the 2006 selection committee: Rainer Johnsen, Dept. of Physics & Astronomy, University of Pittsburgh, Pittsburgh PA 15260, Email: rj@pitt.edu. Please, consult the web site <http://www.aps.org/praw/allis/> for further details and guidelines before submitting nominations.

2006 Davisson-Germer Prize in Atomic Physics:

Call for nominations

Nominations are now open for the 2006 Davisson-Germer Prize in Atomic Physics. The purpose of this prize is to recognize and encourage outstanding work in atomic physics or surface. The prize consists of \$5,000 and a certificate citing the contributions made by the recipient or recipients. The prize is awarded in even-numbered years for outstanding work in atomic physics. The prize shall normally be awarded to one person, but may be shared when all recipients have contributed to the same accomplishments. Nominations are open to scientists of all nationalities regardless of the geographical site at which the work was done. The deadline for submissions is July 1, 2005. Five copies of nominations and supporting documentation for the 2006 prize should be sent to the chair of the 2006 selection committee: Ronald A. Phaneuf (DAMOP) Department of Physics MS-220 University of Nevada, Reno Reno, NV 89557-0058 U.S.A. TEL: 775-784-6818, FAX: 775-784-1398, E-MAIL: phaneuf@unr.edu . Selection Committee for 2006 Prize: Nora Berrah, Western Michigan University (vice-chair) , Charles Clark, NIST, Paul Julienne, NIST , Steve Manson, Georgia State University, Ron Phaneuf, University of Nevada (chair). The past ten recipients are Paul Julienne, Gerald Gabrielse, William Happer, Sheldon Datz, Thomas Gallagher, Carl Weiman, Larry Spruch, David Wineland, John L. Hall and Daniel Kleppner. Further details are available at <http://www.aps.org/praw/davisson/index.cfm> .

Future of Davisson-Germer Prize

Dan Larson is chairing an *ad hoc* committee to explore the creation of an atomic physics prize to succeed the Davisson-Germer Prize. The Davisson-Germer Prize was supported for nearly 40 years by Bell Labs, but Lucent has decided to end the support. The 2006 Davisson-Germer Prize is supported by DAMOP. An alternative to finding funding for a new prize might be to continue the Davisson-Germer Prize by raising funds from the DAMOP community and other sources to support the necessary \$100,000 endowment. Please send any comments or ideas regarding the continuation of the Davisson-Germer Prize or the establishment of a new atomic physics prize to Dan Larson at djlarson@psu.edu .

OTHER PRIZES RECENTLY AWARDED TO DAMOP MEMBERS

From the January 24th issue of C&E News we read that the ACS Award in Theoretical Chemistry has been awarded to **Eric Heller**, Professor of Physics and Chemistry at Harvard for work on time dependent quantum mechanical problems, including those in spectroscopy and molecular dynamics. The American Chemical Society has also awarded the Peter Debye Award in Physical Chemistry to **Stephen Leone**, Professor of Physics and Chemistry at Berkeley. According to C&E News, "Leone instills in his students the idea of getting to the heart of a mechanism using various skills, including those from chemistry, math and physics". **Dan Kleppner**, MIT, has received the Wolf Prize for his work on the Hydrogen Maser, Rydberg atoms and the Bose-Einstein Condensate. Our congratulations to these DAMOP colleagues!

FELLOWSHIP

If you know of a DAMOP member who richly deserves to be a Fellow of the APS but isn't, please nominate her or him. While it may appear trivially obvious to you that this person deserves to be a Fellow, it is crucial that the case be made effectively in the nomination document. Instructions for nomination can be found at the APS webpage <http://www.aps.org/fellowship/fellinfo.cfm>. The deadline for nominations is 15 April 2005. It is to DAMOP's advantage to nominate "foreign" scientists as Fellows. "Foreign," in this context, means scientists of any nationality who do their work primarily outside the boundaries of the United States. The DAMOP Fellowship Committee can forward such nominations to the Forum on International Physics for consideration, thus giving us more "slots." If you have questions regarding nominations, contact Tim Gay (tgay1@unl.edu).

2004 DAMOP FELLOWS

Our hearty congratulations to the following colleagues who were elected to fellowship by DAMOP for 2004.

Adams, Nigel Graham
University of Georgia

For the development of important experimental techniques for studying charged-

particle interactions with molecular neutrals and ions, and seminal contributions in understanding the synthesis of molecules in the interstellar medium.

Caves, Carlton M.
University of New Mexico

For pioneering working on the role of quantum mechanics in the physics of information.

Dressler, Rainer Andreas
Air Force Research Laboratory/VSBT

For innovative developments in the study of electron, ion, and photon interactions with molecules and applications to space vehicles and space research.

Gea-Banacloche, Julio
University of Arkansas

For his contributions to the understanding of quantum-mechanical effects in the interaction of light with matter, and for his valuable service to the physics community as an associate editor of Physical Review A.

Gillaspy, John Dale
National Institute of Standards & Technology

For providing fundamental insights into the radiation and collisional properties of very highly charged ions through pioneering research with an Electron Beam Ion Trap (EBIT).

Kheifets, Anatoli S.
Australian National University

For outstanding contributions to theory of atomic and molecular ionization, in particular elucidation of the role of electron correlation in multiple ionization caused by a photon or charged particle impact.

Krstic, Predrag S.
Oak Ridge National Laboratory

For his important and diverse contributions to atomic theory, in particular to the theory of non-adiabatic heavy-particle collisions and of relativistic effects in ultrastrong laser-atom interaction.

Lewenstein, Maciej
Universitat Hannover

For his seminal contributions to physics of strong laser fields, quantum degenerate gases and quantum information theory.

Martin, Nicholas Leon Semple
University of Kentucky

For experimental and theoretical studies of multipolar interference in atomic ionization processes by electron and photon impact.

Mohideen, Umar

University of California

For his pioneering applications of atomic force microscopy to precision measurements of the Casimir forces.

Ovchinnikov, Serge Yurievich

401 Nielsen Physics Bldg

For the development of the hidden crossing and two-center Sturmian theory of ion-atom collisions, and the hyperspherical hidden crossing theory of electron and positron interactions with atoms

Sadeghpour, Hossein Roshani

Harvard-Smithsonian Center for Astrophysics

For careful quantitative analyses of complex few-body processes, and for catalyzing numerous interdisciplinary collaborations between scientists in atomic, molecular and optical science, and related fields.

Schulz, Michael

University of Missouri-Rolla

For Fundamental Experiments on Atomic Break-Up Processes

Schumacher, Benjamin Wade

Kenyon College

For his development of quantum data compression, entanglement enhancement, and quantum capacity theorems has played a central role in the development of quantum information theory.

ELECTIONS

The electronic elections went smoothly last year and we will be doing it that way again this year. The turnout was unfortunately not enhanced by the ease of voting. The participation was nearly exactly the same traditional 23%. It would be nice to raise this. The only item of possible concern is the increasing aggressiveness of spam blockers. There is no way the APS can know about this, so if you do not get either an electronic or paper ballot, it could mean that the APS thinks you have a working email address, but your spam blocker is blocking them. If you are concerned about this you can put “ballot@megatron.apsmgs.org” on your “white list”. Of course, if you are really seeking electronic isolation, you might also not be reading this. If you are having problems, I still respond to both electronic and normal mail.

Lew Cocke , cocke@phys.ksu.edu

BIOGRAPHIES OF CANDIDATES

FOR VICE CHAIR (Will become Chair-Elect in 2006 and Chair in 2007)

BIGELOW, NICHOLAS P.

B. S. 1981 (Physics and Electrical Engineering), Lehigh University; M. S. 1984, Ph.D.

1989, Cornell University. Lee A. DuBridge Professor of Physics and of Optics, 2000 - present, Department of Physics and Astronomy and Institute of Optics, University of Rochester; Professor 1999-2000; Associate Professor 1997-1999; Assistant Professor 1992-1997; Senior Scientist, 1992 -present, Laboratory for Laser Energetics, University of Rochester; Professeur Invité, selected periods 1992-1996, Ecole Normale Supérieure; Research Associate CNRS 1991-1992 (ENS Paris); Post-doc, Bell Labs 1989-1991; APS Fellow, 2004; David and Lucile Packard Fellow, 1994-1999; Alfred P. Sloan Fellow, 1993 - 95; NSF Young Investigator 1994-1999; Sample Service Work for APS: DAMOP Program 2003 - present; LS program co-chair 2003 and 2004, program committee 2000; APS Representative to Joint Council on Quantum Electronics and International Council on Quantum Electronics 1999-2001; NYS APS Meeting Chair 1996; LS symposium organizer 1995; Schawlow Prize Committee; Samples of Professional Service: Chair NASA Fundamental Physics Working Group 1997 - present; Topical Editor Optics Letters 2001 - 04; NSF Committee of Visitors/AMOP Review Panel/NSF Center Advisory Committee - 2002, 2003, 2004, 2005; Organizer and Chair for OSA meetings 1996, 1999; Organizer, Conference of Coherence and Quantum Optics 1996, 2001; various committee service for the National Academies.

RESEARCH INTERESTS: Laser cooling and trapping of atoms; cold collisions, cold molecules and spectroscopy; quantum information; quantum optics; Bose-Einstein condensation, dilute quantum fluids and gasses (Bose and Fermionic), and atom optics. Both experimental and theoretical contributions.

POLICY STATEMENT: We are all proud of the fact that AMO physics has experienced an explosion of activity over the last decade and that, as a result, DAMOP is the most rapidly growing major field of physics in the APS. What is equally impressive is the degree to which developments in DAMOP overlap with other APS units, for example condensed matter physics (DCMP), chemical physics (DCP), plasma physics (DPP), bio physics (DBP) and, of course, laser science (DLS). And, in DAMOP we provide an anchor point for emergent areas such as quantum information science and distinguished topical groups such as Precision Measurement and Fundamental Constants. While we enjoy the strength of this situation, I believe that we have a growing leadership responsibility. What are some examples? We have a strong track record of undergraduate and graduate research training and we need to keep pushing this strength. We have constituents in institutions of all sizes and we must support these different communities. We organize one of the most popular meetings in AMO science and we must keep it healthy while continuing to nurture joint events with other APS units. With the alarming trends in funding, we must clearly and concisely articulate the value of DAMOP science. These are some of the areas that I would pay attention to as a potential DAMOP leader.

STWALLEY, WILLIAM C.

B. S. 1964 California Institute of Technology; Ph.D. 1969 Harvard University. Assistant Professor, Associate Professor and Professor of Chemistry 1968-1993 and Affiliate Professor of Physics 1977-1993, University of Iowa; Department Head and Professor of Physics and Affiliate Professor of Chemistry 1993-present (Board of

Trustees Distinguished Professor 2002-present) University of Connecticut. Alfred P. Sloan Foundation Fellow 1972-74. Fellow, APS, 1982-present, Fellow, OSA, 1988-present. William F. Meggers Award, OSA, 1998 .

SERVICE: Secretary-Treasurer DCP/APS 1984-90; Member, Joint/International Councils on Quantum Electronics, 1988-90, 1993-96, 2000-03 (Chair 2000-02); Vice Chair/Chair/Ex-Chair, Topical Group on Laser Science, APS 1989-92; Committee on Atomic, Molecular and Optical Science NAS/NRC 1990-91, 1992-96 (Chair 1993-95); Editorial Advisory Board, Physical Review A, 2000-02; General committee Gaseous Electronics Conf. 2004-06. Multiple Review Panels, Award Committees, Program Committees, Nominating Committees.

RESEARCH INTERESTS: Studies of Ultracold Atoms and Molecules, especially photoassociation and formation and trapping of alkali dimer molecules; laser spectroscopy and photodynamics; laser ionization; long range molecules and potential curves; radiative transition probabilities; Bose-Einstein Condensation.

CANDIDATE'S STATEMENT: The field of atomic, molecular, and optical physics is on the one hand one of the most exciting fields in science while on the other hand it is the most precisely understood and understandable field of science, with many remarkable convergences of theory and experiment. It has important impacts and applications in many other fields of science and strong synergies with other APS Divisions (especially DLS and DCP) and Topical Groups (especially Few Body and Precision Measurements). Current DAMOP activities (e.g. the DAMOP meeting) already demonstrate the excitement, precision, impacts, applications, and synergies, but I will do my best to enhance these. I also believe that international participation in DAMOP activities will be increasingly important and believe that the DAMOP meeting should be the international meeting of choice in atomic, molecular and optical physics.

FOR SECRETARY-TREASURER (Three year term)

COHEN, JAMES S.

B.A., 1968, M.A., 1970, Ph.D., 1973, Physics, Rice University. Staff Member, Theoretical Chemistry and Molecular Physics Group (T-12), 1972-91; Group Leader, Atomic and Optical Theory Group (T-4), 1991-present; Program Manager, Advanced Energy Projects, 1994-99, Los Alamos National Laboratory. Visiting Associate Professor, 1979-80, Physics, Rice University. Visiting Scientist: Schweizerisches Institut fur Nuklearforschung, 1983; Centre d'Etudes Nucleaires de Saclay, 1984.

SERVICE TO APS/DAMOP: Fellow, American Physical Society, 1995; DAMOP Nominating Committee, 1997, 2002, 2003 (Chair); Chair, Local Organizing Committee, 29th DAMOP, Santa Fe, 1998; DAMOP Executive Committee, 1999-2002; Co-organizer, Mini-Symposium: Exotic Atoms and Related Topics at the First Joint Meeting of the Nuclear Physics Divisions of the APS and JPS, 2001; DAMOP APS Fellowship Committee, 2002-04.

OTHER SELECTED PROFESSIONAL ACTIVITIES: Associate Editor, Muon Catalyzed Fusion, 1986-92; Delegate, USA-USSR Exchange I-6, 1987; Program and International Advisory Committees, International Conference on Muon-Catalyzed Fusion, 1988-95; Electrical Power Research Institute Advisory Committee, 1989; Lecturer/Research Mentor, Los Alamos Summer School, 1992-2001; Organizing Committee, Low Energy Muon Science, Santa Fe, 1993; Program Committee, APS Topical Conference on Atomic Processes in Plasmas, 1993-present; Ad Hoc Committee on Science-Based Use of High-Energy Laser Facilities, 1994; RIKEN-RAL Physics Advisory Committee, 1996-98; Rochester Theory Center Advisory Board, 1997-98; Executive and Program Committees, ICPEAC, 1999-2003; Advisory Board, International Workshop on Atomic Collisions and Atomic Spectroscopy with Slow Antiprotons, 1999-2001; Advisory Board, International RIKEN Conference on Muon Catalyzed Fusion and Related Exotic Atoms, 2001; Co-chair, Local Organizing Committee, 22nd ICPEAC, 2001; Co-organizer of the US-Japan Joint Workshop on Resonances in Physics, Chemistry, and Biology, 2002; Co-organizer, Bridging the Gap between Science and Society: The Relationship between Policy and Research in National Laboratories, Universities, Government, and Industry, 2003; Chair, Local Organizing Committee, 14th APS Topical Conference on Atomic Processes in Plasmas, Santa Fe, 2004.

RESEARCH INTERESTS: Atom and molecule collisional excitation, charge exchange, and ionization; chemi-ionization; atoms in intense fields; exotic (muonic and antiprotonic) atoms and molecules; interface between atomic and nuclear physics; semiclassical and quasiclassical methods.

SCHULTZ, DAVID R.

B.A., Washington University, 1983; Ph.D., University of Missouri, Rolla, 1989; Member Sigma Pi Sigma, 1987; Sigma Xi Grant-in-Aid for Graduate Research Recipient, 1988; Sandia National Laboratory Outstanding Graduate Fellow, 1988; Postdoctoral Fellow, University of Missouri, Rolla, 1989-91; US DOE Fusion Energy Postdoctoral Fellow, Oak Ridge National Laboratory (ORNL), 1991-92; Staff Member, ORNL, 1992-present; Director, Controlled Fusion Atomic Data Center, ORNL, 1992-present; Adjunct Professor of Physics, University of Tennessee, Knoxville, 1998-present; Group Leader, Atomic Physics, ORNL, 2000-present.

APS/DAMOP ACTIVITIES: APS Fellow, 2000; DAMOP Executive Committee Member, 2002-05; Secretary, Theoretical Atomic, Molecular, and Optical Community (TAMOC), 1995-98; Executive Committee, APS Topical Conference on Atomic Processes in Plasmas (APiP) 2000-present; Local Chair, 13th APiP, 2002; Local Co-Chair, DAMOP Annual Meeting, 2006.

SELECTED PROFESSIONAL ACTIVITIES: Editor, Atomic Data and Nuclear Data Tables, 2001-present; Editorial Board, Atomic Data and Nuclear Data Tables, 1993-2000; International Advisory Board, IOP Journal of Physics B, 2003-present; Advisory Group Member, Atomic and Molecular Data Unit, International Atomic Energy Agency, 1991-present; Treasurer, International Conference on Atomic and Molecular Data and Their Applications (ICAMDATA), 1997-2004; Local Chair, 3rd

ICAMDATA, 2002; Local Committee Member, International Conference on Electronic, Atomic, and Photonic Collisions (ICPEAC) 2001; Program Committee Member, ICPEAC, 2004-present; Chair, Working Group 3: Collision Processes, International Astronomical Union, Commission 14: Atomic and Molecular Data, 1996-present.

RESEARCH INTERESTS: Applications of atomic physics in plasma science and astrophysics; high-performance computing solutions of the atomic few- and many-body problems; ultra-intense laser field interactions with matter; optical computing.

FOR EXECUTIVE COMMITTEE (Two to be elected)

BERRAH, NORA

B.S. (Physics), U. of Algiers, 1979; PhD (Physics), Univ. of Virginia, 1987; Postdoc, Argonne National Lab (ANL), 1987-1989; Assistant Scientist, ANL, 1989-1991; Assistant professor, Physics Dept., Western Michigan University, 1991-1994; Visiting Scientist at the Université d'Orsay, Paris, France, 1992; Visiting Scientist at the Fritz-Haber-Institut der Max Planck Gesellschaft, Berlin, Germany, 1992-1993; Associate Professor, 1994; Professor, 1999, Visiting Scientist, LBNL (ALS) 1998-1999; Distinguished University Scholar, 2000. Humboldt Fellowship, Alexander von Humboldt Foundation, 1992-1993; Fellow, American Physical Society, 1999; Co-organizer, workshop ANL, 1990; Local Organizing Committee, APS, Division of Atomic, Molecular and Optical Physics (DAMOP), Chicago, IL, 1992; Local organizing committee, "International Workshop in Photoionization" (IWP), Berlin, Germany, 1992; Chair, AMO workshops at ALS, 1996, 1997; Proposal Study Panel, Advanced Light Source (ALS), Berkeley, CA, 1997-2000; Chair, Participation Research Team of the AMO beamline, 9.0.1/10.0.1 of ALS, 1995-2004; International General Scientific Committee (ICPEAC), 1995-1998; LBNL Task Force focused on ALS, 1998-1999; International program committee on (e,2e), 1995-1997; Committee on International Scientific Affairs, CISA, APS, 1994-1997; Annual conference QELS 1997; International Conference in X-Ray and Inner-Shell Processes, 1996-1999; Selection committee for the I. I. Rabi prize, 1998-2000; UNESCO, relocation of BESSY I ring to the Middle-East, 1999; BESAC sub-committee to review 4th generation Light Sources (the Leone Panel), 1999; ALS users executive committee, Vice-Chair & Chair 1999-2000; Users Executive Committee, ALS, CA; 1993-1996; 1997-2001; CAMOS committee 2000-2002. DOE, Basic Energy Sciences Advisory Committee (BESAC) 2002-2006; Co-team leader for AMO at the LCLS, SLAC, Stanford, CA, 2004-; Science Advisory Committee for LCLS, Stanford, CA, 2003-. Program committee for Ultrafast x-rays workshop, San Diego, CA 2004; Lake Geneva 2004; Program committee, VUV14, 2004; Program committee for ICPEAC satellite (e-2e/polarization) (2003-2004). International program committee for the X-Ray and Inner-Shell Processes conference, 1999-.

RESEARCH INTERESTS: Experimental studies of few and many-electrons systems; Multielectron excitations in atoms, molecules, clusters and their negative ions. Synchrotron-based molecular and cluster photodissociation; Spin resolved studies in

atoms, molecules and clusters.

EDWARDS, MARK A.

B.S., Georgia Southern University, 1977; M.A., The Johns Hopkins University, 1980; Ph.D., The Johns Hopkins University, 1985; Research Associate, University of Southern California, 1985-1987, Assistant Professor of Physics, Mansfield University, 1987-1988; Programmer/Analyst, Computer Sciences Corporation, 1988-1990; Assistant Professor of Physics, Georgia Southern University, 1990-1996; Associate Professor of Physics, Georgia Southern University, 1996-2002; Professor of Physics, Georgia Southern University, 2002-Present; Guest Researcher, National Institute of Standards and Technology (NIST), 1993-Present; NIST Visiting Scientist, 1993-1995 and 1999-2001; Fellow of the American Physical Society, 2000; Co-organizer of "US Workshop on Bose-Einstein Condensation," at JILA, 1997.

RESEARCH INTERESTS: Quantum-degenerate atomic gases and applications of these to quantum computational devices.

EVERITT, HENRY O.

B.S. (Physics and Mathematics) 1985, MA 1987, and Ph.D. 1990 Duke University; Chief scientist, Army Research Office, 2003-present; Division director, Physics Division, Army Research Office, 2001-03; Program manager, Experimental Condensed Matter Physics, Army Research Office, 1991-2003; Coordinator, Army's Young Investigator Program, 1996-present; Adjunct Professor of Physics, Duke University, 2000-present; Adjunct Assistant Professor of Physics, Duke University, 1992-2000; Physicist, SPARTA Inc., 1990-1991; NASA GSRP Fellow, 1987-1989; Fellow, Optical Society of America, 2003; Fellow, Army Research Laboratory, 2004. SERVICE: Editorial Board, Quantum Information Processing, 2001-present; Editor, Special issue on photonic crystals (JOSA 1992), Special issues on photonic band engineering (IEEE JLT and MTT 1999), Special issue on quantum computing (QIP 2004); Co-editor, Encyclopedia of Modern Optics, 2004; Member of Organizing Committee, SPIE OE/Lase 1994, SPIE Aerosense 1995, OSA Nonlinear Optics Topical Meetings 1998 /2002, International Workshops on Photonic and Electromagnetic Crystal Structures 1999 / 2002, CLEO/QELS 2001 / 2003, SPIE FaN 2003, APS March Meeting 2004/ 2005, Army Science Conference 2004; Organizer of 31 national or international workshops on photonic band engineering, infrared lasers, nanoscience and nanophotonics, and quantum information science; Spokesperson and Army lead in nanoscience, 1992-2002, quantum information, 1995-present; Organizer and chair of ad hoc federal committee Quantum Information Science Coordinating group, 1999-present.

RESEARCH INTERESTS include quantum information science; ultrafast optical techniques, especially applied to spectroscopic characterization of II-VI and III-V (esp. wide bandgap) semiconductor heterostructures and nanostructures; generation and control of acoustic phonons, photons, and surface plasmon polaritons in semiconductors; photonic and plasmonic band engineering for cavity QED; energy transfer in rare earth-doped semiconductors; refractive index measurements of

uniaxial and biaxial dielectrics; RR Lyrae variable stars in globular clusters;
innovative interferometric astronomical imaging; collisional ro-vibrational molecular
energy transfer; optically pumped far infrared molecular lasers.

BURNETT, KEITH

Oxford University. NO BIO AVAILABLE.