



## March 2006 Newsletter

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## Chair's Message

### Harold Metcalf, February 2006

As your new chair since October, I find myself facing a large number of choices concerning things I know little about, so my first message to you begins with a request for your help. If you have an idea of some initiative, or recognize a problem, or have any other thoughts that might improve our DLS (accent on the word "our"), please feel free to communicate with me or any other member of the DLS leadership. You can find us at <http://www.aps.org/units/dls/>. (If you have ideas for the website, please let us know - one of our tasks is its improvement.) I'm taking over a smoothly running organization that has been especially well-governed by its previous chair, Mark Raizen. He solved a lot of problems, made many excellent improvements, and has paved the way for many more enhancements. I hope I can follow his path. We look forward to his continued service as chair of the newly-created membership committee. His message elsewhere in this newsletter commends the superb work of Dan Elliott, and I can

underline and emphasize that compliment. Dan has been superb, and my job will be much easier for what he has done. I'm looking forward to working with his successor, John Fourkas, as well as chair elect Leo Hollberg and vice-chair Mark Johnson. Special thanks also go to Marjatta Lyyra for her superb work on the newsletter, and to Rainer Grobe for his similarly excellent work on the DTL. I'm grateful that each of them has agreed to continue and will also make my job much easier. One goal I have for this year is to provide the six members-at-large of the executive committee with more active roles. We have several initiatives in mind, and I hope they will agree to undertake some of these.

Perhaps our most visible activity is the annual LS meeting. I expect that the forthcoming LS-XXII in Rochester in October will reap the benefits of the changes implemented by Mark Raizen, developed from some suggestions from Nick Bigelow and myself. The co-chairs of that meeting, Poul Jessen and Arjun Yodh, have been hard at work for many months planning the symposia, laying out the sessions, and selecting the organizers and invited speakers. LS-XXII will surely be an excellent meeting, and all are urged to submit abstracts and attend (watch for the announcement at our website). Moreover, their successors, Fred Raab and Charlie Schmutterman, are already getting acquainted with the process so that organization of the 2007 meeting in San Jose will also run smoothly.

One of the tasks that falls to the chair is appointment of very important committees, and one of the tasks that falls to the DLS membership is to help these committees do their jobs. Two very important ones are Nominating and Fellowship. The DLS is run by its officers who are elected from a nominated slate. The DLS membership will be solicited for nominations, and so YOU are the people who can have a huge impact on our future. Fellowship in the APS is prestigious and important, yet many well-deserving people have not been accorded this recognition. You will also be solicited for Fellowship recommendations, and you are encouraged to find people who have been inadvertently bypassed. We find a few every year.

Let's look forward to a productive year in our professional work, good health, and continued and increasing strength of our DLS.

### **Mark Raizen DLS Chair, Past Chair, November 2005**

The past year as DLS Chair has been very intense with many issues and tasks, but above all I enjoyed getting to know many of you as volunteers. I feel that DLS is a growing community and that we are in an exciting period of expansion. My work was greatly helped by the efforts of Hal Metcalf as Chair-elect, and the DLS will continue to thrive under his leadership in the coming year. The role of Secretary Treasurer is especially crucial to our society, and Dan Elliott has worked tirelessly to make sure the things run smoothly. I would like to thank Paul Houston for his work as chair of the nominating committee and Dana Anderson and Prem Kumar

for their service. The result of their work is the new slate of DLS leadership and I extend my welcome to Mark Johnson as Vice-Chair, John Fourkas as Secretary Treasurer, and new Members-at-Large Steve Cundiff and Anne Myers Kelley. Thanks also to Marjatta Lyyra for her efforts in publishing the DLS Newsletter, and to Rainer Grobe for his work on the DTL. Finally, thanks to all our Executive Committee members.

In the past year we have been working to develop a long-term approach to Careers and Education within the DLS. In the coming year these plans will be discussed in more detail, so I will just state my belief that we will be able to make a larger impact in these two areas. We have also streamlined the leadership structure of the LS meeting by appointing LS Vice-Chairs in advance of the meeting who can apprentice before becoming LS Chairs. We have combined the roles of program chairs and general chairs into one, so that there will only be two LS Chairs, with two Vice-Chairs in training. The Chairs of LS XXII are Poul Jessen and Arjun Yodh and the program is well underway.

At the LS XXI meeting in Tucson we saw a drop in submissions which may have been related to the high cost of the location. In any case, we hope to attract a much larger attendance in Rochester next October. One of the highlights of meeting was the undergraduate symposium, a great tradition that was started by Hal Metcalf and continues under his leadership. We also had an excellent banquet that was attended by nearly 70 members. In addition to the good food and company, we enjoyed a presentation by Prof. Barry Sanders from the University of Calgary and Maria Lantin from the Banff Center. They presented their work on Quantum Visualization as a means to explain and popularize quantum communication and computing. To find out more about their work you can find their web site at <http://www.qviz.org/>

I would like to conclude by wishing everyone the best for the new year, and hope to see many of you at future Laser Science events.

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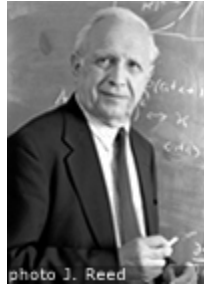
## Honors and Awards to DLS Members 2005



### The Nobel Prize in Physics 2005

*Glauber citation:*  
"for his  
contribution to the  
quantum theory of  
optical coherence"

*Hall and Hänsch citation:*  
"for their contributions to the  
development of laser-based precision  
spectroscopy, including the optical  
frequency comb technique"



**Roy J. Glauber**

🏆1/2 of the prize

USA

Harvard University  
Cambridge, MA,  
USA

b. 1925



**John L. Hall**

🏆1/4 of the prize

USA

University of  
Colorado, JILA;  
NIST  
Boulder, CO, USA

b. 1934



**Theodor W. Hänsch**

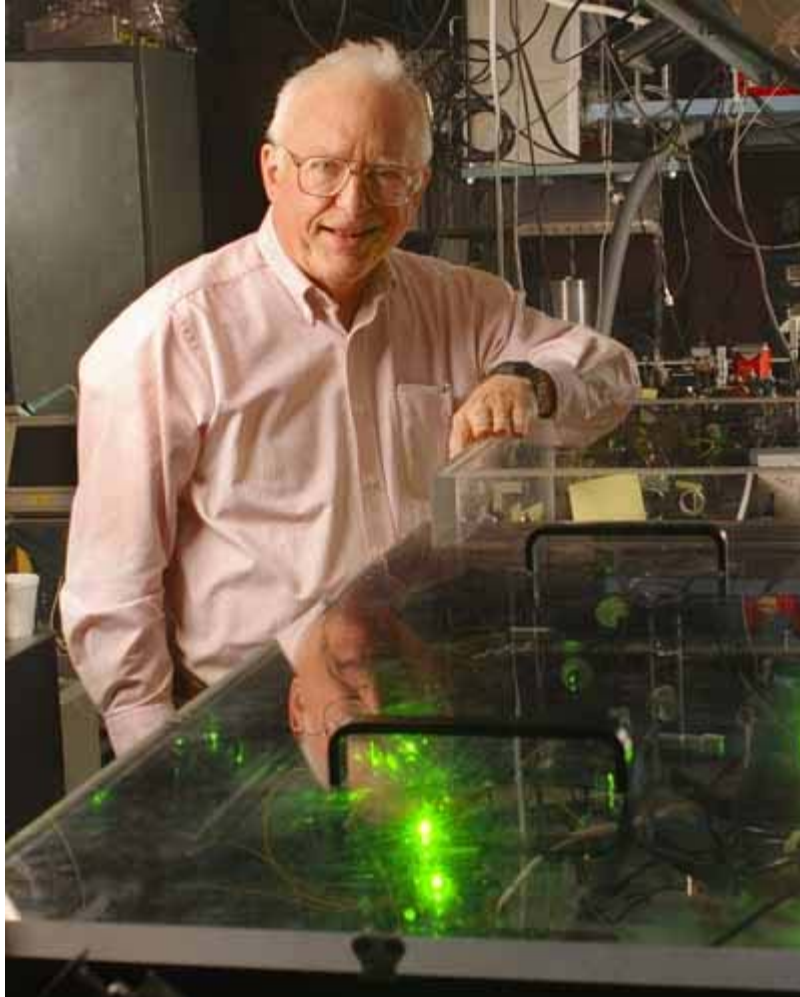
🏆1/4 of the prize

Germany

Max-Planck-Institut  
für Quantenoptik  
Garching, Germany;  
Munich, Germany

b. 1941

source: <http://nobelprize.org/physics/laureates/2005/>



**John L. Hall**

***DLS congratulates John L. Hall, who shared the 2005 Nobel Prize in Physics with Roy J. Glauber and Theodor W. Hansch***

DLS member John L. Hall is known as a pre-eminent laser experimentalist, concentrating on improving the precision and accuracy with which lasers can produce a specific, sharp frequency or color of light, and the stability to hold that frequency. His work has been essential to precision spectroscopy for physical and chemical analysis, new tests and measurements of fundamental physical laws and constants, time and length, metrology and fiber-optic communications.

In the 1960s he worked on the development of the methane-stabilized helium-neon laser, which became the cornerstone of a famous experiment at NIST to measure the speed of light at least 100 times better than any previous determination. The work ultimately led to a fundamental redefinition of the meter, the basic unit of distance measurement.

Hall began his career at NIST as a National Research Council postdoctoral fellow in

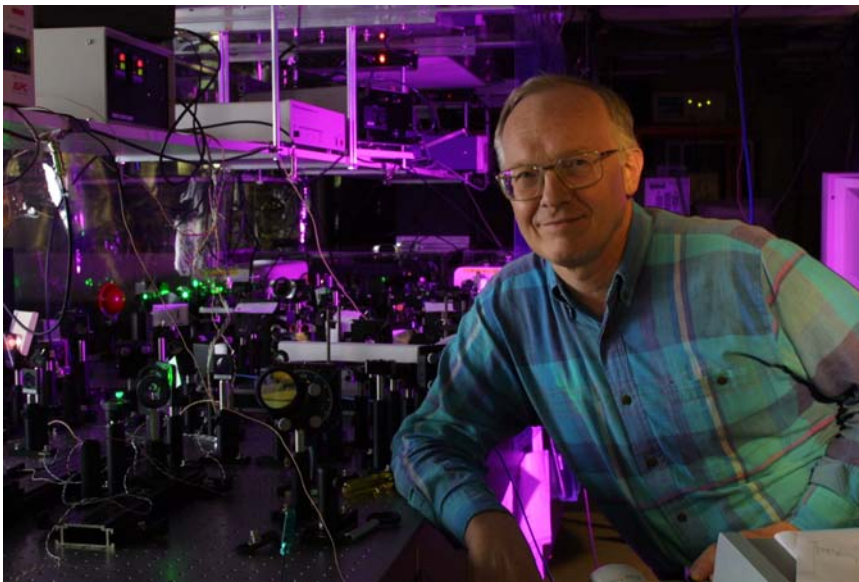
1961. He joined the NIST staff as a physicist in 1962, and was named a senior scientist in 1971. In 1964, he became a fellow of JILA.

He has received many honors during his career, including the Department of Commerce Gold Medal (individually in 1969 and as part of a group in 1974 and 2002). He has been a member of the National Academy of Sciences since 1984.

He has been affiliated with CU-Boulder's physics department since 1966, retired from NIST in 2004 and currently is a senior research associate at JILA, located on the CU-Boulder campus. Hall has been the thesis adviser of 15 physics doctoral students at CU-Boulder.

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**Arthur L. Schawlow Prize in Laser Science**  
**Paul Corkum**  
**National Research Council, Ottawa, Canada**



*Citation: For seminal contributions to the development of ultrashort, intense laser-field science, including his development of the recollision model for laser-matter interactions, and his key insights and leadership that have profoundly influenced the emerging field of attosecond laser science.*

**Biography**

Paul Corkum received his B.Sc. from Acadia University in Nova Scotia and his Ph.D. in theoretical physics from Lehigh University in Pennsylvania. He joined NRC as an experimental post doctoral fellow in 1973. Dr. Corkum is best known for proposing how atomic and molecular gases can produce and measure attosecond optical and electron pulses.

Dr. Corkum is a member of the Royal Society of Canada and a recipient of the Canadian Association of Physicists gold medal for lifetime achievement in Physics, and the Royal Societies of Canada's 2003 Tory medal.

### **Summary or research**

One of the world's experts on lasers (particularly short pulse lasers), Dr. Corkum contributes to atomic, molecular and solid state physics. His work is characterized by a deep physical insight leading to simple, elegant models and supported by highly original experiments. He is the "father" of attosecond science and of attosecond molecular imaging. His model of electron re-collision with its parent ion has become the organizing principle for most of "strong field science."



**Congratulations!**

**Michael G. Raymer of the University of Oregon was appointed a Divisional Associate Editor of Physical Review Letters for the area of Laser Science**

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## **2005 APS Fellows from DLS**

*We congratulate and celebrate our new APS Fellows:*

**Steven T. Cundiff**  
NIST/JILA

*Citation: For pioneering work in carrier-envelope phase stabilization of modelocked lasers and its applications to optical frequency metrology and ultrafast technology.*

**Todd Ditmire**  
University of Texas at Austin

*Citation: For pioneering experiments in High Energy Density physics using ultrashort intense lasers, including production of fusion neutrons from laser-irradiated clusters and states of warm dense matter relevant to astrophysics.*

**Alexander L. Gaeta**  
Cornell University

*Citation: For pioneering experimental and theoretical investigations of nonlinear optical interactions in photonic crystal fibers and with ultrashort pulses in bulk media.*

**A. Marjatta Lyyra**  
Temple University

*Citation: For the development of multi-resonance laser spectroscopic technique for facilitating large inter-nuclear distance molecular excitation with state selectivity and for probing coherence effects in molecular systems.*

**Theodore B. Norris**  
University of Michigan

*Citation: For contributions to ultrafast lasers and their application to semiconductor physics and optoelectronics.*

**Jorge J. Rocca**  
Colorado State University

*Citation: For breakthrough developments in compact soft x-ray lasers and in the applications of these lasers to plasma diagnostics, interferometry and material studies.*

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## Calendar

**APS fellowship nominations:** Deadline for nominations through DLS April 3, 2006. More nominations are strongly encouraged. All nominations should be sent to:

The American Physical Society  
One Physics Ellipse  
College Park, MD 20740  
ATTN: Fellowship Program

For more details see: <http://www.aps.org/fellowship/fellinfo.cfm>

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## CLEO/QELS Conference:

Long Beach Convention Center, Long Beach, CA, May 21-26, 2006.



**Now accepting postdeadline submissions for CLEO/QELS. The deadline for the 35-word abstract and 2-page summary is April 13, 2006 at 12:00p.m. noon EDT (16.00 GMT).**

Questions can be directed to the Technical Papers staff at [cstech@osa.org](mailto:cstech@osa.org) at any time.

April 27, 2006 Pre-Registration Deadline  
Deadline for Hotel Reservations: April 27, 2006

Program: [http://www.cleoconference.org/Conference\\_Program/](http://www.cleoconference.org/Conference_Program/)  
[http://www.cleoconference.org/hotel\\_reservations\\_and\\_travel/](http://www.cleoconference.org/hotel_reservations_and_travel/)

## **Frontiers in Optics 2006 /Laser Science XXII Meeting**

October 8–12, 2006

Rochester Riverside Convention Center  
Rochester, New York

**Note that the Symposium on Undergraduate Research will again take place in Rochester.**

For other details see:

<http://www.osa.org/meetings/annual/>  
<http://www.osa.org/meetings/topicals/>

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## **Distinguished Traveling Lecturer (DTL) Program**

This program is very successful with the number of college applications for speakers in balance with the number of speakers available. We have nine volunteers as Distinguished Travelling Lecturers leading to enough flexibility with respect to accommodating the colleges' first choices for speakers.

The list of current DTLs include:

Jim Kafka, Spectra Physics  
Carlos Stroud, The Institute of Optics, University of Rochester  
Lee W. Casperson, Department of Electrical and Computer Engineering, University of North Carolina Charlotte  
Eric Cornell, JILA, University of Colorado  
Robert Byer, Department of Applied Physics, Stanford University  
Marsha Lester, Department of Chemistry, University of Pennsylvania  
Ron Walsworth, Harvard Smithsonian Center for Astrophysics, Harvard University  
Luis A. Orozco, Physics Department, University of Maryland

Christopher Monroe, Department of Physics, University of Michigan

The DTL Committee members are:

Rainer Grobe (Chair)  
Margaret Murnane  
Ian Walmsley  
Matt Anderson  
Elizabeth McCormack  
Mark Beck

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### **New Laser Scientist Symposium**

The third New Laser Scientist Symposium was held in Rochester, New York, October 15, 2004 in conjunction with the OSA Annual meeting and the Laser Science Conference. The event Chair was Kurt Gobble and the Vice-Chair was Bob Jones. The NLSC was attended by recently appointed faculty in all areas of Laser Science including Physics, Chemistry, Biophysics, and Engineering. Each participant presented a 20 minute invited talk on their work, with ample time for discussion. The NLSC provides a network for new faculty, who are often isolated as they start their careers in academia. The response from the participants was overwhelmingly positive.

DLS will continue this event in the future every other year. Nominations for the fall 2006 New Laser Scientist Symposium to be held at LS-XXII in Rochester should be forwarded to Prof. Bob Jones, Physics Department, University of Virginia: email : [rrj3c@virginia.edu](mailto:rrj3c@virginia.edu) or tel. 434-982-2189.

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### **Symposium on Undergraduate Research**

The Symposium on Undergraduate Research at LS-XXI in Tucson began with a barbeque on Sunday night, 16 October by the swimming pool at the Holiday Inn where most of the participants were staying. It was a beautiful evening and the sunset on the Santa Catalina mountains cast a warm glow on the surroundings. It was a time for getting acquainted with one another and the beginning of a 24 hour period that is expected to have a profound effect on the future of the participants.

This was the fifth such symposium in a series that began in 2001 and has brought nearly 100 students to this prestigious annual meeting to present the first research papers of their budding careers. It has grown from ten papers in that first year to thirty-one this year, with projects done at more than 20 universities. Some of the student participants did their research in various European laboratories under a program run by Professor Martin Richardson of the College of Optics and CREOL at the University of Central Florida. Thus, the symposium provided a reunion for these students whose European summers had

been coordinated

<http://resonator.physics.sunysb.edu/research-symposium/>.

There were three sessions of six or seven talks each, presided by Prof. Richard Haskell of Harvey Mudd College, Prof. Martin Richardson, and Prof. Justin Peatross of Brigham Young University. These oral sessions were preceded by a poster session presided by Dr. John Noé of Stony Brook University that not only had eight additional presentations but also attracted all three of this years Nobel Laureates in Physics, Ted Hänsch, John Hall, and Roy Glauber. The students were thrilled to discuss their work with such famous physicists, and these memories will not be forgotten.

The Symposium was an unqualified success, largely because of the high quality of the talks given by the students (more than 1/3 of the presenters were female, well above the national average of physics students). The questions that came from the audience were broad and ranging, and these emerging young scientists handled them with poise and confidence. The students were well-prepared, informed, articulate, and otherwise excellent. Every single one of them had both a complete grasp of their role in their project and simultaneously a view of where their work fit into the larger scheme of things. It was gratifying to see these very young scientists giving their first talks at a professional meeting, and it was clearly a memorable event for them. As often happens, there were talks on closely related subjects from different universities, and the students were completely unaware that other participants were working on such closely related topics. For example, naïve assumptions about the polarization of Hermite-Gaussian beams, and new techniques for measuring polarization, showed that Maxwell's equations continue to yield new and unexpected information about ordinary light beams. In a similar vein, exquisitely simple generation of optical vortices using only a bent piece of plastic, and the use of such singular beams for trapping atoms, underlined this new and exciting topic in classical optics. Upshifting optical frequencies by non-linear or Raman processes was the focus of a number of talks, and the topic continues to attract considerable interest. We even saw time-lapse movies of embryonic development through the eyes of coherence microscopy. Among the other very diverse topics were studies of optical properties of waveguides produced by various techniques, atomic spectroscopy of fundamental phenomena and cold atom physics, optical characterization of various nano-structures, improvements to laser technology, and many others. All the abstracts are posted on the website above. At the end of the final session, pairs of students were busily exchanging ideas and information as they walked to a dinner/reception hosted by the OSA for all students attending the meeting. The new friendships that were cemented at this final event will undoubtedly become collegial connections in their future careers.

Judging from the enthusiastic notes that accompanied their final expense reports, they'll surely remember this meeting throughout their professional lives. Some of the comments were:

- "I thoroughly enjoyed the experience. It was wonderful to converse with undergraduates from outside of Temple to gain additional research-related

perspectives. And I was able to meet some amazing people!”

- “Thank you very much for the amazing opportunity that I had in presenting my research at such an event. It was definitely a motivator in showing that hard work does pay off. I can't explain in words how exciting it was to hear about all the innovative research that is currently being pursued, as well as meeting people in the field I have only read about. ... I can't say enough how incredible the experience was.”
- “I thought the conference was great! I wish I could have stayed longer, but it was a good experience nevertheless. I emailed the two contacts I made in bio-optics, there (sic) forwarding me very interesting information on their research, company, and life being in that field. ... I greatly appreciate your advice on getting me to come.”

The event was supported by funds from several sources. In addition to the DLS and the grant from NSF, a significant part of the total cost was provided by the departments and colleges of some of the participants. Sincere thanks go to Brigham Young University, Harvey Mudd College, Bates College, Temple University, Univ. California Berkeley, Lawrence University, University of Arkansas, Old Dominion University, Stanford University, University of Pittsburgh, and Stony Brook University. This support has been essential to the ability to provide 100% support to the students, including registration, travel, housing, and meals. It has been greatly appreciated.

The entire symposium was organized and arranged by Prof. Harold Metcalf of Stony Brook University, your current chair. It will be repeated at FiO/LS in Rochester next October, and information can be had from the DLS leadership, accessible through the DLS website at <http://www.aps.org/units/dls/>. Harold Metcalf, Chair, DLS Executive Committee

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### **Student Travel Grant Program**

DLS has reinstated the Student Travel Grant program. Through this program, DLS will provide partial funding (up to \$500) for a limited number of graduate students to attend and participate in one of the Division's two conferences, QELS or Laser Science. **To be eligible, an applicant must be a full-time graduate student, a member of the Division of Laser Science**, and the first author and presenter of an oral or poster paper at the QELS or LS meetings. To make these funds as widely available as possible, only one student per research group is entitled to such support. Applicants should submit a letter stating their estimated need for travel funds, including a commitment of institutional support, if any, attached to a copy of the submitted abstract on which they are the first author, and a letter of nomination from a member of the DLS. This nomination letter must certify that the applicant is a full time graduate student and that the student's visa (for international students) is valid through the meeting dates. Please list daytime phone number, FAX number and e-mail address. Applicants are required to FAX or email their acceptance letter or attach it to the application upon receiving the official notice. Checks will be

issued at the meetings. Hotel accommodations will be covered at up to half the conference rate for a double room. **Please submit your requests by September 12, 2006** to

Prof. John T. Fourkas  
Millard Alexander Professor of Chemistry  
Department of Chemistry and Biochemistry  
University of Maryland  
College Park, MD 20742  
Ph. (301)405-7996  
Fax:(301) 314-4121 FAX  
Email: [fourkas@umd.edu](mailto:fourkas@umd.edu)

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### **CHAIR**

Harold J. Metcalf  
Department of Physics  
SUNY-Stony Brook  
Stony Brook, NY 11794-3800  
Ph: (631) 632-8185  
FAX: (631) 632-8176  
email: [harold.metcalf@sunysb.edu](mailto:harold.metcalf@sunysb.edu)

### **CHAIR-ELECT**

Leo W. Hollberg  
National Institute of Standards and  
Technology  
325 Broadway  
Boulder, Colorado 80305  
Ph: (303) 497-5770  
FAX: (303) 497-7845  
email [hollberg@boulder.nist.gov](mailto:hollberg@boulder.nist.gov)

### **VICE CHAIR**

Mark Johnson  
Department of Chemistry  
Yale University  
225 Prospect Street  
P.O. Box 208107  
New Haven, CT 06520-8107  
Ph: (203) 432-5226  
Email: [mark.johnson@yale.edu](mailto:mark.johnson@yale.edu)

### **PAST CHAIR**

Mark Raizen  
Department of Physics

### **MEMBERS-AT-LARGE**

A.Marjatta Lyyra (to 10/06)  
Physics Department  
Temple University  
Barton Hall  
Philadelphia, PA 19122  
Ph: (215) 204-3776  
Fax: (215) 204-5652  
email: [lyyra@temple.edu](mailto:lyyra@temple.edu)

Alexander L. Gaeta (to 10/06)  
School of Applied and Engr. Phys.  
Cornell University  
Ithaca, NY 14853  
Ph: (607) 255-9983  
Fax: (607) 255-7658  
email: [alex.gaeta@cornell.edu](mailto:alex.gaeta@cornell.edu)

Daniel J. Gauthier (to 10/07)  
Dept. of Physics  
Duke University  
P.O. Box 90305  
Durham, NC 27708  
Ph: (919) 660-2511  
FAX: (919) 660-2525  
email: [gauthier@phy.duke.edu](mailto:gauthier@phy.duke.edu)

Luis A. Orozco (to 10/07)  
Dept. of Physics  
Univ. of Maryland  
College Park, MD 20742-4111  
Ph: (301) 405-9740

Dept of Phys, Univ of Texas  
Austin TX 78712  
Ph: (512) 471-4753  
Fax: (512) 471-9637  
email: [raizen@physics.utexas.edu](mailto:raizen@physics.utexas.edu)

**SECRETARY-TREASURER**

John T. Fourkas  
Millard Alexander Professor of  
Chemistry  
Department of Chemistry and  
Biochemistry  
University of Maryland  
College Park, MD 20742  
Ph. (301)405-7996  
Fax:(301) 314-4121 FAX  
Email: [fourkas@umd.edu](mailto:fourkas@umd.edu)

**NEWSLETTER EDITOR**

A. Marjatta Lyyra  
Physics Department  
Temple University  
Barton Hall  
Philadelphia, PA 19122  
Ph: (215) 204-3776  
Fax: (215) 204-5652  
email: [lyyra@temple.edu](mailto:lyyra@temple.edu)

**DIVISIONAL APS COUNCILOR**

Joseph Eberly  
Dept. of Physics and Astronomy,  
Univ. of Rochester,  
Rochester, NY 14627  
Ph: (585) 275-4576  
Fax: (585) 276-0018  
email: [eberly@pas.rochester.edu](mailto:eberly@pas.rochester.edu)

Email: [lorozco@physics.umd.edu](mailto:lorozco@physics.umd.edu)

Anne Myers Kelley (to 10/08)  
School of Natural Sciences  
University of California, Merced  
P.O. Box 2039  
Merced, CA 95344  
Ph: 209-724-4345  
Fax: 209-724-4356  
Email: [amkelley@ucmerced.edu](mailto:amkelley@ucmerced.edu)

Steve Cundiff (to 10/08)  
Quantum Physics Division  
National Institute of Standards and Technology  
JILA/University of Colorado  
440 UCB  
Boulder, CO 80309-0440  
Ph. (303)492-7858  
Email: [cundiffs@jila.colorado.edu](mailto:cundiffs@jila.colorado.edu)

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**Other committees**

**DLS Nomination Committee**

Carol Tanner (Chair), Mike Chapman and Chris Monroe

**DLS Fellowship Committee**

Mark Johnson (Chair), John Sipe, Louis Bloomfield, Jeff Shapiro and Liz McCormack  
Members:

**The Schawlow Prize Committee**

Rainer Blatt (Chair), Roberto Merlin and Marlan Scully

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Wendell T. Hill, University of Maryland

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Henry Kapteyn, JILA, University of Colorado

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***Newsletter Editor***

[Prof. A. M. Lyyra](#), Temple University