

What is this? (Ans. p 4)

Newsletter of the
DIVISION OF ATOMIC, MOLECULAR, & OPTICAL PHYSICS
of the
American Physical Society
November, 1991

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The DAMOP Newsletter is
prepared by University Printing
at Tulane University.

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Ben Bederson Becomes Editor-in-Chief

At the beginning of 1992 Ben Bederson expects to become Editor in Chief of the American Physical Society, according to Gordon Drake, Chair of the new Search Committee. Many of us who have come to know Ben over his many years of leadership at *Physical Review A* can expect the excellence to continue when he replaces David Lazarus. Like a New York bagel with cream cheese, something will be completed. *Physical Review* is often considered as the best research journal in physics: Ben Bederson helped make it and will help to keep it that way. Congratulations, Ben.

CAMOS Report

As announced in the last Newsletter, the Committee on Atomic, Molecular and Optical Sciences (CAMOS) of the National Research Council has embarked on an assessment of the field. The NRC has appointed a panel under the chairmanship of Neal Lane with Gordon Dunn (chair of CAMOS) as executive co-chair and four panelists in each of the A, M and O areas of the field. Panelists in Atomic are: Barry Dunning of Rice, Steve Lundeen of Notre Dame, Dan Larson of Virginia, and Lloyd Armstrong of Johns Hopkins; in Molecular: Louis Brus of AT&T Bell Labs, Alex Dalgarno of Harvard, Fleming Crim of Wisconsin, and Sylvia Ceyer of MIT; in Optical: Dave Auston of Columbia, Paul Liao of Bellcore, Elsa Garmire of USC, and a pending appointment. The three subpanels will be working closely with the respective parts of the community to achieve the goals of the study. The charge which CAMOS has given the panel is to conduct an assessment of atomic, molecular, and optical science in the United States, which reflects the opinions of the AMO community at large and addresses the following:

- 1) Determines manpower, instrumentation, facility and funding

requirements not only in the context of the intellectual challenges of AMO science, but also in the context of national needs such as a) science education; b) defense, energy, space, and environmental applications; c) industrial and technological competitiveness; and d) appropriate aspects of human health and welfare.

- 2) Seeks to identify scientific frontiers, technological opportunities, and windows of future opportunity.
- 3) Seeks to establish sets of research and educational priorities from various perspectives.
- 4) Sets forth goals and planning scenarios that reflect these research and educational priorities.
- 5) Develops long-range strategies that will best meet the goals set forth.
- 6) Assesses the institutional infrastructure in which AMO science is conducted and identifies changes that would improve its constituent research and educational efforts.
- 7) Provides a comparison of AMO science in the United States with its counterpart in other industrialized nations.
- 8) Reviews the scientific advances made during the last decade.

Funding has been provided from the Department of Energy, the National Science Foundation, and Air Force Office of Scientific Research; and funding has been requested from the National Aeronautics and Space Administration and the Office of Naval Research. The panel will have its first meeting on October 28.

A preliminary research briefing, a 21-page booklet entitled "Selected Opportunities in Atomic, Molecular, and Optical Sciences," prepared by CAMOS

for the agencies, students, workers in the field and other interested parties, is still available and may be obtained by Bitnetting or writing Gordon Dunn or Pat Dehmer.

Results of the CAMOS questionnaire which many of the experimentalists filled out about a year ago have been tabulated, and a report should soon be forthcoming to the community.



New Councillor to APS

Joe Dehmer of Argonne National Laboratory won a close election to become the second DAMOP representative on the Council of the American Physical Society. The APS Council sets the policy of the American Physical Society. Joe joins Dan Larson on the Council to help chart the course of the APS.



Los Alamos Summer School in AMO Physics

The Los Alamos Summer School in AMO Physics for this summer (1992) is underway. The emphasis and organization will be similar to the previous three years. The program is aimed at senior undergraduates and first-year graduate students in order to attract young talent into the field. Formal classes, problem sessions and individual projects will all be part of the curriculum. Classes will be taught by LANL and UNM personnel as well as several guest lecturers and cover a general introduction to AMO physics together with topics of current interest. Problem sessions will stress high-performance supercomputing in addition to basic analytical skills. Students will receive university credit and be paid as graduate students at UNM.

The final status of the School depends on the outcome of grant applications to the NSF and DOE. If successful, an official announcement is expected around the first of December. Inquiries should be addressed to either L. A. Collins, T-4, MS B212, Los Alamos National Lab, Los Alamos, NM 87545 [(505) 667-2100 or lac@lanl (Bitnet)] or H. Bryant, Dept. of Physics and Astronomy, University of New Mexico, Albuquerque, NM 87131 [(504) 277-3044 or hzero@unmb (Bitnet)].

New Slate of Candidates for Office

The Nominating Committee (Bernd Crasemann, Chair) has selected the following candidates for office in DAMOP:

Chair-Elect

Lloyd Armstrong, Jr. (Johns Hopkins University)
Thomas F. Gallagher (University of Virginia)

Vice Chair

Robert N. Compton (Oak Ridge National Laboratory)
Chun C. Lin (University of Wisconsin)

Members-at-Large, Executive Committee

Three-year term (two to be elected)

William E. Cooke (University of Southern California)
Chris H. Greene (University of Colorado/JILA)
Stephen R. Lundeen (Notre Dame University)
Roberta Saxon (SRI International)

Two-year term (one to be elected)

Angela Li-Scholz (Editor, At. Data Nucl. Data Tables)
Thomas Lucatorto (National Inst. of Standards and Technol.)

One-year term (one to be elected)

John B. Delos (College of William and Mary)
Hanspeter Helm (SRI International)

The Committee was pleased to note the considerable number of suggested nominations received from the membership at large and was impressed by the splendid qualifications of colleagues in the pool of possible nominees. This year we are electing more officers in accord with the new DAMOP bylaws (to which Pat Dehmer contributed substantially).

More information about these candidates and a ballot will be included in the next Newsletter.

We thank Bernd Crasemann, Rick Freeman, Dan Larson, Eugen Merzbacher and Ron Stebbings for giving us such wonderfully difficult choices.

Trouble Ahead

DAMOP membership has fallen slightly below 6% of the total. We will lose a councillor unless we get a few more members. *Please help us find members.* They can send \$5.00 with a note saying "I want to join DAMOP" to Membership, APS, 335 E. 45th St., New York, NY 10017. Tel: (212) 682-7341 or contact Jim McGuire who has a special relish for fresh blood. DAMOP with about 2480 members of 42,000 in APS is now about the third largest division (after condensed matter and elementary particles).

23rd Annual Meeting of The Division of Atomic, Molecular, and Optical Physics

Chicago, Illinois
20-22 May 1992

Preliminary Announcement

The 23rd Annual Meeting of the Division of Atomic, Molecular, and Optical Physics (DAMOP) will be held in Chicago, Illinois, on 20-22, May 1992. These dates are the Wednesday through Friday immediately preceding the Memorial Day weekend. The host institution is Argonne National Laboratory and the local organizing committee is chaired by H. Gordon Berry. Partial support for the meeting is being provided by The University of Chicago Board of Governors for Argonne National Laboratory, by Argonne's Division of Educational Programs, by the Associate Laboratory Director for Energy, Environmental, and Biological Research, and by the Associate Laboratory Director for Physical Research.

The scientific program will consist of a plenary session featuring the winners of the Davidson-Germer Prize and the Will Allis Prize, 12 symposia, 10 sessions of contributed oral papers, and three sessions of contributed poster papers. Details of the program will be given in future issues of the *Bulletin of the American Physical Society (BAPS)* and in the *DAMOP Newsletter*. In addition to the scientific program, there will be a reception on Tuesday evening and a conference dinner on Thursday evening.

All scientific sessions and scheduled social events will be held at the Westin Hotel (909 North Michigan Avenue) on Chicago's famed Magnificent Mile. The hotel is exceptionally well-located (next to the Hancock Tower) and provides convenient access to the best that Chicago has to offer, including fine restaurants, museums, art galleries, the symphony and theater, night life, shopping, professional sports, and the Lake Michigan beaches. An orientation session for accompanying persons will be held early in the meeting and literature will be provided to acquaint participants and their families with the complete array of sightseeing possibilities.

Registration

The registration fee for the conference will cover all costs, including the reception, coffee breaks, and the banquet dinner. The fees are as follows. Before April 1, 1992: Members — \$150; Non-members — \$225; Students — \$50. After April: A preregistration form will appear in the January 1991 issue of the *Bulletin of the American Physical Society*.

Contributed Papers

Abstracts in the areas of atomic, molecular, and optical physics may be submitted for either oral or poster

presentation. Each oral presentation will be allotted 10 minutes for the main presentation and 2 minutes for discussion. Each poster presentation will have a 4 ft. by 8 ft. poster board. All abstracts must be camera-ready and must conform to the APS guidelines, which are given in *BAPS*, 36 1866 (1991). Please note on one corner of the abstract whether you prefer an oral or poster session.

Abstracts (one original and two duplicates) should be sent to Patricia Dehmer, Argonne National Laboratory, Building 203, Argonne, IL 60439 by 7 February 1992. Abstracts received after that date will not be included in the regular program that is published in *BAPS*. Postdeadline abstracts may be submitted until 1 May 1992 and will be included in the supplementary program if space permits. Postdeadline abstracts should be submitted to the same address as abstracts for the regular program.

Accommodations

Approximately 300 rooms have been reserved at the Westin Hotel for meeting participants. Unusually attractive room rates have been obtained for our meeting — single rooms are \$82+tax/night and double rooms are \$92+tax/night. A hotel reservation form will appear in the January 1992 issue of the *Bulletin of the American Physical Society*. It should be mailed directly to the hotel. You must make hotel reservations before 28 April 1992 to obtain these conference rates. A limited amount of financial assistance for students attending the meeting is being provided by Argonne's Division of Educational Programs. Students wishing to apply for assistance should contact H. Gordon Berry, Physics Division, Argonne National Laboratory, Argonne, IL 60439 by 7 February 1992.

Travel

Chicago is easily reached by air via either O'Hare International Airport or Midway Airport. The official airline for the conference is United Airlines, which is offering special reduced fares for conference attendees. These fares will be applicable for travel between May 17 and May 24. To take advantage of these fares, you (or a travel agent) should call United at 1-800-521-4041 and refer to meeting account number 512JE. Details of local transportation between the airports and the hotel will be contained in future announcements.

Further Information

Further details about the meeting, as well as registration and hotel reservation forms, will appear in subsequent announcements in the *Bulletin*. For additional information, please contact H. G. Berry, Physics Division, Argonne National Laboratory, Argonne, IL 60439 or by electronic mail DAMOP@ANLPHY (Bitnet) or DAMOP@ANL.GOV (Internet).

Acknowledgment

DAMOP gratefully acknowledges the efforts of L. W. Anderson and C. C. Lin who put together the session on Plasma Physics/Plasma Processing for DAMOP '92. This was arranged through Wilmer Anderson's participation on the Committee on Applications for the APS. Thanks!

DAMOP Program Committee

The program for all 1993 invited talks will be chosen by the program committee. This committee consists of:

David J. Wineland (Chairperson)

NIST, Div. 847

Dr. Patricia M. Dehmer (Ex-Officio)

Argonne National Laboratory

Prof. James H. McGuire (Secretary-Treasurer)

Tulane University

Terms ending May '94

Dr. Gordon W. F. Drake

University of Windsor

Dr. Roscoe E. Marrs

Lawrence Livermore National Laboratory

Dr. William Phillips

National Institute of Standards and Technology

Prof. Edward A. Hinds

Yale University

Prof. Philip Bucksbaum

University of Michigan

Terms ending May '93

Prof. Bernd Crasemann

University of Oregon

Dr. Richard R. Freeman

AT&T Bell Laboratories

Prof. Peter Lambropoulos

University of Southern California

Prof. Keith MacAdam

University of Kentucky

Prof. David Pritchard

Massachusetts Institute of Technology

Terms ending May '92

Prof. Thomas F. Gallagher

University of Virginia

Dr. Kate Kirby

Harvard-Smithsonian Center for Astrophysics

Prof. Stephen R. Leone

University of Colorado

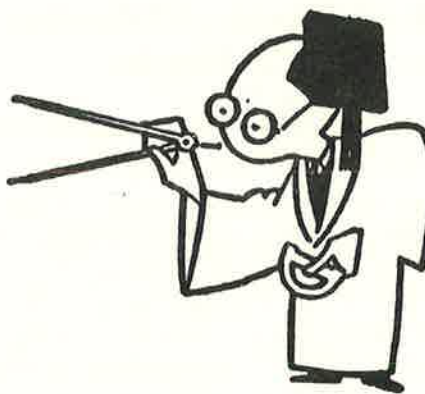
Prof. Stephen R. Lundeen

University of Notre Dame

Prof. William C. Stwalley

University of Iowa

Please give your best suggestions to Dave Wineland (or one of these people) before February 1, 1992.



NIST Precision Measurement Grants

Applications are being solicited for two new Precision Measurement Grants, sponsored by the National Institute of Standards and Technology, to be awarded beginning 1 October 1992 (Fiscal Year 1993). Each grant is in the range \$30,000-\$40,000 per year, renewable for up to two additional years. NIST sponsors these grants to encourage research in U.S. colleges and universities in the field of precision measurement and fundamental constants and to foster contacts between NIST scientists and U.S. academic researchers actively engaged in such work. Candidates' pre-proposal summaries and biographical information must reach NIST by 1 February 1992 to be considered for the FY 93 awards. For more information, contact Barry N. Taylor, Chairman, NIST Precision Measurement Grants Committee, National Institute of Standards and Technology, Building 221, Room B160, Gaithersburg, MD 20899, (301) 975-4220.

Conferences

The Conference on Lasers and Electro-Optics (CLEO 92) and the Quantum Electronics and Laser Science Conference (QELS 92) will be held May 10-15 in Anaheim, CA. Information is available from CLEO/QELS 92, Optical Society of America, 2010 Massachusetts Ave. NW, Washington, DC 20036.

Answer to "What's This?" (front page)

Observed ratios of double to single ionization of helium vs. velocity by proton (p^+), antiprotons (p^-), electrons (e^-), and positrons (e^+) of the same incident velocity in MeV/amu taken from Charlton *et al* (1988). The 80-GeV/amu electron point is from Salzborn and Mueller (1986). The differences between negative and positive projectives above one MeV/amu are thought to be caused by correlation, but the physical mechanism for this correlation is not clear.

'Big Science' Does Cost Money

The Congressional Budget Office has examined the questions of how much money "big science" projects have historically cost and what they may cost in the future. The study shows the share of total nondefense R&D funding devoted to large R&D projects peaked at about 27% in the early 1980s, then fell sharply in 1984 after development work on the space shuttle was finished. In the mid-1980s, an inventory of 80 large R&D projects and facilities accounted for 10% of civilian R&D spending. That share grew to over 15% by 1991. CBO estimates the large science projects contained in the President's 1992 budget proposal would account for 22% of the non-defense R&D budget. The three largest projects in the current inventory — the space station, Earth observation system, and the Superconducting Super Collider — alone would double their share of nondefense R&D spending from the current level of 8% by 1996 under the Administration plan.

Memberships, News, and Announcements



New membership in DAMOP is encouraged. Please contact Jim McGuire, Secretary-Treasurer, concerning new membership or items of interest for this newsletter.



Total R&D Funding (in millions)

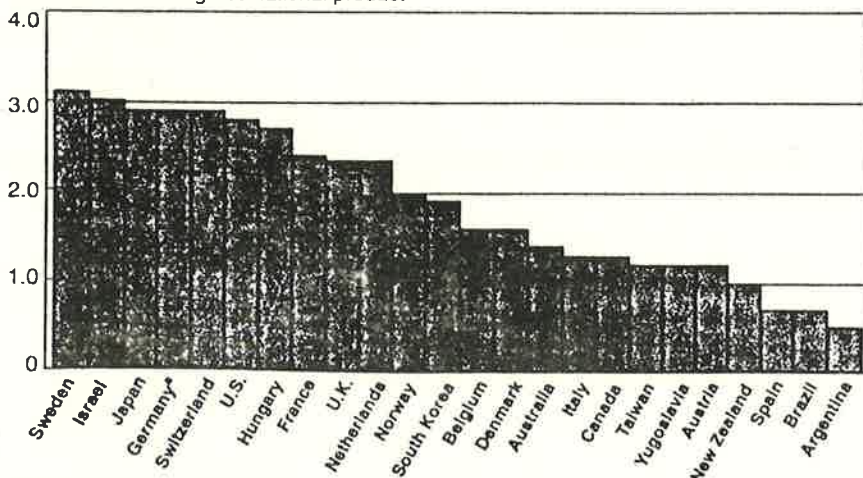
Growth slows for physical sciences

5 Millions	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	Annual change	
												1988-89	1979-89
All sciences	\$7593	\$6956	\$6224	\$5726	\$5191	\$4637	\$4238	\$4059	\$3898	\$3500	\$3069	9%	9%
Life	4773	4318	3830	3488	3184	2827	2586	2502	2365	2094	1819	11	10
Physical	1195	1153	1048	982	890	782	699	650	619	555	491	4	9
Physics	598	576	531	510	453	390	343	307	309	280	253	4	9
Chemistry	424	405	368	338	313	279	247	230	217	190	157	5	10
Environmental	645	583	541	515	473	445	426	391	391	372	329	11	7
Psychology and social	367	329	293	287	260	241	236	250	280	263	227	12	5
Computer	318	289	257	232	196	163	128	107	93	77	69	10	17
Mathematical	156	149	131	114	97	92	76	72	68	61	60	5	10
Others	139	133	125	107	92	87	87	88	82	78	73	5	7
Engineering	1380	1225	1109	976	865	787	744	703	662	596	526	13	10
Chemical	93	78	70	68	59	55	53	50	48	46	na	19	—
TOTAL	\$8972	\$8181	\$7333	\$6702	\$6056	\$5423	\$4983	\$4763	\$4561	\$4096	\$3595	10%	10%
ANNUAL CHANGE	10%	12%	9%	11%	12%	9%	5%	4%	11%	14%	18%		

Note: Data for institutional fiscal years. Data since 1981 were revised in 1989. na = not available. Source: National Science Foundation

Only Sweden spends more than 3% of GNP on R&D

Total R&D as % of gross national product



* Data are for the former West Germany.

Sources: Organization for Economic Cooperation & Development, National Science Foundation

The chart and figure are from *C and E News*, August 19, 1991.



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