The American Physical Society After One Century

George Trilling

March 15, 2003

1. The many roles of the APS in the 21st century

2. The many roles of Andy Sessler in the APS

The APS at a Glance

Objective: ….the advancement and diffusion of the knowledge of physics

Membership: ~ 42000 members

Units: 14 Divisions (major specialties)
6 Forums (cross-disciplinary groupings)
7 Topical Groups (focused on one area)
8 Sections (geographical grouping)

Who really runs APS:

Judy Franz (Executive Officer)
Marty Blume (Editor-in-Chief)
Tom McIlrath (Treasurer)
with the support of a dedicated staff and inputs from an active group of elected officers (presidential line) as well as numerous volunteers (APS committees)

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FGSA

The APS Forum on Graduate Student Affairs encourages a free exchange of ideas among graduate students and the greater scientific community by providing opportunities for meetings, electronic discussion, and access to a permanent archive of member ideas and programs.

FGSA Election 2002 Results

DAP Student Travel Grant Opportunities for April 2003 meeting

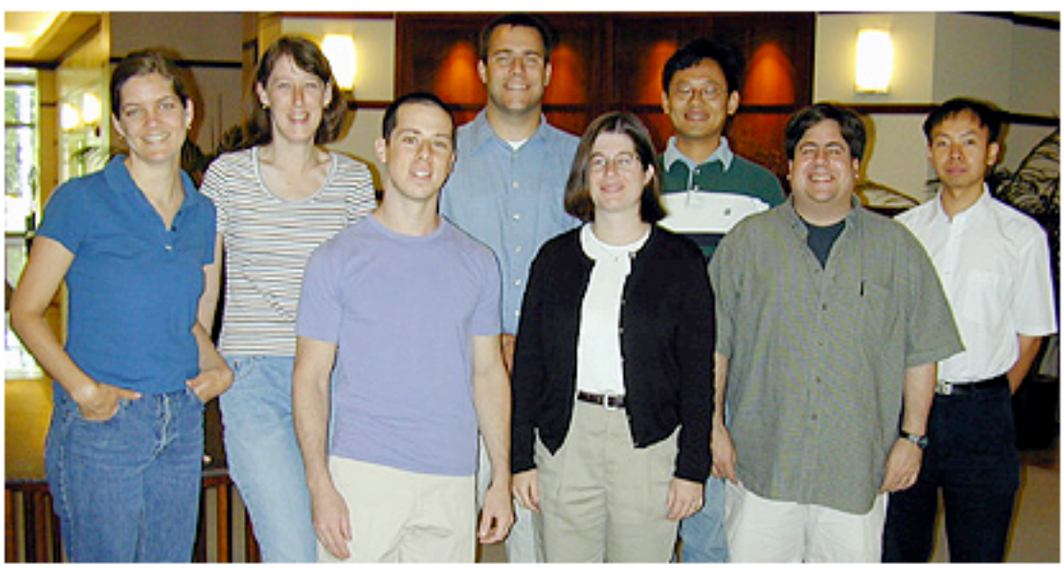
Job Openings at Science's Next Wave

PhD Student Opportunities at the University of Hawaii

International Research Opportunities for Students and Faculty

Landing Your First Job: A Guide for Physics Students

A message to all FGSA and first year Junior APS members



New Grad Student Executive Committee Meets

The new Forum in Graduate Student Affairs held its first Executive Committee meeting at APS headquarters in July 2001. Committee members are: Jennifer West, Louise Parsons, Chad Topaz, Joshua Patin, Susan Niebur, Hsuan-Yeh Chang, Greg Recine and Xin Chen. (Alicia Chang/APS)

Some of the APS Roles

- Publication and dissemination of physics journals
- Organization of scientific meetings
- Involvement in public affairs relevant to physicists
- Initiation of scientific studies relevant to public issues
- Education and outreach
- Participation in international affairs
- Recognizing important contributions with numerous prizes and awards

Research Publications 1
(Accomplishments)

- **Publication Oversight Committee Comment**

The electronic revolution means that we are traveling into uncharted waters, and we struggle with how best to steer the APS Publishing Ship. Thanks to superior foresight and management, the APS journals are doing fantastically well, but we always want to improve and do things better.

- **Recent Progress**

  -- PROLA completed all the way back to beginning in 1893

  -- PROLA mirror at Cornell

  -- Color images on PRL covers

  -- Continuing success of PR Focus

  -- Now five Virtual Journals (with AIP)

  -- Progress toward fully electronic office

Physical Review Focus

Selections from *Physical Review* and *Physical Review Letters* explained for students and researchers in all fields of physics.

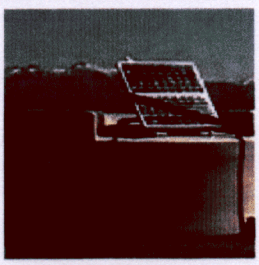
APS Journals

Black Holes from Heaven

11 January 2002

High energy cosmic rays might produce tiny black holes that could be detected in the next several years.

PRL (14 January 2002)



Polymer Pearl Necklaces

9 January 2002

Microscopic polymer beads can link up into chains and networks that might be used in many technologies.

PRL (7 January 2002)

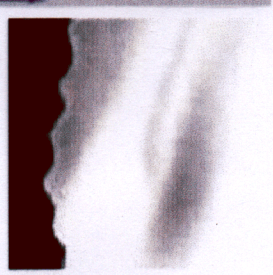
Making Waves in Crack Theory

3 January 2002

Cracks in stretched rubber mysteriously oscillate as they travel. Solving the mystery may help illuminate the puzzling laws of crack motion.

video

PRL (7 January 2002)



Physics News Update

American Institute of Physics news items that describe research from APS journals:

A Sonic Crystal
PRL (14 January 2002)

Slowing and Storing Light in a Solid
PRL (14 January 2002)

Nuclei Go Through Phases
PRL (14 January 2002)
PRC (December 2001)

More from the PNU Index.

Focus Quick Search

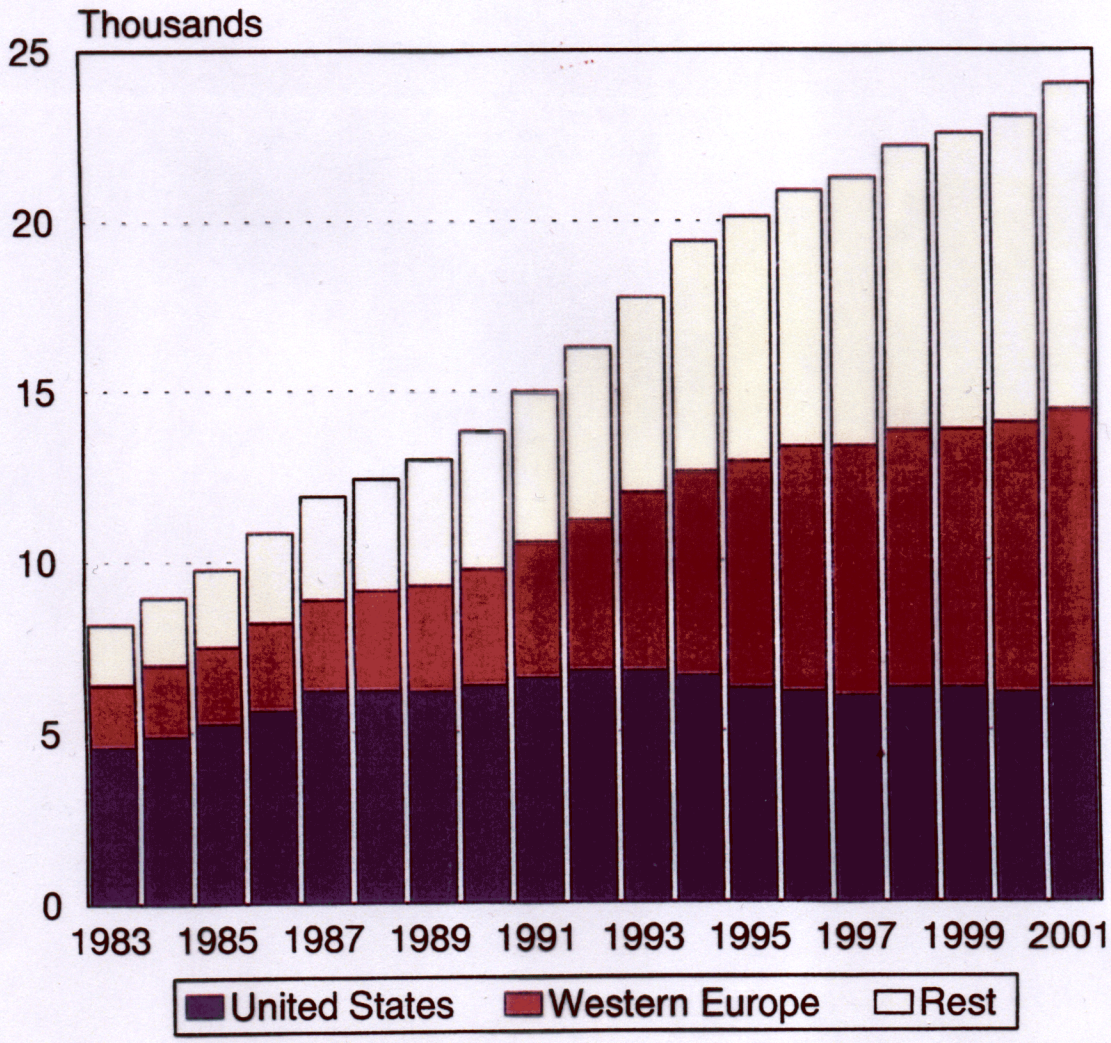
Search

Advanced Search

Click on to see the research paper described in the story.

Physical Review and Physical Review Letters Submissions

1983 - 2001



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Research Publications 2
(Challenges)

- Per-subscriber costs increase faster than inflation
  - -- Worldwide submissions increase by a few % each year
  - -- Each year, non-member subscriptions go down ~3%
  - -- General inflation
- Maintaining financial viability
  - -- Develop creative charging models to keep publishing enterprise afloat on terms acceptable to clients
- Moving to fully electronic office while pursuing ongoing obligations
- Planning for the future
  - -- Future of print journals
  - -- Archiving
  - -- Peer review process
  - -- New technologies
  - -- APS Task Force on Electronic Information Systems (Loken II)

Physics-Related Public Affairs Issues

--Public policy issues that require physics-related input:
Energy, Environment, Missile Defense, Anti-terrorism, Visa policy etc.

-- Unbalance in federal science budget and apparent low priority for physical science support

-- Recognition of importance of DOE/Office of Science programs and facilities, including National Laboratories

-- Increased funding for improvement of K/12 science education

-- Concerns about application of Government Performance and Results Act (GPRA) and performance-based budgeting to basic research: high-risk research must survive

-- Physicist role in helping combat terrorism

-- Ethics and Professional Conduct

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Ethics & Values
APS/AIP Internal
Human Rights
National Policy
International Affairs

By Year

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Current APS Statements - By Subject

Ethics & Values

02.4 Statement on Improving Education for Professional Ethics, Standards and Practices

02.3 Statement on Policies for Handling Allegations of Research Misconduct

02.2 Guidelines for Professional Conduct

99.6 Statement on 'What is Science?'

94.3 Statement of Policy on Equal Professional Opportunity

91.8 Guidelines for Professional Conduct

88.1 Statement on Displays in the Workplace of Graphic Material Depicting Demeaning Images of Women

Education

02.4 Statement on Improving Education for Professional Ethics, Standards and Practices

01.2 Assessment and Science

00.5 Statement on K-12 Education

99.6 Statement on 'What is Science?'

99.5 Statement on the Kansas State Board of Education Decision

99.2 Research in Physics Education

99.1 AIP-Member Society Statement on the Education of Future Teachers

94.2 APS Council Statement on Current Employment Opportunities for Physicists

83.3 General Statement of Principle on Educational Program in Science and Mathematics

81.1 Statement on Creationism

APS/AIP Internal Policy

Report to The American Physical Society of the study group on science and technology of directed energy weapons [1987]

APS Study Group Participants

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Science and Technology of Directed Energy Weapons. This was the first major independent study of the feasibility of lasers or particle beams as a defense against ballistic missiles. The Study Group concluded that at least ten years of research would be required to provide the technical information required to make an informed decision about the effectiveness and survivability of such weapons. The study has had a major impact on strategic defense policy. Financial support was received from Carnegie Corporation of New York and the MacArthur Foundation. The study received full cooperation from the Strategic Defense Initiative Organization and from the Office of Science and Technology Policy.

APS Study of Boost-Phase Systems for Missile Defense

- **Charge to the Study Group**

The American Physical Society directs the Study Group to prepare a report on the science and technology of boost-phase systems for the National Missile Defense, based on fundamental principles of science and engineering and on unclassified information. The Society will review and after acceptance make it available to all interested parties and the general public.

- **Membership of the Study Group**

David K. Barton – Hanover, NH
Roger Falcone – U. C. Berkeley
Daniel Kleppner – MIT, Co-Chair
Frederick K. Lamb – U. Illinois, Urbana, Co-Chair
Ming K. Lau – Sandia
Harvey L. Lynch – SLAC
David Moncton – MIT
David Montague – LDM Associates
David E. Mosher – RAND
Lee Murrer – CARCO-West
William Priedhorsky – LANL
Maury Tigner – Cornell
David R. Vaughan – RAND

- **Comment**

This Study deals only with scientific/technical issues. The APS has been careful to avoid making policy statements on missile defense to avoid undermining the credibility of the Study.

Physics Teacher Education Coalition (PhysTEC)

- **Partnership of APS, AIP, and AAPT**
- **Goal: Improve science preparation of future K-12 teachers**
- **Six universities selected**
- **Main Elements**

  -- Master Teacher-in Residence (TIR) program

  -- Collaboration between physics and education departments and local school community

  -- Redesign of content and pedagogy for both Physics and Science Methods courses based on physics education research and new technologies

  -- Training of TIRs and Master Teachers to mentor novice science teachers

  -- Rigorous process to evaluate and disseminate the results

NSF Grant $5.76M over 5 years, FIPSE Grant $0.498M
APS is now in a fund-raising campaign to add year by year another ten universities.

Some APS International Efforts

- **Interactions with physicists in other countries**
  - -- Inter-American Workshop on the Use of Synchrotron Radiation for Research and Symposium on Nanosecond Technologies, Campinas, Brazil (Feb. 2001)
  - -- Joint meeting of DNP and nuclear physicists from JPS Maui (Oct. 2001)
  - -- International Conference on Medical Physics, Habana, Cuba, (April 2002)
  - -- VIII International Conference on Physics Education, Habana, Cuba (July 2003)
- **U.S. visa issues & APS Off. of International Affairs**
  - -- Assistance with visa delays and denials for Conferences
  - -- Visa issues for long-term research visitors
- **International participation in APS governance**
  - -- International Councillor T. Maurice Rice
  - -- Official visitors from Mexico/Canada at Council
- **70% of APS journal submissions from abroad**

International Interests

Andy was very interested in outreach to Latin America and pushed this hard with CISA. It was something that we all wanted to do, but Andy really helped move things along. There was a meeting (1998) in Mexico where we met with the physical societies of many of the Latin American countries and Canada and Spain. At this meeting Andy played a major role and we came up with a number of specific program items: a statement on the importance of physics that was later (1999) adopted by IUPAP, a plan for exchanges of physicists, and the decision to translate "String and Sticky Tape Experiments" into Spanish and make it available to Latin American teachers. This was the beginning of the Ibo-American Physics Working Group. (Judy Franz)

Meeting in Cuernavaca (Nov. 2-4, 1998)

Working Group In Telecommunications

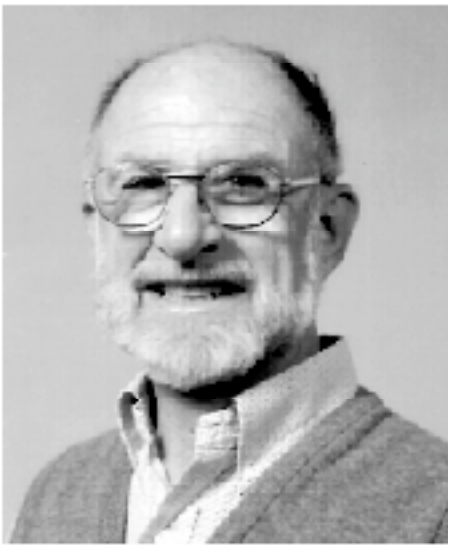
Working Group on Educational Exchanges

Working Group on Research Exchanges

AMERICAN PHYSICAL SOCIETY

Prizes & Awards

1997 Robert R. Wilson Prize to Andrew M. Sessler *Lawrence Berkeley National Laboratory*



Citation:

"For a broad range of theoretical and conceptual advances in particle beam dynamics, leading to important accelerator performance improvements; for contributions in the areas of synchrotron rings, including negative mass instability and resistive wall instability, and free electron lasers; for the two-beam accelerator concept; for helping shape the very language of beam physics; and for inspiring and guiding several generations of accelerator scientists and serving as a statesman of science."

AMERICAN PHYSICAL SOCIETY

Prizes & Awards

Nicholson Medal for Humanitarian Service

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

Previous Winners

2002	Ramon Lopez
2001	D. Allan Bromley
2000	Marshall N. Rosenbluth
1999	Fay Ajzenberg-Selove and Mildred Dresselhaus
1998	Vitaly Lazarevich Ginzburg
1997	Henry W. Kendall
1996	Li-Zhii Fang
1995	Yuri Orlov
1994	Andrew M. Sessler

Pre-Presidential Leadership

Chair, Panel on Public Affairs (POPA)

POPA advises in formulation of APS positions on public policy issues that have a technical dimension of interest to physicists. It also investigates the desirability of of APS-sponsored expert studies in physics related topics of importance to society, and helps organize such studies.

Chair, Committee on International Freedom of Scientists (CIFS)

CIFS monitors concerns regarding human rights for scientists throughout the world, and may recommend courses of action to help alleviate such problems.

Chair, Committee on Applications of Physics (CAP)

CAP was subsequently replaced by the Forum on Industrial Applications of Physics (FIAP).

Chair, Division of Physics of Beams (DPB)

Helped establish FIAP, CIFS, and Physics Planning Committee (PPC)

Played a major role in support of the Campaign for Physics

During his Presidential term (1998), Andy….

Played a major role in planning and preparing for the Centennial due for March 1999. "*He kept the troops stirred up..*" The Centennial was a great success.

Suggested and implemented the idea of having APS Fellows receptions. These have continued to the present day, and we had one in the Berkeley Faculty Club on February 13.

Was very supportive of the idea of increasing the number of APS geographical sections. He supplied much of the drive that resulted in three new sections: Four Corners, Northwest, and California. There are now 8 sections.

Saw the initiation of Physical Review Focus.

Supported several international initiatives.

DRAFT REPORT

HIGHLY CONFIDENTIAL

Expanding Contacts among South Asian and US Physicists: Exploratory meetings at ICTP, December 8-12, 1998

Preamble:

As a result of Indian and Pakistani nuclear tests conducted in May, 1998, APS President Andy Sessler and President-Elect Jerry Friedman, consulted with International Affairs, POPA and CISA to determine what initiatives the Society might undertake. A consensus developed to contact the physics communities in South Asia in a long-term effort to promote communication among physicists with a view to enhancing the role of scientists in building confidence among the regional scientific communities and developing extensive consultations on security, safeguards and arms control. It was decided at the outset to avoid political discussions and moral judgments. This was complicated by the automatic--and in some cases, misplaced--implementation of the Glenn Amendment which mandated sanctions and curtailed the issuance of visas to scientists from institutes presumed to be involved with nuclear weapons development.

By June, the decision was made to undertake a mission to consult with officers of the Indian and Pakistani physical societies and other senior colleagues. Andy and Jerry sent letters to a number of colleagues in both India and Pakistan announcing our interest in arranging informal meetings with a view to 1) improving contacts between our communities and 2) discussing the implications of the recent nuclear tests. The intent was to exchange information and ideas and determine what steps we might take to achieve our objectives. The response to the Presidential letters was positive from India but there was protracted delay in receiving replies from Pakistan--presumably because of the Summer recess.

DETECTION OF ANTI-PERSONNEL LAND MINES FOR HUMANITARIAN DE-MINING: EVALUATION OF TECHNOLOGIES

A PROPOSAL FOR A STUDY

October 28, 2002

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I apologize for this letter being so long, but I had no time to make it shorter. Blaise Pascal

Submitted to

The American Physical Society Executive Board

and to

The American Physical Society Council

Concluding Reflections Relevant to APS Role

- Physics research continues to yield exciting surprises: accelerating expansion of the universe, neutrino mass and oscillations, dark matter, new superconducting materials etc. It underlies many of the technological developments that will be crucial to the health of our economy, our security, and the pursuit of other scientific enterprises.

- Balance in the funding of research needs to be restored through increased support of physical science, especially through the DOE/OS programs.

- The further development of electronic publishing, and the corresponding need for creative financial arrangements will present continuing challenges.

- As physics tools become more costly and complex, international collaboration in the construction and operation of large facilities will be increasingly important.

- The improvement of science education at all levels needs to be a continuing priority.

- The scientific community must ensure that there is sound technical and scientific input into public policy decisions.

The American Physical Society must continue playing an important role in promoting all of these directions.