ACKNOWLEDGMENTS

The APS Officers and Meetings Department staff extend sincere thanks to the unit Program Chairs and abstract sorters who, during the past year, gave so generously of their time and expertise in organizing and sorting abstracts for this April program.

April 2001 Program Co-Chairs:

Trevor Weekes, *Smithsonian Astrophysical Observatory*
Chris Quigg, *Fermilab*

Unit Program Chairs


April Sorters

Welcome to the annual April Meeting of the American Physical Society. The scientific program will take place at the Renaissance Hotel, as will all satellite meetings.

An outstanding scientific program has been planned by the April Meeting Program Committee. The four-day program consists of nearly 800 papers to be presented in invited, contributed, focus and poster sessions.

**Participating APS Units**

**Divisions:** Nuclear Physics, Particles and Fields, Astrophysics, Physics of Beams, Plasma Physics

**Forums:** Education, Physics and Society, International Affairs, History of Physics

**Topical Groups:** Few-Body Systems, Precision Measurement and Fundamental Constants, Gravitation

**General Information**

**Registration Hours at Renaissance Hotel**

**NOTE:** the APS Registration Desk will close promptly at the times listed below.

- Friday, April 27 ............... 1:00pm – 7:00pm
- Saturday, April 28 ........... 7:00am – 5:00pm
- Sunday, April 29 ............. 8:00am – 4:00pm
- Monday, April 30 ............ 8:00am – 3:00pm
- Tuesday, May 1 ............... 8:00am – 10:00am

**Badges**

Badges must be worn at all times. One-day registrants will be given badges that display the day for which they have registered; they are allowed to attend sessions on that day only.

**Exhibits**

Take time during the meeting to visit the exhibits. Exhibits will be located outside of the Congressional Ballrooms. The exhibit schedule is as follows:

- Saturday, April 28 ........... 8:00am - 5:00pm
- Sunday, April 29 ............ 8:00am - 5:00pm

**Message Center**

Message boards will be located near registration. The message phone number is (202) 962-4213.

**APS Membership Desk**

The APS Membership Booth is located in the Grand Ballroom foyer. Stop by the Membership Desk if you have questions about APS membership or journal subscriptions.

**APS Press Room/News Conference Room**

Meeting Room 18, Ballroom level

**Phone Number:** (202) 962-4214

**Press Room Hours:**

- Saturday-Monday ........... 8:00am - 5:00pm
- Tuesday ............................ 8:00am - 12:00noon

Stop by the APS press room for a schedule of press room activities.

**E-mail Service**

E-mail service (5 stations) will be available during the hours listed below for April Meeting attendees to retrieve and send e-mail messages as follows:

- Friday, April 27 ............... 1:00pm - 7:00pm
- Saturday, April 28 ........... 7:00am - 6:00pm
- Sunday, April 29 ............. 8:00am - 6:00pm
- Monday, April 30 ............ 8:00am - 6:00pm
- Tuesday, May 1 ............... 8:00am - 12:00noon

**NOTE:** APS offers e-mail access to attendees as a service. We cannot provide unlimited access to e-mail stations, both in terms of the number of e-mail stations that are available for use and the length of time that they are available.
PROGRAM HIGHLIGHTS

Plenary Talks

**Plenary Session I**
Saturday, April 28 • 8:30am
Grand Ballroom North/Central
- Imaging the Early Universe: Current and Future Measurements of the Cosmic Microwave Background—Andrew Lange (Cosmology Laboratory)
- In Search of Extra Dimensions—Maria Spiropulu (Enrico Fermi Institute)
- My Editor is a Boson: How the News Media Cover Science—David Kestenbaum (National Public Radio)

**Plenary Session II**
Sunday, April 29 • 8:30am
Grand Ballroom North/Central
- Entangled Photons for Quantum Information—Paul Kwiat (University of Illinois)
- Violation in B Mesons—Natalie A. Roe (Lawrence Berkeley National Laboratory)
- Chandra, After the First Year—Stephen Murray (Harvard-Smithsonian Center for Astrophysics)

**Plenary Session III**
Monday, April 30 • 8:30am
Grand Ballroom North/Central
- Neutrino Oscillations and the Sudbury Neutrino Observatory—David Wark (University of Oxford)
- Magnetic Reconnection: The Mechanism for Dissipating Magnetic Energy in the Universe—James F. Drake (University of Maryland)
- Amplification of Atoms and Light in Bose-Einstein Condensates—Wolfgang Ketterle (Massachusetts Institute of Technology)

**Awards Session**
Saturday, April 28 • 5:00pm - 7:00pm
Grand North & Central Ballrooms
(followed by Welcome Reception)
5:00pm - 5:30pm
- Lillienfeld Prize Presentation and Lecture—Lawrence M. Krauss, Case Western Reserve University
5:30pm - 6:00pm
- Outgoing APS President’s Address—James Langer (University of California, Santa Barbara)

6:00pm - 7:00pm
- Award Presentations

**Special Evening Symposium**
*Connecting Quarks with the Cosmos: Scientific Challenges for the New Century*
Sunday, April 29 • 7:30pm - 9:30pm
Grand Ballroom North/Central
The new NRC report of the Committee on the Physics of the Universe (CPU) will be presented by CPU Chair Michael S. Turner. The CPU was asked by DOE, NASA and NSF to identify science opportunities at the intersection of physics and astronomy, and to prioritize projects to realize these opportunities. This Phase I report summarizes the science and discusses the most timely opportunities in a rapidly developing and very active area of research. The second phase of the committee’s task is to evaluate and prioritize projects that address science at the intersection of physics and astronomy. This session begins our process of collecting input from the community on these issues. The committee has also been asked to address issues of inter-agency cooperation and barriers to it, as many of the projects in this area will likely be funded by more than one agency. For more information see http://www.nationalacademies.org/bpa/projects/cpu. Members of the CPU will be present to answer questions and listen to comments about the report. There will also be time for open discussion of future projects and science opportunities.

**Students Lunch with the Experts**
Monday, April 30 • 1:00pm - 2:30pm
Congressional D
This activity is being introduced this year to the April Meeting. It is intended to provide a unique opportunity for students to interact informally with an expert in their area of interest. Students (only) may sign up for one topic (no signing up for 2 topics or for friends) beginning Saturday, April 28 at 1:00pm. Ten tickets will be available for each expert’s table. These will be handed out on a first-come, first-served basis. Once the ten spaces are filled, the topic is closed.
FEATURED ACTIVITIES

Companions Breakfast
Saturday, April 28 • 8:30am
Renaissance Hotel, Congressional A
All companions are invited to attend this complimentary breakfast. Accent on Tours will show a short video about Washington DC, and be on hand following the presentation to provide information on getting around Washington and how to plan your sightseeing activities.

Meet the Editors of Physical Review and Physical Review Letters
Saturday, April 28 • 3:00pm - 5:00pm
Renaissance Hotel, Grand Ballroom Foyer
The Editors of Physical Review and Physical Review Letters cordially invite you to join them for conversation and refreshments on Saturday, April 28 at 3:00pm. Your questions, suggestions, compliments and complaints about the journals are welcome. We hope you will be able to join us.

Book Signing—ATOM: An Odyssey from the Big Bang to Life on Earth and Beyond
Saturday, April 28 • 3:00pm-4:00pm
Room 9
Join the author and Lillienfeld Prize winner, Lawrence Krauss, for an informal talk and book signing.

Welcome Reception
(Following Awards Session)
Saturday, April 28
7:00pm-8:30pm • Congressional A&B

APS Employment Center
Renaissance Hotel, near APS Registration
Saturday, April 28 • 1:00pm - 4:00pm
Job seekers and employers are invited stop by on Saturday to register, post jobs and browse job postings.

Sunday, April 29 – Monday, April 30
9:00am - 5:00pm
The APS Employment Center at the April 2001 Meeting facilitates communication between employers and candidates.

Service to Employers
Employment Center registration includes posting positions, accessing resumes, and interviewing prospective candidates - space is provided. If you are unable to attend, you may post jobs at the Center. Interested candidates will contact you directly. There is a modest fee for employer services. Discounted rates are given for advance registration.

Service to Job Seekers
The Employment Center is free of charge to candidates seeking employment. Employment Center registration includes posting your résumé, accessing current job postings and employment booths, and interviewing with prospective employers. Please bring at least 25 copies of your 1-3 page résumé. Attendees must register on-site.

If you are unable to attend the April Meeting, we will gladly post your résumé at the Center. Please send a copy of your 1-3 page résumé to the address below with a cover letter stating your citizenship and willingness to relocate and reference the APS APRIL EC. Résumés must be received by Monday, April 9 to be included.

For employer registration or for additional information, please contact Greg Carfine at:
AIP Career Services Division
One Physics Ellipse;
College Park, MD 20740
Phone: (301) 209-3190
Fax: (301) 209-0841
e-mail: gcarfine@aip.org
http://www.aip.org/careersvc

Student Reception
Sunday, April 29
5:30pm-7:00pm
Congressional D
Students are invited to attend and enjoy refreshments and the company of other students.
FEATURED ACTIVITIES

COM/CSWP Reception
5:00pm-7:00pm • Room 10

Special Evening Tour
Washington-by-Night Champagne Tour
7:00pm - 10:30pm
Sunday, April 29 • $39

You can register on-site for this tour through Sunday or until all tickets are sold.

This tour is open to all attendees and guests of the April Meeting. As the sun goes down, our national monuments light up, illuminating your journey through the Capital of the United States. Travel from the White House to the Capitol Building set atop Capitol Hill. Along the way, you’ll see the Smithsonian Museum Complex, National Gallery of Art, Supreme Court, Library of Congress, House and Senate office buildings, the Holocaust Memorial Museum, Jefferson Memorial, and the Washington Monument. As you pass the museums on the Mall, your guide will highlight the special exhibits in each museum. Sip champagne as you ride along in a deluxe motor coach with guide.

The tour will include stops at selected sites such as:
• Franklin D. Roosevelt Memorial
• Lincoln Memorial
• Vietnam Veterans, Women’s and Korean War Memorials
• John F. Kennedy Center for the Performing Arts — you’ll see the Hall of States, Hall of Nations, Grand Foyer, and from the roof top, enjoy a spectacular view of the Capital City.

CSWP Networking Breakfast
Monday, April 30 • 7:30am - 9:30am
Meeting Rooms 8 & 9

CSWP sponsors a networking breakfast open to all (men and women) with an interest in issues pertaining to women in physics. Students are most welcome to attend. The featured speaker will be Natalie Roe, Senior Scientist at Lawrence Berkeley National Laboratory, followed by a chance for discussion and networking. Cost is $15 ($5 for students). Details are available at http://www.aps.org/educ/cswp/index.html

Congressional Visits Day
Tuesday, May 1 - Wednesday, May 2

Conference attendees are encouraged to stay an extra day in Washington to participate in the 2001 Congressional Visits Day. The CVD is a two-day annual event that brings scientists, engineers, researchers, educators, and technology executives to Washington to raise visibility and support for science, engineering, and technology. Details can be found at the 2001 CVD Website (http://www.agiweb.org/cvd/). For more information and to sign up, please contact Christina Hood at the APS Washington Office: (202) 662-8700 hood@aps.org.

Business Meetings

Sunday, April 29

FHP Business Meeting
5:30pm • Room 7

GGR Business Meeting
5:30pm • Room 2

GFC Business Meeting
5:30pm • Room 3

Monday, April 30

FED Business Meeting
5pm • Room 8

DNP Business Meeting/Town Hall
5:30pm • Grand Ballroom South

DAP Business Meeting
5:30pm • Room 14
SATELLITE MEETINGS

Friday, April 27

**DNP 2001 Program Committee**  
12:00n-5:00pm • Room 6

**CISA Meeting**  
3:00pm-10:00pm • Room 10

**DNP Program Committee**  
6:00pm-12:00mid • Room 7

Saturday, April 28

**DNP Education Committee**  
7:00am-8:30am • Room 6

**Companion's Breakfast**  
8:30am-10:00am • Congressional A

**DNP Public Information Committee**  
12:00n-2:00pm • Room 7

**DNP Home Page Committee**  
12:00n-2:00pm • Room 6

**OWL Workshop**  
1:00pm-6:00pm • Room 16

**Research Corporation Reception**  
1:00pm-4:30pm • Room 8

**Atomic Data & Nuclear Data Tables Editorial Board Meeting**  
4:00pm-5:00pm • Room 6

**DPF Fellowship Committee**  
6:00pm-8:00pm • Room 8

**University of Illinois Reception**  
6:00pm-8:00pm • Room 9

Sunday, April 29

**RHIC & AGS Users Group**  
7:00pm-9:30pm • Renaissance West A

Monday, April 30

**April 2002 Program Committee Meeting**  
7:30am-9:30am • Room 10

**CIFS Meeting**  
8:30am-5:00pm • Room 6

**Physical Review C Editorial Board Meeting**  
11:30am-2:00pm • Room 7

**Scientists and a Sound National Security Policy**  
6:00pm-8:00pm • Room 10

**PRL Divisional Associate Editors Meeting**  
6:30pm-10:00pm • Room 7

Tuesday, May 1

**CSWP Meeting**  
8:00am-4:00pm • Room 6
AWARD WINNERS

Hans A. Bethe Prize
Session S2 - Monday, 2:30pm, Grand Ballroom South, Renaissance Hotel
Gerald E. Brown, State University of New York, Stonybrook
“For his insightful analyses of the effects of various nuclear constituents on nucleon interactions and nucleon structure, and his contributions to new viewpoints on supernovae, neutron stars, and black hole formation.”

Tom W. Bonner Prize
Session S2 - Monday, 2:30pm, Grand Ballroom South, Renaissance Hotel
Claude Lyneis, Lawrence Berkeley Laboratory
Richard Geller, Institut de Science Nuclaire, Grenoble
“For their critical leadership in conceiving and developing the electron cyclotron resonance (ECR) ion source and advanced ECR source, which have opened a new era in heavy ion studies of nuclear phenomena.”

Edward A. Bouchet Award
Session V11 - Tuesday, 8:00am, Room 4, Renaissance Hotel
Jorge Pullin, Pennsylvania State University
“For his contributions to the study of gravitational wave propagation and quantum theory of gravity and for his effort to increase diversity in the field of physics as a founding member of the National Society of Hispanic Physicists.”

Joseph A. Burton Forum Award
Session H2 - Sunday, 10:45am, Grand Ballroom South, Renaissance Hotel
Lisbeth D. Gronlund, MIT

George N. Lewis, MIT
David C. Wright, MIT
“For creative and sustained leadership in building an international arms_control_physics community and for their own excellence in arms-control physics.”

Lilienfeld Prize
Session E1 - Saturday, 5:00pm, Grand Ballroom North/Central, Renaissance Hotel
Lawrence M. Krauss, Case Western Reserve University
“For outstanding contributions to the understanding of the early universe, and extraordinary achievement in communicating the essence of physical science to the general public.”

Maria Goeppert-Mayer Award
Session J2 - Sunday, 2:30pm, Grand Ballroom South, Renaissance Hotel
Janet M. Conrad, Columbia University
“For her leadership in experimental neutrino physics, particularly for initiating and leading the NuTeV decay channel experiment and the Mini-BooNE neutrino oscillations experiment, which are noted for their timeliness and significance in resolving frontier issues in neutrino physics.”

Dissertation in Nuclear Physics Award
Session S2 - Monday, 2:30pm, Grand Ballroom South, Renaissance Hotel
Daniel Wayne Bardayan, Yale University
Advisor: Peter Parker
“For his innovative experimental development and measurement of the p(17F,p)17F elastic scattering reaction at the Oak Ridge Holifield Radioactive Ion Beam Facility in order to find the key low-energy s-wave
resonance for the $^{17}\text{F}(p,\gamma)^{18}\text{Ne}$ reaction. His measurements of the properties of this resonance greatly reduce the uncertainties in the $^{17}\text{F}(p,\gamma)^{18}\text{Ne}$ rate, which is crucial to an understanding of nucleosynthesis and gamma-ray production in novae as well as in the bre-a-out to the rp-process in X-ray bursts.”

**W. K. H. Panofsky Prize**  
**Session V3 - Tuesday, 8:00am, Renaissance East, Renaissance Hotel**

Paul D. Grannis, State University of New York, Stony Brook  
“For his distinguished leadership and vision in the conception, design, construction, and execution of the D0 experiment at the Fermilab Tevatron proton-antiproton collider. His many contributions have been decisive in all aspects of the experiment.”

**Francis Pipkin Award**  
**Session J9 - Sunday, 2:30pm, Room 2, Renaissance Hotel**

Jens H. Gundlach, University of Washington  
“For identifying, and providing a solution to, an unrecognized weakness in the Cavendish technique for measuring the gravitational constant $G$; improving the accuracy of $G$ by an order of magnitude, representing one of the largest incremental increases in accuracy ever obtained in the history of such measurements.”

**Prize for Research in an Undergraduate Institute**  
**Session B12 - Saturday, 10:45am, Room 5, Renaissance Hotel**

Paul DeYoung, Hope College  
“For his research on reaction processes using short-lived nuclear beams and for his outstanding leadership, both in his research group and his institution, in creating an undergraduate research community.”

**J. J. Sakurai Prize**  
**Session V3 - Tuesday, 8:00am, Renaissance East, Renaissance Hotel**

Nathan Isgur, Jefferson Laboratory  

Mikhail Voloshin, University of Minnesota

Mark Wise, California Institute of Technology  
“For the construction of the heavy quark mass expansion and the discovery of the heavy quark symmetry in quantum chromodynamics, which led to a quantitative theory of the decays of $c$ and $b$ flavored hadrons.”

**Tanaka Dissertation Award**  
**Session B10 - Saturday, 10:45am, Room 3, Renaissance Hotel**

Sunil Golwala, California Institute of Technology  
“For his versatile and extensive contributions to the detectors, hardware, electronics, software, and analysis of the results of the Cryogenic Dark Matter Search (CDMS) experiment, which provided the most sensitive upper limits for elastic scattering of Weakly Interacting Massive Particles (WIMP) on nucleons. The result rules out a significant region of parameter space for one of the major candidates for dark matter in the universe.”

**Leo Szilard Lectureship Award**  
**Session H2 - Sunday, 10:45am, Grand Ballroom South, Renaissance Hotel**

John Harte, University of California, Berkeley  
“For his diverse and incisive efforts utilizing physical reasoning and analytical tools for understanding environmental processes and for his teaching and writing to encourage this approach among students and colleagues.”

**Robert R. Wilson Prize**  
**Session V3 - Tuesday, 8:00am, Renaissance East, Renaissance Hotel**

Claudio Pellegrini, University of California, Los Angeles  
“For his pioneering work in the analysis of instabilities in electron storage rings, and his seminal and comprehensive development of the theory of free electron lasers.”
Program Time-Blocks

There are three session time-blocks for each of the meeting, except for Tuesday when there are only two time-blocks. Time-blocks are designated in alpha order beginning with Session “A” on Saturday at 8:30am. See the schematic below for further explanation:

<table>
<thead>
<tr>
<th>Time</th>
<th>Sat</th>
<th>Sun</th>
<th>Mon</th>
<th>Tues</th>
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<tbody>
<tr>
<td>8:30am</td>
<td>A (plenary)</td>
<td>G (plenary)</td>
<td>P (plenary)</td>
<td>V*</td>
</tr>
<tr>
<td>11:00am</td>
<td>B</td>
<td>H</td>
<td>Q</td>
<td>W</td>
</tr>
<tr>
<td>2:30pm</td>
<td>C</td>
<td>J</td>
<td>S</td>
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</tbody>
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*Starts at 8:00am

Session Codes

Each session within a time-block is numbered sequentially, as well as the papers within a session. For example, session code C4.3 = time-block C at 11:00am on Monday; session #4 within the C time-block, and paper #3 to be presented in session C4.

Poster Presentations

If you are presenting a poster, we ask that you put your poster up between 8:00am and 9:00am on Sunday to enable your colleagues to view the posters at their leisure throughout the day. Please be in attendance at your poster from 2:30pm to 5:30pm. If you want to keep your poster, please remove it at the end of the session. A-V is not allowed in the poster session.

Guidelines for Session Chairs

1. Please check the Bulletin to determine if any supplementary papers have been assigned to the session you are chairing. Prior to the session, check the Corrigenda distributed with the Bulletin, as well as the Program-Changes Board in the registration area to see if any papers have been withdrawn.
2. Arrive at the meeting room about 15 minutes prior to the start of the session and familiarize yourself with the controls for lights, microphones, A-V equipment and the timer. If you encounter problems, you should immediately alert the Meetings Manager and/or the A-V specialist.
3. Start the session on time. Briefly introduce yourself, announce the first paper and author, and start the timer.
4. Please adhere to the time schedule listed in the Bulletin, so that simultaneous sessions are as closely synchronized as possible. Many attendees move from session to session in order to hear specific papers.
5. The allotted time for contributed papers is 12 minutes; for invited papers — 36 minutes. If you are chairing a session that includes both contributed and invited papers please be aware of the different times allocated for each and set the timer as follows:
   - Contributed papers — set timer for 8 minutes to give initial warning, then set the final bell to go off 2 minutes later. When this time is up, allow 2 additional minutes for questions relating to the paper, thank the speaker and promptly introduce the next paper and speaker.
   - Invited papers — set timer for 25 minutes for initial warning, and the final bell to ring 5 minutes later. Then set the timer for 6 additional minutes for questions from the audience. Explain
the timing system to the audience prior to the start of the session, and as often during the session as you think necessary.

6. The By-Laws of the Society request that speakers be asked to stop when their allotted time is up in a courteous but firm manner. Keep in mind that the session must end on time, and that the last speaker has just as much right to an audience as does the first speaker.

7. Should a speaker fail to appear, call the author of the first supplementary paper assigned to the session, if any. If that author is not in attendance, call the author of the following supplementary paper, and so on. If there are no supplementary papers assigned to your session, allow the preceding discussion to continue, or recess the session until it is time for the next scheduled paper. At the end of the session, call again for the regularly scheduled paper, if time allows.

8. When two or more papers are submitted by an author, only one of these will be assigned a scheduled presentation time within that session. It is assumed that the first author listed in the abstract is the person who will present the paper at the meeting. Other papers with the same first author will be assigned as supplementary papers, to be called for if time permits. If you notice that an author who has already presented a paper rises to present another paper, you should request that this paper be presented at the end of the regular program as a supplementary paper, if time allows.

9. If any problems arise that you are unable to handle relative to successfully chairing the session, please inform the A-V tech in the room, or go immediately to the APS registration desk to alert the APS staff.

Audio-Visual Equipment

All rooms will be equipped with:
- overhead projector and screen
- lavalier microphone
- pointer

All additional equipment can be rented (cost to the speaker) directly through AVMG, our contracted A-V company. Equipment may be rented on site at the AVMG office in Meeting Room 11. Attendees are not permitted to bring/use personal A-V equipment such as VCR’s and PowerPoint projectors.

NOTE: Rental of VCRs, video projectors, and LCD projectors is very expensive, so we recommend that you prepare the materials for your talk to be compatible with an overhead projector (provided free) or a slide projector (inexpensive rental cost), to avoid the high cost of renting high-tech A-V equipment.

Please Note:

The American Physical Society has made every effort to provide accurate and complete information in this Bulletin. However, changes or corrections may occasionally be necessary and may be made without notice after the date of publication. To ensure that you receive the most up-to-date information, please check the meeting Corrigenda distributed with this Bulletin.
Divisions
DAMOP ..........Division of Atomic, Molecular and Optical Physics
DAP .............Division of Astrophysics
DBP ..............Division of Biological Physics
DCP ..............Division of Chemical Physics
DCMP ..........Division of Condensed Matter Physics
DCOMP ..........Division of Computational Physics
DFD ..............Division of Fluid Dynamics
DLS ..............Division of Laser Science
DMP ..............Division of Materials Physics
DNP ..............Division of Nuclear Physics
DPB ..............Division of the Physics of Beams
DPF ..............Division of Particles and Fields
DPP ..............Division of Plasma Physics
DPOLY ..........Division of Polymer Physics

Topical Groups
GFBS ............Few Body Systems Topical Group
GGR .............Gravitation Topical Group
GIMS ............Instrumentation and Measurement Science Topical Group
GMAG ...........Magnetism and Its Applications Topical Group
GPAP ............Topical Group on Plasma Astrophysics
GSNP ...........Statistical and Non-linear Topical Group
GFC .............Precision Measurement and Fundamental Constants Topical Group
GSCCM ..........Shock Compression of Condensed Matter

Forums
FEd ..............Forum on Education in Physics
FHP ..............Forum on History of Physics
FIAP ............Forum on Industrial and Applied Physics
FIP ..............Forum on International Physics
FPS ..............Forum on Physics and Society

Committees
COM .............Committee on Minorities
CSWP ...........Committee on the Status of Women in Physics