Division of Physics of Beams Newsletter

A Division of the American Physical Society
Edited by Michael S. Zisman, *Secretary-Treasurer*

May 2004

Election Results for 2003 DPB Executive Committee

The election for the 2003 DPB Executive Committee was carried out according to the DPB Bylaws, Article VII, Section 3. The election was announced to the membership by e-mail and by regular mail for those members not having a valid e-mail address. The election was completed on November 1, 2002.

Most of the ballots were electronic, and were recorded with software ported from BNL. There were 317 cast on-line, and 7 (valid) by paper ballot. The number of invalid paper ballots was also 7. Ballots marked invalid had no name on the outer envelope, and were not counted. The fraction of voters was 324 out of 1199 or 27% of our membership, about the same as the previous year.

The elected members of the Executive Committee were: Gerald Dugan as Vice-Chair, and Donald Hartill and Marion White as Members-at-Large for a three-year term. As a result of the election, the Member-at-Large position of Gerry Dugan became vacant in May, 2003, and Lia Merminga was appointed by the Executive Committee to fill out the remaining portion of his term, in accordance with the DPB Bylaws.

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Introduction and Contents

The information summarized here covers both the 2002 and the 2003 time frame.

In the future, we plan to provide more frequent newsletters to our membership.

Questions? Comments?
Visit the DPB web site at http://www.aps.org/units/dpb/

Or contact the Secretary-Treasurer:
Michael S. Zisman
MS 71R0259, LBNL, One Cyclotron Road, Berkeley, CA 94720
Phone: 510-486-5765 Fax: 510-486-7981 Email:mszisman@lbl.gov

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The membership of the 2003 DPB Executive Committee was thus:

Chair: Ronald Ruth (4/04)
Chair-Elect: Nan Phinney (4/04)
Vice-Chair: Gerry Dugan (4/04)
Past Chair: Alex J. Dragt (4/04)
Divisional Councilor: Steve Holmes (1/06)
Secretary-Treasurer: Michael Zisman (4/05)

Members-at-Large:
William Barletta, LBNL (4/04)
Lia Merminga (4/04) (filling out the remainder of Dugan's at-large term)
Kathy Harkay, ANL (4/05)
Fulvia Pilat, BNL (4/05)
Don Hartill, Cornell (4/06)
Marion White, ANL (4/06)

Non-Voting Members:
Norbert Holtkamp, PAC2005 Chair (5/05)
Swapan Chattopadhyay, PAC2005 Program Chair (5/05)
Bruce Brown, NPSS/IEEE Representative (5/05)

Chair, Education and Outreach Committee:
Ernest Malamud (12/04)
Chair, Publications Committee: John Byrd (12/03)
Chair, Wilson Prize Committee: Satoshi Ozaki (12/03)
Chair, Doctoral Research Award Committee:
Joseph Bisognano (12/04)

Members of the various DPB standing committees (Nominating, Fellowship, Publications, Education and Outreach, Wilson Prize, Doctoral Research Award) are listed on the DBP website, see http://www.aps.org/units/dpb/committees/index.cfm. Terms of office begin in January of the year following appointment.

Election Results for 2004 DPB Executive Committee

The election for the 2004 DPB Executive Committee was carried out according to the DPB Bylaws, Article VII, Section 3. The election was announced to the membership by e-mail and by regular mail for those members not having a valid e-mail address. The election was completed on October 31, 2003.

As was true the past few years, most of the ballots were electronic. There were 269 cast on-line, and 7 valid paper ballots. There were no invalid paper ballots in this election. The fraction of voters was 276 out of 1166 or 24% of our membership, somewhat less than in the previous year.

The elected members of the Executive Committee are: Thomas Roser as Vice-Chair, and Eric Colby and Frank Zimmermann as Members-at-Large for a three-year term.

The membership of the 2004 DPB Executive Committee will therefore be:

Chair: Nan Phinney (5/05)
Chair-Elect: Gerry Dugan (5/05)
Vice-Chair: Thomas Roser (5/05)
Past Chair: Ronald Ruth (5/05)
Divisional Councilor: Steve Holmes (1/06)
Secretary-Treasurer: Michael Zisman (5/05)

Members-at-Large:
Kathy Harkay, ANL (4/05)
Fulvia Pilat, BNL (4/05)
Don Hartill, Cornell (4/06)
Marion White, ANL (4/06)
Eric Colby, SLAC (4/07)
Frank Zimmermann, CERN (4/07)

Non-Voting Members:
Norbert Holtkamp, PAC2005 Chair (5/05)
Swapan Chattopadhyay, PAC2005 Program Chair (5/05)
Bruce Brown, NPSS/IEEE Representative (5/05)

Chair, Education and Outreach Committee:
Ernest Malamud (12/04)
Chair, Publications Committee: Jie Wei (12/04)
Chair, Wilson Prize Committee: Peter Limon (12/04)
Chair, Doctoral Research Award Committee:
Richard Temkin (12/05)

Terms of office for the voting members of the Executive Committee begin after the Business Meeting in the year following election and end at the corresponding time in the year indicated.

Wilson Prize

The DPB and DPF jointly sponsor the Robert R. Wilson Prize to recognize and encourage outstanding achievement in the physics of particle accelerators.

2003 Winner

In 2003, the $5000 prize was awarded to **Helen Edwards** of Fermilab, *"For her pivotal achievement and critical*

contribution as the leader in the design, construction, commissioning and operation of the Tevatron and for her continued contributions to the development of high gradient superconducting linear accelerators as well as bright and intense electron sources."

2004 Winner

In 2004, the prize was awarded jointly to **Katsunobu Oide** (KEK) and **John Seeman** (SLAC), *"For technical leadership and direct contributions to the development of high luminosity B-factories at KEK and SLAC. These machines have set new world records for luminosities in colliding-beam storage rings."*

Edwards' prize was presented at the 2003 April Meeting of the APS. Oide and Seeman were honored at the 2004 April Meeting of the APS. We congratulate all of these outstanding beam physicists for their well-deserved honors.

Outstanding Doctoral Research Prize in Beam Physics

This award is sponsored by the DPB, in conjunction with Universities Research Association, Southeastern Universities Research Association, and Brookhaven Science Associates.

2003 Prize Winner

The 2003 winner was **David Pritzkau**, whose thesis advisor was Professor Robert Siemann at SLAC. Pritzkau's thesis was entitled "RF Pulsed Heating." His Citation reads: *"For an experimental study of the effects of surface heating due to high-power pulsed RF. The experiment established a limit on maximum surface magnetic field and, through it, one limit on achievable accelerating gradient."*

2004 Prize Winner

The 2004 winner was **Dmitry Teytelman**, whose thesis advisor was Professor John Fox at SLAC. Teytelman's thesis was entitled "Architectures and Algorithms for Control and Diagnostics of Coupled-Bunch Instabilities in Circular Accelerators." His Citation reads: *"For his development of new feedback architectures and algorithms for the diagnosis and control of coupled-bunch instabilities in circular accelerators."*

Congratulations to both of these young physicists for this community honor.

DPB Members Appointed as APS Fellows

At the APS Council Meeting of November, 2002, the following list of 2002 DPB Fellows was approved:

Stephen Vincent Benson, TJNAF
"For critical contributions to the development of free-electron lasers, including the first demonstration of lasing at harmonics and of multi-kilowatt lasing with an energy-recovered linac."

Yu-Jiuan Chen, LLNL
"For revolutionizing the achievable beam quality of linear induction accelerators and advancing the state-of-the-art of flash x-ray radiographic technology."

Ralph Bruno Fiorito, Catholic University of America
"For pioneering contributions to the understanding and application of transition radiation, diffraction radiation and parametric x-radiation."

Alan Jackson, LBNL
"For pioneering work in the development and construction of 3rd generation synchrotron radiation sources."

Stephen Val Milton, ANL
"For the development of 3rd and 4th generation light sources including the first demonstration of saturation of self-amplified spontaneous emission (SASE) in the visible and ultraviolet wavelengths."

Nikolai V. Mokhov, FNAL
"For critical contributions to the understanding of the interaction of high energy particle beams with materials."

These Fellows received their citations and pins at the PAC03 Prize Session.

At the APS Council Meeting of November, 2003, the following list of 2003 DPB Fellows was approved:

Chris Edward Adolphsen (SLAC)
"For original contributions to the beam physics and microwave properties of high-frequency high-gradient linear accelerators."

Jean Delayen (TJNAF)
"For numerous contributions to the physics and technology of superconducting rf linear accelerators."

Paul J. Emma (SLAC)
"For his contributions to the physics of high brightness beams in linac and compression systems, and for his critical impact on the development of linear colliders and x-ray free electron lasers."

David Paul McGinnis (FNAL)
"For his important contributions to increasing the performance of the Fermilab accelerator complex."

Vladimir Litvinenko (Duke University)
"For fundamental and pioneering contributions to the physics of beams in electron storage rings and free-electron lasers, including demonstrating the optical klystron and advancing the short wavelength limit of FEL oscillators."

James B. Strait (FNAL)
"For his contributions to superconducting magnet technology and his leadership of the US LHC Accelerator Project."

Jie Wei (BNL)
"For his outstanding and creative contributions to the design and development of RHIC and SNS."

These Fellows received their citations and pins at the Prize Session held during the 2004 April Meeting of the APS in Denver.

We congratulate all of these worthy candidates for the recognition bestowed upon them by the APS.

Chairperson's Report, 2003

Below are remarks made by outgoing Chairperson Alex Dragt as he completed his term in May 2003 at PAC. Dragt thanked Ron Davidson, Chan Joshi, and Helmut Wiedemann for their service to the DPB. All three rotated off the Executive Committee at the end of the Business Meeting. The focus of Dragt's remarks was on the critical issues of "building for the future."

Building for the Future

With regard to building for the future, there are several challenges that have already been recognized by the DPB Executive Committee, but must be addressed more systematically and aggressively. They include the following:

- Beam Physics is not always recognized as a vital part of Physics.
  a) The advent of PRSTAB has given us a journal that is part of the Physical Review family, but a tradition and broadly accepted practice of scholarly publication is still not as widespread in our community as it is in other areas of physics. This is one of the ongoing concerns of the Publication Committee.
  b) It is a problem that relatively few universities offer courses in, or related to, Beam Physics. Except for the few schools that have some direct involvement in the operation of some particular machine, Beam Physics is not generally viewed as a high priority by other physics faculty or as a particularly attractive area by prospective graduate students. Even when a credible case is made for having University programs in Beam Physics, it is not easy to find junior faculty to hire that have the credentials of those being hired in other areas (e.g., degrees from distinguished peer or better universities, numerous publications, and recommendation letters from well-known researchers). The proposal to have DOE-funded graduate fellowships in Beam Physics may help in this regard. The Education and Outreach Committee has to deal with all these challenges.

Business Meetings

As required by our Bylaws, the DPB holds an annual business meeting. In 2003, the meeting was held at PAC2003, on May 14, 2003. In 2004, the meeting was held at the 2004 April APS Meeting, on May 3, 2004.

The next annual Business Meeting will take place at PAC2005 in Knoxville, May 16-20, 2005. PAC2005 will be chaired by Norbert Holtkamp and the Program Committee is Chaired by Swapan Chattopadhyay.
The Meeting is organized jointly by SNS and TJNAF.

The following PAC is being planned for Albuquerque in late June, 2007.

- The experimental part of our field is expensive. The Department of Energy Office of Science that supports the bulk of the experimental work has had essentially flat funding for many years. Depending on the vagaries of the legislative process, some bills currently being considered in Congress may offer some relief. The DPB, perhaps in collaboration with the DPF, DPP, and DNP (and also the IEEE/NPSS), needs to be much more active in interacting with Congress.
- On the whole, there is not a broad public understanding of the whole field of science. In the long run, it is hard to build Congressional support for any particular area of science without broad public support for all of science.
  The DPB should do whatever it can, perhaps again in collaboration with others, to educate the general public. There are things to be learned from the DPP and the DPF in this regard.

Chairperson's Report, 2004

Below are remarks made by outgoing Chairperson Ron Ruth as he completed his term in May 2004 at the April APS Meeting in Denver. Ruth thanked Alex Dragt, Bill Barletta, and Lia Merminga for their service to the DPB. All three rotated off the Executive Committee at the end of the Business Meeting.

Ruth noted that the Division's roots went back to 1985 when we became a topical group (the Division itself was formed in 1989), so next year is our 20th anniversary. The objective of the Division is to advance and diffuse knowledge regarding the nature and behavior of beams and the instruments for their production and use. In particular, our Division

- promotes R&D in the science of beams
- promotes applications of the science of beams
- encourages scholarly publication
- promotes education in beam science and technology
- enhances the professional standing of its members

Using Our Financial Resources

The DPB has a considerable surplus now and can afford to spend a significant amount each year. However, to do this effectively will require a planning process. Ruth proposes that we establish a rough guideline for expenditures each year, along with a process (and timeline) for funding proposals to spend the funds.

Communications

Our scientific communication takes place at conferences and in publications. Conferences also serve as the venue for DPB committee meetings. Communicating with our membership is mainly done via the DPB Newsletter. Ruth has asked the Executive Committee to more clearly define the purpose and scope of the newsletter, in order to communicate with maximum effectiveness. As producing a good newsletter is a large task requiring broad input, we should seek to spread the load more evenly among the Executive Committee members. A process to do this will be developed.

Conferences

Presently, our big conferences are PAC (in the odd years) and the APS April Meeting (in even years). Ruth raised the question of participation in the APS March Meeting, where the synchrotron radiation and neutron communities have a large presence. The concept would be to have mainly joint sessions with interested Divisions, the same strategy we have used successfully in the April Meeting. One question is whether we participate annually or only in the even years. If we decide to participate, a member of the Executive Committee will be assigned to manage the DPB program.

Twentieth Anniversary

Ruth proposed we consider the possibility of a celebration, and a membership drive, to mark the occasion, especially since it coincides with the World Year of Physics. PAC2005 is the natural venue for such an event.

Divisional Councilor's Report

Steve Holmes has ably served as our APS Divisional Councilor for the past two years. Below he reports on the highlights of recent meetings of the APS Council.

Visa Issues

Judy Franz reported that a meeting had been held with Orbach (DOE), Marburger (OSTP), and Neureiter (State) to discuss the topics of visas and free interchange of information. She stated that a meeting was held with Charles Shank, Director of Lawrence Berkeley National Laboratory and meetings are being scheduled with other laboratory directors to find out how the APS can help the national laboratories deal with various security and classification issues. She reported that an e-mail alert was recently distributed to all graduate physics departments informing them of the re-entry risks foreign students face when leaving the country for any reason.

The council discussed, and passed, a "Statement on Visa Rules and Government Procedures Hampering U.S. Science and Technology." Subsequent to the meeting, there was a long

e-mail exchange surrounding specific wordings of the statement, initiated by council members who were not at the meeting. An *ad hoc* task force has been convened to come to agreement on final wording, with the expectation of releasing the statement as soon as possible.

[**Note:** the statement has now been released and appears at http://www.aps.org/statements/03.1.html.] The gist of the statement is that international scientific collaborations have been essential to the U.S. and calls upon the administration and Congress to implement visa procedures that strike the appropriate balance between homeland security and the promotion of international scientific and technical cooperation.

Professional Ethics

Several resolutions (see statements 02.2, 02.3, and 02.4 at http://www.aps.org/statements/index.html#ethics) were passed at the November 2002 meeting relating to professional conduct. In association with this, a Task Force on Ethics has been created, chaired by Frances Houle. At the April 2003 meeting, Houle reviewed the charge given to the task force, presented the names of the task force members, and outlined the activities and plans of the task force. The first undertaking of the task force was to gather information about current practices and perceptions related to ethics and ethics education. This was done through a series of surveys that were distributed and collected during the following few months. From these surveys, information was analyzed to form the basis of recommendations that were presented to the Council at its November 2003 meeting. One notable feature of their work was that they interviewed quite a number of department chairs and conducted a survey of graduate students and post-docs. While the issuance of policy statements on professional ethics was initially prompted by falsification of data, the committee uncovered many more issues. In particular, 40% of the graduate students and post-docs reported observing unethical behavior. Only 4% was falsification of data. Principal issues identified within the survey include:

- Treatment of subordinates (includes authorship issues as well as appropriate mentoring)
- Responsibilities to society (includes protection of the environment)
- Intellectual property

The task force made five recommendations:

1. Review existing statements and guidelines and expand to cover issues related to treatment of subordinates.
2. Review options for providing education in ethics to professional physicists.
3. Review, and update as needed, recommended practices for data documentation and retention.
4. Investigate international ethics standards.
5. Consider a standing APS committee on ethics.

The Council accepted the committee report and took the following actions:

- POPA was asked to revisit recently released statements in light of the report
- POPA and the task force were asked to develop an action plan

Membership Summary Report

Secretary-Treasurer Mike Zisman summarized the trend in DPB membership over the last several years. The results, tabulated below, show a steady decline over many years, despite the fact that overall APS membership is on the rise. This year, through the efforts detailed below, we finally managed to halt the slow decline in our membership. Our ultimate goal, of course, is to increase our membership at least back up to the 3% level, which is nominally required to maintain Divisional status in the APS.

1996	3.22%
1997	3.19%
1998	3.12%
1999	2.97%
2000	2.96%
2001	2.92%
2002	2.85%
2003	2.72%
2004[a)]	2.66%

[a)]Present count 1166, same as last year; percentage decrease due to higher APS membership total.

Statement on Freedom of Scientific Communication

The Panel on Public Affairs (POPA) was recommending adoption of a statement on freedom of communication. The relevant background is:

- Statement 83.2 (issued in 1983) addresses the issue of freedom in scientific communication. (http://www.aps.org/statements/83_2.cfm)
- The new statement is motivated by recent moves within the government to declare documents as "sensitive but unclassified." This leaves them with no mandated legal status but is being used to limit dissemination of information, both scientific and otherwise.
- The areas of largest impact (within the physical sciences) are at the DOE weapons labs. Apparently biology is a much bigger deal than physics.

POPA has recommended adoption and re-release of statement 83.2 including a preamble describing the current context.

The council approved the proposed statement after discussion and some minor modification (see http://www.aps.org/statements/03_4.cfm).

Membership Initiatives

In response to the comments of 2002 Chairperson Alex Dragt, and the continued encouragement of 2003 Chairperson Ron Ruth, the DPB Executive Committee has launched several initiatives in the past two years. As noted in the previous section, these have served to arrest—but not yet reverse—the downward trend in members we have been experiencing.

Our first effort at recruiting took place at PAC2003, a natural venue to find interested members. The potential drawback is that many PAC attendees are not already members of the APS, which makes the cost for joining the DPB a bit steep. Nan Phinney created a colorful flyer to make it easy for people to join. This was put in the packet of all PAC2003 registrants, and turned in to the Secretary-Treasurer after the meeting.

Another effort was launched by Gerry Dugan, who "targeted" the Linear Collider R&D community. He prepared a letter, sent to all members of the LC mailing list, asking those who are getting involved with accelerator physics R&D to join DPB, and to encourage their students to do so also. Those who are already a member of APS can join DPB for a nominal fee ($6/yr) using the link: http://www.aps.org/memb/unitapp.html.

Subsequently, an *ad hoc* Membership Committee was formed. The *ad hoc* committee, includes Fulvia Pilat (Chairperson), Marion White, and Mike Zisman. The Committee has a list of lab APS members and also a list of "lapsed members." One approach is to use personal contacts with the latter group and try to get them to rejoin the APS and DPB. Another approach is to develop a list of APS members who are not now DPB members but might be good candidates. This list would be generated by examining users lists at the labs, i.e., those from the light sources (NSLS, APS, ALS, SSRL), RHIC, BaBar and NLC at SLAC, and the like. Contacting DPF members is another natural source of DPB members.

It was also agreed that we would ask the USPAS to encourage students to sign up for APS and DPB. This is free the first year. Another idea was to explore the possibility of creating "life memberships" in DPB. We plan to inquire with APS whether this is practical.

The DPB encourages all its members to participate in the ongoing recruiting effort. We welcome suggestions on how to better serve, and better recruit, our members.

Physical Review Special Topics–Accelerators and Beams

The PRST–AB journal is now in its seventh volume, and submissions are steadily rising. Submissions presently average about 14 papers per month, with an acceptance rate of 60–70%. Bob Siemann, editor of the journal, presently has no statistics on citations for PRST-AB, but plans to obtain them.

The Executive Committee unanimously acknowledged Siemann's phenomenal effort in launching and nurturing PRST-AB.

Linear Collider Technology Options Study

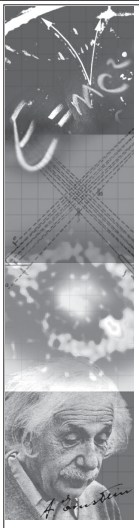
The U.S. Linear Collider Steering Group commissioned a study comparing cold and warm linear colliders built in the U.S. The study was chaired by Gerry Dugan, and considered performance, cost, site issues, and risk. The two options were based on the TESLA superconducting linear collider and the GLC/NLC X-band linear collider, but modified to satisfy the U.S. LC Physics and Detectors requirements, such as 1 TeV upgrade energy and the possibility of polarized positrons. The final report is available at http://www.slac.stanford.edu/xorg/accelops/.

Linear Collider International Technology Recommendation Panel

The International Committee on Future Accelerators (ICFA) has formed an international panel to evaluate the two competing options for a TeV-scale linear collider (TESLA and GLC/NLC) and recommend the preferred technology. The panel is chaired by Barry Barish of Caltech, and includes four members from each of the three regions, Asia, Europe and the Americas. A decision is expected by the end of 2004. Information on the panel members, meetings, and other documents are available at http://www.ligo.caltech.edu/~donna/ITRP_Home.htm.

APS Neutrino Physics Study

The APS has embarked upon a year-long Neutrino Physics Study sponsored jointly by four Divisions, DPF, DPB, DNP, and DAP. The purpose of the Study is to examine the field of neutrino physics from a broad perspective, and to lay the scientific groundwork for the choices that must be made during the next few years. It is co-chaired by Stuart Freedman (LBNL) and Boris Kayser (Fermilab). Its web site is http://www.interactions.org/neutrinostudy/. The Study is organized into a number of working groups. Of most direct relevance to DPB members are the group on Superbeam Experiments and Development, led by W. Marciano (BNL) and D. Michael (Caltech), and the group on Neutrino Factory and Beta Beam Experiments and Development, led by S. Geer (Fermilab) and M. Zisman (LBNL).



World Year of Physics

The year 2005 has been named the World Year of Physics. It is timed to coincide with the centennial celebration of Albert Einstein's "miraculous year," and plans to bring the excitement of physics to the public and inspire a new generation of scientists. A special session on Einstein in the 21st Century will be held at PAC2005 in Knoxville, TN, followed by an evening of festivities introducing physics to the general public. More information on World Year of Physics activities is available at http://www.physics2005.org

World Year of PHYSICS 2005
www.physics2005.org