



# American Physical Society Report from the Division of Physics of Beams

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Chair, APS Division of Physics of Beams

# Outline

- What is the DPB Mission?
- What is the relationship between DPB and HEP?
- Whom do we represent?
- Who are those representatives?
- How do we represent the community?
  - Encouraging publication
  - Sponsoring conferences
  - Supporting students
  - Fostering relationships within the broader accelerator community
  - Outreach: Making the case for the importance of particle accelerators
- Recent issues and topics of importance to our members

# DPB Mission and Objectives

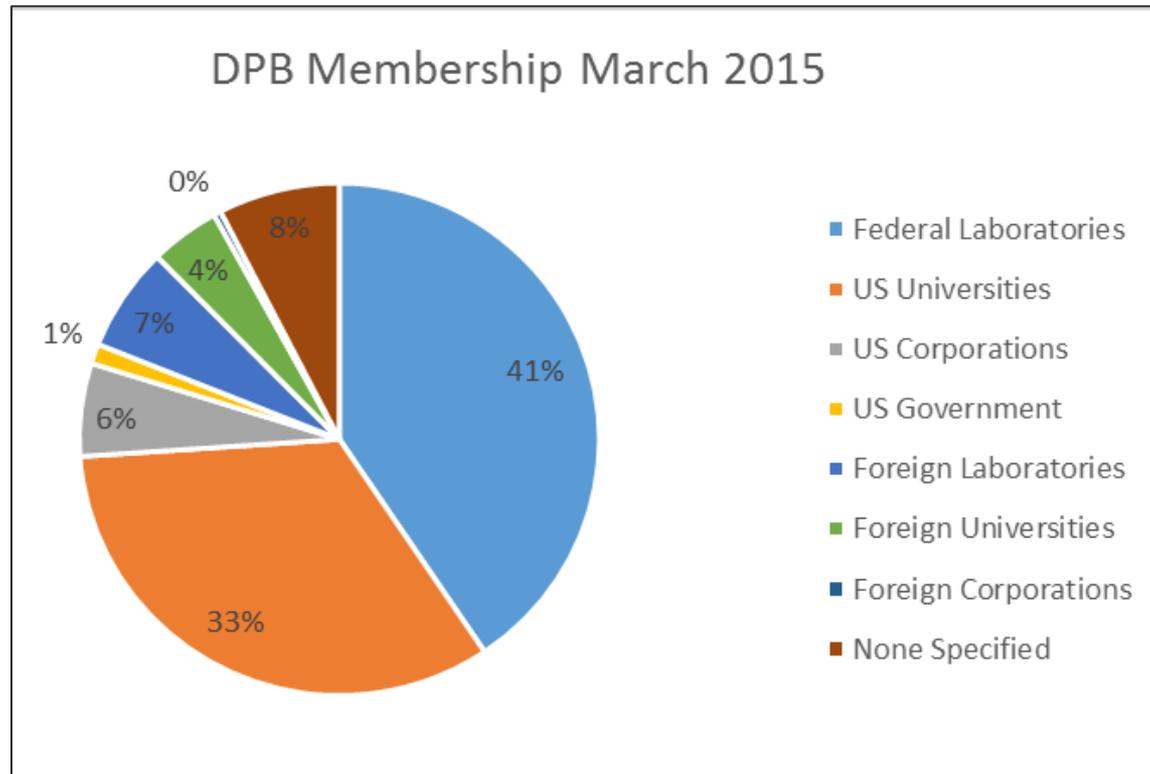
- The objective of the Division of Physics of Beams is the advancement and diffusion of knowledge regarding the nature and behavior of beams and the instruments for their production and use.
  - It provides to its members, and to all members of the American Physical Society, an opportunity for coordination and a forum for discussion and communication.
- In addition, the Division of Physics of Beams:
  - Promotes research and development in the science of beams;
  - Promotes applications of the science of beams
  - Encourages scholarly publication;
  - Promotes education in beam science and technology; and
  - Enhances the professional standing of its members.

# DPB and HEP

- We represent many communities – but we have a special relationship with the particle physics community
- Our accelerator community is an indispensable element of high-energy physics experimentation, and the DPB is a unifying force within that community.
  - Advances in accelerators drive advances in HEP directly
  - Accelerators and experiments together make discoveries in HEP possible
- DPB Leadership and members provide important voices in most community planning activities of importance to HEP

# Whom do we represent?

- DPB has a diverse membership of 1124 members, representing the broad national and international constituency for particle accelerator science and technology

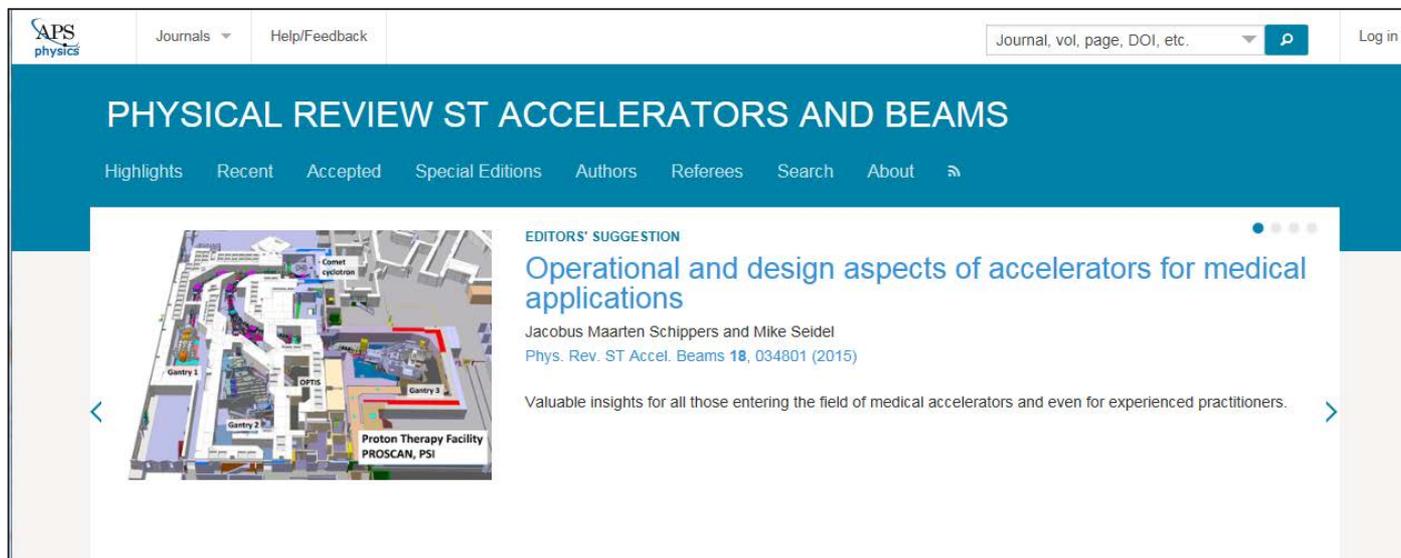


# DPB Executive Committee and Structure

- Chair line:
  - Chair: Stuart Henderson (01/15-12/15) , Argonne National Laboratory
  - Chair: Fulvia Pilat (04/14-03/15) Jefferson Lab
  - Chair-Elect: Stephen Gourlay (01/15-12/15) Lawrence Berkeley Natl Lab
  - Vice Chair: Tor Raubenheimer (01/15-12/15) Stanford Univ
  - Past Chair: Donald Hartill (04/14-03/15) Cornell Univ
- Councilor:
  - Thomas Roser (01/15-12/18) Brookhaven Natl Lab
- Secretary/Treasurer:
  - Stanley Schriber (04/08-01/16) Michigan State Univ
- Committees
  - Education and Outreach Committee Chair: Geoffrey Krafft (JLab) (1/13-12/15)
  - Publications Committee Chair: Cameron Geddes (LBNL) (1/13-12/15)
  - Nominating Committee Chair: Donald Hartill (Cornell)
  - Fellowship Committee Chair: Steve Gourlay (LBNL)
  - Doctoral Research Award Committee Chair: James Rosenzweig (UCLA) (1/13-12/15)
  - Wilson Prize Committee Chair: Sergei Nagaitsev (FNAL) (1/13-12/14)
    - Prize is a shared activity between DPB and DPF
- Members-at-Large:
  - Vladimir Shiltsev ( 04/12-03/15), Fermilab
  - Bruce Carlsten ( 01/13-12/15) Los Alamos Natl Lab
  - Thomas Roser ( 01/13-12/15), Brookhaven Natl Lab
  - John Cary ( 01/14-12/16), Univ of Colorado-Boulder
  - Camille Ginsburg ( 01/14-12/16), Fermilab
  - Roger Dixon ( 01/15-12/17), Fermilab
  - Norbert Holtkamp ( 01/15-12/17), SLAC-Natl Accelerator Lab
  - John Byrd (04/12-03/15) Lawrence Berkeley Natl Lab
  - Student Member: Sam Posen ( 01/15-12/16), Fermilab

# How do we represent our members?

- DPB plays a key role in the scientific life of our field by encouraging scholarly publication
- DPB supports *Physical Review Special Topics – Accelerators and Beams*
  - First all-electronic journal from *Physical Review*
  - Peer-reviewed and open-access
  - Supported by national and international laboratories, APS/DPB and the European Physical Society Accelerator Group



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## PHYSICAL REVIEW ST ACCELERATORS AND BEAMS

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**EDITORS' SUGGESTION**

### Operational and design aspects of accelerators for medical applications

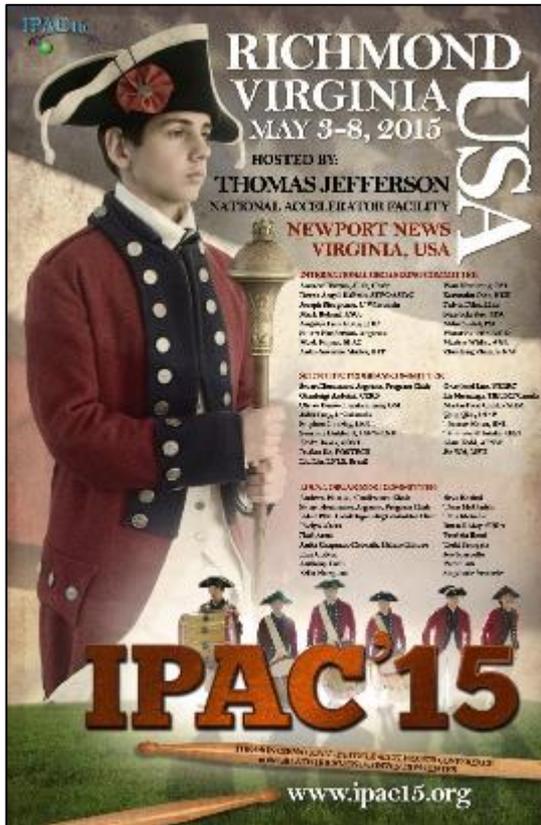
Jacobus Maarten Schippers and Mike Seldel  
Phys. Rev. ST Accel. Beams **18**, 034801 (2015)

Valuable insights for all those entering the field of medical accelerators and even for experienced practitioners.

Proton Therapy Facility PROSCAN, PSI

# Conferences are a central part of our work

- DPB plays a key role in the scientific life of our field by sponsoring and supporting the major conference series in the accelerator field



- International Particle Accelerator Conference (IPAC) series
- North American Particle Accelerator Conference (NA-PAC) series



# Student Involvement and Support

- DPB is working to better engage and support the student accelerator physics community
- Recently added student member to DPB Executive committee
  - Sam Posen, formerly Cornell University
- Student thesis awards selected and presented at IPAC (or April APS meeting)
- Support for Student travel to IPAC and NA-PAC
  - ~\$36,000/year
  - Supports ~20 students

# DPB fosters relationships with the broader community

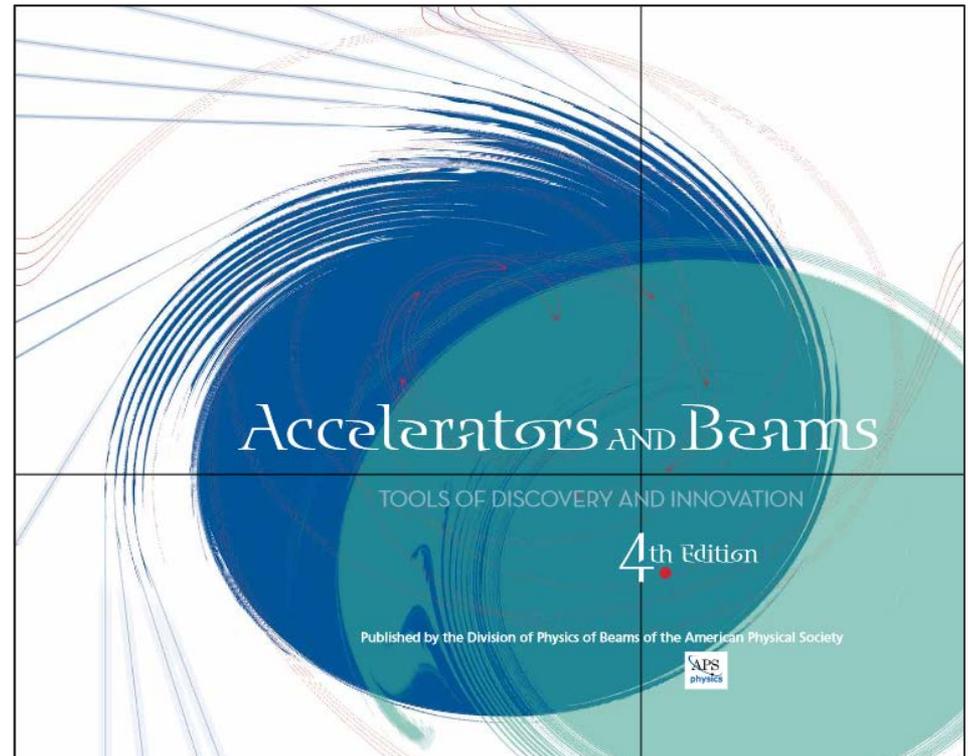
- U.S. Particle Accelerator School
- IEEE
- APS Division of Particles and Fields
- Other APS Divisions that depend on accelerators for discoveries within those fields (DNP, DCMP, ...)
- European Physical Society Accelerator Group (EPS-AG)
- Asian Committee on Future Accelerators (ACFA)

# The DPB Leadership and members are very active in important HEP community planning activities

- Snowmass involvement (working with DPF)
- Accelerator Stewardship Task Force
- Subpanel on Accelerator R&D
- USPAS Review
- Subpanel on Workforce Development
- Outreach events, such as Higgs Boson Day on the Hill, APS Congressional Visits Day

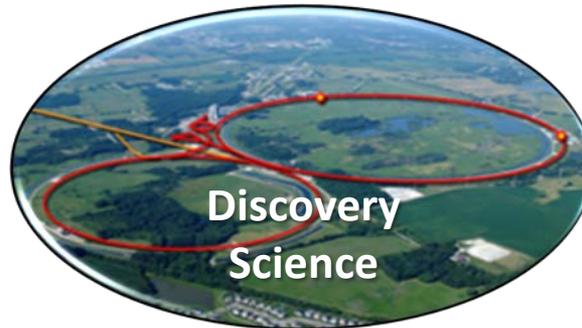
# Outreach

- An extremely important topic for our members is championing the importance and impact of particle accelerators in science, for economic competitiveness and health and well-being
- DPB's major outreach activity has centered around the "Accelerators and Beams" Brochures
- This is a very popular publication
- We are in our 4<sup>th</sup> edition and 7<sup>th</sup> printing
- Have distributed ~55,000 in total
- Thanks to CSU for serving as our brochure clearinghouse



# Discovery Science drives developments in particle accelerator technology

Substantial impacts on Nation's economic competitiveness, health and well-being



# The impact of accelerators is enormous



## Industry

~20,000  
industrial  
accelerators

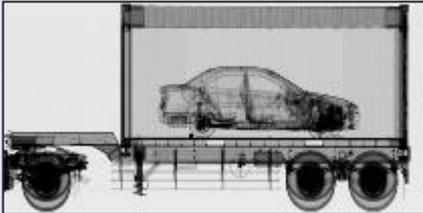
- Annual Market for industrial accelerator systems: \$1.9 billion
- Annual value of all products that make use of accelerator technology: \$500 billion



## Medical

Tens of millions of patients  
receive accelerator-based  
diagnoses/treatments each year

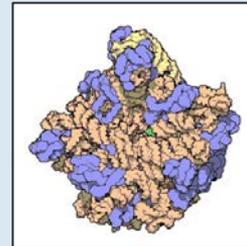
- 50 medical isotopes routinely produced with accelerators
- ~9000 medical accelerators operating worldwide
- Annual market for medical accelerator systems: \$4 billion



## National Security

Accelerators are vital security tools

- Cargo scanning and “active interrogation” to detect special materials
- Nuclear stockpile stewardship, materials characterization, radiography, and support of non-proliferation



## Discovery Science

Nearly 30% of Nobel Prizes in Physics since 1939  
utilized/influenced by accelerators (39 of 141)

- On average, accelerator-motivated research yields a Nobel Prize every 3 years
- 4 of last 14 Nobel Prizes in Chemistry for research that utilized accelerator facilities

# Issues and topics of importance to our members

- Funding, obviously
- Outreach activities and articulation of the impact of particle accelerators
- Status of Accelerator Science as a distinct academic discipline
- Enhancing the quality and impact of publications within the accelerator community – particularly important in tenure/staff scientist decisions
- DOE travel cost restrictions for conferences
- Student travel to conferences
- IPAC and NA-PAC situation
- Growing the next generation of accelerator scientists and engineers
- Concern surrounding the USPAS situation
- Role of the April APS Meeting in the life of DPB