New Faculty Advisory Committee

Beth Cunningham, American Association of Physics Teachers
Paul Gueye, Hampton University
Jack Hehn, American Institute of Physics (retired)
Warren Hein, American Association of Physics Teachers (retired)
Charles Henderson, Western Michigan University
Robert Hilborn, American Association of Physics Teachers
Theodore Hodapp, American Physical Society
Kenneth Krane, Oregon State University
Jorge A. López, University of Texas, El Paso
Tim McKay, University of Michigan
Laurie McNeil, University of North Carolina, Chapel Hill
Edward Prather, American Astronomical Society
Timothy Slater, University of Wyoming
Steven Turley, Brigham Young University

Sponsored by

American Association of Physics Teachers
American Astronomical Society
American Physical Society
National Science Foundation
Workshop Leaders

Robert Hilborn  
*Workshop Chair*  
American Association of Physics Teachers  
College Park, MD 20740  
rhilborn@aapt.org

Mario Belloni  
Davidson College  
Davidson, NC  
mabelloni@davidson.edu

Richard Berg  
University of Maryland  
College Park, MD  
reberg@physics.umd.edu

Gina Brissenden  
University of Arizona  
Tucson, AZ  
gbrissenden@as.arizona.edu

Wolfgang Christian  
Davidson College  
Davidson, NC  
wochristian@davidson.edu

Michael Dubson  
University of Colorado  
Boulder, CO  
michael.dubson@colorado.edu

Noah Finkelstein  
University of Colorado  
Boulder, CO  
noah.finkelstein@colorado.edu

Kenneth Heller  
University of Minnesota  
Minneapolis, MN  
heller@physics.umn.edu

Ken Krane  
Oregon State University  
Corvallis, OR  
kranek@physics.oregonstate.edu

Corinne Manogue  
Oregon State University  
Corvallis, OR  
corinne@physics.oregonstate.edu

Bruce Mason  
University of Oklahoma  
Norman, OK  
bmason@ou.edu

Eric Mazur  
Harvard University  
Cambridge, MA  
mazur@seas.harvard.edu

Lillian C. McDermott  
University of Washington  
Seattle, WA  
lcmcd@phys.washington.edu

Angelica Natera  
Harvard University  
Cambridge, MA  
angelica_natera@harvard.edu

Edward Prather  
University of Arizona  
Tucson, AZ  
eprather@as.arizona.edu

Peter Shaffer  
University of Washington  
Seattle, WA  
shaffer@phys.washington.edu

Tim Slater  
University of Wyoming  
Laramie, WY  
timslaterwyo@gmail.com

David Sokoloff  
University of Oregon  
Eugene, OR  
sokoloff@uoregon.edu

Ronald Thornton  
Tufts University-CSMT  
Medford, MA  
ronald.thornton@tufts.edu

Steve Turley  
Brigham Young University  
Provo, UT  
turley@byu.edu

Carl Wieman  
University of Colorado  
Boulder, CO  
gilbertwieman@gmail.com
Workshop Participants

Ugur Akgun
Coe College
Breakout I

Ma’arib Alsahhaf
Princess Nora bint Abdulrahman University
Breakout II

Erik Aver
Gonzaga University
Breakout III

Mario Borunda
Oklahoma State University
Breakout I

David Brain
University of Colorado-Boulder
Breakout II

Brant Carlson
Carthage College
Breakout III

Gary Case
La Sierra University
Breakout I

Jonathan Celli
University of Massachusetts-Boston
Breakout II

Utpal Chatterjee
University of Virginia
Breakout III

Zengjun Chen
Tuskegee University
Breakout I

James Clem
Grove City College
Breakout II

Moumita Das
Rochester Institute of Technology
Breakout III

Casey Davenport
United States Air Force Academy
Breakout I

Rachele Dominguez
Randolph-Macon College
Breakout II

Maxim Dzero
Kent State University
Breakout III

Susan Enders
Doane College
Breakout I

Jeremy England
Massachusetts Institute of Technology
Breakout II

Briana Fiser
High Point University
Breakout III

Anna Frebel
Massachusetts Institute of Technology
Breakout I

Kayt Frisch
Dordt College
Breakout II

Matthias Fuchs
University of Nebraska-Lincoln
Breakout III

Li Gao
California State University-Northridge
Breakout I

Stephen Gillam
Indiana University-Purdue University-Fort Wayne
Breakout II

Ryan T. Gordon
Western Illinois University
Breakout III

Rebecca Grouchy
Coastal Carolina University
Breakout I

Erin Hackett
Coastal Carolina University
Breakout II

Ulrike Hager
Colorado School of Mines
Breakout III

Jason Hancock
University of Connecticut
Breakout I

Xiao Hu
Rowan University
Breakout II

Anota Ijaduola
University of North Georgia
Breakout III

Thushari Jayasekera
Southern Illinois University
Breakout I

Jason Kestner
University of Maryland-Baltimore County
Breakout II

Mary Kidd
Tennessee Technological University
Breakout III

Kiyong Kim
University of Maryland
Breakout I

Markus Klute
Massachusetts Institute of Technology
Breakout II

Uwe Konopka
Auburn University
Breakout III

Ashwani Kumar
Monmouth College
Breakout I

Keji Lai
University of Texas at Austin
Breakout II

Blake Laing
Southern Adventist University
Breakout III

Andrew Mason
University of Central Arkansas
Breakout I
Workshop Participants

Michelle Milne  
St. Mary's College of Maryland  
Breakout II

Oleg Mryasov  
University of Alabama  
Breakout III

Anne Murdaugh  
Rollins College  
Breakout I

Moses Ntam  
Tuskegee University  
Breakout II

Steven Olmschenk  
Denison University  
Breakout III

Gregory Pawloski  
University of Minnesota  
Breakout I

Gil Paz  
Wayne State University  
Breakout II

Dmytro Pesin  
University of Utah  
Breakout III

Annika Peter  
The Ohio State University  
Breakout I

Michael Peterson  
California State University-Long Beach  
Breakout II

Alexandra Pope  
University of Massachusetts-Amherst  
Breakout III

Quan Qing  
Arizona State University  
Breakout I

Matt Redshaw  
Central Michigan University  
Breakout II

Jason Reed  
Virginia Commonwealth University  
Breakout III

Erin Rericha  
Vanderbilt University  
Breakout I

Humerto Rodriguez-Gutierrez  
University of Louisville  
Breakout II

Claudia Scarlata  
University of Minnesota  
Breakout III

Monika Schleier-Smith  
Stanford University  
Breakout I

Jeremy Schmit  
Kansas State University  
Breakout II

Jason Shulman  
The Richard Stockton College of New Jersey  
Breakout III

Parampreet Singh  
Louisiana State University  
Breakout I

Michael Solontoi  
Lynchburg College  
Breakout II

Sheyum Syed  
University of Miami  
Breakout III

Eric Toberer  
Colorado School of Mines  
Breakout I

Karen Vardanyan  
Southern Illinois University Edwardsville  
Breakout II

Michael Walters  
SUNY Plattsburgh  
Breakout III

Nevin Weinberg  
Massachusetts Institute of Technology  
Breakout I

Laura Wessels  
University of Nebraska-Kearney  
Breakout II

Michael Williams  
Massachusetts Institute of Technology  
Breakout III

Kathrin Wimmer  
Central Michigan University  
Breakout I

Jared Workman  
Colorado Mesa University  
Breakout II

Matthew Wright  
Adelphi University  
Breakout III

Jonathan Wrubel  
Creighton University  
Breakout I

Jun Yan  
University of Massachusetts-Amherst  
Breakout II

Zhengyue Ye  
University of Illinois-Chicago  
Breakout III

Ho-Ung Yee  
University of Illinois-Chicago  
Breakout I

Francisco Yumiceva  
Florida Institute of Technology  
Breakout II

Debing Zeng  
Saint Peter's University  
Breakout III

Fangqiang Zhu  
Indiana University-Purdue University-Indianapolis  
Breakout I

Paolo Zucon  
Massachusetts Institute of Technology  
Breakout II
## Workshop Schedule

### Monday, June 17

10:00 a.m.–4:00 p.m.  **Workshop Registration**  
Hilton Garden Inn, Greenbelt  
Azalea Ballroom Foyer

11:45 a.m.–12:45 p.m.  **Lunch – Hilton Garden Inn – Azalea Ballroom**

1:30–3:00 p.m.  **Optional Workshop: Grant Opportunities at Research Corporation**  
Richard Wiener, Program Officer, rwiener@rescorp.org

3:00–4:30 p.m.  **Optional Workshop: Grant Opportunities**  
NSF Program Officers  
Duncan McBride, Division of Undergraduate Education  
dmcbride@nsf.gov  
Kathleen McCloud, Division of Physics  
kmcloud@nsf.gov  
Daniel Evans, Division of Astronomical Sciences  
devans@nsf.gov  
Gary White, Division of Undergraduate Education  
gwhite@nsf.gov  
Dan Finotello, Division of Materials Research  
dfinotel@nsf.gov

4:30–5:00 p.m.  **Break – Azalea Ballroom Foyer**

5:00–5:15 p.m.  **Welcome and Opening Remarks**  
Robert Hilborn, Associate Executive Officer, AAPT,  
Chair, New Physics and Astronomy Faculty Workshop  
Beth Cunningham, Executive Officer, AAPT  
Renee Michelle Goertzen, Education Programs Manager, APS  
Kevin Marvel, Executive Officer, AAS  
Fred Dylla, Executive Director, AIP  
Duncan McBride, National Science Foundation

5:15–6:15 p.m.  **Large Group Session – Dogwood Ballroom**  
*Introduction to Peer Instruction*  
Eric Mazur, Harvard University

6:15–7:30 p.m.  **Dinner – Azalea Ballroom**

7:30–8:30 p.m.  **Large Group Session – Dogwood Ballroom**  
*Peer Instruction Practical Details*  
Eric Mazur, Harvard University  
Angelica Natera, Harvard University
Tuesday, June 18

6:30–7:30 a.m.  Breakfast – Hilton Garden Inn, Great American Grill
8:00 a.m.  Shuttle bus leaves for American Center for Physics
8:30–10:00 a.m.  Large Group Session – Conference Room A

Research in Physics Education: A resource for improving student learning – Conference Room A
Lillian McDermott and Peter Shaffer
University of Washington

10:00–10:15 a.m.  Refreshment Break – ACP Rotunda
10:15–11:15 a.m.  Large Group Session – Conference Room A

Learner-Centered Teaching in Physics and Astronomy
Edward Prather, University of Arizona

11:15–12:00 a.m.  Small Group Sessions
  • PhET (I) – Conference Room A
    Michael Dubson, University of Colorado-Boulder
  • Upper-level Physics (II) – Conference Room B
    Ken Krane, Oregon State University
  • Lecture Tutorials (III) – Conference Room C
    Edward Prather, Gina Brissenden, University of Arizona

12:00–1:00 p.m.  Group Photo and Lunch – ACP Cafeteria
1:00–1:45 p.m.  Small Group Sessions
  • PhET (II) – Conference Room A
  • Upper-level Physics (III) – Conference Room B
  • Lecture Tutorials (I) – Conference Room C

1:45–2:30 p.m.  Small Group Sessions
  • PhET (III) – Conference Room A
  • Digital Libraries (I) – Conference Room B
  • Lecture Tutorials (II) – Conference Room C

2:30–3:00 p.m.  Refreshment Break – ACP Rotunda
3:00–4:15 p.m.  Large Group Session – Conference Room A

Just-in-Time Teaching
Mario Belloni, Davidson College

4:15–5:00 p.m.  Small Group Discussion – Conference Rooms A, B, and C

Various Topics (presiders TBD)

5:00–6:00 p.m.  Large Group Session – Conference Room A

Help Your Students Develop Expertise in Problem Solving
Ken Heller, University of Minnesota

6:00 p.m.  Shuttle bus leaves for Hilton Garden Inn
6:30–7:30 p.m.  Dinner – Azalea Ballroom
7:30–8:30 p.m.  Large Group Session – Dogwood Ballroom

The Physics IQ Test
Richard Berg, University of Maryland
Wednesday, June 19

6:30–7:30 a.m.  Breakfast – Hilton Garden Inn, Great American Grill

7:45 a.m.  Shuttle bus leaves for American Center for Physics

8:15–9:15 a.m.  

**Large Group Session** – Conference Room A

*Active Learning with Interactive Lecture Demonstrations (ILD)*

David Sokoloff, University of Oregon

Ronald Thornton, Tufts University

9:15–10:00 a.m.  

**Small Group Sessions**

- **Upper-level Physics (III)** – Conference Room A
  
  Corinne Manogue, Oregon State University

- **ILD/Real Time Physics (II)** – Conference Room B
  
  David Sokoloff and Ron Thornton

- **Physlets, Easy Java Simulations, and Open Source Physics (I)**
  
  Conference Room C
  
  Wolfgang Christian, Davidson College

10:00–10:30 a.m.  Break – ACP Rotunda

10:30–11:15 a.m.  

**Small Group Sessions**

- **Upper-level Physics (I)** – Conference Room A

- **ILD/Real Time Physics (III)** – Conference Room B

- **Physlets, Easy Java Simulations, and Open Source Physics (II)**
  
  Conference Room C

11:15–12:00 p.m.  

**Small Group Sessions**

- **Upper-level Physics (II)** – Conference Room A

- **ILD/Real Time Physics (I)** – Conference Room B

- **Physlets, Easy Java Simulations, and Open Source Physics (III)**
  
  Conference Room C

12:00–1:00 p.m.  Lunch – ACP Cafeteria

1:00–2:00 p.m.  

**Large Group Session** – Conference Room A

*Evaluation and Assessment*

Noah Finkelstein, University of Colorado

2:00–3:00 p.m.  

**Small Group Sessions**

*Primarily Undergraduate Institutions* – Conference Room B

*M.S. and Ph.D. Granting Institutions* – Conference Room A

3:00–3:45 p.m.  

**Small Group Sessions**

- **Digital Libraries (I)** – Conference Room A
  
  Bruce Mason, University of Oklahoma

- **Tenure Matters (II)** – Conference Room B
  
  Robert Hilborn, AAPT
  
  Steve Turley, Brigham Young University

- **Problem Solving (III)** – Conference Room C
  
  Ken Heller, University of Minnesota
Wednesday, June 19 (cont.)

3:45–4:15 p.m.  Refreshment Break – ACP Rotunda
4:15–5:00 p.m.  Small Group Sessions
  • Digital Libraries (II) – Conference Room A
  • Tenure Matters (III) – Conference Room B
  • Problem Solving (I) – Conference Room C
5:00–5:45 p.m.  Small Group Sessions
  • Digital Libraries (III) – Conference Room A
  • Tenure Matters (I) – Conference Room B
  • Problem Solving (II) – Conference Room C
5:45 p.m.  Shuttle bus leaves for Hilton Garden Inn
5:45–6:15 p.m.  Reception – Azalea Ballroom
6:15-7:30 p.m.  Dinner – Azalea Ballroom

Thursday, June 20

6:30–7:30 a.m.  Breakfast – Hilton Garden Inn, Great American Grill
  Hotel Check-Out
8:15–9:00 a.m.  Large Group Session – Azalea Ballroom
  Case Studies, Discussion of Student Behavior
  Tim Slater, University of Wyoming
9:00–10:15 a.m.  Large Group Session
  Retention and Diversity
  Carl Wieman, University of Colorado
10:15–10:30 a.m.  Break – Azalea Ballroom Foyer
10:30–11:15 a.m.  Large Group Session
  Time Management
  Tim Slater
11:15 –11:30 a.m.  Final Summary, Evaluations and Adjournment
American Association of Physics Teachers

Founded in 1930, The American Association of Physics Teachers (AAPT) is dedicated to enhancing the understanding of physics through teaching. For our 10,000+ members who serve physics students across the spectrum of schools, colleges, and universities, AAPT is a professional home that helps bring together knowledgeable and innovative colleagues who care deeply about physics teaching and education, and that offers valuable resources and benefits.

We serve our members through programs, publications, and networking, but also reach out to the larger community of physics and science teachers—current and future—and we look after issues of significance in science education. Our national office works closely with our dedicated volunteers around the nation and beyond to promote a better understanding of physics at all levels. The association supports physics educators at all levels through our two publications, the American Journal of Physics and The Physics Teacher; NSF-funded programs including the Physics Teaching Resource Agents institutes; the digital physics library, ComPADRE (with APS and AIP); the Physics Teacher Education Coalition, PhysTEC (with APS and AIP); the Workshops for New Physics and Astronomy Faculty (with APS and AAS); our two national annual meetings; and the student programs and scholarships that we administer, including the Lotze Scholarship for Future Teachers, the High School Physics Teacher Grant, the Physics Bowl, and the U.S. Physics Olympiad.

Beth Cunningham
Executive Officer

American Association of Physics Teachers
One Physics Ellipse, College Park, MD 20740-0845; 301-209-3333; www.aapt.org

American Astronomical Society

The American Astronomical Society promotes the advancement of astronomy and closely related branches of science. It was founded in 1899. AAS members include professional researchers in the astronomical sciences, and also educators, students, and others interested in the advancement of astronomical research. The Society operates in five major areas: Publications, Meetings, Education, Public Policy and Employment in order to ensure that astronomy remains healthy and vital for the benefit of our profession and society at large. AAS publishes The Astrophysical
Journal and The Astronomical Journal, which are among the most important scholarly journals in the field. The Bulletin of the American Astronomical Society reports the latest institutional developments and documents the content of AAS and its divisions’ annual meetings. More information about the Society’s activities and membership are available on the AAS website, www.aas.org.

Kevin Marvel
Executive Officer
American Astronomical Society
2000 Florida Ave. NW, Suite 400, Washington, DC 20009-1231; 202-328-2010; www.aas.org

American Physical Society
With more than 47,000 members worldwide, the American Physical Society works to advance and disseminate the knowledge of physics. Since its formation in 1899, it has been dedicated to providing its members and the international physics community with the latest research results through meetings and the most highly respected international journals in physics. These journals include Physical Review Letters, the Physical Review (with a Special Topics series including a journal on Physics Education Research), and Reviews of Modern Physics. The APS conducts more than 20 meetings per year, to connect physicists and disseminate physics knowledge and information relevant to the community. In addition, APS vigorously lobbies for funding for physics research and education, provides the physics community with timely information about government affairs, carries out studies of physics-based topics of importance to the country, and promotes the interests of the physics community through extensive public information efforts such as www.PhysicsCentral.com, a website for the public.

APS is actively involved in educational programs to improve undergraduate education and to improve the education of future physics and physical science teachers through its leadership in the Physics Teacher Education Coalition (www.PhysTEC.org). APS partners with AAPT in PhysTEC and on numerous other education programs including, the New Faculty Workshop, the ComPADRE digital library of educational resources, and conferences and workshops on education at various levels. For many years APS has worked to increase the number of female and minority physicists, and has several significant programs that advance these goals. Information about these and other APS programs can be found at www.aps.org.

Kate Kirby
Executive Officer
American Physical Society
One Physics Ellipse, College Park, MD 20740-3844; 301-209-3200; www.aps.org