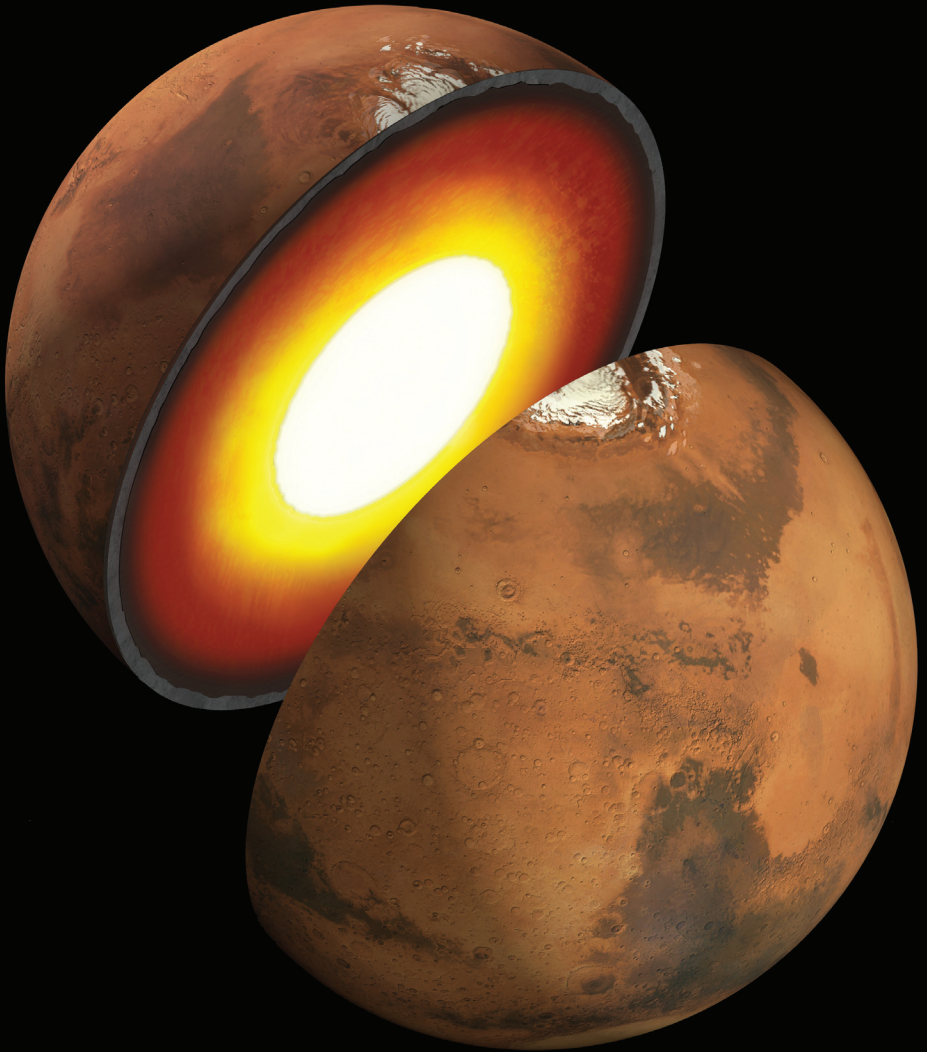


workshop for  
**new physics and  
astronomy faculty**



**Reunion Meeting  
November 2-4, 2012  
American Center for Physics  
College Park, MD**



# 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

Jorgé A. López, University of Texas, El Paso

Tim McKay, University of Michigan

Laurie McNeil, University of North Carolina, Chapel Hill

Timothy Slater, American Astronomical Society

Steven Turley, Brigham Young University

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**American Association  
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**American Astronomical Society**



**American Physical Society**



**National Science Foundation**

**RESEARCH CORPORATION  
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# Workshop Leaders

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

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**Catherine Crouch**  
Swarthmore College  
Swarthmore, PA  
ccrouch1@swarthmore.edu

**Karen Cummings**  
Southern Connecticut State University  
New Haven, CT  
cumplingsk2@southernct.edu

**Roman Czujko**  
American Institute of Physics  
College Park, MD  
rczujko@aip.org

**Melissa Dancy**  
University of Colorado-Boulder  
Boulder, CO  
melissa.dancy@gmail.com

**Charles Henderson**  
Western Michigan University  
Kalamazoo, MI  
charles.henderson@wmich.edu

**Theodore Hodapp**  
American Physical Society  
College Park, MD  
hodapp@aps.org

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

**Laurie McNeil**  
University of North Carolina-Chapel Hill  
Chapel Hill, NC  
mcneil@physics.unc.edu

**Tom Moore**  
Pomona College  
Claremont, CA  
tmoore@pomona.edu

**Edward Redish**  
University of Maryland  
College Park, MD  
redish@physics.umd.edu

**Toni Sauncy**  
American Institute of Physics  
College Park, MD  
tsauncy@aip.org

**Bruce Sherwood**  
North Carolina State University  
Raleigh, NC  
bruce\_sherwood@ncsu.edu

**Carl Wieman**  
University of Colorado-Boulder  
Boulder, CO  
gilbertwieman@gmail.com

# Workshop Participants

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**Paulo Acioli**

Northeastern Illinois University  
Breakout I

**Kara Beauchamp**

Cornell College  
Breakout II

**Harold Butner**

James Madison University  
Breakout III

**Alex Chediak**

California Baptist University  
Breakout I

**Debi Choudhary**

California State University-Northridge  
Breakout II

**Julie Dahlstrom**

Carthage College  
Breakout III

**Trinanjan Datta**

Augusta State University  
Breakout I

**Erin De Pree**

St. Mary's College of Maryland  
Breakout II

**Theja DeSilva**

Binghamton University  
Breakout III

**Jianjun Dong**

Auburn University  
Breakout I

**Santaneel Ghosh**

Southeast Missouri State University  
Breakout II

**Tariq Gilani**

Millersville University  
Breakout III

**Mehmet Goksu**

Millersville University  
Breakout I

**James Higbie**

Bucknell University  
Breakout II

**Tracy Hodge**

Berea College  
Breakout III

**Shane Hutson**

Vanderbilt University  
Breakout I

**Carolina Ilie**

State University of New York at Oswego  
Breakout II

**Abaz Kryemadhi**

Messiah College  
Breakout III

**Stamatios Kyrkos**

Le Moyne College  
Breakout I

**Brian Lane**

Jacksonville University  
Breakout II

**Kristine Lang**

Colorado College  
Breakout III

**Byounghak Lee**

Texas State University - San Marcos  
Breakout I

**Rafael Lopez-Mobilia**

University of Texas At San Antonio  
Breakout II

**Jutta Luettmmer-Strathmann**

University of Akron  
Breakout III

**Vera Margoniner**

California State Univ - Sacramento  
Breakout I

**Douglas Martin**

Lawrence University  
Breakout II

# Workshop Participants

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**Angela Meyer**

Florida Gulf Coast University  
Breakout III

**Mike Mikhael**

William Paterson University  
Breakout I

**Nathan Miller**

University of Wisconsin Eau Claire  
Breakout II

**James Moore**

Coastal Carolina University  
Breakout III

**Patrick Motl**

Indiana University Kokomo  
Breakout I

**Mim Nakarmi**

Brooklyn College - CUNY  
Breakout II

**Robert Olsson**

Milwaukee School of Engineering  
Breakout III

**Deva O'Neil**

The College Of Wooster  
Breakout I

**Michael Orleski**

Misericordia University  
Breakout II

**Gour Pati**

Delaware State University  
Breakout III

**Brett Pearson**

Dickinson College  
Breakout I

**Andrew Piacsek**

Central Washington University  
Breakout II

**Louis Rubbo**

Coastal Carolina University  
Breakout III

**Ellen Siem**

Southern Oregon University  
Breakout I

**Damon Spayde**

Hendrix College  
Breakout II

**Robert Szoszkiewicz**

Kansas State University  
Breakout III

**Mark Taylor**

Hiram College  
Breakout I

**Susan Terebey**

California State University, Los Angeles  
Breakout II

**Renu Tripathi**

Delaware State University  
Breakout III

**Richard Vallery**

Grand Valley State University  
Breakout I

**Graham Wilson**

University of Kansas  
Breakout II

**David Wittman**

University of California-Davis  
Breakout III

**Scott Yost**

Princeton University  
Breakout I

**Samya Zain**

Susquehanna University  
Breakout II

# Workshop Schedule

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## Friday, November 2

- 4:00 p.m.      **Registration** – Holiday Inn-College Park
- 5:00–5:15 p.m.      **Welcoming Remarks and Overview** – Maryland Room  
Bob Hilborn, Chair, Workshop for New Physics  
and Astronomy Faculty  
Beth Cunningham, Executive Officer, American Association of  
Physics Teachers  
Monica Plisch, Associate Director of Education and Diversity,  
American Physical Society  
Kevin Marvel, Executive Officer, American Astronomical Society  
Cathy O’Riordan, Vice-President, Physics Programs, American  
Institute of Physics  
Duncan McBride, Division of Undergraduate Education,  
National Science Foundation
- 5:15–6:15 p.m.      *How Theories of Learning Affect What you will do  
in Class on Monday*  
E. F. (Joe) Redish, University of Maryland – College Park
- 6:15–7:00 p.m.      *Implementing and Sustaining Curricular Change,  
What Works and What Doesn’t*  
Charles Henderson, Western Michigan  
Melissa Dancy, University of Colorado-Boulder
- 7:15–8:15 p.m.      **Dinner** – Holiday Inn – Room AB
- 8:15–9:00 p.m.      **Posters and Reception with cash bar** – Room CD

## Saturday, November 3

- 6:00–7:30 a.m.      **Breakfast** – Holiday Inn – Moose Creek Steak House
- 7:45 a.m.      **Shuttle bus leaves for American Center for Physics**
- 8:15–8:30 a.m.      **Overview of the Day** – Conference Room A  
Bob Hilborn, Chair, Workshop for New Physics  
and Astronomy Faculty
- Rethinking the Content of Introductory Physics** – Conference Room A
- 8:30–9:15 a.m.      *Matter and Interactions*  
Bruce Sherwood, North Carolina State University

# Saturday, November 3

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9:15–10:00 a.m. *Six Ideas That Shaped Physics*  
Tom Moore, Pomona College

10:00–10:15 a.m. **Break**

**Effective Leadership** – Conference Room A

10:15–11:00 a.m. *So You are Asked to be Department Chair*  
– *What I Wish I had Known.*  
Laurie McNeil, former chair, Department of Physics,  
University of North Carolina – Chapel Hill

**Interactive Engagement Teaching Techniques - Breakouts**

11:00–11:45 a.m. **Peer Instruction and Clickers** – Conference Room A  
**Just-In-Time Teaching** – Conference Room B  
**Collaborative Group Problem Solving and related**  
– Conference Room C

11:45–12:15 p.m. *Enhancing Your Undergraduate Physics Program*  
SPS – Toni Sauncy, Director of the Society of Physics Students,  
American Institute of Physics  
Career-Mentoring Site Visit Project – Roman Czujko,  
Director of the Statistical Research Center,  
American Institute of Physics

12:15–1:30 p.m. **Group Photo and Lunch**

1:30–2:15 p.m. *Introductory Physics for the Life Sciences* – Conference Room A  
Catherine Crouch, Swarthmore College

2:15–3:00 p.m. *Introductory Physics for the Life Sciences (I)* – Conf. Room A  
Catherine Crouch  
*Matter and Interactions (II)* – Conference Room B  
Bruce Sherwood  
*Six Ideas That Shaped Physics (III)* – Conference Room C  
Tom Moore

3:00–3:15 p.m. **Break**

3:15–4:00 p.m. *Introductory Physics for the Life Sciences (II)* – Conf. Room A  
*Matter and Interactions (III)* – Conference Room B  
*Six Ideas That Shaped Physics (I)* – Conference Room C

4:00–4:45 p.m. *Introductory Physics for the Life Sciences (III)* – Conf. Room A  
*Matter and Interactions (I)* – Conference Room B  
*Six Ideas That Shaped Physics (II)* – Conference Room C



## Saturday, November 3 continued

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- 4:45–5:30 p.m. *Assessment and Evaluation*  
Karen Cummings, Southern Connecticut State University
- 5:30 p.m. Shuttle bus leaves ACP for Holiday Inn
- 6:00–6:30 p.m. Reception and Cash Bar – Holiday Inn, Adirondack Room
- 6:30–7:30 p.m. Dinner – Adirondack Room

## Sunday, November 4

- 7:00–8:00 a.m. Breakfast – Holiday Inn – Moose Creek Steak House
- 8:15–8:30 a.m. *Enhancing Your Undergraduate Physics Program* – Room AB  
PhysTEC – Ted Hodapp, Director of Education and Diversity,  
American Physical Society

### Re-envisioning Upper-Level Physics

- 8:30–9:15 a.m. *Active-engagement in Upper-Division Physics*  
Corinne Manogue, Oregon State University
- 9:15–10:15 a.m. Keynote Speaker  
*Taking a Scientific Approach to Physics Teaching*  
Carl Wieman, University of British Columbia  
University of Colorado – Boulder
- 10:15–10:30 a.m. Break
- 10:30–11:15 a.m. Table Breakout groups on leadership and change issues  
Bob Hilborn and Carl Wieman  
Characteristics of effective departmental leaders  
Characteristics of ineffective departmental leaders
- 11:15–11:45 a.m. Improving the Workshop for New Physics and Astronomy Faculty  
Bob Hilborn
- 11:45 a.m. Concluding Remarks and Farewell



## AAPT 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; 301-209-3340; [www.aapt.org](http://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](http://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](http://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](http://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](http://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](http://www.aps.org).

Kate Kirby  
*Executive Officer*

Theodore Hodapp  
*Director of Education and Diversity*

American Physical Society  
One Physics Ellipse, College Park, MD 20740-3844; 301-209-3200; [www.aps.org](http://www.aps.org)



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**American Association of Physics Teachers**

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