Conference on Introductory Physics for the Life Sciences

March 14-16, 2014
Key Bridge Marriott
Arlington, VA
Conference Planning Committee

Eric Brewe, Florida International University
Juan Burciaga, Mt. Holyoke College
Catherine Crouch, Swarthmore College
Paul Gueye, Hampton University
Robert Hilborn, American Association of Physics Teachers, Grant PI
Dawn Meredith, University of New Hampshire
Tom O’Kuma, Lee College
Wendell Potter, University of California–Davis
Mark Reeves, George Washington University
Patricia Soto, Creighton University

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Friday, March 14

noon–4:00 p.m. Registration and Poster Set Up

3:00–4:00 p.m. Reception in poster area, Capital View Ballroom Foyer

4:00 p.m. Welcoming Remarks and Introductions, Potomac Ballroom
Beth Cunningham, AAPT Executive Officer
Bob Hilborn, AAPT Associate Executive Officer

4:15–6:25 p.m. Plenary I: The View from Biology, Chemistry, and Medicine
Potomac Ballroom, Moderator: Bob Hilborn

  4:15–4:45 p.m. A new biology education for the 21st century
Susan Rundell Singer, Division of Undergraduate Education, National Science Foundation

  4:45–5:15 p.m. Developing a learning progression for understanding energy changes at the atomic–molecular level
Melanie M. Cooper and Nicole M. Becker, Department of Chemistry, Michigan State University

  5:15–5:25 p.m. Short Break

  5:25–5:55 p.m. An overview of the new MCAT® exam
Marc Kroopnick, Association of American Medical Colleges

  5:55– 6:25 pm Daunting challenges and golden opportunities for teaching physics to biology students
Todd J. Cooke, Department of Cell Biology and Molecular Genetics, University of Maryland

6:30–7:30 p.m. Dinner, Capital Ballroom

7:30–8:30 p.m. Plenary II: Case Studies from the Pedagogical Interface between Biology and Physics
Potomac Ballroom, Moderator: Catherine Crouch

  7:30–8:00 p.m. IPLS Reform: still plenty of questions
Dawn Meredith, Department of Physics, University of New Hampshire

  8:00–8:30 p.m. NEXUS/Physics: an interdisciplinary repurposing of physics for life science students
Edward F. Redish, Department of Physics, University of Maryland

8:30–9:30 p.m. Posters, Capital View Ballroom Foyer
Saturday, March 15

8:00-9:00 a.m.  Plenary III: Laboratories for Introductory Physics for the Life Sciences
Potomac Ballroom, Moderator: Paul Gueye

8:00-8:30 a.m.  Overview of IPLS labs: where are we now and where should we be going?
Nancy Beverly, Department of Physics, Mercy College

8:30-9:00 a.m.  Designing and implementing a sustainable laboratory as a coherent part of an IPLS course
Ken Heller, School of Physics and Astronomy, University of Minnesota

9:00-10:15 a.m.  Working Groups Session I: Course Transformation and Learning Goals
At the end of my physics course, a biology student should be able to....
Michelle Smith, School of Biology and Ecology, Maine Center for Research in STEM Education, University of Maine

10:15-10:45 a.m.  Break in Poster Area

10:45-11:45 a.m.  Plenary IV: Case Studies of IPLS Courses
Potomac Ballroom, Moderator: Patricia Soto

10:45-11:15 a.m.  Reforming physics for the life sciences at the University of Michigan
Tim McKay, Department of Physics, University of Michigan

11:15-11:45 a.m.  Physics of medicine – my field of dreams
Nancy L. Donaldson, Department of Physics, Rockhurst University

11:45-12:30 p.m.  Working Groups II: Defining Strategies and Resources for IPLS Course Transformation

12:30-1:30 p.m.  Lunch, Capital Ballroom

1:30-2:45 p.m.  Plenary Panel I: More Views from Biology
Potomac Ballroom, Moderator: Mark Reeves
1:30-2:30 p.m.  **Panelists Presentations** (20 minutes each)

- **Designing circulatory systems—evolution dances but physics calls the tunes**
  Steve Vogel, *Department of Biology, Duke University*

- **Using physics to turn biological cartoons into mathematical models of cells**
  Jané Kondev, *Department of Physics, Brandeis University*

- **What is the place of physics in a coherent, engaging, and effective biology curriculum?**
  Mike Klymkowsky, *Molecular, Cellular, and Developmental Biology, University of Colorado-Boulder*

2:30-2:45 p.m.  **Discussion**

2:45-3:15 p.m.  **Break and Posters**

3:15-4:15 p.m.  **Working Groups III: Take-home Ideas from Today’s Presentations**

4:15-5:30 p.m.  **Plenary Panel II: Mathematics and IPLS Courses**

- Potomac Ballroom, Moderator: Juan Burciaga

4:15-5:15 p.m.  **Panelist Presentations** (20 minutes each)

- **IPLS in un-IPLS courses: project-based learning in a mixed enrollment course**
  David Weaver, *Physics, Chandler-Gilbert Community College*

- **University physics for the life sciences: calculus-based introductory physics re-imagined**
  Simon Mochrie, *Department of Physics, Yale University*

- **Mathematics: transcending the sciences**
  Scot Gould, *W.M. Keck Science Department, Claremont McKenna, Pitzer & Scripps Colleges*

5:15-5:30 p.m.  **Discussion**

5:30-6:15 p.m.  **Free Time**

6:15-7:15 p.m.  **Dinner**, Capital Ballroom

7:15-8:15 p.m.  **Posters**, Capital View Ballroom Foyer

8:15 p.m.  **Take down posters**
Sunday, March 16

N. B. Hotel Check-out Before Noon

8:00-8:55 a.m. Working Groups IV: Formulating Recommendations for IPLS Courses

9:00-10:00 a.m. Plenary VI: Course Transformation Revisited
Potomac Ballroom, Moderator: Eric Brewe

The intimate relationship between expertise, learning goals, pedagogy, and course transformation
Carl Wieman, Department of Physics and Graduate School of Education, Stanford University

10:00 -10:30 a.m. Refreshment Break

10:30-11:30 a.m. Plenary Discussion: Reports from Breakouts
Potomac Ballroom, Moderators: Dawn Meredith and Tom O’Kuma

11:30 a.m. Final Remarks, Post-Conference Survey, Conference Report Development
Potomac Ballroom, Moderator: Bob Hilborn
Founded in 1930, The American Association of Physics Teachers (AAPT) is dedicated to enhancing the understanding of physics through teaching. For our 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. The 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); 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 Grants, the Physics Bowl, and the U.S. Physics Olympiad.

Beth Cunningham  
*Executive Officer*

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