



Michigan Section of the American Association of Physics Teachers

Fall 2017 Meeting Announcement and Program Schedule

Grand Valley State University, Allendale, MI
October 21, 2017

Program Highlights

We are pleased to welcome Kathleen Stetson of Trill as our keynote speaker. Kathleen Stetson holds a BA in music from Harvard University, an MM in vocal performance from New England Conservatory of Music, and an *MS in architectural acoustics from Rensselaer Polytechnic Institute*. She was an acoustical engineer with Arup in New York City. Her projects included the design of Greece's first national opera house and library with Renzo Piano Building Workshop. Kathleen Stetson is a recent MIT Sloan graduate and is Co-Founder and CEO of Trill (trill.me), Boston's source for all things live shows. While getting her Sloan MBA, she co-created Hacking Arts that is held at the MIT Media Lab (<http://hackingarts.com/#ha2016>).

Program Overview

Location: Sessions and workshops will take place in the **Seymour & Esther Padnos Hall of Science** on the GVSU Allendale campus. For campus maps and directions to the Allendale (main) campus of GVSU, visit their website at: <http://www.gvsu.edu/maps.htm>. (Padnos Hall is labeled building 43 and is located in region D-4 on the campus map found at the above URL.)

Registration: Registration cost is \$10 per meeting. Students and first-time attendees, though, may attend *free* of charge.

Parking: Parking is free on Saturday in all campus lots. The most convenient lot to use is **Lot F**, located along Campus Drive opposite Padnos Hall (C-4 on the aforementioned campus map). [Office1]

Program Overview (cont.)

Lunch: “Fresh Food Company,” a market-style all-you-can-eat restaurant, located in the upper level of the Commons (building 8), adjacent to Padnos Hall. Cost of lunch is \$9.75 plus tax [Office2] (all inclusive).

Hotels: For those who wish to stay overnight for the meeting, local hotel information can be found online at: <http://www.gvsu.edu/hotels.htm>. [Office3] Recommended hotels include:

Sleep Inn & Suites, Allendale, MI: <http://www.sleepinn.com>, (616) 892-8000

Days Inn, Downtown Grand Rapids: <http://www.daysinn.com/DaysInn/control/home>, (616) 956-9304 or toll free at (800) 426-7866

Courtyard by Marriott, Downtown Grand Rapids:

<http://www.marriott.com/hotels/travel/grrdt-courtyard-grand-rapids-downtown/>, (616) 242-6635 or toll free at (800) 321-2211.

Holiday Inn Express Southwest, Grandville (7 miles from GVSU): <http://www.ihotelsgroup.com>, (616) 532-0202 or toll free at (888) 532-8680.

Quality Inn, Hudsonville (8 miles from GVSU): <http://www.choicehotels.com>, (616) 662-4000.

Program Schedule

- 7:30 – 8:10 am** **Registration/Morning refreshments**
Padnos Hall Rm. 106
Meeting fee: \$10.00 (FREE for students and first-time attendees)
- 8:10 – 8:20 am** **Call to order and welcome**
Padnos Hall Rm. 106 [Office5] (adjacent to Padnos Hall/Henry Hall Atrium)
Laurence Tarini, University of Michigan-Flint -- MIAAPT President
Brad Ambrose, Grand Valley State University – Acting Chair, Physics
- 8:20 – 11:00 am** **Contributed Presentations I**
Padnos Hall Rm. 106
- 8:20 – 8:35 Mind Your Syllabus & Modernize Your Curriculum
Taoufik Nadji, Interlochen Arts Academy
(nadjit@interlochen.org)
- 8:35 – 8:50 What makes a planet habitable?
Michael C. LoPresto, University of Michigan, HFC
(lopresto@hfcc.edu)

- 8:50 – 9:05 Mindful feedback through specifications grading
Josh Veazey, Grand Valley State University
(veazeyj@gvsu.edu)
- 9:05 – 9:20 Integrating Computation in Science Across Michigan
Danny Caballero, Michigan State University
(caballero@pa.msu.edu)
- 9:20 – 9:35 Errors in Texts: Making Lemons From Lemonade
Alan Grafe, University of Michigan - Flint
(grafe@umflint.edu)
- 9:35 – 9:45 A preliminary analysis to how introductory physics students view computation
Daniel Oleynik, Michigan State University
(oleynikd@msu.edu)
- 9:45 – 10:00 am Break**
- 9:45 – 10:00 **Poster:** Exploring Gendered Performance Differences in Introductory Physics
Nita Kedharnath, University of Michigan
(nitaked@umich.edu)
- 10:00 – 11:00 am Keynote Address: Adventures in STEAM: Music, Technology, and Architectural Acoustics**
Kathleen Stetson, Trill
(kathleen@trill.me)
Padnos Hall Rm. 106 (adjacent to Padnos Hall/Henry Hall Atrium)
- Kathleen is going to share her life adventures in STEAM and how they shaped her multi-faceted and multidisciplinary career. These adventures include work she has done in architectural acoustics.
- 11:00 – 12:00 pm Lunch: Commons dining facility (*Fresh Food Company*)**
- 12:00 – 12:30 pm MIAAPT Business Meeting**
Padnos Hall Rm. 106
Laurence Tarini (University of Michigan Flint) – MIAAPT President
laurence.tarini@gmail.com
- 12:30 – 1:00 pm Stump the Professor + PhysEd Share-O-Thon + Break**

1:00 – 2:00 pm

Workshops

1:00 – 2:00

Shedding Light on Eclipses in your Physics or Astronomy Classroom
Brad Ambrose, Grand Valley State University
(ambroseb@gvsu.edu)

This workshop introduces participants to an ongoing curriculum development project on the theme of eclipses, with the August 2017 “Great American Solar Eclipse” as a primary motivation. The goal of the project is to develop innovative modular, research-based instructional materials for use in a variety of physics and astronomy courses. Workshop participants will gain firsthand experience with selected materials and learn about the underlying research in astronomy and physics education. This effort, part of a collaboration with the NASA Heliophysics Education Consortium, is led by Ramon Lopez (U. Texas-Arlington), Janelle Bailey (Temple/AAPT), and Rebecca Vieyra (AAPT).

2:00 pm

Adjournment... *See you at MSU for the joint meeting with OSAPS!*

Abstracts for Contributed Presentations

8:20 – 8:35

Mind Your Syllabus & Modernize Your Curriculum
Taoufik Nadji, Interlochen Arts Academy
(nadjit@interlochen.org)

The presenter will share his new syllabus format along with students’ suggestions, reactions, and reflections. In addition, the speaker will provide an update on the modernization of his physics curriculum.

8:35 – 8:50

What makes a planet habitable?
Michael C. LoPresto, University of Michigan, HFC
(lopresto@hfcc.edu)

With the recent discovery of over 2000 exoplanets by the Kepler spacecraft there has been much discussion about what is necessary for a planet to be habitable. The easy answers are that it must be "earth-like" which includes being similar in size and mass to Earth and in its star's "habitable-zone," the range of distances from the star at which temperatures allow water to exist as a liquid. There may however, be other requirements, many of which can be drawn out in a class discussion. The presentation will consist of such a discussion , similar to how it would occur in an introductory astronomy or "life in the universe" course.

8:50 – 9:05

Mindful feedback through specifications grading
Josh Veazey, Grand Valley State University
(veazeyj@gvsu.edu)

Is this student's answer worth 2 points or 3 points? Or maybe 2.5 points? Perhaps 2.25? Does this feel familiar? Do you find yourself structuring comments to justify the number of points you have awarded, rather than giving authentic feedback to promote student learning? In this talk, I will discuss my experimentation with specifications grading, bearing similarities to "standards-based grading." I will share experiences from implementing a specs-based

system in a 20-person physics by inquiry class, as well as my current experience introducing elements of specs-based grading in a large lecture course (60 students) this semester.

9:05 – 9:20 Integrating Computation in Science Across Michigan
Danny Caballero, Michigan State University
(*caballero@pa.msu.edu*)

Using a computer to solve, simulate, or visualize physical problems is a central practice of the modern scientific world. Computation can bring new insights to and support new discoveries in science. And yet, computation is ubiquitous in professional science and engineering, it is lacking in many of our instructional settings. A newly funded NSF project aims to change that by supporting high school physics teachers looking to integrate computation into their courses. The project begins this year as a collaboration between Michigan State, Divine Child Academy, East Lansing Schools, Holt Schools, and Plymouth Schools, but we are looking for additional partners. In this talk, we will discuss the urgent need for computation in physics courses and describe the design of the project. This work is supported by NSF-DRL 1741575.

9:20 – 9:35 Errors in Texts: Making Lemons From Lemonade
Alan Grafe, University of Michigan - Flint
(*grafe@umflint.edu*)

Despite the best efforts of editors and reviewers, significant errors crop up in textbooks. While inconvenient, these errors present teachable moments to help students develop skills that will allow them to critically engage with the text material. Strategies for employing these teachable moments will be modeled and discussed.

9:35 – 9:45 A preliminary analysis to how introductory physics students view computation
Daniel Oleynik, Michigan State University
(*oleynikd@msu.edu*)

When faced with physics problems, students will regularly attempt to solve them using different problem-solving approaches. At the introductory level at MSU, we have designed a problem-based learning environment aimed at teaching student skills that will prepare them for both future classes and future careers. The focus in this class is in both analytical and computational problems, offering students the opportunity to develop problem-solving skills individually. This research project looks at students using minimally working programs, allowing them to visualize the solution and immediately check whether it matches up with their understanding of physics. The research presented here looks at one instance of how students deal with challenges, and how they react when their solution does not match the expected answer. This presentation will focus on that research, building on the established findings, and presenting new possible paths.

9:45 – 10:00 **Poster:** Exploring Gendered Performance Differences in Introductory Physics
Nita Kedharnath, University of Michigan
(*nitaked@umich.edu*)

Gendered performance differences (GPDs) in physics are an unfortunate reality at many universities throughout the country. Despite entering these classes with the same cumulative GPA, ACT math scores, and other relevant academic factors, often times women perform worse than men, particularly on exams. In fact, on average, women perform one-third of a letter grade lower than men in introductory physics. After examining various class factors, we

conclude that stereotype threat, the fear of confirming a negative stereotype about one's identity when in an evaluative environment, is a likely cause for these GPDs since the extra anxiety often leads to underperformance.

Updates or Changes