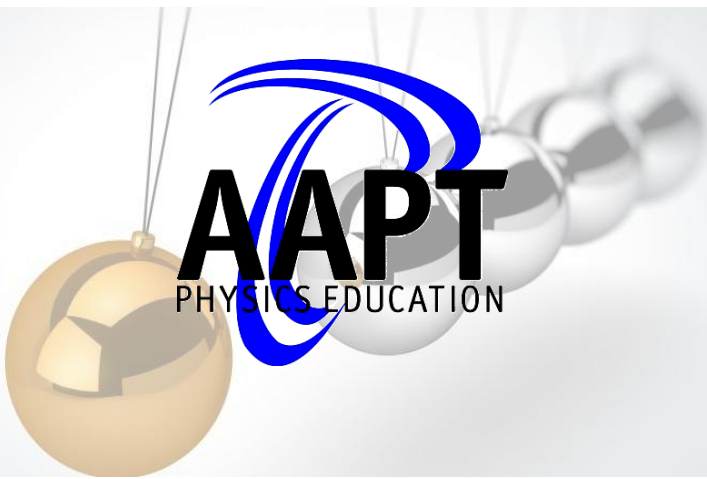


**NJAAPT**

**New Jersey  
American Association  
of Physics Teachers**



**Spring 2017  
Section Meeting  
March 17-18, 2017  
Princeton University**

# *Welcome to the New Jersey AAPT Spring Section Meeting!*

The title and focus of the 2017 section meeting is “*New Approaches in Physics Education*”.

The Friday night dinner meeting will feature a speaker on a current topic: Gravitational Waves.

The Saturday meeting speakers will discuss some new ideas in Physics instruction including: Modeling Physics, Standards-Based Grading, and Physics First. A “Cracker-Barrel”-type discussion will be open for teachers to discuss particularly challenging topics to teach in a Physics classroom.

Special thanks to Geoffrey Gettelfinger from Princeton University for his help and the use of Princeton facilities. Thanks also to the Executive Board for all of their planning efforts, to Jessie Blair for coordinating the catering arrangements.

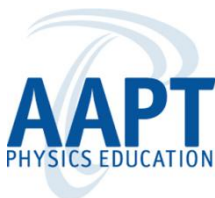
We especially thank our guest speakers, who have taken time out of their busy schedules to be here.

We hope that you will find the meeting informative and enjoyable, and we look forward to seeing you at future events.

# *NJAAPT* *EXECUTIVE BOARD*

<i>Jim Ferrara</i>	President
<i>John Valente</i>	Vice-President
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*Yitzhak Sharon*  
*Jim Signorelli*  
*Justin Son*  
*Joseph Spaccavento*  
*Rich Urban*



# **SCHEDULE of EVENTS**

**Friday March 17, 2017**

**Jadwin Hall**

5:00 – 6:00 p.m. Registration,  
Wine and Cheese Reception

6:00 – 7:00 p.m. Dinner -- Buffet style in the  
Joseph Henry Room

7:00 – 8:30 p.m. **Kent Yagi**  
Princeton University  
*“Gravitational Waves – A New  
Messenger of the Universe”*

# *SCHEDULE of EVENTS*

Saturday March 18, 2017

McDonnell Hall

- 8:00 – 9:00 a.m. Registration,  
Coffee, Tea, Bagels
- 9:00 – 9:15 a.m. Introduction and Welcome:  
**Jim Ferrara**  
President NJAAPT
- 9:15 – 10:15 a.m. **Craig Buszka**  
Montgomery High School  
*“Doing Good Things: Modeling  
Physics in Room E-2314”*
- 10:15–10:30 p.m. Break
- 10:30-11:00 Section Meeting (vote on revisions  
to Constitution and By-Laws).
- 11:00-12:00 p.m. **Frank Noschese**  
John Jay High School  
Lewiston, NY  
*“Standards-Based Grading Strategies”*

- 12:00-1:00                      Lunch in the Brush Gallery
- 1:00 – 2:00 p.m.              **John Roeder**  
The Calhoun School, NYC.  
*“The State of Physics First”*
- 2:00-2:15 p.m.                Break
- 2:15– 3:30 p.m.                Cracker Barrel Discussion  
*“Difficult topics in Physics Teaching”*

# Kent Yagi

Princeton University  
Princeton, NJ

*“Gravitational Waves – A New  
Messenger in the Universe”*



Dr. Kent Yagi received his B.S., M.S., and PhD in Physics from Kyoto University, where he was also a student leader in the Theoretical Astrophysics Group. He was a Postdoctoral Research Associate at the University of Montana, where he received the “Outstanding Technical Staff Award”. Kent is currently a Postdoctoral Research Scholar at Princeton University.

Kent’s main interest is to probe fundamental physics, such as gravitational and nuclear physics and cosmology, with gravitational wave and electromagnetic wave observations. His primary interests include: strong-field tests of general

relativity; gravitational waveform modeling; nuclear astrophysics; and gravitational wave cosmology.

## **Gravitational Waves – A New Messenger of the Universe**

What is the origin of gravity that we feel every day?

Newtonian gravity that we learn at high schools does not answer this question. General Relativity, proposed by Einstein almost 100 years ago, says gravity is nothing but the curvature of spacetime. For example, Earth moves around the Sun due to gravity, but it is just following the curvature of spacetime created by the Sun. What is even more interesting is that when an object moves around, it creates ripples of spacetime that propagate, called gravitational waves. The amplitude of such waves is extremely small, but the advanced Laser Interferometer Gravitational-Wave Observatory (aLIGO) in Hanford and Livingston finally detected these waves in 2015. This historical discovery brought a new messenger on top of electromagnetic waves, which allows us to probe further the mystery of our Universe.

I will give an overview of the first observing run of aLIGO and explain how fascinating the detection is, how amazing the gravitational events are, and what interesting physics we learn from them. I will end my talk by describing future prospects of gravitational wave astronomy.



## Craig Buszka

Montgomery High School  
Skillman, NJ

*“Doing Good Things:  
Modeling Physics in Room E-2314”*



Craig Buszka has been teaching physics for fifteen years at Montgomery High School in Skillman, NJ. He earned a BA Chemistry from Cornell, and M.Ed. in Science Education from Rutgers. His first experience with Modeling Physics was in 2004, during a four-week workshop with the Modeling Instruction Program at Arizona State University. He is member of the Board of Directors of STEMTeachersNYC, a non-profit that organizes professional development workshops for teachers. Craig has been an adjunct with the Physics department at The College of New Jersey since 2015.

**Doing Good Things:**  
**Modeling Physics in Room E-2314**

Modeling Physics is a pedagogy that helps students learn and do science by making and using models to describe phenomena. The discussion will include descriptions of activities used in a Modeling learning cycle, examples of student work, and practical steps to raise the level of student discourse in the classroom.

Links to Modeling resources:

ASU Modeling Instruction: <http://modeling.asu.edu/>

American Modeling Teachers Association:  
<http://modelinginstruction.org/>

For information and workshops by STEMteachersNYC,  
go to: [stemteachersnyc.org](http://stemteachersnyc.org)

# **NOTES**

# Frank Noschese

John Jay High School  
Cross River, NY

*“Standards-Based Grading Strategies”*



Frank Noschese (pronounced “*no-SKAY-zee*”) received a B.S. in Physics and M.A. in Teaching, both from Cornell University. He has been a Physics and Chemistry teacher at John Jay HS in Cross River, NY, from 1998-present. He received National Board Certification (NBCT) in 2010, and received the Presidential Award for Excellence in Math and Science Teaching (PAEMST) in 2011. He is a New York State Master Teacher, and a member of AAPT and AMTA (American Modeling Teachers Association). Frank maintains a blog, is active on Twitter, and has been featured in many new articles and videos about Physics teaching. (TEDxNYED April 28, 2012, on You Tube).

In his own words: “My educational philosophy is that students learn best when they are actively engaged in physics through activities such as reading, discussing,

experimenting, and solving problems. My role is to create more experiences in which my students construct their own understanding of physics and how our universe works. I use a mixture of low-tech and high-tech in class — whichever is pedagogically appropriate. I am a proponent of Modeling Instruction, the Matter and Interactions curriculum, and Standards-Based Grading.”

“While I hate the phrase ‘Action-Reaction’ when used to explain Newton’s 3rd Law, I find it a rather suitable title for a blog about reflections on teaching physics. “  
( <https://fnoschese.wordpress.com/> )

### **Standards-Based Grading Strategies**

Standards-Based Grading (SBG) is a method of assessment and reporting that is framed around learning objectives rather than individual assignments. Instead of receiving a traditional letter or number grade on an assessment, SBG allows teachers to provide students with actionable feedback on their mastery of a set of specific skills and content knowledge. With SBG, conversations become more focused on learning itself rather than report card grades.

Participants are encouraged to bring an assessment (quiz, test, lab report, project, etc) from their own class to use to model how to develop learning targets and scoring systems.

# **NOTES**

# John Roeder

The Calhoun School  
New York City, NY

*“The State of Physics First”*



Teaching physics at The Calhoun School in New York City since 1973 and serving as a Physics Teaching Resource Agent (PTRA) since 1985, John Roeder became a Physics First teacher after hearing Paul Hewitt explain to the PTRAs at the 1989 AAPT Summer Meeting how his high school adaptation of *Conceptual Physics* could be used to teach physics to ninth graders. This is when students should learn physics, Hewitt stressed, because it is the most fundamental science. Chemistry, which is built on physics, should be taught in the tenth grade, followed by biology in the eleventh, because biology is now so dependent on chemistry. After beginning his teaching of Physics First, with Hewitt’s *Conceptual Physics*, in the fall of 1990, he switched to *Active Physics* in 1994 and has been using it ever since.

## **The State of Physics First:**

My teaching career underwent a major change when Paul Hewitt introduced me to teaching physics to ninth graders (“Physics First”) in 1989. I will relate how my teaching Physics First has evolved since and what I have learned about other ways other people are teaching it. If you are interested in implementing Physics First at your school, I have some comments on that, too.

AAPT Statement on Physics First:

<https://www.aapt.org/Resources/policy/physicsfirst.cfm>

AAPT Resources on Physics First:

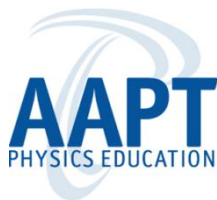
<https://www.aapt.org/Resources/physicsfirst.cfm>

A TIME for Physics First:

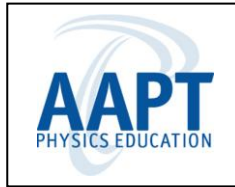
<http://physicsfirstmo.org/>



# *NOTES*



# NJAAPT



[www.njaapt.org](http://www.njaapt.org)

