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CIPT workshop supports community of teachers with research, resources

By Julian Montijo

Nearly 50 high school physics teachers from across New York state and the Northeast gathered at the Cornell Laboratory for Accelerator-based Sciences and Education (CLASSE) Institute for Physics Teachers (CIPT) fall workshop, "Particle Physics and the Higgs Boson," Oct. 27.

The day included tours of facilities, a lecture on the Higgs Boson particle by Maxim Perelstein, associate professor of physics, who sponsored the event through a National Science Foundation (NSF) CAREER award, and two lab activities that teachers can take back to their classrooms.

"Professor Perelstein's presentation helped to clarify my understanding of how physicists use accelerators such as the [Large Hadron Collider] to explore fundamental particles and forces," said Sean Daugherty, a teacher at Newark Valley High School. "His analogy of smashing billiard balls together and producing an elephant (briefly) is one which I will use with my students to help their understanding."

Andy Hain, a physics and chemistry teacher at Campbell-Savona Central School, has been attending CIPT workshops since the program started in 2002. His students are curious about the items in physics and chemistry that go beyond what is needed to know for the Regents exams, he said. "Such things as what particle accelerators do, what is string theory, what is dark matter ... all of these topics have been covered at workshops I have attended at Cornell."

The two lab activities dealt with light-emitting diodes (LEDs) and measuring the speed of light. The LED lab, conducted by New York City physics teacher Howard Spergel '78, had teachers working in teams to



Robert Barker/University Photography

Alton Dunn, a teacher at Laurens Central School District, works on an LED lab activity during the CLASSE Institute for Physics Teachers workshop, Oct. 27.



Lora Hine/CLASSE

Teachers Joe Powers and Robert Morris work on a lab activity.

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measure the electrical energy lost and frequency of light emitted by variously colored LEDs.

The speed of light lab, run by Whitney Point physics teacher Walter Peck, involved mirrors and using optics and electronic components such as a laser, beam splitter, photodiode and a Fresnel lens to measure extremely short time intervals using an oscilloscope. Teams of teachers worked together to troubleshoot issues that might occur in a classroom setting.

Many of the labs are offered by the CIPT Lending Library, a database of more than 40 lab kits and equipment that teachers can borrow. The labs are designed to be applicable to issues in society and relevant to high school physics and chemistry curricula in New York state.

"Small schools cannot afford to buy expensive lab materials, which is one of the reasons CIPT is so valuable to physics teachers," said Jeanne Raish, a physics and chemistry teacher in Avoca, N.Y. "The labs are great hands-on and minds-on activities that I can share with my students." The LED lab, she continued, will allow her students to explore the relationship between energy, frequency and Planck's constant -- especially timely given the 50th anniversary of the invention of the LED this year.

"Since its inception, CIPT has been an incredibly successful program," said Lora Hine, director of educational programs at CLASSE. "We at CLASSE want to see it live on in the capacity that we're able to support it. Our goal is to uphold the mission of CIPT by updating teachers on advances in science, providing educators with the equipment they need for rigorous laboratory investigations, and encouraging teachers to utilize CLASSE as a resource for student inquiry and discovery."

The transition to CLASSE assuming stewardship of the CIPT Lending Library and periodic teacher training institutes, following the end of CIPT's NSF funding period in 2011, was overseen and supported by Robert Buhrman, senior vice provost for research at Cornell and founder of CIPT.

Xraise, the outreach program within CLASSE, will sustain CIPT as part of its regular slate of outreach activities. The next workshop is in April 2013.

Julian Montijo '15 is a writer intern for the Cornell Chronicle.

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