

From the Section Chair

Greetings! Thank you for your support of the New York State Section of APS. This newsletter will keep you informed on what your state section of APS has been doing lately. The New York State Sections (NYSS) of the APS has been striving to advance the exposure of cutting edge research in physics and related fields around the state and nearby. One of our key features is to host two topical symposia each year in order to allow academics, researchers, industrial scientists, educators, and students of all levels to learn and engage with each other. Each symposia features a poster session to showcase work in any field by students at all levels, from high school, undergraduate and graduate students. Cash awards are given to those posters judged as the best of the symposium. In addition to our symposia, the NYSS provides grant money to support physics outreach to K-12 or a public audience. Please read more about these opportunities on our website.

During the last calendar year, we held a symposium on “Physics of Artificial Intelligence” at IBM in Yorktown Heights and “Physics of Optical Materials” at Corning Museum of Glass in Corning. Tours of both facilities were an excellent way to see physics in industry. We also had Andrew Dotson from his Youtube physics channel give a talk on his unorthodox outreach. We thank every invited speaker for their talks that makes our symposia a great experience.



Ken Podolak (chair), outside of the Corning Museum of Glass, is ready for our fall 2019 symposium.

I am pleased to tell you that our membership remains strong. The NYSS is currently the second largest section in the APS, boasting 5.1% of the total membership. So, although this means that roughly 2800 people are members, there are still a lot of APS members living and/or working in New York state that are not members of our section. Membership to the section is FREE! You can add NYSS as a unit when you renew your APS membership or choose to click on the “Join a Unit” link on our section website (aps.org/membership/services). If you or your colleagues are not currently members, please take the time to look into joining. The amount of financial support we receive from APS is directly related to our membership, and this is how we are able to fund the symposia at low cost to the attendees with travel support for students and fund up to \$8000 annually for outreach grants. So, please join today!

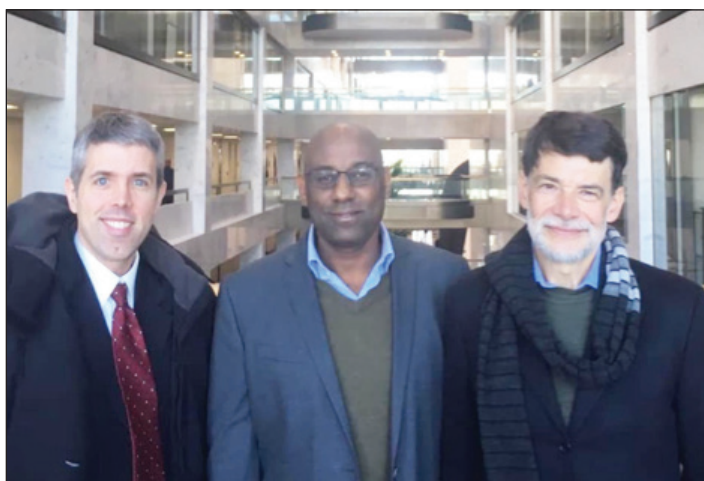
Our executive team makes all of this possible. You may recognize some of these members. These members are Ken Podolak (chair, SUNY Plattsburgh), Samuel Amanuel (vice-chair, Union College), Gianfranco Vidali (secretary/treasurer, Syracuse University), Eric Cotts (Binghamton University), Abram Falk (IBM), Joel Giedt (RPI), Brandon Hoffman (Houghton College), Zak Robinson (SUNY Brockport), Carl



Executive committee members at a recent meeting. Left to right: Gianfranco Vidali, Susan DiFranzo and Erica Simoson.

APS Leadership Convocation and Congressional Visits Day: January 2019

APS leaders gathered on January 31st for APS Leadership Convocation and Congressional Visits Day. Executive members from the NY State section, see photo, had the chance to meet with other unit leaders, learn about current and upcoming programs at APS, and participate in advocacy efforts in support of science. Congressional Visits Day discussions ranged from research funding to the need for reform of the visa system to ensure scientific mobility. We are proud to support the NY State physics community.



Ken Podolak (Chair, SUNY Plattsburgh), Samuel Amanuel (Vice-Chair, Union), and Gianfranco Vidali (Secretary/Treasurer, Syracuse), advocating for APS issues on Capitol Hill.

Physics Outreach Grants are Available

The physics community is eager and willing to share our passion with others. The children of tomorrow should have outlets to sate their ravenous curiosity for the world, and we fully support programs that can help guide these infantile minds to the knowledge that will help them succeed. The NYSS-APS offers grants to projects bringing physics-related learning experiences to the general public, especially to K-12 students. Particularly, we encourage proposals that support the advancement of underrepresented groups in the sciences, mathematics and engineering. We want to create a scientific space where all groups are represented and heard, and where we can advance our knowledge together, as one people. Grants can be up to a maximum of \$2,000, and are due one week before the semi-annual Executive Committee meetings. The estimated funding rate is approximately 70%. For further information, visit the APS webpage at aps.org/units/nyss/outreach/index.cfm.

Outreach Grants

Long Island Science Center (LISC)

In November 2017, the Long Island Science Center offered three physics educational programs to a group of 4th grade students from an impoverished location. The programs hoped to spark interest in 270 young girls and boys by offering four areas of study: force, motion and friction, electricity and magnetism, and applied physics. By exposing physics to young students, the LISC hoped to inspire and nurture important skills for later on in life, like critical thinking, communication, problem-solving, collaboration and creativity.

Nanoscience Lab Tour at St. John's University

The Outreach grant from APS NYSS sponsored the event of "nanoscience lab tour" located at Department of Physics, St. John's University, during Spring 2018 semester. With the support, we purchased supplies, food and local transportation passes for the participants. The nanoscience lab tour last about six hours during one Saturday, which included activities such as a short workshop on nanoscience, a solar cell fabrication demo by undergraduate students, SEM imaging, absorption spectra measurement, and solar cell toolkit assembly by the participants. The participants were K-12 teachers and students (16 in total) from local high school. (St. Francis Prep) The activities educated the K-12 students and teachers of the important and recent progress in the nanoscience through demonstration and real hands-on practices and expectedly increased their interest in physics and science in general. All participants received a certificate of Nanoscience Lab Training at the end of the event.

Microclimates and Toxic/Flammable Chemical Drift

This pilot study investigated the localized climate surrounding the railroad tracks that traverse Plattsburgh, NY. Sensor boxes were placed along the train tracks and reported back their data via text messaging. The study focused on the specific conditions (terrain and weather) where the railroad tracks pass through downtown Plattsburgh and developing a detailed model for possible chemical spills. The models can then be used by urban planners to plan for mitigation of for what might happen if a spill or train derailment were to happen. The community was encouraged to watch the data posted on our website by giving a Science30 talk on the subject. Science30 is an outreach series of seminars held in the community. We are also in talks with one of the city board about the study to get more community exposure for the study.

Bringing Physics to Harlem's Underprivileged Youth

In September 2015, the City College of New York (CCNY) obtained funding for cutting-edge physics demonstrations in one of the United States' most infamously poverty-stricken neighborhoods. In this area, a lack of funding and neglect towards physics in school curricula has created a void, and this outreach project, headed by undergraduate and graduate Physics Clubs, hoped to fill it, at least as much as possible. They used modern technology to perform demonstrations explaining various physical phenomena, sparking the passion of science in this science-starved community.

Oneonta Sparking New Attitudes in Physics (O-SNAP!)

In April 2015, a team from SUNY Oneonta composed of physics and engineering students visited middle schools all across Upstate New York in order to inspire a new generation of scientists, especially in underrepresented groups. Their all female team, consisting of five undergraduates, Bridget Bolland, Erica Corbin, Bridget Chartrand, Kimmy Kushman and Lyteshia Price, did wonders to encourage burgeoning young girls, who once might not have thought that they had a place in the scientific world. This team performed "make and take" activities, where they help their students create or perform their own experiments, which the students are allowed to take home with them and show off to their parents, furthering their scientific curiosity.



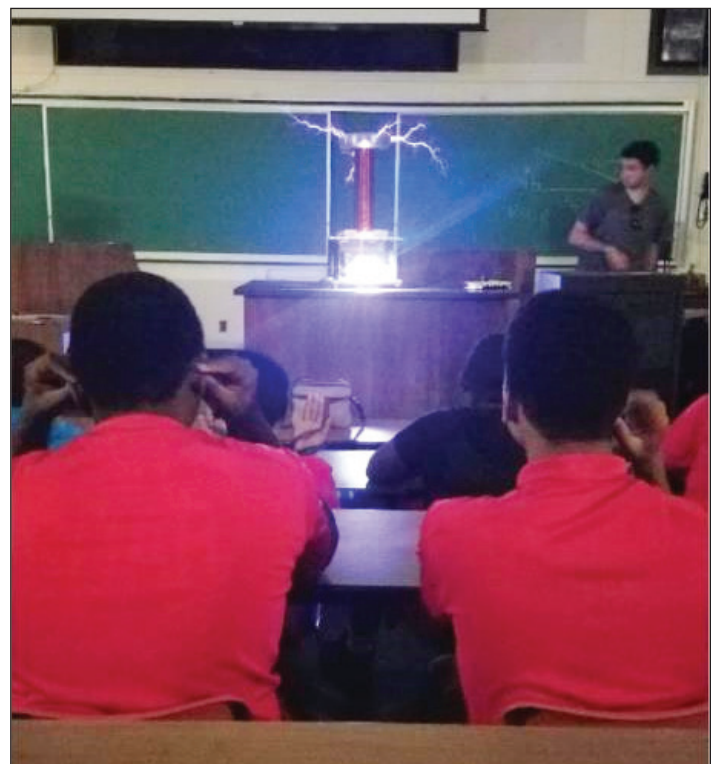
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Ventrice (SUNY Poly. Inst.), Christopher Bass (Le Moyne College), Pratik Dholabhai (RIT), Susie DiFranzo (Hudson Valley CC), Gen Long (St. John's U.), Erica Simoson (SUNY Fredonia), and Rajesh Vaddi (Corning). A special thank you goes to past chair Erica Simoson for her work as chair the past two years and for her support of my current role as chair starting in the summer of 2019.

Lastly, thank you for our existing members who generously devote their time to our section by joining the section and coming to meetings. If you have any questions, comments, or concerns, please do not hesitate to reach out (kpodo001@plattsburgh.edu).

I hope to see you at our next meeting.

Sincerely,
Ken Podolak
State University of New York at Plattsburgh



Past Section Meetings from 2019

Fall 2019 Topical Symposium at the Corning Museum of Glass

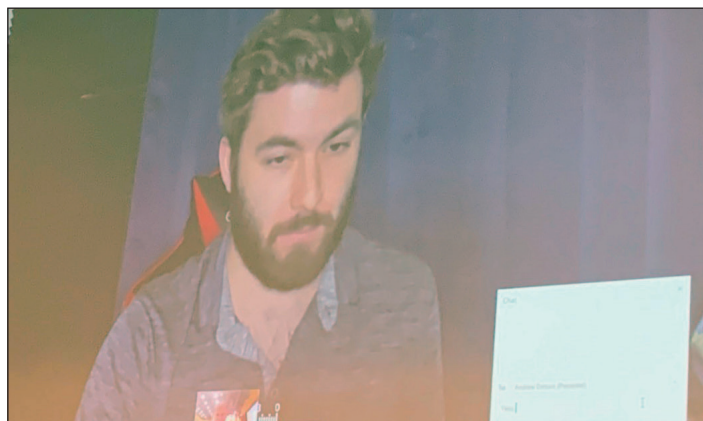
Our 121st Topical Symposium took place on Friday, November 8th, 2019, at the Corning Museum of Glass in Corning, New York. The meeting's theme was the "Physics of Optical Materials," and featured talks by nine different specialists from around New York State, including three scientists from Corning Inc. itself. Some of the topics discussed during the meeting were scratch resistant surfaces (glass), optical fibers, and unique optical materials. Speakers included Dr. Shandon Hart, Dr. Stuart Gray, Dr. Riley Freeland from Corning Research and Development. From outside of Corning speakers included Dr. Francesco Monticone from Cornell, Dr. Bonggu Shim from Binghamton, Dr. Yiquan Wu from Alfred, and Dr. James Zavislan from Univ. Rochester. Mr. Andrew Dotson also gave a talk via live video on his unorthodox approach to science communication.

There was a glass show demonstration followed by a poster session. Of the 14 posters, three were selected as outstanding posters. It was inspiring to see such great research by students across our state. Dr. Karl Koch gave the Keynote Address on the path through applied optical physics which was very well received by all in the audience.

We are so grateful that Corning was able to host this symposium. Many executives made this possible including Dr. Charles Craig. We also thank Dr. Rajesh Vaddi for being our local organizer and his work that made this conference possible.



Glass Demonstration at the Corning Museum of Glass



Live video lecture from Mr. Andrew Dotson (Youtube outreach)



Keynote speaker Dr. Karl Koch



Best Poster Presenters from Corning Symposium

Spring 2019 Topical Symposium at IBM

The 120th Topical Symposium of the APS New York State Section took place on April 26th, 2019, at the IBM TJ Watson Research Center, in Yorktown Heights, New York. The theme for this meeting, organized by Abram Falk of IBM, was the “Physics of Artificial Intelligence,” and featured nine talks by esteemed professionals in the field. The meeting explored new types of electronic and optical devices that could underlie the next artificial intelligence (AI) revolution.

Of the nine talks, two talks were conducted by IBM Research, two talks by scientists at MIT, and the rest were performed by experts from SUNY Polytechnic Institute, Georgia Institute of Technology, Rensselaer Polytechnic Institute, and Harvard University. They discussed such topics as, “Training Deep Neural Networks with Analog Hardware,” courtesy of Dr. Tayfun Gokmen of IBM Research, and “Machine Learning Studies of Magnetic Two-Dimensional Materials,” as explained by Dr. Trevor David Rhone of Harvard. Moreover, members of the *Physical Review B* and the *Physical Review Letters*, Sarma Kancharla and Alessandro Villar, gave a talk on the “Physics of AI.”

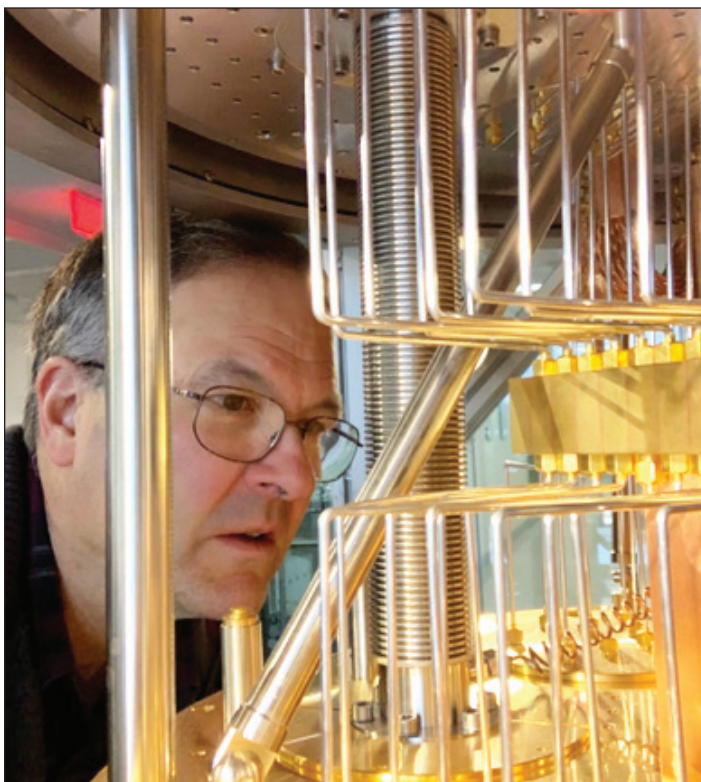
The poster session featured 19 unique projects across New York State. The quality and breadth of the projects were outstanding. We thank our gracious hosts at IBM labs and hope to revisit them in the future.



The spring 2019 Topical NY State Symposium at was held at IBM Yorktown Heights.



A view from the audience during one of the talks during the symposium.



Section member Eric J Cotts ponders IBM's 50-qubit machine while at the recent NYS AI symposium.



Poster winners at IBM with Carl Ventrice (left).