

**Final Report for DE-SC0017598, “Funding Proposal for EDISON’20 Conference
Buffalo, New York, 07/17 - 07/21, 2017”**

Overview

EDISON’20 – *The 20th International Conference on Electron Dynamics in Semiconductors, Optoelectronics and Nanostructures* – was held at the Hyatt Regency Hotel, Buffalo, NY from July 17 – 21, 2017 (the conference webpage can be found at: <http://www.buffalo.edu/edison20.html>.) The technical focus of this conference was on the fundamental physics and applications of nonequilibrium classical and quantum carrier dynamics in semiconductors, optoelectronic devices, and nanostructures. This five-day, single-session conference featured a program consisting of some 15 invited talks, given by internationally-renowned academics from the U.S., Europe, and Japan. Their keynote presentations covered topics including: terahertz phenomena in semiconductors; quantum transport in novel two-dimensional semiconductors; topological insulators; mesoscopic phenomena in semiconductors, and; semiconductor spintronics. The invited papers were supplemented by some 30 contributed talks, selected from almost 120 abstracts submitted in response to the conference’s call for papers, and by two poster sessions that each consisted of close to 40 different reports. This critical mass in terms of scientific content ensured a highly vibrant conference, in which leaders in the field had the opportunity to interact closely with early-career scientists.

DOE support for EDISON’20 was provided through a \$5K award that was used for two purposes; the first being to support a one-day satellite workshop for early-career researchers that provided them with the opportunity to meet, and interact, with some of the keynote speakers from the EDISON conference (further details are given below). Secondly, a portion of the funds was used to cover the cost (\$1248) of the conference proceedings in the Journal of Physics: Conference Series. The proceedings can be found at: <http://iopscience.iop.org/issue/1742-6596/906/1>, where they are available in open-access format.

Some Details About EDISON’20

EDISON’20 was a five-day, single-session conference that featured a program consisting of some 15 invited talks, given by internationally-renowned academics from the U.S., Europe, and Japan. It was supplemented by a one-day workshop held for early-career scientists, on the campus of the University at Buffalo on Saturday, July 22nd. More than 150 participants registered for the conference, with 40 of those registrations coming from student participants. Geographically, the conference attracted a wide audience, with nearly 60 participants coming from the US, 40 from Europe, and, for the first time, eight registered participants from China. Overall, this total doubled the number of participants over the last time that the conference was held in the US (EDISON’17, Santa Barbara, 2011), on which basis the conference can be deemed to have been a great success.

An important aspect of EDISON’20 was the inclusion of a one-day satellite workshop, entitled “*Student Research Symposium: Reflections on Life at the Forefront of Nanotechnology*”. The primary objective of this workshop was to give early-career scientists, primarily graduate students, a chance to interact directly with international leaders in the field, and to hear the particular life experiences of these scholars. In this way, the aim was to give the students some sense of what

is required to succeed in a career in academia, and to learn early on how they can begin to make this possibility a reality. The agenda for the workshop was as follows:

09.00 – 09.15: Opening Remarks (Jonathan Bird)

09.15 – 10.00: Junichiro Kono, Rice University
Toward Single Crystals of Carbon Nanotubes

10.00 – 10.45: David Ferry, Arizona State University
Moore's Law, Post-CMOS, 2D Materials, and All That Chaos

10.45 – 11.15: Coffee Break

11.15 – 12.00: Irena Knezevic, University of Wisconsin Madison
Breaking News: Scientists are Human!

12.00 – 12.45: Robin Nicholas, University of Oxford, UK
Nanotubes, graphene and perovskites: building blocks for a new generation of photovoltaics

12.45 – 13.45: Lunch with the Speakers

13.45 – 14.30: Keshav Dani, Okinawa Institute of Technology, Japan
Filming electrons in the nano-world with femto-light!

14.30 – 15.00: Coffee break

15.00 – 16.30: Poster Session & Award Ceremony

16.30: Closing Remarks

As will be apparent from the agenda above, an important goal of this workshop was to give students maximum opportunity to interact with the expert speakers. The “Lunch with the Speakers” session consisted of a brownbag lunch in which the invited speakers were distributed among different tables of students, rather than being given the usual chance to “huddle” together. Feedback from both the students and the speakers suggested that this turned out to be a particularly fruitful interaction. Following the conclusion of the invited talks, a poster session was held, featuring student submissions that were judged collectively by the invited speakers. Some 30 posters were submitted for this event, with the top three being highlighted by the review panel. More than 35 students, mostly from UB but also from other universities, attended this event, which provided them with a unique enrichment opportunity that they would not normally have access to.

Breakdown of Expenditures

As noted already, some \$1.25K of the \$5K budget was used to cover the cost of the open-access proceedings for the conference. The remaining balance was then applied to cover the costs associated with the student workshop.