



NATIONAL ACADEMY OF ENGINEERING

NSF/NAE-Sponsored ECE Department Heads Workshop

## **Combating Climate Change: Can it also help the ECE Renaissance?**

**April 19-20, 2019 [University of Minnesota](#),  
Minneapolis, MN**

### **Workshop Objective:**

Discuss a course that can be taught by high school teachers to promote awareness of climate change. Given that many of the solutions are ECE-oriented, it becomes a pipeline to electrical engineering programs in which enrollments are declining nationwide.

### Friday, April 19<sup>th</sup>

- 7:00-8:00 Registration and breakfast
- 8:00-9:15 Welcome Session and Importance of EE and STEM  
Dr. Mos Kaveh – Dean of the College of Science and Engineering, University of Minnesota  
Dr. Randy Victora – Head, Department of Electrical and Computer Engineering, University of Minnesota  
Dr. Anil Pahwa – Program Director, National Science Foundation (NSF)  
Dr. Guru Madhavan – Director of Programs, National Academy of Engineering  
Mr. Lynn Petersen – Program Officer, Office of Naval Research (ONR)
- 9:15-10:00 Climate Change: Modeling and Predictions - Dr. Gavin Schmidt, Director of NASA's Goddard Institute for Space Studies (recorded video)
- 10:00-10:30 Coffee Break/Networking
- 10:30-11:00 Mission of the Workshop and the Outline of a pipeline course developed (<http://z.umn.edu/ee1701>) at the University of Minnesota – Ned Mohan, University of Minnesota
- 11:00-11:15 Opportunity to increase female enrollments in EE - Prof. Elsa Garmire, Dartmouth College
- 11:15-11:30 Teaching Climate Change in Academic Health Center (<https://www.health.umn.edu/about>) at the University of Minnesota – Dr. Teddie M. Potter, University of Minnesota

- 11:30-12:00 Challenges in introducing a new course in high schools – John Olson, Science Content Specialist, Minnesota Department of Education
- 12:00-1:30 Lunch (provided); Luncheon Talk: “Science alone cannot stop climate change – human attitudes must change” by Prof. Edgar Hertwich, Yale University
- 1:30-2:30 Breakout Sessions: discussion in small groups by ECE Department Heads regarding designing such a course that their universities can promote in local high schools
- 2:30-3:30 Reports by various groups and general discussion for concrete action
- 3:30-4:00 Coffee Break/Networking
- 4:00-5:30 Challenges and Plans in Combating Climate Change
- 1) Pathways toward 100% Carbon-free by 2050, the Opportunities for Engineering Education – Mark Ahlstrom, VP – NextEra Analytics and Energy Systems Integration Group
  - 2) Latest EV market developments, future predictions and an understanding of the opportunities that plug-in vehicles provide - Jukka Kukkonen, EV market, and business solutions consultant
  - 3) Xcel Energy’s Carbon Vision – 80% lower carbon by 2030, 100% carbon-free by 2050 – and supporting analysis - Nicholas Martin, Xcel Energy, Manager: Environmental Policy
  - 4) Present and future plans by the IEEE-PES - Prof. Edvina Uzunovic, WPI, 2019 IEEE PES Vice President - Educational Activities
- 5:30-7:00 Networking: Cash Bar + **Heavy** Appetizers

#### Saturday, April 20<sup>th</sup>

- 8:00-12:00
- 1) Hands-on demos of the hardware experiments developed for an introductory course on this subject.
  - 2) Hands-on demos of the controller (<https://www.sciamble.com/>), developed by the ONR funding which is an order of magnitude cheaper than the present solutions and can be extremely useful in evolving experiments for this introductory course. It is being used in our senior and graduate-level power electronics and motor-drives labs.

#### **Accommodation:**

- A block of rooms has been reserved at the [Graduate Hotel](#), which is connected to the event venue. **Our grant will cover two-nights of lodging of the ECE Department Heads and the Designated faculty.** Participants are responsible for making their

reservation with the hotel. We will supply names of the eligible faculty to the hotel, so they are not charged for these two nights of lodging.

**Registration:** The Registration Fee is \$195  
through [https://nsf\\_depthhead2019.eventbrite.com](https://nsf_depthhead2019.eventbrite.com)

**Contact:** Prof. Ned Mohan ([mohan@umn.edu](mailto:mohan@umn.edu)) or Jeanine Maiden ([maiden@umn.edu](mailto:maiden@umn.edu))

**Location:** U of M campus in Minneapolis (<http://mac-events.org/rooms/memorial.html>)

**Transit from the MSP airport to the hotel by the Light Rail Line:** The train stop is only a short distance from the hotel and the workshop venue. Otherwise, Taxi.