



# Heliostat Consortium Seminar Series

Brought to you by the Resource, Training, and Education (RTE) topic area



## Abstract:

In this seminar I want to relate our experience introducing concentrating solar power technology (CSP) into the engineering curriculum at Northeastern University. This experience is based on the efforts of developing vehicles for introducing CSP into the graduate Mechanical Engineering program by myself and the PIs, Profs. Metghalchi and Levendis, which is supported by the NREL Heliocon grants. This activity includes developing a graduate course, practical based short courses, Senior design projects and projects into numerous related courses. The challenges in introducing CSP technology into the engineering curriculum revolve around its interdisciplinary requirements and of integrating engineering disciplines into the analysis. Topics such as geometric optics which are critical to CSP analysis are not usually in the student's background. Students also have not usually been asked to integrate different physical phenomena such as convection and radiation in system level simulation involving heat exchangers and high temperature material considerations. Simulations with respect to time involving operating CSP systems and required in energy storage analysis are challenging for the students. At Northeastern University we have used both the Senior design course projects related to CSP technology and an initial offering of a CSP graduate level course to learn more on how to approach these challenges. Including courses in robotics and mechatronics control theory as well as a business finance course we are able to introduce a large number of students to this exciting CSP technology in terms of their field of interest. While in the initial stages of offering these courses, we have learned many of the challenges in this endeavor that we want to share with the CSP community.

## Bio:

Gregory J. Kowalski received his Ph.D. in Mechanical Engineering from the University of Wisconsin-Madison, is an Emeritus faculty member in the Department of Mechanical and Industrial Engineering at Northeastern University in Boston, Massachusetts, was an ABET program evaluator for Mechanical Engineering programs and is a Fellow of ASME. He is active in thermodynamic and heat transfer research in nanoscale calorimetry using photonic sensors as well as thermal modeling of laser beam propagation in medical materials for improving imaging techniques. His energy systems research includes developing tools for analyzing CSP and tri-generation system and their integration with renewable energy system, solar desalination and integrating second law measures in the sustainability measure and energy system design processes. He developed and directed the College of Engineering graduate program in Energy System Integration until 2016 and the Capstone Design program from 1999-2019.

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**Host:** Dr. Brooke  
Stanislowski

**Title:** Introducing  
Concentrating Solar  
Power Technologies to  
the Northeastern  
University Engineering  
Curriculum

**When:** Nov 20<sup>th</sup>  
1-2 PM MT

**Zoom:**  
<https://nrel.zoomgov.com/j/1609978183>