

# PROMETHEUS: Aimpoint Optimization Using Real-Time Conditions Seminar

October 15, 2025  
1 PM MT / 3 PM ET



**Dr. Mike Wagner**

**Charles Ringrose Assistant Professor of Mechanical Engineering, University of Wisconsin-Madison**

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

## BIO

Dr. Mike Wagner is the Charles Ringrose Assistant Professor of Mechanical Engineering at the University of Wisconsin-Madison. He leads research on the optimal design and operation of sustainable energy and energy storage technologies. Dr. Wagner is the principal investigator of the Energy Systems Optimization Lab, a faculty member of the Solar Energy Lab, and a faculty affiliate of both the Department of Nuclear Engineering & Engineering Physics and the Wisconsin Electric Machines and Power Electronics Consortium. His research interests encompass systems design, dynamic performance modeling, and operations optimization for sustainable energy generation and storage technologies. His application areas include solar thermal, nuclear, buildings, and microgrids. Before joining UW-Madison in 2020, Dr. Wagner spent 12 years as a Senior Researcher in the Thermal Systems group at the National Renewable Energy Lab in Golden, Colorado. He holds Bachelor's and Master's degrees from the University of Wisconsin-Madison and earned his PhD from the Colorado School of Mines in 2017, where he also received the Rath Award. Dr. Wagner is a recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE).

## ABSTRACT

This seminar presents recent developments from the PROMETHEUS project, which focuses on predictive and optimized control of heliostat flux aiming strategies in concentrating solar power systems. The project integrates real-time data sources including fisheye cameras, satellite imagery, and distributed smart sensors within the SolarPILOT and HALOS modeling tools to dynamically adjust heliostat aimpoints. Optimization strategies are computed overnight accounting for spatial soiling distributions, heliostat availability, and receiver degradation. During operation, real-time corrections incorporate solar nowcasting via convolutional neural networks and TinyML-based sensor networks to improve flux distribution and reduce receiver fatigue. Results achieved to date focus on the application of nowcasting to spatial DNI, the implementation of stochastic soiling and availability models, and the integration of performance characteristics in SolarPILOT.

Lab webpage: <https://esolab.engr.wisc.edu>

Faculty profile: [https://directory.engr.wisc.edu/me/Faculty/Wagner\\_Michael/](https://directory.engr.wisc.edu/me/Faculty/Wagner_Michael/)

Email: [mike.wagner@wisc.edu](mailto:mike.wagner@wisc.edu)



U.S. Department of Energy

**HelioCon**

Heliostat Consortium for  
Concentrating Solar-Thermal Power

HelioStat Consortium Seminar series hosts:  
Dr. Brooke Stanislawski, Dr. Ulrike Egerer

Register on Zoom: <http://bit.ly/4pHwLls>