



HelioStat Consortium Seminar Series

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



Dr. Matthew Muller
Research Engineer,
National Renewable
Energy Laboratory
(NREL)

Host: Dr. Brooke
Stanislowski

Title:
Progress on two SIPS
projects:
“Development,
Validation and Testing
of High-Reflectance,
Cost-Reducing
Composite Heliostat
Mirror Facets” and
“Development of
Flexible Wireless
Control Architectures
for Heliostat Fields”

When: May 21st
1-2 PM MT

Zoom: <https://nrel.zoomgov.com/join/3RMKSTkPSpGUHMvOYKc7lg#/registration>

Abstract:

First, an update will be given on the progress to fabricate composite facets that incorporate 1 mm mirrors to achieve 96% reflectivity. The focus of the work has been making the composite facets significantly stronger than standard 3-4mm mirrors, achieving performance over 30 years (accelerated environmental testing), being able to withstand hail testing, all while choosing materials that result in composite facets that are cost competitive with standard 3-4mm glass mirrors currently in use by CSP heliostat fields.

Second, an update will be given on work to develop and test heliostat wireless communications that can communicate point-to-point over a kilometer. NREL is currently working with Caribou Labs to deploy 100 radio units at the Flatirons campus and test that these units communicate at sub-second latencies, low bit error rates, and are resilient to jamming. The hardware under test in this project is being made open-source and the intent is to publish all results so as to help the industry overcome hurdles and costs associated with the transition to wireless control.

Bio:

Since 2008, Dr. Matthew Muller has been a research engineer within the National Renewable Energy Laboratory's PV Performance and Reliability group. The focus of his work has covered topics such as Photovoltaic (PV) soiling, PV surface coating durability, PV and concentrating PV (CPV) module and system performance, thermal modeling, spectral performance modeling, solar trackers, IEC standards development, test design, prototyping and design of instrumentation, data acquisition systems, programming and data analysis. He is a member of ANSI and has served as a technical expert to develop several IEC standards. He is currently the PI on two CSP SIPS projects and is co-leading the HelioStat Consortium subtask on components and controls where he is applying his years of experience with solar trackers to help reduce the cost of heliostats to achieve the DOE goal of \$50/m².