U.S. Department of Energy
HelioCon
Heliostat Consortium for Concentrating Solar-Thermal Power

Resources, Training, and Education for the Heliostat Workforce

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Outline

- Introduction
- University outreach
- Diversity, Equity, and Inclusion
- Ways to get involved
- Upcoming opportunities
- Get in touch

Heliostat Consortium (HelioCon)

US Energy Department has funded 5-year heliostat consortium:

- To advance U.S. heliostat technologies, capabilities and national workforce
- $25M + cost share: 30% of funds allocated to RFPs for engagement of US industries and other stake holders

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Gaps in Heliostat Resource, Training, and Education

Workforce pipeline from universities

Training resources for new workers

Diversity, Equity, and Inclusion

Resource Database

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HelioCon RTE Objectives

- Develop heliostat training programs
  - Identify training and education needs of labs, industry, and universities
  - Design and test training materials for new workers
- Engage universities to develop workforce pipeline
  - Support heliostat Master's/PhD thesis development
  - Create heliostat grant opportunities
  - Provide internships opportunities
- Promote Diversity, Equity, and Inclusion (DEI)
  - Create programs that benefit minority/underserved communities
- Create centralized resource database
  - Compile all RTE materials and information into centralized web-based resource

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University Outreach

- Conducted 11 interviews with university faculty in mechanical engineering programs who do research in solar thermal applications.
  - Yucheng Liu, South Dakota State University
  - Hohyun Lee, Santa Clara University
  - Kimani Toussaint, Brown University
  - Greg Jackson, Colorado School of Mines
  - Peiwin Li, University of Arizona
  - Sarah Kurtz and YangQuan Chen, University of California Merced
  - Renkun Chen, University of California San Diego
  - Peter Vorobieff, University of New Mexico
  - Mike Wagner and Greg Nellis, University of Wisconsin
  - Ranga Pitchumani, Virginia Technical Institute
  - Nathan Siegel, Bucknell University

University Outreach Questions

- Diversity, equity, and inclusion programs
- Budget scale and cost share to support graduate research
- Preferred collaboration mechanisms with the HelioCon project
- Opportunities for curriculum development
- Gaps to be addressed to develop workforce pipeline

University Outreach: Diversity, Equity, and Inclusion

Financial aid + STEM Research Opportunities

Engaging Underserved Communities

Graduate Engineering Research Scholars
UNIVERSITY OF WISCONSIN-MADISON

UC San Diego
JACOBS SCHOOL OF ENGINEERING

idea engineering student center

CHRES CONSORTIUM OF HYBRID RESILIENT ENERGY SYSTEMS
DE-NA0003982

SOUTH DAKOTA STATE UNIVERSITY

#FIRSTGEN
UC San Diego

Wokini Initiative

COLABORACIÓN
UC SAN DIEGO Y MÉXICO

COLORADO SCHOOL OF MINES

FORT LEWIS COLLEGE

ENGINEERING STUDENT SUCCESS CENTER

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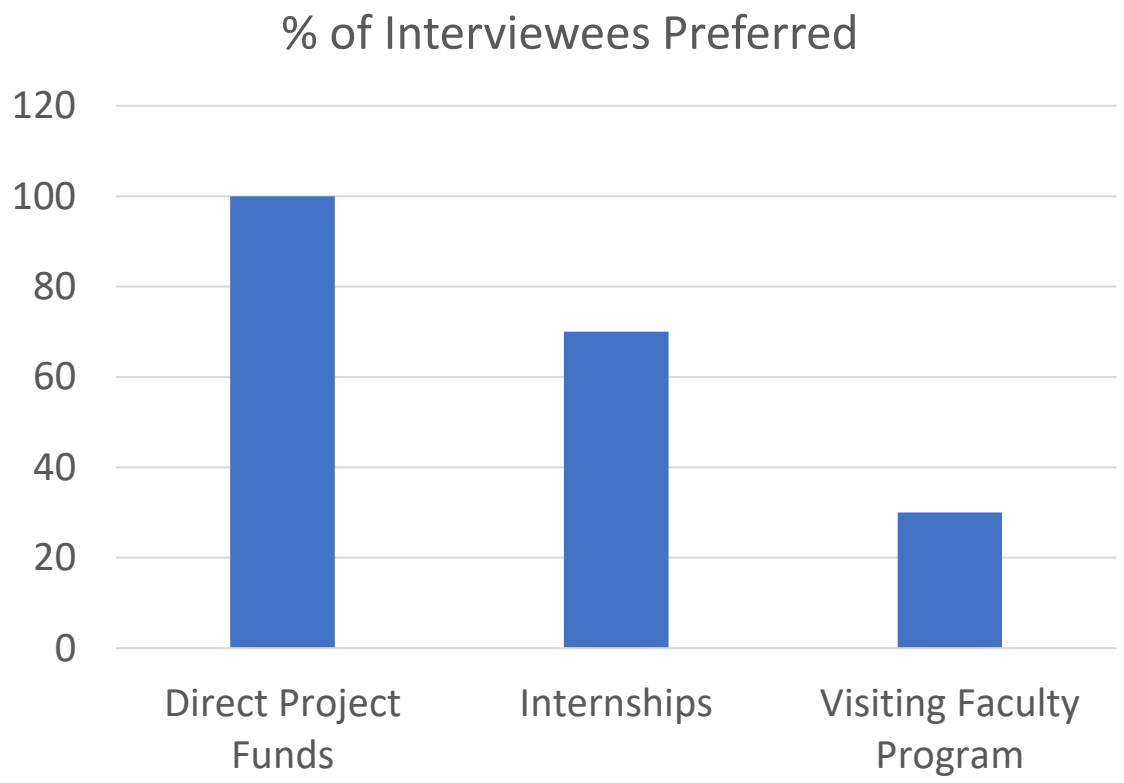
University Outreach: Budget Scale and Cost Share

- Budget Scale
  - PhD student: 50-100k, averaging ~70k per year
  - Masters student: same as PhD, smaller budget, or out of pocket for students
  - Professor: 12-20k, averaging ~15k per month
- Cost share
  - 20% cost share requirement
  - Subsidize student tuition, professor salaries, or equipment costs

University Outreach: Preferred Collaboration Mechanisms

- Strong preference for project funds supplemented with internships
  - Professors at advocates for students
  - Internships allow exposure to large-scale problems
- Visiting Faculty Program logistically difficult, target junior faculty



University Outreach: Curriculum Development

- Lecture series – host guest researchers
- Online workshops
- Develop materials to serve as homework problems or small projects within ME courses
- Visual exposure: virtual tour of CSP plant
- Develop degree or certificate programs

University Outreach: Main Takeaways

- Multidisciplinary approach
  - Renewable/sustainable energy programs are already popular
  - Insert Heliostat educational materials into existing ME and RE coursework to reach students with diverse set of skill sets
  - Supporting students' STEM development more generally sets them up for more career options
- Exposure to CSP Industry
  - Support access of academic programs to industry plant data and networking opportunities
  - Provide more general CSP problems to form basis of research/education
- Project funds combined with lab/industry engagement

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Diversity, Equity, and Inclusion in the DOE

- Office of Scientific Workforce Diversity, Equity, and Inclusion
- DOE funding calls require a Diversity, Equity, and Inclusion (DEI) Plan containing:
  - Equity impacts to underserved communities
  - Benefits to underserved communities
  - How DEI objectives will be incorporated into the project

Diversity, Equity, and Inclusion at NREL

- DEI Plan Building Blocks
  - Step 1: DEI in Project Team
  - Step 2: DEI in Research and Implementation Partners
    - University Partnerships Programs
  - Step 3: Benefits to Underserved Communities
  - Step 4: Smart goals and metrics to quantify success and track goal attainment
- ERG Resource groups and resources

William H. Kindred ›

Director, Diversity, Equity, and Inclusion

william.kindred@nrel.gov

- Asian Employee Resource Group
- Black Employee Resource Group
- Hispanic and Latinx Alliance
- Postdoc and Graduate Student Network ›
- Veteran Employee Resource Group
- Early Career Network
- Women's Network
- Full Spectrum Network (LGBTQIA+) ›

Diversity, Equity, and Inclusion in HelioCon

- DEI in Project Team
  - DEI resources, trainings, and forums made available to project team
  - Hiring opportunities made accessible to minority/underserved applicants
  - DEI review process for RFPs
- DEI in Research and Implementation Partners
  - Partner with university programs that support underserved/minority communities
- Benefits to Underserved Communities
  - Design RFPs to combine financial support with research opportunities
  - Multidisciplinary approach: insert HelioCon research/education opportunities into existing mechanical engineering programs to support STEM development of minority/underserved students with variety of background/skillsets to allow for wide range of career options
- SMART goals and metric
  - Surveys to assess DEI on the HelioCon project team
  - Track hiring/funding participation with partners and students to assess benefit/accessibility to minority/underrepresented students and underserved communities.

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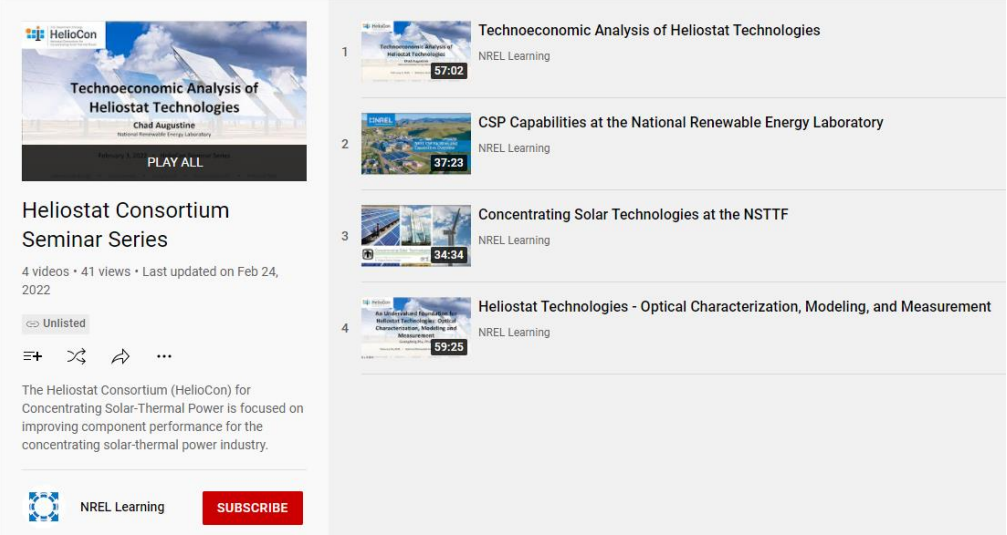
Internship Opportunities

- Graduate Internships
  - Postings at NREL
  - Postings at Sandia
  - No current postings, but get in touch anyway
- Science Undergraduate Laboratory Internships (SULI)
  - NREL hosts SULI interns for spring, summer, and fall
  - Sandia hosts SULI interns for summer
  - Applications for Fall 2022 term are due **May 26, 2022**

HelioCon Seminar Series

- Monthly/bimonthly seminars to educate public audience about the HelioCon project and heliostat fundamentals
- available on the NREL Learning Youtube Channel
- Contact heliostat.consortium@nrel.gov or rebecca.Mitchell@nrel.gov to receive updates







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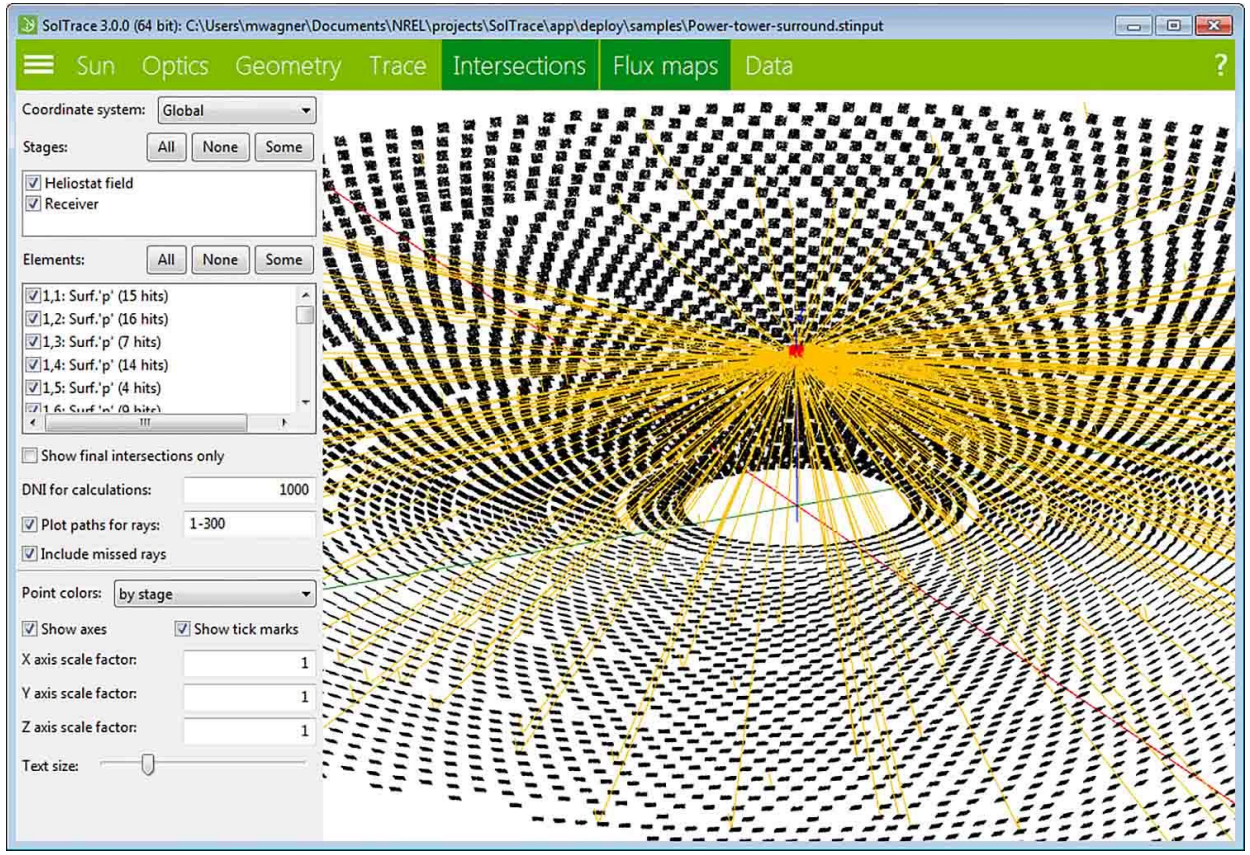
Request For Proposals (RFPS)

1. HelioCon team will select team or merit reviewers not associated with HelioCon institution, recommended by DOE
2. RFPs will be announced in June and collected in online database
3. RFPs meeting qualification/scope requirements will be evaluated by merit review team
4. HelioCon selection team will create final rankings and collaborate with DOE to determine final list of RFPs chosen for award negotiation
5. NREL will communicate results of selection process and begin award negotiations

HelioCon Training Resources

- Heliostat Introductory training resources
  - Introductory heliostat overview paper
  - Short introductory video will be developed this summer
- Heliostat Workshop
  - Online workshop hosted this summer
  - Targeted at audience without background/experience in heliostats
- Workshops/projects built around open-source Software tools
  - SolTrace



HelioCon Website and Resource Database

- Resource database
  - Heliostat reference material
  - List of research institutions, industries, plants, and manufacturers
  - List of publicly available tools
  - List of heliostat industry standards
- Training and education tools
  - Seminar series presentations
  - Training videos and documents
- Information on funding opportunities
  - RFPs
  - Job postings

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Get In Touch

- Contacts:
  - Rebecca Mitchell, RTE topic lead, rebecca.mitchell@nrel.gov
  - HelioCon email, heliostat.consortium@nrel.gov
- Please reach out if:
  - You're a student looking to get involved in HelioCon
  - You're a faculty member with feedback on university outreach
  - You know of existing RTE programs we might want to partner with
- Request to be added to the distribution list!

More From the HelioCon Seminar Series

- Past seminar presentations now available on the NREL YouTube learning channel: https://www.youtube.com/playlist?list=PLmIn8Hncs7bGAK-hIf4qxuAbHUHK-xgZK
- Subscribe to the seminar series or get in touch: heliostat.consortium@nrel.gov

Next Seminar March 30th!

HelioCon Seminar Series: What's Looking Up Down-Under? Progress of Australian Solar Thermal Research Institute (ASTRI) Heliostat Activities
Speaker: Dr. Mike Collins, ASTRI
When: 3-4pm MDT Wednesday March 30th
Zoom:https://nrel.zoomgov.com/j/1613396360?pwd=TVVwZE0xYWRMWTdHYW1WblNneU1Mdz09