

Building a Renewable Future within the Liberal Arts

AALAC Workshop

Proposal for Wellesley College, Summer 2023

Motivation

Never has it been more important to engage students in the study and development of renewable energy technologies. The IPCC's most recent report has made it clear that implementing current climate mitigation efforts are likely to result in global warming exceeding a 1.5 °C increase¹. Such warming would increase the occurrence of extreme temperature events with devastating effects on our global population and environment¹. To prevent and respond to these emerging challenges requires new renewable technologies and an informed workforce to implement them. We believe that liberal arts colleges, with their emphasis on interdisciplinary learning and critical thinking, have an important role to play in developing this workforce to implement equitable solutions. However, engaging students in the practicalities of the development of renewable technologies presents distinct research and pedagogical challenges. For example, designing learning environments where students work directly to create renewable energy devices such as solar cells or batteries is both resource and time intensive. Additionally, the interdisciplinary work of renewable energy development calls for both student and instructor expertise across multiple traditional subject areas.

Goals

Across AALAC there are physical sciences faculty doing the foundational work of preparing a renewable energy workforce, bringing students from diverse backgrounds into their labs to develop new technologies, and carrying their passion into their classrooms. We propose a workshop to bring together and strengthen this community. Over two days our AALAC community will share research expertise, exchange ideas on how we mentor and conduct research with undergraduate students, and showcase pedagogical innovations in teaching renewable energy technologies in classrooms. In doing so we create new research collaborations, expand pedagogical approaches, and build a community that is beneficial for both faculty and students.

Intended Audience

Our intended audience are faculty in the physical sciences whose work contributes to or is informed by renewable energy technologies. We will extend an invitation to all the AALAC institutions and anticipate attendance from faculty across chemistry, physics, and engineering departments. We've identified over 40 AALAC faculty members who fall squarely in this category and will reach out to them directly to encourage participation.

¹ IPCC, 2022: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. In Press.

Proposed Schedule and Format

The workshop will span two days and allow faculty to share and discuss both their research and their pedagogy. Day one of the workshop will focus on research and research methods with individual presentations of faculty scholarship and a roundtable on best practices for mentoring students in renewable energy research. Day two of the workshop will focus on teaching methods and will again feature individual presentations on pedagogical approaches for teaching renewable energy science at both the introductory and advance level in addition to a curriculum design workshop.

Impact and Follow up Activities

Our primary goal in the development of this workshop is to connect liberal arts faculty and students working across the renewable technologies space at liberal arts college. This will span possible research collaboration to the exchange of pedagogical best practices. This work will immediately begin at our workshop. To foster further community development, we will create a listserv of attendees to support regular communication and sharing of ideas. We will create a website capturing teaching materials shared at the workshop to be shared with attendees. And we will encourage attendees to advertise the successes of their connections whether that be through research collaboration, exchanging speaking invitations, or other work. Additionally, we will expand on what we begin at the workshop through an online colloquium series entitled “The Science of Sustainability” we intend to run quarterly over the coming year. This colloquium, and the opportunity to speak, will be advertised to our attendees but also open to the broader AALAC community of faculty and student researchers. Our aim is to build sustainable connections for faculty and students to promote the exchange of ideas and collaboration and hope to continue both the colloquium and regular communication amongst the attendees into the future.

Workshop Leaders and Organizing Committee

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Designated Workshop Liaison

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