

## Call for Abstracts

### QCE22 Workshop on Quantum Computing Opportunities in Renewable Energy and Climate Change

#### Date and Time

- One day between September 18-23, 2022
- 10:45–16:45 Mountain Time (MDT) — UTC-6

#### Organizers

- Annarita Giani, GE Research, General Electric Company
- Zhenyu (Henry) Huang, Pacific Northwest National Laboratory

#### Abstract

Quantum computing is poised to begin solving important, practical problems with real-world impact. While the quantum sector prepares for this transition into applicability, a parallel transition is happening in the world of energy, where large-scale, fossil-fuel-driven generation is facing increased environmental scrutiny and competition from small-scale renewables with rapidly dropping prices. In this workshop, we will combine these technological trends and provide a forum for discussion and interaction among academia, industry, and government actors with relevant interests. This workshop will include discussion of both quantum computing devices, ranging from annealers to NISQ devices to future digital quantum computers, as well as a description of some of the major computational challenges facing renewable energy today – simulation for chemistry and forecasting; integrating the increasing distributed generation; and scheduling and dispatch of variable renewable resources. These challenges represent some of the most technically exciting and practically impactful areas for innovations in order to achieve energy decarbonization across the world. Our workshop goal is to identify the most fruitful areas of collaboration and identify what types of research need to be done to advance the intersection of renewable energy and quantum computing. We welcome participants in quantum computing to learn about this exciting and vital area of potential applications and also participants in renewable energy to present computational challenges and learn about the opportunities quantum computing represents.

#### Workshop objectives

We envision this workshop as a platform for facilitating the exchange of discovery and information between the quantum computing and renewable energy communities. Starting a conversation between these two groups is crucial for advancing common knowledge about needs and opportunities. These communities usually do not intersect and gaining expertise of the other group is often left to the scientific curiosity of a few individuals. Our hope is to create an environment focused on discussion and information exchange between the two groups. Our goal is to for participants to leave the room with an enhanced understanding of energy issues and the computational challenges that exist in the renewable energy space. We also hope that invited speakers and participants who specialize in energy will make connections and form collaborations with quantum computing practitioners. In the longer-term, we hope to see the emergence of publications and joint research efforts to define in more granularity what the quantum/renewables crossover looks like.

## **Call for Abstracts**

This workshop will feature talks on a variety of topics related to quantum computing, renewable energy, and climate change. We are seeking speakers both for 15-minute and 30-minute slots. 15-minute slots will be filled by early-stage research and short results, while 30-minute slots are intended for research programs which have been more developed. Presenters from the 2020 and 2021 Quantum Computing and Renewable Energy Workshops are encouraged to submit an application for updating us on their progress. We welcome submissions that focus on subjects such as quantum computing experimental results, algorithms development, and resource estimation. Furthermore, we welcome renewable energy and climate change researchers who are interested to submit talks on their areas of specialty that illustrate cutting-edge computational techniques and challenges which provide potential opportunities for quantum speedup.

## **Abstract Submission through EasyChair**

Abstracts are submitted through EasyChair at <https://easychair.org/my/conference?conf=qce22>. Then select the track "WKS: Renewable Energy and Climate Change" to submit your abstract. In your submission please indicate: Title, authors, whether you believe your topic is suited for a 15-minute slot, 30-minute slot, or both.

## **Important Dates**

- **Abstract Submission Deadline: July 20, 2022**
- Notification of Acceptance: August 15, 2022
- One day between September 18-23, 2022