QCE21 Workshop on
Quantum Computing Opportunities in Renewable Energy and Climate Change

Date and Time
- Tuesday, October 19, 2021
- 10:45–16:45 Mountain Time (MDT) — UTC-6

Organizers
- Annarita Giani, GE Research, General Electric Company

Abstract. Quantum computing is poised to begin solving important, practical problems with real-world consequences. 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; the rise of distributed generation; and scheduling and dispatch of variable renewable resources. Our goal is to identify the most fruitful areas of collaboration and identify what types of research need to be done to advance the field of renewable energy and quantum computing. We welcome participants in quantum computing to learn about this exciting and vital area of potential application and participants in renewable energy to present computational challenges and learn about the opportunities quantum computers represent.

Workshop objectives. We consider this workshop the beginning of an effort on 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 individuals. Our hope is to create an environment focused on discussion and information exchange between the two groups. In the room itself, 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 Speakers. 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 we intend to give to research programs which have been more developed. Presenters from the 2020 Quantum Computing and Renewable Energy Workshop are encouraged to submit an application for updating us on their progress since last year. We welcome submissions that focus on subjects, including quantum computing experimental results, algorithms development, 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 submissions will go through EasyChair https://easychair.org/conferences/submission_new?a=27173135#. Please indicate in your submission whether you believe your topic is suited for a 15-minute slot, 30-minute slot, or both.

Workshop agenda
- Short version — Agenda only (Link will go here)
- Long version — Agenda with speakers’ bios and abstracts (Link will go here)

Important Dates
- Speaker Proposal Submission Deadline: September 4, 2021
  https://easychair.org/conferences/submission_new?a=27173135#
- Notification of Acceptance: September 18, 2021
- Workshop Date: Tuesday, October 19, 2021