General Atomics Energy Group
Current Career Opportunities

General Atomics (GA) Energy Group has remained at the forefront of energy and nuclear power innovation for more than 60 years. GA scientists and engineers are pushing the frontiers of scientific discovery to produce safe, sustainable, and economic energy solutions with the potential to positively change how our growing planet will be powered in the future.

Post-doctoral Researcher - Quantum Scientist

Description
General Atomics (GA) is looking for a highly motivated post-doctoral quantum scientist to assist with quantum computing (QC) calculations and algorithm development for applications in support of energy science research. The target problems span aspects of chemistry, materials science/condensed-matter, quantum physics, and nuclear physics. The effort will be focused on the formulation of theory and coding implementations to model the properties of static and dynamical systems suitable for execution using QC simulators and hardware.

To be successful in this role, the post-doctoral quantum scientist will need to be highly motivated, a good communicator, capable of independently formulating representations of the QC problems, and capable of working with a team of interdisciplinary scientists. They are expected to work closely with researchers/staff at GA and collaborators at other institutions. The post-doctoral quantum scientist will be located at General Atomics in San Diego, CA. The position is for a one-year contract with potential for renewal.

Duties and Responsibilities:
• Formulate problem Hamiltonian(s) for quantum systems of interest in both first and second quantization representations. Map formulation to quantum gate operations.
• Develop quantum theory and algorithms in support of quantum computation. Extend existing quantum computing algorithms such as the variational quantum eigensolver.
• Implement quantum calculations on physical hardware and interpret results.
• Disseminate work in peer-reviewed papers, conference presentations or patents where applicable.

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For more information or to apply visit: www.ga-careers.com
Post-doctoral Researcher - Quantum Scientist (continued)

**Required Qualifications:**

- Ph.D. in Quantum Physics, or related discipline such as Quantum Chemistry, Condensed Matter Physics, Theoretical Chemistry, Theoretical Physics, Mathematical Physics, Quantum Information Sciences (QIS).
- Substantial background in theory and simulations of bosonic and fermionic physics.
- Must be able to formulate problem Hamiltonian(s) for quantum systems of interest, including first and second quantization representations, and map formulation to quantum gate operations.
- Familiarity with electronic structure theory & calculations as relates to quantum computation; e.g., coupled cluster theory, configuration interaction, hybrid quantum-classical such as the variational quantum eigensolver (VQE).
- Programming skills in Python (object-oriented paradigm preferred).
- Established history of conference presentations and peer-reviewed publications, preferably with emphasis on applications of QIS to quantum physics problems.

**Desired Additional Qualifications:**

- Experience using QC hardware with quantum algorithm and gate programming using open libraries such as OpenFermion/Cirq, Forest/Pyquil, and Qiskit.
- Knowledge of topological quantum computation paradigms and associated codes, e.g., Surface and Toric codes.
- Programming skills in C/C++, FORTRAN, Julia, or MATLAB.
- Familiar with quantum error correction and fault-tolerant QC, matrix product states and tensor networks, annealing and adiabatic QC approaches (e.g. QUBO).
- Working knowledge of QC hardware, quantum gate modeling, and quantum algorithm design.

*DIII-D Team*

Contact Information

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