Opportunity Title: Quantum Information, Sensing and Metrology
Opportunity Reference Code: ARL-R-SEDD-300165

Organization DEVCOM Army Research Laboratory

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Description **About the Research**

A postdoctoral fellowship for a theoretical/computational physicist within the Computational and Information Science Directorate (Network Science Division) of the US Army Research Laboratory is open. Suitable candidates should have a PhD in physics with a background in AMO, many-body physics, quantum information, quantum control, or quantum optics. Programming experience in Python or a similar language is mandatory. Prior experience in machine learning techniques, optimal control theory, and/or open source software development would be welcome, but is not a requirement.

Potential research topics include (but not limited by):
* Development of novel optimal control methods based on machine learning;
* Development of computer-algebraic systems for modeling quantum networks;
* Use of reinforcement learning for the design of quantum network topologies;
* Use of optimal control for quantum sensing devices such as atomic interferometers and quantum gyroscopes.

The above projects will be conducted in collaboration with MIT, Stanford, and other leading Universities. The fellowship can be renewed yearly up to a total duration of 3 years. The primary research location will be the Open Campus area of the Adelphi Lab Center in Adelphi, MD, in close vicinity to the University of Maryland at College Park. The fellowship is open to non-US citizens and can be supported by a J1 or F1/OPT visa. Interested candidates should email a cover letter and CV to Dr. Vladimir S. Malinovsky (vladimir.s.malinovsky.civ@mail.mil). The fellowship is available immediately and will remain open until filled.

ARL Advisor: Vladimir S. Malinovsky
ARL Advisor Email: vladimir.s.malinovsky.civ@army.mil

About SEDD

The Sensors and Electron Devices Directorate (SEDD) is the Army's principal center for research and development in the exploration and exploitation of the electromagnetic spectrum, which includes radio frequency, microwave, millimeter-wave, infrared (IR), visible, and audio regions. SEDD is responsible for advances in laser sources, RF sources, IR sensors, signature detection and decoding, target imaging and its interpretation, fusion of data derived from several sensors, and electromagnetic protection.

In addition, SEDD is responsible for improving the technology base for electron devices and materials related to sensors and power devices. Research is conducted in related aspects of physics, electrical engineering,

computer science, solid-state physics, chemical engineering, material sciences, and electrochemistry.

About ARL-RAP

The Army Research Laboratory Research Associateship Program (ARL-RAP) is designed to significantly increase the involvement of creative and highly trained scientists and engineers from academia and industry in scientific and technical areas of interest and relevance to the Army. Scientists and Engineers at the CCDC Army Research Laboratory (ARL) help shape and execute the Army's program for meeting the challenge of developing technologies that will support Army forces in meeting future operational needs by pursuing scientific research and technological developments in diverse fields such as: applied mathematics, atmospheric characterization, simulation and human modeling, digital/optical signal processing, nanotechnology, material science and technology, multifunctional technology, combustion processes, propulsion and flight physics, communication and networking, and computational and information sciences.

A complete application includes:

- **Curriculum Vitae or Resume**
- **Three References Forms**
  - An email with a link to the reference form will be available in Zintellect to the applicant upon completion of the on-line application. Please send this email to persons you have selected to complete a reference.
  - References should be from persons familiar with your educational and professional qualifications (include your thesis or dissertation advisor, if applicable)
- **Transcripts**
  - Transcript verifying receipt of degree must be submitted with the application. Student/unofficial copy is acceptable

If selected by an advisor the participant will also be required to write a **research proposal** to submit to the ARL-RAP review panel for :

- Research topic should relate to a specific opportunity at ARL (see Research Areas)
- The objective of the research topic should be clear and have a defined outcome
- Explain the direction you plan to pursue
- Include expected period for completing the study
- Include a brief background such as preparation and motivation for the research
- References of published efforts may be used to improve the proposal

A link to upload the proposal will be provided to the applicant once the advisor has made their selection.

Questions about this opportunity? Please email

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ARLFellowship@orau.org

Eligibility Requirements

- **Degree:** Doctoral Degree.
- **Academic Level(s):** Any academic level.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Engineering** (2 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Physics** (16 👁)