Opportunity Title: Neuromorphic device development
Opportunity Reference Code: ARL-C-SEDD-300053

Organization DEVCOM Army Research Laboratory

Reference Code ARL-C-SEDD-300053

Description **About the Research**

This research position focuses on low power electronic devices and circuits. As the challenges with computing reaches its limits, due to power scaling challenges of today's transistor technologies, a desperate need for development of new approaches to high performance computing dis needed. In this research program we attempt to develop neuromorphic devices based on ferroelectric FETs. To achieve the objectives of this research program we seek to appoint a motivated, competent, and skillful candidate that can move this project forward.

This opportunity will expose the candidate to a multidisciplinary research program that spans materials development, device design and integration, and circuit development. The candidate is expected to have an in-depth knowledge of device physics and basic circuit design. The basic Qualifications for this position include experience with fabrication and characterization of FETs and memory devices, experience with electrical and material characterization techniques, experience with material growth and device integration techniques (e.g. ALD and PLD) The main objective of this project is to develop ferroelectric materials and their stacks for threshold-gate ferroelectric FET devices.

Keywords: Ferroelectric FETs, ALR and PLD Ferroelectrics, Neuromorphic computing, NC FETS

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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

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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 ARLFellowship@orau.org

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Academic Level(s):** Any academic level.
- **Discipline(s):**

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- **Engineering** (3 👁)
- **Age:** Must be 18 years of age