

Opportunity Title: Photonic Integrated Circuit (PIC) sensor for small molecules and proteins

Opportunity Reference Code: ARL-R-SEDD-300095

Organization DEVCOM Army Research Laboratory

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Description **About the Research**

We have an exciting opportunity to join our team of photonic integrated circuit (PIC) and sensor experts. Here at the U.S. Army Research Laboratory (ARL) we are developing PIC sensors for the detection of physiologically relevant small molecules and proteins. We are searching for someone to join our team in the development of a PIC wearable sensor. An ideal applicant will have experience with micro/nano fabrication or electrical measurements with a background in electrical engineering, bioengineering or related disciplines. Experience in sensors and analytical characterization is a plus. Working knowledge of data analysis and analytical methods including spectroscopy and microscopy is preferred. Primary responsibility will be assisting in the development of wearable PIC sensors as well as characterizing and optimizing films/components for sensing requirements. Additional responsibilities will include working with surface modifications and polymer deposition.

This is an excellent opportunity to develop skills in photonic integrated circuits and sensor development. This research fellowship is open until filled and may extend into 2022. This opportunity is open to applicants with a BS or MS as well as MS or PhD students. Contact Jennifer Morales and Justin Bickford to discuss the project and your interest in joining us.

Keywords: Wearable, Biosensor, Sensing, Photonics, Photonic Integrated circuits, Silicon Photonics, Electrical Engineering, Bioengineering

ARL Advisor: Jennifer Morales; Justin Bickford

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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 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,

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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:** Bachelor's Degree, Master's Degree, or Doctoral Degree.
- **Discipline(s):**
 - **Engineering** (27 )
 - **Other Physical Sciences** (12 )
- **Age:** Must be 18 years of age