

Opportunity Title: Advanced Nonlinear Electronics

Opportunity Reference Code: ARL-PEQS-400061-F1

Organization DEVCOM Army Research Laboratory

Reference Code ARL-PEQS-400061-F1

How to Apply A complete application includes:

1. Curriculum Vitae or Resume

- List relevant coursework and lab experience as well as all papers, presentations, or publications you may have authored or co-authored. Include any reprints or abstracts if they are available.

2. 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)

3. Transcripts

- Transcript verifying receipt of degree or current enrollment in an undergraduate or graduate program at an accredited university or technical institute. Student/unofficial copy is acceptable

4. Research Proposal

- Research topic should relate to a specific opportunity at ARL
- 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

Description The student will investigate nonlinear behaviors in quantum and Van der Waals materials to build advanced electronics capabilities for the Army. Potential tasks include design, fabrication, and benchmarking broadband spectral properties as a function of device geometry, electromagnetic stimuli, temperature, and other environmental factors to quantify performance metrics relevant to electronic warfare and defense priorities. Nonlinear, inductive, and/or spin-based responses will be targeted as potential leap-ahead areas of development for novel material systems. The role of the Berry curvature dipole, noncentrosymmetry, inversion symmetry breaking, and intrinsic vs extrinsic effects on the harmonic composition and rectification of observed signals will be highlighted as topics of interest in expanding the operational relevance of these effects to higher frequency.

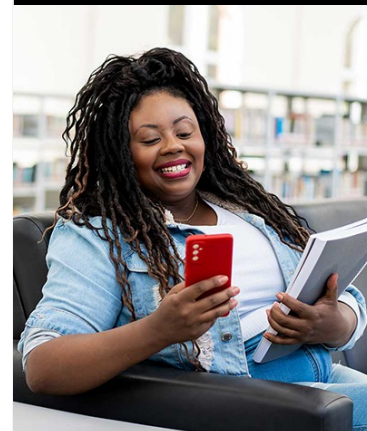
ARL Advisor:

Owen Vail

owen.a.vail.civ@army.mil



 ORAU Pathfinder



Whether you are just starting your career or already at a senior level, ORAU offers internships, fellowships, research opportunities, and contract positions that can provide you with invaluable experience. Download the ORAU Pathfinder mobile app and find the right opportunity to propel you along your career path!

Visit ORAU Pathfinder 



Opportunity Title: Advanced Nonlinear Electronics

Opportunity Reference Code: ARL-PEQS-400061-F1

About Army Research Directorate (ARD)

ARL's Army Research Directorate (ARD) focuses on exploiting concept development, discovery, technology development, and transition of the most promising disruptive science and technology to deliver to the Army fundamentally advantageous science-based capabilities through laboratory's 11 research competencies. This intramural research directorate also manages the laboratory's essential research programs, which are flagship research efforts focused on delivering defined outcomes.

About [Army Research Laboratory Research Associateship Program \(ARL-RAP\)](#)

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.

About Photonics, Electronics, & Quantum Sciences (PE&QS)

Materials (and related manufacturing methods) and devices intended for achieving photonic, electronic, and quantum-based effects.

Questions about this opportunity? Please

email ARLFellowship@orau.org

Point of Contact [ARL-RAP](#)

- | | |
|---------------------------------|---|
| Eligibility Requirements | <ul style="list-style-type: none">• Citizenship: LPR or U.S. Citizen• Degree: Associate's Degree, Bachelor's Degree, Master's Degree, or Doctoral Degree.• Academic Level(s): Associate's Degree (Journeyman Fellow), Bachelor's Degree (Journeyman Fellow), Master's Degree (Journeyman Fellow), or Doctoral Degree (Postdoctoral Fellow).• Discipline(s):<ul style="list-style-type: none">◦ Chemistry and Materials Sciences (12 )◦ Communications and Graphics Design (2 )◦ Computer, Information, and Data Sciences (17 )◦ Earth and Geosciences (21 ) |
|---------------------------------|---|

Opportunity Title: Advanced Nonlinear Electronics

Opportunity Reference Code: ARL-PEQS-400061-F1

- **Engineering** ([29](#) )
- **Environmental and Marine Sciences** ([14](#) )
- **Life Health and Medical Sciences** ([51](#) )
- **Mathematics and Statistics** ([11](#) )
- **Physics** ([16](#) )
- **Science & Engineering-related** ([2](#) )
- **Social and Behavioral Sciences** ([29](#) )