

Opportunity Title: Physics of Wide and Ultra-Wide Bandgap Semiconductor

Electronic and Optoelectronic Devices

Opportunity Reference Code: ARL-R-PEQS-20260609-F1

Organization DEVCOM Army Research Laboratory

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How to Apply Applications must be submitted in [Zintellect](#).

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

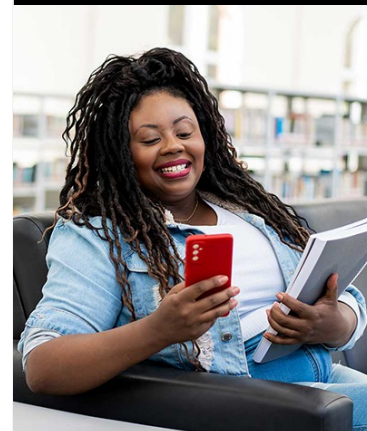
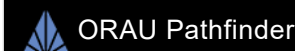
- Transcript verifying receipt of degree or current enrollment in an undergraduate or graduate program at an accredited university or technical institute. Student/unofficial copy is acceptable

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 U.S. Army DEVCOM Army Research Laboratory (ARL), located in Adelphi, MD, outside of Washington, DC, is seeking Postdoctoral Fellows interested in the physics of wide and ultra-wide bandgap (UWBG) semiconductor electronic and optoelectronic devices. Fellows will have the opportunity to conduct their research using a wide variety of experimental capabilities. Areas of active research include:

UWBG Semiconductor Carrier Dynamics—Optical spectroscopy using ultrafast and continuous wave lasers and other light sources spanning the 200 nm to 2500 nm spectral range along with a picosecond pulsed electron source, coupled to experimental techniques such as time-resolved and continuous wave photoluminescence, cathodoluminescence, electron beam induced current, Terahertz spectroscopy, and other pump-probe photomodulation spectroscopies such as photorefectance,



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electroreflectance, and both time domain and frequency domain thermoreflectance.

Growth of III-Nitride Materials and Device Structures—Plasma-assisted molecular beam epitaxy (MBE) and metalorganic vapor-phase epitaxy (MOVPE) of UWBG semiconductors and novel device designs with access to RHEED, XRD, SEM, AFM, and Hall Effect characterization tools.

High Power Electronic and UV-Optoelectronic Devices—Next generation power switching devices, UV-lasers and LEDs, and UWBG semiconductor detectors; design and fabrication with access to ARL's Specialty Electronic Materials and Sensors Cleanroom (SEMASC) which includes e-beam and direct write laser lithography; atomic layer, e-beam evaporator, plasma chemical vapor, and sputtering deposition; as well as various etching techniques. Device packaging and testing, including auto probers, high-field measurements, as well as detector testing and LED/laser characterization systems with an emphasis on device efficiency and thermal transport problems.

Semiconductor Theory and Device Modeling—3D full band Monte-Carlo calculations, DFT, non-equilibrium Green's function techniques, commercial TCAD packages, to understand materials and device physics all within the ARL Modeling Research Environment.

Research projects can focus on a specific problem or take an idea from conception to production. Either way, Fellows will have the opportunity to collaborate with a multidisciplinary team as well as with academic and industrial research groups.

ARL Advisor:

Gregory Garrett

Gregory.A.Garrett.civ@army.mil

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.

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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](#)

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| Eligibility | <ul style="list-style-type: none">• Citizenship: U.S. Citizen Only |
| Requirements | <ul style="list-style-type: none">• Degree: Doctoral Degree.• Academic Level(s): Doctoral Degree (Postdoctoral Fellow) or Doctoral Degree 5+ years (Senior 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 )◦ 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 ) |