

Opportunity Title: Research Scientist in Electrical Carrier Transport Modeling **Opportunity Reference Code:** ARL-R-ESS-400038-F1

Organization DEVCOM Army Research Laboratory

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Description ORAU has an opportunity working with US DEVCOM Army Research Laboratory (ARL) . ARL is the Army's premier research laboratory, providing the foundational and applied research to operationalize science and provide the Army of tomorrow with transformational overmatch to protect and preserve the freedoms of the United States.

Description:

We are currently seeking a talented and motivated Research Scientist to join our team for an exciting project designing state of the art detectors based on colloidal quantum dots coupled to graphene. As a Research Scientist, you will be responsible for developing and implementing models to understand and predict the effects of excitation of the colloidal quantum dots on the transport of current within a graphene strip. This role involves theoretical and computational work, data analysis, and collaboration with experimental teams to validate models and refine approaches.

Key Responsibilities:

- Develop theoretical models to describe the changes electrical carrier transport in graphene due to excitation of coupled colloidal quantum dots.
- Perform computational simulations to predict detector responsivity and detectivity.
- Analyze simulation data and compare with experimental results to validate models.
- Design and model changes to improve device performance.
- Document and present research findings in technical reports and scientific publications.

ARL Advisor:

Greg Rupper greg.s.rupper.civ@army.mil (301) 394-2989

About 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.







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!





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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 ELECTROMAGNETIC SPECTRUM SCIENCES (ESS)

Novel approaches to sensing and operating across the entire electromagnetic (EM) environment; counter-sensing across the EM spectrum; protection from EM effects; emerging concepts for RF, radars, and electronic warfare (EW).

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



Questions about this opportunity? Please

email ARLFellowship@orau.org.

- Qualifications
- Ph.D. in Physics, Electrical Engineering, Materials Science, or a related field.
 - Strong background in semiconductor physics, quantum mechanics, and electrical transport phenomena.
 - Experience with computational modeling and simulation tools (e.g., COMSOL, MATLAB, Python, and Synopsys).
 - Familiarity with colloidal quantum dots and graphene materials is highly desirable.
 - Proven track record of scientific publications and research presentations.
 - Excellent problem-solving skills and the ability to work independently and collaboratively.
 - Strong communication skills to effectively convey complex technical information.

Point of Contact ARL

Eligibility

• Citizenship: U.S. Citizen Only

- Requirements Degree: Doctoral Degree.
 - Academic Level(s): Doctoral Degree 5+ years (Senior Fellow).
 - Discipline(s):
 - Chemistry and Materials Sciences (12.)
 - Communications and Graphics Design (2.)
 - Computer, Information, and Data Sciences (17. (1)
 - Earth and Geosciences (21 (1)
 - Engineering (<u>27</u>.
 - Environmental and Marine Sciences (14 (1)
 - Life Health and Medical Sciences (51 (*)
 - Mathematics and Statistics (<u>11</u>)
 - Physics (<u>16</u>)
 - Science & Engineering-related (2_)
 - Social and Behavioral Sciences (<u>29</u>)