

Opportunity Title: Plasmonic Metasurface Nonlinear Physics - Research Internship

Opportunity Reference Code: DEVCOM-SC-2026-0001

Organization U.S. Department of Defense (DOD)

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How to Apply Click on *Apply* at the bottom of the opportunity to start your application.

Description The Department of Defense (DoD) is offering an internship opportunity at the U.S. Army Combat Capabilities Development Command Soldier Center (DEVCOM SC).

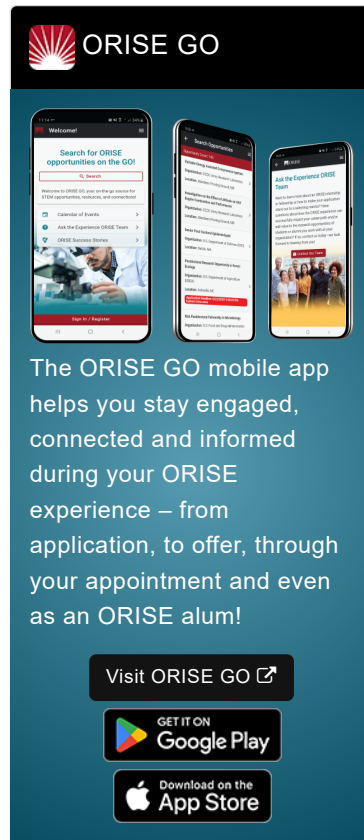
What will I be doing?

As an Oak Ridge Institute for Science and Education (ORISE) participant, you will join and learn from a community of scientists, engineers and researchers involved in a program that explores nonlinear optical materials patterned into metasurfaces, which are artificially created to have optical and optoelectronic properties not existing naturally. As a participant, you will seek to understand the curious nature of how electrical direct current flows in response to laser illumination of a plasmonic metasurface, verify that it is optical rectification and not another effect, understand how quantum mechanical electronic wavefunctions and surface plasmon-polaritons may influence the optical rectification, and attempt to quantify the optical rectification and optimize it, while designing and building the plasmonic nanostructures and devices required to experimentally demonstrate this unique and very publishable optical rectification. You will have the opportunity to present your research results in appropriate forums and attempt to publish the results. This early-stage materials and device physics is potentially transitional in the future to Army protection missions and counter-Uncrewed Systems (UxS) autonomy via newly developing line-of-sight communications, power beaming, and improved autonomy technologies. Semiconductor-free, supply-chain resilient materials and devices are manufacturable in the United States and could be developed in the future for new nonlinear optical rectification and potentially future laser communications (analogous to that used by the recent Artemis lunar mission) and/or power beaming.

Why should I apply?

Under the guidance of a mentor, it is anticipated that you will,

- Gain an understanding of quantum materials, plasmonic nanostructures, and nonlinear optical devices that exhibit optical rectification in response to laser illumination at plasmonic resonances (at certain frequencies) through hands-on research.
- Become familiar with the design and nanofabrication of plasmonic (metallic and oxide) samples, especially optically rectifying metasurfaces and also control samples, with new asymmetric geometries, together with supporting material and patterning analysis to maintain high-quality materials and understanding of quantum properties.
- Know how to perform optical, electrical, and optoelectronic

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characterization of samples under laser illumination to understand resonances and the response of the electrical current to frequency, polarization, etc.

- Hone your ability to analyze and calculate, using physical and mathematical methods including basic understanding of quantum properties, to compare to optical and electrical experiments on these and other samples.
- Enhance your presentation skills by sharing results at internal meetings, presenting at an external scientific conference (if permitted), and potentially contributing to a publication in a peer-reviewed journal.

Where will I be located?

Natick, Massachusetts

What is the anticipated start date?

The DEVCOM SC is ready to make appointments immediately. Exact start dates will be determined at the time of selection and in coordination with the selected candidate. Applications are reviewed on an ongoing basis and internships will be filled as qualified candidates are identified.

What is the appointment length?

An ORISE appointment period can be a short-term (less than 2 weeks), summer (10-12 weeks), or yearlong appointment. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

What are the provisions?

You will receive a stipend to be determined by DEVCOM-SC. Stipends are typically based on a participant's academic standing, discipline, experience, and research facility location. Other provisions may include the following:

- Health Insurance Supplement (*Participants are eligible to purchase health insurance through ORISE*)
- Relocation Allowance
- Training and Travel Allowance

Security Clearance

While participants will not enter into an employment relationship with DoD or any other agency, this opportunity will require a suitability investigation/background investigation. Any offer made is considered tentative pending favorable outcome of the investigation.

About DEVCOM SC

The U.S. Combat Capabilities Development Command - Soldier Center (DEVCOM SC) is located at the U.S. Army Natick Soldier Systems Center in Natick, Massachusetts, under the Army's Futures Command. Stretching back to 1954, the CCDC Soldier Center's history of support for the Soldier

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has continued uninterrupted for more than six decades, with a focus on Soldier-related research, development, testing and evaluation efforts. If Soldiers wear it, eat it, sleep under it, or have it airdropped to them in theater, it can be traced back to the CCDC Soldier Center. Diverse expertise comprised of scientists, engineers, technologists and equipment designers, the CCDC Soldier Center provides a wide range of capabilities to the Soldier, to include field feeding and life support systems, protective clothing, precision airdrop systems, and ballistic, chemical and laser-protection systems, and human performance optimization.

About ORISE

This program, administered by Oak Ridge Associated Universities (ORAU) through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and DoD. Participants do not enter into an employee/employer relationship with ORISE, ORAU, DoD or any other office or agency. Instead, you will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE. For more information, visit the [ORISE Research Participation Program at the U.S. Department of Defense](#).

Qualifications The qualified candidate is a US citizen who will have completed their sophomore year of undergraduate study, preferably with a major in physics.

Preferred skills include:

- Interest in a Physics, Materials Science, or Electrical Engineering major.
- Understanding and interest in physics, materials, nanofabrication (e.g., fabrication of nanoscale structures), and early interest in quantum mechanics

Application Requirements

A complete application consists of:

- Zintellect Profile
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - Please upload a copy of a transcript for your current or most recent degree program that meets the disciplinary qualifications of the opportunity. [Click here for detailed information about acceptable transcripts.](#)
- One Recommendation. We encourage you to contact your recommender as soon as you start your application to ensure they are able to complete the recommendation form and to let them know to expect a message from Zintellect. Recommenders will be asked to rate your scientific capabilities, personal characteristics, and describe how they know you. You can always log back in to your Zintellect account and check the status of your application.

If you have questions, send an email to army-rdecom@orise.orau.gov. Please list the reference






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code of this opportunity DEVCOM-SC-2026-0001 in the subject line of the email. Please understand that ORISE does not review applications or select applicants; selections are made by the sponsoring agency identified on this opportunity. All application materials should be submitted via the "Apply" button at the bottom of this opportunity listing. Please do not send application materials to the email address above.

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Point of Contact [Richard](#)

- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **Degree:** Currently pursuing a Bachelor's Degree.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([11](#) )
 - **Earth and Geosciences** ([2](#) )
 - **Engineering** ([9](#) )
 - **Physics** ([13](#) )
 - **Science & Engineering-related** ([1](#) )
 - **Age:** Must be 18 years of age

Affirmation I affirm that I have completed my sophomore year of undergraduate studies.