Opportunity Title: Design, Model, and Verify Graphene for Heat Flow Control Faculty Appointment at DEVCOM-SC
Opportunity Reference Code: CCDC-SC-2022-0002-F

Organization U.S. Department of Defense (DOD)

Reference Code CCDC-SC-2022-0002-F

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

Description The U.S. Combat Capabilities Development Command - Soldier Center (CCDC Soldier Center) is offering a part-time faculty appointment for an experienced faculty researcher.

What will I be doing?

As an ORISE participant, you will join a community of scientists and researchers in an effort to study the control of infrared thermal emission from surface nanostructures for controlling heat flow for thermal management (e.g., trapping heat in cold climates, for warming applications). You will review thermal images to verify that their theoretical results agree with experiment (imaging experiments done at DEVCOM Soldier Center) or at least ensure there is partial agreement. You will then discuss with experimentalists how to combine graphene with textile-grade fibers (e.g. printing) in order to achieve heat trapping or fibers and textiles and would document all the results, periodically presenting the research accomplishments to Army and DoD Scientists and Engineers.

Theoretically, and through analysis of experiments carried out on different materials at DEVCOM Soldier Center by DEVCOM SC technical staff (especially imaging experiments), you will be a part of enabling new heat trapping textile-compatible materials for retaining heat in cold climates, as determined by infrared camera measurements. This research may enable trapping of heat to prolong battery lifetime in cold climates, especially for Army platforms exposed to significant cold weather, including unmanned vehicles. Without design and modeling of new nanostructures composed of graphene and their required first-principles calculations, it is much less likely to be able to scientifically study the control of infrared thermal control of heat flow for thermal management. A “trial-and-error” purely experimental effort may be limited to haphazard measurements without design and theoretical underpinning, since there are many possibilities for combining graphene with fibers, films, textiles, and platform bodies.

This research appointment will be primarily offsite due to anticipated COVID-19 and teaching responsibilities, but a travel stipend is included to support monthly visits to DEVCOM SC, consistent with COVID-19 guidance, and also to present results at a scientific conference in the United States, after they have been reviewed by the DEVCOM SC Security Office.

What is the anticipated start date?

The CCDC-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 intern

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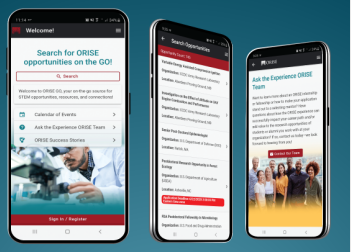

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What is the appointment length?

This appointment is a nineteen week research appointment. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

What are the benefits?

You will receive a stipend determined by DEVCOM SC with consideration of your faculty salary.

Other benefits may include the following:

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

About CCDC SC

The U.S. Combat Capabilities Development Command - Soldier Center (CCDC Soldier Center) 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 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. For more information about the CCDC SC, please visit https://www.army.mil/devcom.

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 will have a Doctoral degree in mathematics, material sciences, nanotechnology or physics.

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It is expected that you will have expertise in performing ab-initio calculations to determine the electronic and optical properties of nanostructures, using density functional theory (DFT) and electrodynamic simulations, e.g. finite-difference time domain (FDTD) simulations. You should be a highly experienced scientist with leading research in these areas.

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)
- One Recommendation

If you have questions, send an email to ORISE-ARMY-RDECOM ARMY-RDECOM@orise.orau.gov. Please list the reference code of this opportunity [CCDC-SC-2022-0002-F] 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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Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 600 month(s).
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (1)
  - **Mathematics and Statistics** (1)
  - **Physics** (5)
  - **Science & Engineering-related** (1)