

**Opportunity Title:** Summer 2021 Undergraduate Research - Novel Optical Properties of Biopigments

**Opportunity Reference Code:** CCDC-SC-2021-0002

**Organization** U.S. Department of Defense (DOD)

**Reference Code** CCDC-SC-2021-0002

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

**Application Deadline** 5/21/2021 4:00:00 PM Eastern Time Zone

**Description** The U.S. Combat Capabilities Development Command - Soldier Center (CCDC-SC) is offering an undergraduate internship at the U.S. Army Natick Soldier Systems Center in Natick, Massachusetts.

#### What will I be doing?

As an ORISE participant, you will join a community of scientists and researchers to learn from a laboratory experience, contributing to DEVCOM SC's disruptive innovation in advanced optical materials: bio-inspired pigments and magnetic materials, both of which have novel optical (visible and infrared) properties, such as high index of refraction, bio-inspired facile synthesis, and reconfigurability (especially with magnetic fields). You will learn new expertise in creating innovative coatings relevant to different platforms, enabling better optical properties, such as color. You will conduct laboratory research to synthesize and apply coatings on representative samples and evaluate optical properties, experimentally and through coached modeling. You will also conduct experiments on tunable and reconfigurable magnetic materials - including magnetic metal-insulator-metal diodes, 1D and 2D magnetic metasurfaces, and possibly magnetic fibers- under short- /long-wave infrared laser illumination (advanced tunable infrared lasers) and in an applied external magnetic field.

#### Why should I apply?

Under the guidance of a mentor, you will gain hands-on experience to complement your education and support your academic and professional goals. Along the way, you will engage in activities and research in several areas.

You will gain experience and hopefully a more profound interest in laboratory research, critical to developing new US technology in advanced optical, bio-inspired, and magnetic materials. Significant laboratory research experience is not required, but an interest in learning laboratory research and a demonstrated laboratory research ethic is essential to this learning experience.

#### Where will I be located?

Natick, Massachusetts

#### What is the anticipated start date?

The CCDC-SC is ready to make an appointment effective June 1, 2021. Exact start date will be determined at the time of selection and in coordination with the selected candidate. Applications are reviewed on an ongoing basis and internship will be filled




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as qualified candidates are identified.

#### **Appointment Length**

This appointment is a twelve week research appointment, with the possibility to be renewed for additional research periods. 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 to be determined by CCDC-SC. Stipends are typically based on a participant's academic standing, discipline, experience, and research facility location. Other benefits may include the following:

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

#### **Nature of Appointment**

You will 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.

#### **About CCDC-SC**

The U.S. Combat Capabilities Development Command - Soldier Center (CCDC-SC) is located at the U.S. Army Natick Soldier Systems Center in Natick, Massachusetts, under the Army Futures Command. CCDC-SC supports Soldier-related research, development, testing and evaluation efforts. Diverse expertise comprised of scientists, engineers, technologists and equipment designers, the CCDC-SC provides a wide range of capabilities to the Soldier, to include field feeding and life support systems, protective clothing, and ballistic, chemical and laser-protection systems, and human performance optimization.

CCDC-SC's highly skilled team of scientists perform a variety of research that includes, Soldier's uniforms, meals ready to eat (MREs), tents, sleeping bags, to parachutes and airdrop capabilities. If Soldiers wear it, eat it, sleep under it, or have it airdropped to them, the product research and development can be traced back to the mission of CCDC-SC. This Army laboratory is focused on all aspects of the Soldier and small squad performance encompassing combat rations, personal and collective protection, aerial delivery of supplies, Soldier training and human performance optimization. For more information about the CCDC-Soldier Center, please see: <https://ccdcsoldiercenter.army.mil/#/whoweare>

#### **Qualifications**

All candidates should be actively pursuing a Bachelor's degree in biophysics, material sciences, applied physics, condensed matter physics, optics, or general physics with an anticipated graduation date on or before May 27, 2024.

The following skills and experience are preferred:

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- Interest in materials, optics, infrared, physics, imaging, bio-inspired materials, chemical synthesis. The Areas of Disciplines selected represent a desired match between the applicant's interests and the disciplines needed for the opportunity. Expertise in these areas is not required, since this is an opportunity for an undergraduate.
- Previous laboratory experience - significant laboratory research experience is not required, but an interest in learning laboratory research and a demonstrated laboratory research ethic is essential to this learning experience.
- Preferably can drive to and from the facility and be able to arrive each day early (by 0800); mentors and coaches also arrive early. For safety, one should always be accompanied by a mentor when conducting experiments in the building after 6 pm.

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 - For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. [Click here for detailed information about acceptable transcripts.](#)
- One Recommendation

*Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed (blanked out, blackened out, made illegible, etc.) prior to uploading into the application system. All documents must be in English or include an official English translation.*

If you have questions, send an email to [ARMY-MRMC@orise.orau.gov](mailto:ARMY-MRMC@orise.orau.gov). Please list the reference code of this opportunity CCDC-SC-2021-0002 in the subject line of the email.

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**Eligibility  
Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Currently pursuing a Bachelor's Degree to be received by 5/27/2024 12:00:00 AM.
- **Overall GPA:** 3.65
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (1 )
  - **Life Health and Medical Sciences** (1 )
  - **Physics** (4 )
- **Age:** Must be 18 years of age