

**Opportunity Title:** 2020 STEMcoding / AFIT Summer Teacher Internship

**Opportunity Reference Code:** AFIT-2020-0031

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

**Reference Code** AFIT-2020-0031

**How to Apply** Components of the online application are as follows:

- Profile Information
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- 1 Recommendation(s)

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.

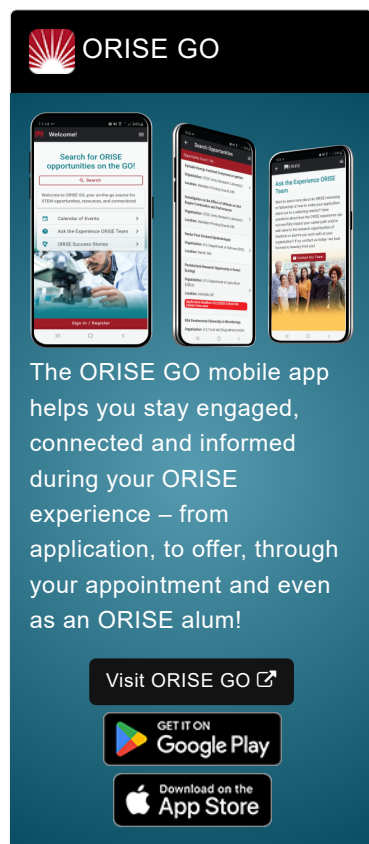
If you have questions, send an email to [AIRFORCE@orise.orau.gov](mailto:AIRFORCE@orise.orau.gov). Please list the reference code of this opportunity in the subject line of the email.

All documents must be in English or include an official English translation.

**Letter of Recommendation:** While a letter of recommendation is not required to be considered, applicants are required to provide contact information for one recommendation in order to submit the application. Applicants are encouraged to request a letter of recommendation before submission as this may help reviewers have a better understanding of the applicant's qualifications and interests. If selected, a letter recommendation must be submitted on your behalf upon acceptance of the appointment

**Description** AFIT's mission is to help build America's airpower, by educating military and civilian Airmen to innovatively accomplish the Air Force's core missions, in support of joint operations, more effectively, efficiently, sustainably and affordably. We provide unique defense-focused, research-enabled, multi-disciplinary advanced academic education, as well as globally delivering career-long, action-based, functional professional continuing education, over a continuum of learning, on-command and on-demand. Our success is measured by the career-long contributions of our graduates, faculty and staff. AFIT accomplishes this mission through four schools: the Graduate School of Engineering and Management, the School of Systems and Logistics, the Civil Engineer School, and the School of Strategic Force Studies. To learn more about the research performed at AFIT, please visit [www.afit.edu](http://www.afit.edu).

This project is intended to mentor one or two interns, who will use High Performance Computing (HPC) systems to engage in summer projects mentored by Prof. Chris Orban from Ohio State University, who is a current



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DoD HPC user and former AFOSR summer faculty fellow at Wright Patterson Air Force Base. Prof. Orban also leads the STEMcoding project. CDR Royce W. James, Ph.D. from the Air Force Institute of Technology (AFIT), the US Coast Guard Academy, and the Center for Directed Energy at the Air Force Institute of Technology, will also serve as subject matter expert and advisor.

Task 1. Laser Environment STEMcode (LESc). Connects computer science, directed energy and atmospheric science. The teacher/intern will develop a coding activity that uses Snell's law of refraction to reproduce the lens equation, which is an important formula for directed energy applications. A followup to this activity will involve using a simple Beer's law prescription to estimate how far a laser beam (like a laser pointer) can travel through the air without significant attenuation. If time allows, the teacher/intern will develop a lab activity where students predict and measure the intensity of laser pointer beams with various colors after traveling the distance of a football field. The teacher/intern would work with Prof. Orban to record video tutorials to describe these lessons that would be posted to the STEMcoding YouTube channel (<http://youtube.com/c/STEMcoding>) for other educators to see.

Task 2. High Frame Rate Video STEMcoding (HFRV-Sc). The teacher/intern will develop classroom activities for physics/physical science that leverage the high frame rate video capabilities available on most smartphones and tablets. Through advances in consumer electronics, these devices can capture the motion of objects with frame rates up to 240 frames per second or more. Performing simulations of objects in slow motion videos could be an impactful way of integrating CS into physics/physical science classes, but there are not widely available resources to help teachers to do this. The teacher/intern working on this project would substantially improve this working demo and create lesson plans and new activities that would consider other situations such as projectile motion, model rocket launches and air drag. These lessons would be recorded and disseminated on the STEMcoding YouTube channel (<http://youtube.com/c/STEMcoding>).

### **Appointment Length**

This appointment is a nine 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.

### **Participant Benefits**

Participants will receive a stipend to be determined by **AFIT**. Stipends are typically based on the 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.*

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- Relocation Allowance
- Training and Travel Allowance

**Nature of Appointment**

The participant will not enter into an employee/employer relationship with ORISE, ORAU, DOD, or any other office or agency. Instead, the participant will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment.

**Qualifications** Currently employed high school teachers who are US citizens. Teachers can be from any part of the US (not restricted to Ohio). Teachers must be interested in integrating computation into their curriculum. Prior coding or computer science experience is not necessary.

We especially value applications from teachers who are leaders in their local professional networks who may be able to impact other teachers with the skills they gain. Likewise, we also value teachers who have a leadership role in their districts regarding curriculum. We are especially committed to this “internship” supporting professional networks with high impacts in diverse learning communities that can demonstrate equitable and inclusive outcomes.

- Eligibility Requirements**

- **Citizenship:** U.S. Citizen Only
  - **Degree:** Any degree .
  - **Discipline(s):**
    - **Chemistry and Materials Sciences** ([12](#) 👁)
    - **Communications and Graphics Design** ([2](#) 👁)
    - **Computer, Information, and Data Sciences** ([16](#) 👁)
    - **Earth and Geosciences** ([21](#) 👁)
    - **Engineering** ([27](#) 👁)
    - **Environmental and Marine Sciences** ([14](#) 👁)
    - **Life Health and Medical Sciences** ([45](#) 👁)
    - **Mathematics and Statistics** ([10](#) 👁)
    - **Other Non-Science & Engineering** ([2](#) 👁)
    - **Physics** ([16](#) 👁)
    - **Science & Engineering-related** ([1](#) 👁)
    - **Social and Behavioral Sciences** ([27](#) 👁)