Opportunity Title: High-speed Camera Pixel Analysis for Simultaneous Temperature and Detonation Velocity Imaging
Opportunity Reference Code: ARL-C-WMRD-1793002616

Organization DEVCOM Army Research Laboratory

Reference Code ARL-C-WMRD-1793002616

Application Deadline 10/14/2026 3:00:00 PM Eastern Time Zone

Description **About the Research**

Located at Aberdeen Proving Ground in Maryland, the U.S. Army Research Laboratory (ARL) is the Army's central laboratory. Its diverse assortment of unique facilities and dedicated workforce of government and private sector partners make up the largest source of world-class integrated research and analysis in the Army.

High-speed Camera Pixel Analysis for Simultaneous Temperature and Detonation Velocity Imaging High-speed color movies (up to 1M fps) are decomposed into their blue, green, and red matrix components, and the relative intensities used to create temperature "movies" of detonation events. The temperature movies are then used to calculate the velocity of detonation fronts and fireball expansion velocities for explosions. This work represents the first time that the simultaneous imaging of temperature and shock velocity has been attempted. This work builds on imaging techniques developed at ARL for single-camera imaging pyrometry. This research opportunity aligns with the ARL's core competency of Ballistics Sciences focused on gaining a greater understanding and discovery of mechanisms and on generating concepts and emerging technologies that support lethality and protection systems.

Applicants should have received an MS degree or higher in Mechanical or Chemical Engineering, Materials Science and Engineering or a closely related discipline. Candidates should demonstrate a strong academic background with research experience in imaging and analysis of high speed events. Additional experience with handling and characterization of energetic materials is are highly desirable.

ARL Advisor: Joshua M. Sadler

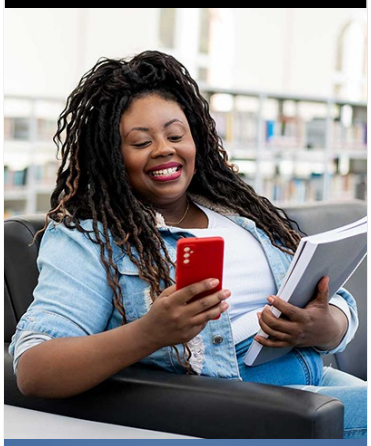
ARL Advisor Email: joshua.m.sadler4.civ@mail.mil

About WMRD

The goals of the Weapons and Materials Research Directorate (WMRD) are to enhance the lethality and survivability of weapons systems, and to meet the soldier's technology needs for advanced weaponry and protection. Research is pursued in energetic materials dynamics, propulsion/flight physics, projectile warhead mechanics, terminal effects phenomena, armor/survivability technologies, environmental chemistry, and advanced materials (energetic, metals, ceramics, polymers, composite/hybrids, and mechanics) for armor, armament, missiles, ground vehicles, helicopters, and individual soldier applications necessary for maintaining and ensuring

DEVCOM ARMY RESEARCH LABORATORY

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supremacy in future land warfare.

About ARL-RAP

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.

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

A link to upload the proposal will be provided to the applicant once the advisor has made their selection.

Questions about this opportunity? Please email

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ARLFellowship@orau.org

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Master's Degree.
- **Academic Level(s):** Any academic level.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (16 👁)
  - **Engineering** (27 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Physics** (16 👁)
- **Age:** Must be 18 years of age