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Opportunity Title: Polymeric Material Development and Manufacturing for Army Applications
Opportunity Reference Code: ARL-C-WMRD-300048

Organization DEVCOM Army Research Laboratory

Reference Code ARL-C-WMRD-300048

Description **About the Research**

An advantage of polymeric materials is that they are relatively easy to process on large scales, into complex shapes, and exhibit high toughness. However, polymers provide a relatively narrow range of mechanical, optical, and electrical performance. Traditional approaches to improve the polymer performance including altering the polymer chemistry and the addition of rigid particulate fillers commonly results in increased viscosity, decreased elongation at break, and decreased melt strength that limit the ability to process the material. The Polymers Branch of the Combat Capabilities Development Command's Army Research Laboratory is seeking qualified candidates in the area of polymer physics and chemistry pertaining to polymer processing. The candidate will investigate new strategies for polymer processing with the goal of realizing never before obtained polymer performance while maintaining melt processability utilizing ARL's Center for Advanced Polymer Processing (ACAPP). The research will require working with a large multi-disciplinary team that is focused on addressing real-world challenges. The main focus of the program will be the development of structure-property-processing relationships to obtain performance enhancements while facilitating rapid, large scale production and implementation.

Qualifications. A minimum of a B.S. in Materials Science, Chemical Engineering, Chemistry, or related discipline. Previous research experience involving polymer structure-property relationships, polymer physics, and/or polymer chemistry is preferred. Candidates will be selected based on their academic record, research background, and recommendations

Keywords: polymer, processing, material science, structure property relationships

ARL Advisor: Randy Mrozek

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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 supremacy in future land warfare.

About ARL-RAP

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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 ARLFellowship@orau.org

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Bachelor's Degree.

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- **Academic Level(s):** Any academic level.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (9 👁)
  - **Engineering** (4 👁)
  - **Physics** (1 👁)