Opportunity Title: Development of Novel Properties from Complex Oxide Thin-films
Opportunity Reference Code: ARL-R-WMRD-1980964779

Organization DEVCOM Army Research Laboratory

Reference Code ARL-R-WMRD-1980964779

Description **About the Research**

Research opportunities are available for fundamental and applied research of complex oxide and ferroelectric thin-film materials for RF/MW and acoustic applications. This research will focus on theoretical understanding and experimental determination of non-linear electrical and electromechanical properties of metastable phases derived from thin-film heterostructures. This research includes the design and characterization of microwave acoustic resonators and novel RF/MW components based on tunable ferroelectric thin-film materials. Therefore, desired candidates should have a strong knowledge and expertise in the following areas: 1) Design of agile RF/MW components and acoustic wave devices based on ferroelectric thin-films; 2) Fabrication of devices and test structures using lithographic techniques; 3) Characterization of material and device properties via on-chip RF/MW testing; and 4) Characterization of thin-film material properties, including composition and structure, using techniques such as XPS, SEM, XRD, or similar techniques. Other attributes beneficial to this research area are knowledge of materials mechanics, such as continuum and elasticity theory, and experience with thin-film synthesis using physical vapor deposition methods. Candidates of interest are U.S. Citizens with a degree in Materials Science, Physics, Electrical Engineering, or similar discipline.

Keywords: Ferroelectric, Microwave, RF, Thin-film

ARL Advisor: Mathew Ivill

ARL Advisor Email: mathew.p.ivill2.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 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)

Opportunity Title: Development of Novel Properties from Complex Oxide Thin-films
Opportunity Reference Code: ARL-R-WMRD-1980964779

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, Master's Degree, or Doctoral Degree.
- **Academic Level(s):** Any academic level.
- **Discipline(s):**
  - **Engineering** (6 👁)
  - **Physics** (16 👁)