

Opportunity Title: Quantum Networks

Opportunity Reference Code: ARL-R-CISD-300003

Organization DEVCOM Army Research Laboratory

Reference Code ARL-R-CISD-300003

Description About the Research

Experimental research focuses on creation, manipulation of entangled photonic states and entanglement manipulation and characterization. It includes fundamental properties of communication channels enabling quantum communication; loss and decoherence in quantum state transfer; entanglement distribution over channel of various physical implementations; fundamental and technological performance limitations of quantum networks.

Theoretical research aims at functionalities of quantum networks for Army-relevant operations that are unattainable by classical systems. It includes theories and models aimed at understanding quantum-network phenomena, network protocols, algorithms and architectures; techniques and methods that enable the design and characterization of quantum networks; managing protocols for efficient entanglement routing, control and manipulation; defining and characterizing network metrics.

ARL Advisor: Michael Brodsky

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About CISD

The Computational and Information Sciences Directorate (CISD) conducts research in a variety of disciplines relevant to achieving and implementing the so-called digital battlefield. Problems address the sensing, distribution, analysis, and display of information in the modern battle space. CISD research focuses on four major areas: communications, atmospheric modeling, battlefield visualization, and computing

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.

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- **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**
- **Degree:** Doctoral Degree.
 - **Academic Level(s):** Any academic level.
 - **Discipline(s):**
 - **Computer, Information, and Data Sciences** ([16](#) )
 - **Engineering** ([3](#) )
 - **Physics** ([16](#) )
 - **Age:** Must be 18 years of age