Opportunity Title: Reconfigurable Intelligent Surfaces and Retrodirective Arrays
Opportunity Reference Code: ICPD-2025-57

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2025-57

How to Apply **Create and release your Profile on Zintellect** – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 3 pages.**

Complete your application – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.

Additional information about the IC Postdoctoral Research Fellowship Program is available on the program website located at: https://orise.orau.gov/icpostdoc/index.html.

If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline 2/28/2025 6:00:00 PM Eastern Time Zone

Description **Research Topic Description, including Problem Statement:**

The proliferation of low-cost radios, beamforming capabilities, and additive manufacturing has facilitated a surge in radio frequency (RF) structures such as antennas, transmission lines, and radomes that are otherwise unrealizable using conventional manufacturing methods. The integration of these new capabilities has allowed for modern takes (reconfigurable intelligent surfaces (RIS's)) on classical techniques (retrodirective arrays). Next generation wireless networks, relying on higher frequency operation, will experience higher bandwidth of operation, at the expense of reduced range

Example Approaches:

Numerous applications are of interest for RIS's or retrodirective arrays operating in the MHz to GHz ranges, whether it be narrowband, multiband, or wideband. The nature of the contribution can be at the aperture, beamforming, signal processing, or system level. Researchers could take a purely theoretical approach, discussing limitations and bounds for various phenomenon within this field of study. Alternately, a purely applied approach – such as the manufacturing practicalities associated with a near-full-sphere coverage retrodirective array. Applicants are encouraged to present their novel concepts and approaches for the theory, modelling, development, and/or fabrication of retrodirective arrays and/or next generation RIS's.

Linkage to current DNI's S&T Priorities:
Develop/enhance capabilities for improved communications with sensors (e.g., in high-interference environments)

Key Words: Antennas, Radio Frequency, Microwave, Filters, Additive Manufacturing, Waveguides, Modeling

Opportunity Title: Reconfigurable Intelligent Surfaces and Retrodirective Arrays
Opportunity Reference Code: ICPD-2025-57

Qualifications

Postdoc Eligibility

- U.S. citizens only
- Ph.D. in a relevant field must be completed before beginning the appointment and within five years of the appointment start date
- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory
- Eligible candidates may only receive one award from the IC Postdoctoral Research Fellowship Program

Research Advisor Eligibility

- Must be an employee of an accredited U.S. university, college or U.S. government laboratory
- Are not required to be U.S. citizens

Point of Contact

Keri Tarwater

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12)
  - **Communications and Graphics Design** (3)
  - **Computer, Information, and Data Sciences** (17)
  - **Earth and Geosciences** (21)
  - **Engineering** (27)
  - **Environmental and Marine Sciences** (14)
  - **Life Health and Medical Sciences** (45)
  - **Mathematics and Statistics** (11)
  - **Other Non-Science & Engineering** (2)
  - **Physics** (16)
  - **Science & Engineering-related** (1)
  - **Social and Behavioral Sciences** (30)