

Opportunity Title: Advanced Techniques for Antenna-Receiver Performance Enhancement and Miniaturization (ATARPEM)
Opportunity Reference Code: ICPD-2025-49

Organization Office of the Director of National Intelligence (ODNI)

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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 IC often requires communication systems working under severe size, weight, and power (SWaP) constraints (e.g., space, man-portable). This is particularly true when RF antennas are small in relation to the wavelength of operation which sets limits on the efficiency, bandwidth, sensitivity, or other properties of the communication system. Recent approaches to overcome the limitations of electrically small antenna systems include antenna-amplifier codesign, predistortion and feedback, direct antenna modulation, on-board parametric amplification, and fast antenna tuning

Example Approaches:

1) Predistortion of transmitted waveform to account for dispersive impedance with nonlinear, adaptive amplifier, 2) direct antenna modulation (DAM) where an antenna is driven directly without the waveform passing through an amplifier, 3) on-board parametric amplification used to increase receive sensitivity or transmit bandwidth, 4) antenna tuning faster than the sample rate to increase bandwidth or enable broadband waveform transmission

Relevance to the Intelligence Community:

Enhance capabilities for RF comms, detection/location of RF signals & overhead infrastructure.

Key Words: SWaP, Electrically Small Antenna, Bandwidth, Efficiency, Amplification, RF, Receiver

Qualifications Postdoc Eligibility



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Enhancement and Miniaturization (ATARPEM)

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- 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 • **Citizenship:** U.S. Citizen Only

Requirements • **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](#))