

Opportunity Title: Nanodiamond Quantum Sensing and Microfluidic Technologies
for Chemical and Biological Detection

Opportunity Reference Code: ICPD-2025-48

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:**

Advancing the detection of chemical and biological threats is a critical challenge for national security, requiring innovative technologies that balance sensitivity, specificity, and operational constraints. This project should focus on the development of quantum sensing technology leveraging functionalized nanodiamond particles embedded in emulsion droplets for multi-agent and agnostic chemical detection.

Example Approaches:

<https://www.spiedigitallibrary.org/conference-proceedings-of-spie/PC12863/PC1286300/High-throughput-in-flow-quantum-sensing-based-on-droplet-microfluidics/10.1117/12.3003471.short>

Key Words: Quantum Chemical Sensing, Emulsion Droplet Microfluidics, Nanodiamond Sensors, Nitrogen Vacancy Centers, Chemical and Biological Detection, Optically Detected Magnetic Resonance (ODMR) Chemical Sensing

Qualifications **Postdoc Eligibility**

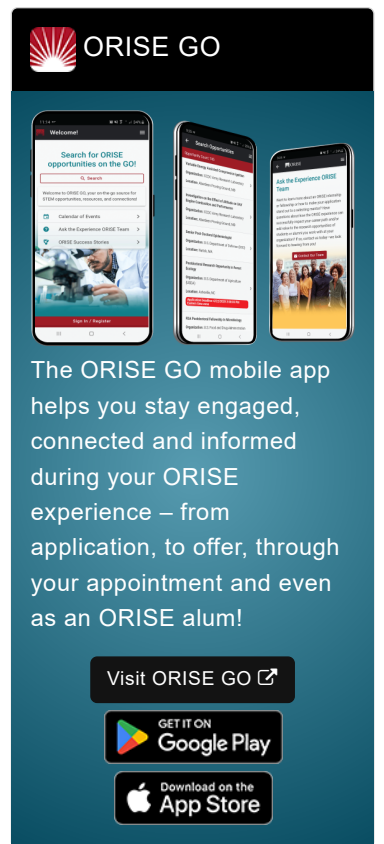
- U.S. citizens only
- Ph.D. in a relevant field must be completed before beginning the appointment and within five years of the appointment start date
- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory
- Eligible candidates may only receive one award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





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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](#))