

**Opportunity Title:** Drone-Based Quantum Sensing Fellowship

**Opportunity Reference Code:** ICPD-2024-16



**Organization** Office of the Director of National Intelligence (ODNI)

**Reference Code** ICPD-2024-16

**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.ornl.gov/icpostdoc/index.html>.

If you have questions, send an email to [ICPostdoc@ornl.gov](mailto:ICPostdoc@ornl.gov). Please include the reference code for this opportunity in your email.

**Application Deadline** 2/28/2024 6:00:00 PM Eastern Time Zone

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

This project explores the emerging technologies collectively known as quantum sensors and identifies opportunities where these technologies could be deployed on automated or remote-controlled vehicles, whether airborne, aquatic, or land based. Three areas of focus for the effort include:

- Dense foliage obscures intrusions at the US northern border. Drone-based technology is needed for efficient detection of objects through dense foliage.
- Port security requires detection of large objects under water.
- Underground tunnels and passages are routinely discovered by U.S. Border Patrol agents, which are used for criminal activity. The ability to safely and accurately determine the location of these underground voids would be a transformative capability for DHS.

The need for mobile sensors in these and related areas adds constraints to the quantum sensing development that may both enrich the problem as well as guide solutions towards one set of technologies over another.

**Example Approaches:**

Classification of sensor technologies with size and weight requirements immediately map to constraints on drone technologies that may be capable as platforms for the sensors. Nevertheless, innovations in quantum infrastructure that are on

**Opportunity Title:** Drone-Based Quantum Sensing Fellowship

**Opportunity Reference Code:** ICPD-2024-16

the horizon, or immersing drone technology, may rapidly change these relationships, giving rise to new possibilities.

**Relevance to the Intelligence Community:**

- Develop new capabilities supporting border protection, law enforcement, and investigations.
- Develop/enhance understanding of emerging technical surveillance capabilities.

**Key Words:** Quantum Sensing, Unmanned Vehicles, Tunnel Detection, Detection through Foliage, Underwater 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

## Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 )
  - **Communications and Graphics Design** (6 )
  - **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 )