

Opportunity Title: Exploration of Quantum Sensing Concepts Fellowship

Opportunity Reference Code: ICPD-2024-27

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2024-27

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.ora.gov/icpostdoc/index.html>.

If you have questions, send an email to ICPostdoc@ora.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:**

How can quantum sensing technologies be developed and leveraged by the NIC to improve operational capabilities in the realms of situational awareness, threat detection, and decision-making, amongst others?

This research topic investigates the development and integration of quantum sensing technologies into national security applications. This topic explores paths to a range of quantum sensor prototypes, commencing with conceptual models, that can potentially meet Australia's national security needs. The operational range may be taken to be between 1 meter and 200 meters. This research may have applications across domains including intelligence collection, operations, surveillance, and counterintelligence.

Example Approaches:

A literature Review followed by conceptual or experimental quantum sensor development, secure communication and data processing protocols/development, testing and evaluation, cybersecurity and resilience safeguarding.

Relevance to the Intelligence Community:

Quantum sensing technologies may offer significant improvements in sensitivity and accuracy over classical sensors, potentially enabling improved situational awareness, threat




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detection, object-tracking, navigation and mapping, technical surveillance and detection, and leading to more informed decision-making – all of which will support the NIC to mitigate against criminal, terrorist and state-actor threats.

Reference:

- B. Kantsepolsky, I. Aviv, R. Weitzfeld and E. Bordo, (2023) 'Exploring Quantum Sensing Potential for Systems Applications,' IEEE Access, vol. 11, doi: 10.1109/ACCESS.2023.3262506.
- Jean-François Bobier, Matt Langione, Cassia Naudet-Baulieu, Thilo Tamme, and Antoine Gourévitch, (2023) 'Making Sense of Quantum Sensing', Quantum Computing, <https://www.bcg.com/publications/2023/making-sense-of-quantum-sensing>
- Subcommittee on Quantum Information Science Committee on Science of the National Science & Technology Council, (2022) 'Bringing Quantum Sensors to Fruition', National Quantum Initiative US. Government, <https://www.quantum.gov/wpcontent/uploads/2022/03/BringingQuantumSensortoFruition.pdf>.
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Key Words: quantum, superposition, entanglement, plasmonics, qubit.

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** (47 )

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- **Mathematics and Statistics** (10 )
- **Other Non-Science & Engineering** (2 )
- **Physics** (16 )
- **Science & Engineering-related** (1 )
- **Social and Behavioral Sciences** (30 )