

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.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 2/28/2024 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.

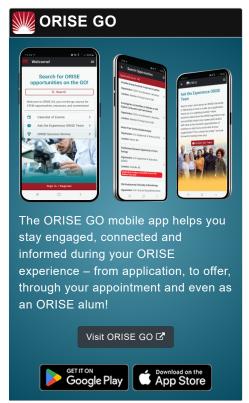
### **Example Approaches:**

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-ofquantum-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/BringingQuantumSensorstoFruition.pdf.

**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 ②)
  - Computer, Information, and Data Sciences (17 ⑤)
  - Earth and Geosciences (21 ●)
  - ∘ Engineering (27 ●)
  - Environmental and Marine Sciences (14
  - Life Health and Medical Sciences (47

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- o Other Non-Science & Engineering (2 ●)
- Physics (16 ◆)
- ∘ Science & Engineering-related (1 ●)
- Social and Behavioral Sciences (30 ●)

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