

**Opportunity Title:** Novel Optoelectronic Devices for Classical Computing and Quantum Sensing

**Opportunity Reference Code:** ICPD-2025-36

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

**Reference Code** ICPD-2025-36

**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](mailto: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:**

**Problem Statement:** The IC requires optoelectronic hardware for future computing and quantum sensing, which is compact, low power, and operational at room temperature. **Topic Description:** Solid-state systems with strong light-matter interactions display emergent quantum behavior and highly nonlinear responses. This topic aims to advance the use of low-dimensional materials in strongly-coupled optoelectronic devices where electronics are used to tune the coupling and/or transduce changes in the optical cavity with external

**Example Approaches:**

Approaches can include fabrication, characterization, and/or modeling of low-dimensional materials coupled to optical cavities with integrated electrodes.

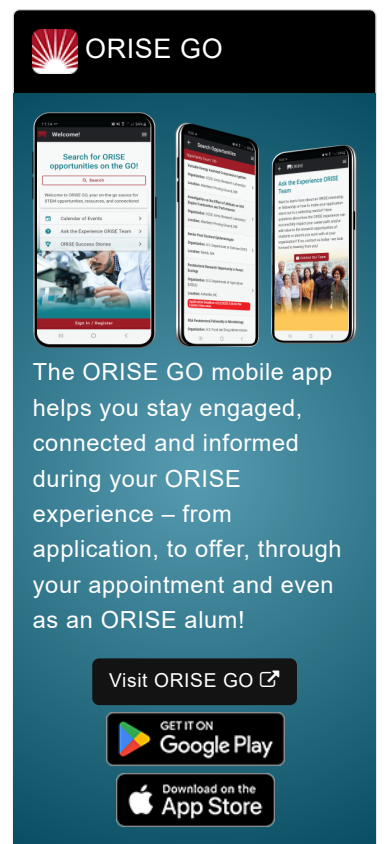
**Relevance to the Intelligence Community:**

Develop/enhance high performance computing and sensor capabilities using novel materials.

**Key Words:** Light-matter interactions, strong coupling, optoelectronics, quantum sensing, neuromorphic computing, quantum emulation, two-dimensional materials, optical cavities, nanotechnology


**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




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**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](#))