

Opportunity Title: Developing Advanced Materials for Efficient Heat Management in Compact Spacecraft Components

Opportunity Reference Code: ICPD-2025-51

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2025-51

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:**

Spacecraft systems are increasingly reliant on compact high-power electronic components to support advanced capabilities. However, these components generate significant heat, which can compromise system performance, longevity, and overall reliability. The goal is to develop and integrate novel materials that can effectively manage the extreme thermal loads and cycling, while also meeting the requirements for reliability, durability in the harsh space environment, and operability at lower SWaP.

Example Approaches:

- Shape Memory alloys, Phase Change Materials (PCMs), smart thermal coatings or waveguides for adaptive, efficient thermal management systems.
- Thermal energy harvesting, where heat is converted into electrical energy
- Ultrathin, light weight thermal interface materials for efficient heat dissipation (e.g.: graphene, MXene, BNNT)

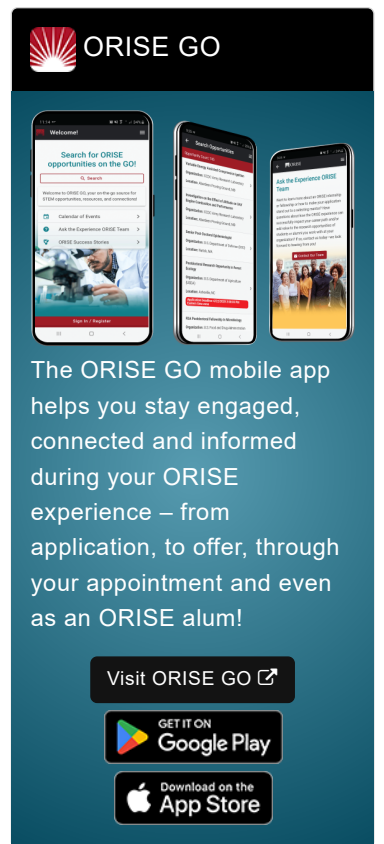
Relevance to the Intelligence Community:

Materials science and manufacturing, energy and power, space, other

Key Words: thermal management, radiative cooling, variable emissivity, smart materials


Qualifications **Postdoc Eligibility**


- U.S. citizens only
- Ph.D. in a relevant field must be completed before beginning the appointment and within five




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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

Point of Contact [Keri Tarwater](#)

- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **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](#))