

Opportunity Title: Modeling Space Situational Awareness for Interactive Investigation of Potential Threats

Opportunity Reference Code: ICPD-2025-54

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2025-54

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:**

This research aims to realize the concept of space situational awareness by building an interactive system to allow structured investigation of potential threats. For space situational awareness, the challenges are data availability, data variety, data quality, and data dynamics.

Example Approaches:

Methods in ontology and graph databases were studied recently. More work is still needed to represent dynamic relationships among space objects, identify outliers, trace the sources of threats, explain the reasons, and measure the uncertainty. References: (1) A. P. Cox, C. K. Nebelecky, R. Rudnicki, W. A. Tagliaferri, J. L. Crassidis and B. Smith, "The Space Object Ontology," 2016 19th International Conference on Information Fusion (FUSION), Heidelberg, Germany, 2016, pp. 146-153. (2) S. Le May, "Graph databases to support space situational awareness and space traffic management," PhD thesis, RMIT University, 2021.

Linkage to current DNI's S&T Priorities:

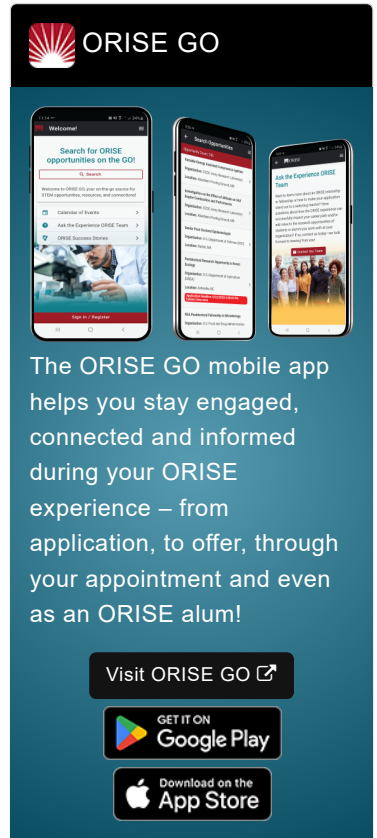
- Develop/enhance capabilities to advance space situational awareness
- Develop/enhance capabilities to characterize the space operating environment and improve global space situational awareness

Key Words: Situational awareness, graph modeling, knowledge graph, description logic, ontology, reasoning, uncertainty

Qualifications **Postdoc Eligibility**


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


 OAK RIDGE INSTITUTE
FOR SCIENCE AND EDUCATION




ORISE GO

The ORISE GO mobile app helps you stay engaged, connected and informed during your ORISE experience – from application, to offer, through your appointment and even as an ORISE alum!

Visit ORISE GO 

GET IT ON
 Google Play

Download on the
 App Store

Opportunity Title: Modeling Space Situational Awareness for Interactive Investigation of Potential Threats

Opportunity Reference Code: ICPD-2025-54

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 • **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](#))