

Opportunity Title: Novel Magnetic Materials and Devices for High Performance

Computing Fellowship

Opportunity Reference Code: ICPD-2024-02

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2024-02

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:**

Problem Statement: Performance and device density of current magnetic memory such as STT-MRAM are limited by the physical properties of the ferromagnetic layers.

Topic Description: Current spintronic devices are limited by the intrinsic magnetic properties of conventional ferromagnetic materials. Antiferromagnetic and other zero-moment magnetic materials could overcome these limitations by contributing negligible fringing magnetic fields, being essentially immune to external magnetic fields, and offering THz operation speeds. Utilization of antiferromagnets requires scalable growth of high-quality thin films, as well as better understanding of the control and detection of the magnetic order. This topic aims to understand what novel magnetic materials can be used for next-generation devices and how to efficiently control the magnetic state of materials with vanishing or negligible net magnetic moment.

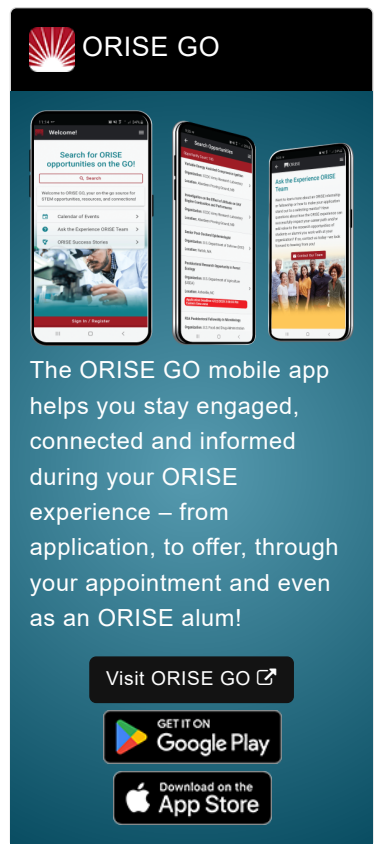
Example Approaches:

Approaches could include growth and characterization of novel antiferromagnetic magnetic materials, modeling and simulation of novel magnetic devices, and fabrication and testing of antiferromagnetic memory devices.

Relevance to the Intelligence Community:

Develop/enhance high-performance computing capabilities.

Key Words: Novel magnetism, noncollinear antiferromagnet, altermagnet, compensated ferrimagnet, spintronics, materials science, synthesis, fabrication, characterization, modeling



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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** ([2](#) 👁)
 - **Computer, Information, and Data Sciences** ([17](#) 👁)
 - **Earth and Geosciences** ([21](#) 👁)
 - **Engineering** ([27](#) 👁)
 - **Environmental and Marine Sciences** ([14](#) 👁)
 - **Life Health and Medical Sciences** ([47](#) 👁)
 - **Mathematics and Statistics** ([11](#) 👁)
 - **Other Non-Science & Engineering** ([2](#) 👁)
 - **Physics** ([16](#) 👁)
 - **Science & Engineering-related** ([1](#) 👁)
 - **Social and Behavioral Sciences** ([29](#) 👁)