

Opportunity Title: Synthesis of Flexible Electrochromic Polymer

Opportunity Reference Code: ICPD-2021-38

Organization Office of the Director of National Intelligence (ODNI)

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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 2 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 3/2/2021 2:00:00 PM Eastern Time Zone

Description **Research Topic Description, including Problem Statement:**

Electrochromic materials are providing a unique material solution to a number of technical applications; however, virtually all of these materials have been synthesized for use in the visible band of the electromagnetic spectrum. Beyond the visible spectrum are different and independent materials that can be tuned for specific band transmittance in the ultraviolet (100-400 nm), the near infrared (780 nm to 2500 nm), and/or the infrared (2,500 to 16,000 nm) regions of the electromagnetic spectrum. Any materials identified should possess a certain flexibility and have chemical stability in varying environments. Additionally, these materials should potentially be able to be layered with other electrochromic materials to provide a tunable optical filter that navigates through a wide variety of bands in the electromagnetic spectrum. The research needs to consider:

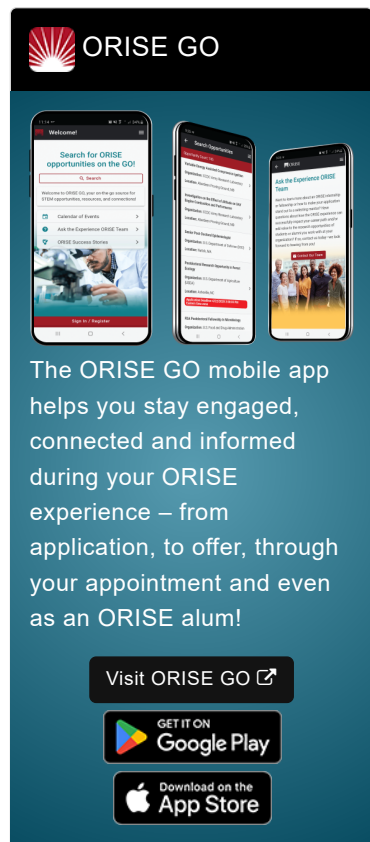
- In which frequency bands are the materials able to switch "off" and "on" in transmittance, while remaining "clear" in the visible spectrum;
- Can the material be layered with other electrochromic materials to create a dynamic filter in a variety of electromagnetic bands;
- Is the material physically and chemically durable in a variety of environmental conditions; does the material possess a certain physical flexibility while maintaining operability.

Example Approaches:

A traditional scientific approach within the organic and/or inorganic synthesis realms should be employed. Suitable chemical candidates should be identified, synthesis routes determined and executed, and materials purified and quantitatively interrogated for applicability. These steps would be followed by laboratory spin-up to synthesize enough material to determine electrochromic viability as a filter.


Relevance to the Intelligence Community:


The use of a thin film filter, which is tuneable for transmittance in specific bands of the electromagnetic spectrum, would provide the Intelligence Community with an optical device that is capable of passively interrogating a wide variety of environments and any impacts to said environment. By being able to dynamically select filters in some of these bands, information could




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be gained in near real time and applied immediately to gain further information.

Key Words: Electrochromic Material, Thin Film, Tunable Optical Filter

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 application deadline
- 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** ([45](#))
 - **Mathematics and Statistics** ([10](#))
 - **Other Non-Science & Engineering** ([2](#))
 - **Physics** ([16](#))
 - **Science & Engineering-related** ([1](#))
 - **Social and Behavioral Sciences** ([27](#))