Opportunity Title: Biotemplated Nanofabrication
Opportunity Reference Code: ICPD-2022-19

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2022-19

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 2/28/2022 6:00:00 PM Eastern Time Zone

Description

Research Topic Description, including Problem Statement:

Looking forward over the next 30 years, the materials and fabrication techniques that have enabled technology spaces such as microelectronics, photonics, and sensors have limitations that mark the end of continued performance scaling under Moore's Law. Fabrication techniques that enable the registration (orientation and position) of novel materials within functional devices with nanometer-scale precision and accuracy in three-dimensions are needed. Biologic nanotechnology (e.g., DNA origami, slats and bricks; proteins) enables the self-assembly of micron-scale three-dimensional structures with nanometer-precise features composed entirely from biologic polymers (e.g., DNA, proteins). These structures have been employed as templates to facilitate the nanometer-scale registration of emerging nanomaterials (e.g., carbon nanotubes, quantum dots, 2D materials) over small areas (< 1 cm^2), which have then been integrated into functional devices using existing fabrication infrastructure. While these early-stage demonstrations provide a significant proof-of-concept, there is a need to demonstrate the scalability of these biologically templated nanofabrication techniques while focusing on both the precision and accuracy potential. This research topic will investigate novel approaches to scalable biotemplated nanofabrication techniques that register functional nanomaterials with high precision and accuracy and offer compelling solutions to issues associated with throughput, yield, and cost.

Opportunity Title: Biotemplated Nanofabrication
Opportunity Reference Code: ICPD-2022-19

Example Approaches:

- 10.1126/science.aaz7435
- 10.1126/science.abd6179

Relevance to the Intelligence Community:

Biologically templated nanofabrication technologies, while a nascent, have the potential to set the IC on a path toward continuous exponential improvements across its national security mission space. Contributing to the development of domestic supply chains for functional devices enabled by these technologies will enhance this capability.

Key Words: Nanofabrication, Nanomaterials, Registration, Self-Assembly

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** (16 👁)
  - **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 👁)