Opportunity Title: Novel approaches to compact energy storage and lighter/more efficient autonomous systems
Opportunity Reference Code: IC-18-04

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	IC-18-04
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://orau.org/icpostdoc/. If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.
Application Deadline	3/12/2018 11:59:00 PM Eastern Time Zone
Description	**Research Topic Description, including Problem Statement:** • The range, speed, endurance, and mission capability of mobile or stationary land, maritime, air, or space systems is limited by the size, weight, and efficiency of the overall system and the energy density of its power source. Therefore, there is an enduring need for ever more compact power sources as well as more energy efficient components for autonomous systems used by civilians, law enforcement, homeland security, defense, and intelligence. • The purpose of this topic is to encourage research that should either increase efficiency of key components used in these systems, increase the energy density of their power sources, or both. **Example Approaches:** • Research the use of smart or multifunctional materials to reduce the weight of a specific component or the overall system by having one material serve two purposes. • Conduct research on a more energy dense battery or other energy storage technology. • Research hybrid energy storage and propulsion approaches. • Research energy management algorithms to minimize energy waste. • Research biomimetic approaches to develop efficient propulsion/locomotion modalities. • Research use of light, strong materials and architectures with additive manufacturing to produce ultralight components or systems having reduced propulsion requirements compared to conventional ones. • Research lighter more compact shielding materials for satellites to reduce launch weight and energy use during its operational lifetime. • Research energy scavenging or recovery technologies that can be incorporated without adding weight or

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volume to the system – conformal structural solar cells, thermoelectric materials, piezoelectric materials, etc.

- Proposals might consider one or more of the following:
- What novel combination of technology and techniques could be combined to produce a radical gain in capability per volume or weight?
- How can cross-disciplinary or hybrid approaches to design be used to produce more efficient systems?
- How can nature be mimicked to improve locomotion or energy efficiency?
- How can smart materials be used to reduce weight or increase energy storage in autonomous systems?

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** (6 👁)
  - **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** (5 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (28 👁)