Opportunity Title: Electronic Materials and Components for Low Power Flexible Devices Unclassified Research
Opportunity Reference Code: IC-17-04

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.

Application Deadline 3/31/2017 11:59:00 PM Eastern Time Zone

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

Organic, inorganic and polymer integrated semiconductors have been researched as materials for use in integrated transistors for new flexible device applications. These devices must meet a multitude of requirements that include displaying a high mobility, high current on/off ratios, material robustness/inertness, and just as importantly, satisfy challenging fabrication techniques on flexible substrates to ever be viable in products. Few flexible transistor examples exist that meet all of these technical expectations for displays or image sensing, or in other sensor technology, as well as for solar cells. Despite these challenges, low cost, low power, high performance devices are considered achievable goals within the next decade and promise a wide spectrum of new applications.

Unclassified Example Approaches:

There are different ways that this research can be approached; versatile approaches are encouraged. The researchers could focus on testing and evaluating specific known semiconductor materials in unique configurations, synthesizing new materials (organic, amorphous, polycrystalline) for flexible thin-film transistors (TFT's), or nearly single crystalline thin films, or analyzing material robustness on a flexible substrate.

Proposals could consider one or more of the following:

- Comprehensively, what semiconductor materials have been studied, and what are the strengths and weaknesses of each material in this type of configuration/device? What new materials show promise in this area and why?
- Are there new device fabrication methods that can be tested on existing materials that improve important measurable characteristics and overall performance?
- What flexible substrates have been studied and what are the strengths and weaknesses of each material in this type of configuration? What

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new materials show promise in this area and why?
- Based on conceptual applications, what is the minimum power threshold that must be achieved for these devices?

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Business** (11)
  - **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** (13)
  - **Physics** (16)
  - **Science & Engineering-related** (1)
  - **Social and Behavioral Sciences** (28)