Opportunity Title: Biological and spectral responses of plants to stressors
Opportunity Reference Code: IC-18-15

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	IC-18-15
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.

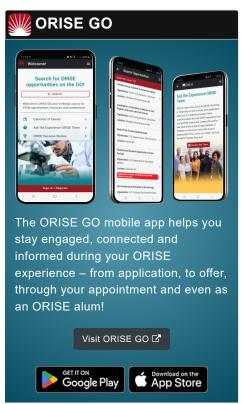|	
Application Deadline	3/12/2018 11:59:00 PM Eastern Time Zone
Description	**Research Topic Description, including Problem Statement:**

As the biological toolkit expands, the opportunities to monitor environment and ecosystem health via the flora are increasing. Consequently, it may be possible to determine early signs of environmental stress or relatively low levels of contaminants using techniques to identify plant metabolite or protein production or other reactions that are unique to particular stressors. These reactions to stress can come in the form of metabolomic or proteomic changes within the plant. These responses can be assessed through laboratory-based measurements detecting the changes, but moving to standoff (meter level or greater) distances is challenging. If plant responses can be identified, correlated with remotely-detectable signatures and profiled to corresponding cause of stress, we may be able to ascertain the cause of plant stress remotely.

Example Approaches:

Approaches to this problem could use a variety of techniques. Potential methods include but are not limited to:

- A theoretical approach to modeling molecular level responses in plants to particular stressors. This approach would be based upon knowledge of plant responses to certain classes of chemicals or elemental over/under

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exposure.

- A modeling approach that estimates/predicts the resulting spectra of various plant responses to stressors in a systematic framework (e.g., similar plant responses to an entire family of chemicals).

- Introducing particular stresses to plants in a controlled experiment and documenting the proteomic or metabolomic or other molecular level changes in the plant's responses at small standoff distance (i.e., centimeter to meter scale).

- Using field scale remotely sensed spectral data to identify plants that have been stressed by known phenomena or exposed to a particular pollutant or chemical.

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 👁)