

Opportunity Title: Improved understanding of composite material properties, with the aim of increased blast resistance

Opportunity Reference Code: IC-17-36

Organization Office of the Director of National Intelligence (ODNI)

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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 Research Topic Description, including Problem Statement:

The risk of terrorism related attacks on aircraft remains high. Significant effort is directed towards the prevention of such acts through intelligence and screening. Unfortunately, a small number of incidents remain undetected and so we must still be prepared to mitigate the impact of any attacks which cannot be prevented.

As the aviation industry moves towards composite construction materials, significant benefits are being realized in weight and cost. However, there is a need to simultaneously improve our understanding of the mechanical properties of composites at high temperatures, pressures and loading, to better understand their failure mechanism when subject to blast effects.

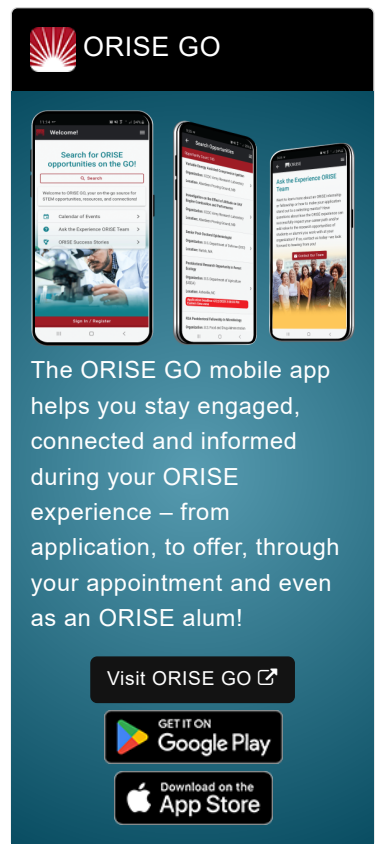
Presented with an understanding of the blast response of composite materials, both the aviation and defense industries will be better placed to improve the mitigation of blast events using these materials, without losing the cost and weight benefits that they offer.

Example Approaches:

The following are some possible approaches:

- Develop suitable testing and modelling approaches which replicate blast conditions.
- Test and model materials to understand the limits and failure mechanisms of composites.
- Assess and recommend innovative solutions which could improve the mechanical properties of composites to improve blast resistance, either through process change, adding new materials or developing new materials.
- Test any new materials and compare their performance with previous ones.

Eligibility • **Citizenship:** U.S. Citizen Only
Requirements • **Degree:** Doctoral Degree.



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- **Discipline(s):**

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- **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](#) 👁)