

Attachment 1 – Research Topic Template

1. **Research Title:** Quantifying Degradation in High Performance Structural Composites Exposed to Extreme Environments

2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level:** Materials Science & Engineering, Mechanical Engineering, Chemical Engineering, Chemistry, Physics, Polymer Science, or closely related field. BS/BA level preferred.

4. **Objectives:** Develop a method for the spatially resolved characterization of polymer composite properties subjected to highly localized, rapid heat fluxes.

5. **Description:** Student will utilize a combination of analytical techniques (nanoindentation, DMA, TGA, TMA, x-ray CT, optical/electron microscopy) and sample preparation to interrogate local composite properties after exposed to extreme heat. Focus will be on determining appropriate tools to characterize composite and then extend to determining mechanisms of composite degradation. Student is expected to learn to operate experiments independently, take initiative in pursuing goals, analyze data and recommend further action.

6. **Research Classification/Restrictions:** Research will be FOUO, Distribution D limited to US Government and Contractors, at the Unclassified level.

7. **Eligible Research Institutions:** Indicate to what organizations this topic should be provided.

DAGSI (Wright State University, AFIT, Ohio State University, University of Dayton, Miami University, Ohio University, University of Cincinnati)
PA Approval #: 88ABW-2013-3436

AFIT (only)

USAFA (only)

If you are submitting a topic for the USAFA, please indicate if you are also interested in sponsoring a USAF Cadet in summer of 2013 (Avg Cost for USAF Cadet for 33 days was \$5000)

Yes No