

1. **Research Title:** Development and Behavior of High-Temperature Ceramic Matrix Composites
2. **Individual Sponsor:**  
Dr. Michael K. Cinibulk  
AFRL/RXCC  
2941 Hobson Way  
WPAFB, OH 45433-7750  
[michael.cinibulk@us.af.mil](mailto:michael.cinibulk@us.af.mil)
3. **Academic Area/Field and Education Level:** Materials Science Engineering (MS or PhD level)
4. **Objectives:** 1) Develop fundamental understanding of the science necessary to develop novel fibers, fiber coatings, and matrices for ceramic matrix composites for improved temperature capability and environmental durability 2) Investigate effects of service environment, at the constituent level, on CMC behavior and life.
5. **Description:** Numerous fundamental scientific issues remain to be addressed to enable the development of a full range of high-performance ceramics and ceramic-matrix composites for Air Force air and space applications. These issues encompass basic design, new constituents, compatible chemistries, and enabling processes for oxide and nonoxide ceramic matrix composites. Current research focuses on investigating higher temperature nonoxide fiber and matrix constituents for enhanced durability, continuing development of oxide fiber coatings and interface control, developing fabrication processes specifically for nonoxide composites, investigating the stability of constituents in aggressive environments, and developing design methodologies for durable composites. Modeling of ceramic matrix composite fabrication processes is of particular interest. Intended service environments for these composites include turbine engines and scramjet engines, as well as hot structures and thermal protection systems for high-speed flight.
6. **Research Classification/Restrictions:** Unclassified/No restrictions
7. **Eligible Research Institutions:** All

**NOTE: Topics submitted to DAGSI must be approved for public release. Need PA Approval#**