

1. **Research Title:** Structural Dynamics & Mechanics of Turbomachinery Components
2. **Individual Sponsor:**

Dr. Dino Celli,
AFRL/RQTI Bldg 252,
2066 5th Street
WPAFB, OH 45433-7333
dino.celli.1@us.af.mil

3. **Academic Area/Field and Education Level**

Mechanical Engineering, Aerospace Engineering, and/or Computer Science
(MS or PhD level)

4. **Objectives:** Develop advanced experimental, analytical, or data-driven approaches for the accurate assessment of targeted turbine engine component life. The research can be directed towards improved bench experimentation, innovative component fatigue and creep models with emphasis on additively manufactured material systems, advanced real-time damage monitoring systems, or improved dynamic response prediction for rotors.
5. **Description:** Turbomachinery components are a significant driver of both unscheduled and scheduled maintenance actions that drive fleet sustainment costs and remove conservatism in structural life design. The goal of this research is to advance the life assessment capability of turbine engine components and, furthermore, to increase engine performance with the deployment of novel material systems and component design. Activities will be performed in the Turbine Engine Fatigue Facility (TEFF) or with the Structural Analysis Group (SAG). The TEFF and SAG maintain unique research capabilities to perform structural, vibration, and mechanical evaluations of turbine engine components. They provide direct support of Versatile Affordable Advanced Turbine Engine (VAATE) program through basic and applied research. Experimental capabilities include scanning vibrometry, real-time digital laser analysis, digital image correlation, derotation, large scale dynamic shakers, high temperature ovens and single and multi-axial fatigue tests.
6. **Research Classification/Restrictions:** Open to U.S. citizens only. Some aspects of this research may include ITAR restrictions.
7. **Eligible Research Institutions:** All DAGSI Universities.

PA Approval #88ABW-2017-3609