1. **Research Title:** Advanced Structural Concepts for lighter and low cost Aircrafts

2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level:** Aerospace or Mechanical Engineering (MS or Ph.D. level).

4. **Objectives:** Explore and evolve innovative structural design and fabrication concepts focusing on agility, capability, and affordability for aerospace structures.

5. **Description:** Modern aircraft structures and materials technologies have developed over a hundred years since the first flight but orthogonal structures such as spars, ribs, longerons, or bulkheads are still widely used for substructure construction. These technologies limit vehicle performance due to increased weight. Recently, unitized composite structures have demonstrated great potential to balance competing performance and cost requirements in aircraft design; and in some instances attain performance beyond traditional capabilities. AFRL is interested in exploring advanced structural technologies that enable light weight and low cost structure. Research opportunities exist in advanced structural concept design, low cost manufacturing, and design for assembly, maintenance, and repair. The topics of research include but are not limited to: (1) Structural topology optimization; (2) Innovative structural concepts such as morphing structures, reconfigurable mechanisms, and bioinspired structures; (3) Multi-functional structures such as structurally integrated antennas, batteries, and thermal management systems; (4) Design for manufacturing/assembly; (5) Advanced prototyping such as continuous fiber composite, automated fiber placement, additive manufacturing, and smart tooling; (6) Low cost manufacturing; (7) Enabling materials and actuators such as flexible/corrugated materials, meta materials, smart materials, and novel hybrid compact actuators.

6. **Research Classification/Restrictions:** None.

7. **Eligible Research Institutions:** All DAGSI Universities.