

1. **Research Title: Flexible Electronics for Responsive Structures**
2. **Individual Sponsor:**

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

Chemistry, Chemical Engineering, Polymer Science and Engineering, Materials Science, Mechanical Engineering, Electrical Engineering (BA/BS, MS or Ph.D. level)

4. **Objectives:** Processing, packaging, and integration of flexible/stretchable conductors for architected responsive constructs
5. **Description:** An opportunity exists to perform research that integrates stretchable electronics into physically deformable structures in order to monitor and report physical deformations through responsive electrical performance. A range of possible material sets which could be utilized to achieve explore this area include but are not limited to nanoparticle / elastomer composites, liquid metal conductors, and intrinsically conductive organic polymers. The research project would likely consist of a combination of materials synthesis exploration, advanced processing such as multi-material additive manufacturing to generate novel integrated designs, and mechanical testing of fabricated devices with in-line, real time electrical characterization. The objective of the research should be the development of a suite of materials, integration strategies, and design protocols that could be implemented to generate novel mechanical/electrical functionality to report physical changes in structure and enable machine-logical operation for future air force relevant applications.
6. **Research Classification/Restrictions:** This research is unclassified with the goal of publication in the open literature, however the general research area is Distribution D