

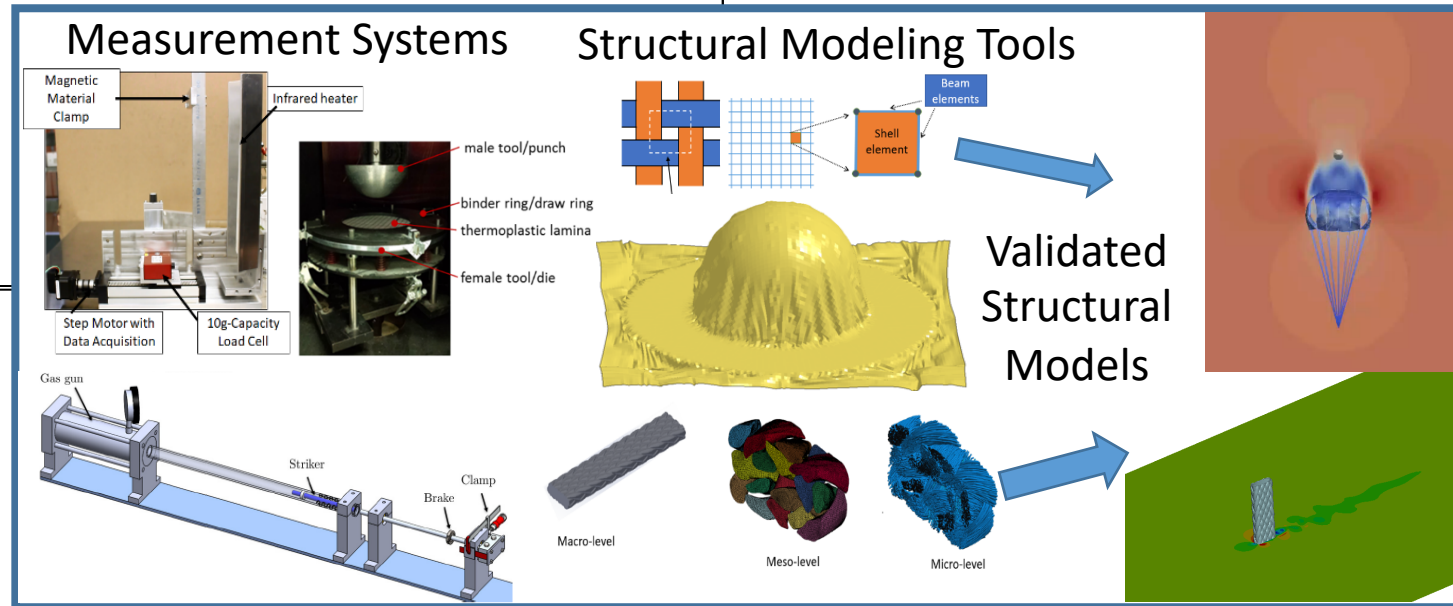
# Enhanced Characterization and Structural Modeling of Canopy Fabrics and Parachute Suspension Lines for Advancing FSI Simulations during Inflation and Descent

Alireza V. Amirkhizi (PI, UMass Lowell), James Sherwood (UMass Lowell), Al Witkowski (Katabasis Aerospace)



## Approach

- The experimental program will (a) develop the *rules and tools for characterization* of canopy fabrics and suspension lines, and (b) build a *material database* for their response in service conditions (strain rates).
- The modeling effort will contribute to the implementation of *high-fidelity textile models* into NASA-relevant FSI codes.
- The structural models will be validated in quasi-static as well as inflation and decent conditions.



## Research Objectives

To advance SOA for FSI simulations of decelerator systems by providing *experimentally calibrated structural models* of the parachute components that capture the salient physical features of textile mechanics.

The effort will progress structural modeling capacities from TRL 2 to TRL 3. It will also develop *application relevant characterization* capacities from TRL 1 to TRL 2.)

## Potential Impact

- The study of the physics of textile systems in a coordinated program leading to improved FSI modeling that can be validated at proper scales,
- Foundations for a realistic virtual design platform to reduce the cost in time and dollars to build and test multiple prototypes before concluding a final design,
- More affordable, safe, and sustainable space flight and platforms by eliminating overdesign.