PROJECT DESCRIPTION/OVERVIEW

Project description: NASA presently uses granular, solid phase physical sorbents for carbon dioxide removal in spacecraft. The US Navy uses liquid sorbents, and contacts submarine air directly with liquid phase sorbents. The liquids have higher capacities and lower regeneration temperatures than the solid phase sorbents, resulting in a smaller, more power efficient system – NASA uses the larger, more power intensive solid phase system because direct contact between gases and liquids in microgravity is tricky. NASA is presently developing a small scale flight experiment that intends to pump liquids through a conventional tube and manifold system, distribute the liquid as a thin film that is in direct contact with the air, collect the thin film into a conventional tube and manifold system, and allow a recirculating liquid loop in microgravity to directly expose a thin film of liquid to air. The flight experiment is small scale, and focused on the study of microgravity fluid flow phenomena. This student project would apply the lessons of microgravity fluid management to design and build, and test a large scale engineering device intended to function as a CO2 scrubber.

DESIGN TEAM PROFILE

| NASA MENTOR:    | John Graf          |
| LEVEL:          | Upper Division [JR/SR] |
| MAJOR / DISCIPLINES: | EE, CHEME, Physics, Materials |
| AREA OF RESEARCH: | Carbon Dioxide Removal in Spacecraft |
| TEAMS:          | Mentor will allow one team |
| DURATION:       | Two-Semester       |