MOSAIC: Miniature Optical Steered Antenna for Intersatellite Communication

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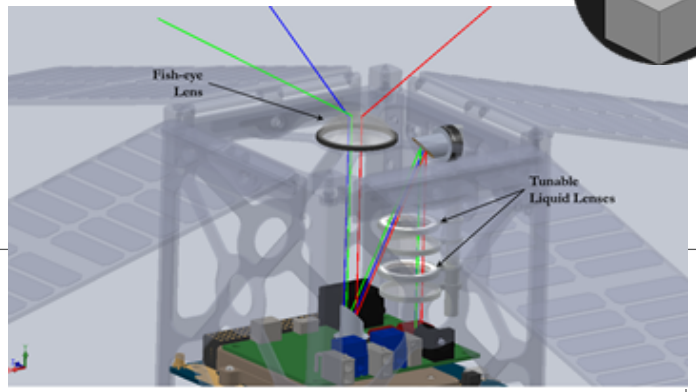

An artist's impression of a MOSAIC terminal slewing a beam over a nearly-full hemisphere.

Approach

- Year 1: Qualify liquid lenses for space environment, begin design of MOSAIC optics
- Year 2: Build, integrate, test MOSAIC prototype (optics, structure, thermal, and electronics)
- Year 3: Refine to flight-like engineering model.

Research Objectives

- MOSAIC's goal is to qualify liquid lens technology for operation in space, and to use liquid lenses to achieve wide-angle (150+ degree) beam steering without mechanical parts.
- State-of-the-art beam steering requires body pointing (which may conflict with science operations) and/or gimbals and steering mirrors (mechanical points of failure).
- Liquid lenses available in production, but never flown in space (TRL 1); we propose to qualify lenses for the space environment (TRL 4)

Potential Impact

- Small-satellite laser communication without body-pointing (enables communication without interrupting other tasks)
- Rapid switching between communication targets (constellation operations, dispersed ground relays)
- Possible applications for non-comms tasks, e.g. LIDAR for remote inspection, asteroid proximity navigation...