

Galileo to image objects in geosynchronous orbit faster

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Military satellites are critical sources of communications and data for today's operations environments. Through DARPA's Phoenix program, usable antennas or solar arrays from retired satellites in geosynchronous orbit (GEO – 36,000 kilometers above earth) could be removed and potentially repurposed as components for new satellites to provide vital mission support. However, identifying cooperating satellites from which to harvest an array is a difficult and lengthy task using current ground-based satellite imaging techniques. By introducing precise fiber optic controls to ground-based telescopes, this challenge may be overcome. DARPA's Galileo program seeks to bridge the precision fiber optic controls and long-baseline astronomical interferometry technical communities to enable imaging of objects in GEO faster than is possible today.

"We know the fiber optic control community is engaged in precision control of light," explained Air Force Lt. Col. Travis Blake, [DARPA](#) program manager. "If those solutions could be meshed with the unique demands of astronomic imaging, we could develop a new means of better, faster imaging of objects in GEO. We encourage experts from both technical communities to participate in Galileo's upcoming Proposers' Day."

Technology for imaging objects in space uses astronomical long-baseline interferometers, which rely on several interconnected telescopes grouped together to measure light reflections off an astronomical object as it moves across the sky. Current systems, however, can only view space

objects from limited angles due to a complicated combination of evacuated light pipes—which can be several hundred feet long—turning mirrors and the active metrology required between telescopes to establish an extremely high-precision optical path.

Imaging objects in GEO is a slow process because they don't move much in the sky relative to the Earth's rotation. Galileo seeks to harness the power of precision fiber optic controls to connect astronomical interferometry telescopes via flexible fiber optics cable, removing the need for rigid light pipes. Fiber optics technology may enable a larger number of interconnected mobile telescopes, which could more quickly capture the data required of an object in GEO from multiple angles, resulting in faster image creation.

More information: DARPA issued a special notice today announcing the upcoming proposers' day for the Galileo program. The full special notice can be found here: [www.fbo.gov/spg/ODA/DARPA/CMO/ ... N-12-11/listing.html](http://www.fbo.gov/spg/ODA/DARPA/CMO/...N-12-11/listing.html)

Provided by Defense Advanced Research Projects Agency

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