Geosynchronous orbit is of particular interest to U.S. intelligence experts because it is the altitude at which orbiting remote-sensing satellites maintain the same position above the Earth's surface; the Earth does not rotate underneath the spacecraft as it does with satellites orbiting at lower altitudes.

As more nations become active in space, U.S. intelligence agencies have an increasing need for space situational awareness -- particularly timely information about systems and activities in geosynchronous Earth orbit, IARPA officials explain.

The U.S. Senate Armed Services Committee has identified the need to develop ground-based capabilities for passive imagery of geosynchronous objects to provide a credible layer of accountability for behavior in space.

Since objects in geosynchronous orbit are 22,236 miles above the Earth's surface, these objects appear from the ground to be so small and dim that telescopic observation cannot provide imagery of sufficient resolution for the space situational awareness needs of the military and intelligence community, IARPA officials say. The altitude of geosynchronous orbit is nearly three times the diameter of Earth.

Different ground-based approaches to image geosynchronous objects have focused on interferometers such as the Naval Precision Optical Interferometer (NPOI) and the Magdalena Ridge Optical Interferometer (MROI), both of which have active research programs in geosynchronous imaging.

Because geosynchronous objects are dim, however, finding and measuring the interference fringes developed between any two apertures in the interferometer is challenging, IARPA officials say.

The complex shape of geosynchronous objects also reduces inherent signal strength in the fringes resulting in a fringe tracking and fringe measurement problem that rapidly becomes more difficult at longer interferometer baselines necessary for high-resolution image reconstruction.

Previous attempts have involved several design approaches using relatively large apertures of one to two meters in diameter. Even with such large apertures, however, taking enough baseline measurements for image reconstruction in a reasonably short period of time leads to prohibitively high system costs.

The upcoming Amon-Hen project will try to overcome many of these challenges. IARPA will release a formal solicitation with more details around early May.

Companies interested in attending the Amon-Hen industry briefings on 11 May 2017 should register online no later than 4 May 2017 at https://eventmanagement.cvent.com/AMON-HENPD. Those registering will receive email directions to the briefing location. Only U.S. citizens may attend.

Email questions or concerns to IARPA's Merrick DeWitt at dni-iarpa-baa-17-02@iarpa.gov. More information is online at https://www.fbo.gov/notices/5327a4fdba9bf3b451594850c8861422.