

LightSail Program Update

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This LightSail program has been fully active since late 2013 after an 18-month pause. Conceived by The Planetary Society, the program is privately funded via citizen contributions and seeks to be the first mission to demonstrate controlled solar sailing using a 3U CubeSat package, serving as a precursor for currently active lunar and deep-space CubeSat projects employing similar solar sails (e.g., Lunar Flashlight and NEO Scout).

Nearly identical spacecraft, LightSail A and LightSail B, were designed by Stellar Exploration, Inc., San Luis Obispo, CA, who completed preliminary integration of both spacecraft in 2012. Each spacecraft incorporates four-panel solar sails which deploy into a square sail 8 meters on the diagonal. Currently, the lead contractor for LightSail final integration and testing is Pasadena-based Ecliptic Enterprises Corporation. The rest of the LightSail team consists of Boreal Space, Half Band Technologies, California Polytechnic University San Luis Obispo and Georgia Institute of Technology.

LightSail A is ready for an Atlas 5 launch in May 2015. LightSail B will be completed summer 2015 and is on track for a Falcon Heavy launch in 2016, serving as an integral element of the Prox-1 mission led by Georgia Tech.

LightSail A will demonstrate and validate the majority of key functions of the system design. Its relatively low orbit and resultant atmospheric drag, however, precludes demonstration of controlled solar sailing. Once in orbit, the spacecraft will execute a month-long checkout and testing sequence before deploying its solar sails. After the sails unfurl and system-level tests are conducted for a few days, LightSail A will be pulled back into the Earth's atmosphere.

The LightSail-B mission will build on the results of the LightSail-A mission and conduct a full demonstration of solar sailing in Earth orbit. With LightSail B packaged inside a small spacecraft called Prox-1, the spacecraft duo will be launched into a higher, longer lasting orbit than that of LightSail A. Prox-1 will deploy LightSail B and use it as a test target for its own demonstration of in-space rendezvous and inspection technologies. Prox-1 will then image LightSail B as its sails deploy and the solar sailing mission starts. The months-long orbit will allow the LightSail team to fully test all subsystems (including momentum wheels for improved attitude control, not included in the LightSail-A design) and measure orbit changes due to solar radiation pressure.

LightSail programmatic status and connections with active NASA deep-space projects will be addressed.

399 words (400 word limit)