

LightSail 2 – The Planetary Society – 3U CubeSat

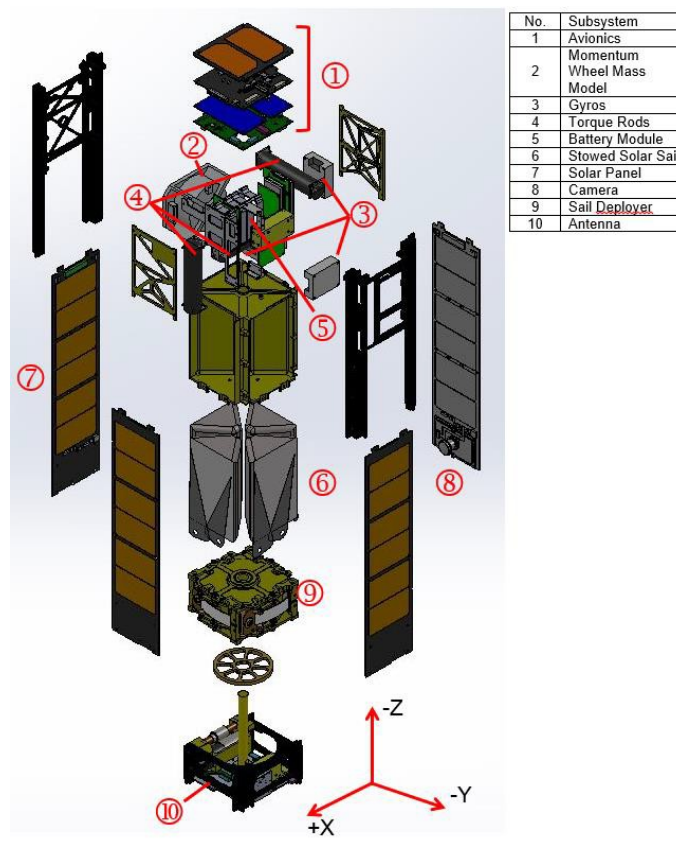


Figure 1: LightSail-A Expanded View

LightSail 2 shown in Figure 1, is the second privately developed solar sail project conceived and led by The Planetary Society. It was launched 25 June 2019 and is currently operating under a Special Temporary Authority issued 17 May 2019. It has deployed a $\sim 32 \text{ m}^2$ Mylar sail and demonstrated solar sailing by raising its orbit apogee. Partners include Ecliptic Enterprises Corporation, the Georgia Institute of Technology, Boreal Space, and Cal Poly SLO.

LightSail 2 launched within a P-POD embedded within the Prox-1 small satellite. Upon ejection from the P-POD, LightSail 2 began the boot-up sequence. After successful completion of boot-up sequence, the unit started the ACS and went into detumble mode. At 45 minutes after ejection, the antenna deployed and UHF beacon commenced shortly after. The ground team acquired and tracked LightSail 2 verifying all parameters are within tolerance. The solar panels and solar sail was then deployed. Orbit raising operations began for a period of 4 weeks. During this time LS2 downlinked images, and tracked orbital change. LightSail 2 will deorbit in approximately 12 months or more.

The CubeSat structure is made of Aluminum 6061-T6. It contains all standard commercial off the shelf (COTS) materials, electrical components, PCBs and solar cells. The payload consists of a 32 m^2 Mylar solar sail with a custom metal boom.

There are no pressure vessels, hazardous or exotic materials.

The electrical power storage system consists of common lithium-polymer batteries with over-charge/current protection circuitry. The batteries are not UL listed, however the

batteries will be tested per AFSPCMAN 91-710 to ensure compliance with safety requirements.

