

GUSTO Payload Design and Performance

Gal/Xgal U/LDB Spectroscopic/ Stratospheric THz Observatory (GUSTO) is a NASA Explorers Mission of Opportunity that will make large scale maps of the Milky Way and Large Magellanic Cloud in three important interstellar lines: [CII], [OI], and [NII] at 158, 63, and 205 μm , respectively. During its ~50+ day stratospheric (~120,000 ft) flight, GUSTO's 0.9-meter balloon-borne telescope and THz heterodyne array receivers will provide the spectral and spatial resolution needed to untangle the complexities of the interstellar medium by probing all phases of its Life Cycle. The GUSTO payload consists of (1) a telescope; (2) three 8-pixel heterodyne array receivers; (3) autocorrelator spectrometers; (4) instrument control electronics; and (5) a cryostat. The GUSTO gondola is derived from successful APL designs. Much of the GUSTO instrument architecture and hardware is based on the experience gained in developing and flying the Stratospheric Terahertz Observatory (STO). GUSTO is currently undergoing integration and test and will launch from the NASA Long Duration Balloon (LDB) Facility near McMurdo, Antarctica in December 2023. During our presentation we will provide an overview of the GUSTO payload design and performance characteristics.