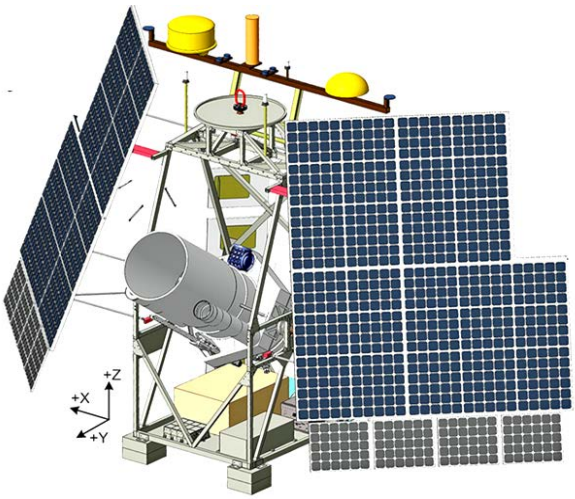
The Gal/Xgal Ultra-Long Duration Balloon-borne Spectroscopic THz Observatory (*GUSTO*)

C. K. Walker[1], C. A. Kulesa[1], Paul Goldsmith[2], and the *GUSTO* Team

The Gal/Xgal Ultra-Long Duration Balloon-borne Spectroscopic THz Observatory (GUSTO) will dramatically improve our understanding of the Universe by probing the topology and ecology of interstellar gas throughout the Milky Way and nearby galaxies. GUSTO is a balloon-borne, 0.9 m Cassegrain telescope with cryogenic heterodyne array receivers designed to stay aloft for 100 days or more. During this time GUSTO will survey 124 square degrees of the Milky Way and all of the Large Magellanic Cloud (LMC) in three important interstellar lines: [CII], [OI], and [NII] at 158, 63, and 205 μm, respectively. GUSTO will map the structure, dynamics, energy balance, pressure, and evolution of the Interstellar Medium within the Milky Way and LMC. GUSTO is an Explorer Mission of Opportunity. The mission will utilize the 100+ day flight potential of the Super Pressure Balloon, also known as the Ultra Long Duration Balloon (ULDB), provided by NASA's Balloon Program Office. GUSTO features a proven measurement approach, a high-heritage payload, and a simple, repeatable observing strategy that, combined with the ultra-long duration capability of the SPB, enables these important new galactic/extragalactic observations at a fraction of the cost of a comparable orbital mission



GUSTO balloon craft and payload include a 0.9 m telescope, cryogenic THz receivers, and a gyro stabilized pointing system to provide an unparalleled galactic-extragalactic survey capability.

[1] Steward Observatory, 933 N. Cherry Ave., University of Arizona, Tucson AZ 85721 USA.

[2] Jet Propulsion Laboratory, 4800 Oak Grove Dr., Pasadena CA 91109

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