

**THERMODYNAMIC MEASUREMENTS NEAR THE ^3He LIQUID-GAS
CRITICAL POINT: THE MISTE FLIGHT EXPERIMENT**

M. Barmatz, Fang Zhong, Inseob Hahn

Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Dr.,
Pasadena, CA 91109

barmatz@squid.jpl.nasa.gov

The MISTE flight experiment will perform *PVT*, heat capacity at constant volume and isothermal susceptibility measurements near the liquid-gas critical point of ^3He during a 4.5-month mission on the International Space Station. These microgravity measurements will provide a stringent test of the asymptotic predictions of critical phenomena theories. Combining these asymptotic measurements close to the critical point with ground-based measurements in the crossover region farther away from the transition will also permit a more thorough test of crossover equation-of-state models. The motivation for performing these experiments and the planned experimental approach will be discussed. Recently developed theoretical crossover models will also be tested using ground-based measurements obtained in preparation for flight.