An experiment called MISTE (Microgravity Scaling Theory Experiment) is now being developed by NASA to fly in the LTMPF (Low Temperature Microgravity Physics Facility) on the International Space Station. The main objective of this flight experiment is to perform continuous in-situ $PVT$, specific heat at constant volume, $C_v$, and isothermal susceptibility, $\chi_T$, measurements in the asymptotic region of the $^3$He critical point. On the ground, gravity induced density gradients exclude precision measurements in the asymptotic region. In preparation for this microgravity flight, precision ground-based experiments are now being performed in the crossover region away from the critical point to determine the leading crossover amplitudes. Recent $C_v$ and $\chi_T$ measurements along the critical isochore have been analyzed using a new parametric crossover equation-of-state and a field theoretical Renormalization Group calculation based upon the $\phi^4$ model. A description of the experimental techniques and results of these theoretical analyzes will be presented.