

The Interior Structure of the Moon from the Gravity Recovery and Interior Laboratory Mission
Maria T. Zuber
Massachusetts Institute of Technology

The Gravity Recovery and Interior Laboratory (GRAIL) is a twin-spacecraft lunar gravity mission that has two primary objectives: to determine the structure of the lunar interior, from crust to core; and to advance understanding of the thermal evolution of the Moon. GRAIL mapped the Moon from March through December 2012 at average altitudes from 55 km down to 11 km. The current global gravity field spatially resolves blocks of 5 km and observations have been improved in quality by as much as a factor of 10^6 over previous lunar gravity models. Observations have elucidated the Moon's early thermal state, have solved the long-standing question of the origin of mascons, have provided insight into the depth to which the effects of impacts penetrate into and beneath the lunar crust, and have refined the population of impact basins, and by extension, the early lunar impact flux. We synthesize the wide range of results from the mission so far and discuss the expectations of ongoing analyses.