



## The GRAIL gravity mission to the Moon

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The Gravity Recovery and Internal Laboratory (GRAIL) mission will measure the gravity field of the Moon with horizontal resolution of 30 km, measurement resolution of 0.1 mGal, and a global accuracy of better than 10 mGal. The primary science objectives are: (1) determine the structure of the lunar interior, from crust to core, and (2) advance understanding of the thermal evolution of the Moon; the secondary objective is to (3) extend knowledge gained from the Moon to the other terrestrial planets. GRAIL's gravity observations will be used to support six scientific investigations: (1) map the structure of the crust and lithosphere, (2) understand the Moon's asymmetric thermal evolution, (3) determine the subsurface structure of impact basins and the origin of mascons, (4) ascertain the temporal evolution of crustal brecciation and magmatism, (5) constrain deep interior structure from tides, and (6) place limits on the size of a possible solid inner core. The GRAIL mission will obtain the lunar gravity field by measuring the precise instantaneous relative range-rate between two spacecraft separated by approximately 200 km at a mean altitude of 50 km in lunar polar orbit. GRAIL will be launched in 2011.