

Early Results from the Lunar Atmosphere and Dust Environment Explorer (LADEE)

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On 6 September, 2013, a near-perfect launch of the first Minotaur V rocket successfully carried NASA's Lunar Atmosphere and Dust Environment Explorer (LADEE) into a high-eccentricity geocentric orbit. After 30 days of phasing, LADEE arrived at the Moon on 6 October, 2013. LADEE's science objectives are twofold: (1) Determine the composition of the lunar atmosphere, investigate processes controlling its distribution and variability, including sources, sinks, and surface interactions; (2) Characterize the lunar exospheric dust environment, measure its spatial and temporal variability, and effects on the lunar atmosphere, if any. After a successful commissioning phase, the three science instruments have made systematic observations of the lunar dust and exospheric environment. These include initial observations of argon, neon and helium exospheres, and their diurnal variations; the lunar micrometeoroid impact ejecta cloud and its variations; spatial and temporal variations of the sodium exosphere; and the search for sunlight extinction caused by dust. LADEE also made observations of the effects of the Chang'e 3 landing on 14 December 2013.