



NanoSWARM - A nano-satellite mission to measure particles and fields around the Moon

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The NanoSWARM mission concept uses a fleet of cubesats around the Moon to address a number of open problems in planetary science: 1) The mechanisms of space weathering, 2) The origins of planetary magnetism, 3) The origins, distributions, and migration processes of surface water on airless bodies, and 4) The physics of small-scale magnetospheres. To accomplish these goals, NanoSWARM targets scientifically rich features on the Moon known as swirls. Swirls are high-albedo features correlated with strong magnetic fields and low surface-water. NanoSWARM cubesats will make the first near-surface (<500 m altitude) measurements of solar wind flux and magnetic fields at swirls. NanoSWARM cubesats will also perform low-altitude neutron measurements to provide key constraints on the distribution of polar hydrogen concentrations, which are important volatile sinks in the lunar water cycle. To release its cubesats, NanoSWARM uses a high-heritage mother ship in a low altitude, polar, circular orbit. NanoSWARM's results will have direct applications to the geophysics, volatile distribution, and plasma physics of numerous other bodies, in particular asteroids and the terrestrial planets. The technologies and methods used by NanoSWARM will enable many new cubesat missions in the next decade, and expand the cubesat paradigm into deep space. NanoSWARM will be proposed as a NASA Discovery mission in early 2015.