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Boulders on Ceres

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In December 2015 Dawn arrived in its lowest orbit (LAMO) around Ceres, encircling the dwarf planet at a distance of 400 km to the surface. At this altitude the images of the on-board Framing Camera (FC) have a resolution of about 40 meters per pixel, high enough to distinguish large boulders on the surface. Indeed, the LAMO images show a multitude of boulders around what appear to be relatively young craters. At its previous target, asteroid Vesta, the FC was also able to resolve boulders from LAMO orbit. We mapped their distribution and found them to predominantly cluster around young craters. Using the ages obtained from crater counts it appears that the average lifetime of Vesta boulders is similar to that of lunar boulders, as may be expected for Vesta's basaltic surface composition. The nature of Ceres' surface has not definitely been established yet. Its bulk composition may be carbonaceous chondrite-like with significant contributions of clays, salt, and possibly water ice. As such, the abundance and distribution of boulders on Ceres may be unlike that on the Moon or Vesta. Our analysis of the distribution in combination with crater age estimates may provide clues to the physical nature and composition of the surface. We provide the first results of our boulder mapping effort using Ceres LAMO images.