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Vesta as a geophysical laboratory for studying impact contamination

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Abstract.

The NASA mission Dawn recently completed its investigation of Vesta (Russell et al. 2012) and left the asteroid leading for its second target, Ceres. Among the first results of the Dawn mission were the confirmation of the link between the bulk of the Howardite-Eucrite-Diogenite (HED) meteorites and Vesta (De Sanctis et al. 2012a; Prettyman et al. 2012), and the detection of the presence of dark material on the surface of the asteroid and in buried veneers exposed in the walls of craters (McCord et al. 2012). The Vesta-HED link suggests that the dark material is likely carbonaceous in nature (McCord et al. 2012; Reddy et al. 2012; Turrini et al. 2014). In close association to the dark material, the instruments on-board the Dawn spacecraft also revealed the presence of OH and H-rich material (De Sanctis et al. 2012b; Prettyman et al. 2012). In this talk I will discuss the role of impacts in delivering exogenous, volatile-rich material to Vesta, how the same impacts affected the vestan surface in terms of erosion, crater saturation and ejecta blanketing, and how the results obtained with the model developed to study the dark material can be applied to identify the best tracers for other kind of contaminants (Turrini et al. 2014).

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