

Hydrothermal venting on carbonaceous chondritic elevations on 1 Ceres and 4 Vesta

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Framing Camera images of the Dawn spacecraft [1] led to the discovery of recent geologic activity on Ceres, including deposition of salts, formation of near surface haze [2], and impact associated spectral diversity. More detailed analyses revealed widespread flow features, partly composed of granular material, but also indicating sites of fluidized areas of the surface and sub-surface. The unexpected discovery of deposits of carbonaceous chondritic material on Vesta associated with indications of considerable amounts of volatiles at large impact structures hint at similar processes [3, 4]. Near large crater walls on both proto-/dwarf-planets, montes and domes appear to be associated with uplift and even release of water-driven material including salts and clays [5, 6]. We report morphologic and color band spectroscopic characteristics of selected key features on 1 Ceres and 4 Vesta which demonstrate this context. A first analysis indicates compositional differences of the proportion of the content of salts and phyllosilicates, e. g. on the different elevations of the primary and secondary spots in Occator and some flow features. The distribution and diversity of these color features is further characterized by a comparison with more widespread properties on the whole surface. During this investigation, not only the link between salt deposits and different types of materials at the centers of activity could be described, but we also offer an intriguing new interpretation of one of the most prominent surface features of Vesta: Lucaria Tholus. Several analogies with similar features and properties of Mars [7] further support the view of a related origin.

References: [1] Sierks, H. et al., *Space Sci. Rev.*, 163, 263–327, 2011. [2] Nathues, A. et al., *Nature* 528, 237–240, 2015. [3] Reddy, V. et al. *Icarus*, 221, 544-559, 2012. [4] Scully, J. E. C. et al., *EPSC Abstracts* 8, 2013-242-2, 2013. [5] Platz, T. et al. *LPSC 2016* [6] Ruesch, O. et al. *LPSC 2016* [7] Platz, T. et al. *EPSC Abstracts* 8, 2013-1055, 2013.