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Presentation Abstract

Title **Vesta Mineralogy after Dawn global Observations**

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Abstract The Dawn mission has completed its mapping phases at Vesta and millions of spectra have been acquired by the Visible and InfraRed Mapping Spectrometer, VIR(1). VIR characterizes and maps the mineral distribution on Vesta -strengthening the Vesta HED linkage- and provides new insights into Vesta’s formation and evolution(2,3). VIR spectra are dominated by pyroxene absorptions near 0.9 and 2.0 µm and large thermal emission beyond 3.5 µm. Although almost all surface materials exhibit howardite-like spectra, some large regions can be interpreted to be richer in eucritic (basaltic) material and others richer in diogenititic (Mg-orthopyroxenitic) material. The Rheasilvia basin contains Mg-pyroxene-rich terrains for example. Vesta' s surface shows considerable diversity at local scales. Many bright and dark areas(3,4) are associated with various geological features and show remarkably different morphology. Moreover, VIR detected statistically significant, but weak, variations at 2.8 µm that have been interpreted as indicating the presence of OH-bearing phases on the surface(5). The OH distribution is uneven with large regions lacking this absorption feature. Associations of 2.8 µm band with morphological structures indicate complex process responsible for OH. Vesta exhibits large spectral variations that often correlate with geological structures, indicating a complex geological and evolutionary history, more similar to that of the terrestrial planets than to other asteroids visited by spacecrafts. Grateful Support of the Dawn Instrument, Operations, and Science Teams is acknowledged. This work is supported by an the Italian Space Agency (ASI) grant n° I/004/12/0, a DLR grant, and by NASA through the Dawn project and the Dawn at Vesta Participating Scientist grant. References: (1) De Sanctis M.C. et al., Space Sci. Rev., 2010. (2) Russell C.T et al., Science, 336, 684 2012. (3) De Sanctis M.C. et al., Science, 336, 697, 2012 (4) McCord, Nature, submitted (5) De Sanctis M.C. et al., Science, submitted