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IMAGING ASTEROID 4 VESTA USING THE FRAMING CAMERA

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The Framing Camera (FC) onboard the Dawn spacecraft serves a dual purpose. Next to its central role as a prime science instrument it is also used for the complex navigation of the ion drive spacecraft. The CCD detector with 1024 by 1024 pixels provides the stability for a multiyear mission and its high requirements of photometric accuracy over the wavelength band from 400 to 1000 nm covered by 7 band-pass filters. Vesta will be observed from 3 orbit stages with image scales of 227, 63, and 17 m/px, respectively. The mapping of Vesta's surface with medium resolution will be only completed during the exit phase when the north pole will be illuminated. A detailed pointing strategy will cover the surface at least twice at similar phase angles to provide stereo views for reconstruction of the topography. During approach the phase function of Vesta was determined over a range of angles not accessible from earth. This is the first step in deriving the photometric function of the surface. Combining the topography based on stereo tie points with the photometry in an iterative procedure will disclose details of the surface morphology at considerably smaller scales than the pixel scale. The 7 color filters are well positioned to provide information on the spectral slope in the visible, the depth of the strong pyroxene absorption band, and their variability over the surface. Cross calibration with the VIR spectrometer that extends into the near IR will provide detailed maps of Vesta's surface mineralogy and physical properties. Georeferencing all these observations will result in a coherent and unique data set.

During Dawn's approach and capture FC has already demonstrated its performance. The strong variegation observed by the Hubble Space Telescope can now be correlated with surface units and features. We will report on results obtained from images taken during survey mode covering the whole illuminated surface. Vesta is a planet-like differentiated body, but its surface gravity and escape velocity are comparable to those of other asteroids and hence much smaller than those of the inner planets or

the Moon. The comparison with 21 Lutetia, recently passed by the Rosetta comet rendezvous mission, will reveal the effects of body differentiation on surface cratering and morphology and will at the same time improve our understanding of Vesta's interior.

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