

Abstract Submitted
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Capture of cometary dust grains in impacts at 6.1 km s⁻¹.¹

MARK BURCHELL, NICHOLAS FOSTER, Univ. of Kent, ANTON KEARSLEY, PENNY WOZNIAKIEWICZ, Natural History Museum (London) — The NASA Stardust mission collected freshly ejected dust from comet 81P/Wild 2 during a fly by at 6.1 km s⁻¹ in 2004 (in what was in effect a real life shock/recovery experiment), and returned its samples to Earth in 2006 (Brownlee et al., *Science* **314**, 1711 – 1716, 2006). The collecting media were aerogel and aluminum foil. We will present laboratory data from an extensive series of light gas gun experiments at 6.1 km s⁻¹ on these media. For aluminum targets, the shock pressures (~60 – 100 GPa) extensively disrupt the impactors, leaving residue in craters. Using SEM-EDX and Raman spectroscopy we show that it is nevertheless possible in some cases to reconstruct *both* projectile elemental composition *and* mineralogy. Capture in aerogel is less destructive, but still modifies the impactors (shock pressures ~1 GPa). The processing during aerogel capture and the resulting biases introduced in determining particle size, shape and mineralogy will be discussed. Examples of real Stardust cometary dust samples will be shown to illustrate the results.

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