

Cometary dust particles of 67P under a microscope

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COSIMA (COmetary Secondary Ion Mass Analyzer, [1]) has collected more than 35 000 particles and particle fragments in the near coma of 67P/C-G. These particles, which impacted the COSIMA metallic targets at very low velocity [2], have been imaged by the internal camera of COSIMA, the COSISCOPE, with a spatial resolution of 14 μm . Sub-pixel sampling of the cometary particles show that the particles are aggregates of smaller units [3], the impact patterns of the particles on the targets [4] and their break-up on charging during secondary ion mass spectrometry [5] reveal their fragile nature. The density of the cometary dust particles collected by COSIMA [4] and their optical properties [6] imply that the particles collected by COSIMA are highly porous and less dense than interplanetary dust particles collected on Earth. Further investigations are ongoing, in particular via numerical simulations [7] and laboratory measurements [8], which will allow deriving physical properties of these particles which are not directly accessible at the resolution of the COSISCOPE.

- [1] Kissel et al., 2007, *Space Science Reviews*, 128, 823
- [2] Della Corte et al., 2015, *A&A*, 26208
- [3] Langevin et al., 2016, *Icarus*, 271, 76
- [4] Hornung et al., 2016, *P&SS*, 133, 63
- [5] Hilchenbach et al. *Phil. Trans. R. Soc. A* 375, 1–16 (2017).
- [6] Langevin et al., 2017, *MNRAS*, 469, S535-S549
- [7] Maroger et al., 2018, *LPI*, 2149
- [8] Ellerbroek et al., 2017, *MNRAS*, 469, S204-S216