



Cometary dust at the smallest scale - latest results of the MIDAS Atomic Force Microscope onboard Rosetta

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The MIDAS instrument onboard the Rosetta orbit is a unique combination of a dust collection and handling system and a high resolution Atomic Force Microscope (AFM). By building three-dimensional images of the dust particle topography, MIDAS addresses a range of fundamental questions in Solar System and cometary science.

The first few months of dust collection and scanning revealed a deficit of smaller (micron and below) particles but eventually several 10 μm -class grains were discovered. In fact these were unexpectedly large and close to the limit of what is observable with MIDAS. As a result the sharp tip used by the AFM struck the particles from the side, causing particle breakage and distortion.

Analyses so far suggest that the collected particles are fluffy aggregates of smaller sub-units, although determination of the size of these sub-units and high resolution re-imaging remains to be done. The latest findings will be presented here, including a description of the particles collected and the implications of these observations for cometary science and the Rosetta mission at comet 67P.