# Simulating Stardust – Studies of Interstellar Dust Analogue Tracks in Stardust Aerogel and Foils

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In 2000 and 2002 the Stardust Mission exposed aerogel collector panels for a total of about 200 days to the stream of interstellar grains sweeping through the solar system[1]. The material was brought back to Earth in 2006. We present laboratory calibration of the collection process by shooting high speed [5 - 30km/s] interstellar dust (ISD) analogues onto Stardust aerogel flight spares.

A complete range of speeds up to 30 km/sec can only be achieved by a Van de Graaff accelerator such as operated at the MPI für Kernphysik (Heidelberg)[2]. Using a recently improved version of the Particle Selection Unit (PSU), individual shots with defined speed and particle size are performed. In a subsequent survey in an optical microscope the impacts were characterised. Subsequently tracks in picokeystones[3] were extracted and analyzed with Scanning Transmission X-ray Microscopy (STXM). This enabled an investigation into both the morphology of impact tracks as well as any structural and chemical modification of projectile and collector material. For each set of parameters, about 50 particles were collected. First results show a bulbous track shape at 15 km/s similar to type A Stardust tracks with a terminal particle. For the first time it could be shown experimentally that cores of sub-micron minerals survive aerogel capture at speeds well above 10km/s. The calibration allows recalculation of the ISD flux for the Stardust collection period. Preliminary results indicate a quite different ISD flux than previously assumed[4].

## References

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