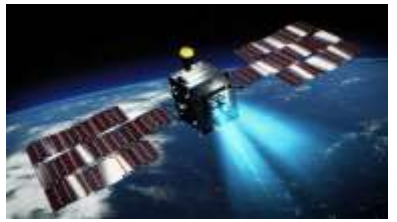
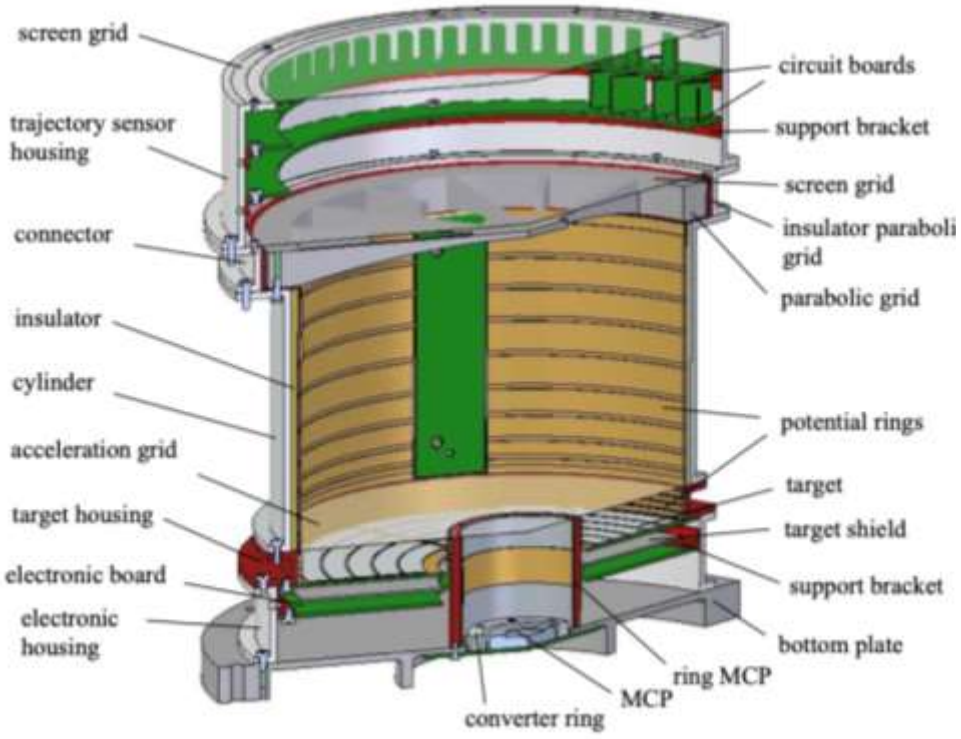
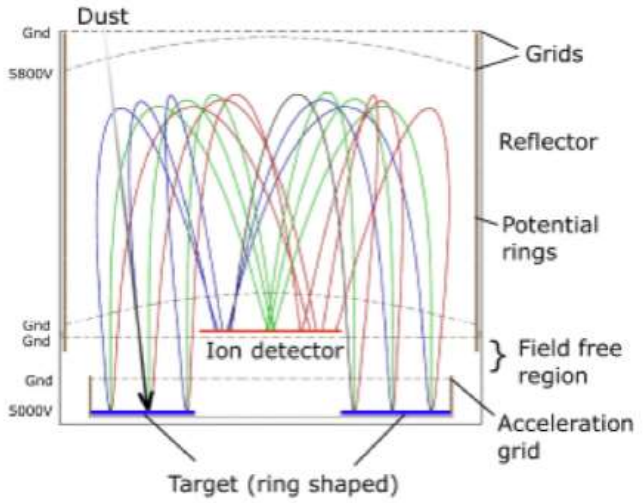
DESTINY⁺ Dust Analyser (DDA)



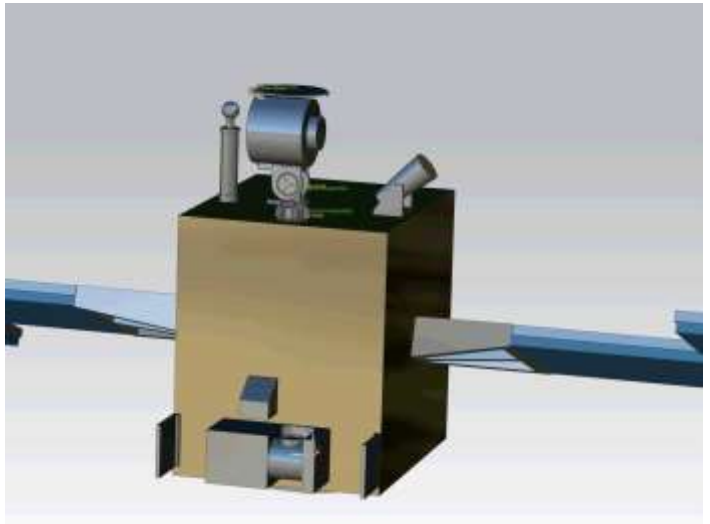


Kobayashi et al., 2018, LPSC conf.



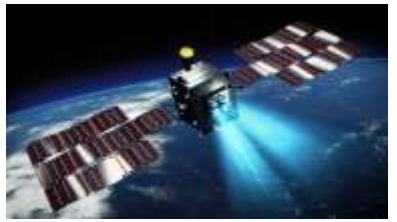
- Impact-ionization trajectory sensor and TOF-MS; measures mass, speed, charge, direction and compositon of each impacting dust particle
- Developed by IRS, University of Stuttgart, Germany (PI Ralf Srama)
- Heritage from Cassini, Giotto, Stardust, Rosetta, Europa Clipper

Dust telescope



TOF-MS with m/dm > 100
Sensor area: 0.03 m^2
Mass range: 1-1000 u
Ion polarities: cations
Dust speed: 5- 100 km/s
Dust size: 10 nm - 100 µm
Dust charge: > 2 fC
Dust trajectory: < 10°-20°

DDA Major Science Goals



PHAETHON

- Activity Search
- Dust Ejection Mechanism
- Dust Size Distribution
- Composition: Link to asteroid populations
- Volatile depletion

INTERSTELLAR DUST

- Organics?
- Compositional variability
- Element depletion in interstellar medium
- Size distribution, mass balance of ISM
- Interaction with heliosphere

INTERPLANETARY DUST

- Cometary and asteroidal contributions
- Search for Oort Cloud and Kuiper Belt dust
- Study particle dynamics

COMETARY METEOROID TRAILS

NANO GRAINS

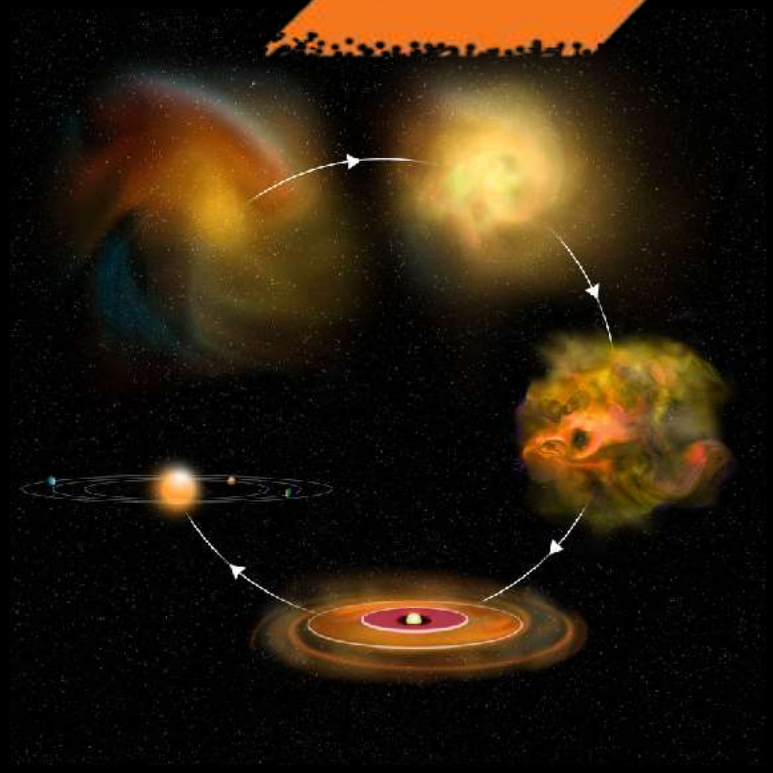
BETA METEOROIDS

LUNAR DUST

SPACE DEBRIS

ldge from Astrophysics to Planetary Science

DESTINY$^+$



- DESTINY$^+$/DDA allows for TOF-MS analysis of in-situ impacts of micrometeoroids
- 0.9 - 1.1 AU heliocentric distance
- Interplanetary dust
- Interstellar dust (sample ISM)
- Composition of Phaethon