

The hard task of observing the meteoroids

J. Vaubaillon

W. Reach

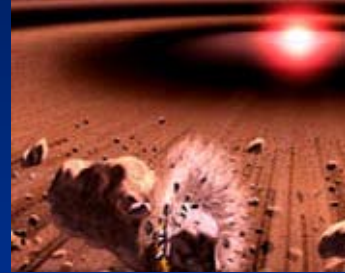
California Institute of Technology

IMC2007, Barege, France



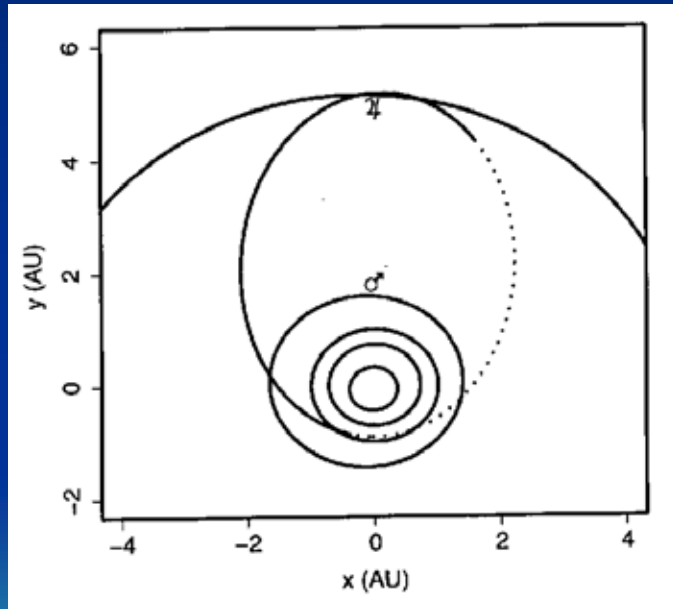
Introduction

- Too small to be detected by telescopes
- Too large to efficiently scatter Sun light
- 90% of cometary mass loss

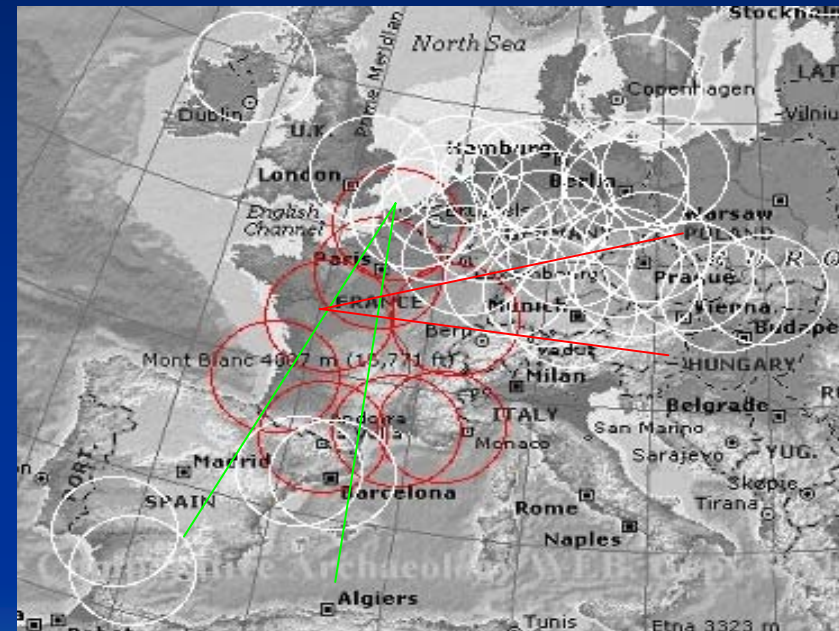


Limits of today observations

- Meteors: **necessary** but not enough



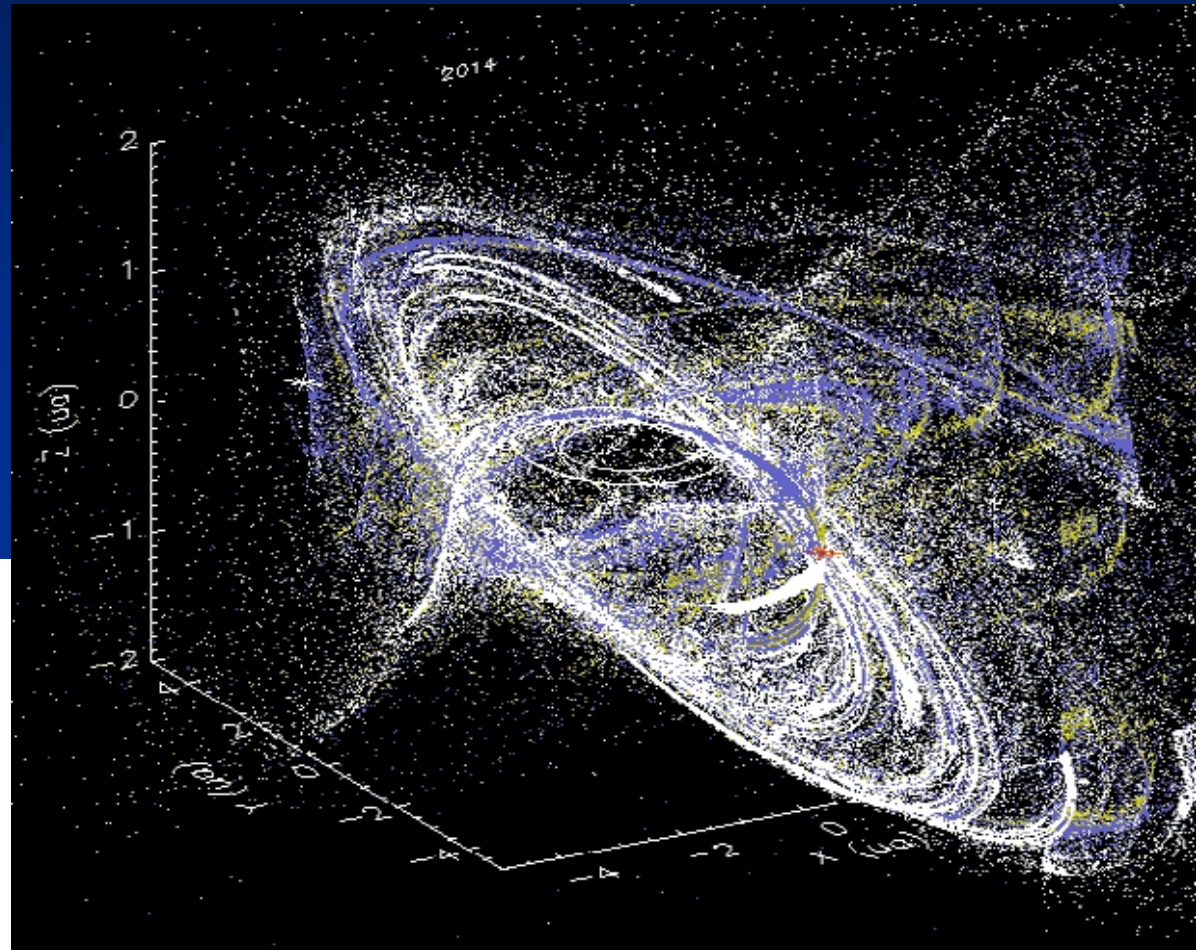
Wiegert et al. 2005, MNRAS, 361, 638-644



Future French network

= LORMS
(Maquet,
Vaubaillon,
Colas,
Vienne 2006)

What we see and what we want to know (1)



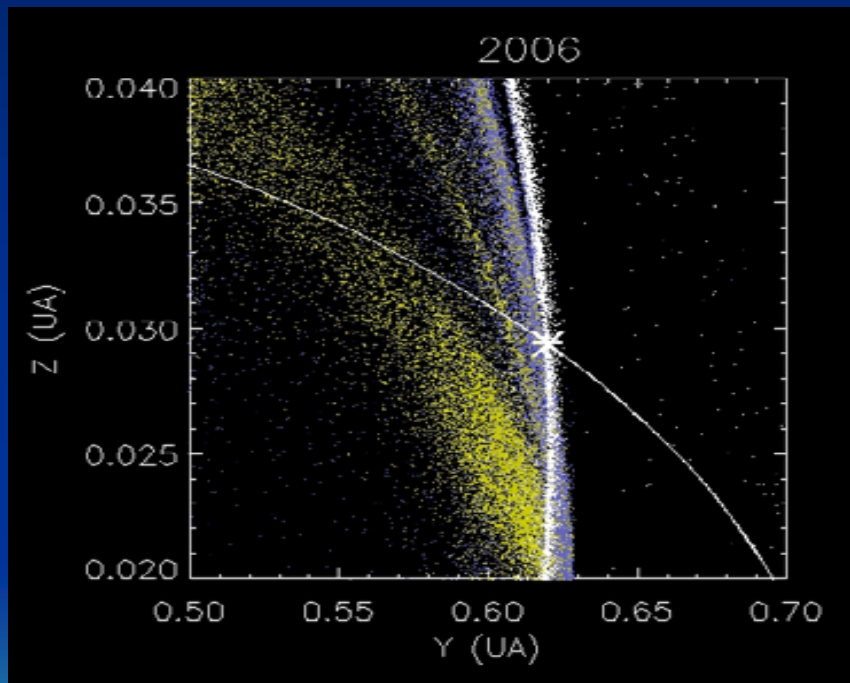
67P/Churyumov-Gerasimenko

Extend our reach (1)

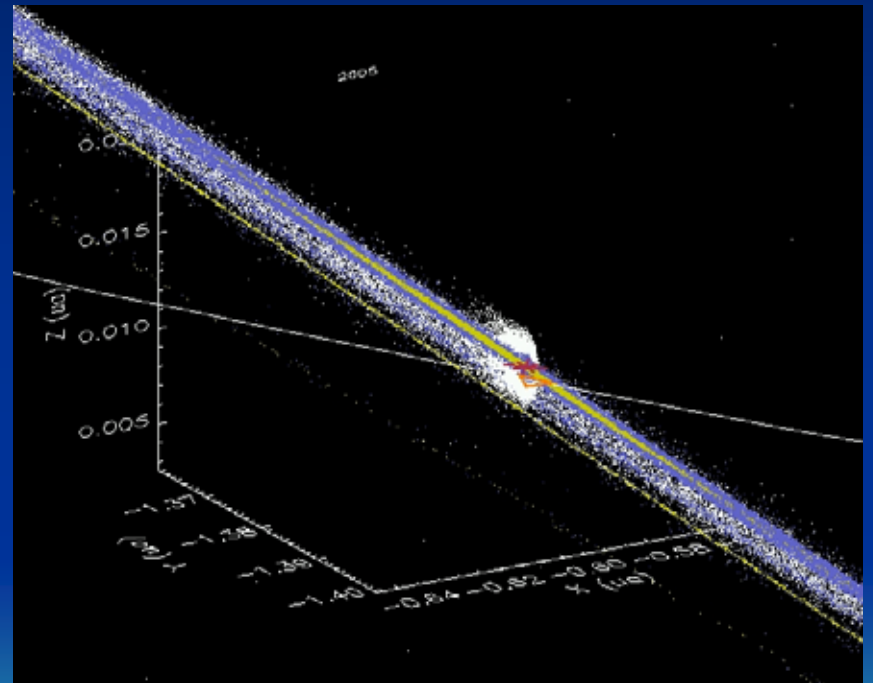
- Other planets
- Christou et al., 2007
(in press, Europlanet):
review of tomorrow
possibilities: visible,
radio, exosphere etc.
- Dedicated
instruments (ESA
study, D. Koschny)



Extend our reach (2)



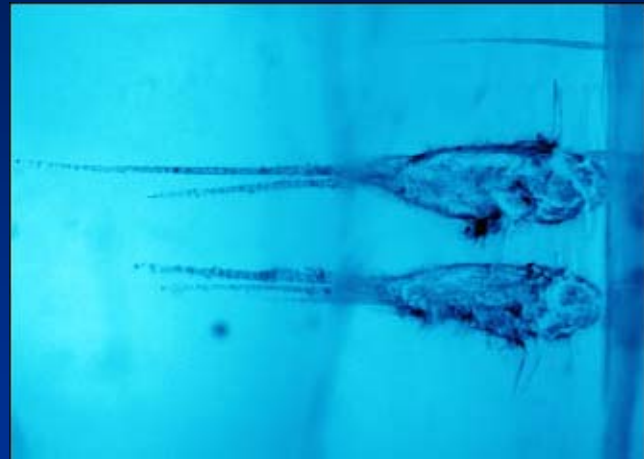
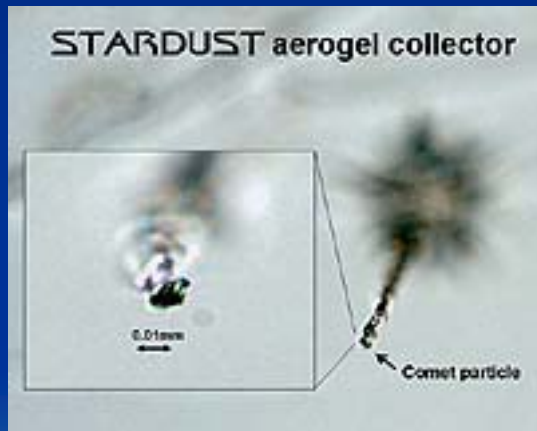
45P dust at Venus
(Vaubailon, Christou, 2006)



9P and Deep Impact
(Vaubailon et al., 2006)

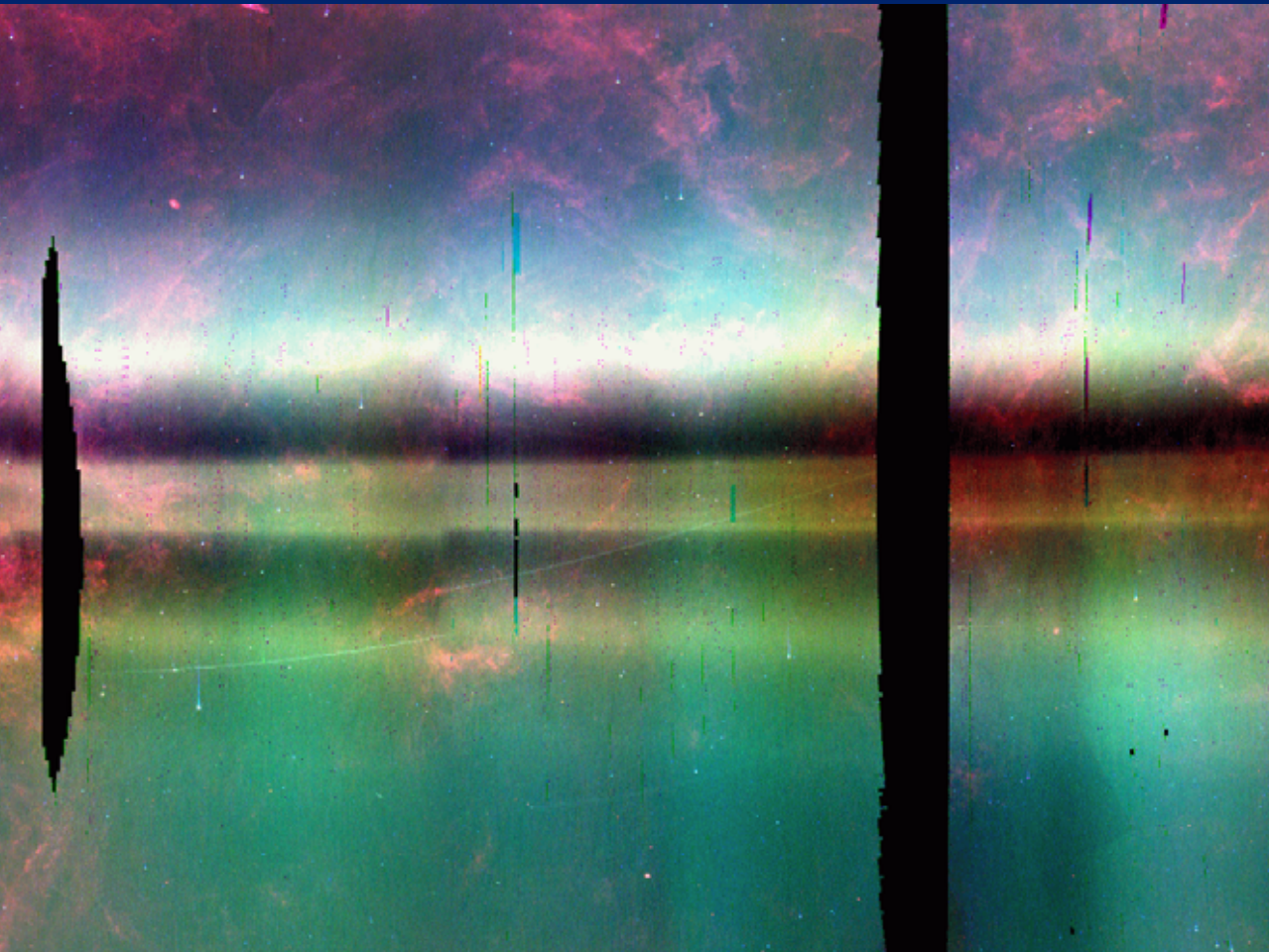
In situ measurements

- The question of the grain density

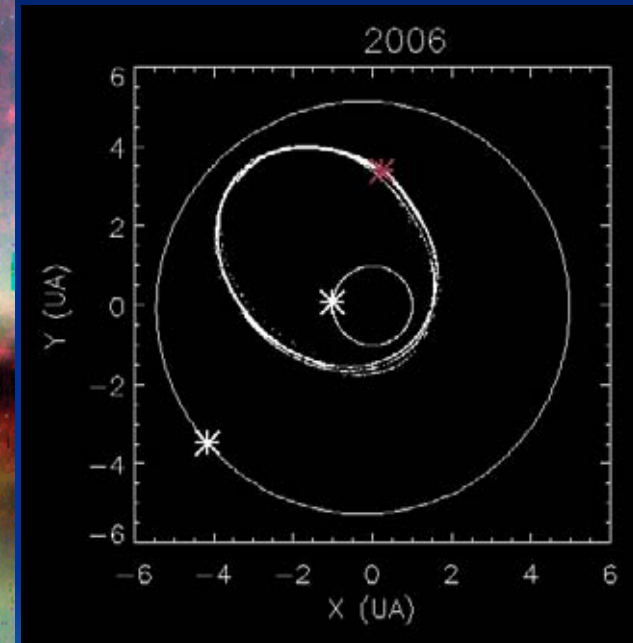


What we see and what we want to know (2)

The power of infrared observations



Tempel 2: IRAS observations

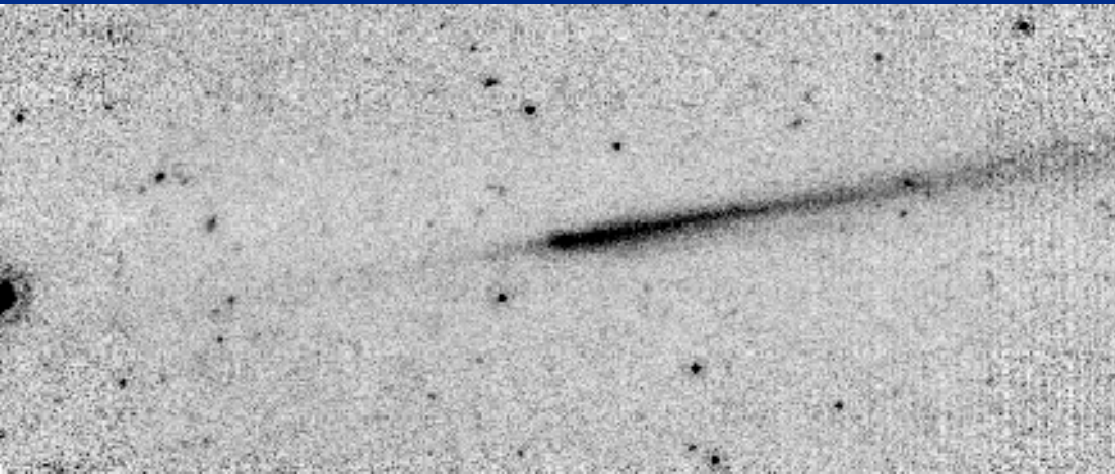


Tempel 2: simulations
(Vaubillon, Reach)

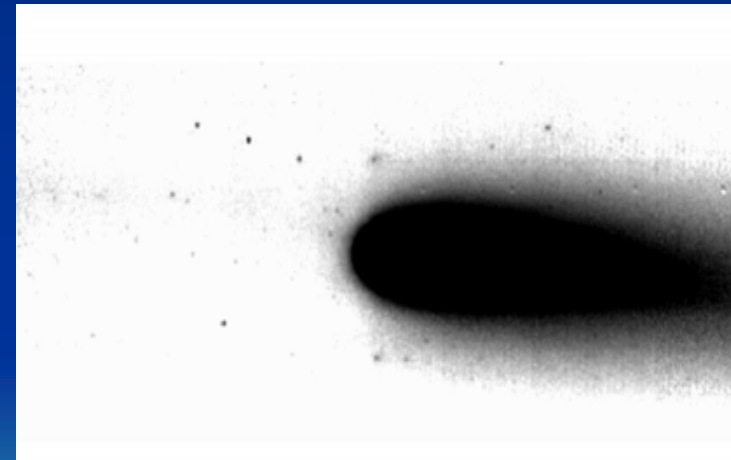
Infrared observation (1)

- Reach et al., 2007: survey of 32 comets

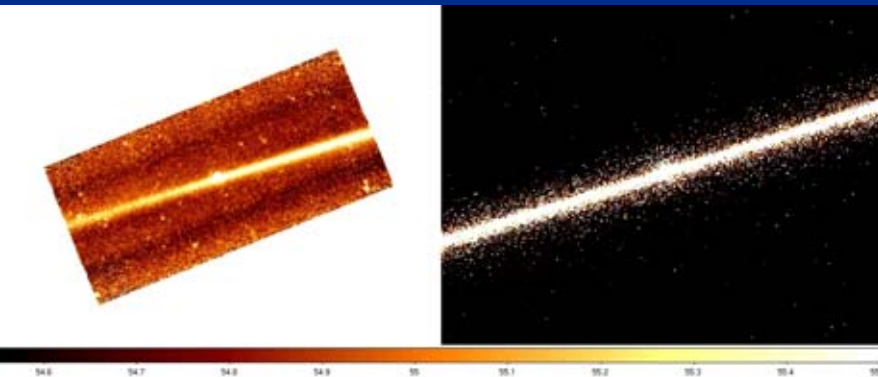
67P/Churyumov-Gerasimenko



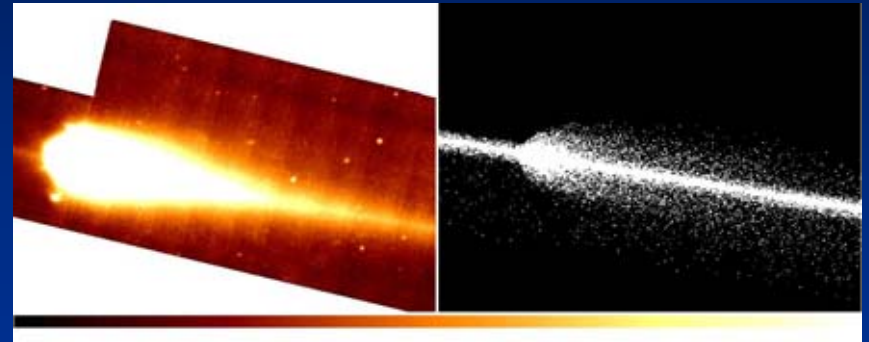
88P/Howell



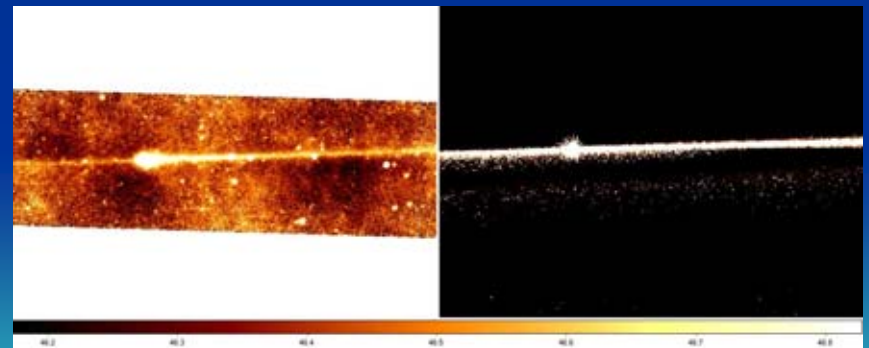
Infrared observation (2)



10P/Tempel 2

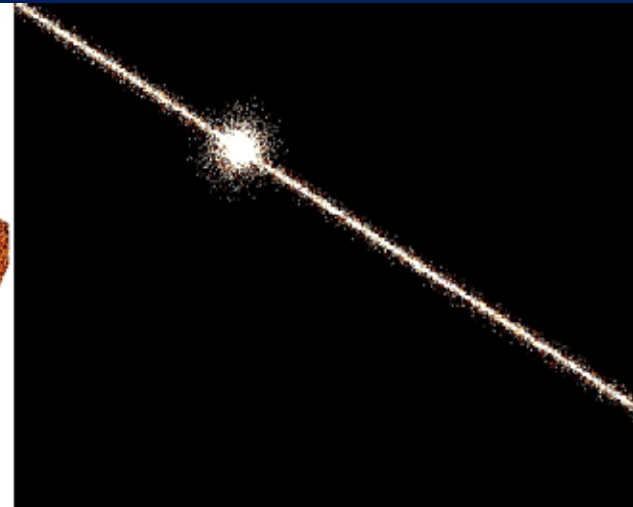
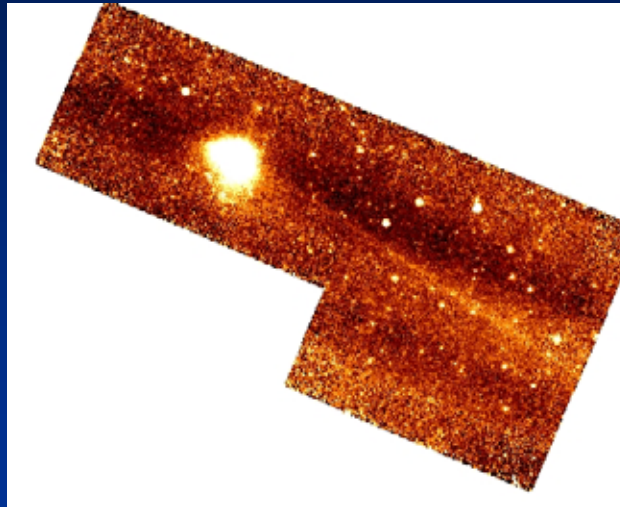


Clark

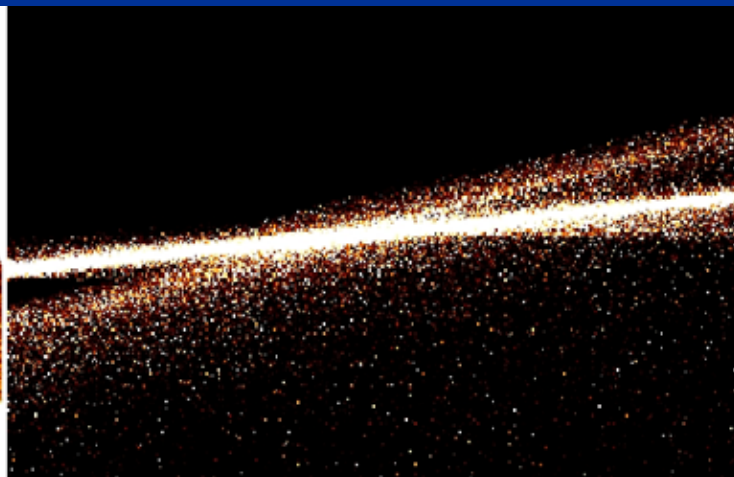
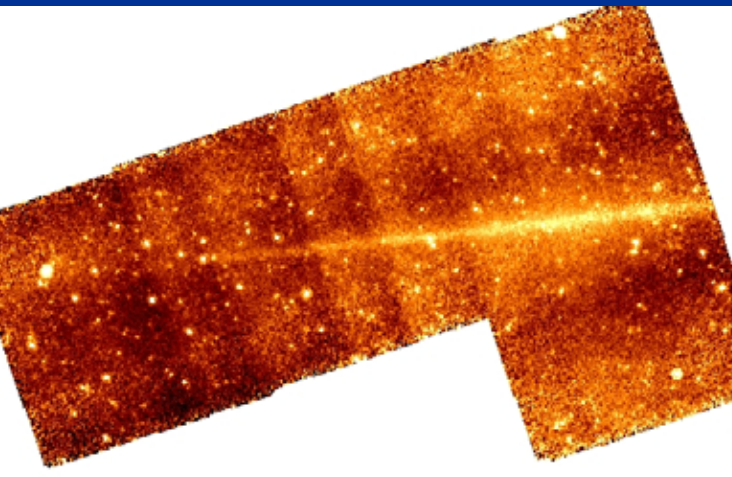


SL3

Infrared observation (3)



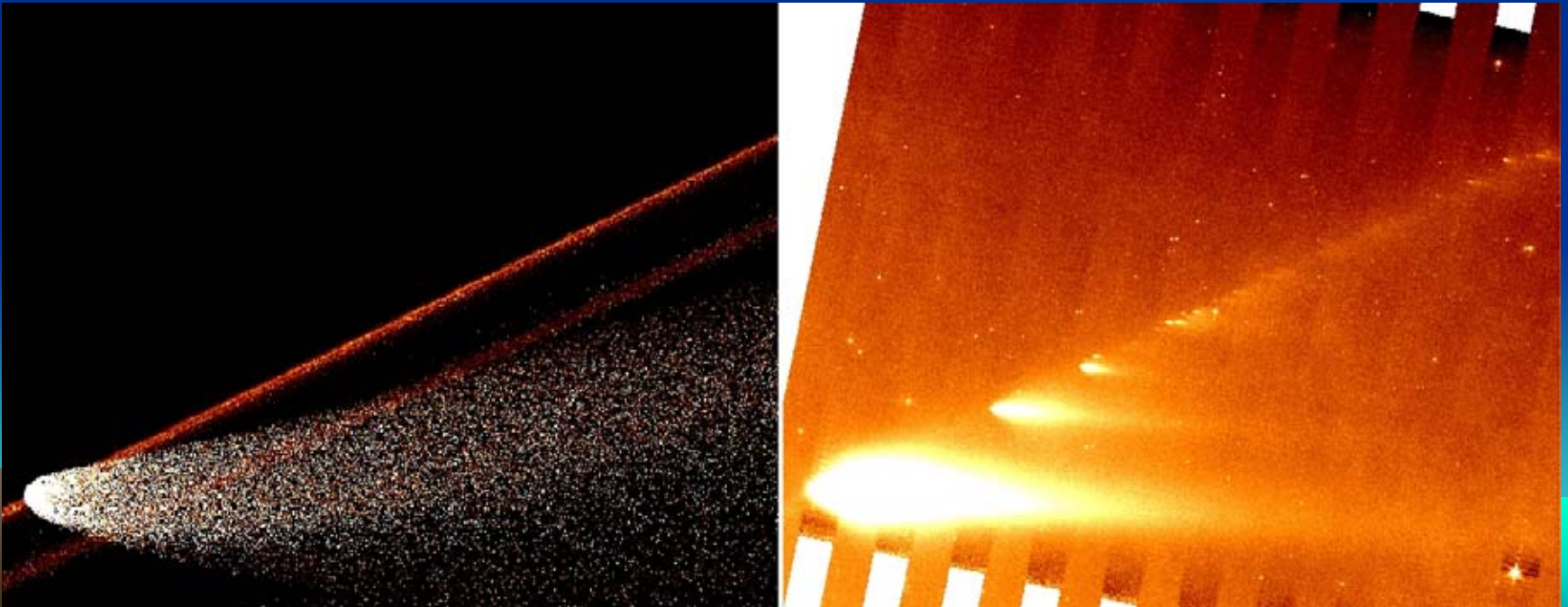
Slaughter-Burnham



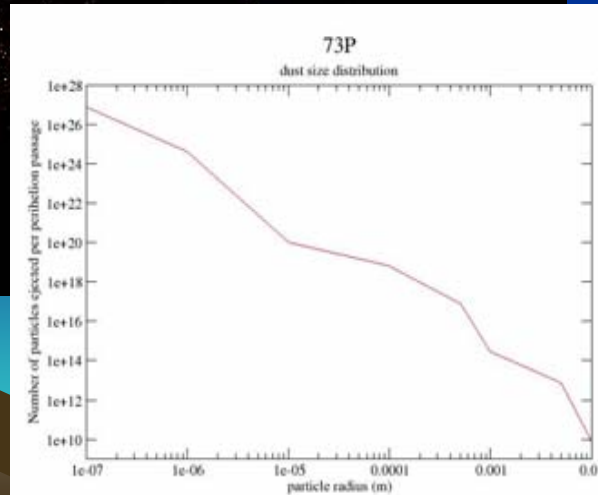
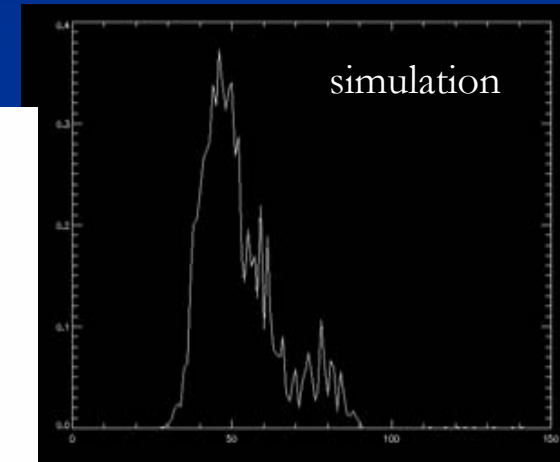
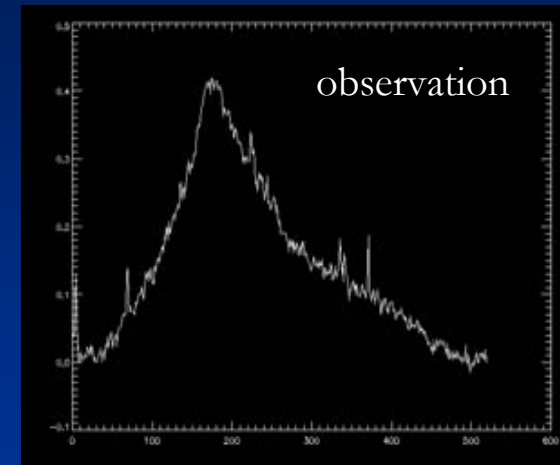
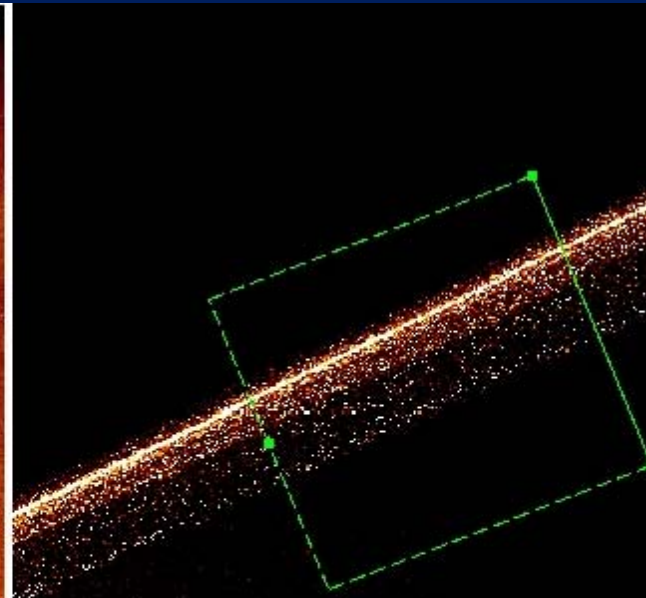
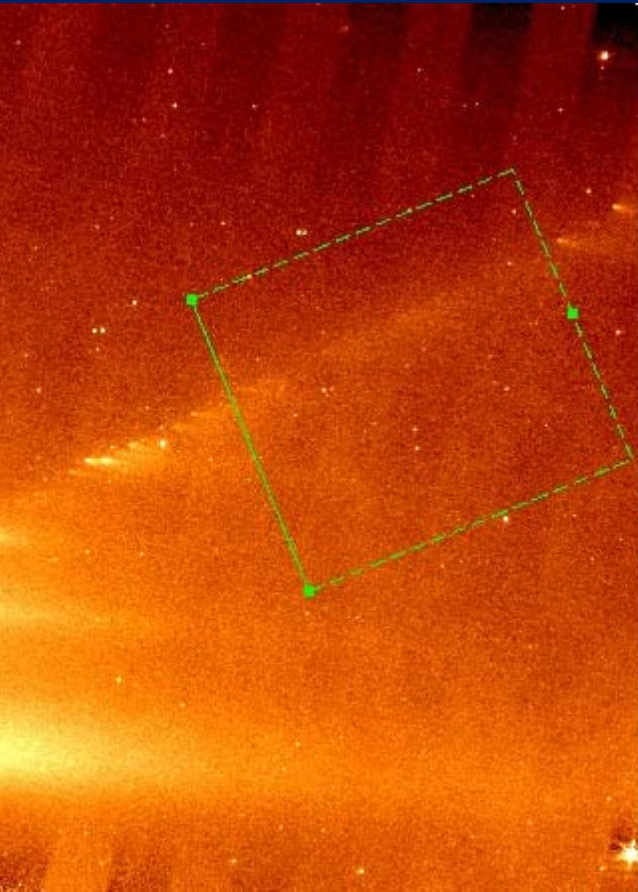
Clark (2005)

IR observations of 73P

- Age of particles
- Q_{dust} before/after breakup $\sim 1/11$
- Pb with coma
- Puzzling spectrum

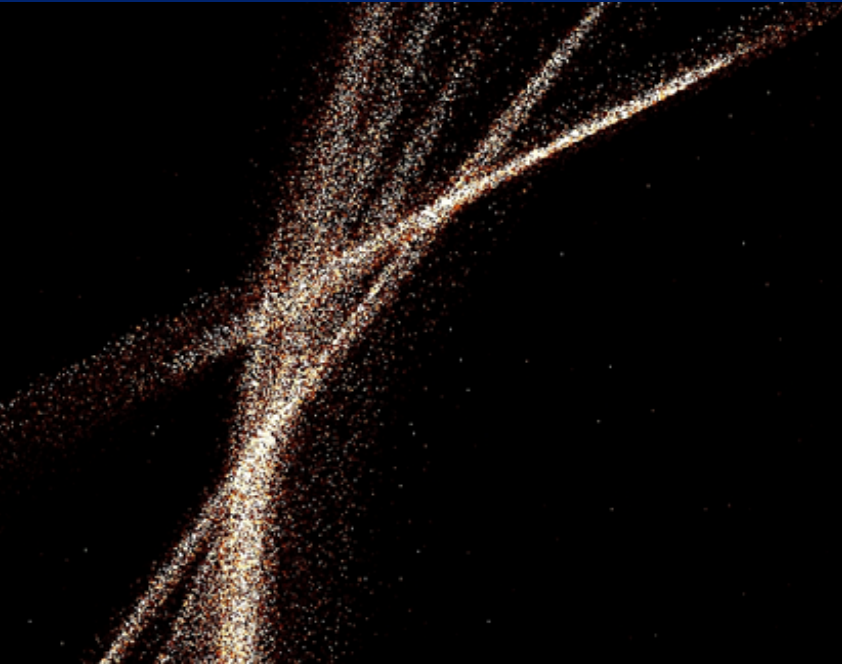


Size distribution index

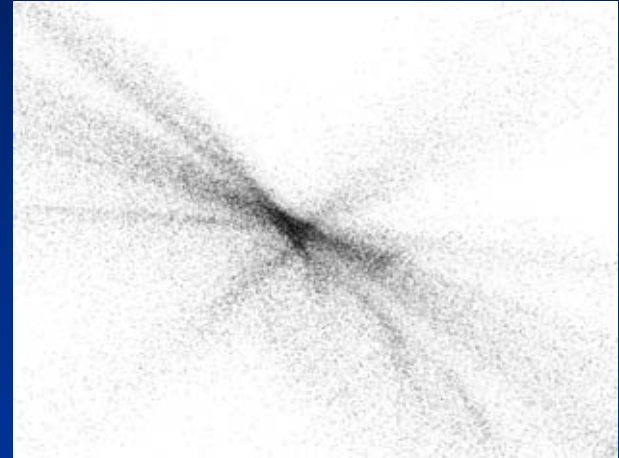


What we (well... I at least...) dream to see

32P/Coma Sola (2013)



Finlay 1 (2007)



45P/Honda-Mrkos-Pajdusakova
(2007)



Conclusion

- Meteor observation on Earth is necessary but not enough
 - Other planets
 - Infrared
 - In situ
-
- Need for an unaltered cometary dust sample return

