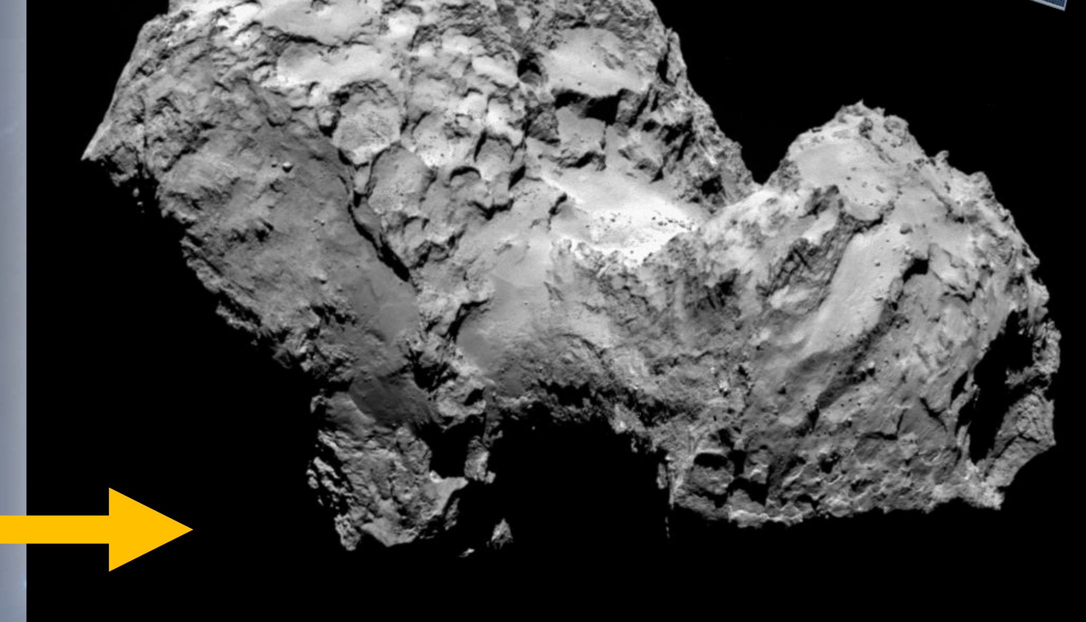
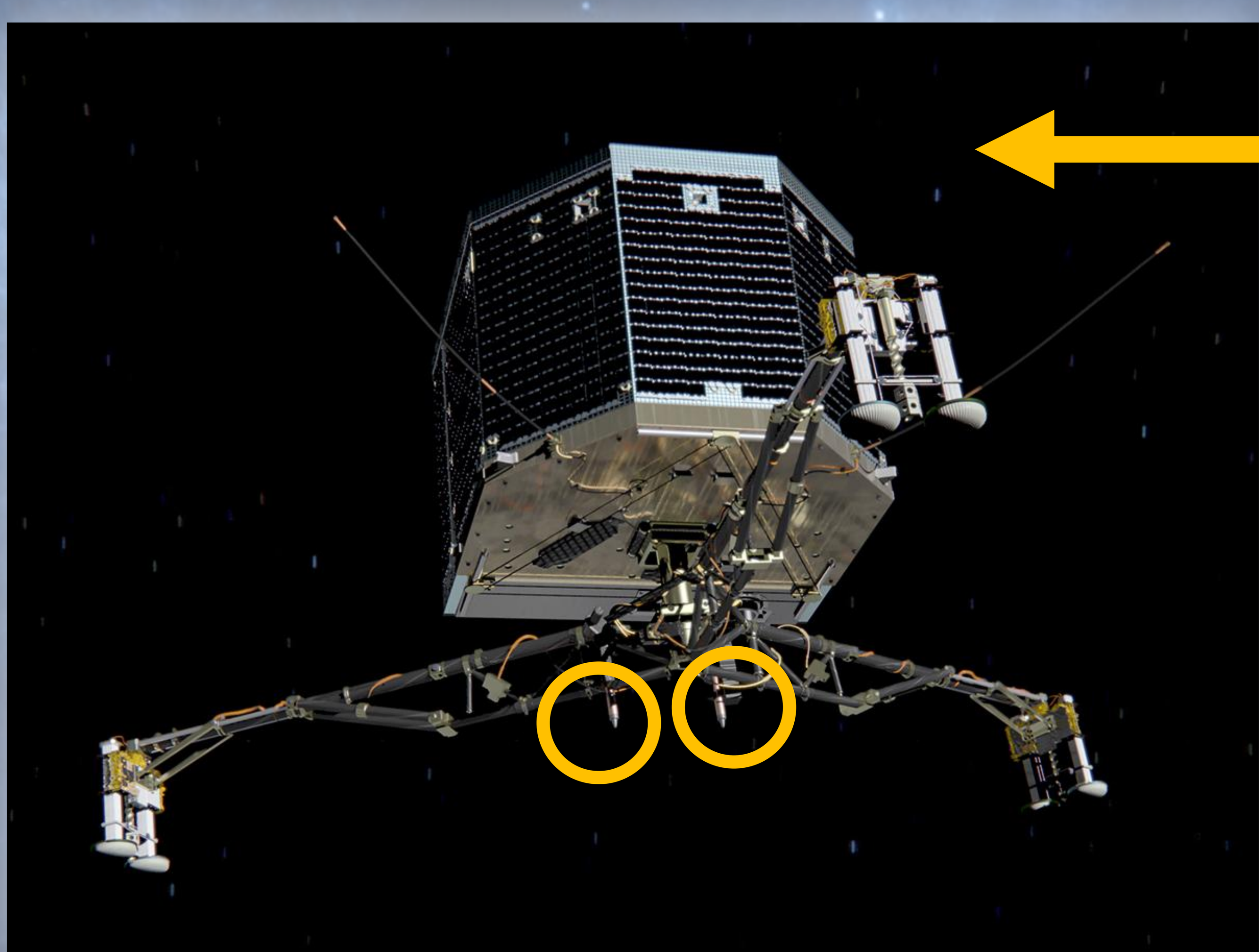
# ITE's contribution to the *Rosetta* mission

*Philae* landing visualisation, ESA



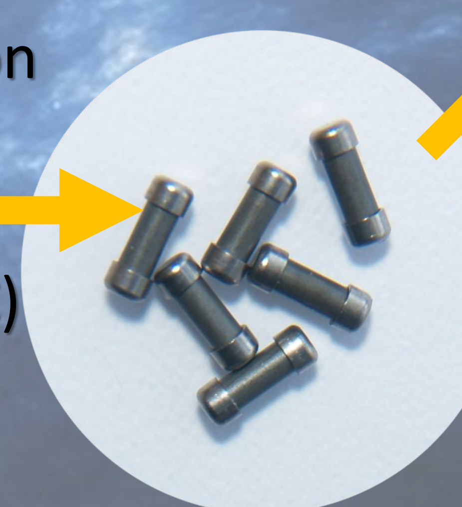
**Our components are used in the *Philae* lander, which will land on comet 67P on 12 Nov 2014**

Comet 67P/Churyumov–Gerasimenko as seen by *Rosetta*, 3 Aug 2014, ESA/OSIRIS

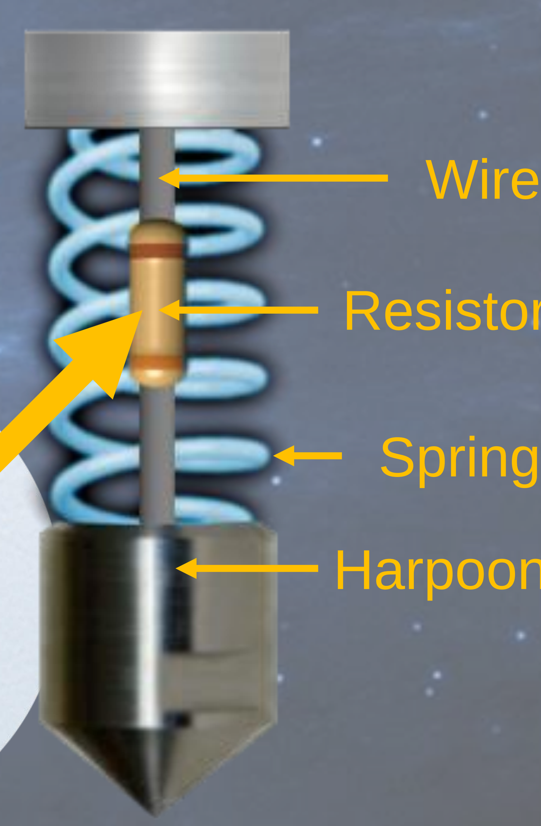


*Philae* landing visualisation, ESA

On landing, *Philae* will release two harpoons to attach itself to the comet. The mechanism uses a small resistor to burn through a wire holding the spring-loaded harpoon in place. The application demanded ***ceramic resistors*** with very low TCR (operation between -160°C and +100°C) and excellent long-term stability to survive the 10-year journey.

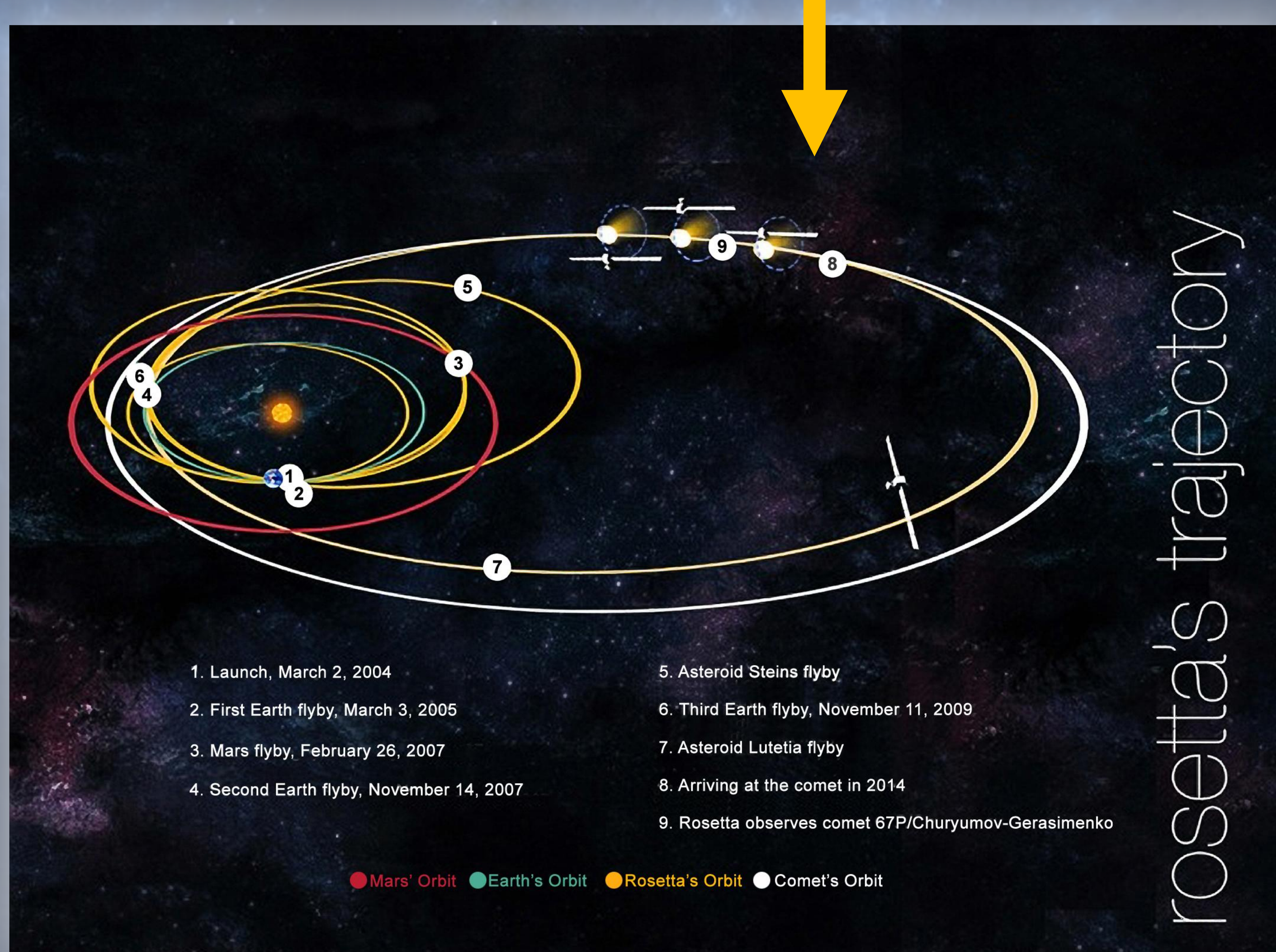


Ceramic resistors similar to the ones used on *Philae*

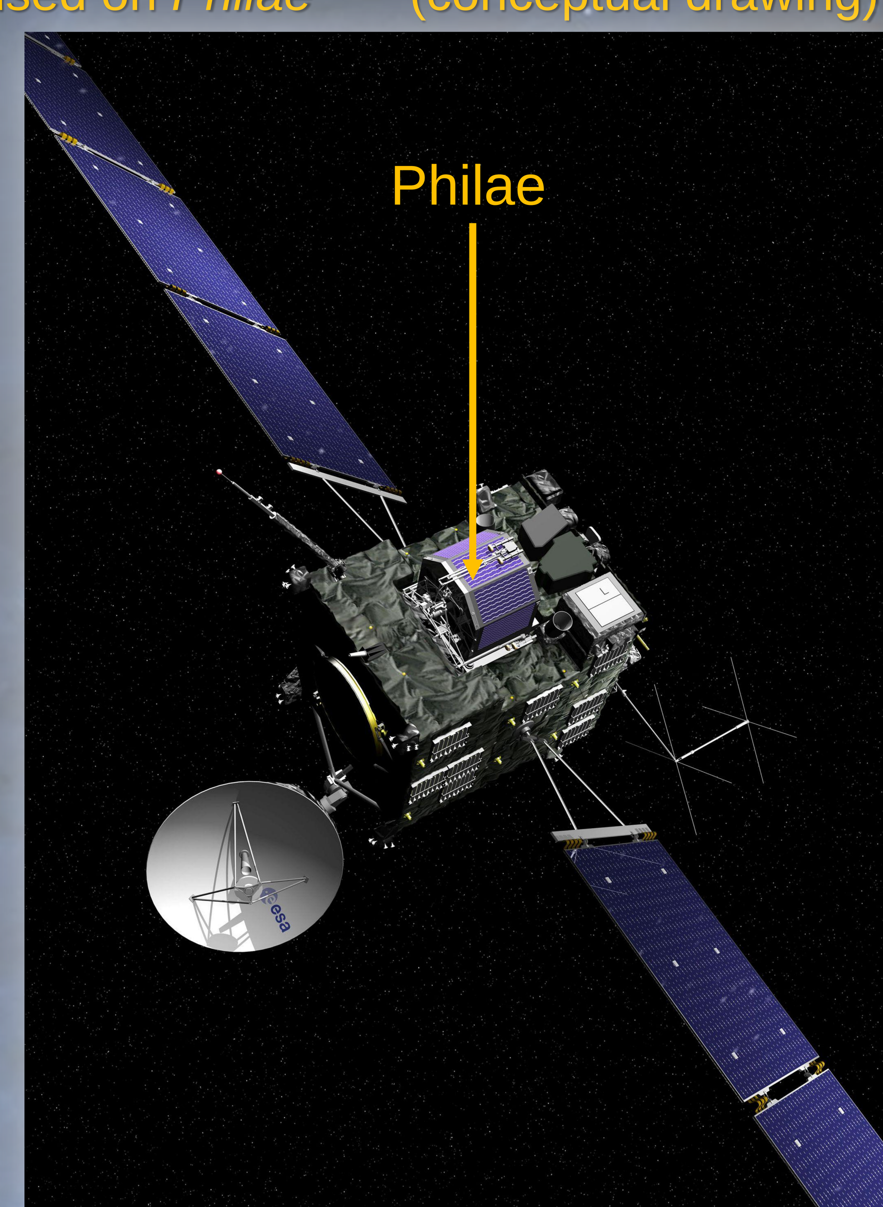



Harpoon release mechanism (conceptual drawing)

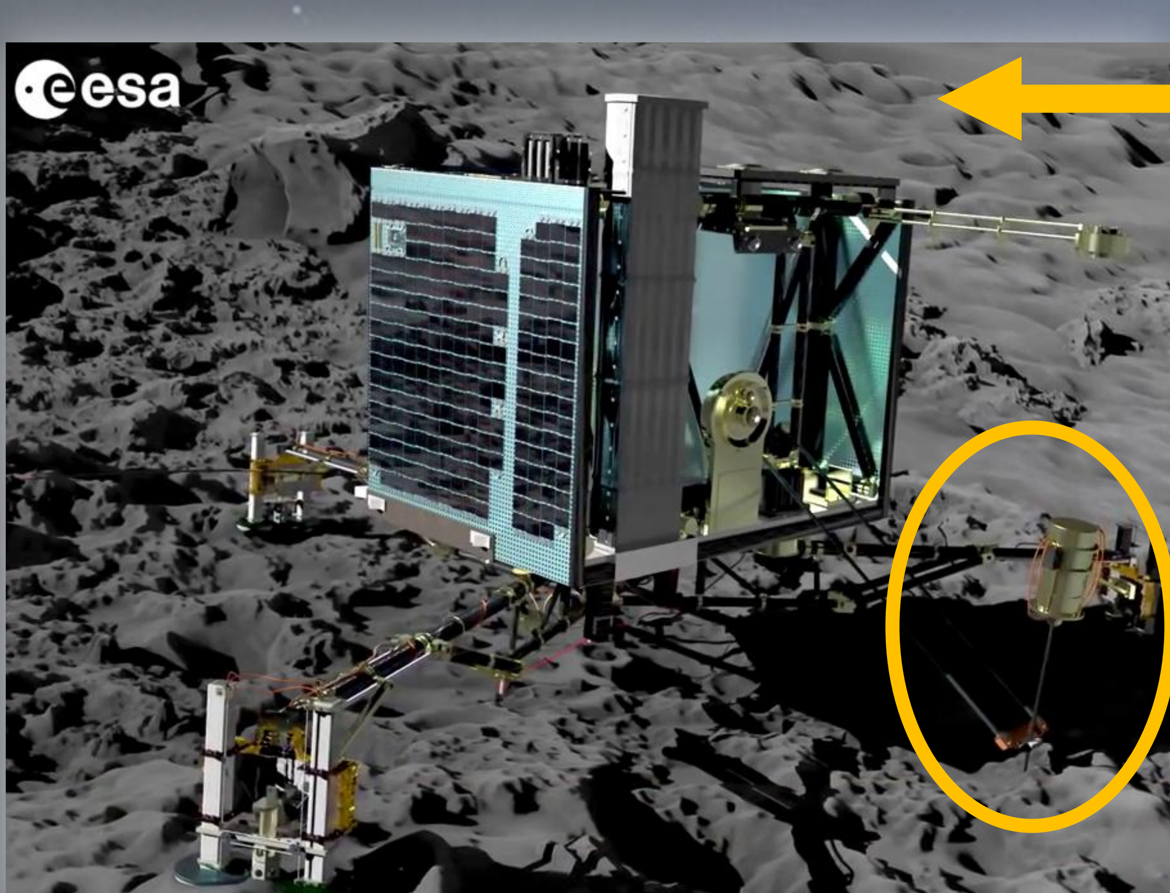
*Rosetta* lift-off on 2 Mar 2004, ESA/CNES/ARIANESPACE




*Rosetta* trajectory, NASA

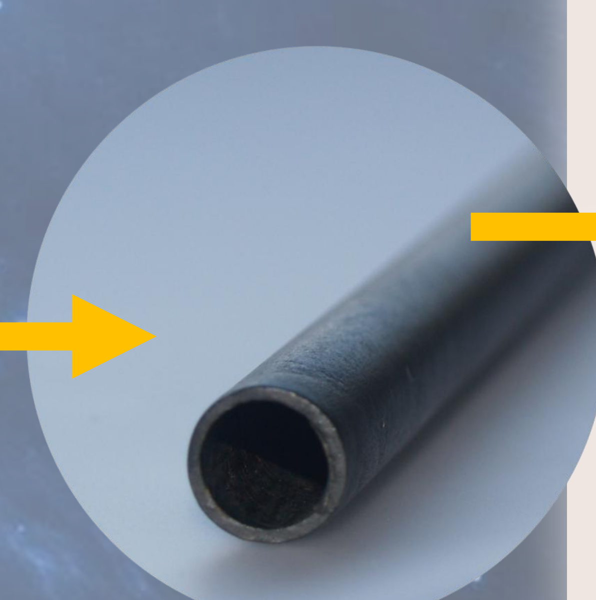


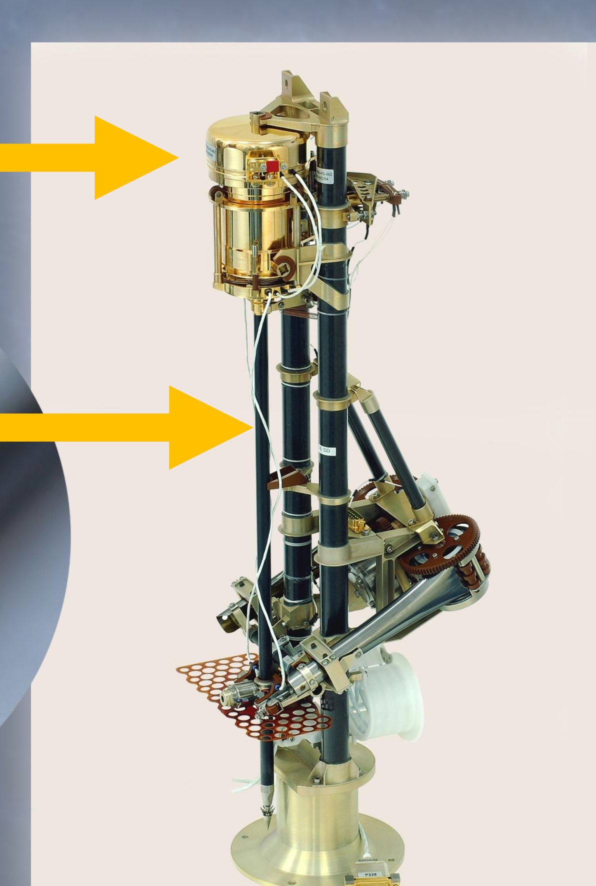

*Rosetta* and *Philae* in flight, ESA



*MUPUS* deployment visualisation, ESA

After landing, *Philae* will deploy the MUPUS instrument (developed at Poland's Space Research Centre) which will measure surface hardness by hammering a rod into the comet's surface. The rod is actually a **multilayer carbon composite resistor**. Measurement of penetration depth will be done simply by measuring electrical resistance of the part of the rod still being above „ground".





The *MUPUS* instrument, CBK PAN

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