

Comet-chaser's instruments come alive

Comet 67P/Churyumov-Gerasimenko: Named after its 1969 discoverers. Icy core, or nucleus, is about 4km across

↑ Empire State Building to scale

Nov 2014
Landing:
Philae probe released

Aug 2015:
Closest approach to Sun

After two and a half years in deep-space hibernation, each of the Rosetta spacecraft's 11 science instruments are being tested in preparation for the first-ever landing by a spacecraft on a comet

Jan 2014:
Rosetta awakes
Mar-Apr:
Instruments tested

Aug 2014
Rendezvous:
Rosetta maps comet to find suitable site to dispatch lander

June 2011
After four flybys of Earth and Mars, Rosetta is put into hibernation to save energy

Mar 2004
Rosetta launched

Dec 2015:
Nominal end of mission

ROSETTA ORBITER: Instruments to measure structure of nucleus, dust and plasma tails. Others for visible, ultraviolet and infra-red imaging

Comet 67P/C-G orbit

COMET STRUCTURE

Antenna link to Earth

PHILAE LANDER: Must attach to nucleus of comet – travelling through space at 20 kilometres per second

Experiments: X-ray spectrometer measures elemental composition of comet's surface; radiowaves probe internal structure of nucleus; six micro-cameras take panoramic pictures

Gas analysers identify complex organic molecules and isotopic ratios of light elements

Weight: 100kg

Dust tail

Coma

Nucleus

Plasma tail: Molecules – ionised by ultraviolet solar radiation – blown away by solar wind

Sampling system: Can drill 20cm into surface. Samples deposited in ovens or delivered for microscope inspection

Legs: Absorb kinetic energy to reduce risk of bouncing. Can rotate or tilt to return lander to upright position

Harpoon: Fired to anchor probe to ground. Sensors measure density, and thermal properties of surface