

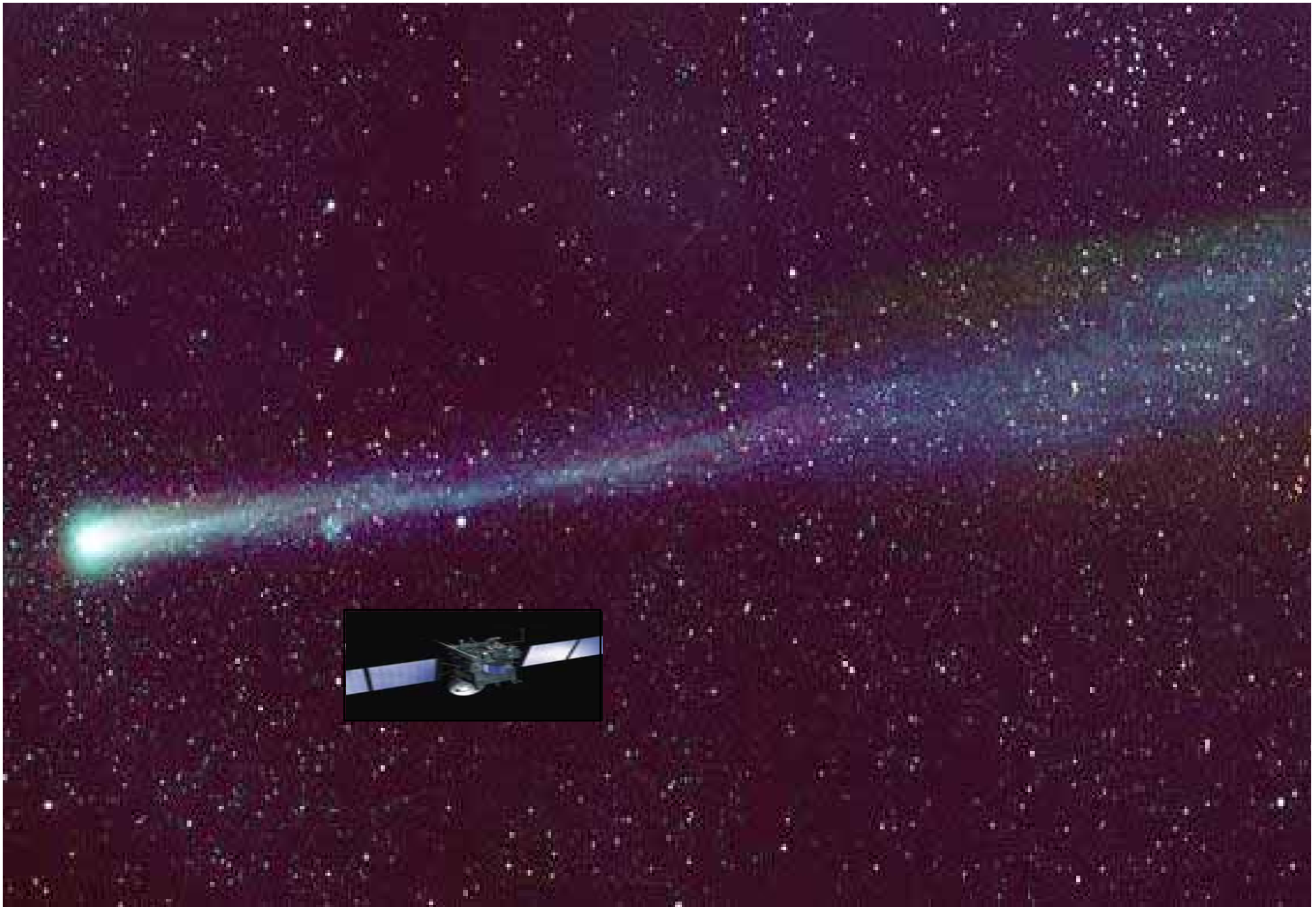
esa



For the closest inspection of a comet ever made

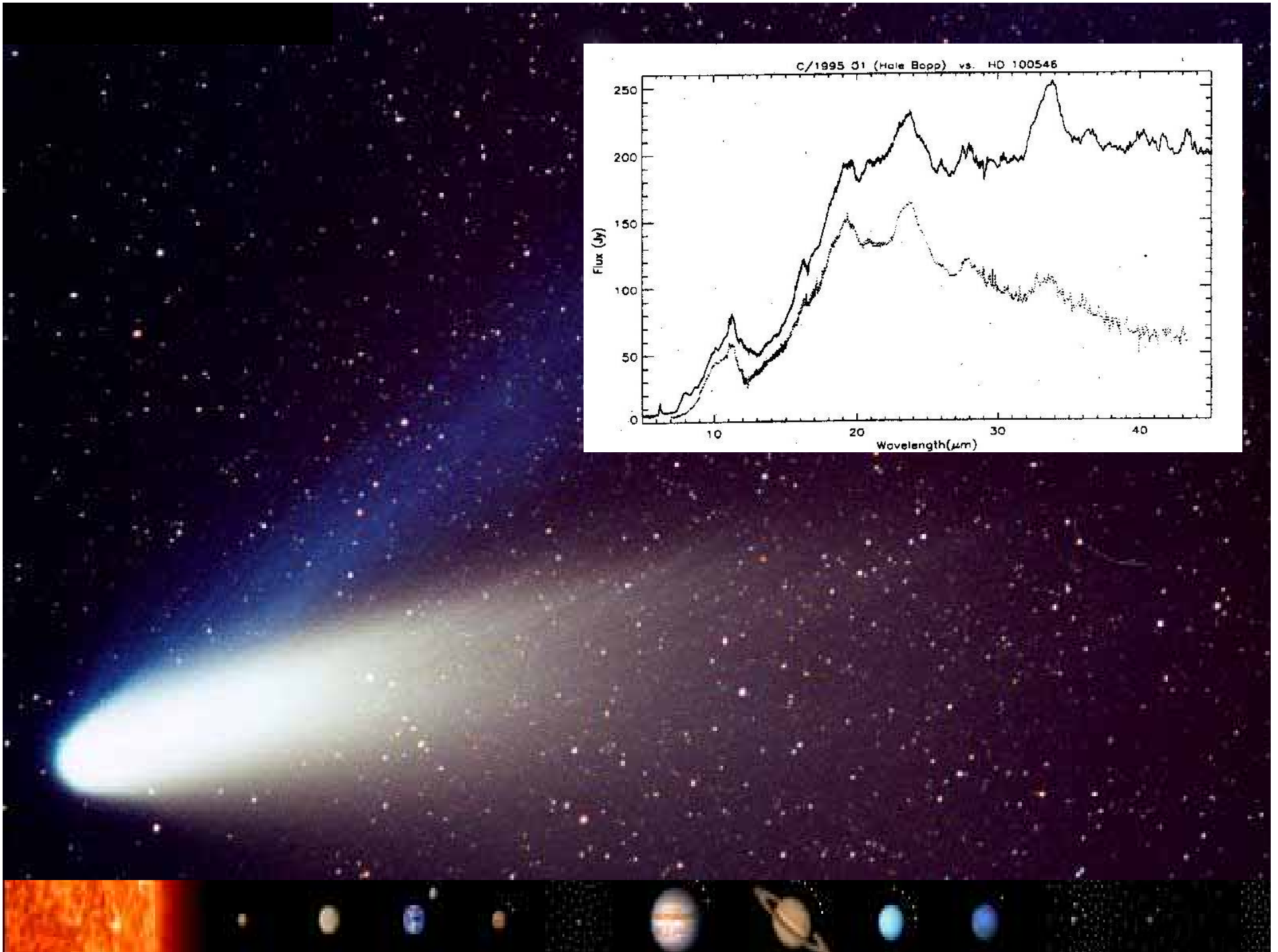
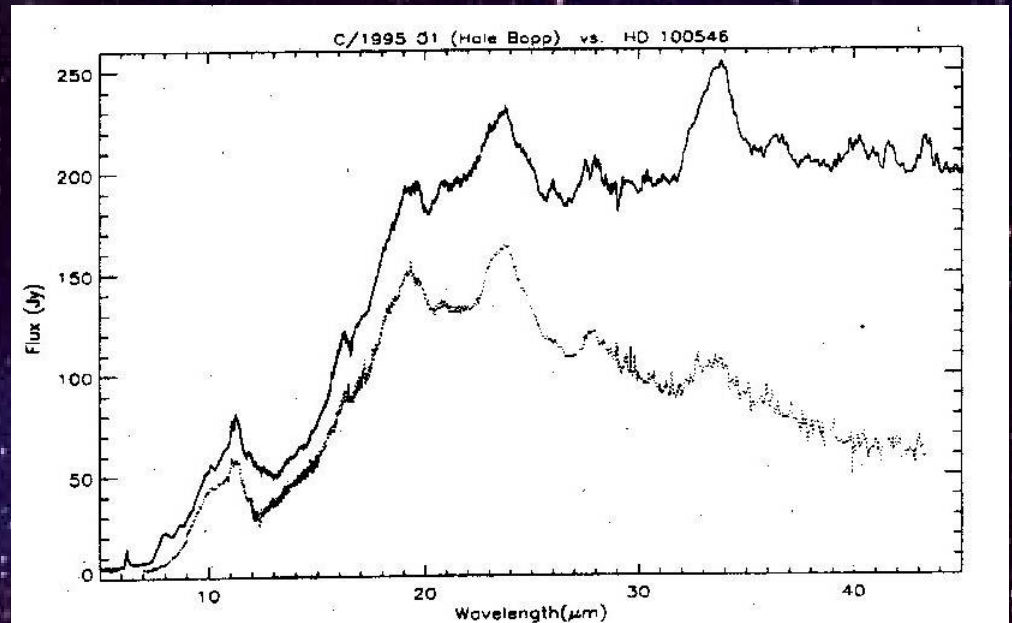
ROSETTA



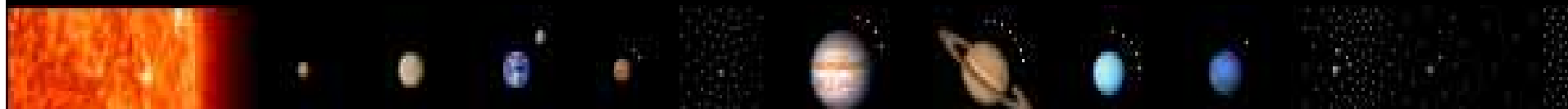
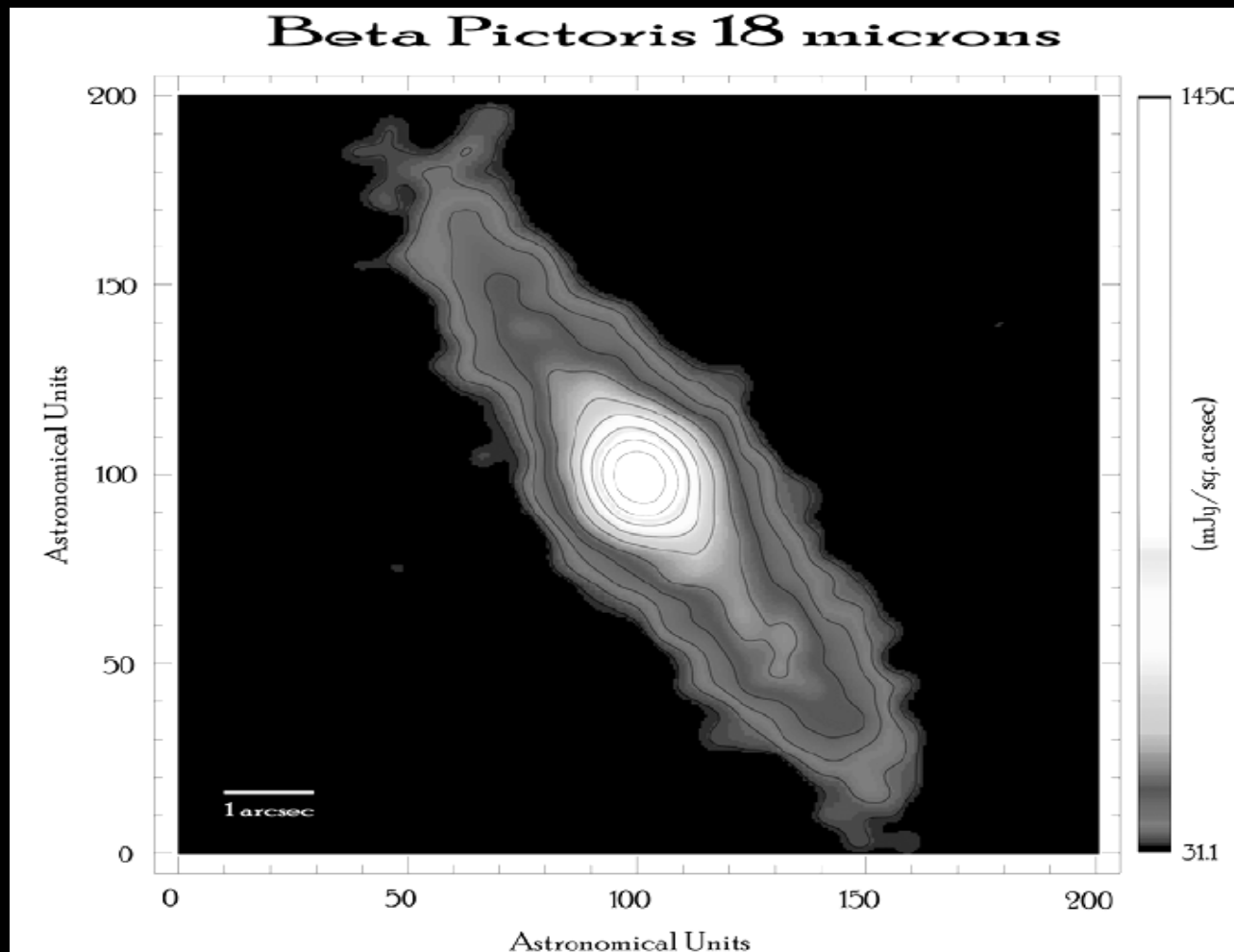


 esa

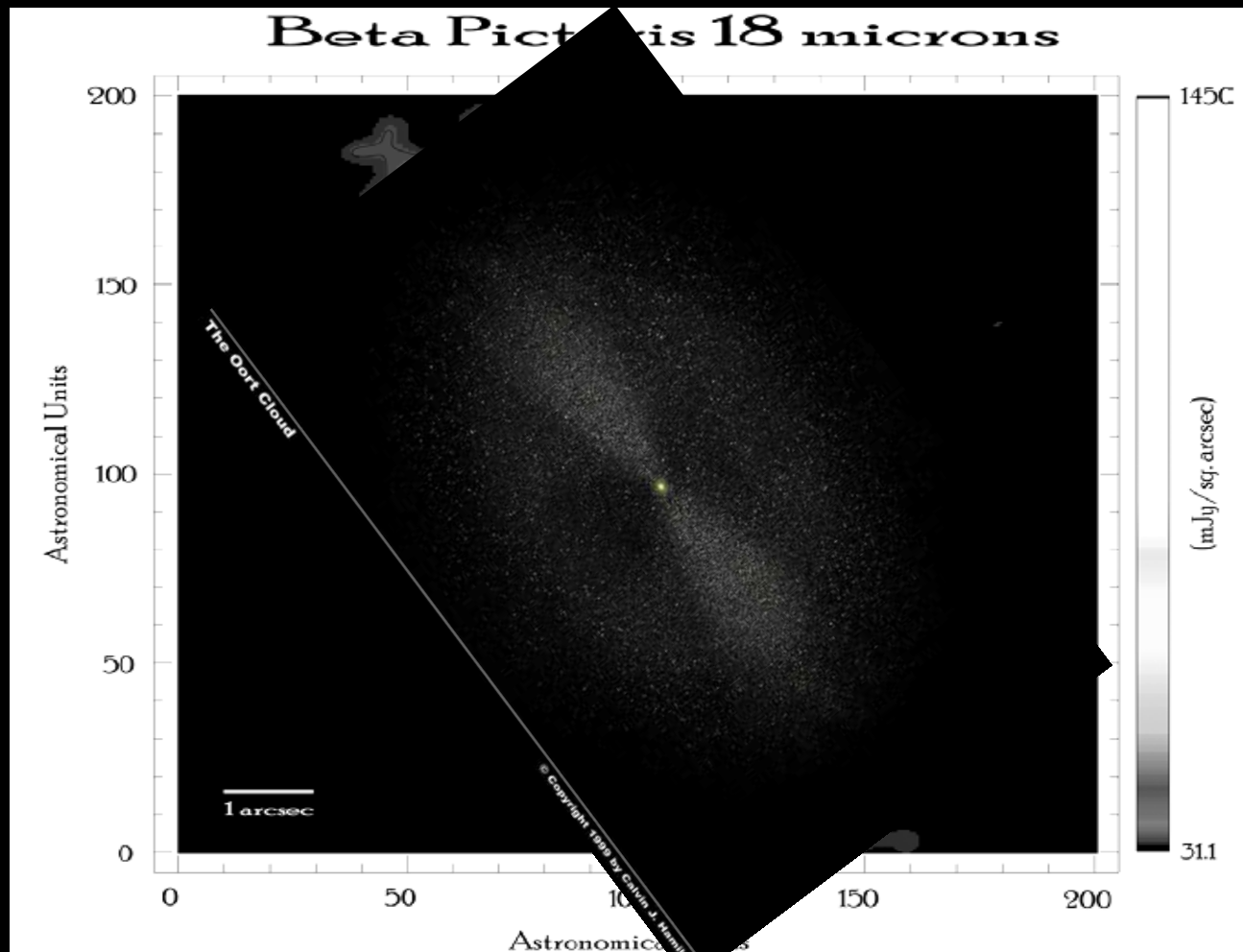




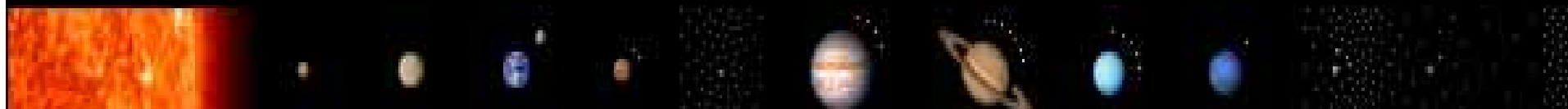
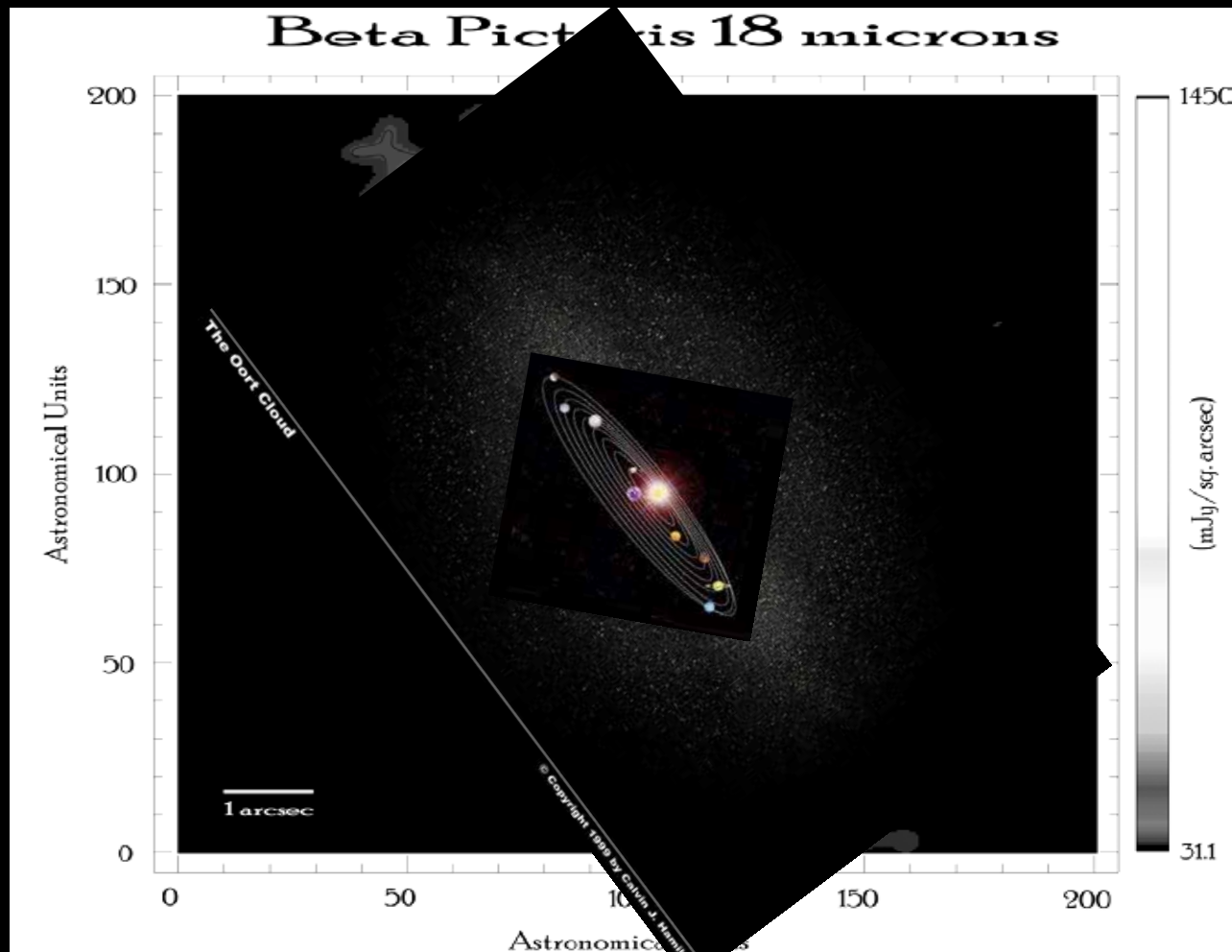
Beta Pictoris 18 microns

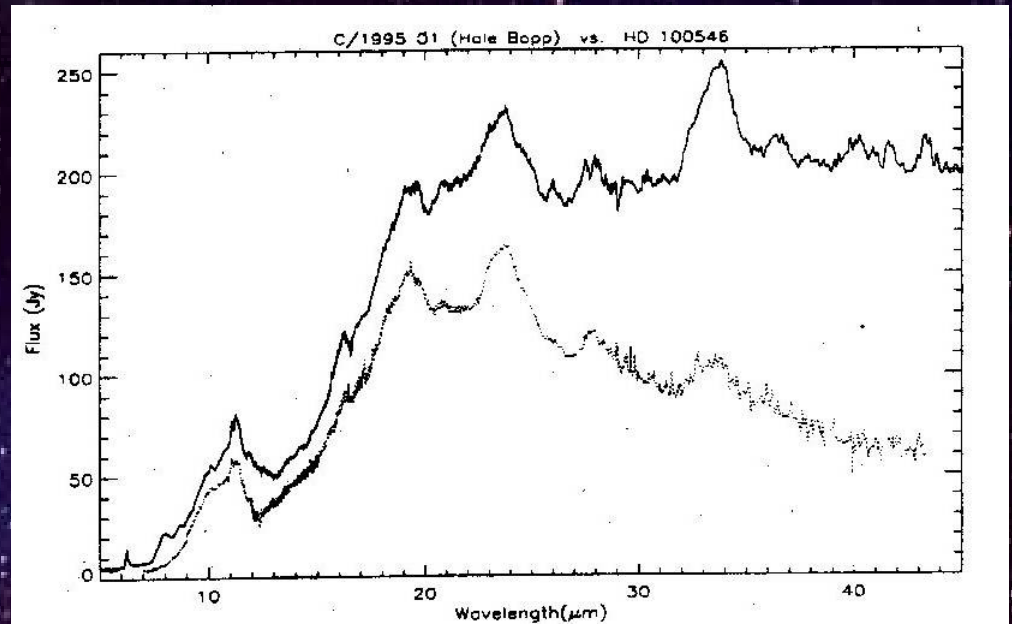


Beta Pictoris 18 microns



Beta Pictoris 18 microns







19P/Borrelly (2001)



1P/Halley (1986)

81P/ Wild 2 (2004)



19P/Borrelly (2001)



1P/Halley (1986)

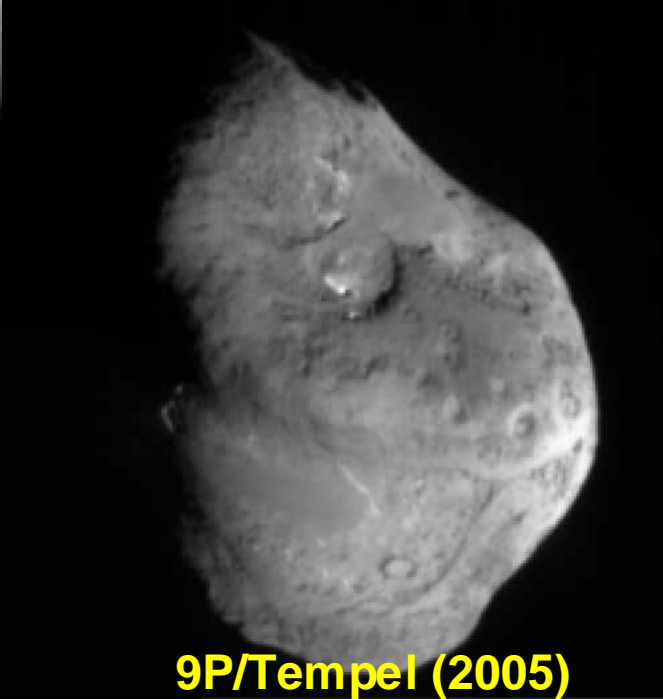
81P/ Wild 2 (2004)



19P/Borrelly (2001)



9P/Tempel (2005)



1P/Halley (1986)



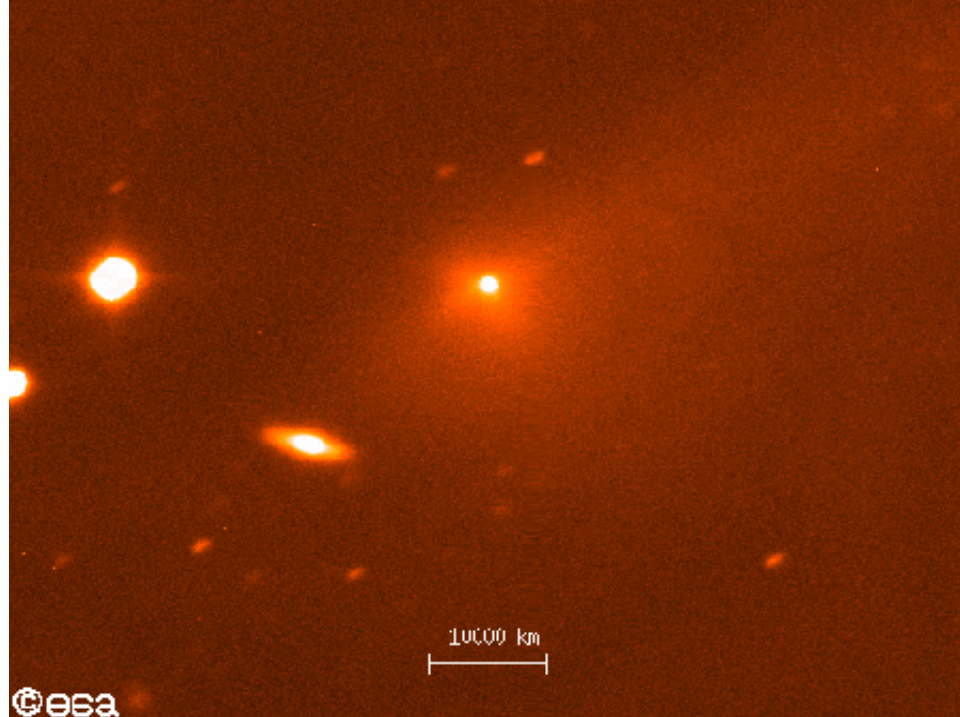


*THE COMET
SEEN FROM
EVERY ANGLE*

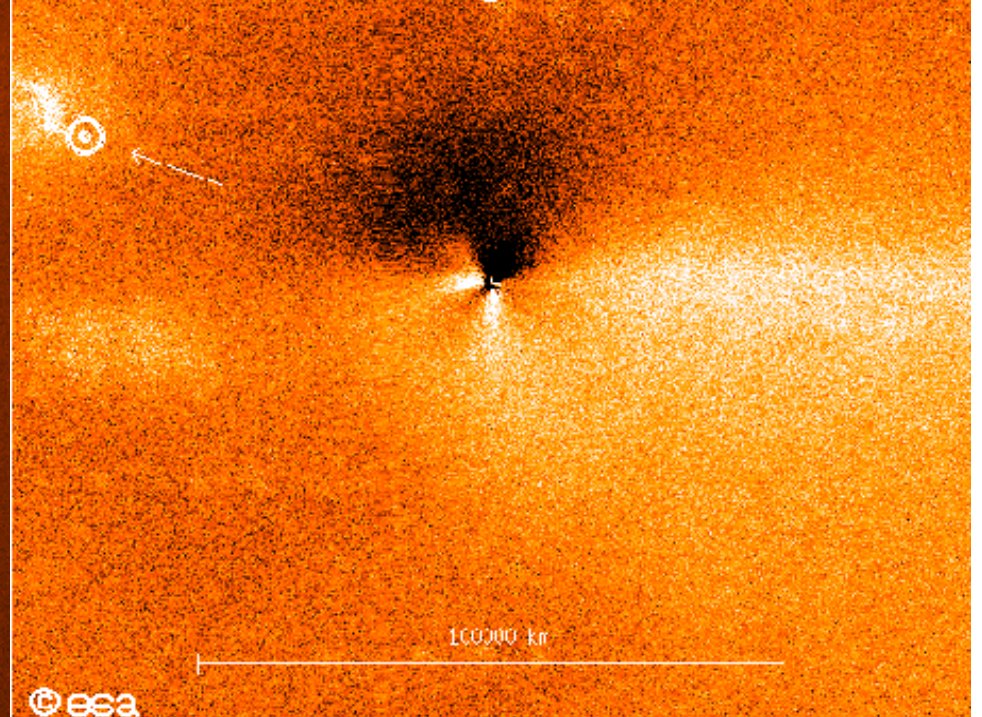
67P/Churyumov-Gerasimenko

Heliocentric Period:	6.59 years
Perihelion:	1.30 AU
Aphelion:	5.73 AU
Discovery:	1969

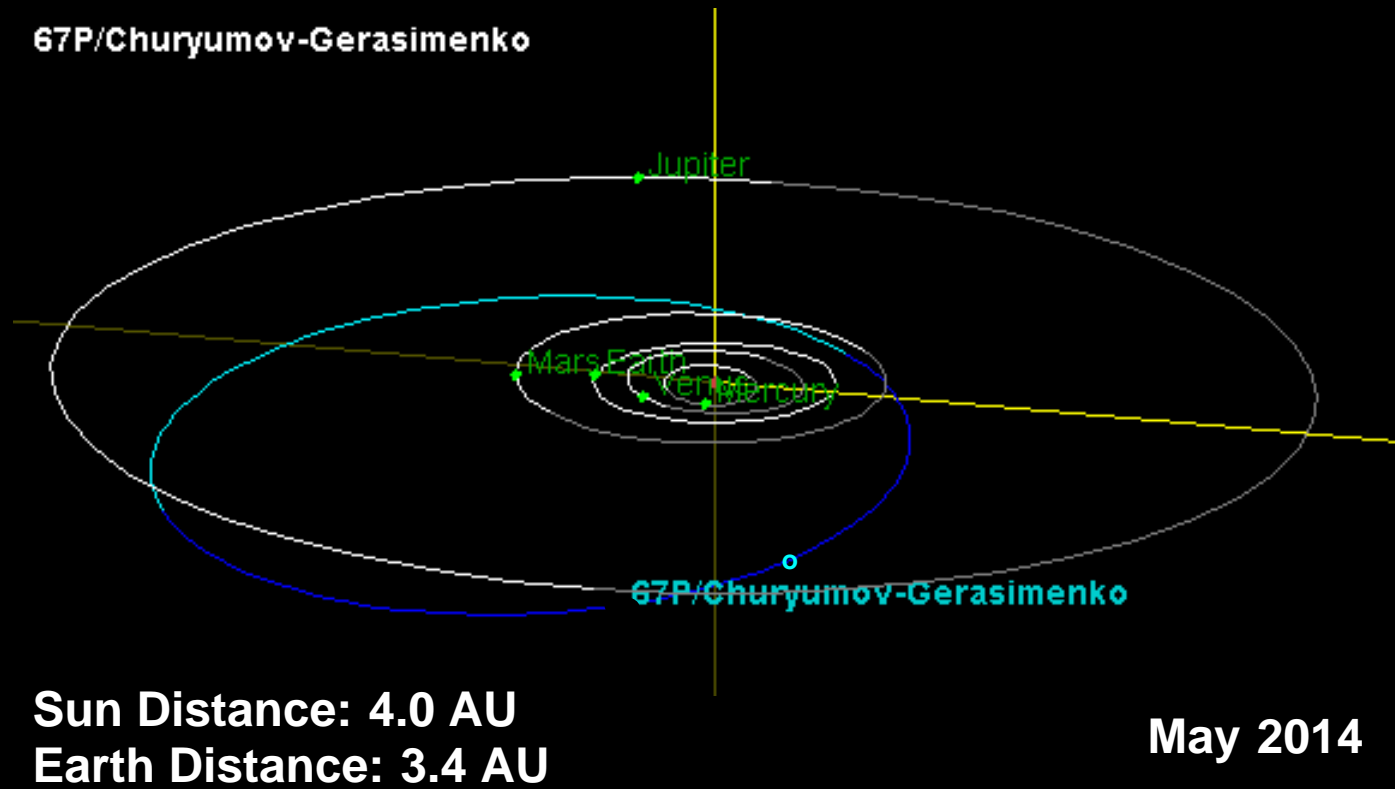
67P/Churyumov-Gerasimenko
ESO 3.6m Telescope, La Silla, Chile
11.02.2003 04:55 UT



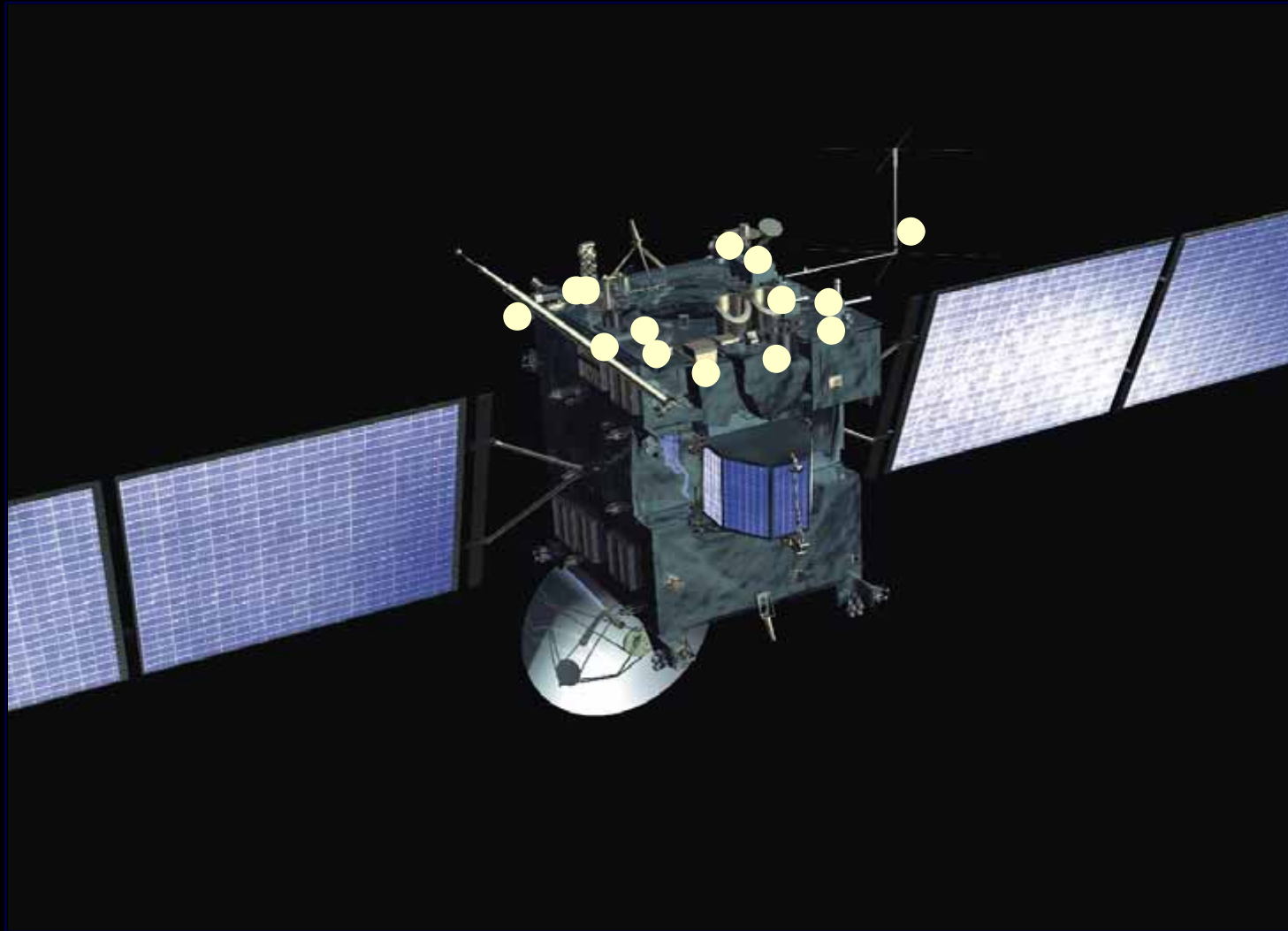
67P/Churyumov-Gerasimenko
ESO 3.6m Telescope, La Silla, Chile
11.02.2003 @ 05:10 UT



Rosetta arrival at the comet



Rosetta Spacecraft and Payload



● ROSINA (Rosetta Orbiter Spectrometer for Ion and Neutral Analysis) ● OSIRIS (Optical, Spectroscopic, and Infrared Remote Imaging System) ● MI (Micrometeoroid and Dust Analyzer) ● VIRT-M (Visible and Infrared Thermal Imaging) ● LORAN (Laser Ocular Ranging and Navigation) ● AISA (Advanced Imaging Science Experiment) ● MIDAS (Micro-Imaging Doppler Atomic Spectrometer) ● COSY-CORONA (Cometary and Outflow Spectroscopy) ● MUPUS (Micro-Pattern Ultra-Pure Silicon) ● REXIS (Rosetta X-ray Imager) ● RALPH (Radio and Plasma Wave Experiment) ● SPCAR (Search for Polyatomic Molecules) ● ROSINA (Rosetta Orbiter Spectrometer for Ion and Neutral Analysis) ● OSIRIS (Optical, Spectroscopic, and Infrared Remote Imaging System) ● MI (Micrometeoroid and Dust Analyzer) ● VIRT-M (Visible and Infrared Thermal Imaging) ● LORAN (Laser Ocular Ranging and Navigation) ● AISA (Advanced Imaging Science Experiment) ● MIDAS (Micro-Imaging Doppler Atomic Spectrometer) ● COSY-CORONA (Cometary and Outflow Spectroscopy) ● MUPUS (Micro-Pattern Ultra-Pure Silicon) ● REXIS (Rosetta X-ray Imager) ● RALPH (Radio and Plasma Wave Experiment) ● SPCAR (Search for Polyatomic Molecules)

Philae Lander and Payload

Imaging

Composition analysis

Physical properties

Nucleus large-scale structure

Magnetic field and plasma

Drill and sampling device

CIVA, ROLIS

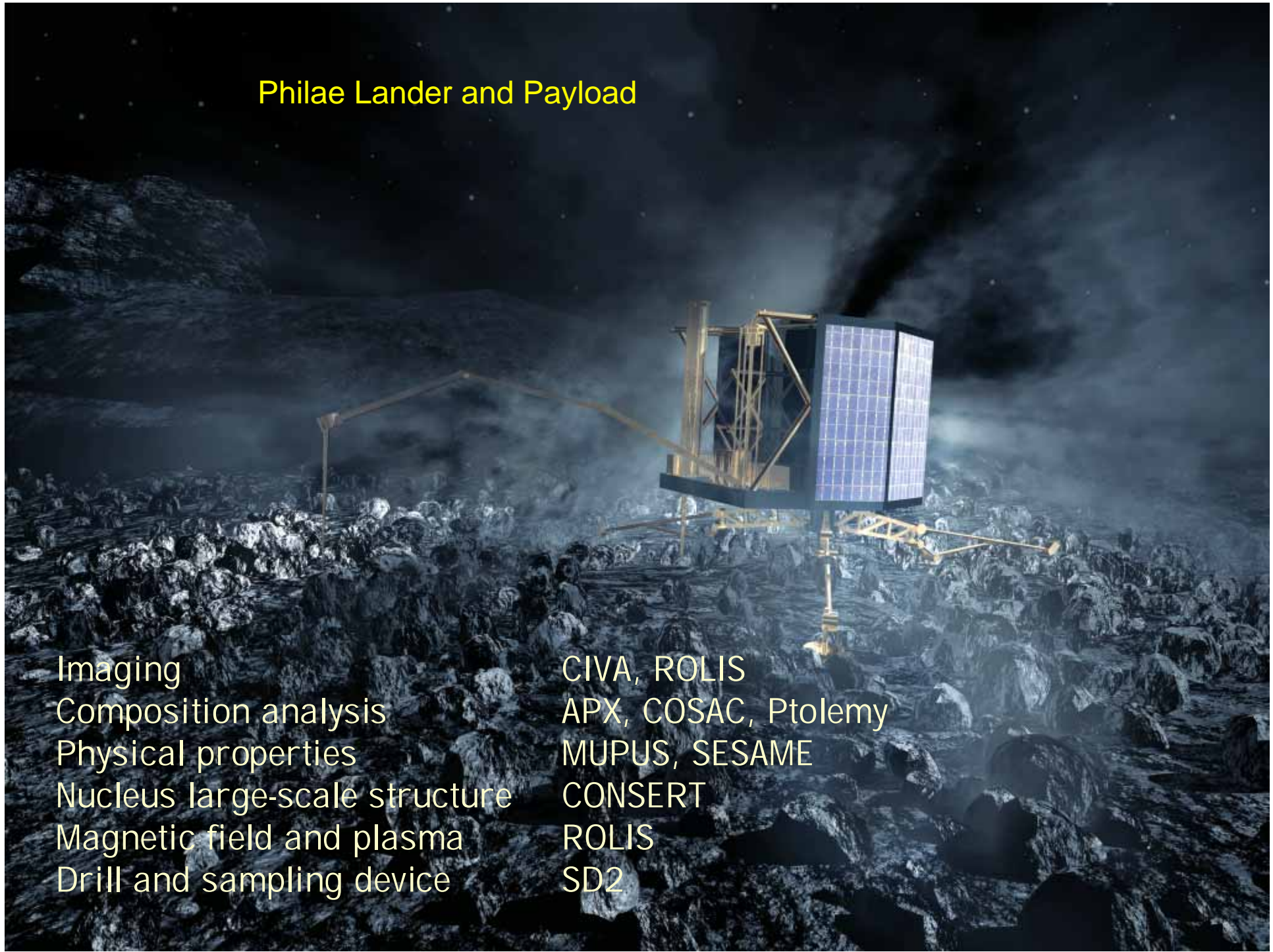
APX, COSAC, Ptolemy

MUPUS, SESAME

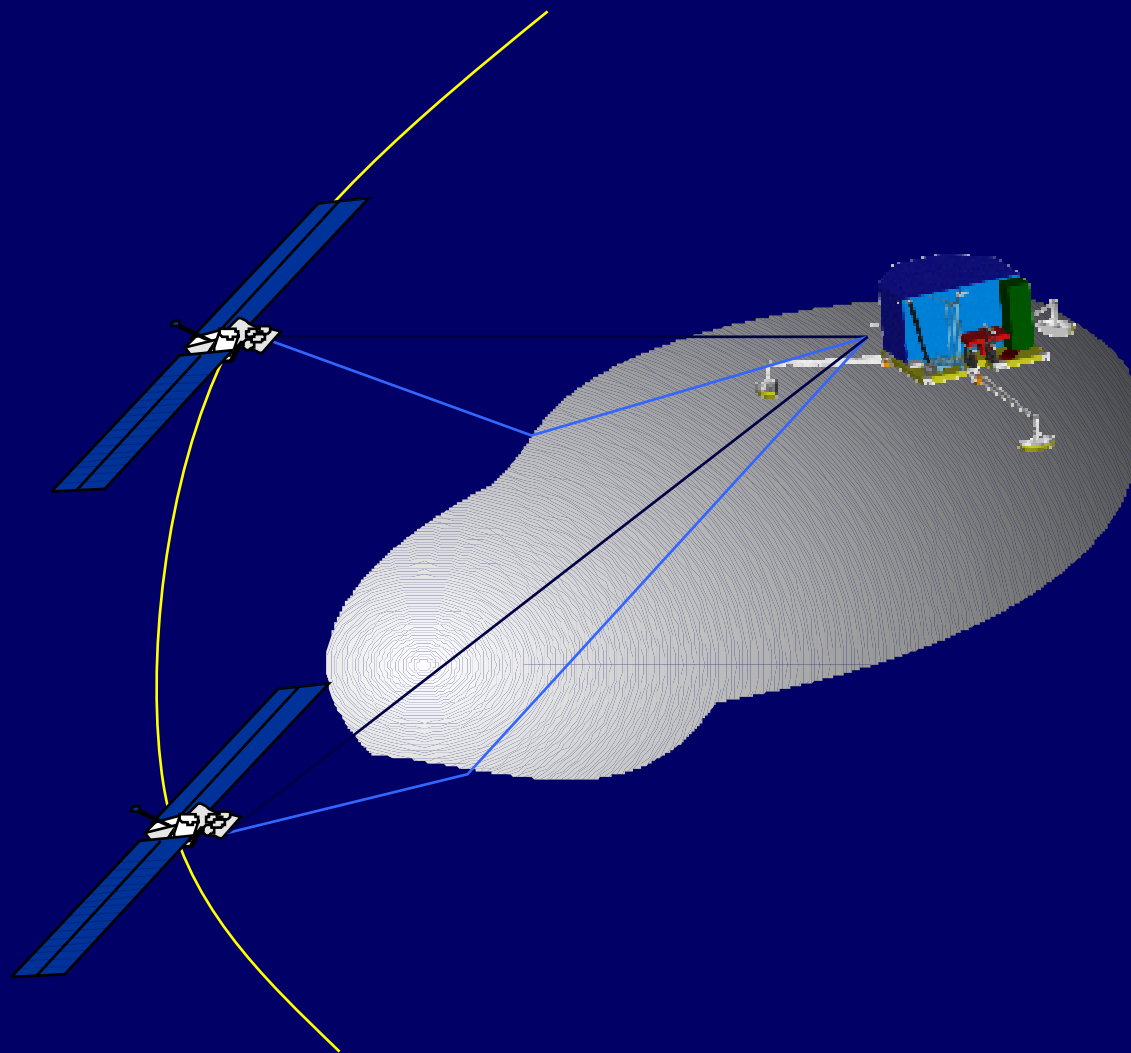
CONSERT

ROLIS

SD2



CONSERT Experiment



Rosetta Milestones

- **Launch: 2 March 2004 with Ariane 5**
- **Journey:**
 - 3 Earth gravity assists**
Mar 2005, Nov 2007, Nov 2009
 - 1 Mars gravity assist**
Feb 2007
 - 2 Asteroid flybys**
2867 Steins: Sep 2008, 21 Lutetia: Jul 2010
 - Comet Rendezvous maneuver**
May 2014 m(4 AU)
 - Lander delivery:**
Nov 2014 (3 AU)
 - Perihelion Passage:**
Aug 2015 (1.24 AU)
 - End of Nominal Mission:**
Dec 2015 (1.9 AU **)

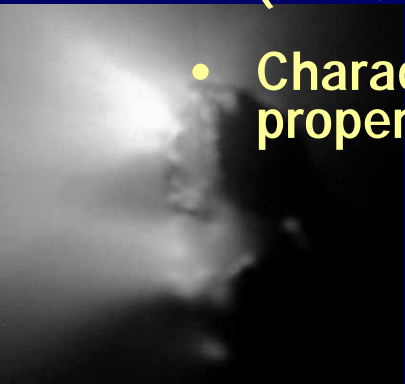


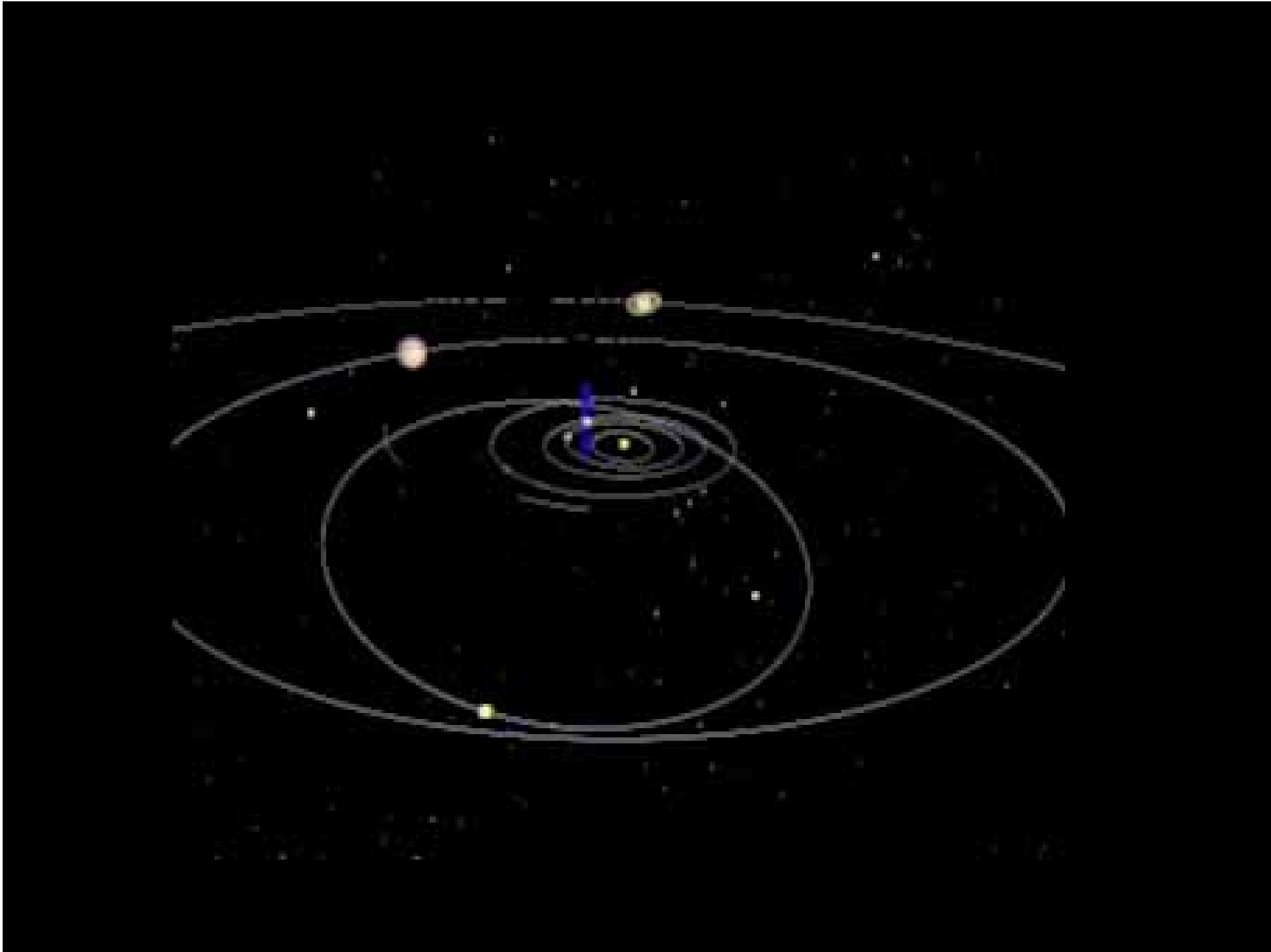


Rosetta Scientific Objectives



- Investigate the origin of the Solar System by studying the origin of comets
- Global characterization of the comet nucleus, dynamic properties, surface morphology and composition
- Determination of chemical, mineralogical and isotopic compositions of volatiles and refractories in a comet nucleus
- Determination of the physical properties and interrelation of volatiles and refractories in a comet nucleus
- Study of the development of cometary activity and the processes in the surface layer of the nucleus and inner coma (dust/gas interaction)
- Characterisation of main belt asteroids including dynamic properties, surface morphology and composition



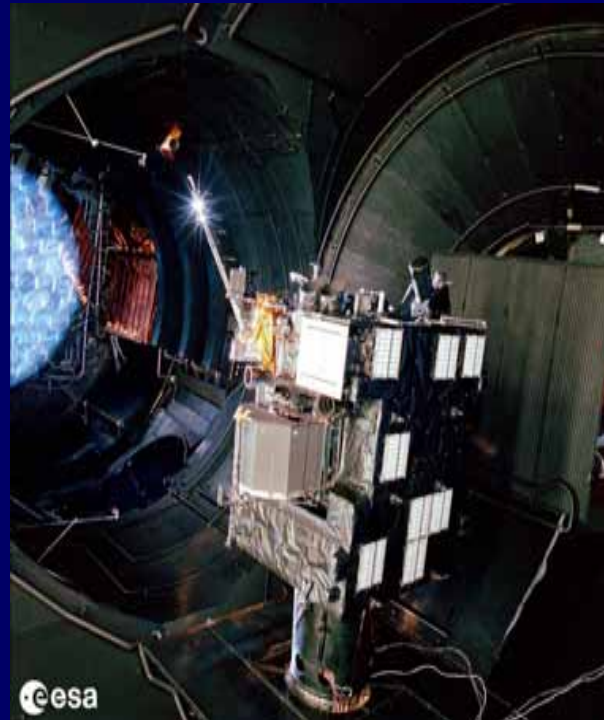


Rosetta Launch Preparations



**Preparation of
vibrations testing**

In vacuum chamber



Arrival in Kourou

• esa



Rosetta Fly-By at Asteroid 2867 Steins

Summary of Steins fly-by

Duration:	8 Aug – 3 Oct. 2008
Closest Approach:	9 Sep 2008, 18:30 UT
Relative velocity:	8.62 km/s
Heliocentric distance:	2.14 AU
Geocentric distance:	2.41 AU
Phase angle at approach:	38.52°
Targeted minimum distance:	800 km

- Continuous observations of the asteroid
- Fly-by on the Sun side of the asteroid in the plane defined by the relative velocity and Sun direction
- Fly-by will go through phase angle zero.

