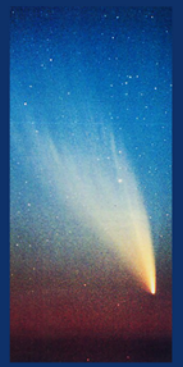


# Summary Information Sheet

## Comets

A comet's nucleus is a "dirty snowball" consisting of frozen gases (ices) and dust. Orbital periods range from about 3 years to millions of years and some comets move in highly inclined orbits. Close to the Sun, ices evaporate and dust grains are released from the nucleus, forming a "coma" (the comet's head) and one or more tails. Some comets become very bright and have spectacular tails.

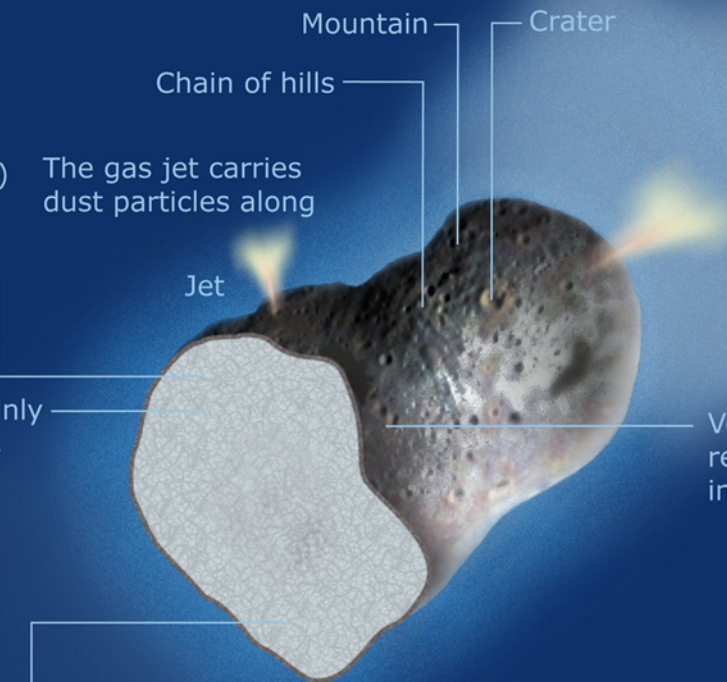


The Bayeux Tapestry with Comet Halley (1066)

The gas jet carries dust particles along

Dust grains: organic compounds and silicates

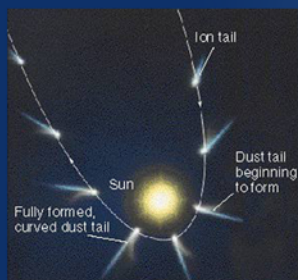
Frozen gases (ices): mainly water, carbon monoxide, carbon dioxide



Sunlit side

Surrounding "coma" of gas and dust up to several mio km diameter. Gases glow and dust grains reflect sunlight

Very dark surface layer reflects only 3-4% of incoming sunlight

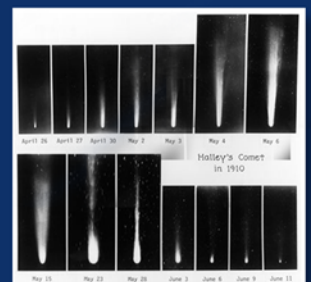


Orbit and evolution of a comet

Internal structure is loose and fluffy – some comets break up

Comets carry material dating from the formation of the Solar System

Dust tail up to 100 mio km long or more



Comet tail evolution (Halley 1910)



Tails of comet Hale-Bopp (1998)



Comet Halley's nucleus (ESA Giotto, 1986)



Comet Borrelly (NASA Deep Space 1, 2001)



Broken-up comet SL-9 hits Jupiter (1994)

### Physical Data

### For comparison

Property	Comet Halley	Asteroid Gaspra	Mars moon Deimos
Distance from the Sun	88-5300 mio km	332 mio km	-
Orbital period	76 years	3.29 years	1.26 days
Dimensions	Nucleus: 16 x 8 x 7 km	19 x 12 x 11 km	15 x 12 x 11 km
Mass	$8 \times 10^{13}$ kg	?	$1.8 \times 10^{15}$ kg
Density	100 kg/m <sup>3</sup>	?	1700 kg/m <sup>3</sup>

Images from ESO, ESA or NASA except otherwise stated

Concept: Bernhard Mackowiak