

Comets!



What are Comets?

“Dirty Snowballs”

A 2-40 km across loose collection of chunks of ices (H_2O , CO_2 , methane, ammonia) which are mixed with many types of organic compounds (like CN, HCN, hydrocarbons, amino acids).

When the comet gets close to the Sun it grows a huge coma and tails.



What are Comets?

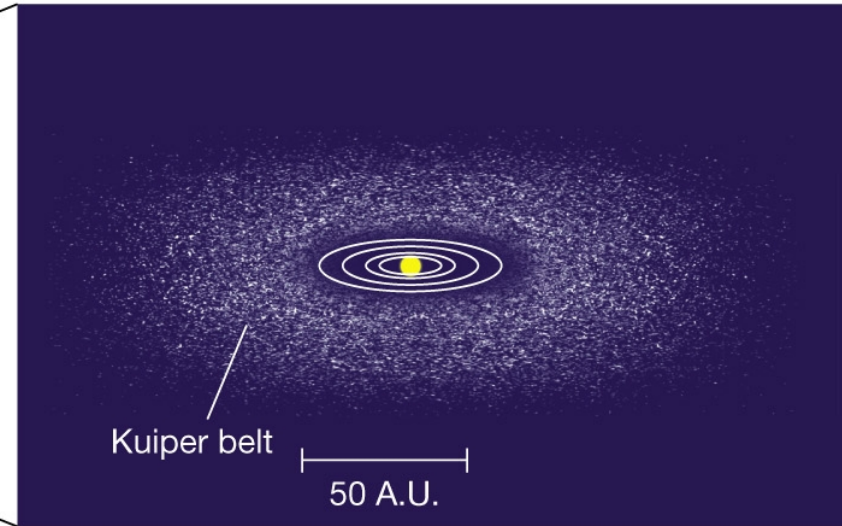
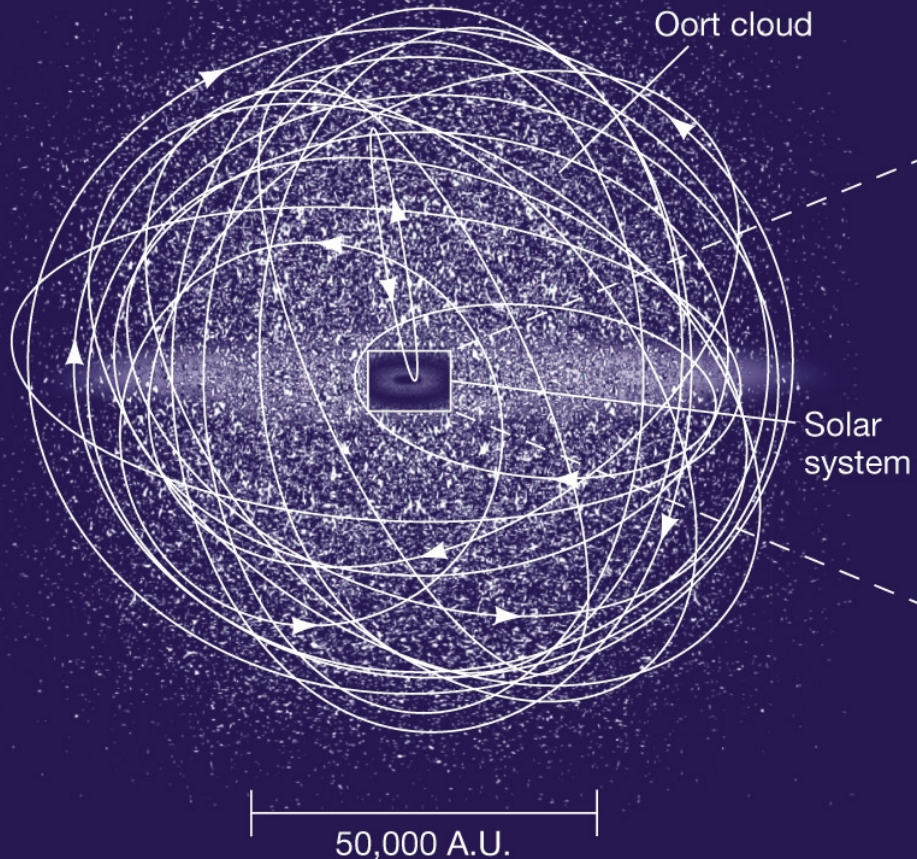
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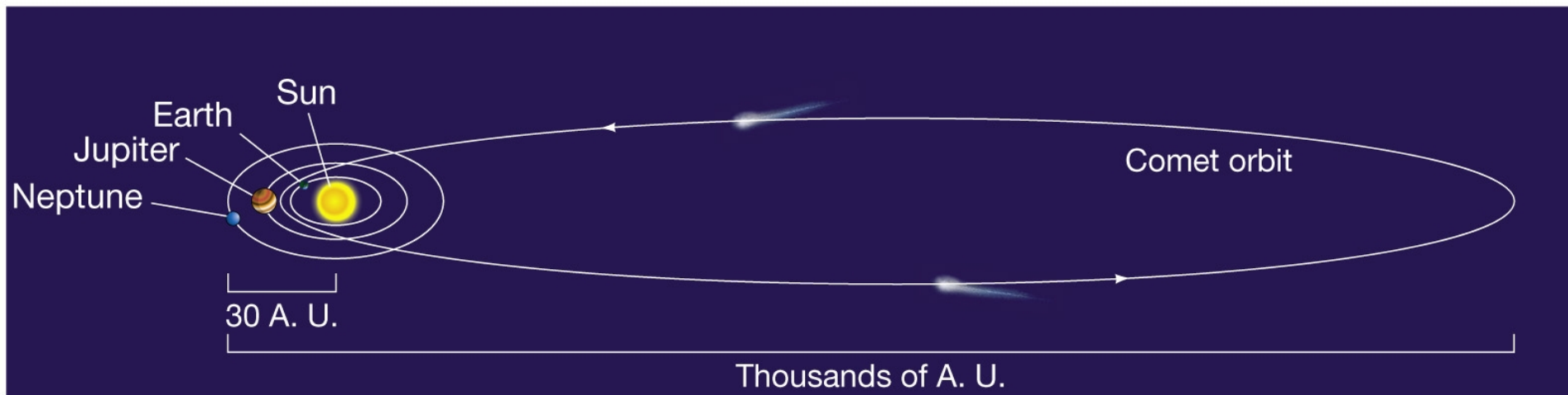
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Where do comets come from?



Where do comets come from?



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Comet Structure



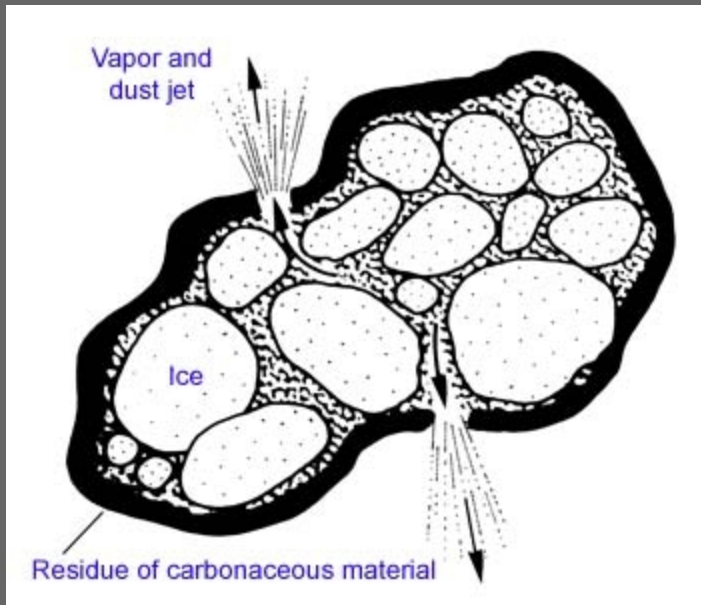
Gas (ion, plasma) Tail

Dust Tail

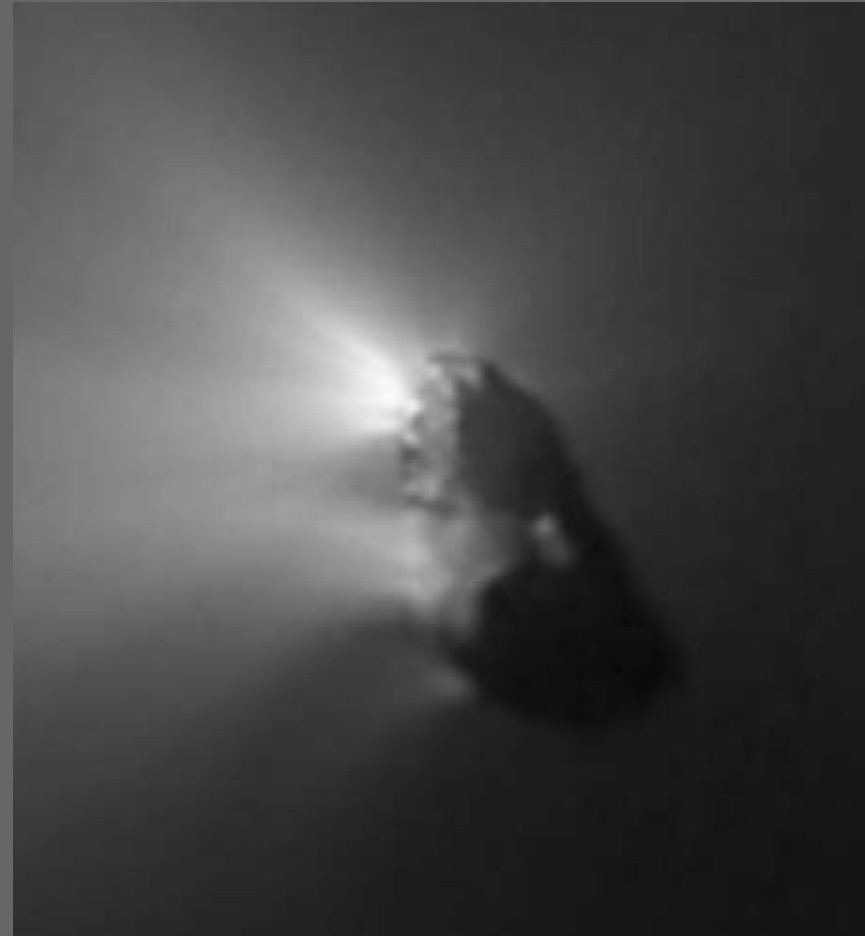
Coma (up to size of the Sun 10^6 km)

Comet Structure

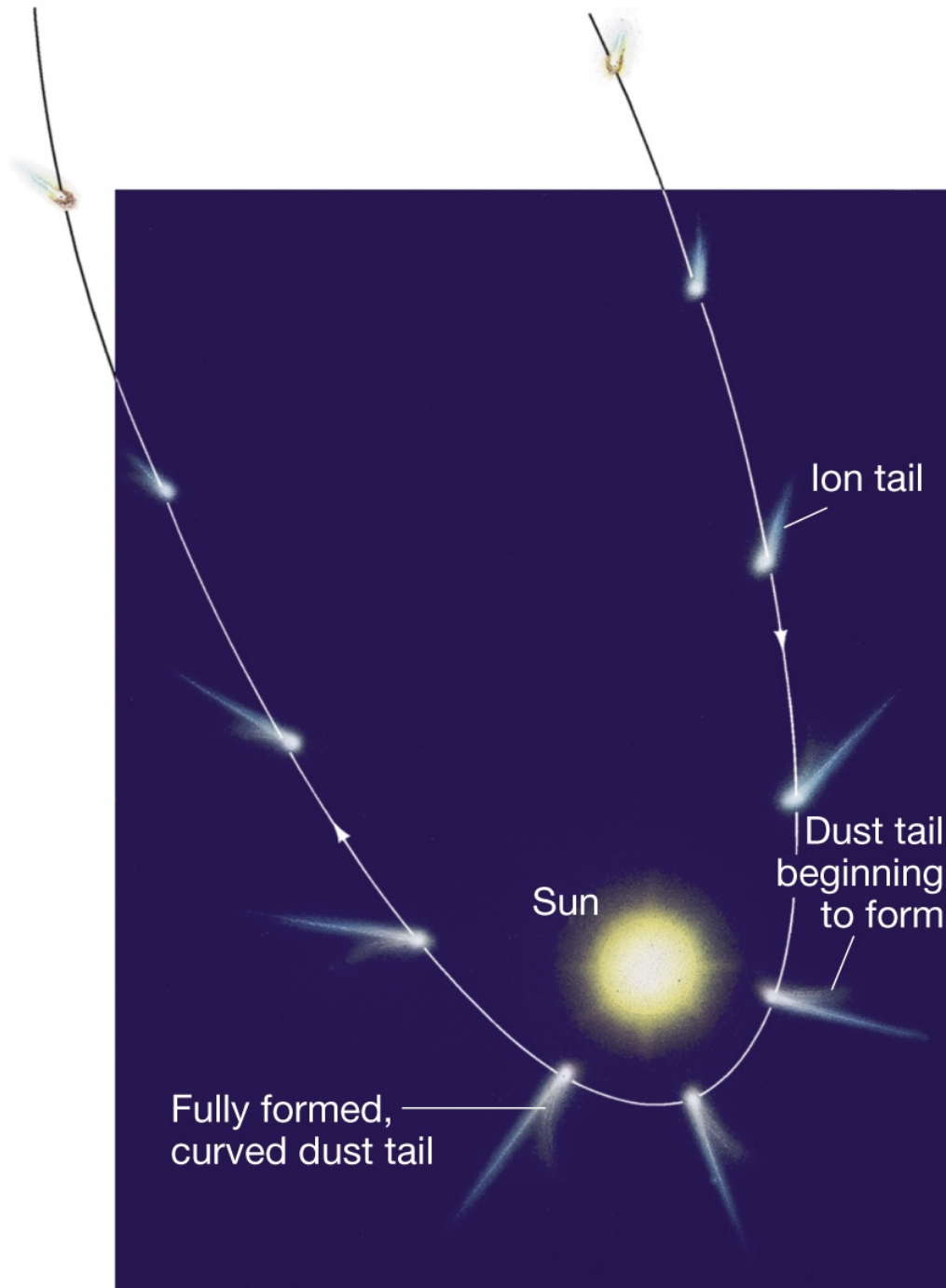
Nucleus (2-50 km across)



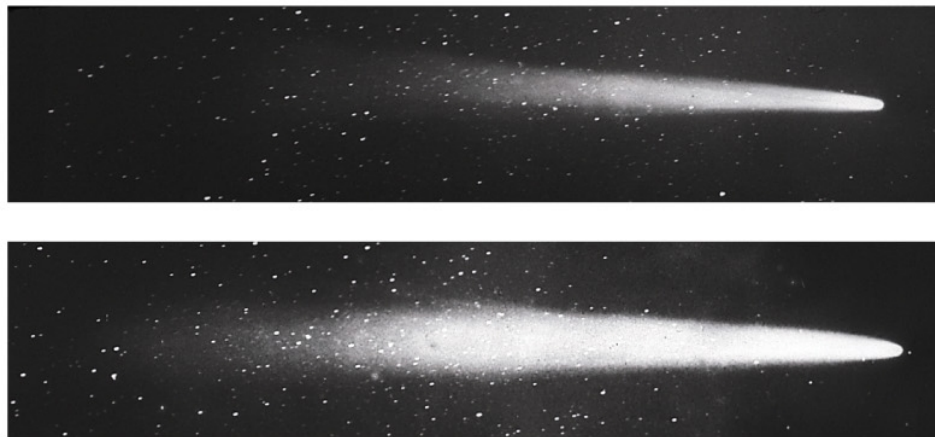
Nucleus of Halley's comet



**Comet Tails get bigger
near the Sun.**



Halley's Comet



(a)

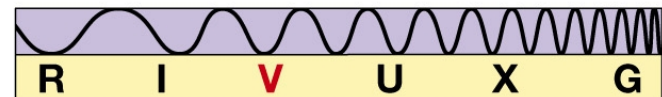
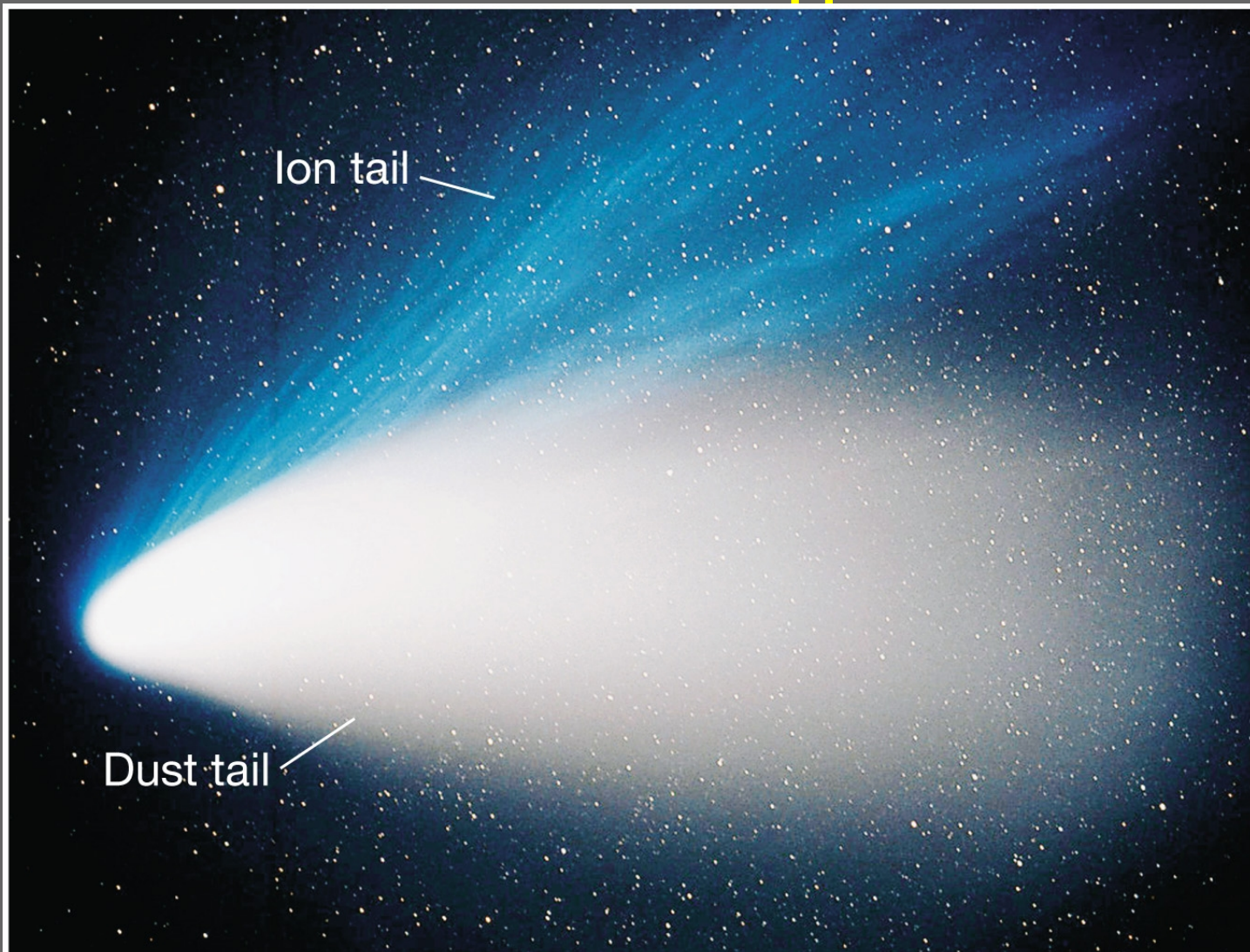


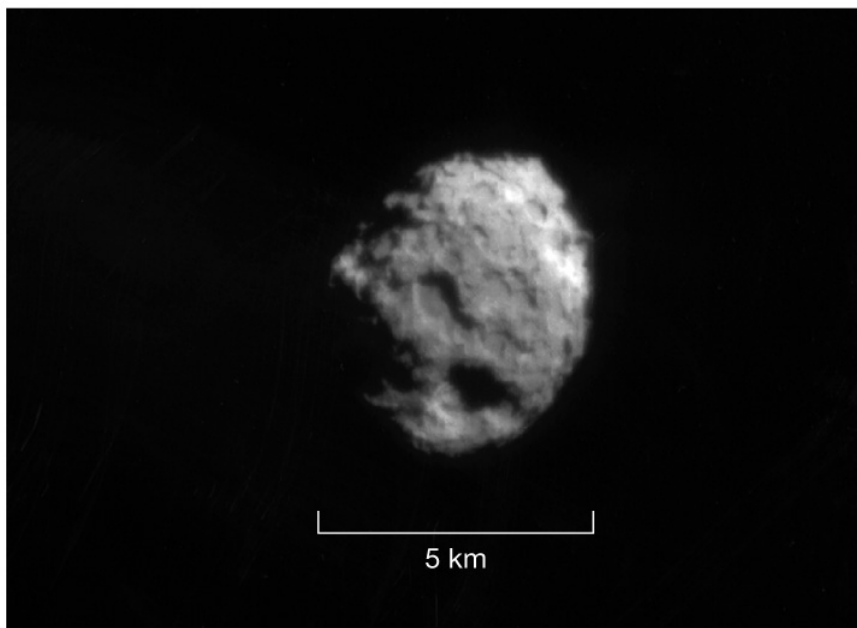
(b)



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Comet Hale-Bopp





(a)



(b)



Comet Exploration

Giotto at Halleys (1986)

Stardust at Comet Wild-2
(1999)

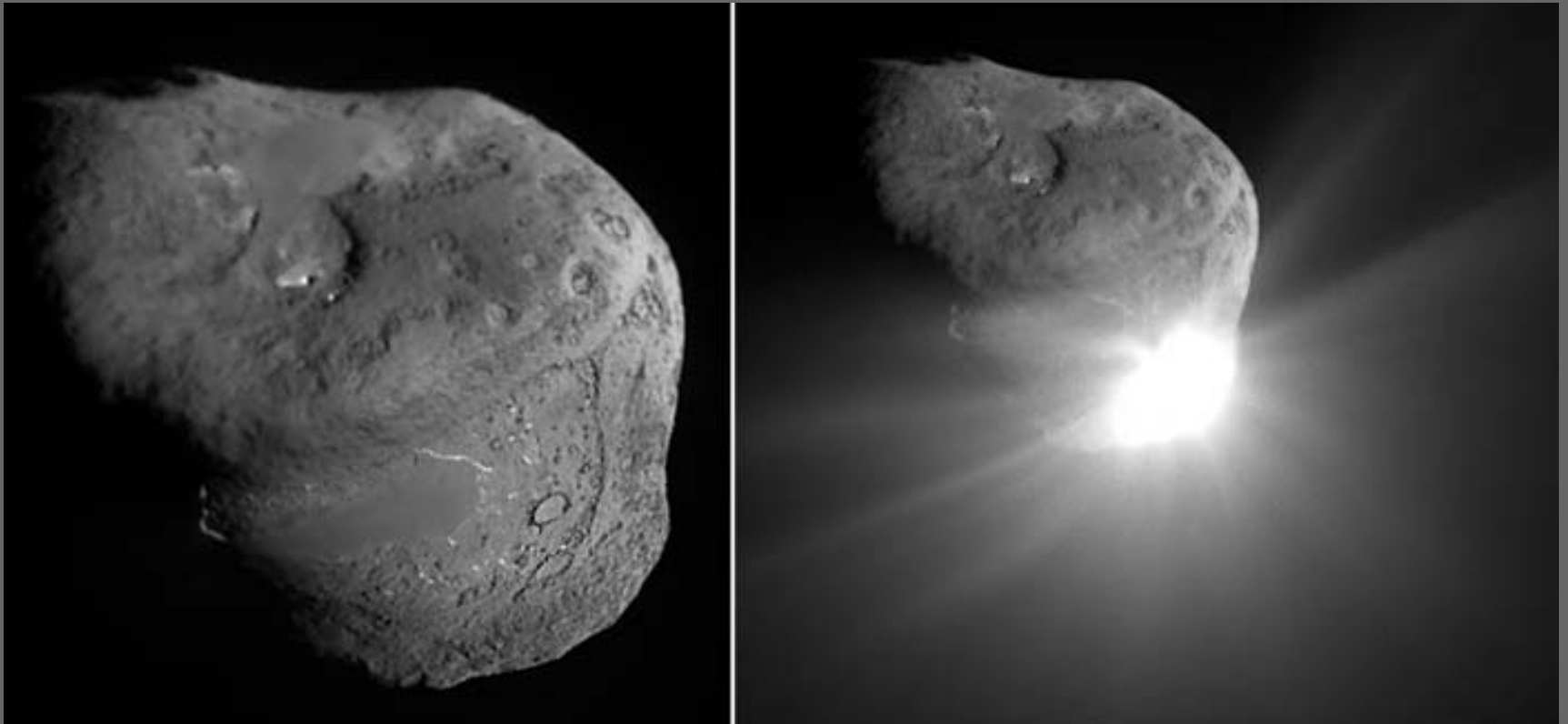
We have flown a spacecraft
through the tail of this comet
and collected samples!

Aerogel!

Comet Exploration

We have crashed a spaceprobe into the nucleus of a comet and watched the ejected material!

Comet Temple I was hit by "*Deep Impact*"



Meteor Trails

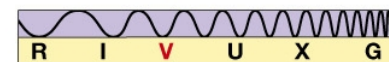
Most meteors originate as fragments and dust from comets.



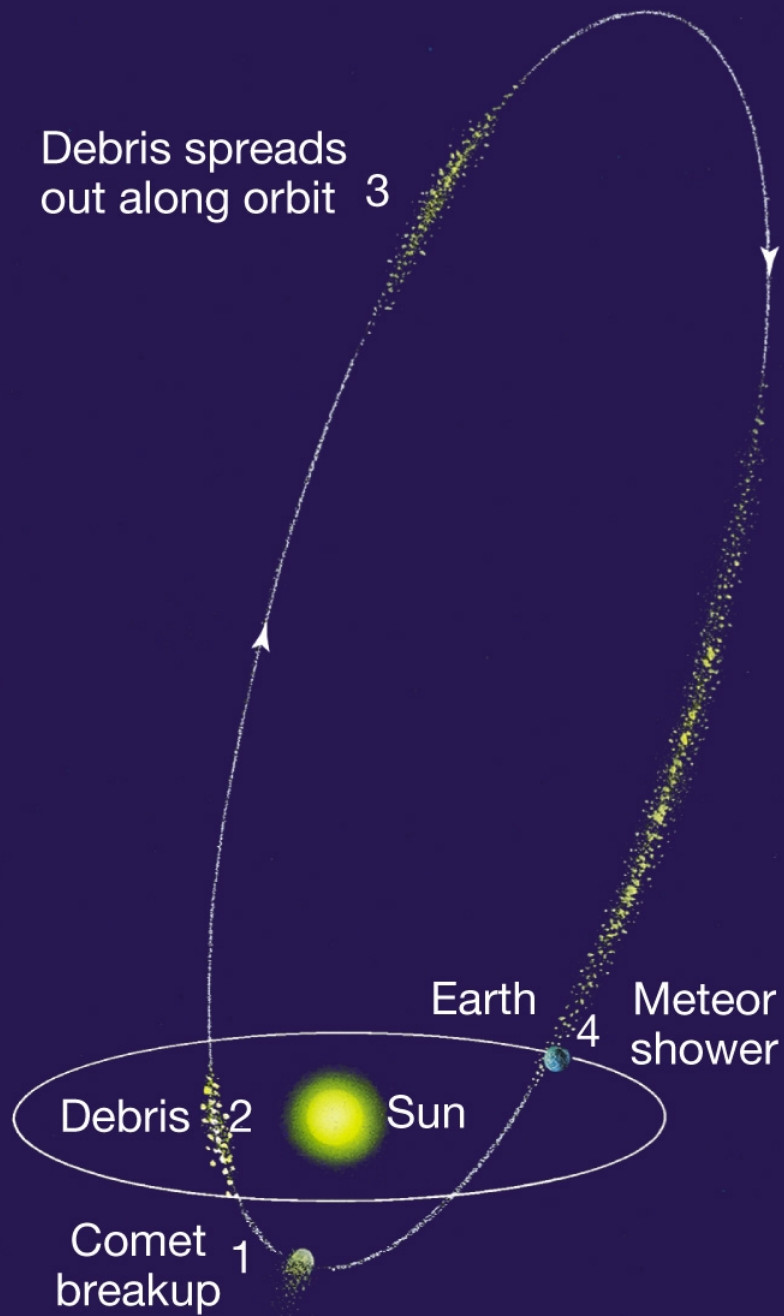
(a)



(b)



Comets: source of meteor showers



Comet Garradd ... last summer.



Comet Garradd passed M71 in Sagitta on the evening of August 26th.



Comet Garradd ... this spring.

Comet Garradd
on the evening of Feb 1.

