

Comets!

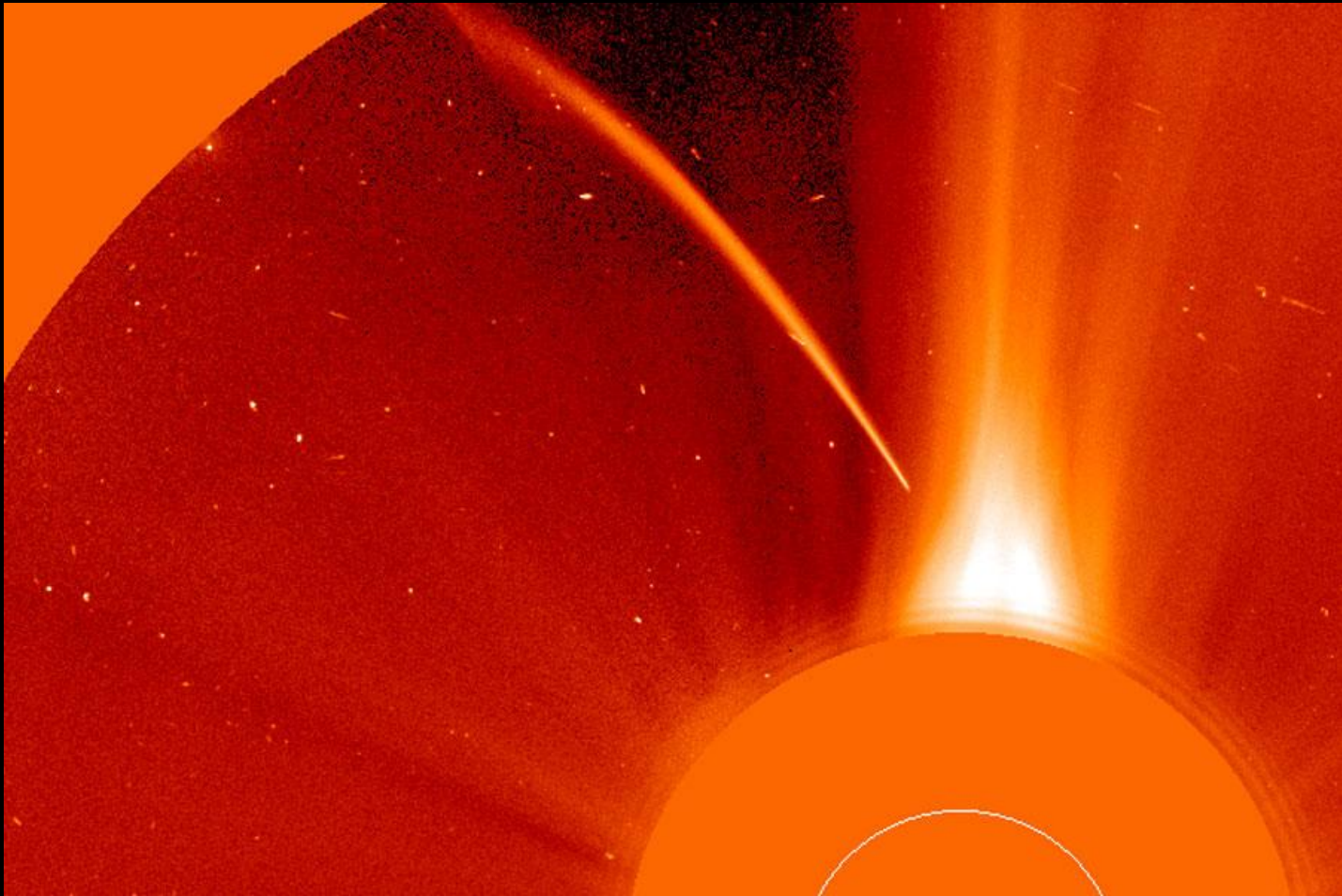


AKA the most awesome objects in the universe!



“Comets are like cats. They have tails, and they do precisely what they want.” – David Levy

Picture of the Day (First of Many!)

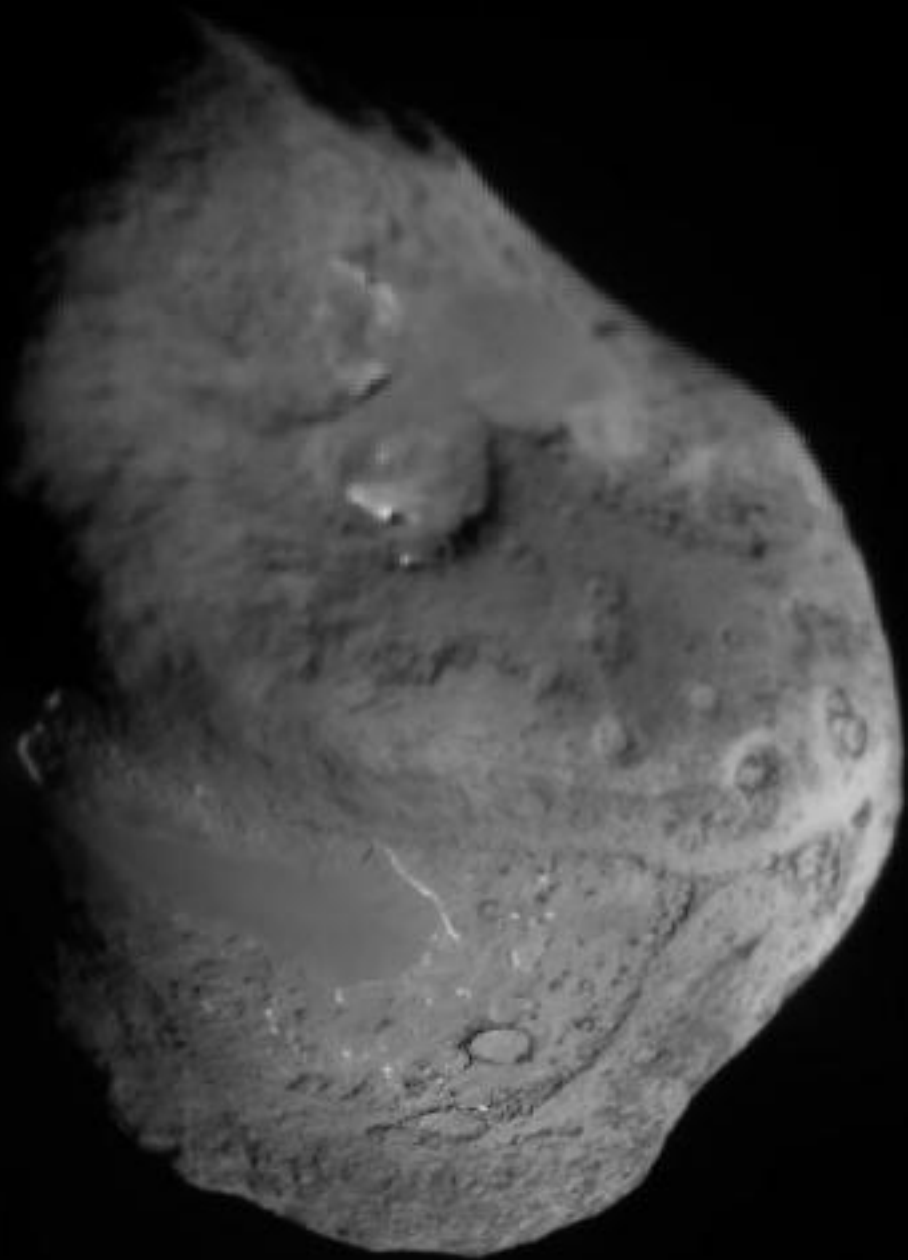


Ancient Comets

- Known since ancient times
- Interpreted as bad omens
- Atmospheric phenomenon?
- Halley's prediction of the return of Halley's comet







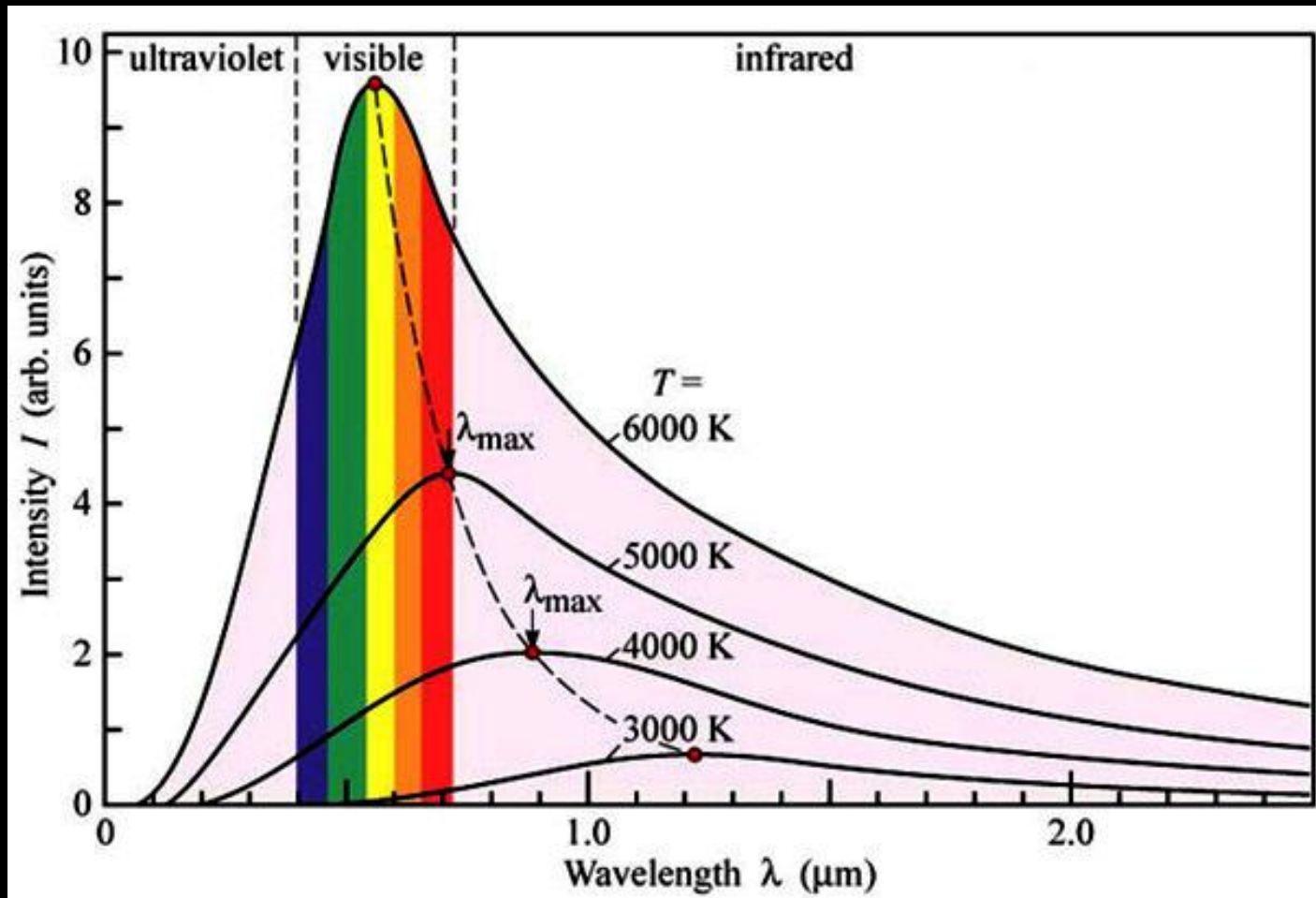
Comet Hale-Bopp!



Comets Emit X-rays!

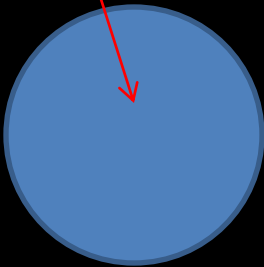


... But Why?



Charge Transfer

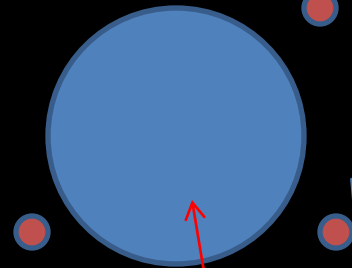
Highly ionized atom



Outer shell electron

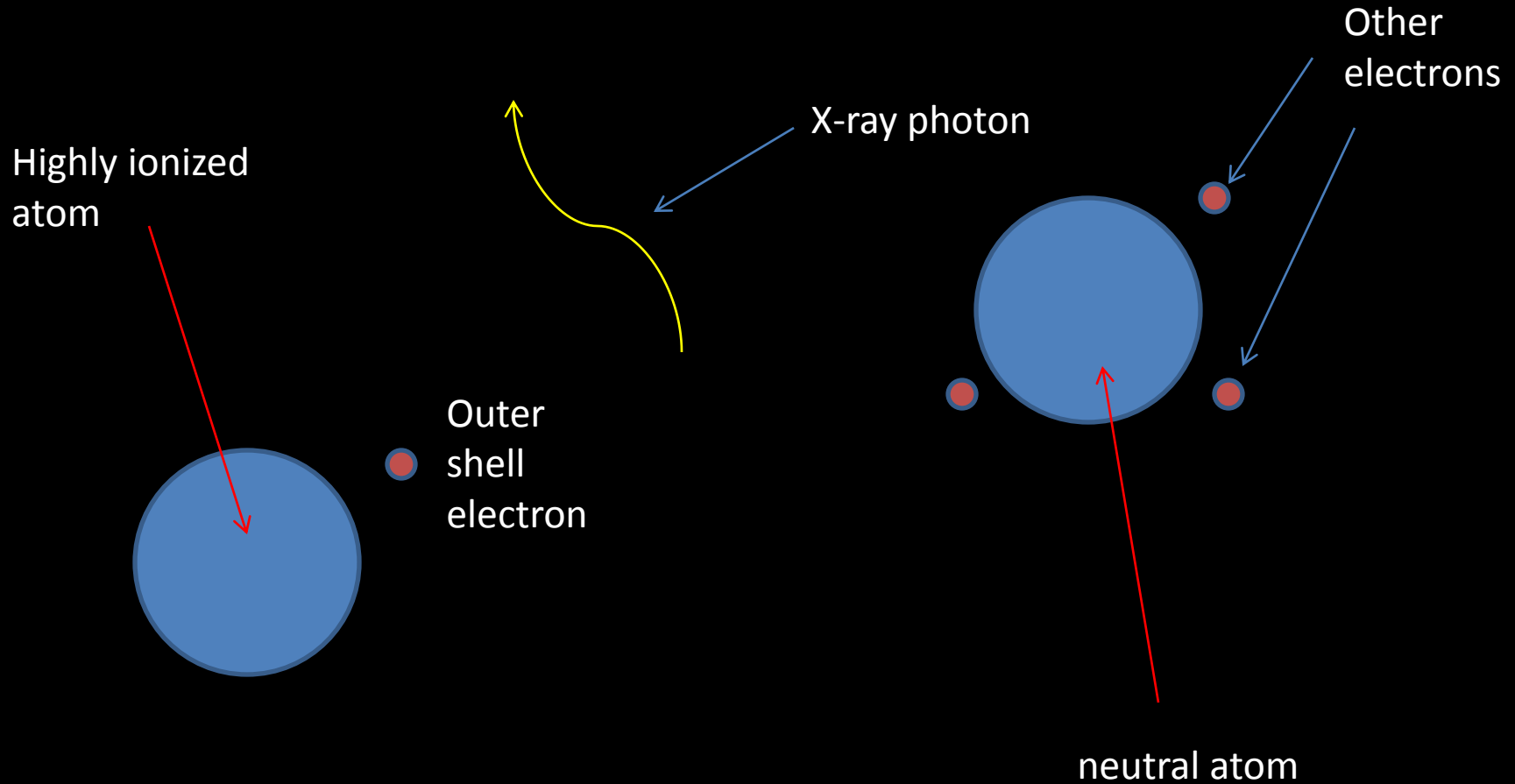


Other electrons

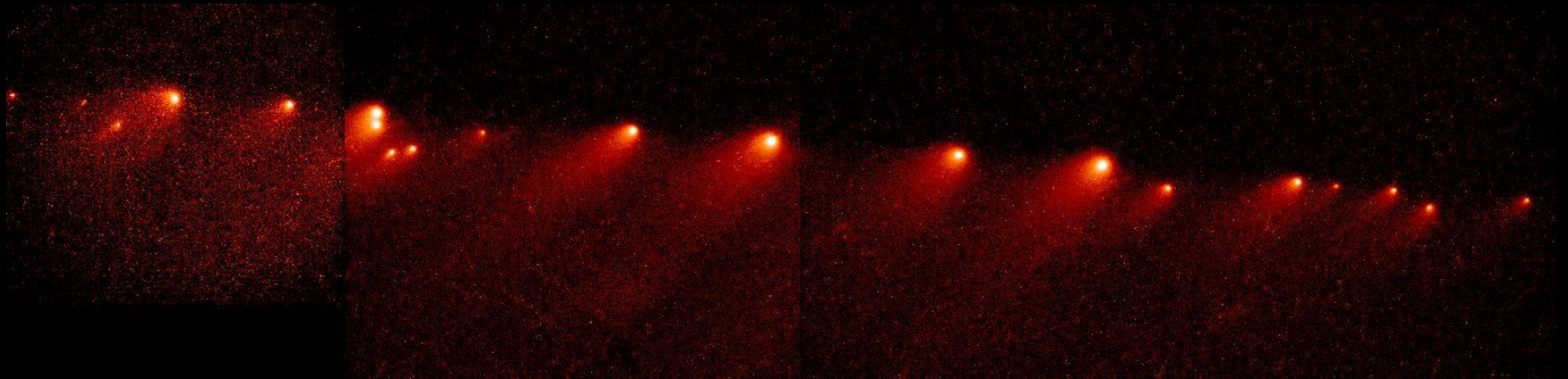


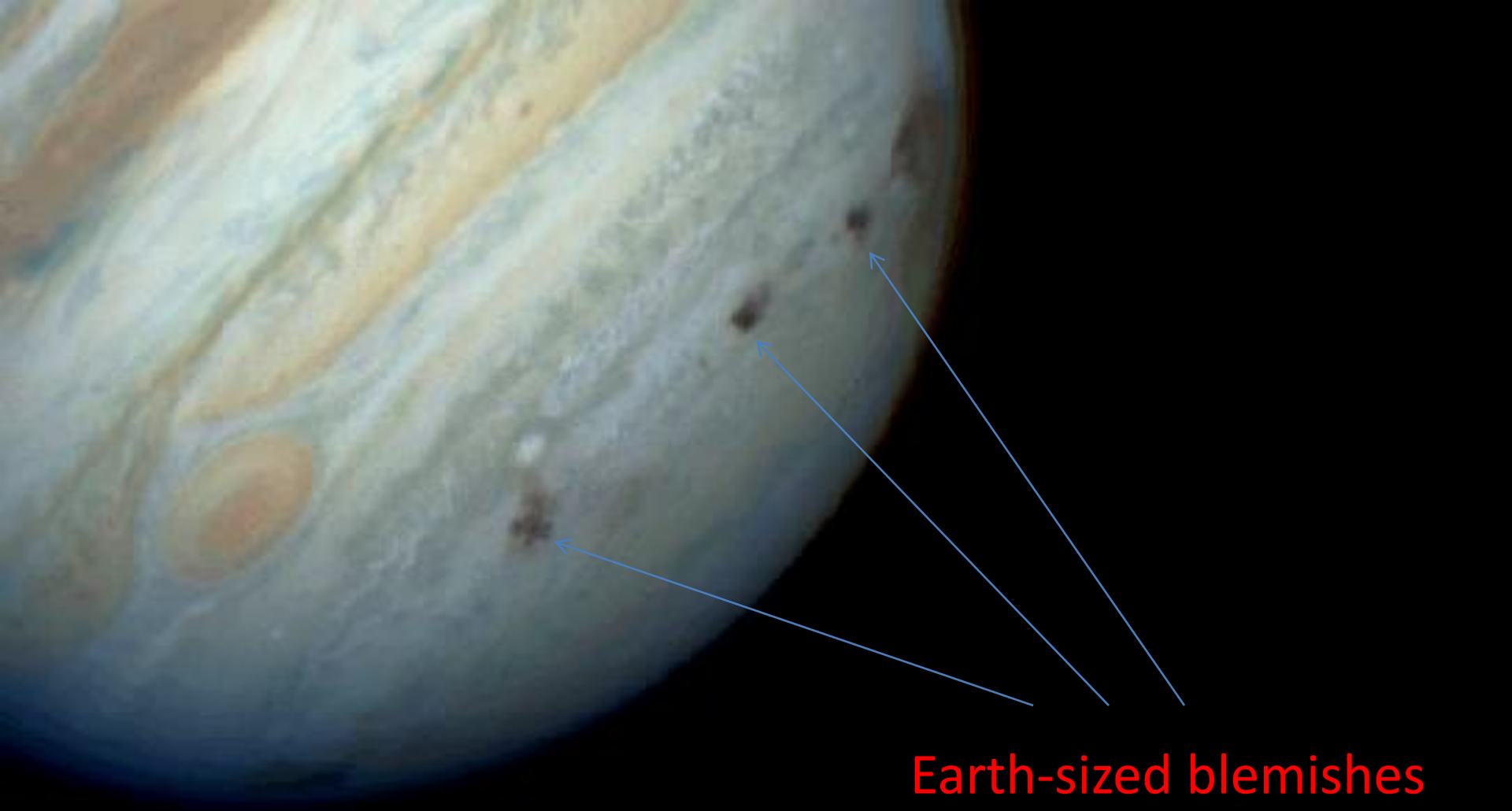
neutral atom

Charge Transfer



Shoemaker-Levy 9



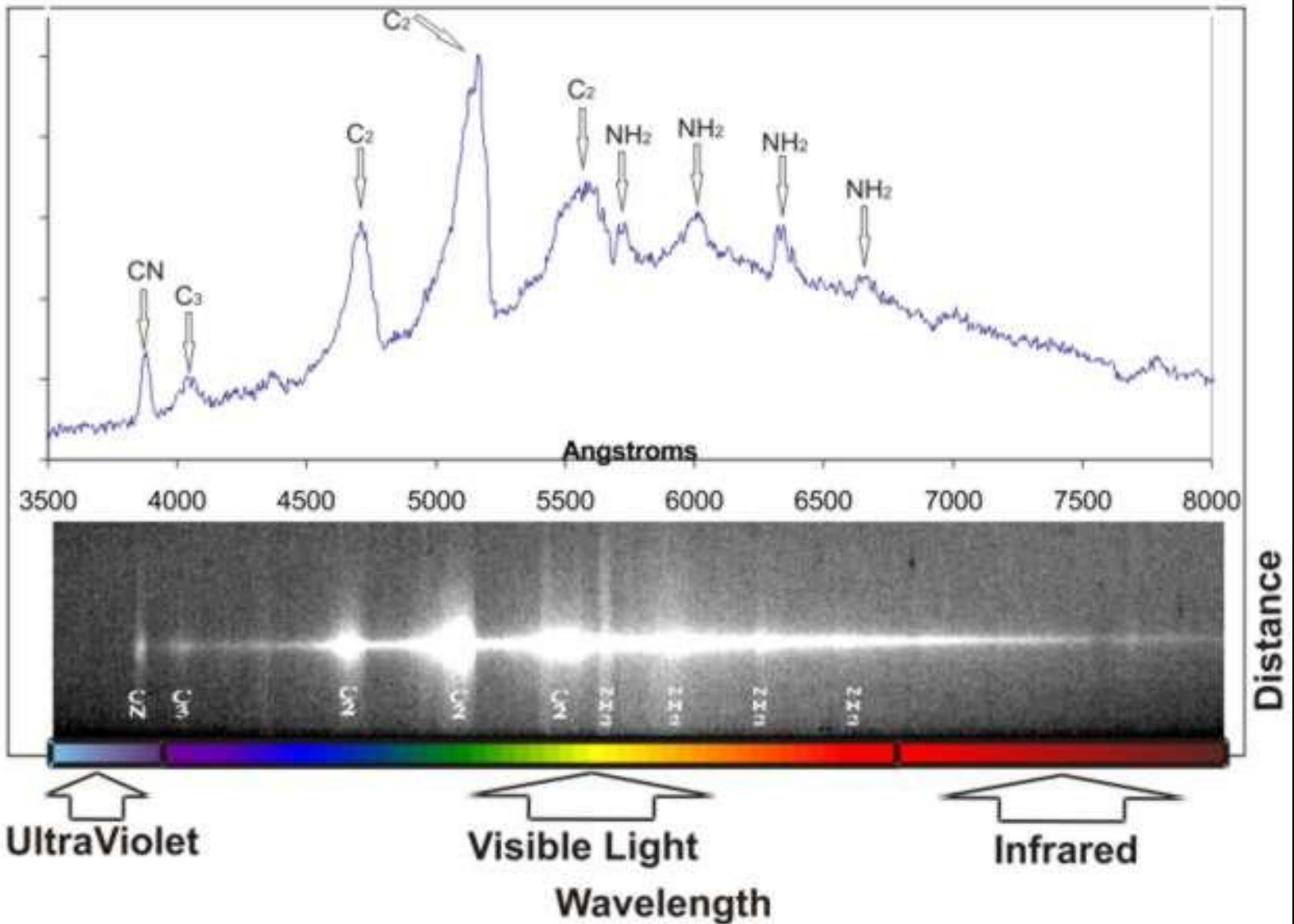


Earth-sized blemishes

Comet Holmes!



Spectra!



Why Study Comets?

- Primordial matter
- Gives astronomers an idea of what was present when the solar system was formed
- Probable source of Earth's water
- Panspermia – source of organic materials and possibly life!

Comets vs. Asteroids

Comets

- Icy dust balls
- Can grow comae and tails
- Originate in outer solar system in Kuiper Belt (beyond Neptune) and Oort Cloud (well beyond Neptune)
- Usually on highly elliptical orbits

Asteroids

- All rock and metal
- Cannot grow comae and tails
- Mostly located in the Asteroid Belt between Mars and Jupiter
- Orbits closer to circular