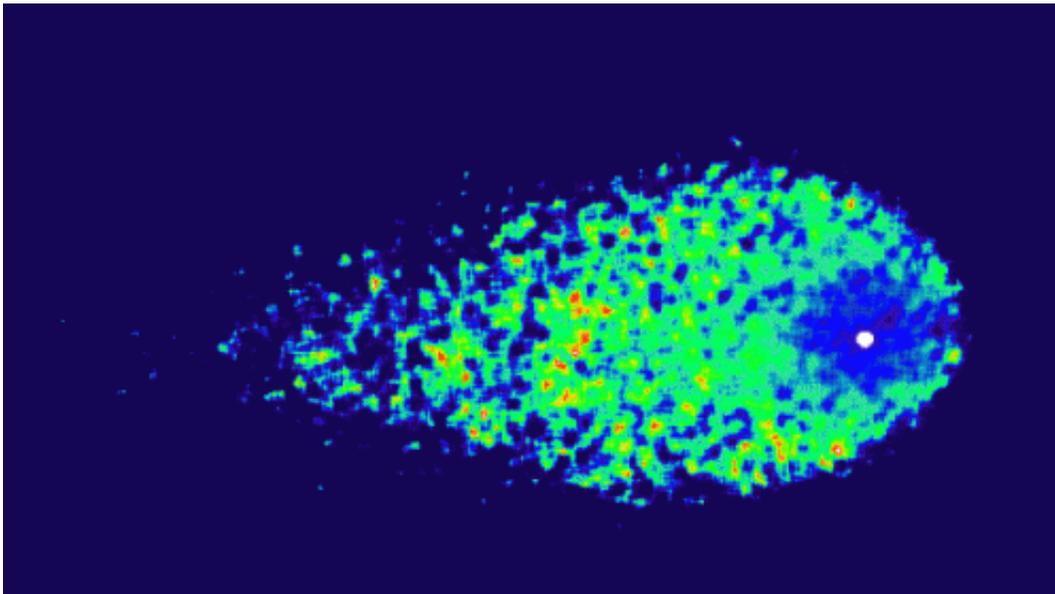


# Comet C/ISON details emerge as it races toward the Sun

October 11 2013

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This image shows the color change of Comet C/ISON's dust coma. The white dot at the center of the coma marks the location of the nucleus. ISON's dust coma appears to be less red near the nucleus than it is further away from the nucleus. Although the color change is actually very small, it could be an indication of relatively more water ice particles near the nucleus. Those icy particles evaporate, as they move outward, makes the coma appear redder. Credit: NASA, ESA, J.-Y. Li (Planetary Science Institute) and Hubble Comet ISON Imaging Science Team

Scientists are unraveling more information on Comet C/2012 S1 (ISON) as it continues on its journey toward the Sun. Comet C/ISON will skim

730,000 miles above the Sun's surface on Nov. 28 and has the potential to be readily visible from Earth starting in early December.

"We measured the rotational pole of the nucleus. The pole indicates that only one side of the [comet](#) is being heated by the Sun on its way in until approximately one week before it reaches its closest point to the Sun," said Planetary Science Institute Research Scientist Jian-Yang Li, who led a team that imaged the comet.

"Since the surface on the dark side of the comet should still retain a large fraction of very volatile materials, the sudden exposure to the strong sunlight when it gets closer to the Sun than Mercury could trigger huge outbursts of material," Li said.

Li presented the findings today at the American Astronomical Society's Division for Planetary Sciences 45th Annual Meeting in Denver.

Comet C/ISON was imaged with the Hubble Space Telescope using the Wide Field Camera 3 on April 10.

"We measured the color of the coma, and found that the outer part of the coma is slightly redder than the inner part," Li said. "This color change is unusual in comets, and seems to imply that the inner part contains some water ice grains, which sublimate as they move away from the nucleus."



Comet C/ISON was imaged with the Hubble Space Telescope on April 10 using the Wide Field Camera 3, when the comet was 394 million miles from Earth. Credit: NASA, ESA, J.-Y. Li (Planetary Science Institute) and Hubble Comet ISON Imaging Science Team

Comet C/ISON was discovered in September 2012 when it was farther away from the Sun than Jupiter, and was already active at such a great distance. This is distinct from most other sungrazers – comets that pass extremely close to the [sun](#) – that are only discovered and remain visible for at most several days when nearest the Sun. At such a close perihelion

distance from the Sun, sungrazers are expected to be intensely heated by the Sun, and sublimate not only ice but also silicates and even metals, releasing a tremendous amount of dust. The expectation is high that Comet C/ISON will be much brighter and more spectacular than most other sungrazers when it puts on a show late this year.

"As a first-time visitor to the inner solar system, Comet C/ISON provides astronomers a rare opportunity to study a fresh comet preserved since the formation of the Solar System," Li said. "The expected high brightness of the comet as it nears the Sun allows for many important measurements that are impossible for most other fresh comets."

Provided by Planetary Science Institute

Citation: Comet C/ISON details emerge as it races toward the Sun (2013, October 11) retrieved 25 April 2024 from <https://phys.org/news/2013-10-comet-cison-emerge-sun.html>

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