First results from the Comet ISON Observing Campaign (CIOC)

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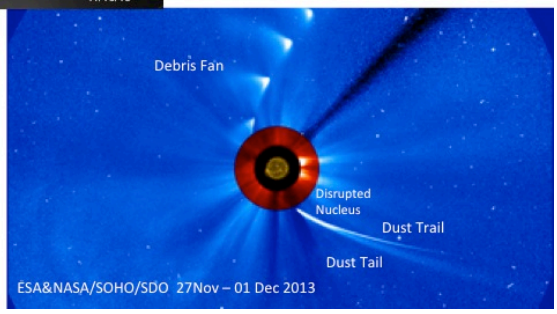
Comet ISON came fresh from the Oort Cloud as predicted, coming within 0.07 au of Mars, 0.24 au of Mercury, and 10^6 km of the solar photospheric surface. It did not become the "Comet of the Century" in terms of its brightness in the Earth's night-time sky as predicted, but instead became one of the rare dynamically new Oort Cloud comets to graze the Sun's corona (these occur every few decades; the last one observed was C/Ikeya-Seki 1965). For an initially bright comet detected as far out as the orbit of Saturn in Sept 2011, the comet worried us all quite a bit with its flat-lining activity from 4 to 0.8 au (March to Oct 2013). It thus put on a somewhat disappointing showing at Mars in early October, but then defied predictions of its demise and a government shutdown, ramping up instead to become a beautiful early morning green "lollipop" as it passed Mercury in mid-November (Figure). ISON ultimately peaked at maximum $Q_{gas} = 2 \times 10^{30}$ mol/s of water [1] within the last few days before perihelion, then seemed to have almost no gas output the day of perihelion, 28 Nov 2013 [2] before spectacularly disrupting under the watchful eyes of the SOHO and STEREO spacecraft (Figure), after which its debris fan was tracked for days until it finally disappeared [3,4].

Over 19 NASA and ESA spacecraft ultimately pointed at the comet, with at least 14 reporting detections of it ranging from the X-rays through the infrared. More than 30 ground-based observatories observed ISON from at UV to radio wavelengths. Important findings concerning the comet's size, rotation state, dust to gas ratio, composition, and coma and tail structure were made during ISON'S apparition. Numerous observing groups produced evidence for a small and CO poor (but rich in solid carbon and CO_2) nucleus that was rapidly evolving. Throughout this time, parallels to the behavior of other dynamically new comets, like C/1973 E (Kohoutek), were readily apparent. In this talk I present an overview of the observational findings for ISON.

Comet ISON at its most dramatic. (*Left*) The comet as imaged from the ground by at optical wavelengths in mid-November, showing the incredibly bright **greenish (i.e., H_2O, C_2, CN, and CO_2 rich but CO poor)** coma, and highly extended dust and gas/ion tails. **Numerous reports of fragmentation events and variable structures in the gas tail** were received at this time.



(*Right*) Time lapse montage of Comet ISON and the Sun taken by the SDO and SOHO spacecraft, showing the loss of a condensed brightness maximum a few hrs before perihelion and the extended debris clouds after perihelion passage.

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