

## Soft X-rays from Comets and the Outer Heliosphere

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A flux of soft X-rays was rather surprisingly detected from comet Hyakutake by the ROSAT spacecraft in 1996. Since then, it has been shown that all active comets emit X-rays. A number of competing mechanisms were rapidly suggested -- including scattering of solar X-rays by extremely small dust grains and excitation by electron bombardment. The winning explanation appears to be charge-transfer collisions between highly charged solar wind ions (e.g.,  $O^{7+}$ ) and gas in the cometary coma. Recent X-ray spectroscopy with the Chandra observatory has confirmed this mechanism. Similar charge-exchange reactions between the solar wind and interstellar gas can account for roughly half of the soft X-ray background intensity observed by ROSAT.