

NH₂ dominated spectra of Comet C/2025 K1 (ATLAS)

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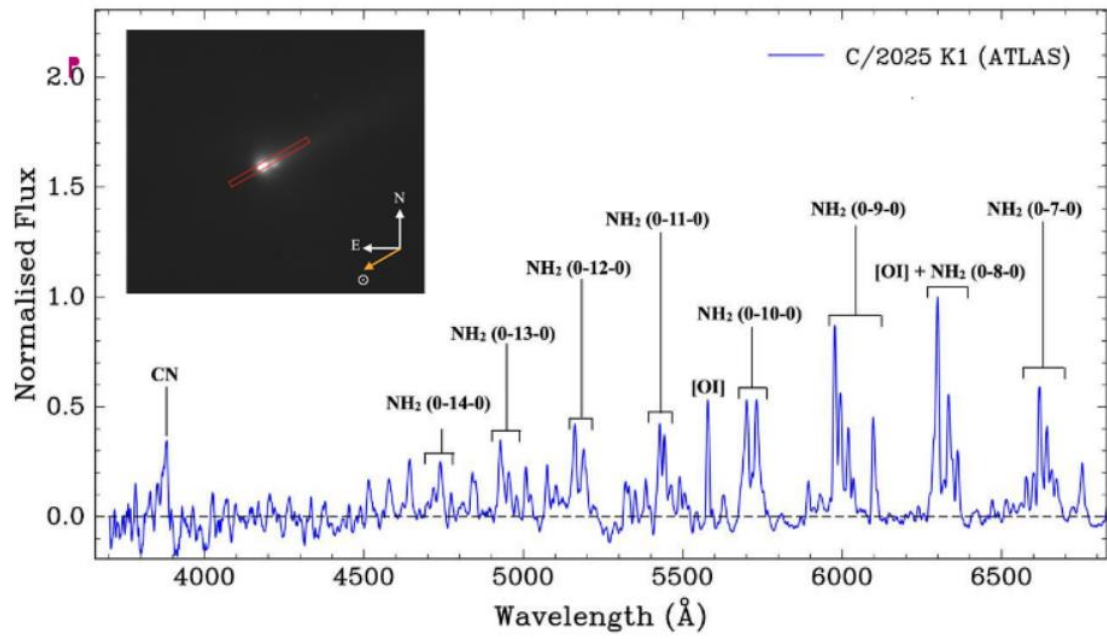
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We obtained low-resolution optical spectra of the fragmented comet C/2025 K1 (ATLAS) on 13 November 2025 at 22:08 UT using the Hanle Faint Object Spectrograph and Camera (HFOSC) on the 2-m Himalayan Chandra Telescope at Hanle, India. The observations were conducted using Grism 7, which provides spectral coverage from 3750 to 6850 Å. At the time of observation, the comet was at a heliocentric distance of 0.96 AU and a geocentric distance of 0.54 AU. The spectrum was extracted using a rectangular aperture of 60×1.92 arcseconds, corresponding to approximately 23500 km \times 753 km on the coma. The spectrum was flux-calibrated and solar continuum corrected to remove the dust contribution. The slit was centered on the main fragment and aligned with the Sun-to-Target radial vector direction.

In striking contrast to the typical spectra of most solar system comets, the optical spectrum of C/2025 K1 is dominated exclusively by NH₂ emission bands (see figure at the link below). Emission from the major radicals CN, C₂, and C₃ is very weak. Such an NH₂-dominated spectrum is very rare and, to date, has been observed only in the short-period comet 96P/Machholz (Langland-Shula et al. 2007 and Schleicher 2008), and comet Yanaka (1988r) (Fink 1991, 1992).

We are conducting further regular spectroscopic observations with PRL's Mount Abu telescopes and encourage continued spectroscopic monitoring of C/2025 K1 in the coming days. This may be crucial to determine whether this unusual spectral behaviour is a transient effect related to the comet's fragmentation - expected to dissipate over a short timescale - or whether it reflects a genuine compositional peculiarity.

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HCT spectrum of C/2025 K1 (slit orientation is shown in the inset) [#ATel 17500](#)