Comet Levy Detected by SEST

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On September 27 the Swedish-ESO Submillimetre Telescope (SEST) tracked Comet Levy (1990c). Its receiver system was tuned to 266 GHz (λ = 1.13 mm) where there is a spectral line of hydrogen cyanide (HCN) created by a transition between the third and second rotational energy levels. The result after an integration time of 4.6 hours is shown in Figure 1.

The spectrum was registered by the acousto-optical spectrometer and its attached on-line computer. The frequency scale has been converted into radial velocity relative to the centre of the earth. At the time of observation the comet was at a distance of 1.1 astronomical units and was receeding from the earth at a speed of 42 km/s heading for its perihelion. The intensity scale is in units of antenna temperature corrected for atmospheric absorption. A gaussian curve has been fitted to the observed line profile. Its amplitude of 0.18 K corresponds to roughly 7×10^{-26} $W/m^2/Hz$ in physical units. Its width is about 2 km/s which reflects a gas expansion velocity of the order of 1 km/s.

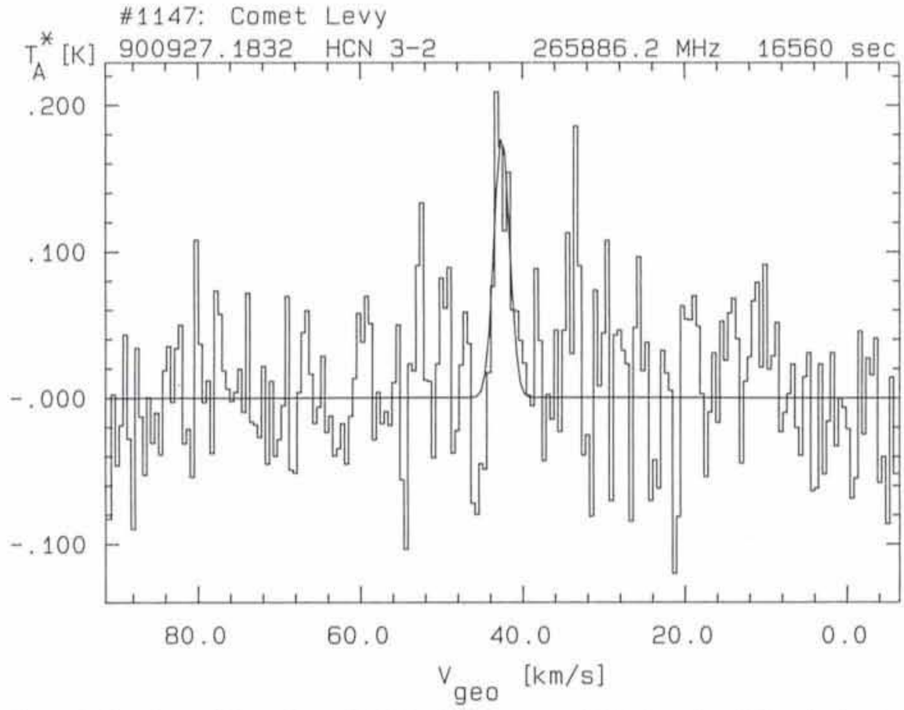

Figure 1: *Spectrum of Comet Levy (1990c) at a frequency of 266 GHz (λ = 1.13 mm) showing the rotational line J = 3–2 of hydrogen cyanide (HCN). The frequency scale has been converted into radial velocity relative to the centre of the earth. The intensity scale is in units of antenna temperature corrected for atmospheric absorption. A gaussian curve has been fitted to the line profile. HCN is believed to be one of the many compounds which are evaporated directly from the surface of the nucleus. Further out in the coma, HCN is photo-dissociated and it is probably the main source of the cyanide radical CN.*

Radio spectroscopy of comets is important because it can give us information about the composition of the nucleus. When the solar radiation heats up the surface, the so-called "parent molecules" evaporate and expand from the nucleus. Further out they are eventually dissociated by the solar UV radiation and the resulting atoms and radicals are later ionized. All these secondary species radiate in the near infrared, in the visual, and in the UV regions of the electromagnetic spectrum. The parent molecules, however, radiate only in the millimetre and submillimetre ranges because this gas is extremely cold (approx. 30 K) due to adiabatic expansion. This central "parental cloud" also is quite small (approx. 100 km) which makes its emission difficult to detect.

HCN is probably the main parent molecule of the radical CN, which emits very strong bands in optical cometary

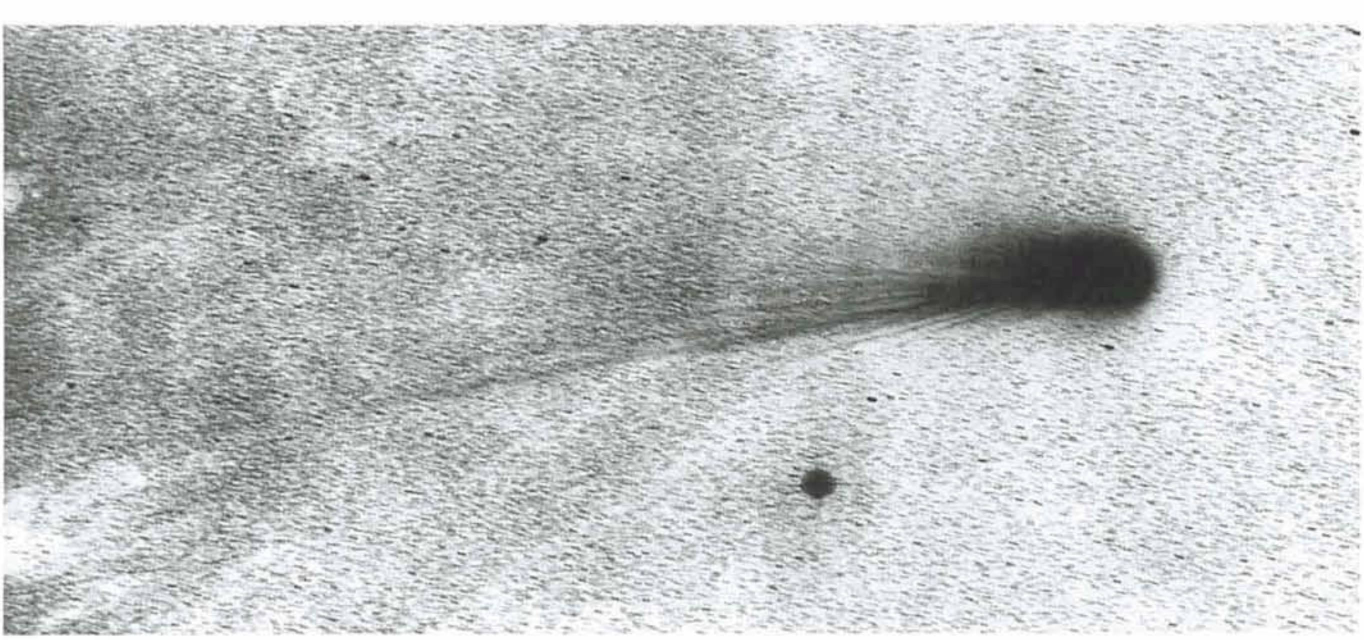

Figure 2: *This photo of Comet Levy (1990c), one of the brightest comets in recent years, was obtained with the ESO 1-m Schmidt telescope on September 14, 1990. Observer: O. Pizarro; photographic work: H.-H. Heyer: IIa–0 + GG385; 32 min.*

spectra. The J = J–0 rotational line of HCN was claimed to be detected for the first time in Comet Kohoutek (1973 XII) by Huebner, Snyder, and Buhl. However, this detection could not be confirmed by any other group and subsequent searches in other comets were unsuccessful. The line was unambiguously detected in Comet P/Halley by three observing groups using three different radio telescopes in 1985–86. (Bockelée-Morvan et al., Schloerb et al.; Winnberg et al.). The J = 3–2 line of HCN (the J = 2–1 line lies at a frequency with strong atmospheric oxygen absorption) was then detected earlier this year in Comet Austin by a French and an American group. The present observation is the first successful detection of a comet by SEST and it has been confirmed by two other telescopes. Let us hope that SEST can continue to contribute to cometary spectroscopy.

Announcement of the 3rd ESO/ST-ECF

Data Analysis Workshop

ESO, Karl-Schwarzschild-Str. 2
Garching, Germany

April 22–24, 1991

The aim of the Workshop is to provide a forum for discussions of astronomical software techniques and algorithms. It is held annually during the spring (April/May) and centres on a different astronomical area each time. Due to available space, participation will be limited to 80 people. At the last Workshop several people could not be accommodated and we therefore recommend that you send in the corresponding participation and accommodation forms well before the deadline.

The topic for the 1991 Data Analysis Workshop will be analysis of direct imaging data. The scientific section of the meeting will consist of three sessions each starting with a main talk followed by presentation of papers of 5–10 minutes duration. The last day is reserved for general user meetings for MIDAS and ST-ECF.

The tentative agenda is:

Analysis of Direct Imaging Data

April 22: 14.00–18.00: Digital Filters
April 23: 9.00–12.30: Image Restoration
14.00–17.00: Decomposition techniques
17.00–18.00: European FITS Committee
April 24: 09.00–12.00: MIDAS user's meeting
12.00–13.00: European FITS Committee
14.00–17.30: ST-ECF user's meeting

Contributions on algorithms and techniques, e.g. removal of cosmic ray events on CCD's, digital transformations, deconvolution, decomposition of images and fitting techniques are especially welcome. We encourage people to present their work in these areas even if it is only ideas. After each introductory talk, we will have a more informal discussion where such contributions can be made. We also plan to have a poster session where people can present short contributions. Proceedings of the scientific sessions will be published.

The scientific organizing committee includes:

P. Grosbøl (Chairman)	P. Benvenuti
L.B. Lucy	S. D'Odorico
D. Baade	R.H. Warmels

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Change at the ESO Schmidt Telescope

After a period of nearly 20 years in charge of the ESO Schmidt telescope, and after the successful completion of the taking of plates for the ESO Southern Surveys, *Hans-Emil Schuster* will hand over the reins to *Bo Reipurth*, staff astronomer at La Silla. Dr. Reipurth will take up his new operational responsibilities as of January 1, 1991, so please direct all Schmidt-related questions, enquiries, etc. to him after this date.

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Interestingly, in terms of atmospheric stability La Silla was found to be better than previously thought, with a measured median "seeing" of 0.76 arcsec. Paranal is better with a mean of 0.66 arcseconds, but of even greater importance is the fact that the number of clear nights of exceptional quality (seeing better than 0.5 arcsecond) is about 2.4 times higher on Paranal (16% of all nights) than on La Silla (7%).

The atmospheric conditions on Paranal will allow the VLT to take full advantage of its unique imaging and spectroscopic capabilities so that fainter and more distant objects can be observed than with any other telescope in the world. Moreover, when the VLT is supported by "adaptive optics", it will produce images that are almost as sharp as if it were in space. In the "interferometric" mode, when the light from the four 8.2-m telescopes is combined coherently (in the same phase), the resolving power of the VLT is further increased, so that even finer details can be seen. Under optimal circumstances, it should be possible to achieve a resolution of 0.0005 arcseconds. This would correspond to imaging 1 metre objects on the surface of the Moon.

Because of the extremely low atmospheric water vapour content in the Paranal region, probably the driest area on the surface of the Earth, this site is also highly suited for astronomical observations in the infrared and submillimetre wavelength regions.

The decision to place the VLT Observatory at Paranal implies that some years from now ESO will operate two, geographically separate observatories in Chile. In order to ensure the optimal functioning of both units, it will be necessary to adjust ESO's set-up in Chile.

The efficient running of the La Silla Observatory, on which so many European astronomers are dependent, will of course continue to have high priority, but it is expected that a certain streamlining will have to be made of the operations there.

The next step in the VLT programme will be to decide about the exact configuration of the four 8.2-metre telescopes and their enclosures. Several major contracts will be signed with European industry during the coming year, for instance for the construction of the mechanical structure of the giant telescopes and also the buildings which will be erected on Paranal. *The Editor*

In its session on December 4, 1990, Council elected Professor Franco Pacini (Florence) as new President and Mr. Henrik Grage (Copenhagen) as Vice-President.