

**Central Bureau for Astronomical Telegrams
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COMET 1995 S1

Word has been received from Japan of the independent visual discoveries by Yuji Nakamura, Masaaki Tanaka, and Shougo Utsunomiya of a comet, with the following information available:

1995	UT	α_{2000}	δ_{2000}	m_1	Observer
	Sept.17.792	9 ^h 03. ^m 5	- 2°28'	7.0	Nakamura
	17.802	9 03	- 2 30	7	Utsunomiya
	17.80635	9 03.4	- 2 27		Tanaka

Y. Nakamura (Suzuka, Mie). 20×120 binoculars. Comet diffuse; coma diameter 2'. Motion noted as 1.5 northward in 50 min. Communicated by T. Nakamura, National Astronomical Observatory, Tokyo.

S. Utsunomiya (Minamioguni, Kumamoto). 25×150 binoculars. Coma diameter 5'; central condensation present. Possible slight eastward motion in 40 min. Communicated by A. Nakamura, Kuma, Ehime.

M. Tanaka (Iwaki, Fukushima). Discovered on Sept. 17.795 with 25×150 binoculars, visual $m_1 = 7.5$, coma diameter 5', strong central condensation. Above position was from a 2-min exposure with a 0.20-m $f/1.5$ Schmidt camera (+ TP2415 film) that shows an ion tail 25' long in p.a. 260° and a dust tail 5' long in p.a. 320°. Communicated by T. Hirayama, National Astronomical Observatory, Tokyo.

COMET 6P/D'ARREST

M. J. Mumma, Goddard Space Flight Center (GSFC), NASA; M. A. DiSanti, Universities Space Research Association and GSFC; and X. Xie, National Academy of Sciences, National Research Council, and GSFC, report the detection of water vapor in 6P/d'Arrest using the NASA Infrared Telescope Facility (+ CSHELL) with the comet at $r = 1.42$ AU and $\Delta = 0.47$ AU: "The 202-303 ortho rotational line (5083.93 cm^{-1} , rest) of the 111-100 vibrational hot-band was detected in emission on Sept. 5 and 6 UT at the correct doppler-shifted frequency (5083.81 cm^{-1}) and with the expected intensity. A fluorescence model based on solar pumping in the 000-111 vibrational band, and assuming a rotational temperature of 50 K, leads to a water-production rate of 8×10^{27} molecules/s on Sept. 5.5."

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COMET 1995 S1

The following additional approximate positions have been reported:

1995 UT	α_{2000}	δ_{2000}	m_1	Observer
Sept. 18.50	9 ^h 07 ^m	-1°57'	6.5	Morris
18.517	9 06.1	-1 46	6	Machholz

C. S. Morris (Whitaker Peak, CA). 20×80 binoculars. Very approximate position. Comet strongly condensed, coma diameter ~ 4'; extremely faint tails 70' and 45' long in p.a. ~ 295° and 5°, respectively.

D. E. Machholz (Colfax, CA). Independent discovery with 27×120 binoculars; coma diameter ~ 10'.

COMET 6P/D'ARREST

M. Fomenkova, University of California, San Diego; and M. J. Mumma, Goddard Space Flight Center, NASA, write: "We obtained infrared images and spectra with the NASA Infrared Telescope Facility (+ NSFCAM) on Aug. 29–Sept. 1 UT. On Sept. 1.5, the fluxes (measured in $W m^{-2} \mu m^{-1}$) through *J*, *K*, and *L* filters in a box of size 1".2 × 1".2 centered on the nucleus were: *J*, 6.8×10^{-15} ; *K*, 1.3×10^{-15} ; *L*, 3.6×10^{-15} . On Aug. 31, low-resolution spectra (3.2–3.8 μm) were acquired using the grism and the *L* filter. The cometary spectrum is significantly redder than an F5 comparison star. The comet shows excess emission above the thermal continuum at 3.4 μm and possibly also at 3.52 μm ."

COMET C/1995 O1 (HALE-BOPP)

Fomenkova and Mumma also communicate: "We obtained infrared images of this comet (details as above) on Sept. 1.3 UT, yielding the following fluxes (in $W m^{-2} \mu m^{-1}$) in a box of size 1".2 × 1".2 centered on the nucleus: *J*, 3.5×10^{-15} ; *K*, 5.6×10^{-15} ."

COMET 58P/JACKSON-NEUJMIN

Total visual magnitude estimates: Sept. 4.39 UT, 13.5 (C. S. Morris, Pine Mountain Club, CA, 0.26-m reflector); 16.23, 13.4 (Morris); 17.24, 12.9 (A. Hale, Cloudcroft, NM, 0.41-m reflector).

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COMET 1995 S1

The following precise positions have been reported:

1995	UT	α_{2000}	δ_{2000}	m_1	Observer
Sept.18.	75576	9 ^h 06 ^m 53 ^s .95	-1°32'16".7		Garradd
	18.75986	9 06 54.76	-1 32 03.2		"
	18.76104	9 06 55.06	-1 31 58.7		"
	18.76306	9 06 55.53	-1 31 51.9		"
	18.78339	9 06 59.87	-1 30 41.1		"
	18.78407	9 07 00.00	-1 30 38.7		"
	18.78488	9 07 00.22	-1 30 45.8	7.9	Yusa
	18.79279	9 07 01.78	-1 30 19.2		"
	18.79882	9 07 03.13	-1 29 56.5		"
	18.80461	9 07 04.32	-1 29 33.1		"
	18.80859	9 07 05.20	-1 29 22.0		"
	18.80911	9 07 05.32	-1 29 20.0		Cross
	18.81219	9 07 05.99	-1 29 09.2		"
	18.81303	9 07 06.09	-1 29 06.0		Yusa
	18.81468	9 07 06.52	-1 29 00.6		Cross
	18.81927	9 07 07.49	-1 28 42.6		Seki
	18.82417	9 07 08.52	-1 28 27.1		Yoshida
	18.82660	9 07 09.11	-1 28 17.1		"
	18.82760	9 07 09.34	-1 28 14.2		Seki
	18.83200	9 07 10.32	-1 28 00.2		Nakamura
	18.83351	9 07 10.66	-1 27 54.8		"
	18.83495	9 07 10.96	-1 27 50.1		"

G. J. Garradd (Loomberah, N.S.W.). 0.25-m $f/4.1$ reflector + CCD.

T. Yusa (Kogota, Japan). $\lambda = 141^\circ 08' 66.7$ east, $\phi = +38^\circ 53' 99.4$, $h = 10$ m.
0.20-m $f/6.3$ Schmidt-Cassegrain + CCD.

K. Cross (Sendai Astronomical Observatory). 0.41-m $f/3.3$ reflector + CCD.

T. Seki (Geisei). 0.60-m $f/3.5$ reflector. 15' tail in p.a. 261° .

S. Yoshida (Wakayama). 0.25-m $f/6.3$ Schmidt-Cassegrain + CCD.

A. Nakamura (Kuma Kogen). 0.60-m $f/6.0$ Ritchey-Chrétien + CCD.

Total visual magnitude estimates: Sept. 17.824 UT, 6: (T. Seki, 0.20-m refractor; independent discovery; 5' tail in p.a. 260°); 18.82, 5.5 (Seki); 19.38, 6.4 (J. E. Bortle, Stormville, NY, 10×50 binoculars; 5' coma).

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COMET 1995 S1

The following additional precise positions are available:

1995 UT	α_{2000}	δ_{2000}	Observer
Sept. 17.80635	9 ^h 03 ^m 33.14	-2° 26' 20.9	Tanaka
19.80703	9 10 44.81	-0 31 00.9	Sugie
19.80990	9 10 45.41	-0 30 50.4	"
19.81406	9 10 46.40	-0 30 35.9	"
20.74921	9 14 19.99	+0 25 31.5	Garradd
20.75298	9 14 20.85	+0 25 45.2	"
20.75631	9 14 21.65	+0 25 57.5	"
20.76024	9 14 22.54	+0 26 12.0	"
20.76758	9 14 24.28	+0 26 39.1	"
20.79120	9 14 29.78	+0 28 04.5	"
20.79249	9 14 30.05	+0 28 10.2	"
20.79383	9 14 30.29	+0 28 13.9	"
20.80255	9 14 32.38	+0 28 38.4	Kobayashi
20.80329	9 14 32.49	+0 28 40.0	Kojima
20.80701	9 14 33.38	+0 28 54.8	Kobayashi
20.80728	9 14 33.39	+0 28 55.6	Kojima
20.81096	9 14 34.30	+0 29 09.1	Kobayashi
20.81139	9 14 34.34	+0 29 10.3	Kojima
20.81985	9 14 36.42	+0 29 41.6	Nakamura
20.82222	9 14 36.98	+0 29 50.3	"
20.82465	9 14 37.55	+0 29 58.9	"

M. Tanaka (Iwaki). 0.20-m *f*/1.5 Schmidt. Measurer M. Koishikawa. Communicated by A. Nakamura, Kuma, Ehime, Japan.

A. Sugie (Dynic Astronomical Observatory). 0.60-m *f*/5.0 reflector + CCD. Communicated by A. Nakamura.

G. J. Garradd (Loomberah, N.S.W.). 0.25-m *f*/4.1 reflector + CCD.

T. Kobayashi (Oizumi). 0.25-m *f*/4.4 reflector + CCD.

T. Kojima (YGCO Chiyoda Observatory). 0.25-m *f*/6 reflector + CCD. Kinked tail > 25' long in p.a. 265°. Communicated by A. Nakamura.

A. Nakamura (Kuma Kogen). 0.60-m *f*/6.0 Ritchey-Chrétien + CCD.

Total visual magnitude estimate by K. Černis, Vilnius, Lithuania (0.12-m refractor): Sept. 20.09 UT, 6.7.

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COMET P/1995 S1 = P/1846 D1 (DE VICO)

Preliminary orbital elements, from 39 observations Sept. 17–20, bear a striking resemblance to those of D/1846 D1 (1846 IV). Though the predictions were known to have an uncertainty of several years, R. J. Buckley [1979, *JBAA* 89(3), 260] had calculated $T = 1996$ July 3. It has not been possible to link the two apparitions, despite great effort to do so, probably because of nongravitational forces that require a longer arc of observation at the current return. The following orbital elements by the undersigned were computed from an unpublished 1846 orbit utilizing 17 observations 1846 Feb. 27–Apr. 27 (mean residual 2".9); the observations had been re-reduced recently by B. G. Marsden using the new *PPM Star Catalogue* and a computer program written by G. V. Williams. The resulting orbit was adjusted (with full perturbations) so that e in 1846 produced an orbit with $T \sim 1995$ Oct. 6, which is the value found by performing a 2-body calculation using the 1995 observations alone; the 1995-epoch elements from the 1846 observations were then differentially corrected (2-body calculation) while holding e and q fixed (and solving for T and the angles):

$$\left. \begin{array}{ll} T = 1995 \text{ Oct. } 6.026 \text{ TT} & \omega = 12.978 \\ e = 0.96274 & \Omega = 79.626 \\ q = 0.65891 \text{ AU} & i = 85.382 \end{array} \right\} 2000.0$$

$$a = 17.68245 \text{ AU} \quad n^\circ = 0.013255 \quad \mathbf{P = 74.36 \text{ years}}$$

These elements suggest $T \sim 1922$ Apr. for the comet's last (missed) return to perihelion. Crommelin (1917, *JBAA* 27, 265; 1920, *JBAA* 30, 135) suggested that the most probable T at its first predicted return was around 1921 Nov., though search ephemerides were provided for several years. Ephemeris from the above elements:

1995TT	α_{2000}	δ_{2000}	Δ	r	ϵ	β	m_1
Sept. 20	9 ^h 11 ^m .46	− 0° 19'.5	1.157	0.737	39.1	59.2	6.5
22	9 19.30	+ 1 42.4	1.129	0.720	38.9	61.1	6.3
24	9 27.80	+ 3 50.1	1.102	0.704	38.7	63.0	6.2
26	9 37.07	+ 6 03.3	1.076	0.691	38.6	64.9	6.1
28	9 47.19	+ 8 21.5	1.052	0.680	38.5	66.8	5.9
30	9 58.24	+10 43.4	1.030	0.671	38.5	68.5	5.8