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The International Comet Quarterly (*ICQ*) is a journal devoted to news and observation of comets, published by the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts. Regular issues are published 4 times per year (January, April, July, and October), with an annual *Comet Handbook* of ephemerides published normally in the first half of the year as a special fifth issue. An index to each volume normally is published in every other October issue (even-numbered years); the *ICQ* is also indexed in *Astronomy and Astrophysics Abstracts* and in *Science Abstracts Section A*.

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CALL FOR CCD OBSERVATIONS OF COMET 9P/TEMPEL

Readers are reminded of the call for CCD observations of comet 9P/Tempel put forther by the *Deep Impact* spacecraft mission team (see April 2004 issue, p. 57).

Vicente Ferreira de Assis Neto

Brazilian amateur astronomer Vicente Ferreira de Assis Neto passed away at age 68 on 2004 November 3 after a sudden heart attack. He was buried on the next day in his home town, São Franscisco de Paula, in the state of Minas Gerais, Brazil. Since the beginning of the 1960s, Vicente was an avid and excellent visual observer. His observations of comets were published in many *IAU Circulars* over the years, along with variable-star magnitude estimates. He observed visually more than one hundred comets and ranks among the most prolific Brazilian comet observers. Neto subscribed to the *ICQ* for many years, contributing many observations for publication therein. The *ICQ* archive contains 265 of his observations of long-period comets under observatory code DEA spanning 1978-2000, and 149 observations of short-period comets spanning 1982-1999. Vicente was invited to be the Primary Contact for Brazil and Latin America in the International Halley Watch Real Time Monitor Network, and he was also the Coordinator for the Comet Section of the Centro de Estudos Astronomicos de Minas Gerais (CEAMIG).

Cristovao Jacques and Daniel W. E. Green

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2003, 2004 Edgar Wilson Awards

The 2003 and 2004 Edgar Wilson Awards for the amateur discovery of comets was announced on *IAU Circulars* 8162 and 8372, respectively. The 2003 Award was split between Sebastian Florian Hönig (Dossenheim, Germany) for his visual discovery of comet C/2002 O4; Tetuo Kudo (Nishi Goshi, Kikuchi, Kumamoto, Japan) and Shigehisa Fujikawa (Oonohara, Kagawa, Japan) for their visual discoveries of C/2002 X5; and Charles Wilson Juels (Fountain Hills, AZ, U.S.A.) and Paulo R. Holvorcem, Campinas, Brazil) for their joint CCD discovery of C/2002 Y1. There were two Australian winners of the 2004 Award: Vello Tabur (Wanniassa, A.C.T.) for his CCD discovery of comet C/2003 T3, and William A. Bradfield (Yankalilla, S. Australia) for his eighteenth visual discovery (C/2004 F4). Fujikawa and Tabur also had previous comets named for them due to their visual discoveries of them. This was Fujikawa's first credited comet discovery in 20 years, Bradfield's first in nearly nine years, and Tabur's first in over six years. The Edgar Wilson Award was explained in these pages in the July 1998 issue (*ICQ* **20**, 111).

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Review of Recent Literature: Research Concerning Comets*

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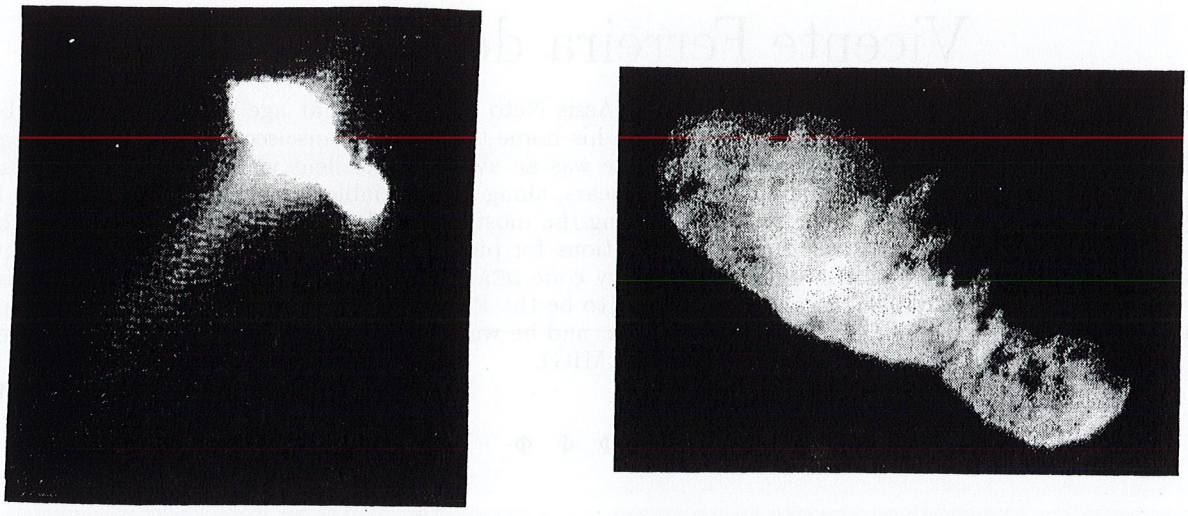
Deep Space 1's Encounter with 19P/Borrelly

The advent of NASA's "faster, better, cheaper" philosophy and the revival of small planetary missions during the 1990s have produced an increase in the *in-situ* studies of small solar-system bodies. Prior to that time, 1P/Halley was the only comet that had been closely visited by spacecraft, with five missions from three space agencies. The *International Cometary Explorer* (originally designated the *International Sun-Earth Explorer 3*) made a distant flyby of 21P/Giacobini-Zinner in September 1985 but was not designed for a comet-encounter mission. NASA's Discovery program of relatively small planetary explorers includes three comet missions. The *CONTOUR* mission to characterize the nuclei of 2P/Encke, 73P/Schwassmann-Wachmann, and a third (undetermined) target failed in August 2002 while conducting an engine burn to leave Earth orbit. The *Stardust* mission to retrieve cometary samples from the coma and tail of 81P/Wild successfully encountered the comet in January 2004 and is scheduled to return its quarry to Earth in January 2006. The *Deep Impact* mission, scheduled for launch in January 2005, will impact a projectile into the nucleus of 9P/Tempel and observe the resulting crater formation.

* This is the fourth installment of a semi-regular *ICQ* column; the last installment appeared in the January 2002 issue of the *ICQ*.



Two images of comet 19P taken by Deep Space 1 as it approached the comet on 2001 Sept. 22. Left: Enhanced image to reveal dust being ejected from the nucleus, so that the nucleus itself is over-exposed. The main dust jet (actually composed of three smaller features) is directed toward the bottom left of the frame, ≈ 35° away from the comet-sun line. The expansion of the gas/dust mixture has swept some material around the body of the nucleus to hover above the night-side hemisphere. Right: The highest-resolution image of the nucleus of 19P/Borrelly, at a level of ≈ 45 meters/pixel, taken when the spacecraft was ≈ 3400 km away. The Deep Space 1 team has derived a length of 8 km for the comet's nucleus, and the team states that "smooth, rolling plains containing brighter regions are present in the middle of the nucleus and seem to be the source of dust jets seen in the coma", adding that the rough terrain at both ends of the nucleus "contains very dark patches that appear to be elevated compared to surrounding areas" with some "grooves and apparent faults". The lower-right end of the nucleus was tipped toward the camera. Courtesy NASA/JPL.

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A fourth NASA comet mission is *Deep Space 1 (DS1)*, which flew past 19P/Borrelly in September 2001. *Deep Space 1* was the first spacecraft built under the New Millennium program, which focuses on the development and engineering of new spaceflight technology. Note that the 'Deep Space' moniker has since been changed to 'Space Technology' for future missions. A *Deep Space/Space Technology 4* mission was to orbit and study comet 9P/Tempel but has since been cancelled. Much of the science from that mission will be conducted by the *Deep Impact* mission.

Deep Space 1 was built by Spectrum Astro of Chandler, Arizona, for the Jet Propulsion Laboratory. The craft was launched on 1998 October 24 by a Delta II rocket and injected directly into solar orbit. The 486-kg spacecraft contains 12 new technologies, including autonomous navigation (the use of asteroid astrometry to pinpoint the spacecraft's location in the solar system), miniature cameras and spectrometers, low-power electronics, and the first ion-propulsion engine. After flying within 25 km of the Mars-crossing minor planet (9969) Braille in July 1999, *DS1* worked out some of its bugs and headed for a flyby of comet 19P/Borrelly on 2001 September 22. The total spacecraft cost was just under $150 million. The encounter occurred at a distance of 2171 ± 10 km from the comet's nucleus on the sunward side at a relative speed of 16.58 km/s. At the time, the comet was 1.36 AU from the sun and 8 days past perihelion. Prior to the flyby, little was known of comet 19P's nucleus, other than a rough estimate of 25-26 hours for its rotation period and a size of 4.4 ± 0.3 by 1.8 ± 0.2 km. *Deep Space 1* spacecraft and encounter information was published in McDowell (1998) and Nelson *et al.* (2004a).

In the January 2004 issue of the planetary-science journal *Icarus*, results from *DS1*'s encounter with comet 19P are presented. Soderblom *et al.* (2004a) summarizes the findings by *DS1*'s imaging package. *DS1* carried the Miniature Integrated Camera and Spectrometer instrument (MICAS). MICAS contained four channels, of which only two — the Visible-light CCD (VISCCD) imager and the Short-Wavelength Infrared (SWIR) Imaging Spectrometer — operated at the time of encounter. Comet 19P's near-nucleus coma is dominated by two strong jets; the main jet originates at the axis of rotation and is fixed in orientation. The second jet moves across the surface of the nucleus under the sub-solar point. The rotation axis is normal to the long axis of the comet. Complex rotation, which is rotation along more than one axes and common to many comets, was not observed.

Photometric observations by Buratti *et al.* (2004) determined an average geometric albedo for comet 19P's nucleus of 0.029 ± 0.006 at a wavelength of 660 nm. Approximately 95% of the surface albedo fell between 0.02 and 0.04. This is darker than the canonical 0.04 albedo value assumed for most comet nuclei, though not out of range for other comets observed from the ground. The Bond albedo, a value expressing the ratio of energy reflected by the surface to that received from the sun, is 0.009 ± 0.002, the lowest value measured in the solar system. The changing aspect ratio during the encounter allowed a phase function for the nucleus to be determined. Between 10° and 30°, the phase coefficient is 0.024 ± 0.002 magnitude per degree.

Two papers by Britt *et al.* (2004) and Oberst *et al.* (2004) analyzed the surface morphology of 19P. They found the surface dominated by four major morphological units (dark spots, mottled terrain, mesas, and smooth terrain) and four terrain features (ridges, troughs, pits, and hills). One notable exception to the imaged features and units is the lack of craters and impact structures. Though a number of quasi-circular depressions — called pits by the authors — were imaged, the conformity in their diameters and spacing suggest that they may be sublimation features. The dark spots are some of the darkest material in the solar system, with an average geometric albedo of 0.015. The spots are confined to the ends of the comet. Due to the coarse resolution of *DS1* images (the best resolution was 47 meters per pixel), it is at first uncertain whether the dark spots are areas of lower albedo or simply shadows. A study of the photometric behavior of these features by Nelson *et al.* (2004b) shows them to be low-albedo spots rather than shadows. Shadows would not display any variation in reflectance with changing phase angle, while the dark regions had similar reflectance variations with respect to those of the brighter regions. One possible explanation for the darkening is space weathering. This would mean that the dark spots are the oldest surface features and have been weathered the most, while the brighter terrain is younger in age and has not yet been darkened. Many of the remaining units and features (such as the ridges, hills, and mesas) may be related to variable sublimation rates across the surface. Areas experiencing faster sublimation would become lower in elevation, while regions experiencing little or no sublimation would remain at a constant elevation.

Near-infrared observations with the MICAS instrument presented by Soderblom *et al.* (2004b) show a steep red slope spectral reflectance from 1.3 to 2.5 microns. The near-infrared colors are among the reddest measured for comet nuclei (or for D-type asteroids, which may be related to comets). Comet 19P/Borrelly has a hot, dry surface with temperatures peaking at 345° K, which is close to that expected for an object in thermal equilibrium with incident solar radiation. The high temperature and lack of any H_2O ice suggests that more than 90% of the surface is inactive and not in a state of sublimation. A persistent 0.1-micron-wide absorption feature is visible at 2.39 microns. This feature has not been identified but may be due to nitrogen-bearing organic molecules.

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COMETS FOR THE VISUAL OBSERVER IN 2005

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Among known long-period comets, one object should become a moderately conspicuous naked-eye object during the early months of 2005, and one other may also reach marginal naked-eye visibility. Meanwhile, several short-period comets should become detectable with small visual instruments during the middle months of the year. Several fainter comets, of both long and short orbital periods, should be visible with larger visual telescopes throughout 2005.

Perihelion information (utilizing the most recently computed orbits at the time of this writing) for the comets discussed below is given in Table 1, in chronological order of perihelion passage. Ephemerides are available in the *2005 Comet Handbook* published by the *ICQ*.

Bright Long-Period Comets

C/2004 Q2 (Machholz)

This comet was visually discovered on 2004 August 27 by amateur astronomer Donald Machholz in California, his

tenth comet discovery. At that time, the comet was near total visual magnitude $m_1 \sim 11$, and it has brightened more or less "on schedule" since then — at the time of this writing (late October 2004) being near $m_1 \sim 8$.

The comet is at opposition in late November 2004 and is nearest the earth (at geocentric distance $\Delta = 0.35$ AU) in early January 2005. At that time, it is conveniently placed for observation by observers in both the southern and northern hemispheres, and if it maintains its current rate of brightening may be as bright as $m_1 \sim 4$. It then travels rapidly north, entering northern-circumpolar skies by the beginning of February and reaching $\delta \sim +85°$ in early March — still perhaps as bright as $m_1 \sim 6$. It should continue to fade slowly as it travels southward after that point, being near $m_1 \sim 10$ at the beginning of June, and perhaps near $m_1 \sim 13$ on the first anniversary of its discovery, when it will be located in the western evening sky some 4° south of the star Arcturus.

C/2003 K4 (LINEAR)

Discovered by the LINEAR program as long ago as 2003 May 28 when located at $r = 6.2$ AU, this comet reached $m_1 \sim 6.5$ in August 2004 before disappearing into evening twilight in early September. It was visible for approximately two weeks within the field of the LASCO C3 coronagraph aboard the *SOHO* spacecraft and at this writing has just begun emerging into the morning sky at $m_1 \sim 7$. It travels rapidly southward, being near $\delta \sim -60°$ at the end of 2004.

After the beginning of 2005, the comet comes back north, and should be accessible to northern-hemisphere observers by the end of January. The comet, which may be near $m_1 \sim$ 7-8 at the beginning of the year and perhaps a magnitude fainter when it becomes accessible from the northern hemisphere, should fade fairly rapidly thereafter, being at perhaps $m_1 \sim$ 11-12 when it disappears into evening twilight around early April.

C/2003 T4

Like the above comet, this object was also discovered by LINEAR when still located far from the sun ($r = 6.5$ AU, on 2003 October 13). At this writing, it is in conjunction with the sun, although well north of it (near $\delta \sim +65°$), and has recently become visually detectable at $m_1 \sim 13$.

The comet remains near solar conjunction until early 2005, eventually traveling southward into the northern hemisphere's morning sky by the latter part of January (being at perhaps $m_1 \sim$ 9-10 around that time). C/2003 T4 continues traveling southward in a steeply-inclined orbit ($i = 87°$) and remains at a fairly small elongation (40° to 45°) for the next few months. It may become as bright as $m_1 \sim 6$ when near perihelion, by which time C/2003 T4 will have become visible from the southern hemisphere and will be rapidly becoming inaccessible from the northern. The comet is closest to the earth ($\Delta = 1.08$ AU) in late April, when it will be near $\delta \sim -30°$.

After this, the comet remains in the southern hemisphere's morning sky as it recedes and fades, being at perhaps $m_1 \sim$ 9-10 during June, and dropping below the threshold of visual detectability by August or September.

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TABLE 1.
PERIHELION INFORMATION FOR POTENTIALLY VISUAL COMETS IN 2005

Designation/Name	T (TT)	q (AU)
29P/Schwassmann-Wachmann	2004 July 10.8	5.72
121P/Shoemaker-Holt	2004 Sept. 1.7	2.65
C/2003 K4 (LINEAR)	2004 Oct. 13.7	1.02
78P/Gehrels	2004 Oct. 27.1	2.01
69P/Taylor	2004 Nov. 30.6	1.94
C/2004 Q1 (Tucker)	2004 Dec. 6.9	2.05
62P/Tsuchinshan	2004 Dec. 7.9	1.49
P/2004 F3 (NEAT)	2005 Jan. 4.3	2.86
C/2004 Q2 (Machholz)	2005 Jan. 24.9	1.20
49P/Arend-Rigaux	2005 Feb. 24.6	1.37
C/2004 L1 (LINEAR)	2005 Mar. 30.1	2.05
32P/Comas Solá	2005 Apr. 1.3	1.83
C/2003 T4 (LINEAR)	2005 Apr. 3.6	0.85
161P/Hartley-IRAS	2005 June 25.6	1.28
91P/Russell	2005 June 26.8	2.60
21P/Giacobini-Zinner	2005 July 2.8	1.04
9P/Tempel	2005 July 5.3	1.51
37P/Forbes	2005 Aug. 1.8	1.57
60P/Tsuchinshan	2005 Dec. 24.1	1.77
101P/Chernykh	2005 Dec. 25.0	2.35
C/2004 B1 (LINEAR)	2006 Feb. 8.1	1.60
C/2003 WT_{42} (LINEAR)	2006 Apr. 10.8	5.19
(944) Hidalgo	2005 Jan. 21.6	1.95

Other Long-Period Comets

C/2004 Q1 (Tucker)

This object was discovered by amateur astronomer Roy Tucker in Arizona on 2004 August 23. At this writing, it is near opposition and is a relatively easy visual object of $m_1 \sim 11$. The comet should still be as bright as $m_1 \sim$ 11-12 at the beginning of 2005 and should remain visually detectable until perhaps March (at which time it will be in northern-circumpolar skies near $\delta \sim +60°$).

C/2004 L1

This comet, traveling in a strongly retrograde orbit ($i = 159°$), is at opposition in late March 2005, nearly simultaneously with perihelion passage. It should be near $m_1 \sim$ 13-14 around that time; because of the comet's declination near $\delta \sim -30°$ southern-hemisphere observers are favored.

C/2004 B1

This is another "early" LINEAR discovery, being over two years away from perihelion passage when first detected in January 2004. The comet begins to emerge from solar conjunction around July 2005, and should become visually detectable ($m_1 \sim$ 13?) within one or two months after that; because of its location south of the sun, observations will generally be restricted to the southern hemisphere. C/2004 B1 travels rapidly southward, entering southern-circumpolar skies by early October and reaching $\delta \sim -86°$ in early November. By this time, the comet may be as bright as $m_1 \sim$ 10-11 and may brighten an additional magnitude by the end of the year. Although still deep in southern skies at that time, the comet will later become well placed for observation from both hemispheres during the middle months of 2006.

C/2003 WT_{42}

Discovered as long ago as 2003 November 19 when located at $r = 8.2$ AU, this comet remains distant from both the sun and the earth throughout its apparition. It is at opposition in early February 2006, and may reach $m_1 \sim 14$ in late 2005 and early 2006; its location near $\delta \sim +50°$ will generally restrict observations to the northern hemisphere.

Brighter Short-Period Comets

62P/Tsuchinshan

The geometric circumstances at this comet's current return are moderately favorable, with opposition occurring during the latter part of March 2005. Based upon visual observations obtained at previous returns, which suggest a possible asymmetry in the light curve (although this is not yet conclusive), the comet should be near a peak brightness of $m_1 \sim$ 10-11 during the first one to two months of the year.

161P/Hartley-IRAS

This comet, with an orbital period of 21.5 years, is making its first predicted return since its discovery apparition in 1983-1984. P/1983 V1 was recently recovered and designated P/2004 V2 before receiving the permanent number 161P.

The comet travels in a steeply inclined orbit ($i = 96°$) and is presently in southern-circumpolar skies, and remains well south of the sun for the first few months of 2005. It is in conjunction of the sun near the end of March, and emerges into the morning sky in May, when it may be near $m_1 \sim 11$. It travels rapidly northward, reaching $\delta \sim +81°$ during the latter part of July. The comet should reach a peak brightness of $m_1 \sim 10$ during June and July and remain visually detectable until about September.

In 1984, the comet underwent a brief 2.5-magnitude outburst (to $m_1 \sim 7.5$) about seven weeks after perihelion. If similar activity is exhibited at this return, it could become somewhat brighter than the above prediction.

21P/Giacobini-Zinner

This comet's 2005 return is not especially favorable, but due to its rather high intrinsic brightness, it should nevertheless be easily detectable visually. It should become visually observable around April and remain so until perhaps October, with a peak brightness near $m_1 \sim 10$ being exhibited around perihelion. The comet's elongation remains near 50° (in the morning sky) throughout this period.

9P/Tempel

With this comet's orbital period being almost exactly 5.5 years, the geometric circumstances of its returns alternate between very favorable and unfavorable; the 2005 return is a favorable one, being almost identical to those of 1972, 1983, and 1994, with opposition taking place in early April. The comet should become visually observable ($m_1 \sim 13$) around February, should reach a peak brightness of $m_1 \sim$ 9-10 for one to two months around perihelion, and remain accessible to visual instruments until about September.

The *Deep Impact* spacecraft mission, currently slated for launch on 2004 December 30, will be arriving at comet 9P in early July, and it is expected to fire a 370-kg impacting projectile at the comet's nucleus on July 4. It is entirely possible that the subsurface material exposed by the impact will produce an increase in the comet's brightness, although the magnitude and duration of any such outburst cannot be predicted.

37P/Forbes

This comet also has a very favorable return in 2005, although perturbations have increased its perihelion distance by 0.13 AU over that of recent returns. It should become visually detectable by sometime in April and will be opposition near the end of May, when it should be near $m_1 \sim$ 11-12 (and at declination $\sim -41°$, so southern-hemisphere observers are favored). The comet may brighten by perhaps a half-magnitude at it approaches perihelion, and will then probably fade below the visual threshold by about October.

Other Short-Period Comets

29P/Schwassmann-Wachmann

This object has been unusually active for the past few years, being in almost a state of continuous outburst for each of the past three viewing seasons. It was at opposition in late September 2004 (and is presently in outburst at $m_1 \sim 12$ at this writing), and remains accessible in the evening sky until February 2005. After conjunction with the sun, it emerges into the morning sky during June, is at opposition in late October, and again remains in the evening sky throughout the rest of the year and for the first few months of 2006. Continuous monitoring of the comet throughout this viewing season is recommended to see if it maintains the present level of high activity.

121P/Shoemaker-Holt

The present return of this comet is essentially identical to those of 1988-1989 (discovery) and 1996-1997. It is at opposition in late February 2005, and should be near its peak brightness of $m_1 \sim 13.5$ during the first two to three months of the year.

78P/Gehrels

This comet is currently undergoing a very favorable return and at this writing is easily detectable at $m_1 \sim 12$. It is at opposition in early November 2004 and should still be near $m_1 \sim 13$ at the beginning of 2005, fading below the visual threshold within one to two months.

P/2004 F3

This comet was discovered by the NEAT program (utilizing the Haleakala telescope in Hawaii) on 2004 March 28. Visual observations obtained by this writer in May (shortly after the comet was at opposition) indicated a brightness of $m_1 \sim$ 14-14.5. The comet undergoes a second opposition in late July 2005 and, under the assumption that it exhibits a "normal" brightness behavior, may be approximately a half-magnitude brighter than at its 2004 opposition. The comet's declination near $\delta \sim -35°$ will favor observers in the southern hemisphere.

49P/Arend-Rigaux

This object, widely considered as a possible "transition object" between comet and asteroid, undergoes a moderately favorable return in early 2005. It was at opposition in early October 2004, and will be in the evening sky near an elongation of 74° when near perihelion. There is evidence from observations obtained at previous returns for an asymmetry in its light curve, and these suggest a peak brightness of $m_1 \sim 13$ taking place around perihelion and shortly thereafter. The coma size and overall activity level are likely to remain quite small.

32P/Comas Solá

This comet is at opposition in early November 2004, and should be near its peak brightness ($m_1 \sim$ 13?) between December 2004 and February 2005. It may remain visually detectable for another month or two after that as it approaches perihelion.

91P/Russell

Viewing cirmcumstances for this comet are quite favorable, with opposition taking place in early May. The comet was reported as being near $m_1 \sim 14$ during the similar return in 1990, and thus a similar peak brightness might be expected this time, although the present perihelion distance is 0.08 AU larger than it was then.

101P/Chernykh

The geometrical circumstances of this comet's 2005 return are quite similar to those at its 1977-1978 (discovery) and 1991-1992 returns, although the present perihelion distance is some 0.22 AU smaller than in 1978. The comet was widely observed at $m_1 \sim 12$ in 1977-1978 but was apparently much fainter in 1991-1992; thus any brightness predictions for the present return are quite problematical. It is at opposition in late September 2005.

There are two additional short-period comets that, theoretically, might be visually observable during 2005. Comet 69P/Taylor is normally a rather faint object but was observed at $m_1 \sim 13$ at the previous return in 1997-1998, quite possibly as a result of outburst activity. The geometrical circumstances are somewhat similar at the present return, with opposition taking place in early February 2005; at this writing, the comet has just been recovered at a relatively bright $m_1 \sim$ 16-17, suggesting that the activity exhibited in 1997-1998 may still be present. Comet 60P/Tsuchinshan has had, at best, a very spotty visual observational record at previous returns, and thus any brightness predictions are rather

problematical; the viewing conditions in late 2005 are quite favorable, however, with opposition taking place in early March 2006.

Other Objects

(944) Hidalgo

This object, discovered in October 1920, was the first known of the "cometary" asteroids, having orbital parameters ($e = 0.66$, $P = 13.8$ years) that distinctly resemble those of a comet. It has been observed at every subsequent return since its discovery, but despite careful scrutiny has to date shown no signs of any cometary activity.

Hidalgo has been under visual observation by this writer since mid-August 2004, and at this writing is near opposition and near its expected peak brightness of $m_v \sim 13$. It should still be near $m_v \sim 14$ at the beginning of 2005, and should remain visually detectable through about April; its location then in northern-circumpolar skies ($\delta \sim +61°$) will restrict observations to the northern hemisphere.

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Selection of Dark-Sky Sites for Visual Telescopic Comet Hunting: Personal Experiences*

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Abstract: *The author outlines his experiences associated with the use of country roadside sites in the visual search for new comets during 1971-2004. The impact of light pollution on his comet hunting is also discussed.*

I lived in Dernancourt, a northeastern suburb of Adelaide (the capital city of South Australia) in the period 1970-1995 inclusive, but I moved to a small country town named Yankalilla, located south-southwest of Adelaide, in January 1996. In late 1970, shortly after purchasing the telescope subsequently used for the majority of my comet discoveries, a decision was made to test the telescope away from street lights and look at some northern constellations low on the meridian. A little-used dirt track crossing a 2-km-wide block of vacant land between two outer Adelaide suburbs, located $\approx$ 6 km northeast of Dernancourt, was chosen as being suitable. A police patrol came down the track and caught sight of what appeared to them to be some strange activity. The two policemen carried out a pincer operation to apprehend the person doing something in the dark behind a vehicle. They were surprised, and possibly disappointed, to find a man looking through a telescope.

I was very pleased with my purchase and decided to start comet hunting starting 1971 January 1. On the first clear night for evening endeavor, travel was undertaken much further out into the country. A little-used road was located and a suitable spot on the verge[1] was found for placing the telescope. It was decided not to seek permission from acquaintances for entry onto their properties, as this would be an on-going chore and could cause problems when decisions to travel for evening searches were last-minute actions based on sudden clearing of cloud.

Up to about late 1973, street lights in the Adelaide suburbs were turned off at 1 a.m. (with the exception of lights at main road intersections). Thus, the early-morning sky at Dernancourt was dark, and comet hunting was carried out in my backyard beginning on 1971 January 1, resulting in the first Bradfield comet discovery in March 1972. The change-over to all-night street lighting by all local government bodies in the Adelaide metropolitan area was a gradual process from late 1973 to early 1974, but when the northeastern suburbs changed to all-night street lighting, it was necessary to travel out into the countryside for all comet-hunting activity.

The country area north of Adelaide (called the Adelaide Plains) contained several very small but widely separated towns. Their light-pollution generation was insignificant, but roadside sites were always chosen several kilometers north of any town, so that the sky near the horizon (particularly in the general-westerly direction) could be examined without light-pollution concern. One would always expect to see the zodiacal light. Over the years, I travelled in the evening further and further north of Adelaide, taking up to one hour to reach the chosen site. This action was to counter the effect of the expansion of the metropolitan area created by new outer suburbs and to obtain a darker sky, free from air pollution. The latter problem was a variable quantity, depending on the wind direction.

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* This article was kindly submitted by Mr. Bradfield at the request of the *ICQ* Editor, following the discovery of Bradfield's 18th comet (C/2004 F4) while searching for sungrazing comets. For this discovery, he received a share of the 2004 Edgar Wilson Award for amateur comet discovery. This serves as an update to his two previous articles in this journal, published in the July 1981 and Oct. 1987 issues of the *ICQ*.

[1] "on the verge" is evidently an Australian term that simply means "by the side or shoulder of the road"; thanks to Andrew Pearce for the interpretation! – Ed.

For morning activity, travel was either to the north (but far enough to avoid looking into the light pollution of the town Gawler) or into the Mt. Lofty Ranges when choosing to travel to the northeast or east. A dark sky with less travel distance was then obtained because of the light-pollution blockage given by the Ranges. However, this action was not without difficulties because there were more chances of encountering fog or low cloud, particularly in winter.

In general, roadside sites on the Adelaide Plains should be at least 1 km from main roads, so as to reduce main-traffic headlight illumination being directed towards the site. I usually carried a spade when going to a new site, to slash off tall grass or improve the standing area for the telescope. A roadside shrub or leafy tree might be a bonus if it provided a wind-break, in which case the telescope would be placed accordingly. In any case, suitable placing of the vehicle could be a help in this regard, when bushes were absent. In the initial planning of site locations, reference to a topographical 1:50,000 map of the areas under consideration was helpful. Daytime inspection of possible sites was beneficial, to establish whether the roads or tracks could be negotiated after wet weather, to see if any roadside drains posed a possible hazard, and to determine if the vehicle could be easily driven off the road and over the verge if required. Another aspect to be checked was the possible presence of dumped rubbish or discarded fencing wire!

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TABLE 1.
Information on the Last Six Bradfield Comets

Designation (Old-style)	Discovery Date (UT)	Discovery magnitude	Search hours*
C/1987 P1 (1987 XXIX = 1987s)	Aug. 11.4	10	307
C/1989 A3 (1988 XXIII = 1989c)	Jan. 6.5	12	164
C/1992 B1 (1992 VII = 1992b)	Jan. 31.7	10	299
C/1992 J2 (1992 XIII = 1992i)	May 3.8	10	30
C/1995 Q1	Aug. 17.4	6	289
C/2004 F4	Mar. 23.4	8	728

*Since previous discovery.

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Over the years, many sites were used for evening and morning operations — more than 100 in total — but some sites were only used a few times when some undesirable characteristics became evident. Some sites in the Mt. Lofty Ranges were used extensively, but I needed to be ready for rapid action if low cloud appeared. It was possible for me to place the telescope (150-mm-aperture refractor with stand and yoke) into my station wagon in two minutes and drive to a fall-back site that had slightly more light pollution — but more importantly was usually cloud-free — to continue the search, having lost only 15 minutes in total.

On another occasion (early morning), I discovered a new comet from a site much further into the Ranges. A sketch of the comet's position with respect to the field-of-view through the eyepiece had just been completed when, suddenly, total-sky low cloud cover occurred. I decided to seek out another spot that was free from cloud by driving in a direction that hopefully would provide a large break in the clouds — one that was at least sustainable for the two minutes needed to set up the telescope and see the comet field again. After driving for about 20 minutes, including several brief stops to gauge chances of seeing the field again, the effort was rewarded when a large break in cloud cover was found, and the field and comet were observed again: the comet had moved within the star field!

Travelling into the Mt. Lofty Ranges for early-morning searches sometimes presented the problem of fog in the valleys along which travel was undertaken. Apart from the need to be careful in driving, there was always the thought that the chosen site would be covered in fog: considerable relief was experienced on arriving at the site when finding that fog was absent. This was usually expected if the site was at a higher altitude.

In conducting comet hunting in the evening, numerous interruptions occurred over the years. Vehicles coming down the road with high-beam headlights illuminating the site would either pass by (in a cloud of dust in summer months) or slow down (or even stop) while the occupants made a quick survey of the scene. Those drivers who stopped were invariably local farmers, and in many cases they were the owners of the adjacent property. Their main concern, when they became aware of a station wagon and a person, was that some illegal activity was in progress. Theft of portable items from farm buildings, or maybe a battery from a tractor left in view from the roadside, were mentioned. Generally they were intrigued when told that a search for a new comet was being undertaken. One farmer wanted to look through the telescope. He was happy to be shown ω Centauri and went on his way. If that particular site was used on subsequent nights, perhaps weeks or months later, the same people who had stopped to investigate would slow down and wave.

In summer months, a popular activity undertaken by farmers was rabbit shooting. They would drive around their property or along various roads in their utility vehicles with several shooters on board, searching for rabbits with the aid of powerful spotlights. Invariably, they would pass my observing site, investigate, and move on.

Sometimes the site being used was near a large area of scrub, and the occasional appearance of a kangaroo hopping down the road towards the site would occur. On becoming aware of the stationary vehicle and some movement of a

person, the animal would pause and head off in another direction. I always wore knee-high rubber boots in case there was an accidental encounter with a snake, particularly in the summer months.

On one occasion, I discovered that a large collection of horses had been placed in a paddock near my chosen site. I was concerned when some of the younger horses came up to the fence to satisfy their curiosity and suddenly bolted off when I moved to my vehicle to refer to a chart. They raced around and I was expecting the local farmer to emerge from his house about 500 meters away to see what was happening.

Sometimes selecting a favorite evening site during a particular part of the year might need a last-minute change of site. On one evening, in travelling the last kilometer up and over a ridge, the scene presented was of several seeding vehicles all with headlights carrying out night work, moving about along parallel paths and throwing up clouds of dust.

When I moved to a house along the main street of Yankalilla, roughly 65 km (straight-line distance) from the central business area of Adelaide, the light-pollution glow of Adelaide — although visible in the low-altitude sky from the backyard — was not a major issue. The local light pollution of street lights, and the much larger quantity of light from the local sportsground just 200 meters from my back fence, was the problem. It was necessary to conduct evening comet hunting in a darker sky at least a few kilometers south of town. Some high-altitude comet hunting could be done from my backyard in the morning, when the sportsground lights were not being used, but low-altitude morning searches had to be conducted out of town because of sky blockage by trees.

In the evening, use of roadside sites was mostly free of interaction with passing motorists. For morning use of roadside sites, there was no interaction, as was the case for all activity carried out when I was living at Dernancourt — simply because there were no motorists passing the side-road sites in the early hours.

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Tabulation of Comet Observations

In the case of split comets, contributors should place the proper component letter, **in lower-case letters** (e.g., 'a', 'b', etc., *not* 'A', 'B', etc.), in column 11. Many contributors of data in full *ICQ* format know that there are problems with the space allotted for designations of comets concerning objects that have lengthy minor-planet designations (with subscripted numerals that exceed two digits), and this problem is made even worse with such objects that have split — such as P/2003 YM_{159}, a problem that was alleviated by the assignment of the new designation P/2004 V5. But if such a situation does surface where column 11 is taken up by the minor-planet-type designation, the lower-case component letter should be placed in column 1 (only in such cases where there is no room after the designation in column 11). For such cases where a minor-planet designation with three subscripted digits is coded, since only columns 10 and 11 are available for this subscripted number, column 10 must contain a letter corresponding to the first two digits of the number (i.e., the hundreds and tens digits), so that 100 = `A0`, 110 = `B0`, 125 = `C5`, etc.

Four observers who contributed only CCD photometry (not visual photometry) that was published in the July 2004 issue accidentally had their names omitted from the Key to Observers on page 134-135: `EZA`, `NAK01`, `OHS`, and `SRB` (all are listed in this issue, though Ezaki and Srba have no data in this issue).

Again, some observations contributed on paper via postal mail in recent months (several hundred observations — still constituting a few percent of the total number of observations contributed to the *ICQ*) are being delayed to the January issue, so as to get this issue to press more quickly — with apologies to the contributing observers.

New addition to the CCD camera code: `S1C` = Russian CCD camera called S1C (chip unknown) [submitted by BOR04 and BAR06].

Descriptive Information, to complement the Tabulated Data (all times UT):

See the July 2001 issue (page 98) for explanations of the abbreviations used in the descriptive information.

◇ *Comet 2P/Encke* ⟹ 2004 Sept. 13.56: $B-V$ of comp. stars were +0.68, +0.72, and +0.73 [NAK01].

◇ *Comet 29P/Schwassmann-Wachmann* ⟹ 2004 Aug. 20.70 and Oct. 17.48: `Guide 8.0` software used for comp.-star mags [OHS]. Aug. 20.70: comp. star has $B-V$ = +0.60 [OHS]. Sept. 8.59 and Oct. 12.54: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Sept. 8.62 and Oct. 6.52: `Guide 8.0` software used for comp.-star mags [TSU02]. Sept. 8.62: comp. star has $B-V$ = +0.70 [TSU02]. Sept. 11.96: starlike central cond., large diffuse outer coma [BAR06]. Sept. 15.96: starlike central cond., diffuse outer coma [BAR06]. Sept. 17.11: strongly condensed; outburst [GON05]. Sept. 18, 19, and 21: major outburst seen in a series of CCD images taken w/ 0.4-m f/6.5 L, in which the brightness of the inner coma increased by ∼ 4 mag; at least three 'porcupine-like' jets and an expanding 'helicoidal' structure were surprisingly highlighted after processing the images according to the Larson-Sekanina method [Federico Manzini, Novara, Italy]. Sept. 18.87: comet looks like slightly foggy star (outer diffuse part of coma practically is not visible) [BAR06]. Sept. 19.85: new outburst; strong, nearly stellar cond. of mag 13-13.5 [BOU]. Oct. 5.77: difficult mag estimates (comet close to star of mag 12.8; ref = HS) [BAR06]. Oct. 6.51 and 11.54: `Guide 8.0` software used for comp.-star mags [YOS02]. Oct. 6.52: comp. star has $B-V$ = +0.41 [TSU02]. Oct. 6.59: "very distinct inner coma of dia. 0′.35 indicates that this outburst is pretty new"; $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. Oct. 7.60: `Guide 7.0` software used for comp.-star mags [MIY01]. Oct. 7.88: another outburst; comet small, and strongly condensed with near-stellar central cond. of mag ∼ 13.5 [BOU]. Oct. 10.60 and 15.64: `StellaNavigator ver.6.1` software used for comp.-star mags

[NAG08]. Oct. 13.81: central cond. not at center of coma [SHU]. Oct. 16.57: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 17.48: comp. star has $B-V$ = +0.63 [OHS]. Oct. 21.58: $B-V$ of comp. stars were +0.70 and +0.75 [NAK01].

◇ *Comet 32P/Comas Solá* ⟹ 2004 Sept. 14.76: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.50 [TSU02]. Oct. 15.78: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.73 [OHS]. Oct. 16.67: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 23.69: $B-V$ of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

◇ *Comet 42P/Neujmin* ⟹ 2004 Aug. 11.59 and Sept. 8.50: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.64 [TSU02]. Oct. 6.49: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

◇ *Comet 48P/Johnson* ⟹ 2004 Aug. 11.53, Sept. 8.48, and Oct. 6.47: `Guide 8.0` software used for comp.-star mags [TSU02]. Aug. 11.53: comp. star has $B-V$ = +0.61 [TSU02]. Aug. 12.60 and Oct. 17.46: `Guide 8.0` software used for comp.-star mags [OHS]. Aug. 12.60: comp. star has $B-V$ = +0.71 [OHS]. Aug. 13.57: $B-V$ of comp. stars were +0.68, +0.72, and +0.73 [NAK01]. Sept. 8.48: comp. star has $B-V$ = +0.32 [TSU02]. Oct. 6.47: comp. star has $B-V$ = +0.51 [TSU02]. Oct. 6.48: `Guide 8.0` software used for comp.-star mags; comp. stars have $B-V$ = +0.36 and +1.09 [NAK01]. Oct. 17.46: comp. stars have $B-V$ = +0.67 and +0.50 [OHS].

◇ *Comet 49P/Arend-Rigaux* ⟹ 2004 Sept. 20: 60-sec CCD exposures w/ Uppsala Schmidt telescope at Siding Spring (Australia) shows a short tail ~ 30″ long in p.a. 290° [MCN]. Oct. 6.57: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.40 [TSU02]. Oct. 6.65: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.55 [NAK01]. Oct. 21.60: $B-V$ of comp. stars were +0.70 and +0.75 [NAK01].

◇ *Comet 53P/Van Biesbroeck* ⟹ 2004 Oct. 12.58: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01].

◇ *Comet 56P/Slaughter-Burnham* ⟹ 2004 Aug. 11.64, Sept. 8.58, and Oct. 6.50: `Guide 8.0` software used for comp.-star mags [TSU02]. Aug. 11.64: comp. star has $B-V$ = +0.43 [TSU02]. Sept. 8.58: comp. star has $B-V$ = +0.81 [TSU02]. Sept. 8.60: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Oct. 6.50: comp. star has $B-V$ = +0.39 [TSU02]. Oct. 6.56: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

◇ *Comet 65P/Gunn* ⟹ 2004 Oct. 16.61: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 17.64: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.63 [OHS].

◇ *Comet 69P/Taylor* ⟹ 2004 Oct. 23.80: $B-V$ of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

◇ *Comet 74P/Smirnova-Chernykh* ⟹ 2004 Oct. 6.53: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

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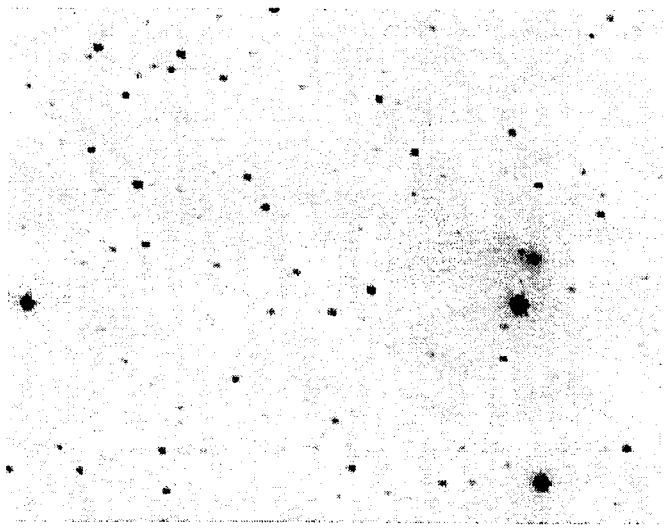

Image of comet 78P taken by Michael Jäger and G. Rhemann (near Vienna, Austria) on 2004 Oct. 7.89 UT with a SXV-H9 CCD camera and a 20-cm Schmidt camera (combination of nine 70-sec exposures). The comet is to right of center, above the bright star, with a faint tail pointing toward the left.

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◇ *Comet 78P/Gehrels* ⟹ 2004 July 16.76, Sept. 14.63, Oct. 6.63, and 15.58: `Guide 8.0` software used for comp.-star mags [TSU02]. July 16.76: comp. star has $B-V$ = +0.63 [TSU02]. Sept. 11.96: difficult obs. (comet close to star of mag 11.8) [BAR06]. Sept. 14.63: comp. star has $B-V$ = +0.41 [TSU02]. Sept. 14.78, Oct. 15.78, and 21.83: `Guide 8.0` software used for comp.-star mags [NAG04]. Sept. 15.76, Oct. 10.62, 15.65, 16.55, and 23.81: `StellaNavigator ver.6.1` software used for comp.-star mags [NAG08]. Sept. 18.93: rather bright, well-seen comet; fan-like coma [BAR06]. Sept.

21.79, Oct. 6.78, 13.80, 14.80, 17.78, 21.79, and 22.77: `Guide 7.0` software used for comp.-star mags [MIY01]. Oct. 6.57 and 11.62: `Guide 8.0` software used for comp.-star mags [YOS02]. Oct. 6.63: comp. star has $B-V = +0.70$ [TSU02]. Oct. 7.93: some interference from nearby star of mag 8.8 (TK) [BOU]. Oct. 16.73: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 17.65: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.63$ [OHS]. Oct. 18.93: very compact coma and surprisingly easy tail; at 242×, compact central cond. w/ rather high surface brightness, but without a false nucleus [KAM01].

◇ *Comet 81P/Wild* ⟹ 2004 Apr. 28.79: $B-V$ of comp. stars were +0.66, +0.68, +0.72, +0.73, +0.76, and +0.84 [NAK01].

◇ *Comet 88P/Howell* ⟹ 2004 Apr. 28.80: `Guide 8.0` software used for comp.-star mags [YOS02]. July 16.77, Sept. 14.61, and Oct. 6.61: `Guide 8.0` software used for comp.-star mags [TSU02]. July 16.77: comp. star has $B-V = +0.56$ [TSU02]. Aug. 20.74, Oct. 15.76, and 17.58: `Guide 8.0` software used for comp.-star mags [OHS]. Aug. 20.74: comp. star has $B-V = +0.84$ [OHS]. Sept. 8.64: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Sept. 14.61: comp. star has $B-V = +0.38$ [TSU02]. Oct. 6.61: comp. star has $B-V = +0.69$ [TSU02]. Oct. 15.76: comp. star has $B-V = +0.73$ [OHS]. Oct. 16.64: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 17.58: comp. star has $B-V = +0.63$ [OHS].

◇ *Comet 116P/Wild* ⟹ 2004 Sept. 13.58: $B-V$ of comp. stars were +0.68, +0.72, and +0.73 [NAK01].

◇ *Comet 119P/Parker-Hartley* ⟹ 2004 Sept. 8.64 and Oct. 6.55: `Guide 8.0` software used for comp.-star mags [TSU02]. Sept. 8.64: comp. star has $B-V = +0.63$ [TSU02]. Sept. 8.65: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Oct. 6.55: comp. star has $B-V = +0.35$ [TSU02]. Oct. 16.59: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 22.71: `Guide 8.0` software used for comp.-star mags [OHS].

◇ *Comet 120P/Mueller* ⟹ 2004 Oct. 21.63: $B-V$ of comp. stars were +0.70 and +0.75 [NAK01].

◇ *Comet 129P/Shoemaker-Levy* ⟹ 2004 Oct. 23.78: $B-V$ of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

◇ *Comet 131P/Mueller* ⟹ 2004 Sept. 8.62: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Oct. 12.57: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01].

◇ *Comet 152P/Helin-Lawrence* ⟹ 2004 Oct. 6.57: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

◇ *Comet 160P/2004 NL_{21} (LINEAR)* ⟹ 2004 Oct. 6.54: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

◇ *Comet C/1999 F1 (Catalina)* ⟹ 2004 Oct. 16.65: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01].

◇ *Comet C/2001 HT_{50} (LINEAR-NEAT)* ⟹ 2004 July 16.74, Aug. 11.65, Sept. 8.60, and Oct. 6.48: `Guide 8.0` software used for comp.-star mags [TSU02]. July 16.74 and Aug. 11.65: comp. star has $B-V = +0.46$ [TSU02]. Aug. 20.76: comp. star has $B-V = +0.60$ [OHS]. Sept. 8.58: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Sept. 8.60: fan-shaped coma toward SE; comp. star has $B-V = +0.37$ [TSU02]. Oct. 6.48: comp. star has $B-V = +0.41$ [TSU02]. Oct. 6.55: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. Oct. 17.50: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.54$ [OHS].

◇ *Comet C/2001 K5 (LINEAR)* ⟹ 2004 Oct. 13.45: $B-V$ of comp. stars were +0.51, +0.55, and +0.70 [NAK01].

◇ *Comet C/2001 Q4 (NEAT)* ⟹ 2004 Mar. 14.56: w/ 20.0-cm f/10 K (80×), coma dia. 5′, DC = 5 [HAN05]. Mar. 21.50: coma slightly elongated towards p.a. 180°; secondary reference for HD-catalogue star mags was `Cartes du Ciel V2.72` software [HAN05]. Apr. 8.47 and 19.44: secondary reference for HD and HR mags was `StarCalc V5.72` software by A. Zavalishin [HAN05]. Apr. 26.48: moderate light pollution [MAT08]. May 1.50, 2.44, 4.46, 6.46: moonlight [MAT08]. May 4.46: w/ 7×50 B, coma dia. ~ 15′ with short tail in p.a. 120° [MAT08]. May 7.40: "prior to moonrise; Milky Way interference; a beautiful view through 25×100 B, w/ star clusters M47/M46 in same field-of-view" [MAT08]. May 8.06 and 17.08: comet easily seen via naked eye [NOW]. May 8.44: adjacent to α Mon; in 7×50 B, ion tail has length > 8°; "a magnificent view through 25×100 B; excellent conditions, comet at alt. 50°; nuclear cond. appears stellar w/ a triangular-shaped dust wave forward of the core; coma appears 25′ in size and is blue-green in color; a long, faint strand of ion tail is traceable between NGC 2506 and NGC 2539 out to at least 8°; the rather faint type-II dust tail appears broad w/ slight curvature towards the S and is over 2° in length in p.a. 130°; a very faint (type-III?) dust fan spreads in p.a. 185° along the orbit of the comet" [MAT08]. May 10.40: faint tail visually; in 25×100 B, coma dia. 22′, ion tail is > 5° in p.a. 108° w/ 2° dust tail arching southward of the ion tail [MAT08]. May 20.10: comet just barely seen via naked eye [NOW]. May 23.68: fan-shaped tail spanning p.a. 100°-144°, brightest in p.a. 112°; definite point of mag ~ 10 at center of coma [COO02]. May 23.68: tail very broad [PRI04]. May 23.73: leading edge of coma parabolic in shape; tail broadening the further it gets from the coma; faint, diffuse fan trailing from the main tail and coma, 40′ long in central p.a. 138° [BEG01]. May 24.70: tail actually a broad triangular fan now; brightest portion 1°.0 long in p.a. 106°, w/ central section of tail 1°.0 long in p.a. 123°, ending 50′ in p.a. 155° [BEG01]. May 25.70: tail is a broad triangular fan extending from p.a. 92° to 158° (brightest component in p.a. 118°) [BEG01]. May 26.75: strong moonlight interference [PRI04]. May 29.70: faint, almost-stellar point in coma (but well shrouded by coma); in 10×50 B, total mag 5.2, DC =

6, no tail visible [COO02]. May 29.70: in 20.3-cm L (40×), DC = 4, dia. 3′ [VAN15]. May 31.08: unable to see comet via naked eye [NOW]. May 31.71: bright moonlight; tail very short, but still visible in binoc. [PRI04].

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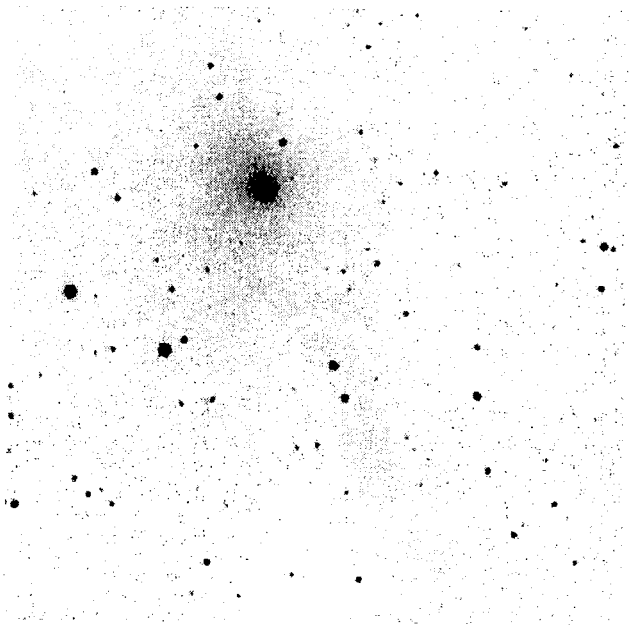

Image of comet C/2001 Q4 taken on 2004 Oct. 18.869 UT (180-sec exposure) by Martin P. Mobberley (Cockfield, U.K.) with a 35-cm f/7.7 'Celestron 14' reflector (+ ST9-XE CCD camera). North is up, and the field size is 13′ × 13′. A faint tail extends from the coma toward bottom-center, past the edge of the frame.

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June 1.97: comet's visibility inferior to that of M13; strong twilight [GRA04]. June 5.10: tail is getting faint and thin — hard to see [NOW]. June 6.70: no tail visible [COO02]. June 6.71: broad fan-like tail extending from p.a. 77° to 120° [BEG01]. June 7.71: tail very diffuse and ill-defined [BEG01]. June 8.71: no tail visible [BEG01]. July 1.49, 7.50, Aug. 19.47, Sept. 15.80, Oct. 6.80, 14.81, and 17.82: `Guide 7.0` software used for comp.-star mags [MIY01]. July 13.87: central cond. of mag 10.6 [SHU]. July 26.98: comet hard to see in nautical twilight [GRA04]. Aug. 2.50, Sept. 8.44, and Oct. 6.42: `Guide 8.0` software used for comp.-star mags [TSU02]. Aug. 2.50: comp. star has B–V = +0.52 [TSU02]. Aug. 4.47: `The Sky ver.5` software used for comp.-star mags [MIT]. Aug. 5.47, 12.47, Sept. 11.77, 15.79, Oct. 10.72, 15.63, 16.50: `StellaNavigator ver.6.1` software used for comp.-star mags [NAG08]. Aug. 5.49, 6.48, Sept. 2.47, Oct. 6.50, and 11.51: `Guide 8.0` software used for comp.-star mags [YOS02]. Aug. 6.02: only faintly visible due to thin clouds and moonlight [GRA04]. Aug. 11.86: comet close to 7th-mag star [MEY]. Aug. 12.57: `Guide 8.0` software used for comp.-star mags [NAG04]. Aug. 12.58 and Oct. 17.42: `Guide 8.0` software used for comp.-star mags [OHS]. Aug. 12.58: comp. star has B–V = +0.54 [OHS]. Aug. 14.93: appearance of comet similar to M51 (galaxy was slightly brighter) [GRA04]. Aug. 15.86: comet very close to a star of mag 8.1 (thus difficult to estimate mag of comet w/ binoc.); w/ 36-cm L (70×), total mag 9.0, dia. 5′ (brightness of outer coma is not uniform) [BAR06]. Aug. 16.83: w/ 36-cm L (70×), total mag 9.1, dia. 5′; starlike pseudo-nucleus, disk-like inner coma, fan-like outer coma [BAR06]. Aug. 18.01: faintly seen at solar alt. −12° from observing site at lat. 64° N [GRA04]. Aug. 21.96: well-condensed round coma; faint, diffuse tail w/ brightest part in p.a. 30° (but extending to p.a. ~ 0°); alt. 40° [WAR01]. Sept. 2.85: moonlight interfering; still condensed w/ starlike false nucleus of mag ~ 12.5 [KAM01]. Sept. 6.82: enhancement seen w/ a Lumicon Swan Band Filter [MEY]. Sept. 6.82: fan-like diffuse coma [BAR06]. Sept. 8.44: coma extends in p.a. 25°; comp. star has B–V = +0.60 [TSU02]. Sept. 8.81: comet close to 11th-mag star [MEY]. Sept. 8.89: w/ 30-cm T (242×), small central cond. w/ a starlike false nucleus of mag ~ 13.5 [KAM01]. Sept. 11.85: disk-like inner coma of dia. 1′.5; parabolic outer coma somewhat extended (4′.8) in anti-solar direction; tail not seen [BAR06]. Sept. 15.86: comet close to stars of mag ~ 7.5 [SCH04]. Sept. 15.95: only barely visible despite a quite dark sky [GRA04]. Sept. 17.89: at 242×, central cond. of dia. 20″; at 333×, starlike false nucleus of mag 14.0 [KAM01]. Sept. 22.99: slightly hazy [BAR06]. Oct. 4.80: at 242×, small central cond. w/ starlike false nucleus of mag 14.0 [KAM01]. Oct. 4.82: comet close to 11th-mag star [BOU]. Oct. 6.42: comp. star has B–V = +0.57 [TSU02]. Oct. 13.43: B–V of comp. stars were +0.51, +0.55, and +0.70 [NAK01]. Oct. 13.88: a small central cond. still visible at 242× [KAM01]. Oct. 14.97: difficult mag estimates — comet close to star of mag 6.3 [BAR06]. Oct. 17.42: B–V of comp. stars were +0.67 and +0.50 [OHS]. Oct. 18.91: object w/ very low surface brightness, but weak central cond. still visible; at 242×, starlike false nucleus of mag ~ 14.5 glimpsed [KAM01]. Oct. 19.81: comet close to 12th-mag star [BOU].

◇ *Comet C/2002 T7 (LINEAR)* ⟹ 2004 Feb. 12.00 and 16.01: easily seen in 7×35 B [NOW]. Apr. 23.79 and 24.78: `StellaNavigator ver.6` software used for comp.-star mags [MOM]. Apr. 27.79 and 28.78: `StellaNavigator ver.6` software used for comp.-star mags [NAG08]. Apr. 27.80 and 28.80: `Guide 8.0` software used for comp.-star mags

[YOS02]. May 7.83 and 14.83: moonlight [MAT08]. May 7.83: ι and η Cet used as comparisons [MAT08]. May 14.83 and 18.38: correction for atmospheric extinction not applied [MAT08]. May 14.83: 13° above morning horizon; "a spectacular view through 25×100 B; the coma lacks a stellar nucleus" [MAT08]. May 18.38: 15° above evening horizon; tail appears to have lost intensity since last obs. on May 14.83 [MAT08]. May 19.38: hazy conditions; similar to β Lep in magnitude [MAT08]. May 23.68: tail faint and quite narrow; in 20-cm L (89×), considerable 'spurious' outer coma of DC = 5; hint of central point of mag 11-12 [COO02]. May 23.70: very impressive spherical coma; inner two-thirds very condensed, almost like a planetary disk; outer third still bright, but more diffuse; tail slightly brighter tonight despite minor interference from the moon; w/ naked eye, total mag 2.8, dia. 20′, DC = 7 [BEG01]. May 24.72: w/ naked eye, total mag 3.0, dia. 8′, DC = 7 [BEG01]. May 25.72: comet an easy naked-eye object despite moonlight, but tail only visible in binoc.; w/ naked eye, total mag 3.5, dia. 10′, DC = 6 [BEG01]. May 26.71: w/ naked eye, total mag 3.8, dia. 10′, DC = 7; no tail visible [BEG01]. May 26.76: despite moonlight interference, the tail is still very apparent in binoc.; comet not visible to the unaided eye [PRI04]. May 29.70: in 20-cm L (89×), no sharpness to tail, but rather a 'spurious' narrow fan in general direction of p.a. ≈ 122° [COO02]. May 29.71: moonlight interference; however, the cond. appears more compact [PRI04]. June 1.69: end of astron. twilight w/ the moon at alt. 32° [PRI04]. June 4.68: rapid fading in mag over the past 24 hr [PRI04]. June 5.09: very hard to see in bright twilight (near horizon) [NOW]. June 5.70 and 6.70: "I have some doubt regarding my position angles — they seem 'out of kilter' with surrounding measurements (I checked back in my original plots, and these were definitely the values I measured, and so that is what I have reported)" [COO02]. June 8.72: distinct fading since last obs. [BEG01]. June 9.69: tail is a narrow fan in p.a. 125° [COO02]. June 14.16: CCD images show a weak 'conical-shaped' anti-tail 225″ long in p.a. 300°, which is 20″ wide but narrowing to 8″ at its end [James McGaha, Tucson, AZ]. June 14.72: short stubby tail [BEG01]. June 17.19: CCD images show a strong, straight anti-tail 331″ long in p.a. 298° and 22″ wide [James McGaha, Tucson, AZ]. July 3.68: coma diffuse and quite large, not an easy object from nearby Johannesburg; AAVSO chart X SEX used [COO02]. July 5.51: obs. prior to moonrise [PEA]. July 12.51: "diffuse and of low surface brightness; comet is getting quite difficult to observe now" [PEA].

◇ *Comet C/2002 V2 (LINEAR)* ⟹ 2004 Oct. 16.63: B–V of comp. stars were +0.60, +0.70, and +0.75 [NAK01].

◇ *Comet C/2003 E1 (NEAT)* ⟹ 2004 Apr. 28.76: B–V of comp. stars were +0.66, +0.68, +0.72, +0.73, +0.76, and +0.84 [NAK01]. Aug. 13.54: B–V of comp. stars were +0.68, +0.72, and +0.73 [NAK01].

◇ *Comet C/2003 G1 (LINEAR)* ⟹ 2004 Aug. 13.55: B–V of comp. stars were +0.68, +0.72, and +0.73 [NAK01]. Oct. 6.46: B–V of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

◇ *Comet C/2003 H3 (NEAT)* ⟹ 2004 Oct. 12.47: B–V of comp. stars were +0.68 and +0.87 [NAK01].

◇ *Comet C/2003 K4 (LINEAR)* ⟹ 2004 Apr. 27.77: `StellaNavigator ver.6` software used for comp.-star mags [NAG08]. Apr. 27.78, 28.75, Aug. 5.51, and 6.50: `Guide 8.0` software used for comp.-star mags [YOS02]. July 1.50, 7.51, 11.54, 19.54, Aug. 8.46, and 19.46: `Guide 7.0` software used for comp.-star mags [MIY01]. July 5.56: obs. w/ the moon just above the E horizon; "comet alt. only 12°, and therefore clearly I'm not seeing the coma size as observed in the N hemisphere currently, where it is at the zenith" [PEA]. July 13.73: large coma; tail broad and stubby [BEG01]. July 16.5, Aug. 2.46, 7.50, 9.48, 11.46: `Guide 8.0` software used for comp.-star mags [TSU02]. July 16.54: comp. star has B–V = +0.55 [TSU02]. July 16.98: faintly visible (a much more difficult object than M13); nautical twilight [GRA04]. July 17.72: very good conditions; coma seems slightly smaller and the central cond. appears slightly displaced in the sunward direction [BEG01]. July 18.73: tail faint, diffuse and broad — difficult to see without averted vision [BEG01]. July 30.50, Aug. 5.48, 12.48, and 12.49: `StellaNavigator ver.6.1` software used for comp.-star mags [NAG08]. Aug. 2.46: comp. star has B–V = +0.51 [TSU02]. Aug. 2.92, 4.92, and 5.98: comp. stars have V = 6.23 (B–V = +0.18) and V = 6.96 (B–V = +0.43) [AMO01]. Aug. 3.90: clouds interfering [SOU01]. Aug. 4.48: `The Sky ver.5` software used for comp.-star mags [MIT]. Aug. 4.91: double tail spanning p.a. 75°-105° [GON05]. Aug. 4.92 and 5.98: interference from fog [AMO01]. Aug. 7.94: diffuse coma; low alt. [GRA04]. Aug. 8.89: w/ 30-cm T (75×), faint tail ~ 0°.1 long towards p.a. 85°; at 242×, starlike false nucleus of mag 11.5 [KAM01]. Aug. 8.93: comp. stars have V = 5.95 (B–V = +0.49) and V = 6.45 (B–V = +0.25) [AMO01]. Aug. 9.48: comp. star has B–V = +0.47 [TSU02]. Aug. 10.94, 11.91, 12.94, and 15.90: comp. stars have V = 6.45 (B–V = +0.25) and 6.96 (B–V = +0.43) [AMO01]. Aug. 11.46: comp. star has B–V = +0.53 [TSU02]. Aug. 11.85: faint outer halo [MEY]. Aug. 11.93: faint, more difficult to see than M3; low alt. [GRA04]. Aug. 12.54: `Guide 8.0` software used for comp.-star mags; also 10′ tail in p.a. 80° and 9′ tail in p.a. 110°-140° [NAG04]. Aug. 12.90: double tail spanning p.a. 75°-105° [GON05]. Aug. 14.91: a rather large object of fairly low surface brightness; obs. at low alt. (≈ 8°); visibility significantly improved as solar alt. changed from −12° to −14° [GRA04]. Aug. 16.82: w/ 36-cm L (70×), 'parabolic' tail 50′ long in p.a. 84° [BAR06]. Aug. 19.91: double tail spanning p.a. 65°-90° [GON05]. Aug. 21.85: tail faint, mainly due to low alt. and some twilight, but length and p.a. confirmed in 25×100 B [BOU]. Aug. 23.88: seen for only a few minutes before setting below local horizon [GRA04]. Sept. 2.91: poor conditions [SOU01]. Sept. 9.91: comet low (alt. ~ 10°), hard to see [SOU01]. Oct. 26.30: comp. stars have V = 7.14 (B–V = +0.46) and 7.88 (B–V = +0.27) [AMO01].

◇ *Comet C/2003 O1 (LINEAR)* ⟹ 2004 Apr. 28.75: B–V of comp. stars were +0.66, +0.68, +0.72, +0.73, +0.76, and +0.84 [NAK01]. Aug. 16.51: B–V of comp. stars were +0.68, +0.72, and +0.73 [NAK01].

◇ *Comet C/2003 S3 (LINEAR)* ⟹ 2004 Oct. 16.69: B–V of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 23.70: B–V of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

◇ *Comet C/2003 T3 (Tabur)* ⟹ 2004 July 16.79 and Sept. 14.83: `Guide 8.0` software used for comp.-star mags

[TSU02]. July 16.79: comp. star has $B-V = +0.52$ [TSU02]. Aug. 16.91, 17.91, and Sept. 12.07: coma elongated [BAR06]. Sept. 14.83: possible faint tail to N; comp. star has $B-V = +0.44$ [TSU02]. Oct. 17.74: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.63$ [OHS].

◇ *Comet C/2003 T4 (LINEAR)* ⟹ 2004 Aug. 19.94: small, faint nebulosity observed at calc. position (orbital elements from *MPC* 52315 for epoch 2004 July 14 used for search ephemeris); DSS image shows no interfering stars or nebulae near calculated position [BOU]. Sept. 8.88: difficult obs.; slight motion suspected after ∼ 30 min [BOU]. Sept. 14.80: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.62$ [TSU02].

◇ *Comet C/2003 WT_{42} (LINEAR)* ⟹ 2004 Oct. 23.75: $B-V$ of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

◇ *Comet C/2004 B1 (LINEAR)* ⟹ 2004 Oct. 23.77: $B-V$ of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

◇ *Comet C/2004 D1 (NEAT)* ⟹ 2004 Oct. 23.74: $B-V$ of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

◇ *Comet C/2004 DZ_{61} (Catalina-LINEAR)* ⟹ 2004 Oct. 6.43: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

◇ *Comet C/2004 F2 (LINEAR)* ⟹ 2004 Apr. 28.72: $B-V$ of comp. stars were +0.66, +0.68, +0.72, +0.73, +0.76, and +0.84 [NAK01].

◇ *Comet P/2004 F3 (NEAT)* ⟹ 2004 Apr. 25.68: `Guide 8.0` software used for comp.-star mags; $B-V$ of comp. stars were +0.57 and +0.61 [OHS]. Aug. 2.47: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.50$ [TSU02]. Aug. 13.46: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.63$ [NAK01].

◇ *Comet C/2004 F4 (Bradfield)* ⟹ 2004 Apr. 24.79 and 28.77: `StellaNavigator ver.6` software used for comp.-star mags [MOM]. Apr. 27.78, 28.78, and 29.78: `StellaNavigator ver.6` software used for comp.-star mags [NAG08]. Apr. 27.81 and 28.79: `Guide 8.0` software used for comp.-star mags [YOS02]. Apr. 28.78: `The Sky ver.5` software used for comp.-star mags [MIT]. May 12.33: tail very thin and straight; "not seen in 7×35 B" [NOW]. May 17.28: "comet is just a very thin, faint needle of light" [NOW].

◇ *Comet P/2004 H2 (Larsen)* ⟹ 2004 Apr. 28.70: $B-V$ of comp. stars were +0.66, +0.68, +0.72, +0.73, +0.76, and +0.84 [NAK01].

◇ *Comet P/2004 H3 (Larsen)* ⟹ 2004 Apr. 28.68: $B-V$ of comp. stars were +0.66, +0.68, +0.72, +0.73, +0.76, and +0.84 [NAK01].

◇ *Comet C/2004 H6 (SWAN)* ⟹ 2004 May 14.39: visual confirmation of comet observed in SWAN images on Apr. 29, May 2, 5, 8, and 10; at 2° alt. in the evening sky; moderate enhancement w/ a Swan-band filter; position estimated with an uncertainty of 5′ [MAT08]. May 20.84: at 4° alt. in the morning sky; strong enhancement w/ a Swan-band filter; coma appears strongly condensed, but no stellar nucleus is visible (28-cm T) — a uniformly bright disk 3′ across (strongly enhanced w/ a Swan-band filter, suggesting a very gassy comet); the comet's "rapid rise into prominence on SWAN data between Apr. 29 and May 10 from mag ≈ 10 to 8 would seem to indicate a possible outburst at perihelion; this would explain why it was not picked up earlier by the surveys and why it has now faded into obscurity" [MAT08]. May 21.84: a CCD image reveals an ion tail > 8′ long in p.a. 187° [MAT08]. May 29.15: in 20-cm L (100×), a hint of an anti-tail is visible, ≈ 5′ long in p.a. 20° — brighter than the main tail; comet barely visible in 7×40 B [VAN15]. May 31.15: low alt. and hazy sky; small coma, but sharp intensity gradient towards center [COO02]. June 1.15: onset of twilight [VAN15]. June 2.14: in 40-cm T (101×), coma appears as a circular puff of light, w/ a small brightish core; at 290×, this core disappears and the coma appears as a compact haze moving to a soft outer coma; a short possible tail or extension of the coma, of length ∼ 3′.5 in p.a. ∼ 200°; obs. difficult due to alt. [STR03]. June 7.84: moonlight [MAT08]. July 13.03: comet seems larger, but much fainter than when last obs. [VAN15]. July 16.11: comet seems irregular in shape, and central coma exhibits a mottled appearance [VAN15]. July 16.72, Aug. 2.61, and 11.61: `Guide 8.0` software used for comp.-star mags [TSU02]. July 16.72: comp. star has $B-V = +0.43$ [TSU02]. July 17.60: comet has grown considerably more diffuse since last obs.; a large coma w/ very little brightening towards the center [MAT08]. July 17.85: large and diffuse object of relatively high surface brightness — easy to see in a dark sky [PEA]. Aug. 2.61: comp. star has $B-V = +0.34$ [TSU02]. Aug. 7.49: considerably diffuse; rapid fading apparent; star of mag 5.7 located 6′ west of comet [MAT08]. Aug. 8.91: very diffuse — just a faint glow [BOU]. Aug. 11.61: comp. star has $B-V = +0.57$ [TSU02]. Aug. 15.88, 16.95 and 17.93: rather large, absolutely diffuse coma [BAR06]. Aug. 16.57: $B-V$ of comp. stars were +0.68, +0.72, and +0.73 [NAK01]. Aug. 19.92: extremely vague object, but seen at correct location near star of mag 11.5 [BOU]. Aug. 21: CCD image indicated that the nuclear cond. had faded to mag 17, but no evidence of fragmentation [MAT08].

◇ *Comet C/2004 HC_{18} (LINEAR)* ⟹ 2004 Aug. 13.50 and Sept. 13.47: $B-V$ of comp. stars were +0.68, +0.72, and +0.73 [NAK01]. Oct. 12.44: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01].

◇ *Comet C/2004 K1 (Catalina)* ⟹ 2004 Aug. 16.55: $B-V$ of comp. stars were +0.68, +0.72, and +0.73 [NAK01].

◇ *Comet P/2004 K2 (McNaught)* ⟹ 2004 Oct. 16.72: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01].

◇ *Comet C/2004 L1 (LINEAR)* ⟹ 2004 Aug. 13.47: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.63$ [NAK01].

◇ *Comet C/2004 P1 (NEAT)* ⟹ 2004 Sept. 8.57: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Oct. 6.51: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. Oct. 13.47: $B-V$ of comp. stars were +0.51, +0.55, and +0.70 [NAK01].

◇ *Comet C/2004 Q1 (Tucker)* ⟹ 2004 Aug. 29.49: w/ 35-cm $f/11$ T + CCD, coma dia. ≈ 15″; "the comet's tail, which had been quite distinct on the discovery images [Aug. 23.46, when it showed a coma of dia. ~ 50″ and a 70″ tail in p.a. 230°], is now not much more than a bulge in the coma" in p.a. 255°, extending 25″ from the coma's center; "there appears to be another slight bulge in the coma" extending ≈ 20″ from the coma center in p.a. 45° — "as if the tail is pointing almost directly away from the earth"; red mag 14.7 estimated [Roy A. Tucker, Tucson, AZ]. Sept. 8.64: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Sept. 8.66, Oct. 6.51, 6.59, and 15.60: `Guide 8.0` software used for comp.-star mags [TSU02]. Sept. 8.66: comp. star has $B-V = +0.54$ [TSU02]. Sept. 8.95: some interference from nearby star of mag 5.9, but comet well visible [BOU]. Sept. 14.69, Oct. 15.75, and 21.76: `Guide 8.0` software used for comp.-star mags [NAG04]. Sept. 15.77, Oct. 10.61, 15.66, 16.53, and 23.78: `StellaNavigator ver.6.1` software used for comp.-star mags [NAG08]. Sept. 15.79, 16.79, 17.78, 21.79, Oct. 6.77, 7.59, 13.79, 14.79, 17.77, and 22.76: `Guide 7.0` software used for comp.-star mags [MIY01]. Sept. 23.01: slightly hazy [BAR06]. Sept. 24.85: bright and large object [PEA]. Oct. 5.90: at 242×, starlike false nucleus of mag 14.0 [KAM01]. Oct. 5.99: difficult obs. (comet close to star of mag 11.8) [BAR06]. Oct. 6.53 and 11.60: `Guide 8.0` software used for comp.-star mags [YOS02]. Oct. 6.59: comp. star has $B-V = +0.42$ [TSU02]. Oct. 6.66: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. Oct. 7.87: some interference from β Ari, 10′ away, but star was kept just outside field-of-view [BOU]. Oct. 10.53: `MegaStar ver.5.0` software used for comp.-star mags [MUR02]. Oct. 13.93: considerably brighter than a week ago; easy object w/ a rather small, strongly condensed coma; at 242×, small inner coma within which a false nucleus of mag 13.5 was easily discernible [KAM01]. Oct. 16.61: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 17.68: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.63$ [OHS]. Oct. 18.89: at 242×, small inner coma w/ a starlike false nucleus of mag 13.5-14.0 [KAM01].

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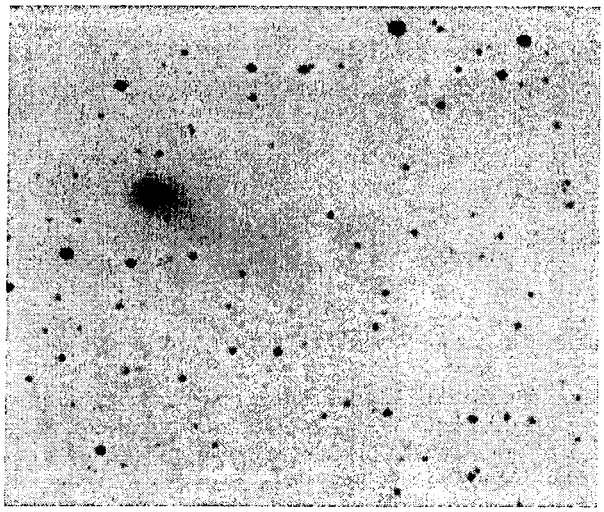

Image of comet C/2004 Q2 taken by Jäger and Rhemann on 2004 Sept. 14.10 UT with the 20-cm f/1.5 Schmidt camera (+ SXV-H9 CCD). Five 100-sec exposures. The coma diameter was estimated by Jäger as 6′-7′, and the tail 15′-20′ long in p.a. 220°.

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◇ *Comet C/2004 Q2 (Machholz)* ⟹ 2004 Aug. 28.16: obs. from Alto del Castro (elev. 1720 m), Leon, Spain; zodiacal light near the ecliptic plane; comet's alt. 17°; motion evident after 1 hr; nuclear cond. w/ mag 14.5 [GON05]. Aug. 30.88: bright moonlight; moderately condensed object [PEA]. Sept. 9.79: moonless sky; moderately condensed object of high surface brightness [PEA]. Sept. 10.86: very prominent central cond.; coma elongated w/ possible 5′-long tail in p.a. 255° [PEA]. Sept. 11.79, 15.78, Oct. 10.76, 15.68, and 23.82: `StellaNavigator ver.6.1` software used for comp.-star mags [NAG08]. Sept. 12.08 and 16.06: coma elongated in anti-solar direction (p.a. 271°) [BAR06]. Sept. 12.85: hurried obs. through clouds; comet located very close to an 11th-mag star [PEA]. Sept. 13.76, 14.80, and Oct. 11.71: `Guide 8.0` software used for comp.-star mags [YOS02]. Sept. 14.73, Oct. 15.82, and 21.80: `Guide 8.0` software used for comp.-star mags [NAG04]. Sept. 14.78, Oct. 6.72, and 15.72: `Guide 8.0` software used for comp.-star mags [TSU02]. Sept. 14.78: comp. star has $B-V = +0.63$ [TSU02]. Sept. 15.78, 16.78, 18.79, 21.78, 30.78, Oct. 6.79, 13.79, 14.73, 17.76, and 22.75: `Guide 7.0` software used for comp.-star mags [MIY01]. Sept. 16.13: low alt. (10°); some interference from nearby star of mag 5.7 [BOU]. Sept. 16.14: comp. stars have $V = 9.61$ ($B-V = +0.39$) and $V = 9.93$ ($B-V = +0.56$) [AMO01]. Sept. 16.60: fainter when viewed through Swan-Band filter [SEA]. Sept. 24.87: bright and condensed object w/ extended

coma, as easily seen in binoc. [PEA]. Oct. 5.55: w/ 25×100 B, little change (though possibly slightly fainter) through Swan-band filter [SEA]. Oct. 6.72: comp. star has $B-V = +0.53$ [TSU02]. Oct. 7.10 and 8.07: comp. stars have $V = 9.17$ ($B-V = +0.52$) and $V = 9.59$ ($B-V = +0.48$) [AMO01]. Oct. 11.17: comet close to star of mag 8.7 [BUS01]. Oct. 12.12: comet obs. at alt. 9° [BOU]. Oct. 14.16: also a tail in of length $\geq 2'$ in p.a. 270° [BUS01]. Oct. 16.76: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 17.72: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.63$ [OHS]. Oct. 20.11 and 21.17: comp. stars have $V = 8.29$ ($B-V = +0.31$) and $V = 8.52$ ($B-V = +0.09$) [AMO01]. Oct. 25.34: poor conditions [ROB06]. Oct. 26.11, 28.10, and 29.05: comp. stars have $V = 7.61$ ($B-V = +0.84$) and $V = 8.29$ ($B-V = +0.31$) [AMO01]. Oct. 26.11 and 29.05: moonlight [AMO01]. Oct. 28.10: during lunar-eclipse totality [AMO01].

◇ *Comet P/2004 R1 (McNaught)* ⟹ 2004 Sept. 13.46: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.56$ [NAK01].

◇ *Comet C/2004 R2 (ASAS)* ⟹ 2004 Sept. 10.86: comet located in rich star field; 10th-mag star situated within the coma, which made the estimate more difficult; coma of high surface brightness; however, there is no evidence of pronounced central cond. [PEA]. Sept. 11.81: `StellaNavigator ver.6.1` software used for comp.-star mags [NAG08]. Sept. 11.85: "this comet appears to be brightening rapidly; it was clearly much brighter than previous morning's obs.; impressive sight against a rich Milky Way background" [PEA]. Sept. 12.86: hurried obs. through clouds; comet located very close to a 12th-mag star [PEA]. Sept. 15.66: somewhat enhanced through Swan Band filter [SEA]. Sept. 16.32: comp. stars have $V = 8.07$ ($B-V = +0.40$) and $V = 8.87$ ($B-V = +0.49$); clouds interfering [AMO01]. Sept. 16.68: comet much more condensed than even 24 hr ago, but no brighter (in fact, possibly fainter overall, as the estimate suggests); coma elongated [RAE]. Sept. 16.87: "this comet has brightened rapidly over the last 4 days and has become more condensed; under higher power, a central cond. is clearly seen" [PEA]. Sept. 20.76: "little, if any, brighter through Swan Band filter; comet close to star" [SEA]. Sept. 24.86: "bright and strongly condensed, although the rate of brightening seems to have slowed" [PEA]. Oct. 17.39: CCD image taken w/ 0.25-m $f/5.0$ L did not show the comet to limiting mag 14.5 in a 10′ × 10′ field (*MPEC* orbit used that predicted the SOHO positions Oct. 7–9 to within 1′, according to Syuichi Nakano) [KAD02].

◇ *Comet P/2004 R3 (LINEAR-NEAT)* ⟹ 2004 Oct. 6.61: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. Oct. 12.56: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Oct. 21.59: $B-V$ of comp. stars were +0.70 and +0.75 [NAK01].

◇ *Comet C/2004 S1 (Van Ness)* ⟹ 2004 Oct. 6.63: $B-V$ of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. Oct. 8.97: difficult object, being very diffuse; rapid motion evident over half-hour period [BOU]. Oct. 12.53: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01].

◇ *Comet P/2004 T1 (LINEAR-NEAT)* ⟹ 2004 Oct. 12.59: $B-V$ of comp. stars were +0.68 and +0.87 [NAK01]. Oct. 16.58: $B-V$ of comp. stars were +0.60, +0.70, and +0.75 [NAK01]. Oct. 17.55: `Guide 8.0` software used for comp.-star mags; comp. stars have $B-V = +0.63$ and +0.54 [OHS].

◇ *Comet C/2004 U1 (LINEAR)* ⟹ 2004 Oct. 23.82: $B-V$ of comp. stars were +0.45, +0.59, +0.62, +0.63, +0.67, +0.83, and +0.85 [NAK01].

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Key to observers with observations published in this issue, *with 2-digit numbers between Observer Code and Observer's Name indicating source [07 = Comet Section, British Astronomical Association; 11 = Dutch Comet Section (Werkgroep Kometen); 16 = Japanese observers (via Akimasa Nakamura, Kuma, Japan); 35 = South American observers (c/o Jose G. de Souza Aguiar, Brazil); 42 = Belarus observers (c/o V. S. Nevski and S. E. Shurpakov, Vitebsk); 48 = Ukrainian observers (c/o Denis A. Svechkarev); etc.]:*

ADA02 18 Jacek Adamik, Poland
ADD Gerardo Addiego, Uruguay
AMO01 35 Alexandre Amorim, Brazil
ARA 35 Wesley Araujo, Salvador, Brazil
BAN01 18 Robert Bankowski, Sanok, Poland
BAR06 37 Alexandr R. Baransky, Ukraine
BEG01 15 Mike Begbie, Harare, Zimbabwe
BOH02 18 Jerzy Bohusz, Gdynia, Poland
BOR04 37 Sergiy A. Borysenko, Ukraine
BOU Reinder J. Bouma, Netherlands
BUR04 18 Wojciech Burzynski, Poland
BUS01 11 E. P. Bus, The Netherlands
CHE03 33 K. T. Cernis, Moletai, Lithuania
CHR 18 Antoni Chrapek, Pikulice, Poland
COM 11 Georg Comello, The Netherlands
COO02 Tim P. Cooper, South Africa
DES01 Jose G. de Souza Aguiar, Brazil
DIE02 Alfons Diepvens, Belgium
DIJ Edwin van Dijk, The Netherlands
DOR02 18 Dariusz Dorosz, Poland
EZA 16 Yuusuke Ezaki, Osaka, Japan
FIL04 18 Marcin Filipek, Poland
GIA01 A. Giambersio, Potenza, Italy
GON05 J. J. Gonzalez, Asturias, Spain
GRA04 24 Bjoern Haakon Granslo, Norway
GRA09 18 K. Graczewski, Izabelin, Poland
GRI01 42 Igor B. Grinevich, Russia
*HAN05 Robert Hancock, South Australia

HAS02		Werner Hasubick, Germany
HOE		Sebastian F. Hoenig, Germany
JAN06	18	P. Januszkiewicz, Lodz, Poland
JAR01	18	M. Jarski, Niezabitow, Poland
JAR02	18	Maciej Jarmoc, Bialystok, Poland
KAD02	16	K. Kadota, Ageo, Saitama, Japan
KAM01		A. Kammerer, Ettlingen, Germany
KID01	18	Krzysztof Kida, Elblag, Poland
KIE	18	Grzegorz Kieltyka, Poland
KIS03	18	Adam Kisielewicz, Poland
*KOV01	37	Mychailo Kovzikov, Ukraine
KOZ02	42	Alexandr Kozlovski, Russia
KUS01	18	Michal Kusiak, Zywiec, Poland
KWI	18	Maciej Kwinta, Krakow, Poland
LAB02		C. Labordena, Castellon, Spain
LEG	18	Marian Legutko, Gliwice, Poland
LEH		Martin Lehky, Czech Republic
LIN04		Mike Linnolt, HI, U.S.A.
MAK02	18	Pawel Maksym, Lodz, Poland
MAN04		Luis A. Mansilla, Argentina
MAR02	13	Jose Carvajal Martinez, Spain
MAR12	18	Leszek Marcinek, Poland
MAR13	18	Jerzy Marcinek, Poland
MAT08		Michael Mattiazzo, S. Australia
MEY	28	Maik Meyer, Germany
MIT	16	Shigeo Mitsuma, Saitama, Japan
MIY01	16	Osamu Miyazaki, Ibaraki, Japan
MOM	16	Masahiko Momose, Nagano, Japan
MOR		Charles S. Morris, U.S.A.
MOZ	18	Dawid Mozdzierski, Poland
MUR02	16	Shigeki Murakami, Niigata, Japan
NAG04	16	Kazuro Nagashima, Nara, Japan
NAG08	16	Yoshimi Nagai, Nagano, Japan
NAK01	16	Akimasa Nakamura, Ehime, Japan
*NAZ01	37	Sergiy Nazarov, Ukraine
NEV	42	V. S. Nevski, Vitebsk, Belarus
NOW	05	Gary T. Nowak, VT, U.S.A.
OHS	16	Yuuji Ohshima, Nagano, Japan
*OZI	18	Szymon Ozimek, Oleszyce, Poland
PAC03	18	Pawel Paczkowski, Serock, Poland
PAR03	18	Mieczyslaw L. Paradowski, Poland
PEA	14	Andrew R. Pearce, Australia
PEN02	15	Gerrit Penning, S. Africa
PLE01	18	Janusz Pleszka, Poland
POW01	18	Jacek Powichrowski, Poland
PRI04	15	David Pringle-Wood, Zimbabwe
RAE		Stuart T. Rae, New Zealand
RES	18	Maciej Reszelski, Poland
RIE	11	Hermanus Rietveld, Netherlands
ROB06		Walter R. Robledo, Argentina
RZE	18	Zbigniew Rzepka, Poland
SAN04	38	Juan M. San Juan, Madrid, Spain
SCH04	11	Alex H. Scholten, Netherlands
SCI		Tomasz Sciezor, Poland
SEA	14	David A. J. Seargent, Australia
SEM02	42	Andrey S. Semenyuta, Kazakstan
SER	42	Ivan M. Sergey, Belarus
SER02		J. Serant, Chevillon, France
SHA02	07	J. D. Shanklin, Cambridge, U.K.
SHU	42	S. E. Shurpakov, Baran, Belarus
SIE	33	Henryk Sielewicz, Lithuania
SIE01	18	M. Siekierko, Michalowo, Poland
SIK01	18	M. Sikora, Lublin, Poland
SIW	18	Ryszard Siwiec, Poland
SLO01	18	W. Slotwinski, Lancut, Poland
SOU01	35	Willian C. de Souza, Brazil
SPE01	18	Jerzy Speil, Poland
SRB	23	Jiri Srba, Vsetin, Czech Rep.
STR03	15	Magda Streicher, South Africa
SWI	18	Mariusz Swietnicki, Poland
SZW	18	Grzegorz Szwed, Torun, Poland
TSU02	16	M. Tsumura, Wakayama, Japan
TUR01	18	Pawel Turek, Krakow, Poland
VAN15	15	Koos van Zyl, South Africa
WAR01		Johan Warell, Sweden
YOS02	16	Katsumi Yoshimoto, Hirao, Japan
YOS04	16	Seiichi Yoshida, Ibaraki, Japan
ZAN01	11	W. T. Zanstra, The Netherlands

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TABULATED VISUAL DATA (also format for old-style CCD data)

NOTE: As begun in the October 2001 issue, the CCD and visual tabulated data are separated. The tabulated CCD data are also now generally further separated into two "CCD" sections: the first in the old format for those observations submitted only in the old format, and the second in the new format (whose columns are described on page 208 of the July 2002 *ICQ*).

The headings for the tabulated data are as follows: "DATE (UT)" = Date and time to hundredths of a day in Universal Time; "N" = notes [* = correction to observation published in earlier issue of the *ICQ*; an exclamation mark (!) in this same location indicates that the observer has corrected his estimate in some manner for atmospheric extinction (prior to September 1992, this was the standard symbol for noting extinction correction, but following publication of the extinction paper — July 1992 *ICQ* — this symbol is only to be used to denote corrections made using procedures different from that outlined by Green 1992, *ICQ* **14**, 55-59, and in Appendix E of the *ICQ Guide to Observing Comets* — and then only for situations where the observed comet is at altitude > 10°); '&' = comet observed at altitude 20° or less with no atmospheric extinction correction applied; '$' = comet observed at altitude 10° or lower, observations corrected by the observer using procedure of Green (*ibid.*); for a correction applied by the observer using Tables Ia, Ib, or Ic of Green (*ibid.*), the letters 'a', 'w', or 's', respectively, should be used; x indicates that a secondary source (often amateur computer software) was used to get supposedly correct comparison-star magnitudes from an accepted catalogue].

"MM" = the method employed for estimating the total (visual) magnitude; see article on page 186 of the Oct. 1996 issue [B = VBM method, M = Morris method, S = VSS or In-Out method, I = in-focus, C = unfiltered CCD, c = same

as 'C', but for 'nuclear' magnitudes, V = electronic observations — usually CCD — with Johnson *V* filter, *etc.*]. "MAG." = total (visual) magnitude estimate; a colon indicates that the observation is only approximate, due to bad weather conditions, *etc.*; a left bracket ([) indicates that the comet was not seen, with an estimated limiting magnitude given (if the comet IS seen, and it is simply estimated to be fainter than a certain magnitude, a "greater-than" sign (>) must be used, not a bracket). "RF" = reference for total magnitude estimates (see pages 98-100 of the October 1992 issue, and Appendix C of the *ICQ Guide to Observing Comets*, for all of the 1- and 2-letter codes; an updated list is also maintained at the *ICQ* World Wide Website). "AP." = aperture in centimeters of the instrument used for the observations, usually given to tenths. "T" = type of instrument used for the observation (R = refractor, L = Newtonian reflector, B = binoculars, C = Cassegrain reflector, A = camera, T = Schmidt-Cassegrain reflector, S = Schmidt-Newtonian reflector, E = naked eye, *etc.*). "F/" and "PWR" are the focal ratio and power or magnification, respectively, of the instrument used for the observation — given to nearest whole integer (round even); note that for CCD observations, in place of magnification is given the exposure time in seconds [see page 11 of the January 1997 issue; a lower-case "a" indicates an exposure time under 1000 seconds, an upper-case "A" indicates an exposure time of 1000-1999 seconds (with the thousands digit replaced by the "A"), an upper-case "B" indicates an exposure time of 2000-2999 seconds (with the thousands digit replaced by the "B"), etc.].

"COMA" = estimated coma diameter in minutes of arc; an ampersand (&) indicates an approximate estimate; an exclamation mark (!) precedes a coma diameter when the comet was not seen (*i.e.*, was too faint) and where a limiting magnitude estimate is provided based on an "assumed" coma diameter (a default size of 1′ or 30″ is recommended; cf. *ICQ* **9**, 100); a plus mark (+) precedes a coma diameter when a diaphragm was used electronically, thereby specifying the diaphragm size (i.e., the coma is almost always larger than such a specified diaphragm size). "DC" = degree of condensation on a scale where 9 = stellar and 0 = diffuse (preceded by lower- and upper-case letters S and D to indicate the presence of stellar and disklike central condensations; cf. July 1995 issue, p. 90); a slash (/) indicates a value midway between the given number and the next-higher integer. "TAIL" = estimated tail length in degrees, to 0.01 degree if appropriate; again, an ampersand indicates a rough estimate. Lower-case letters between the tail length and the p.a. indicate that the tail was measured in arcmin ("m") or arcsec ("s"), *in which cases the decimal point is shifted one column to the right.* "PA" = estimated measured position angle of the tail to nearest whole integer in degrees (north = 0°, east = 90°). "OBS" = the observer who made the observation (given as a 3-letter, 2-digit code).

A complete list of the Keys to abbrevations used in the *ICQ* is available from the Editor for $4.00 postpaid (available free of charge via e-mail); these Keys (with the exception of the Observer Codes) are also available in the *Guide to Observing Comets* and via the *ICQ*'s World Wide Web site. *Please note that data in archival form, and thus the data to be sent in machine-readable form, use a format that is different from that of the Tabulated data in the printed pages of the ICQ;* see pages 59-61 of the July 1992 issue, p. 10 of the January 1995 issue, and p. 100 of the April 1996 issue for further information [note correction on page 140 of the October 1993 issue]. Further guidelines concerning reporting of data may be found on pages 59-60 of the April 1993 issue, and in the *ICQ Guide to Observing Comets.*

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NOTE: *The new-style CCD tabulated data begin on page 334 of this issue.*

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Visual Data

Comet 29P/Schwassmann-Wachmann

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 17.87	x	S	12.4	TT	20	L	4	100	1.2	2			PEA
2004 07 23.92		S	13.2	HS	30	L	5	100	0.7	2			NEV
2004 08 11.88		M	14.4	TJ	41	L	4	178	0.31	3			SHU
2004 08 13.09		S	12.8	TK	20.3	T	10	100	1	3			GON05
2004 08 15.87		S	12.8	HS	44.0	L	5	156	0.7	2			HAS02
2004 08 16.94		S	13.4	HS	36	L	6	80	1.3	2/			BAR06
2004 08 19.95		S	13.0	AU	31.0	J	6	89	1.0	3			BOU
2004 08 19.96		S	12.5	AU	31.0	J	6	89	0.8	1/			DIJ
2004 08 21.11		S	12.8	TK	20.3	T	10	100	1.5	3			GON05
2004 08 22.01		S	13.0	AU	31.0	J	6	89	1.2	2/			DIJ
2004 08 22.01		S	13.0	AU	31.0	J	6	89	1.1	2/			BOU
2004 08 26.11		S	12.8	TK	20.3	T	10	77	2	2			GON05
2004 09 08.91		S	12.8	AU	31.0	J	6	109	1.2	0/			DIJ
2004 09 08.91		S	12.9	AU	31.0	J	6	109	1.2	1/			BOU
2004 09 10.83	x	S	[12.5	TT	20	L	4	100	1!				PEA
2004 09 11.82	x	S	13.0	TT	20	L	4	100	1.2	2			PEA
2004 09 11.96		M	13.0	HS	36	L	6	80	1.5	4			BAR06
2004 09 14.97		S	12.9	AU	25.4	J	6	115	1.1	1			BOU
2004 09 15.96		I	12.4	HS	36	L	6	80	1.3	S8			BAR06

Comet 29P/Schwassmann-Wachmann [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 17.11		B	12.2	TK	20.3	T	10	160	0.5	7			GON05
2004 09 17.78		I	12.1	AU	40.0	L	4	144		8/			YOS04
2004 09 17.88		S	11.5	TK	13.0	L	7	45	0.5	6			RES
2004 09 17.93		S	12.2	TK	30	L	5	60	0.5	7			NEV
2004 09 17.99		I	12.5	HS	20	L	5	70	0.7	S7/			BAR06
2004 09 18.87		I	12.6	HS	36	L	6	80	0.9	S8			BAR06
2004 09 18.87		S	11.7	TK	13.0	L	7	45	0.5	6			RES
2004 09 19.77		M	12.4	TJ	41	L	4	89	0.8	4/			SHU
2004 09 19.85		M	12.3	AU	25.4	J	6	88	0.9	6			BOU
2004 09 19.85		S	12.4	AU	25.4	J	6	88	1.2	6/			DIJ
2004 09 24.84	x	S	12.2	TT	20	L	4	100	1.4	3			PEA
2004 10 05.77		M	12.5:	HS	36	L	6	80	1.5	3			BAR06
2004 10 06.51		M	12.6	AU	25.4	L	4	113	0.6	7/			YOS02
2004 10 07.60	x	S	11.7	HS	31.7	L	6	152	0.7	6			MIY01
2004 10 07.88		M	12.4	AU	31.0	J	6	143	0.6	7			BOU
2004 10 07.88		M	12.6	AU	31.0	J	6	143	1.2	6			DIJ
2004 10 08.87		M	12.3	AU	31.0	J	6	109	0.7	6/			BOU
2004 10 08.87		M	12.6	AU	31.0	J	6	109	1	5/			DIJ
2004 10 10.60	x	M	11.7	TJ	32.0	L	5	58	1.4	7			NAG08
2004 10 10.86		M	12.3	AU	31.0	J	6	109	1.0	6			BOU
2004 10 10.87		M	12.6	AU	31.0	J	6	109	1	5			DIJ
2004 10 11.54		M	12.1	AU	25.4	L	4	113	1.2	6			YOS02
2004 10 11.82		M	12.4	AU	25.4	J	6	115	1.1	5/			BOU
2004 10 12.82		M	12.2	AU	31.0	J	6	89	1.3	4/			BOU
2004 10 12.82		M	12.4	AU	31.0	J	6	89	0.9	4/			DIJ
2004 10 13.86		S	11.9	TK	30	L	5	60	1.2	3			NEV
2004 10 13.99		M	12.0	HS	36	L	6	80	2.0	4			BAR06
2004 10 14.97		M	12.0	HS	20	L	5	70	2	3			BAR06
2004 10 15.45		S	11.7	GA	25.4	L	4	71	2				SEA
2004 10 15.47		S	11.7	TJ	40.0	L	4	144	1.5	2			YOS04
2004 10 15.64	x	S	12.2	TJ	32.0	L	5	58	1.1	5/			NAG08
2004 10 18.90		S	12.5	AU	31.0	J	6	89	1.4	3			BOU
2004 10 18.91		S	12.6	AU	31.0	J	6	89	1.3	2			DIJ
2004 10 21.93		S	12.4	AU	31.0	J	6	89	1.6	2/			BOU

Comet 32P/Comas Solá

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 10 15.72		S	14.0	AU	40.0	L	4	144	0.9	6			YOS04

Comet 78P/Gehrels

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 11.99		S	12.5	HS	30	L	5	60	1	2			NEV
2004 08 12.94		S	13.4:	HS	36	L	6	70	1.3	2			BAR06
2004 08 13.14		S	12.8	TK	20.3	T	10	100	0.8	4			GON05
2004 08 20.01		S	12.8	AU	31.0	J	6	109	0.9	4/			BOU
2004 08 20.01		S	13.2	AU	31.0	J	6	109	0.7	3/			DIJ
2004 08 21.14		S	12.5	TK	20.3	T	10	100	1.0	3			GON05
2004 08 21.76		S	12.4	AU	40.0	L	4	144	1.1	5/			YOS04
2004 08 22.03		S	12.7	AU	31.0	J	6	109	1.0	4/			BOU
2004 08 22.03		S	12.7	AU	31.0	J	6	109	1	3			DIJ
2004 08 24.97		M	12.1	TJ	41	L	4	89	1	3/			SHU
2004 09 10.85	x	S	12.6	TT	20	L	4	45	1.2	2/			PEA
2004 09 11.84	x	S	12.7	TT	20	L	4	45	1.2	1/			PEA
2004 09 11.96		S	13.0:	HS	36	L	6	80	1.5	4			BAR06
2004 09 13.98		S	11.8	TK	30	L	5	60	1.5	3			NEV
2004 09 14.67		S	12.3	AU	25.4	L	4	113	0.7	6	1.5m	250	YOS02
2004 09 14.78	x	S	12.8	HS	30.4	L	5	100	0.75	4/			NAG04
2004 09 14.95		S	12.2	AU	25.4	J	6	88	1.2	4			BOU
2004 09 15.76	x	M	11.5	TJ	32.0	L	5	87	1.4	6/			NAG08
2004 09 16.12		S	12.2	AU	25.4	J	6	88	1.2	4			BOU
2004 09 17.02		S	12.1	TK	20.3	T	10	77	1.8	3			GON05

Comet 78P/Gehrels [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 17.70		S	11.7	AU	40.0	L	4	144	1.1	7	1.7m	240	YOS04
2004 09 17.86	x	S	12.4	TT	20	L	4	100	1.2	3			PEA
2004 09 17.93		S	12.1	TK	13.0	L	7	45	0.5	4			RES
2004 09 17.94		S	11.5	TK	30	L	5	60	1.5	4			NEV
2004 09 18.93		S	12.0	HS	36	L	6	80	2.8	3/			BAR06
2004 09 18.96		S	12.0	TK	13.0	L	7	45	0.5	4			RES
2004 09 18.99		S	11.8	TI	23.5	T	10	94	1	3			LAB02
2004 09 19.82		M	12.3	TJ	41	L	4	89	1	3/			SHU
2004 09 21.79	x	S	12.4	HS	31.7	L	6	152	0.7	6			MIY01
2004 09 24.85	x	S	11.8	TT	20	L	4	45	2.1	4			PEA
2004 10 06.57		S	11.4	AU	25.4	L	4	46	1.3	6			YOS02
2004 10 06.63	x	M	11.0	TT	12.5	L	6	60	2				TSU02
2004 10 06.78	x	S	11.5	HS	31.7	L	6	63	0.7	6			MIY01
2004 10 07.93		M	11.8	AU	31.0	J	6	109	1.5	5			BOU
2004 10 07.93		S	11.5	AU	31.0	J	6	109	1.5	4/			DIJ
2004 10 08.97		M	11.7	AU	31.0	J	6	72	1.5	4/			BOU
2004 10 08.97		S	11.4	AU	31.0	J	6	72	1.4	4			DIJ
2004 10 09.93		S	11.0:	TK	5.6	B		10	& 2.5	1/			BUS01
2004 10 10.38		M	11.4	TJ	25.6	L	4	105	1.3	3/			MOR
2004 10 10.62	x	M	11.4	TJ	32.0	L	5	58	1.8	6/			NAG08
2004 10 10.94		M	11.6	AU	31.0	J	6	72	1.7	5			BOU
2004 10 10.94		S	11.4	AU	31.0	J	6	72	1.8	4			DIJ
2004 10 11.62	x	S	11.5	TK	25.4	L	4	46	1.3	6			YOS02
2004 10 12.01		B	11.2	TI	23.5	T	10	57	2	3			LAB02
2004 10 12.01		B	11.2	TI	23.5	T	10	57	2	3			LAB02
2004 10 12.12		M	11.6	AU	31.0	J	6	72	1.6	4/			BOU
2004 10 12.95		S	11.0:	TK	5.6	B		10	& 2.5	2			BUS01
2004 10 13.80	x	S	11.0	HS	31.7	L	6	63	1.4	5/			MIY01
2004 10 13.85		S	10.7	TK	30	L	5	60	1	6	3 m	250	NEV
2004 10 13.99		S	11.0	HS	36	L	6	80	1.7	3/	0.05	260	BAR06
2004 10 14.14		S	11.0	TK	5.6	B		10	& 3	2/			BUS01
2004 10 14.80	x	S	11.2	HS	31.7	L	6	63	1.4	5/			MIY01
2004 10 14.97		S	10.9	HS	36	L	6	80	1.8	3	0.05	260	BAR06
2004 10 15.54		S	11.4	GA	25.4	L	4	71					SEA
2004 10 15.56		M	11.0	TJ	40.0	L	4	75	1.1	7	1.7m	260	YOS04
2004 10 15.58	x	M	10.1	TT	25.0	L	6	47	5	5	7 m	260	TSU02
2004 10 15.65	x	M	11.0	TJ	32.0	L	5	58	2.3	6			NAG08
2004 10 15.78	x	B	11.3	TJ	30.4	L	5	79	1.0	5			NAG04
2004 10 16.14		S	10.9	TK	5.6	B		10	& 3	2/			BUS01
2004 10 16.55	x	S	11.2	TJ	32.0	L	5	87	2.2	5/			NAG08
2004 10 16.96		B	11.0	TI	23.5	T	10	94	2	4			LAB02
2004 10 17.78	x	S	11.0	TJ	31.7	L	6	63	1.6	5/			MIY01
2004 10 18.92		M	11.3	AU	31.0	J	6	72	1.9	4/			BOU
2004 10 18.93		S	11.2	AU	31.0	J	6	72	1.9	3/			DIJ
2004 10 18.93		S	11.2	TK	30.5	T	10	75	1.0	7	0.06	270	KAM01
2004 10 21.79	x	S	11.2	TJ	31.7	L	6	63	2.1	5/			MIY01
2004 10 21.83	x	B	11.0	TJ	30.4	L	5	79	0.9	5			NAG04
2004 10 21.93		M	11.3	AU	31.0	J	6	72	2.0	5			BOU
2004 10 22.77	x	S	11.0	TJ	31.7	L	6	63	1.9	5/			MIY01
2004 10 23.14		S	10.8	TK	5.6	B		10	& 3	3			BUS01
2004 10 23.81	x	M	10.8	TJ	32.0	L	5	58	1.9	6/	4 m	260	NAG08

Comet 88P/Howell

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 04 28.80	xa	S	10.5	TK	25.4	L	4	46	2.5	4			YOS02
2004 05 19.88	x	S	10.3	TT	20	L	4	45	4.5	2			PEA
2004 07 17.86	x	S	11.4	TT	20	L	4	45	3	2			PEA
2004 08 21.77		S	14.1	AU	40.0	L	4	144	1.4	3			YOS04
2004 08 22.04		S	11.8	AU	31.0	J	6	89	2.0	1/			BOU
2004 08 22.05		S	11.3:	AU	31.0	J	6	89	2.4	3			DIJ
2004 09 08.96		S	12.0	AU	31.0	J	6	89	1.9	1/			DIJ
2004 09 08.96		S	12.0	AU	31.0	J	6	89	2	1/			BOU

Comet 88P/Howell [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 10.85	x	S	[12.5	TT	20	L	4	100	1!				PEA
2004 09 11.83	x	S	[12.7	TT	20	L	4	100	1!				PEA
2004 10 15.71		S	14.1	AU	40.0	L	4	144	0.9	2			YOS04

Comet C/2001 HT_50 (LINEAR-NEAT)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 17.77		S	[13.8	AU	40.0	L	4	144	! 0.4				YOS04
2004 10 15.45		S	[13.7	AU	40.0	L	4	144	! 0.7				YOS04

Comet C/2001 Q4 (NEAT)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 03 14.56	x&	B	7.2	TI	5.0	R		8					HAN05
2004 03 21.50	x&	B	6.6	HD	11.4	F	9	25	7.5	5			HAN05
2004 04 08.47	x	B	5.6	HD	5.0	B	8	10	8	5			HAN05
2004 04 19.44	x	B	4.3	HR	5.0	B	8	10	13	6	1	160	HAN05
2004 04 26.48		S	4.2:	TK	5.0	B		7	13	6	>2	140	MAT08
2004 05 01.50		I	3.6	TK	0.7	E		1		6			MAT08
2004 05 02.44		I	3.5	TK	0.7	E		1		6			MAT08
2004 05 04.46		I	3.4	TK	0.7	E		1		6			MAT08
2004 05 06.46		I	3.1	TK	0.7	E		1		6			MAT08
2004 05 07.40		I	2.8	TK	0.7	E		1	25	6	>3	110	MAT08
2004 05 08.06					3.5	B		7	20	8	1	180	NOW
2004 05 08.06		B	3.5	AC	0.0	E		1					NOW
2004 05 08.44		I	2.8	TK	0.7	E		1	25	6	>4	110	MAT08
2004 05 08.78		B	3.0	TK	6	R	7	25	15	4	0.5		NAZ01
2004 05 09.80		B	3.0	TK	6	R	7	25	15	4	0.7		NAZ01
2004 05 09.81	x	B	3.8:	TJ	5.0	B		10	7	S6			MAR12
2004 05 09.82	x	B	3.7	TJ	7.0	B		15	10	6			SWI
2004 05 10.40		I	3.1	TK	0.7	E		1	20	6			MAT08
2004 05 10.81	x	B	4.0:	TJ	5.0	B		10	8	S6			MAR12
2004 05 10.81	x	B	4.0:	TT	8.0	B		20	& 8	D5			KIS03
2004 05 10.82	x	B	4.8:	TT	11	L	7	34	& 8	S7			SLO01
2004 05 11.81	x	B	3.5:	TT	3.5	B		7	&10	D5			PAR03
2004 05 11.82	x&	B	4.3	TJ	5.0	B		10	12	S4/	0.4	130	MAR13
2004 05 11.83	x	B	4.7	TJ	6.0	B		20	5	D5			TUR01
2004 05 11.83	x&	B	4.3	TJ	5.0	B		10	10	S5	0.3	125	MAR12
2004 05 11.84	x&	B	3.7	TT	20	L	8	60	5	S6	&0.17	115	PAC03
2004 05 11.85	x	B	3.5	TK	5.0	B		7	&10	D7	&1	125	DOR02
2004 05 12.82	x	M	3.2	TT	3.5	B		7	10	D5			PAR03
2004 05 12.82	x	M	4.0	TJ	20	L	5	58	7	6			SWI
2004 05 12.83	x	B	4.0	TT	5.0	B		7	&15	5/	&0.5	100	FIL04
2004 05 12.83	x	B	4.3	S	6.0	B		20	& 8	D5/	1.2	112	TUR01
2004 05 12.83	x	B	4.4	TT	6.0	B		20	& 8	D6	0.3	104	SCI
2004 05 12.83	x	M	3.6	TT	4.0	B		8	8	6	1.5	110	GRA09
2004 05 12.83	x&	B	4.0	TT	11	L	7	34	&10	S6			SLO01
2004 05 12.84	x	B	3.7	TJ	8.0	B		20	3	d6	0.25	105	SIK01
2004 05 12.84	x&	B	3.8	TT	20	L	8	60	6	S6	0.4	120	PAC03
2004 05 12.85	x	B	3.5	TT	0.0	E		1	30	7			GRA09
2004 05 12.85	x	B	4.0	TK	5.0	B		20	&25	5	1	102	DOR02
2004 05 12.86	x&	B	4.1	TJ	5.0	B		10	12	S5	0.8	110	MAR12
2004 05 13.80		B	3.0	TK	6	R	7	25	20	4	1		NAZ01
2004 05 13.85	x	B	3.3	TJ	6.0	B		30	15	s6/	0.25	112	BUR04
2004 05 13.85	x	B	4.0	TJ	6.0	B		20	15	S5	0.5	105	SIW
2004 05 13.86	x	B	3.3	TK	11	L	7	32	14	s7	1.1	115	BOH02
2004 05 13.92	x&	B	4.1	TJ	6.0	B		20	10	6	0.9	115	KID01
2004 05 14.82	x	B	4.1	TT	6.0	B		30	&20	5			POW01
2004 05 14.82	x&	S	4.4:	S	6.0	B		20	& 7	s5			RZE
2004 05 14.83	x	B	4.3	TT	6.0	B		20	& 7	D6	0.3	107	SCI
2004 05 14.84	x	B	4.1	TT	6.0	B		12	&11	S6	&0.9		SLO01
2004 05 14.85	x	B	3.8	TK	5.0	B		7	15	5	2	110	DOR02
2004 05 14.86	x	B	4.0	TT	20	L	8	60	6	S5	0.25	99	PAC03

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 14.86	x	B	4.1	TJ	7.0	B		13	15	5	0.3	110	SIW
2004 05 14.86	x	M	3.9	TT	4.0	B		8	8	6	1.9	110	GRA09
2004 05 14.87	x	B	4.3	TJ	5.0	B		7	11	S6	0.6	112	SPE01
2004 05 14.87	x&	B	4.1	TJ	5.0	B		10	12	S5	1.0	90	MAR12
2004 05 14.88	x&	B	4.0	TJ	5.0	B		10	&15	S5	1.20	120	MAR13
2004 05 14.93	x	B	4.8	TJ	6	R	6	20	10	s6	&0.5	99	SIK01
2004 05 15.86	x	B	4.2	TJ	6.0	B		20	12	5	0.3	110	SIW
2004 05 16.80		B	3.5	TK	20	L	5	32	10	4	1		NAZ01
2004 05 16.82	x&	S	4.8:	S	6.0	B		20	& 7	s5			RZE
2004 05 16.83	x	B	4.5	TT	6.0	B		12	& 8	D6	&1.5		SLO01
2004 05 16.85	x	B	4.0	TJ	20	L	5	32	9	6	1.30		SWI
2004 05 16.85	x	B	4.6	TK	5.0	B		7	15	5	2	110	DOR02
2004 05 16.86	x	B	4.0	TT	6.0	B		30	15	6	4	118	POW01
2004 05 16.86	x	B	4.3	TT	5.0	B		10	&18	7	&0.60	105	JAN06
2004 05 16.86	x	B	4.7	S	5.0	B		10	&12	5	1.2	97	TUR01
2004 05 16.86	x	B	4.8	TT	6.0	B		20	& 9	D6	&0.6	110	SCI
2004 05 16.87	x	I	3.9	TJ	0.0	E		1	&15	S6			BUR04
2004 05 16.88	x	B	4.2	TT	5.0	B		20	7	D6	1	105	PAC03
2004 05 16.88		I	4.2	TK	1.0	E		1					HOE
2004 05 16.90	x&	B	4.4	TT	5.0	B		7	&15	5/	&1.3	110	FIL04
2004 05 17.08					3.5	B		7	27	7	5.25	210	NOW
2004 05 17.08		B	3.7	AC	0.0	E		1					NOW
2004 05 17.82	x&	B	5.0:	S	6.0	B		20	8	3			RZE
2004 05 17.85	x	B	4.1	TT	6.0	B		30	10	6	&1	116	POW01
2004 05 17.85	x	B	4.8	S	5.0	B		10	&12	S6	0.7	109	TUR01
2004 05 17.87	x	B	4.3	TJ	5.0	B		10	&14	S5	1.60	120	MAR13
2004 05 17.87	x	B	4.4	TJ	5.0	B		7	10	S6	0.6	110	SPE01
2004 05 17.87	x	B	4.8	TK	5.0	B		7	12	5	1	110	DOR02
2004 05 17.87	x	M	4.4	TT	4.0	B		8	9	6	0.65	110	GRA09
2004 05 17.88	x	B	4.3	TT	8.0	B		20	10	S5/	&1.2	120	KIS03
2004 05 17.88	x	B	5.1	TJ	6	R	6	20	10	s5	&2.2	107	SIK01
2004 05 17.88	x&	B	4.3	TT	4.0	B		7	15	S5	1.2	105	SIE01
2004 05 17.89	x&	B	4.1	TT	5.0	B		20	4.5	S5/	1.1	110	SIE01
2004 05 18.81		B	3.5	TK	6	R	7	25	20	3	1.5		NAZ01
2004 05 19.87	x	B	5.1	TT	5.0	B		7	&10	5/	&1.0	110	FIL04
2004 05 19.88	x	B	4.5	TJ	5.0	B		7	8	S6	0.7	108	SPE01
2004 05 19.89	x	B	4.8	TK	5.0	B		7	7	6	1.5	106	DOR02
2004 05 19.91	x	B	5.2	TT	6.0	B		20	& 7	D5/	&0.3	108	SCI
2004 05 19.93	x	B	4.4	TJ	6.0	B		20	11	5	1.0	105	KID01
2004 05 20.10					3.5	B		7	18	5	3.25	200	NOW
2004 05 20.10		B	4.6	AC	0.0	E		1					NOW
2004 05 20.83	x	B	5.0	TJ	7.0	B		15	& 7	6			SWI
2004 05 20.85	x	B	4.7	TT	8.0	B		20	& 8	S5	&1	120	KIS03
2004 05 20.85	x	B	5.0	TJ	6.0	B		20	8	s4/	0.50	90	MAR12
2004 05 20.85	x	B	5.1	TT	11	L	7	34	& 4	D5			SLO01
2004 05 20.86	x	I	4.5	TJ	0.0	E		1	&20	s6			BUR04
2004 05 20.87	x	B	5.8	TJ	6	R	6	20	5	4	&0.3	111	SIK01
2004 05 20.89	x	B	4.9	TK	5.0	B		7	10	D5	2	106	DOR02
2004 05 20.90	x	B	5.1	TT	5.0	B		7	&13	5/	&1.0	100	FIL04
2004 05 21.84		B	4.0	TK	6	R	7	25	15	3	2.5		NAZ01
2004 05 21.88	x	I	4.5	TT	0.0	E		1	&10	5			POW01
2004 05 22.75	x	M	5.0:	HI	4.0	B		8		7	1.9	95	VAN15
2004 05 22.81		B	4.3	TK	11.5	R		20	15	3	2.5		NAZ01
2004 05 22.85	x	B	4.8	TT	15.3	L	5	23	6	S6/	0.93	120	MOZ
2004 05 22.86	x	B	4.9	TJ	6.0	B		20	5	4			MAR12
2004 05 22.87	x	B	5.0	TT	8.0	B		20	& 8	S5/	&0.8	110	KIS03
2004 05 22.88	x	B	4.4	TT	5.0	B		7	11	6	1.2	115	POW01
2004 05 22.88	x	B	4.8	TK	5.0	B		7	10	5	2	102	DOR02
2004 05 22.88		B	5.2	TJ	12.0	R	5	27	8	5	0.3		SIE
2004 05 22.88	x&	B	4.6	TT	15	L	6	45	9	S5/	0.6	95	SIE01
2004 05 22.89	x	B	4.8	TJ	6.0	B		12	8	4	&0.8	114	SIK01
2004 05 22.90		I	4.8	TK	1.0	E		1					HOE
2004 05 23.68		S	4.9	AA	5.0	B		10	9	7	0.7	112	COO02

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 23.69	x	M	5.0	HI	4.0	B		8		8			VAN15
2004 05 23.70		M	4.5	AA	5.0	B		10	10	6	1.0	100	PRI04
2004 05 23.73		M	4.3	AA	5.0	B		7	10	7	2.0	110	BEG01
2004 05 23.82		B	4.5	TK	11.5	R		20	15	3	2.0		NAZ01
2004 05 23.87	x	B	4.5	TT	5.0	B		10	& 7	5/	&0.5	98	MAK02
2004 05 23.87	x	B	4.7	TT	6.0	B		30	10	6			POW01
2004 05 23.87	x	B	5.5	TT	6.0	B		20	& 6	4/	&0.3	94	SCI
2004 05 23.88	x	B	4.9	TK	5.0	B		7	10	5	1	100	DOR02
2004 05 23.88	x	B	5.2	TT	5.0	B		7	& 9	D6	&0.67	100	FIL04
2004 05 24.70		M	4.3	AA	5.0	B		7	11	6	1.0	106	BEG01
2004 05 24.70	x	M	5.4	HI	4.0	B		8		8			VAN15
2004 05 24.85	x	B	5.5	TT	5.0	B		10	& 8	5	&0.25	105	JAN06
2004 05 24.86	x	B	5.5	TT	6.0	B		20	& 6	4/	&0.3	100	SCI
2004 05 24.87	x	B	5.0	TJ	5.0	B		10	5	s4	0.1		MAR12
2004 05 24.87	x	B	5.3	TT	5.0	B		7	&12	6	0.6	100	FIL04
2004 05 24.87	x	B	5.3	TT	5.0	B		10	& 8	5	&0.4	103	MAK02
2004 05 24.97	x	B	5.5	TJ	6.0	B		20	10	5	0.7	90	KID01
2004 05 25.69	x	M	5.5	HI	4.0	B		8		8			VAN15
2004 05 25.70		M	4.5	AA	5.0	B		7	8	6	1.2	125	BEG01
2004 05 25.88	x	B	5.5	TK	5.0	B		7	10	5	0.5	100	DOR02
2004 05 26.70		M	5.2	AA	5.0	B		7	8	6	45 m	113	BEG01
2004 05 26.75		M	5.3:	AA	5.0	B		10	7	6	0.5	100	PRI04
2004 05 26.88	x	B	5.8:	TT	6.0	B		20	& 6	4/			SCI
2004 05 26.89	x	B	5.5	TJ	5.0	B		7	& 8	S5			SPE01
2004 05 27.68		S	4.9	AA	5.0	B		10	5	7			COO02
2004 05 27.85	x	B	5.7	TT	6.0	B		20	& 5	4/	&0.2	98	SCI
2004 05 27.90	x	B	5.9	TK	5.0	B		7	6	5	&0.5	90	DOR02
2004 05 27.92	x	B	5.6	TT	6.6	B		20	& 6	5/	&0.4	85	FIL04
2004 05 28.94	x	B	5.6	TJ	5.0	B		7	& 7	S4			SPE01
2004 05 29.69	x	S	5.6	HI	4.0	B		8					VAN15
2004 05 29.70		S	5.2:	AA	20.0	L	8	89	3.2	5	0.3	127	COO02
2004 05 29.89	x	B	5.3	TT	6.0	B		30	&10	5			POW01
2004 05 29.90	x	B	5.6	TT	6.0	B		20	& 5	5	&0.1	100	SCI
2004 05 29.90	x	B	6.1	TK	5.0	B		7	5	5	&0.5	90	DOR02
2004 05 30.70	x	S	5.6	HI	4.0	B		8					VAN15
2004 05 30.85	x	B	5.4	TJ	20	L	5	32	4	5			SWI
2004 05 30.87		B	5.7	TJ	12.0	R	5	27	7	4			SIE
2004 05 30.88		B	5.3	TJ	5.0	B		7	7	5	0.2		CHE03
2004 05 30.88	x	B	5.8	TT	6.0	B		20	& 6	5	&0.1	92	SCI
2004 05 30.88	x	B	6.3	S	6.6	R	6	13	4	S5			TUR01
2004 05 30.90	x	B	5.8	TK	5.0	B		7	6	6	&0.5	85	DOR02
2004 05 30.91	x	B	5.8	TJ	5.0	B		7	& 5	s4			SPE01
2004 05 30.91	x	B	6.1	TT	6.6	B		20	& 6	5/	&0.4	115	FIL04
2004 05 31.08		B	6.1	AC	5.0	B		10	18	4	1	300	NOW
2004 05 31.71		M	6.1:	AA	5.0	B		10	8	5	20 m	90	PRI04
2004 05 31.82	x	B	5.5	TJ	6.0	B		20	& 4	D6			CHR
2004 05 31.86	x	B	6.0	TT	6.0	B		20	& 5	5			SCI
2004 05 31.89		B	5.4	TJ	5.0	B		7	8	5			CHE03
2004 05 31.89	x	B	6.1	TT	6.6	B		20	& 6	5/	&0.45	115	FIL04
2004 05 31.90	x	B	5.9	TK	5.0	B		7	8	D5			DOR02
2004 05 31.91	x	S	5.8:	TJ	6.0	B		20	& 6	s6	&0.22	90	BAN01
2004 05 31.96		B	6.0	TJ	12.0	R	5	27	7	4			SIE
2004 05 31.97		M	5.5	TK	15.2	L	5	38	6	5/			GRA04
2004 06 01.87	x	B	6.0	TK	10	M	10	35	6	5	&0.2	115	DOR02
2004 06 01.88	x	B	6.1	TJ	6.0	B		20	5	s4			MAR12
2004 06 01.88	x	B	6.4	TJ	8	R	5	20	6	2	&0.58	100	SIK01
2004 06 01.89	x	B	5.9:	TT	6.0	B		30	& 9	4			POW01
2004 06 01.92	x	M	5.9:	TJ	6.0	B		20	& 7	s6			BAN01
2004 06 01.97		S	5.5	TK	15.2	L	5	38	5.5	4/			GRA04
2004 06 02.87	x	B	6.0	TK	10	M	10	35	7	5	&0.2	110	DOR02
2004 06 02.87	x	B	6.2	TJ	6.0	B		20	5	3/			MAR12
2004 06 02.88		B	5.6	TJ	5.0	B		7	8	4			CHE03
2004 06 02.91		S	6.1	TK	5.0	B		10	5				ARA

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 03.80	x	B	5.7	TJ	6.0	B		20	& 4	D6			CHR
2004 06 03.87	x	B	6.1:	TK	5.0	B		7	& 6	5			DOR02
2004 06 03.88	x	B	6.3	TT	5.0	B		20	& 8	5/	&0.6	106	FIL04
2004 06 03.90	x	B	6.4:	TT	6.0	B		30	& 8	4			POW01
2004 06 03.90		S	6.0	TK	8.0	B		11	5				ARA
2004 06 04.88	x	B	6.1	TK	5.0	B		7	5	5			DOR02
2004 06 05.10		B	5.6	AC	3.5	B		7	11	5	2	110	NOW
2004 06 05.70	x	B	6.4	TI	6.3	B		9	7	5			SZW
2004 06 05.81	x	B	5.7	TJ	6.0	B		20	& 4	D6			CHR
2004 06 05.90		B	6.0:	TJ	5.0	B		7		4			CHE03
2004 06 06.70		S	6.1	AA	5.0	B		10	8	6			COO02
2004 06 06.71		M	6.1	AA	5.0	B		7	4	6	1.3	92	BEG01
2004 06 06.72	x	B	6.4	TI	6.3	B		9	7	6			SZW
2004 06 06.82	x	B	5.9	TJ	6.0	B		20	& 4	D6			CHR
2004 06 06.89	x	S	6.5	TT	4.0	B		8	8.5	5			PEA
2004 06 06.94	x	B	6.6	TJ	8.0	B		20	& 6	s4	0.3	92	SPE01
2004 06 07.71		M	6.3	AA	5.0	B		7	4	6	1.0	100	BEG01
2004 06 07.89	x	B	6.5	TK	5.0	B		7	6	5			DOR02
2004 06 07.89	x	B	6.6	TJ	6.0	B		20	4	s4			MAR12
2004 06 07.90	x	S	6.5	TT	4.0	B		8	7.5	6			PEA
2004 06 07.98	x	B	6.3	TJ	8	R	5	20	6	s3	0.7	106	SIK01
2004 06 08.71		M	6.5	AA	5.0	B		7	4	6			BEG01
2004 06 08.88	x	B	6.5	TK	10	M	10	35	7	5	0.3	92	DOR02
2004 06 08.89	x	S	6.6	TT	4.0	B		8	8.5	5			PEA
2004 06 08.90	x	B	6.8	TJ	5.0	B		10	4	s3/			MAR12
2004 06 08.94	x	M	6.5	TT	4.0	B		8	6	4/			GRA09
2004 06 09.69		S	6.6	AA	11.2	L	8	50	3	6			COO02
2004 06 09.86	x	B	6.2	TJ	6.0	B		20	& 4	D6			CHR
2004 06 09.89		B	6.3	TJ	5.0	B		7		4			CHE03
2004 06 09.89	x	B	6.6	TK	5.0	B		20	5	6	0.2	90	DOR02
2004 06 09.98	x	B	6.7:	TJ	6.0	B		20	& 4	s7			BAN01
2004 06 10.90	x	S	6.6	TT	4.0	B		8		5/			PEA
2004 06 11.88	x	B	6.9	TK	5.0	B		20	4	4			DOR02
2004 06 11.90	x	S	6.7	TT	4.0	B		8	7.5	5/			PEA
2004 06 12.90	x	B	6.7	TT	6.0	B		30	7				POW01
2004 06 12.90	x	S	6.8	TT	4.0	B		8	7.5	5/			PEA
2004 06 13.84	x	B	6.7	TJ	6.0	B		20	& 4	D6			CHR
2004 06 13.89	x	B	7.2	TK	10	M	10	35	5	5	0.1	93	DOR02
2004 06 13.92	x	B	6.5	TT	5.0	B		10	& 5	5	&0.25	105	JAN06
2004 06 13.92	x	B	6.5	TT	6.6	B		20	& 7	D5/	&0.33	115	FIL04
2004 06 13.93	x	B	6.8	TJ	8.0	B		20	& 6	S5			SPE01
2004 06 13.95	x	S	7.0	TT	6.0	B		20	& 5	5			SCI
2004 06 13.96	x	M	7.2:	TJ	6.0	B		20	& 4	s5			BAN01
2004 06 14.71		M	6.7	AA	5.0	B		7	5	5			BEG01
2004 06 15.71		M	6.7	AA	5.0	B		7	5	4			BEG01
2004 06 15.77		S	6.8	HV	6	R	10	30	2.7	4			SEM02
2004 06 15.84	x	B	6.7	TJ	6.0	B		20	& 4	D5			CHR
2004 06 15.87	x	B	7.3	TT	6.0	B		20	& 5	5			SCI
2004 06 16.92	x	B	7.3	TK	5.0	B		20	7	5	0.5	90	DOR02
2004 06 17.89	x	B	7.6	TT	6.0	B		20	& 4	5/			SCI
2004 06 17.90		S	6.6	TJ	8.0	R	4	18	5	4			CHE03
2004 06 17.92	x	B	7.3	TT	6.6	B		20	& 6	6	&0.67	100	FIL04
2004 06 17.98	x	B	6.8:	TJ	6.0	B		20	& 5	s5/			BAN01
2004 06 19.92	x	B	7.8	TK	5.0	B		7	5	4			DOR02
2004 06 21.90	x	B	7.6	TT	6.0	B		20	& 4	5/			SCI
2004 06 21.92	x	B	7.3	TK	5.0	B		7	5	5	0.15	90	DOR02
2004 06 21.93	x	B	7.2	TT	6.6	B		20	& 5	6/	&0.25	95	FIL04
2004 06 21.94	x	B	7.4	TJ	8.0	B		20	& 6	s5			SPE01
2004 06 22.84	x	B	6.9	TJ	6.0	B		20	& 3	D5			CHR
2004 06 22.88	x	S	7.7	TJ	6.0	B		20	2	s3			MAR12
2004 06 22.92	x	B	7.5	TK	5.0	B		20	4	5			DOR02
2004 06 22.93	x	B	7.4:	TJ	6.0	B		20	& 4	5			BAN01
2004 06 22.94	x	M	7.7	TT	30	L	4	47	3	4/	0.2	85	GRA09

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 23.92	x	B	7.7	TK	5.0	B		20	4	4			DOR02
2004 06 23.93	x	B	7.6	TT	5.0	B		10	& 6	5			MAK02
2004 06 23.96	x	B	7.7:	TJ	6.0	B		20	& 4	4			BAN01
2004 06 23.96		S	7.2	TJ	11.0	B		20	5	5			CHE03
2004 06 24.75		S	7.3	HV	6	R	10	30	2.6	3			SEM02
2004 06 24.92	x	B	7.7	TT	6.0	B		20	& 4	5/			SCI
2004 06 24.93	x	B	7.8	TK	5.0	B		20	4	4			DOR02
2004 06 24.94	x	B	7.4	TT	5.0	B		10	& 6	6/			MAK02
2004 06 24.96	x	B	7.4	TT	6.6	B		20	& 6	6/	&0.33	85	FIL04
2004 06 25.91	x	B	7.6	TT	6.6	B		20	& 7	5/	&0.27	95	FIL04
2004 06 25.92	x	B	7.9	TT	6.0	B		20	& 4	5/			SCI
2004 06 26.93	x	B	8.0:	TT	6.0	B		20	& 5	5/			SCI
2004 06 26.94	x	B	8.0	TT	5.0	B		10	& 5	6			MAK02
2004 06 26.97	x	S	8.2:	TJ	6.0	B		20	& 3	2/			BAN01
2004 06 27.77		S	7.7	HV	6	R	10	30	2.9	3			SEM02
2004 06 27.93	x	B	8.1	TK	5.0	B		7	4	5			DOR02
2004 06 28.93	x	B	7.8	TK	5.0	B		20	4	5			DOR02
2004 06 28.97	x	B	7.5	TT	6.0	B		20	& 4	5/			SCI
2004 06 28.98		S	6.6	TT	5.0	B		10	13	1			ZAN01
2004 06 29.89	x	S	7.6	TT	6.0	B		20	& 4	5/			SCI
2004 06 29.93	x	B	8.0	TK	5.0	B		20	4	5			DOR02
2004 06 30.89	x	S	7.3	SC	6.6	B		20	& 6	4			FIL04
2004 06 30.93	x	B	8.0	TK	5.0	B		20	4	5			DOR02
2004 07 01.49	x	S	7.8	HV	8.0	B		11	4	5			MIY01
2004 07 02.86		S	7.3:	TJ	11.0	B		20		3			CHE03
2004 07 02.90	x	S	7.5	TT	6.0	B		20	& 5	4			SCI
2004 07 03.88	x	S	7.7	TT	6.0	B		20	& 5	4			SCI
2004 07 03.89	x	S	6.9:	TT	6.6	B		20	& 5	5			FIL04
2004 07 04.90	x	B	8.2	TK	5.0	B		20	3	4			DOR02
2004 07 04.93		B	7.5:	TJ	11.0	B		20	4	3			CHE03
2004 07 05.90	x	B	7.8	TT	5.0	B		10	& 4	5			MAK02
2004 07 05.90		S	7.3	TT	8.0	B		15	10	4			SCH04
2004 07 05.90	x	S	7.7	TJ	6.0	B		20	3	s3			MAR12
2004 07 05.92	x	B	8.0	TK	5.0	B		20	4	5			DOR02
2004 07 05.93	x	S	7.5	TT	6.0	B		20	& 3	4			SCI
2004 07 05.95	x	S	7.2	TT	6.6	B		20	& 6	5/	&0.13	95	FIL04
2004 07 06.89	x	S	7.7	TT	6.0	B		20	& 3	4			SCI
2004 07 06.90	x	B	7.7	TJ	6.0	B		20	5	s3			MAR12
2004 07 06.90	x	B	7.7	TT	5.0	B		10	& 4	5			MAK02
2004 07 06.91	x	B	7.8	TK	5.0	B		20	4	5			DOR02
2004 07 07.50	x	S	7.5	HV	8.0	B		11	6	5			MIY01
2004 07 07.86	x	B	7.4	TJ	6.0	B		20	& 2	d3			CHR
2004 07 07.87	x	S	7.5	TJ	20	L	5	58	& 4	3			SWI
2004 07 07.90	x	S	7.9	TJ	6.0	B		20	3	3			MAR12
2004 07 07.90	x	S	8.0:	TJ	6.0	B		20	& 4	2			BAN01
2004 07 07.91	x	B	7.9	TK	5.0	B		20	4	5			DOR02
2004 07 07.93	x	S	7.9:	TT	6.0	B		20	& 4	3/			SCI
2004 07 08.90	x	B	8.0	TT	5.0	B		10	& 4	4/			MAK02
2004 07 09.88	x	S	8.1	TT	6.0	B		20	& 4	4			SCI
2004 07 09.93		S	7.5	TT	4.0	B		8	12	5			SCH04
2004 07 10.92		S	7.7	TT	8.0	B		15	&12	5			SCH04
2004 07 10.93	x	S	7.7	TT	6.0	B		20	& 3	3			SCI
2004 07 10.96	x	M	7.5:	TT	6.0	B		20	3	3			LEG
2004 07 11.75		S	9.0	HV	6	R	10	30	1.1	1			SEM02
2004 07 13.87		M	8.0	TJ	11	L	7	40	2	5			SHU
2004 07 13.93	x	S	7.8	TT	6.0	B		20	& 3	3			SCI
2004 07 13.93	x	S	7.9	TT	5.0	B		10	& 3	3			MAK02
2004 07 14.87	x	S	8.0:	TJ	6.0	B		20	2	2/			MAR12
2004 07 14.92	x	S	7.8	TT	6.0	B		20	& 3	3			SCI
2004 07 14.93	x	S	8.0	TT	5.0	B		10	& 3	3/			MAK02
2004 07 14.93	x	S	8.4	TT	20	L	5	50	& 2	3/			MAK02
2004 07 15.75		S	8.9	HV	6	R	10	30	2.0	1			SEM02
2004 07 15.86		S	7.8	TJ	8.0	R	4	18	3	3			CHE03

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 16.68		S	9.3	HI	15	L	8	48	3.5	6			GRI01
2004 07 16.90		M	7.8	TK	10.0	B		20	6	4/			MEY
2004 07 16.92	x	B	8.2	TT	5.0	B		10	& 3	4/			MAK02
2004 07 16.92	x	B	8.6	TT	20	L	5	50	& 3	4			MAK02
2004 07 16.98		S	8.0	TT	8.0	B		15	&10	5/			SCH04
2004 07 17.84		S	7.9:	TJ	8.0	R	4	18	3	3			CHE03
2004 07 17.87	x	B	8.6:	TT	20	L	5	50	3.1	4/			POW01
2004 07 17.90	x	S	8.4	TT	5.0	B		10	6	2			JAN06
2004 07 17.90	x	S	8.4	TT	17	L	5	50	5	s4			JAN06
2004 07 17.90	x	S	8.7:	TT	6.0	B		20	4	1			LEG
2004 07 17.91	x	B	8.3	TT	5.0	B		10	& 5	3/			MAK02
2004 07 17.92	x	B	8.3	TT	6.0	B		20	& 4	3/	&0.2	80	SCI
2004 07 17.92	x	B	8.5	TT	6.6	B		20	& 7	5	&0.13	95	FIL04
2004 07 18.75		S	8.9	HV	6	R	10	30	1.3	1			SEM02
2004 07 18.87		S	7.9:	TJ	8.0	R	4	18	3	3			CHE03
2004 07 18.88	x	B	8.2	TT	6.0	B		20	& 7	3/	&0.2	75	SCI
2004 07 18.90	x	B	8.4	TT	5.0	B		10	& 6	4/			MAK02
2004 07 19.88		M	7.8	HD	11	B		20	4	3			NEV
2004 07 19.89		S	8.1	TJ	8.0	R	4	18	4	3			CHE03
2004 07 19.90	x	B	8.1	TT	6.6	B		20	& 8	5/			FIL04
2004 07 19.90	x	B	8.4	TT	5.0	B		10	& 6	4/			MAK02
2004 07 20.87	x	S	8.4:	TJ	6.0	B		20	& 4	1			BAN01
2004 07 20.89	x	S	7.9	TT	6.0	B		30	4	3/			POW01
2004 07 20.90	x	M	7.9	TJ	6.0	B		20	4	s3			PAR03
2004 07 20.90	x	S	8.2:	TT	5.0	B		10	& 4	3			JAN06
2004 07 20.91	x	B	8.2	TT	5.0	B		10	& 4	4/			MAK02
2004 07 20.92	x	S	8.1	TT	6.6	B		20	& 7	4/			FIL04
2004 07 21.88	x	B	8.3	TT	5.0	B		10	& 5	4			MAK02
2004 07 21.88	x	S	8.4	TT	6.0	B		20	& 4	3			SCI
2004 07 21.90	x	B	8.1	TT	6.6	B		20	& 6	5/			FIL04
2004 07 21.91	x	B	8.5	TT	20	L	5	50	& 4	5			MAK02
2004 07 22.86	x	B	7.9	TJ	6.0	B		20	& 2	d2			CHR
2004 07 22.86	x	S	7.9	TJ	6.0	B		20	& 2	d2			CHR
2004 07 22.87	x	B	8.1	TT	6.0	B		30	6	3			POW01
2004 07 22.88	x	B	8.2	TT	6.6	B		20	& 6	5/			FIL04
2004 07 22.89	x	S	8.3:	TT	6.0	B		20	& 3	3			SCI
2004 07 23.87	x	S	8.2	TJ	6.0	B		20	3	2			MAR12
2004 07 23.89		M	7.8	HD	11	B		20	3	5			NEV
2004 07 23.92		S	8.1	TT	8.0	B		15	7	6			SCH04
2004 07 24.84	x	S	8.0	TJ	6.0	B		20	& 2	d2			CHR
2004 07 24.84	x	S	8.0	TJ	6.0	B		20	& 2	d2			CHR
2004 07 24.88	x	B	8.1	TT	6.0	B		30	4.5	3			POW01
2004 07 24.89	x	B	7.5	TT	20	L	6	37	2.5	S3			KIS03
2004 07 24.89		S	8.0	TK	10.0	B		20	6	4			MEY
2004 07 24.92	x	B	9.0	TK	5.0	B		20	3	4			DOR02
2004 07 25.90	x	B	8.0	TT	6.0	B		30	8	3			POW01
2004 07 25.90	x	B	9.0	TT	6.0	B		30	5	3/			BUR04
2004 07 25.92	x	B	8.4	TT	6.6	B		20	& 6	5/			FIL04
2004 07 25.92	x	B	8.7	TT	5.0	B		10	& 4	4/			MAK02
2004 07 26.90		M	7.9	HD	11	B		20	2.5	3			NEV
2004 07 26.92		S	7.9	TT	8.0	B		15	7	6			RIE
2004 07 26.98		S	8.5	TK	15.2	L	5	44	3	3			GRA04
2004 07 27.96		S	8.6	TK	15.2	L	5	29	3.5	3/			GRA04
2004 07 29.92		M	8.2	HD	11	B		20	2.5	3			NEV
2004 07 30.00	x	B	9.2	TK	10	M	10	30	3	4			DOR02
2004 07 30.26		S	8.1	TK	5.0	B		10	5	4			SHA02
2004 07 30.90	x	B	8.8	TT	20	L	5	50	& 3	4/			MAK02
2004 07 30.92	x	B	8.3	TT	5.0	B		10	& 5	4/			MAK02
2004 07 30.93		B	8.4	TJ	15.0	R	5	25	5	4			CHE03
2004 07 30.95	x	S	8.5	TT	6.6	B		20	& 4	4			FIL04
2004 07 31.00		S	8.4	TK	15.2	L	5	38	4	3			GRA04
2004 07 31.26		S	8.2	TK	5.0	B		10	5	3			SHA02
2004 07 31.84	x	S	8.0:	TT	5.0	B		10	& 4	2			SCI

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 31.88	x	B	9.9	HS	26.5	L	4	38	2	3			TUR01
2004 07 31.90	x	B	9.5:	TK	10	M	10	30	3	3			DOR02
2004 08 01.84		M	8.1	TT	10	B	4	25	6	3			LEH
2004 08 01.87	x	S	8.1:	TT	5.0	B		10	& 4	2			SCI
2004 08 01.96		S	8.3	TK	15.2	L	5	38	4.5	3/			GRA04
2004 08 02.82		M	8.2	HD	6	R	10	10	3	2			KOZ02
2004 08 02.88		S	8.3	TJ	15.0	R	8	75	2	4			DIE02
2004 08 02.91		M	8.6	TK	25.4	J	6	47	3.5	4			BOU
2004 08 03.83	x	S	8.0	TT	6.6	B		20	& 6	4			FIL04
2004 08 03.84		M	8.2	TT	10	B	4	25	6	3			LEH
2004 08 03.84	x	S	8.3	TT	5.0	B		10	& 3	2			SCI
2004 08 03.87		M	8.9	TJ	19	L	5	38	1.5	3			SHU
2004 08 03.87	x	S	8.3	TT	25	L	8	100	& 4	3			MAK02
2004 08 03.90		M	8.5	TK	25.4	J	6	47	4.5	4/			BOU
2004 08 03.90		S	8.4	TK	5.6	B		10	> 5	4			BUS01
2004 08 03.91	x	B	9.7:	TK	5.0	B		20	2	2			DOR02
2004 08 04.47	x	M	8.9	HV	15.0	B		25	5	4/			MIT
2004 08 04.85		M	8.2	TT	10	B	4	25	5	3			LEH
2004 08 04.90	x	S	8.2	TT	25	L	8	100	& 4	2			MAK02
2004 08 04.91	x	S	8.3	TT	5.0	B		10	& 3	2			SCI
2004 08 04.92		S	8.2	TK	5.0	B		7	8	4			GON05
2004 08 05.47	x	M	8.5	TJ	8.0	B		11	5	5			NAG08
2004 08 05.49	x	M	8.9	TK	10.0	B		20	4	6			YOS02
2004 08 05.82		M	8.3	HD	6	R	10	30	3	2/			KOZ02
2004 08 05.85		M	8.2	TT	10	B	4	25	5	3			LEH
2004 08 05.85		M	8.5	HD	11	B		20	3.5	2			NEV
2004 08 05.87	x	S	8.0	TT	6.6	B		20	& 6	4			FIL04
2004 08 05.89	x	S	8.2	TT	5.0	B		10	& 5	3			MAK02
2004 08 05.90	x	B	9.0	TK	10	M	10	30	3	3			DOR02
2004 08 05.91		S	8.6	TK	8.0	B		15	5	3/			BOU
2004 08 05.92		M	8.7	TK	8.0	B		15	6.5	2/			DIJ
2004 08 05.92		S	8.6	TJ	8.0	B		18	5	4			CHE03
2004 08 05.93	x	S	8.2	TT	5.0	B		10	& 4	4			MAK02
2004 08 05.94	x	B	8.2	TT	22.5	L	7	111	3	s4			MOZ
2004 08 06.02		S	8.5	TK	15.2	L	5	38	4	3			GRA04
2004 08 06.48	x	M	8.7	TK	10.0	B		20	5	6			YOS02
2004 08 06.79		M	8.4	HD	6	R	10	30	3	2/			KOZ02
2004 08 06.83		M	9.0	TJ	19	L	5	38	3	3			SHU
2004 08 06.84		M	8.3	TT	10	B	4	25	5	3			LEH
2004 08 06.90		B	8.7	HD	11	L	8	32	6	3			SER
2004 08 06.94		S	8.5	TJ	8.0	B		18	5	4			CHE03
2004 08 06.94	x	S	10.2	TI	10	R	7	40	2	6			SZW
2004 08 07.68		E	9.7	HV	6	R	10	30	0.8	3			SEM02
2004 08 07.82		M	8.4	HD	6	R	10	30	3	2/			KOZ02
2004 08 07.84	x	B	9.1	HS	26.5	L	4	38	4	3			TUR01
2004 08 07.84		M	8.5	TT	10	B	4	25	5	3			LEH
2004 08 07.85		M	8.9	HD	11	B		20	3.5	3			NEV
2004 08 07.88		B	8.2	TJ	34.0	L	4	50	6	3			SIE
2004 08 07.89		M	8.7	TK	8.0	B		15	5	3/			BOU
2004 08 07.90		B	9.0	HD	11	L	8	32	9	3			SER
2004 08 07.90		S	8.6	TK	8.0	B		15	4.5	3			DIJ
2004 08 07.92		M	9.1	TJ	19	L	5	38	2.5	5			SHU
2004 08 07.95		S	8.5	TK	15.2	L	5	38	5	3			GRA04
2004 08 08.79		M	8.5	HD	6	R	10	10	3	2/			KOZ02
2004 08 08.84	x	S	9.2	TT	5.0	B		10	& 5	3			SCI
2004 08 08.85		B	8.9	HD	11	L	8	32	6	3			SER
2004 08 08.85		M	8.5	TT	10	B	4	25	5	3			LEH
2004 08 08.87		S	8.5	TK	10.0	B		20	6	3/			MEY
2004 08 08.87		S	8.6	TK	5.0	B		10	2.8	4			HAS02
2004 08 08.89		M	8.7	TK	31.0	J	6	58	4.5	4/			BOU
2004 08 08.89		M	8.7	TK	31.0	J	6	58	4	3/			DIJ
2004 08 08.91		S	8.4	TJ	8.0	B		18	5	4			CHE03
2004 08 08.92		S	8.5	TJ	15.0	R	8	75	2	5			DIE02

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 08.93	&	S	9.5	TT	20.0	L	4	42	& 3	6/			SCH04
2004 08 09.82		M	8.0	TK	5.0	B		10	9	3			BAR06
2004 08 09.86		S	8.6	TK	10.0	B		20	5.5	3			MEY
2004 08 09.88		B	8.7	TK	10.0	R	5	20	3.4	4			HAS02
2004 08 09.89	x	S	9.3	TT	5.0	B		10	& 6	2/			SCI
2004 08 09.91		M	8.8	TK	8.0	B		15	4.5	4			BOU
2004 08 09.93		B	8.5	TJ	8.0	B		18	6	4			CHE03
2004 08 10.84		M	9.1	TJ	19	L	5	38	3.8	5/			SHU
2004 08 10.86		M	8.6	TT	10	B	4	25	5	3			LEH
2004 08 10.89	x	B	9.4	TT	25	L	5	47	& 4	4			MAK02
2004 08 10.89	x	S	9.1	TT	5.0	B		10	& 7	3			SCI
2004 08 10.90	x	B	9.0	TT	20	L	5	30	2.5	3			POW01
2004 08 10.91		B	8.4	TJ	34.0	L	4	50	6	3			SIE
2004 08 10.91		S	8.5	TJ	8.0	B		18	5	4			CHE03
2004 08 10.91		S	8.5	TK	8.0	B		20	5	3			SHA02
2004 08 11.85		M	9.0	HD	11	B		20	3	3			NEV
2004 08 11.86		S	8.7	TK	10.0	B		20	5.5	3			MEY
2004 08 11.87		B	8.9	TI	8.0	B		11	5	3	5 m		LAB02
2004 08 11.87		M	9.6	TJ	5	R		20	2.5	3/			SHU
2004 08 11.88	x	S	9.1	TT	5.0	B		10	& 4	2/			SCI
2004 08 11.93		S	8.6	TJ	8.0	B		18	4	4			CHE03
2004 08 11.96		B	8.4	TJ	34.0	L	4	50	5	3			SIE
2004 08 12.47	x	S	9.0	TJ	10.0	B		20	5	5			NAG08
2004 08 12.57	x	B	9.6	TJ	30.4	L	5	47	3.0	4/	20 m	40	NAG04
2004 08 12.82		M	8.3	TK	5.0	B		10	7	3			BAR06
2004 08 12.84	x	S	8.7	TT	5.0	B		10	& 5	2			SCI
2004 08 12.86		M	8.7	TT	10	B	4	25	4	3			LEH
2004 08 12.88	x	B	9.6	TT	25	L	5	47	& 6	4			MAK02
2004 08 12.91		S	8.5	TK	8.0	B		20	5	5			SHA02
2004 08 12.91		S	8.6	TK	8.0	B		11	8	3			GON05
2004 08 12.92		S	8.8	TK	10.0	B		25	6	4	0.1	90	GON05
2004 08 12.93		M	9.6	TJ	19	L	5	38	3.8	4/			SHU
2004 08 13.79		M	8.9	HD	6	R	10	10	3	2			KOZ02
2004 08 13.84	x	S	8.4	TJ	6.0	B		20	& 2	d2			CHR
2004 08 13.86	x	B	9.8	TT	25	L	8	100	& 7	4			MAK02
2004 08 13.88		S	8.8	TK	5.6	B		10	& 5	4			BUS01
2004 08 13.91		M	9.4	NP	7.0	B		10	3	4/			MAR02
2004 08 13.91		M	9.9	NP	7.0	B		10	2.5	3			SAN04
2004 08 13.95		M	8.6	TK	7.0	R	7	24	5.5	3			GRA04
2004 08 14.83		B	8.7	TJ	12.0	R	5	27	5	3			SIE
2004 08 14.83		M	9.2	TJ	19	L	5	38	7.5	5			SHU
2004 08 14.86		B	8.9	TI	8.0	B		11	5	4	6 m		LAB02
2004 08 14.88		M	9.5	NP	10	R	5	27	3	4			MAR02
2004 08 14.91		B	8.8	TJ	8.0	B		18	5	4			CHE03
2004 08 14.93		M	8.6	TK	15.2	L	5	38	5.5	3/			GRA04
2004 08 15.83		B	8.8	TJ	34.0	L	4	50	6	3			SIE
2004 08 15.84	x	B	9.0	TJ	25	L	6	54	& 3	3			SWI
2004 08 15.84	x	B	9.4	TJ	31.7	L	5	78	& 3	4			ADA02
2004 08 15.84	x	S	9.2	TT	6.6	B		20	& 4	5			FIL04
2004 08 15.85	x	S	9.2	TT	20	L	5	30	3	2/			POW01
2004 08 15.86	x	B	9.7	TT	25	L	8	100	& 6	3/			MAK02
2004 08 15.86		M	8.5:	TK	5.0	B		10	8	3			BAR06
2004 08 15.86	x	S	9.7:	TJ	12	L	7	50	3	2/			LEG
2004 08 15.86	x	S	10.6:	TT	10	M	10	100	& 1	2			SCI
2004 08 15.88		M	9.6	NP	10	R	5	27	3	4			MAR02
2004 08 15.90	x	S	8.9	TT	5	R	6	20	5	3			GRA09
2004 08 15.92		S	9.0	TJ	11.0	B		20	5	4			CHE03
2004 08 16.82		M	7.3	HD	15	L	10	75	3	2/			KOZ02
2004 08 16.83		M	8.6	TK	5.0	B		10	8	3			BAR06
2004 08 16.86		S	8.9	TJ	15.0	R	8	75	2	5			DIE02
2004 08 16.89		S	8.8	TK	5.6	B		10	& 5	4			BUS01
2004 08 16.90		M	9.0	TK	25.4	J	6	47	4	4/			BOU
2004 08 16.95		S	8.5	TK	8.0	B		20	4	5			SHA02

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 17.58	x	B	9.7	TT	7	R	10	58	& 5	4/			MAK02
2004 08 17.79		M	9.3	TJ	19	L	5	10	3	2			KOZ02
2004 08 17.83		M	9.1	TJ	19	L	5	38	2.8	3/			SHU
2004 08 17.84		M	8.7	TK	5.0	B		10	10	4			BAR06
2004 08 17.85		B	8.9	TJ	34.0	L	4	50	5	3			SIE
2004 08 17.85	x	B	9.3	TT	22.5	L	7	111	4.5	D5			MOZ
2004 08 17.86		M	9.7	NP	10	R	5	27	3	3/			MAR02
2004 08 17.86	x	S	9.3	TJ	25	L	5	47	3.5	3			LEG
2004 08 17.88	x	B	9.2	TT	6.6	B		20	& 7	4/			FIL04
2004 08 17.89		S	8.6	TK	30.5	T	10	56	& 6	3			COM
2004 08 17.89		S	8.6	TK	30.5	T	10	56	& 6	3			COM
2004 08 18.01		S	8.9	TK	7.0	R	7	24	4	3			GRA04
2004 08 18.76		M	9.4	TJ	19	L	5	10	2	2			KOZ02
2004 08 18.82		B	9.0	TJ	34.0	L	4	50	5	3			SIE
2004 08 18.82		M	9.1	TK	5.0	B		10	6	4			BAR06
2004 08 18.84	x	B	9.5	TT	25	L	5	47	& 6	4/			MAK02
2004 08 18.85	x	M	9.8:	TJ	25	L	5	47	3.5	3			LEG
2004 08 18.86		M	9.4	TJ	19	L	5	38	3	4			SHU
2004 08 18.87	x	B	9.3	TT	6.6	B		20	& 7	4/			FIL04
2004 08 18.88	x	B	9.3	TT	22.5	L	7	111	3.5	s5/	0.05	49	MOZ
2004 08 19.00		S	8.9	TK	7.0	R	7	24	5	2/			GRA04
2004 08 19.47	x	S	8.4	TJ	8.0	B		11	5	3/			MIY01
2004 08 19.68		S	9.1	TK	15	L	8	48	3.2	4			GRI01
2004 08 19.76		M	9.5	HD	6	R	10	10	2	2			KOZ02
2004 08 19.83		B	9.1	TJ	34.0	L	4	50	4	3			SIE
2004 08 19.83		M	9.2	TK	20	L	5	60	4.5	3			BAR06
2004 08 19.83	x	S	9.2	TT	6.0	B		20	3	3			PAR03
2004 08 19.85		M	9.2	TJ	19	L	5	38	2.4	4			SHU
2004 08 19.86		S	9.1	TJ	15.0	R	8	75	1	2			DIE02
2004 08 19.86	x	S	9.2	TT	6.6	B		20	& 6	4			FIL04
2004 08 19.88		S	9.0	TK	8.0	B		15	4.5	3/			BOU
2004 08 19.89		S	8.7	TK	8.0	B		15	3.5	3/			DIJ
2004 08 19.89		S	8.9	TK	7.8	R	4	12	& 5	3/			BUS01
2004 08 19.89		S	9.0	TT	8.0	B		15	4	4			RIE
2004 08 19.89		S	9.0	TT	8.0	B		15	& 6	3			SCH04
2004 08 19.92		S	9.1	TJ	15.0	R	5	25	4	3			CHE03
2004 08 19.97		S	9.0	TK	10.0	B		25	7	4			GON05
2004 08 19.98	x	B	9.6	TK	10	M	10	35	3	3			DOR02
2004 08 19.98		S	9.0	TK	30.5	T	10	56	& 5	3			COM
2004 08 20.45		S	9.4	TJ	40.0	L	4	75	2.3	6			YOS04
2004 08 20.77		M	9.5	HD	6	R	10	30	2	2			KOZ02
2004 08 20.83		M	9.0	HD	11	L	7	32	3	3			SER
2004 08 20.83		M	9.6	HD	15	L	8	48	2	2			GRI01
2004 08 20.85		M	9.1	TJ	19	L	5	38	2.4	3/			SHU
2004 08 21.05	x	B	9.3	TK	5.0	B		20	3	3			DOR02
2004 08 21.05	x	B	9.3	TK	5.0	B		20	3	3			DOR02
2004 08 21.08		S	9.2	TK	20.3	T	10	77	4	4			GON05
2004 08 21.68		E	10.1	HV	6	R	10	30		1			SEM02
2004 08 21.74		M	9.6	HD	6	R	10	30	2	2			KOZ02
2004 08 21.83		B	9.2	TJ	34.0	L	4	50	4	3			SIE
2004 08 21.85		B	9.2	TJ	15.0	R	5	25	3	3			CHE03
2004 08 21.87		S	9.1	TK	10.0	B		25	4.5	3/			BOU
2004 08 21.87		S	9.1	TK	10.0	B		25	5	3/			DIJ
2004 08 21.89		S	8.8	TK	7.8	R	4	12	& 5	3/			BUS01
2004 08 21.91		M	8.8	TK	15.2	L	5	29	5.5	3/			GRA04
2004 08 21.96		B	9.6	TK	38.0	L		68	6	6			WAR01
2004 08 21.99		S	9.0	TK	30.5	T	10	56	& 5	3			COM
2004 08 22.00		S	9.0	TK	30.5	T	10	56	& 5	3			COM
2004 08 22.82	x	S	9.1	TT	6.6	B		20	& 7	3/			FIL04
2004 08 22.82	x	S	9.3	TT	20	L	5	50	& 6	3/			MAK02
2004 08 22.83	x	S	10.1	TT	20	L	5	50	3	3			POW01
2004 08 22.85		S	8.9	TK	13.0	L	7	45	3	4			RES
2004 08 22.85		S	9.0	TJ	15.0	R	8	75	1	2			DIE02

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 22.87		B	9.4	TJ	15.0	R	5	25	3	3			CHE03
2004 08 22.87	x	B	9.7	TT	22.5	L	7	111	3	s4/			MOZ
2004 08 22.94		M	8.9	TK	15.2	L	5	38	5.5	3			GRA04
2004 08 23.83		B	9.5	TJ	34.0	L	4	50	4	3			SIE
2004 08 23.84		B	9.3	TJ	15.0	R	5	25	3	3			CHE03
2004 08 23.84		B	9.5	TJ	34.0	L	4	50	3	3			CHE03
2004 08 23.85	x	S	9.1	TT	6.6	B		20	& 9	3/			FIL04
2004 08 23.85	x	S	9.5	TT	20	L	5	50	& 7	3			MAK02
2004 08 23.87	x	B	10.3	TK	10	M	10	35	3	3			DOR02
2004 08 23.89		M	8.9	TK	15.2	L	5	38	5	2/			GRA04
2004 08 23.93		M	9.3	TJ	19	L	5	38	4	5/			SHU
2004 08 24.74		M	10.0	HD	6	R	10	10	2	1/			KOZ02
2004 08 24.86		M	10.0	TJ	5	R		20	3	2/			SHU
2004 08 24.87		S	9.1	TJ	15.0	R	5	25	3	3			CHE03
2004 08 25.79		S	9.8	TK	15	L	8	48	2.6	3			GRI01
2004 08 25.89	x	B	10.0	TT	20	L	5	50	& 4	3/			MAK02
2004 08 25.89	x	B	10.3	TK	10	M	10	35	3	3			DOR02
2004 08 25.89	x	S	9.6	TT	10.0	B		25	& 5	3			FIL04
2004 08 25.94		S	8.9	VB	8.0	B		20	5	5			SHA02
2004 08 25.96		S	9.2	TK	13.0	L	7	45	3	4			RES
2004 08 26.09		S	9.3	TK	20.3	T	10	77	4	4			GON05
2004 08 27.89		S	9.1	VB	8.0	B		20	4	3			SHA02
2004 08 31.96	x	S	10.3:	TT	30	L	6	60	& 2	2			FIL04
2004 09 01.83		S	9.5	TK	15.0	R	5	38	3.3	2/			MEY
2004 09 02.47	x	S	9.9	TK	10.0	B		37	3	4/			YOS02
2004 09 02.78		M	9.5	TK	6.0	B		20	3	3			BAR06
2004 09 02.82		S	9.4	TK	15.0	R	5	38	3.7	3			MEY
2004 09 02.85		S	9.3	TK	30.5	T	10	75	3.0	4			KAM01
2004 09 03.79		M	9.9	TJ	19	L	5	38	2	3			SHU
2004 09 03.79		S	9.9	TK	30	L	5	60	2	3			NEV
2004 09 03.81		M	9.4	TK	6.0	B		20	5	3			BAR06
2004 09 03.87	x	S	10.5	TT	30	L	6	60	& 2	2/			FIL04
2004 09 04.01		S	9.4	TK	13.0	L	7	45	3	4			RES
2004 09 04.81		M	9.4	TK	6.0	B		20	5	3			BAR06
2004 09 04.82		S	9.4	TK	15.0	R	5	38	4.5	3			MEY
2004 09 04.86		B	10.3	TI	15.0	M	10	27	3	4			SER02
2004 09 04.95		S	9.5	TK	13.0	L	7	45	3	4			RES
2004 09 05.79		B	10.0	TJ	34.0	L	4	50	3	2			SIE
2004 09 05.81		B	9.7:	TJ	15.0	R	5	25	2	2			CHE03
2004 09 05.81		M	9.5	TK	6.0	B		20	5	2			BAR06
2004 09 05.82		S	9.6	TK	15.0	R	5	38	3.9	3			MEY
2004 09 05.82	x	S	9.8	TJ	10.0	B		25	3	3			PAR03
2004 09 05.87	x	B	10.3	TT	30	L	6	60	& 3	3/			FIL04
2004 09 05.87	x	S	10.1	TT	20	L	5	50	& 4	3			MAK02
2004 09 06.79		B	10.1	TJ	34.0	L	4	50	3	2			SIE
2004 09 06.81	x	S	9.8	TJ	10.0	B		25	3	3			PAR03
2004 09 06.81	x	S	10.2	TT	20	L	5	50	& 3	3/			MAK02
2004 09 06.82		B	10.0:	TJ	15.0	R	5	25	2	2			CHE03
2004 09 06.82		M	9.5	TK	20	L	5	70	7	3			BAR06
2004 09 06.82		S	9.6	TK	15.0	R	5	38	3.6	2/			MEY
2004 09 06.85	x	S	10.2	TT	30	L	6	60	& 3	3/			FIL04
2004 09 07.82		S	9.6	TK	15.0	R	5	38	3.4	2/			MEY
2004 09 07.84		B	10.1	TJ	34.0	L	4	50	3	2			SIE
2004 09 07.85		S	9.7	TK	25.4	J	6	58	3.3	3/			BOU
2004 09 07.86		M	9.7	TK	25.4	J	6	58	4	4			DIJ
2004 09 07.87		S	9.8	TT	20.0	L	4	42	& 4	3			SCH04
2004 09 07.88		S	9.3	TK	15.2	L	5	44	4.5	2			GRA04
2004 09 07.89		S	9.5:	TK	7.8	R	4	12	& 3	3			BUS01
2004 09 07.89		S	9.8	TK	30.5	T	10	56	& 4	2			COM
2004 09 08.80	x	S	9.9	TJ	10.0	B		25	3	3			PAR03
2004 09 08.81		S	9.6	TK	15.0	R	5	38	4.2	3			MEY
2004 09 08.82		B	9.6	TJ	15.0	R	5	25	2	3			CHE03
2004 09 08.84		S	9.4	TK	7.8	R	4	12	& 4	3			BUS01

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 08.88	x	S	10.1	TT	10.0	B		25	& 3	3/			FIL04
2004 09 08.89		M	9.7	TK	31.0	J	6	58	3	4			BOU
2004 09 08.89		M	9.7	TK	31.0	J	6	58	5.2	3/			DIJ
2004 09 08.89		S	10.0	TK	30.5	T	10	75	2.6	3			KAM01
2004 09 08.90	x	B	10.5	TK	10	M	10	35	3	2			DOR02
2004 09 09.78		B	10.1	TJ	34.0	L	4	50	3	2			SIE
2004 09 09.82		S	9.7	TJ	15.0	R	5	25	3	2			CHE03
2004 09 09.88	x	S	9.8	TT	20	L	5	50	4	3			POW01
2004 09 09.88	x	S	9.9	TT	20	L	5	50	& 4	3/			MAK02
2004 09 09.98		M	9.9	TK	20	L	5	70	4	3			BAR06
2004 09 10.65		S	10.2	TK	15	L	8	80	1.6	4			GRI01
2004 09 10.82	x	S	10.0	TT	10.0	B		25	3	3			PAR03
2004 09 10.82	x	S	10.0	TT	20	L	5	50	& 3	3			MAK02
2004 09 10.84	x	S	10.1	TT	20.0	L	4	89	2	s3			PAR03
2004 09 10.84	x	S	10.8:	TT	12	L	7	50	3	3			LEG
2004 09 10.85		S	10.1	TJ	34.0	L	4	50	3	1			SIE
2004 09 10.85	x	S	11.0	TT	20	L	5	30	3.7	3/			POW01
2004 09 10.85	x	S	11.1	TT	20	L	5	30	3	5			BUR04
2004 09 10.86	x	S	10.7	TT	30.0	L	6	60	& 3	3/			FIL04
2004 09 10.88	x	B	11.1	TK	10	M	10	35	3	3			DOR02
2004 09 10.99		M	9.9	TK	20	L	5	70	4	3			BAR06
2004 09 11.14		M	9.9	TJ	25.6	L	4	68	2.7	3			MOR
2004 09 11.77	xa	S	9.9	TJ	32.0	L	5	87	2.6	6			NAG08
2004 09 11.85		M	9.8	TK	36	L	6	80	4.8	d4			BAR06
2004 09 11.86		S	10.1	TJ	34.0	L	4	50	3	1			SIE
2004 09 11.86		S	10.4	TK	30.5	T	10	56		1/			COM
2004 09 11.88	x	S	10.7	TT	30.0	L	6	60	& 3	3/			FIL04
2004 09 13.79		S	9.6	TJ	15.0	R	5	25	4	2			CHE03
2004 09 13.79		S	10.4	TK	30	L	5	60	2.5	4			NEV
2004 09 13.82		S	10.2	TJ	34.0	L	4	50	4	1			SIE
2004 09 13.93		M	9.9	TK	36	L	6	80	5	3/			BAR06
2004 09 14.80		S	9.8	TJ	15.0	R	5	25	4	2			CHE03
2004 09 14.80	x	S	10.1	TT	10.0	B		25	3	3			PAR03
2004 09 14.80		S	10.2	TJ	34.0	L	4	50	4	1			SIE
2004 09 14.93		S	10.0	TK	25.4	J	6	58	2.8	3/			BOU
2004 09 15.10	x	S	10.3	TT	20	L	5	50	& 3	3			MAK02
2004 09 15.10	x	S	11.4	TT	20	L	5	50	3	3			POW01
2004 09 15.79	xa	S	10.2	TJ	32.0	L	5	58	2.3	5			NAG08
2004 09 15.80		M	10.0	TK	36	L	6	80	4.7	4			BAR06
2004 09 15.80		S	9.9	TK	15.0	R	5	38	3.6	2/			MEY
2004 09 15.80	x	S	10.0	TJ	31.7	L	6	63	2.5	4			MIY01
2004 09 15.86		S	10.0	TT	20.0	L	4	42	3	3			SCH04
2004 09 15.95		S	9.8	TK	15.2	L	5	38	5	1/			GRA04
2004 09 16.80		S	9.9	TK	15.0	R	5	38	3.3	2/			MEY
2004 09 16.80	x	S	10.2	TT	10.0	B		25	3	3			PAR03
2004 09 16.89	x	S	10.1	TT	30.0	L	6	60	& 4	3/			FIL04
2004 09 16.95		S	10.1	TK	20.3	T	10	77	3	4			GON05
2004 09 17.03	x	S	11.0	TT	20	L	5	50	3	3			POW01
2004 09 17.78		S	9.8	TK	30	L	5	60	2.2	4			NEV
2004 09 17.80		S	9.8	TJ	15.0	R	5	25	4	2			CHE03
2004 09 17.80		S	10.7	TJ	40.0	L	4	144	1.1	6			YOS04
2004 09 17.83	x	S	10.2	TT	10.0	B		25	3	3			PAR03
2004 09 17.84	x	S	10.3	TT	30.0	L	6	60	& 4	3/			FIL04
2004 09 17.89		S	10.3	TK	30.5	T	10	75	2.6	3			KAM01
2004 09 17.98		M	9.6	TK	36	L	6	80	5	3/			BAR06
2004 09 18.06		S	10.1	TK	13.0	L	7	45	2	4			RES
2004 09 18.81		S	9.9	TK	15.0	R	5	38	4.1	3			MEY
2004 09 18.84		B	10.2	TI	23.5	T	10	57	4	4			LAB02
2004 09 18.85		S	10.0:	TJ	28.0	T	10	75					CHE03
2004 09 18.86	x	S	10.2	TT	10.0	B		25	3	3			PAR03
2004 09 18.99		M	9.8	TK	36	L	6	80	4.5	4			BAR06
2004 09 19.05	x	S	9.7	TT	30.0	L	6	60	& 6	3			FIL04
2004 09 19.05	x	S	10.1	TT	20	L	5	50	& 6	3			MAK02

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 19.08		S	10.2	TK	13.0	L	7	45	2	3/			RES
2004 09 19.79		S	10.3	TJ	34.0	L	4	50	5	1			SIE
2004 09 19.82		S	10.0:	TK	7.8	R	4	12					BUS01
2004 09 19.83		S	10.2	TK	25.4	J	6	58	3.0	3/			BOU
2004 09 19.83		S	10.5	TK	25.4	J	6	58	3	3			DIJ
2004 09 19.85		S	9.9	TJ	15.0	R	5	25	3	2			CHE03
2004 09 19.93	x	S	11.0	TT	20	L	5	50	4.1	3			POW01
2004 09 19.94	x	S	11.4	TT	20	L	5	50	4.0	3			BUR04
2004 09 20.00	x	S	10.1	TT	20	L	5	50	& 2	3			MAK02
2004 09 20.08		M	10.7	TJ	41	L	4	89	3	4			SHU
2004 09 20.11	x	S	10.7	TT	30.0	L	6	105	& 2	3			FIL04
2004 09 21.85	x	S	10.7	TT	30.0	L	6	105	& 3	3/			FIL04
2004 09 21.86	x	S	10.4	TT	20	L	5	50	& 3	3			MAK02
2004 09 22.99		S	10.3:	TK	20	L	5	70	3	3			BAR06
2004 10 03.13		M	10.3	TJ	40.6	T	10	156	2.0	2/			MOR
2004 10 03.14		M	10.3	TJ	25.6	L	4	68	2.4	1/			MOR
2004 10 04.80		S	11.2	TK	30.5	T	10	75	1.4	2			KAM01
2004 10 04.82		S	10.6	TK	25.4	J	6	72	2.5	3			BOU
2004 10 05.76		S	10.1	TK	36	L	6	80	4.7	s3			BAR06
2004 10 05.80		S	10.6	TK	25.4	J	6	58	2.5	3			BOU
2004 10 05.86	x	S	11.7	TT	30.0	L	6	105	& 2	3			FIL04
2004 10 06.50	x	S	10.6	TK	25.4	L	4	46	2.5	3			YOS02
2004 10 06.75	x	S	10.8	TJ	25	L	6	108	3	2			SWI
2004 10 06.80		S	10.7	TK	31.0	J	6	72	3	2/			BOU
2004 10 06.80	x	S	10.7	TJ	31.7	L	6	63	2.5	3/			MIY01
2004 10 06.81		S	11.0:	TK	20.0	L	4	80	& 3	2			SCH04
2004 10 06.84		S	10.4	TK	20	L	5	70	3.5	2			BAR06
2004 10 06.85	x	S	10.9	TT	20	L	5	50	& 3	3			MAK02
2004 10 07.08	x	S	12.0	TT	30.0	L	6	105	& 1.5	3			FIL04
2004 10 07.89		S	10.7	TK	31.0	J	6	72	2.8	2/			BOU
2004 10 07.89		S	10.9	TK	31.0	J	6	72	2.2	2/			DIJ
2004 10 08.84		S	10.6	TK	31.0	J	6	72	2.0	2			DIJ
2004 10 08.85		S	10.8	TK	31.0	J	6	72	2.5	3			BOU
2004 10 09.82		S	10.7	TK	5.6	B		10	> 3	1/			BUS01
2004 10 09.86	x	S	11.3	TT	30.0	L	6	105	& 2	2			FIL04
2004 10 10.15		S	10.5	TJ	25.6	L	4	68	2.1	1/			MOR
2004 10 10.72	x	S	10.5	TJ	32.0	L	5	58	2.6	5			NAG08
2004 10 10.80		B	10.6	TI	10.2	T	5	20	4	4			LAB02
2004 10 10.82		S	10.7:	TK	5.6	B		10	> 2	1/			BUS01
2004 10 10.83	x	S	10.7	TT	10.0	B		25	2	3			PAR03
2004 10 10.84		S	10.6	TK	31.0	J	6	72	2.4	2/			DIJ
2004 10 10.84		S	10.8	TK	31.0	J	6	72	3	3			BOU
2004 10 10.93	x	S	11.5	TT	30.0	L	6	105	& 2.5	2			FIL04
2004 10 11.51	x	S	11.3	TK	25.4	L	4	46	2.5	3			YOS02
2004 10 11.80		S	10.8	TK	25.4	J	6	72	2.4	2/			BOU
2004 10 11.83	x	S	11.2	TT	30.0	L	6	105	& 2	3			FIL04
2004 10 12.01		B	10.6	TI	10.2	T	5	20	3	4			LAB02
2004 10 12.01		B	10.6	TI	10.2	T	5	20	3	4			LAB02
2004 10 12.05		S	10.9	TJ	15.0	R	5	25	2	1			CHE03
2004 10 12.09	x	S	12.1	HS	20	L	5	50	2.3	2			POW01
2004 10 12.13	x	S	10.8	TT	10.0	B		25	2	3			PAR03
2004 10 12.79		S	10.9	TK	31.0	J	6	72	2.3	2/			BOU
2004 10 12.80		S	10.8	TK	31.0	J	6	72	2	1/			DIJ
2004 10 12.83		S	11.2	TK	30.5	T	10	125	& 2	1			COM
2004 10 12.83		S	11.2	TK	30.5	T	10	125	& 2	1			COM
2004 10 12.91	x	S	11.4	TT	30.0	L	6	105	& 2	2/			FIL04
2004 10 13.06		S	10.8	TJ	15.0	R	5	25	3	1			CHE03
2004 10 13.82		S	10.6	TK	30	L	5	60	4	3			NEV
2004 10 13.88		S	11.5	TK	30.5	T	10	75	1.6	2			KAM01
2004 10 13.89	x	S	11.8	TT	30.0	L	6	105	& 2	2/			FIL04
2004 10 13.96		S	10.4	TK	36	L	6	80	3.5	3			BAR06
2004 10 14.11	x	S	11.5	TT	20	L	5	50	2.7	3			POW01
2004 10 14.78		S	10.7	TJ	15.0	R	5	25	3	1			CHE03

Comet C/2001 Q4 (NEAT) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 10 14.81	x	S	10.9:	HS	31.7	L	6	63	1.3	3			MIY01
2004 10 14.97		S	10.6:	TK	20	L	5	70	3	3			BAR06
2004 10 15.43		S	11.4	TJ	40.0	L	4	75	1.7	3/			YOS04
2004 10 15.63	x	S	10.9	TJ	32.0	L	5	58	2.1	4			NAG08
2004 10 15.89		S	10.8	TJ	15.0	R	5	25	3	1			CHE03
2004 10 16.50	x	S	11.2	TJ	32.0	L	5	87	2.2	2			NAG08
2004 10 16.79		S	10.8	TI	23.5	T	10	57	4	3	2 m		LAB02
2004 10 17.82	x	S	11.0	HS	31.7	L	6	63	1.4	3			MIY01
2004 10 18.91		S	11.6	TK	30.5	T	10	75	1.8	2			KAM01
2004 10 19.81		S	11.3	TK	31.0	J	6	89	2.0	2/			BOU
2004 10 21.94		S	11.4	TK	31.0	J	6	72	2.5	3			BOU

Comet C/2002 T7 (LINEAR)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2003 08 29.03	x	S	12.7:	HS	25	L	5	110	0.5	4			BOH02
2003 09 01.00	x	S	12.2	TT	20	L	5	110	0.5	5			POW01
2003 09 21.94	x	S	11.9	TT	20	L	5	110	0.7	4/			POW01
2003 09 22.10	x	S	12.0	TT	30	L	6	105	& 1	5			FIL04
2003 09 26.08	x	S	11.4	TT	20	L	5	50	0.8	5			POW01
2003 09 27.02	x	S	11.5	TJ	25	L	5	100	1.0	3			BOH02
2003 09 27.07	x	S	11.6	TT	20	L	5	50	0.9	5			POW01
2003 10 18.86	x	S	11.2	TT	20	L	5	50	0.7	5			POW01
2003 10 18.92	x	B	11.4	HS	50	L	5	100	& 0.7	S4/			PLE01
2003 10 18.94	x	S	11.5	HS	50	L	5	212	0.6	5			TUR01
2003 10 19.85	x	S	11.3	TJ	25	L	6	108	0.7	5			SWI
2003 10 19.94	x	S	11.1	TT	20	L	5	50	1	4			POW01
2003 10 19.94	x	S	11.4	HS	50	L	5	212	& 0.5	5			TUR01
2003 10 23.87	x	S	10.9	TT	20	L	5	50	1.0	5			POW01
2003 10 24.91	x	B	11.0	TJ	25	L	6	108	0.7	6			SWI
2003 10 24.93	x	B	11.2:	TJ	31.7	L	5	78	0.5	6			ADA02
2003 10 24.93	x	S	10.9	TT	20	L	5	50	1.2	5			POW01
2003 10 24.95	x	B	11.3	HS	50	L	5	100	0.8	5			TUR01
2003 10 24.96	x	B	11.4	HS	50	L	5	100	& 1	S5/			PLE01
2003 10 25.95	x	B	10.9	TJ	20	L	5	58	0.8	6			SWI
2003 10 26.94	x	B	11.3	TK	25	L	5	130	1.1	4/			BOH02
2003 10 27.84	x	S	10.9	TJ	35	L	6	105	& 0.5	d3			CHR
2003 10 27.95	x	B	11.0:	TK	25	L	5	100	& 1.1	3			BOH02
2003 10 28.92	x	B	10.1	TK	25	L	5	75	2.0	5			BOH02
2003 10 28.96	x	S	10.8	TT	20	L	5	50	1.5	5/			POW01
2003 10 28.97	x	S	10.9	TT	15	L	6	30	1.3	5			JAR02
2003 10 29.78	x	S	10.7	TJ	35	L	6	105	& 0.5	d3			CHR
2003 10 30.05	x	S	10.2	TT	20	L	5	50	1.6	5			POW01
2003 10 30.06	x	S	10.4	TT	15	L	5	50	2	5			JAR02
2003 11 03.94	x	B	10.5	TK	25	L	5	90	1.7	5			BOH02
2003 11 04.11	x	M	10.1	TJ	18.5	L	5	53	2	5			KWI
2003 11 12.64	x	S	10.9	TJ	35	L	6	105	& 0.5	d3			CHR
2003 11 12.70	x	S	10.0	TJ	20	L	5	58	1	6			SWI
2003 11 13.64	x	S	9.9	TJ	35	L	6	105	& 0.5	d3/			CHR
2003 11 16.97	x	B	10.3	TT	30	L	6	60	& 1	6	&0.1	120	FIL04
2003 11 20.72	x	S	10.5	TJ	35	L	6	105	& 3	d1			CHR
2003 11 21.74	x	S	9.7	TJ	35	L	6	105	& 0.5	d4			CHR
2003 11 24.67	x	B	9.7	TK	10	M	10	50	2	5			DOR02
2003 11 24.85	x	S	9.9	TT	20	L	6	56	1.5	d7			KIS03
2003 11 24.86	x	B	10.4	TT	20.5	L	6	56	1.5	D6			SIK01
2003 11 27.72	x	B	9.8	TK	10	M	10	50	2	6			DOR02
2003 11 27.77	x	M	9.3	TJ	18.5	L	5	53	2	6			KWI
2003 11 28.02	x	B	9.8	TT	20	L	6	56	1.5	d6/	& 2 m	90	KIS03
2003 11 28.85	x	S	9.6	TJ	25	L	5	88	1.5	6			KID01
2003 12 01.75	x	B	10.2	HS	50	L	5	100	1.6	6			TUR01
2003 12 01.98	x	M	8.6	TJ	18.5	L	5	53	2	6			KWI
2003 12 03.01	x	S	9.5	TK	10	M	10	50	3	6			DOR02
2003 12 10.71	x	B	9.8:	TT	20	L	5	50	1.5	5			POW01

Comet C/2002 T7 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2003 12 11.66	x	B	8.8	TJ	35	L	6	105	& 1	4			CHR
2003 12 11.67	x	B	9.2	TT	20	L	5	50	2.0	6			POW01
2003 12 12.73	x	S	9.8	TJ	25	L	5	66	1.5	5			KID01
2003 12 15.87	x	B	9.0	TT	20	L	5	50	2.4	6			POW01
2003 12 17.66	x	B	8.8	TJ	35	L	6	105	& 1	4			CHR
2003 12 19.68	x	B	8.8	TJ	35	L	6	105	& 1	4			CHR
2003 12 19.69	x	B	9.3	TK	25	L	5	90	2.7	4/			BOH02
2003 12 19.71	x	M	8.6	TJ	9	L	9	45	& 2.5	d6			KUS01
2003 12 19.79	x	S	9.3	TJ	25	L	5	66	2	5			KID01
2003 12 19.85	x	B	8.9	TT	20	L	5	30	3.2	6	0.07	85	POW01
2003 12 19.85	x	S	8.5	TT	6.6	B		20	& 4	4/			FIL04
2003 12 19.87	x	B	8.3	TT	7.0	B		20	& 6	5/			MAK02
2003 12 19.87	x	B	8.7	TT	32	L	8	50	& 4	5/	0.09	101	MAK02
2003 12 19.98	x	B	9.3	TT	20	L	6	57	1.5	d5/			KIS03
2003 12 20.97	x	S	8.7	TT	6.6	B		20	& 5	4			FIL04
2003 12 22.74	x	S	8.5	TT	6.6	B		20	& 7	4/			FIL04
2003 12 23.69	x	S	9.0:	TT	6.7	B		20	& 3	3/			SCI
2003 12 23.82	x	B	9.2	TT	11.0	L	8	32	3.5	6	0.06	80	BUR04
2003 12 23.84	x	M	8.5	TJ	18.5	L	5	53	2	6/	12 m	70	KWI
2003 12 24.70	x	S	8.6	TT	6.7	B		20	& 3	3/			SCI
2003 12 24.75	x	B	8.9	TJ	25	L	6	108	1.5	6			SWI
2003 12 24.78	x	B	8.9	TT	20	L	5	30	3.1	5	0.10	70	POW01
2003 12 24.81	x	S	8.2	TT	6.6	B		20	& 6	4/			FIL04
2003 12 24.92	x	B	9.3	HS	50	L	5	100	2	5	0.07	78	TUR01
2003 12 25.70	x	S	8.9	TT	6.7	B		20	& 3	3/			SCI
2003 12 25.72	x	B	8.7	TJ	20	L	5	58	2	6			SWI
2003 12 25.73	x	B	9.7	HS	50	L	5	100	1.5	d4/	0.08	78	TUR01
2003 12 25.74	x	B	8.3	TJ	9	L	9	45	& 2	d8			KUS01
2003 12 25.74	x	S	9.2:	TJ	31.7	L	5	78	& 1.5	4	0.1	80	ADA02
2003 12 26.90	x	B	8.4	TJ	9	L	9	45	& 2	s7/			KUS01
2003 12 28.71	x	B	8.4	TJ	9	L	9	45	& 2.5	d7			KUS01
2004 01 03.81	x	S	9.0:	TT	20	L	5	50	& 2	5			POW01
2004 01 08.77	x	S	8.6	TT	30	L	6	60	& 4	5			FIL04
2004 01 11.71	x	B	8.4	TJ	9	L	9	45	& 3	D6			KUS01
2004 01 11.81	x	S	7.8	TT	6.6	B		20	& 6	4			FIL04
2004 01 12.69	x	S	8.3	TT	6.7	B		20	& 5	4/			SCI
2004 01 15.75	x	B	8.2	TK	5.0	B		20	& 6	3			DOR02
2004 01 18.70	x	S	8.5	TJ	6.0	B		20	3	3			MAR12
2004 01 18.77	x	B	8.0	TK	10	M	10	50	4	4			DOR02
2004 01 18.85	x	S	8.6	TJ	25	L	5	66	4	5			KID01
2004 01 21.80	x	S	7.4	TT	5	R	6	20	10	s4/	0.31	71	GRA09
2004 01 22.77	x	B	8.2	TK	5.0	B		20	& 8	4			DOR02
2004 01 22.77	x	S	8.3	TJ	6.0	B		20	4	s3			MAR12
2004 01 23.73	x	S	8.0	TJ	8.0	B		20	7	s3			SPE01
2004 01 23.73	xw	S	8.2	TT	6.0	B		20	6	d3			MOZ
2004 01 24.71	x	B	8.8	TT	20	L	5	50	3	4			POW01
2004 01 24.73	x	S	8.0	TJ	8.0	B		20	5	s2/			SPE01
2004 01 25.71	x	B	8.7	TT	20	L	5	50	3	3/			POW01
2004 01 25.74	x	S	8.1	TJ	8.0	B		20	5.5	s3			SPE01
2004 01 26.04		B	6.8	AC	4.2	B		8	8	5			NOW
2004 01 26.78	x	M	8.2	TJ	15.0	L	5	44	4.3	s3			SPE01
2004 02 02.72	x	S	7.8	TT	6.7	B		20	& 4	4			SCI
2004 02 07.71	x	S	7.7	TJ	6.0	B		20	4	3			MAR12
2004 02 07.72	x	B	7.8	TJ	35	L	6	105		D4			CHR
2004 02 07.74	x	B	7.9	TT	6.6	B		20	& 5	6	&0.1	60	FIL04
2004 02 07.74	x	B	8.0	TJ	14	L	6	47	& 5	4			ADA02
2004 02 07.75	x	S	7.6	TT	6.0	B		20	& 4	4			SCI
2004 02 07.78	x	S	7.3	TJ	18.5	L	5	53	4	4	15 m	63	KWI
2004 02 08.66	x	B	8.2	TK	5.0	B		20	6	5			DOR02
2004 02 08.74	x	M	6.9	TJ	5.0	B		7	& 5	D5/			KUS01
2004 02 08.76	x	S	8.0:	TT	6.7	B		20	& 4	3/			SCI
2004 02 11.71	x	B	7.9	TT	20	L	5	30	3	4			POW01
2004 02 11.73	x	S	7.6	TT	6.0	B		20	& 5	3/			SCI

Comet C/2002 T7 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 02 11.73	x	S	8.0	TJ	6.0	B		20	4	s3/			MAR12
2004 02 11.74	x	B	8.0	TK	5.0	B		20	5	5			DOR02
2004 02 11.75	x	S	7.8	TJ	6.0	B		20	& 5	3			SIW
2004 02 11.78	x&	B	7.9	TJ	5.0	B		12	5	s4/			JAR01
2004 02 12.00		B	6.3	AC	10.0	B		20	7	4			NOW
2004 02 12.70	x	B	7.6	TJ	35	L	6	105	& 2	D4	& 3 m		CHR
2004 02 12.71	x	B	7.8	TK	5.0	B		20	5	5			DOR02
2004 02 12.74	x	B	7.9	TJ	5.0	B		12	6	s4/			JAR01
2004 02 12.75	x	S	7.6	TT	6.0	B		20	& 5	3			SCI
2004 02 16.01		B	6.4	AC	8.0	B		15	8	4			NOW
2004 02 19.72	x	B	7.8	TT	20	L	5	30	3	5			POW01
2004 02 19.73	x	B	7.6	TK	5.0	B		20	5	6			DOR02
2004 02 19.75	x	S	7.7	TJ	6.0	B		20	5	3			SIW
2004 02 19.77	x&	B	7.7	TJ	5.0	B		12	6	d5			JAR01
2004 02 20.71	x	B	7.3	TJ	35	L	6	105	& 2	D4	& 5 m		CHR
2004 02 20.72	x	B	7.5	TK	5.0	B		20	4	6			DOR02
2004 02 20.73	x	S	7.6	TJ	20	L	5	58	4	5			SWI
2004 02 20.73	x	S	7.7	TT	6.0	B		20	& 3	4			SCI
2004 02 20.74	x	S	7.0:	TT	5.0	B		20	& 4	d2/			MOZ
2004 02 20.75	x	M	6.9	TJ	5.0	B		7	& 4.5	D4/			KUS01
2004 02 20.75	x	M	7.6	TJ	8.0	B		20	9	s4			SPE01
2004 02 20.75	x&	B	7.5	TJ	5.0	B		12	5	D5			JAR01
2004 02 20.75	x&	S	7.5	TJ	6.0	B		20	4	s3			MAR12
2004 02 20.76	x	B	7.5	TT	11	L	7	34	5	d3			SLO01
2004 02 20.76	x	B	7.5	TT	11	L	7	34	5	d3			KIE
2004 02 20.76	x	S	7.2	TT	5	R	6	20	4	4			GRA09
2004 02 20.77	x&	S	7.9:	TT	6.6	B		20	& 4	5	&0.25	52	FIL04
2004 02 20.78	x&	S	6.9	TJ	6.0	B		20	5	s2			MAR13
2004 02 21.70	x	B	7.2	TJ	35	L	6	105	& 2	D4	& 7 m		CHR
2004 02 21.73	x	B	7.7	TT	20	L	5	30	4	4/			POW01
2004 02 21.73	x	S	6.7	TJ	5.0	B		7	6	s3			PAR03
2004 02 21.73	x	S	7.5	TT	6.0	B		20	& 5	4/			SCI
2004 02 21.74	x	B	6.8	TT	6.0	B		20	4	d2/			MOZ
2004 02 21.74	x	S	6.8	TJ	6.0	B		20	5	s3			PAR03
2004 02 21.74	x	S	7.0	TT	5	R	6	20	8	3	&0.24	50	GRA09
2004 02 21.74	x	S	7.2	TJ	6.0	B		20	& 3	3			BAN01
2004 02 21.75	x	B	6.7	TJ	6.3	B		9	8	3			SZW
2004 02 21.75	x&	S	7.5	TJ	6.0	B		20	4	s3	0.06	50	MAR12
2004 02 21.77	x&	B	7.6	TT	11	L	7	34	& 4	s4			SLO01
2004 02 24.78	x	B	7.4	TJ	6.3	B		9	4	3			SZW
2004 02 27.73	x	B	7.3:	TK	10	M	10	45	& 5	5			DOR02
2004 03 05.75	xw	S	6.4:	TT	6.0	B		20	& 5	3			SCI
2004 03 06.74	x	B	7.0:	TT	20	L	5	50	& 4	4			POW01
2004 03 06.74	x&	S	6.0:	TT	6.6	B		20	& 5	5			FIL04
2004 04 23.79	x$	S	4.6	TJ	7.0	B		10		6			MOM
2004 04 24.78	x$	S	4.7	TJ	4.0	B		8		6			MOM
2004 04 27.79	x$	M	4.2	TJ	3.5	B		7	5	8	&1	260	NAG08
2004 04 27.80	x$	M	4.1:	TK	3.5	B		7		6			YOS02
2004 04 28.78	x$	M	4.1	TJ	3.5	B		7	6	8			NAG08
2004 04 28.80	x$	M	4.3	TK	3.5	B		7		6/			YOS02
2004 05 07.83		I	3.6	TK	0.7	E		1		6			MAT08
2004 05 14.83		I	2.6:	TK	0.7	E		1	25	6	>4	213	MAT08
2004 05 18.38		I	2.5	TK	0.7	E		1	30	5	>2	162	MAT08
2004 05 19.38		I	2.8	TK	0.7	E		1	30	5			MAT08
2004 05 22.69	x	M	3.7:	HI	4.0	B		8		6	5	120	VAN15
2004 05 23.68		S	3.2	AA	5.0	B		10	11	6	0.5	144	COO02
2004 05 23.69	x	M	3.3	HI	4.0	B		8		6			VAN15
2004 05 23.70		M	3.0	AA	5.0	B		7	15	8	3.5	137	BEG01
2004 05 23.70		M	3.0	AA	5.0	B		10	18	7	2	130	PRI04
2004 05 23.70	x	M	3.4	TK	5.0	B		12	23	7	2.2	152	PEN02
2004 05 24.69	x	M	3.4	HI	4.0	B		8		6/			VAN15
2004 05 24.70		M	3.0	AA	5.0	B		10	15	7	1.5	140	PRI04
2004 05 24.70	x	M	3.2	TK	5.0	B		12		7	2.2	125	PEN02

Comet C/2002 T7 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 24.72		M	3.3	AA	5.0	B		7	14	7	3.6	125	BEG01
2004 05 25.68	x	M	3.4	HI	4.0	B		8		6			VAN15
2004 05 25.72		M	3.5	AA	5.0	B		7	17	7	3.5	128	BEG01
2004 05 26.71		M	3.8	AA	5.0	B		7	9	7	1.9	118	BEG01
2004 05 26.76		M	3.3	AA	5.0	B		10	10	7	1.2	125	PRI04
2004 05 27.69		S	4.2	AA	5.0	B		10	9	6	0.4	123	COO02
2004 05 29.69	x	M	4.4	HI	4.0	B		8					VAN15
2004 05 29.70		S	4.6	AA	5.0	B		10	6	6/	0.4	132	COO02
2004 05 29.71		M	4.2:	AA	5.0	B		10	12	7	25 m	120	PRI04
2004 05 30.69	x	M	4.5	HI	4.0	B		8					VAN15
2004 05 31.73	x	M	4.5	HI	4.0	B		8		5			VAN15
2004 06 01.69		M	5.0:	AA	5.0	B		10	6	6	30 m	120	PRI04
2004 06 02.69	x	S	4.8	HI	4.0	B		8					VAN15
2004 06 03.68		M	5.4:	AA	5.0	B		10	8	6	30 m	120	PRI04
2004 06 04.68		M	6.1	AA	5.0	B		10	8	4			PRI04
2004 06 04.68		S	5.4	AA	5.0	B		10	6	5			COO02
2004 06 05.09		B	5.7	AC	6.3	B		12	8	5			NOW
2004 06 05.70		S	5.5	AA	5.0	B		10	6	5/	20 m	161	COO02
2004 06 05.70	x	S	6.2	TI	6.3	B		9	8				SZW
2004 06 05.72	x	S	5.4:	TK	4.0	B		8					VAN15
2004 06 06.68		M	6.1	AA	5.0	B		10	8	4			PRI04
2004 06 06.70		S	5.6	AA	5.0	B		10	7	6	20 m	160	COO02
2004 06 06.72		M	6.0	AA	5.0	B		7	6	6	30 m	126	BEG01
2004 06 07.72		M	6.0	AA	5.0	B		7	6	6	30 m	126	BEG01
2004 06 08.72		M	6.3	AA	5.0	B		7	7	5	30 m	130	BEG01
2004 06 09.69		S	6.4	AA	11.2	L	8	50	4	6	45 m	125	COO02
2004 06 11.70	x	M	6.3	TK	4.0	B		8	6	5	0.5	125	VAN15
2004 06 13.72	x	S	6.3	TK	4.0	B		8					VAN15
2004 06 14.72		M	6.7	AA	5.0	B		7	7	6	40 m	118	BEG01
2004 06 14.72	x	S	6.4	TK	4.0	B		8					VAN15
2004 06 15.72		M	6.7	AA	5.0	B		7	8	5	35 m	120	BEG01
2004 06 17.72	x	S	6.7	TK	4.0	B		8					VAN15
2004 06 20.73		S	7.5	AA	5.0	B		7	12	3			BEG01
2004 06 22.68		S	7.8	S	20.0	L	8	89	2.5	2/			COO02
2004 07 03.68		S	9.0	AC	20.0	L	8	89		2			COO02
2004 07 05.51	x	S	9.6	TT	20	L		45	2.3	3			PEA
2004 07 07.70		S	9.2	AC	20.0	L	8	89	2	2			COO02
2004 07 12.51	x	S	9.8	TT	20	L		45	3.5	2			PEA
2004 07 13.69		S	9.4	AC	40.0	L	4	90	2	1			COO02
2004 07 14.48	x	S	9.7	TT	20	L		45	2.5	2			PEA
2004 07 14.74		S	9.0	AA	6.0	B		15	2	2			BEG01
2004 07 15.49	x	S	9.8	TT	20	L		45	2.5	2			PEA
2004 07 17.49	x	S	9.8	TT	20	L		45	2.3	1/			PEA

Comet C/2003 K4 (LINEAR)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 03 23.10	x	S	11.8	TT	30	L	6	105	0.7	5			FIL04
2004 04 01.09	x	S	11.0	TT	20	L	5	110	0.5	6			POW01
2004 04 02.09	x	S	11.1	TT	20	L	5	80	0.5	6			POW01
2004 04 15.08	x	S	11.9	TK	25	L	5	150	0.7	4			BOH02
2004 04 16.09	x	S	11.3	TK	25	L	5	150	0.9	5			BOH02
2004 04 16.09	x	S	11.5	TT	30	L	6	105	& 1	6/			FIL04
2004 04 16.09	x	S	12.6	TT	50	L	5	212	& 1	2			TUR01
2004 04 23.06	x	S	10.8	TT	20	L	5	50	1	4			POW01
2004 04 26.07	x	S	11.4	TK	25	L	5	150	0.6	4			BOH02
2004 04 27.04	x	S	10.9	TT	20	L	5	50	1.8	4			POW01
2004 04 27.77	x	S	11.0	TJ	32.0	L	5	87	0.7	7			NAG08
2004 04 27.78	x	M	11.6	TK	25.4	L	4	113	0.8	6			YOS02
2004 04 28.75	x	M	11.3	TK	25.4	L	4	113	0.8	6			YOS02
2004 04 29.73		S	11.1	TJ	40.0	L	4	144	1.1	7			YOS04
2004 04 30.03	x	S	11.5	TK	25	L	5	125	1.0	4			BOH02
2004 05 09.91	x	S	11.3	TT	30	L	6	72	0.7	5			FIL04

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 12.88	x	S	11.3	TT	20	L	8	120	1	d5			PAC03
2004 05 13.91		M	10.5	TJ	41	L	4	150	1.5	4			SHU
2004 05 14.03	x	S	11.3	TT	20	L	8	120	& 1	4			PAC03
2004 05 16.93	x	S	10.3	TT	20	L	5	50	1.4	3			POW01
2004 05 16.93	x	S	10.4	TJ	20	L	5	50	1.2	3/			BUR04
2004 05 17.03	x	S	10.0	TT	30	L	6	60	& 1.5	4			FIL04
2004 05 19.88	x	S	10.9	TT	20	L	4	45	1.8	4			PEA
2004 05 19.90	x	S	10.2	TT	30.0	L	6	105	& 1.5	4/			FIL04
2004 05 20.96	x	B	9.9	TK	25	L	5	94	1.7	4			BOH02
2004 05 22.92	x	S	10.3	TT	15	L	6	45	2	3/			SIE01
2004 05 23.89	x	S	10.0	TT	30.0	L	6	60	& 2	4/			FIL04
2004 05 23.90	x	S	9.8	TT	15	L	6	50	& 3	4/			MAK02
2004 05 24.84	x	S	10.3	TJ	35	L		105	& 1	d2			CHR
2004 05 24.89	x	S	9.8	TT	15	L	6	50	& 3	5			MAK02
2004 05 24.90	x	S	9.7	TT	30	L	6	60	& 3	4			FIL04
2004 05 24.95	x	B	10.0	TK	25	L	5	94	1.8	s5			BOH02
2004 05 26.94	x	B	9.8	TK	25	L	5	94	2.8	d5			BOH02
2004 05 27.93	x	B	10.0	TT	30	L	6	60	& 2	4			FIL04
2004 05 27.94	x	B	9.7	TK	25	L	5	94	2.9	d4/			BOH02
2004 05 28.97	x	B	9.8:	TK	25	L	5	94	2.5	3			BOH02
2004 05 30.00	x	B	9.7	TK	25	L	5	94	2.9	4			BOH02
2004 05 30.06	x	S	10.1	TK	20.3	L	5	100	2	1			VAN15
2004 05 30.93	x	S	9.5	TT	30	L	6	105	& 1.5	4			FIL04
2004 05 30.94	x	B	9.6	TK	25	L	5	94	4.0	d4/			BOH02
2004 05 31.09	x	S	10.1	TK	20.3	L	5	100	1	1			VAN15
2004 05 31.90	x	S	9.9	TT	30	L	6	105	& 1.5	d4			FIL04
2004 06 03.89	x	S	10.1	TT	30	L	6	105	& 1	d3/			FIL04
2004 06 06.84	x	S	10.0	TJ	35	L		105	& 1	d2			CHR
2004 06 07.90	x	B	9.5:	TK	5.0	B		20	& 4	3			DOR02
2004 06 09.84	x	S	10.0	TJ	35	L		105	& 1	d3			CHR
2004 06 11.88	x	B	8.6	TK	5.0	B		20	8	3			DOR02
2004 06 13.83	x	S	9.6	TJ	35	L		105	& 1	d3			CHR
2004 06 13.88	x	B	8.9	TK	25	L	5	94	4.0	s5/			BOH02
2004 06 13.90	x	B	9.0:	TK	5.0	B		20	3	3			DOR02
2004 06 13.91	x	S	10.0	TT	20	L	5	50	1.5	3			POW01
2004 06 13.93	x	B	8.7	TT	6.6	B		20	& 2	5			FIL04
2004 06 16.92	x	B	8.8	TK	5.0	B		20	3	3			DOR02
2004 06 17.91	x	B	8.8	TT	6.0	B		20	& 4	5			SCI
2004 06 17.93	x	B	8.5	TT	6.6	B		20	& 7	5			FIL04
2004 06 18.02	x	B	8.2:	TJ	6.0	B		20	& 5	1/			BAN01
2004 06 19.92	x	B	8.6	TK	5.0	B		7	4	3			DOR02
2004 06 19.93	x	S	9.3	TK	20.3	L	5	40		1			VAN15
2004 06 21.91	x	B	8.5	TT	6.0	B		20	& 4	5			SCI
2004 06 21.92	x	B	8.6	TK	5.0	B		7	6	3			DOR02
2004 06 21.92	x	B	8.6	TT	6.6	B		20	& 8	5			FIL04
2004 06 22.92	x	B	8.7	TK	5.0	B		20	7	3			DOR02
2004 06 22.98	x	M	9.0	TT	30	L	4	47	& 5	s4			GRA09
2004 06 23.86	x	B	8.4	TJ	35	L		105	& 1.5	D5	& 3	m	CHR
2004 06 23.92	x	B	8.5	TT	5.0	B		10	& 6	3/			MAK02
2004 06 23.92	x	B	8.7	TK	5.0	B		20	7	3			DOR02
2004 06 24.93	x	B	8.3	TT	5.0	B		10	& 5	3/			MAK02
2004 06 24.93	x	B	8.3	TT	6.0	B		20	& 5	5			SCI
2004 06 24.93	x	B	8.6	TK	5.0	B		20	7	3			DOR02
2004 06 24.95	x	B	8.2	TT	6.6	B		20	&10	5			FIL04
2004 06 25.92	x	B	8.0:	TT	6.6	B		20	&10	5			FIL04
2004 06 26.93	x	B	8.4	TT	5.0	B		10	& 5	4			MAK02
2004 06 26.94	x	S	8.5:	TT	6.0	B		20	& 6	4/			SCI
2004 06 26.98	x	B	8.2:	TJ	6.0	B		20	& 6	2/			BAN01
2004 06 27.93	x	B	8.4	TK	5.0	B		7	8	4			DOR02
2004 06 28.93	x	B	8.2	TK	5.0	B		20	10	3			DOR02
2004 06 28.97	x	S	8.0	TT	6.0	B		20	& 8	4/			SCI
2004 06 29.89	x	S	8.0	TT	6.0	B		20	& 8	4/			SCI
2004 06 29.93	x	B	8.3	TK	5.0	B		20	10	3			DOR02

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 30.93	x	B	8.4	TK	5.0	B		20	10	3			DOR02
2004 07 01.50	x	S	7.7	HV	8.0	B		11	10	4/			MIY01
2004 07 02.91	x	S	7.8	TT	6.0	B		20	&10	4/			SCI
2004 07 03.90	x	S	8.0	TT	6.6	B		20	& 8	5			FIL04
2004 07 03.90	x	S	8.1	TT	6.0	B		20	& 8	4			SCI
2004 07 04.77		S	7.3	HV	6	R	10	30	3.2	2			SEM02
2004 07 04.90	x	B	8.2	TK	5.0	B		20	10	3			DOR02
2004 07 05.56	x	S	7.4	TT	8.0	B		20	8	2			PEA
2004 07 05.90		S	7.7	TT	8.0	B		15	&18	5			SCH04
2004 07 05.91	x	S	7.5:	TJ	6.0	B		20	5	s3			MAR12
2004 07 05.92	x	B	7.6	TT	5.0	B		10	& 5	3/			MAK02
2004 07 05.92	x	B	8.0	TK	5.0	B		20	8	4			DOR02
2004 07 05.94	x	S	7.6	TT	6.0	B		20	&10	4			SCI
2004 07 05.96	x	S	7.8	TT	6.6	B		20	& 9	5			FIL04
2004 07 06.90	x	B	7.5	TJ	6.0	B		20	7	3			MAR12
2004 07 06.91	x	B	7.6	TT	5.0	B		10	& 6	4/			MAK02
2004 07 06.91	x	B	7.8	TK	5.0	B		20	8	5			DOR02
2004 07 06.92	x	S	7.8	TT	6.0	B		20	& 7	4/			SCI
2004 07 07.51	x	S	7.3	HV	8.0	B		11	8	5			MIY01
2004 07 07.81		E	7.0	TK	11.5	L	9	108	6	d3			KOV01
2004 07 07.84	x	B	8.0	TJ	35	L		105	& 2	D5	15	m	CHR
2004 07 07.89	x	B	7.0	TJ	20	L	5	58	6	5			SWI
2004 07 07.90	x	B	7.5	TJ	6.0	B		20	6	3			MAR12
2004 07 07.91	x	B	7.8	TK	5.0	B		20	8	5			DOR02
2004 07 07.94	x	S	7.8:	TT	6.0	B		20	& 5	4/			SCI
2004 07 08.01	x	S	7.9:	TJ	6.0	B		20	& 6	2			BAN01
2004 07 08.91	x	B	7.8	TT	5.0	B		10	& 7	4/			MAK02
2004 07 09.90	x	B	7.7	TT	6.0	B		20	& 8	4/			SCI
2004 07 09.93		S	7.4	TT	4.0	B		8	16	6			SCH04
2004 07 10.92	x	M	8.0:	TT	6.0	B		20	6	5			LEG
2004 07 10.92		S	7.4	TT	4.0	B		8	16	6			SCH04
2004 07 10.94	x	S	7.7	TT	6.0	B		20	& 8	4/			SCI
2004 07 11.54	x	S	7.2	HV	5.0	B		7	10	5			MIY01
2004 07 11.77		S	7.2	HV	6	R	10	30	3.2	3			SEM02
2004 07 11.99	x	B	7.3	TJ	8.0	B		20	&12	s4			SPE01
2004 07 12.56	x	S	7.3	TT	8.0	B		20	8	3			PEA
2004 07 12.92	x	B	7.4	TT	5.0	B		7	&22	5/			FIL04
2004 07 13.01	x	B	7.3:	TJ	6.0	B		20	& 5	2/			BAN01
2004 07 13.73		M	6.8	AA	6.0	B		15	11	5	30	m 121	BEG01
2004 07 13.86		M	7.2	TJ	11	L	7	40	4	6			SHU
2004 07 13.92	x	B	7.7	TT	5.0	B		10	& 9	4/			MAK02
2004 07 13.93	x	B	7.5	TT	6.0	B		20	&10	4			SCI
2004 07 14.55	x	S	7.3	TT	8.0	B		20	6	3			PEA
2004 07 14.72		M	6.9	AA	6.0	B		15	15	5	30	m 120	BEG01
2004 07 14.87	x	S	7.6	TJ	6.0	B		20	10	2/			MAR12
2004 07 14.92	x	B	7.5	TT	5.0	B		10	& 8	4/			MAK02
2004 07 14.92	x	B	7.5	TT	6.0	B		20	&10	4			SCI
2004 07 14.92	x	B	7.8	TT	20	L	5	50	& 5	4/			MAK02
2004 07 15.56	x	S	7.2	TT	8.0	B		20	8	3			PEA
2004 07 15.77		S	7.5	HV	6	R	10	30	3.1	2			SEM02
2004 07 15.87		B	6.9	TJ	8.0	R	4	18	9	3			CHE03
2004 07 16.50	x	M	7.6	TT	12.5	L	6	31	8	5			TSU02
2004 07 16.80		M	6.2	HD	15	L	10	75	6	4	0.25		KOZ02
2004 07 16.90	x	B	8.0	TT	20	L	5	50	& 4	5			MAK02
2004 07 16.91	x	B	7.7	TT	5.0	B		10	& 6	5			MAK02
2004 07 16.92		M	7.0	TK	10.0	B		20	9	5	0.2	105	MEY
2004 07 16.98		S	6.9	TK	15.2	L	5	38	7	3/			GRA04
2004 07 16.99		S	7.0	TT	5.0	B		10	&12	4			SCH04
2004 07 17.54	x	S	7.2	TT	8.0	B		20	9	3			PEA
2004 07 17.72		M	7.2	AA	6.0	B		15	11	5	50	m 124	BEG01
2004 07 17.84		B	7.2	TJ	8.0	R	4	18	8	3			CHE03
2004 07 17.88	x	B	8.0	TT	20	L	5	50	3.3	5			POW01
2004 07 17.88	x	M	8.6	TT	6.0	B		20	7	2/			LEG

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 17.89	x	S	7.4	TJ	6.0	B		20	6	s2/			MAR12
2004 07 17.90	x	B	7.4	TT	5.0	B		7	&10	5			FIL04
2004 07 17.90	x	B	7.8	TT	5.0	B		10	& 6	4/			MAK02
2004 07 17.91	x	B	7.3	TJ	5.0	B		7	& 9	s3			SPE01
2004 07 17.92	x	B	7.6	TT	6.0	B		20	&10	4	&0.6	64	SCI
2004 07 17.93	x	S	6.6	TT	5.0	B		10	7	3			JAN06
2004 07 18.73		M	7.1	AA	6.0	B		15	12	5	35 m	125	BEG01
2004 07 18.76		S	7.5	HV	6	R	10	30	6.5	3			SEM02
2004 07 18.87		B	7.2	TJ	8.0	R	4	18	9	3			CHE03
2004 07 18.88	x	B	7.6	TT	6.0	B		20	&10	4	&1.6	66	SCI
2004 07 18.88	x	B	7.8	TT	5.0	B		10	& 8	4	&1.0	107	MAK02
2004 07 19.54	x	S	7.3	TT	8.0	B		20	7.5	4			PEA
2004 07 19.54	x	S	7.6	HV	5.0	B		7	13	5			MIY01
2004 07 19.72		M	7.2	AA	6.0	B		15	10	5	32 m	123	BEG01
2004 07 19.88		B	7.3	TJ	8.0	R	4	18	7	3			CHE03
2004 07 19.88	x	B	7.7	TT	5.0	B		10	& 7	4/	&1.0	99	MAK02
2004 07 19.89	x	B	7.3	TT	6.6	B		20	& 7	5/	&0.17	115	FIL04
2004 07 19.89		M	6.4	HD	11	B		20	7	5	0.2	95	NEV
2004 07 20.90	x	B	7.0	TT	6.0	B		30	15	4			POW01
2004 07 20.90	x	B	7.4	TT	5.0	B		10	& 9	4/	&1.5	115	MAK02
2004 07 20.91	x	M	6.6	TJ	6.0	B		20	10	s5			PAR03
2004 07 20.92	x	B	7.1	TT	6.6	B		20	&11	5/			FIL04
2004 07 20.92	x	B	7.2:	TT	5.0	B		10	&11	5			JAN06
2004 07 20.92	x	B	7.6	TT	5.0	B		10	& 4	5	&0.5	111	MAK02
2004 07 20.93		S	6.8	TT	5.0	B		10	&14	6			SCH04
2004 07 20.93	x	S	7.2:	TJ	6.0	B		20	& 6	3			BAN01
2004 07 20.97		S	6.7	TK	15.2	L	5	38	6	4			GRA04
2004 07 21.88	x	B	7.6	TT	6.0	B		20	&10	3/			SCI
2004 07 21.90	x	B	7.9	TT	5.0	B		10	& 8	5/	&1.0	110	MAK02
2004 07 21.90	x	B	7.9	TT	6.6	B		20	& 8	6	&0.3	115	FIL04
2004 07 21.91	x	B	7.6	TJ	8.0	B		20	& 8	s3			SPE01
2004 07 21.91	x	B	8.1	TT	5.0	B		10	& 4	5	&0.4	107	MAK02
2004 07 22.03	x	B	7.8	TT	22.5	L	7	111	4	s5/	0.12	90	MOZ
2004 07 22.84	x	B	7.0	TJ	35	L	6	105	& 3	D5			CHR
2004 07 22.84	x	B	7.0	TJ	35	L	6	105	& 3	D5			CHR
2004 07 22.88	x	B	7.8	TT	6.6	B		20	&10	6	&0.22	95	FIL04
2004 07 22.89	x	B	7.2	TT	6.0	B		30	13	3			POW01
2004 07 22.89	x	B	7.8:	TT	6.0	B		20	& 6	5			SCI
2004 07 23.88	x	B	6.9	TT	6.0	B		30	&15	4			POW01
2004 07 23.88	x	S	7.2	TJ	6.0	B		20	6	2/			MAR12
2004 07 23.90		M	6.3	HD	11	B		20	7	4/			NEV
2004 07 23.92		S	6.7	TT	5.0	B		10	&12	4			SCH04
2004 07 24.82	x	B	6.8	TJ	6.0	B		20	& 3	D5			CHR
2004 07 24.82	x	B	6.8	TJ	6.0	B		20	& 3	D5			CHR
2004 07 24.86	x	B	7.9	TI	8	L	7	21	8	5			OZI
2004 07 24.90	x	B	7.2	TT	6.0	B		30	18	4			POW01
2004 07 24.91		M	7.0	TK	10.0	B		20	7	5			MEY
2004 07 24.92	x	B	7.3	TK	5.0	B		20	8	5	0.1	92	DOR02
2004 07 24.95	x	B	7.6	TT	8.0	B		20	5	S4			KIS03
2004 07 25.89	x	B	7.3	TT	6.0	B		30	16	5			BUR04
2004 07 25.91	x	B	7.9	TT	5.0	B		10	& 6	4/			MAK02
2004 07 25.92	x	B	7.1	TT	6.0	B		30	16	4			POW01
2004 07 25.92	x	B	7.6	TT	6.6	B		20	&10	5/	&0.42	90	FIL04
2004 07 25.94	x	S	7.1:	TT	5.0	B		10	& 7	4			JAN06
2004 07 25.97		S	6.7	TK	7.0	R	7	24	6	4			GRA04
2004 07 26.89		M	6.4	HD	11	B		20	8	5			NEV
2004 07 26.93		S	6.5	TT	4.0	B		8	14	5	0.2	105	RIE
2004 07 26.94		S	6.8	TT	5.0	B		10	&18	4/			SCH04
2004 07 26.97		M	6.8	TK	15.2	L	5	29	7	4			GRA04
2004 07 27.27		S	6.5	TK	5.0	B		10	11	3			SHA02
2004 07 27.95		M	6.8	TK	15.2	L	5	29	6	4/			GRA04
2004 07 28.90	x	B	7.3	TI	10	R	7	25	3	4			SZW
2004 07 29.24		S	6.4	TK	5.0	B		10	9	3			SHA02

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 29.74		S	7.7:	HV	6	R	10	30	3.0	3			SEM02
2004 07 29.90		S	6.7	TJ	5.0	B		20	5	5			DIE02
2004 07 29.91		M	6.6	HD	11	B		20	7	5			NEV
2004 07 29.92		B	7.0	TJ	5.0	B		7		2			CHE03
2004 07 29.93	x	B	7.7	TK	5.0	B		20	10	3			DOR02
2004 07 30.25		S	6.6	TK	5.0	B		10	5	4	0.2	80	SHA02
2004 07 30.50	x	M	7.1	TJ	8.0	B		11	8	6			NAG08
2004 07 30.79		M	6.1	HD	6	R	10	30	7	5			KOZ02
2004 07 30.88	x	S	8.1	TI	10	R	7	40	3	4			SZW
2004 07 30.91	x	B	8.0	TT	5.0	B		10	& 4	4/			MAK02
2004 07 30.92	x	B	7.7	TT	5.0	B		10	& 7	5			MAK02
2004 07 30.95	x	S	7.8	TT	6.6	B		20	& 5	4/			FIL04
2004 07 31.00		M	6.7	TK	15.2	L	5	38	7	4			GRA04
2004 07 31.25		S	6.5	TK	5.0	B		10	11	3			SHA02
2004 07 31.84	x	B	8.3	HS	26.5	L	4	38	4	3/			TUR01
2004 07 31.87	x	B	6.8:	TT	5.0	B		10	& 8	3			SCI
2004 07 31.90	x	B	7.6	TK	5.0	B		20	8	4			DOR02
2004 08 01.24		S	6.6	TK	5.0	B		10	9	4			SHA02
2004 08 01.84	x	B	7.1:	TT	5.0	B		10	& 4	3			SCI
2004 08 01.86		M	6.6	TI	8.0	B		10	15	3			LEH
2004 08 01.92		S	6.5	TK	8.0	B		11	5	5/			DES01
2004 08 01.95		M	6.8	TK	15.2	L	5	38	7	4/			GRA04
2004 08 02.24		S	6.5	TK	5.0	B		10	9	4			SHA02
2004 08 02.70		M	6.7	AA	6.0	B		15	8	5	37 m	104	BEG01
2004 08 02.79		M	6.0	HD	6	R	10	10	7	5			KOZ02
2004 08 02.89		M	7.0	TK	6.0	B		15	8.5	5	20 m	96	DIJ
2004 08 02.90		M	7.1	TK	8.0	B		15	7.5	4/			BOU
2004 08 02.90		S	6.7	TJ	15.0	R	8	75	4	4			DIE02
2004 08 02.92		S	6.5	TK	8.0	B		11	5	5/			DES01
2004 08 02.92		S	6.5	TK	8.0	B		20	5	5			AMO01
2004 08 02.92		S	6.6	TK	5.0	B		7	7	4			AMO01
2004 08 03.24		S	6.4	TK	5.0	B		10	9	3			SHA02
2004 08 03.34		S	6.7	AA	5.0	B		10					SEA
2004 08 03.83	x	B	7.5	TT	6.6	B		20	& 8	5/			FIL04
2004 08 03.84	x	B	7.1	TT	5.0	B		10	& 8	3			SCI
2004 08 03.86		M	6.6	TI	8.0	B		10	15	3			LEH
2004 08 03.88		M	7.2	TJ	19	L	5	38	7.5	6			SHU
2004 08 03.89		S	6.7	TK	5.6	B		10	> 8	5/			BUS01
2004 08 03.90		M	6.9	TK	8.0	B		15	7.5	5			BOU
2004 08 03.90		S	6.7	TK	8.0	B		11	5	4			SOU01
2004 08 03.91	x	B	7.7	TK	5.0	B		20	8	5			DOR02
2004 08 03.92		S	6.5	TK	8.0	B		11	5	5/			DES01
2004 08 04.48	x	M	6.6	HV	8.0	B		11	13	5			MIT
2004 08 04.86		M	6.6	TI	8.0	B		10	15	3			LEH
2004 08 04.90		S	6.4	TK	5.0	B		7	10	6			GON05
2004 08 04.91		S	6.6	TK	10.0	B		25	10	6	0.3	105	GON05
2004 08 04.92		S	6.5	TK	8.0	B		11	5	5/			DES01
2004 08 04.92		S	6.5	TK	8.0	B		20	5	4/			AMO01
2004 08 05.48	x	M	6.6	TJ	3.5	B		7	9	5			NAG08
2004 08 05.51	x	M	6.9	TK	3.5	B		7	12	5			YOS02
2004 08 05.80		M	6.0	HD	6	R	10	30	7	5			KOZ02
2004 08 05.84		M	6.5	HD	11	B		20	8	5			NEV
2004 08 05.86	x	B	7.2	TT	6.6	B		20	&10	5			FIL04
2004 08 05.86		M	6.4	TI	8.0	B		10	15	3	1	70	LEH
2004 08 05.88	x	S	7.1	TI	10	R	7	40	3	4			SZW
2004 08 05.89	x	B	7.1	TK	5.0	B		20	7	5			DOR02
2004 08 05.90		S	6.8	TT	8.0	B		15	& 9	6			SCH04
2004 08 05.91		M	6.8	TK	8.0	B		15	9	5			BOU
2004 08 05.91		M	7.0	TK	8.0	B		15	7.5	5			DIJ
2004 08 05.91		S	6.5	TK	8.0	B		11	5	5/			DES01
2004 08 05.91		S	6.5	TK	8.0	B		11	5	6			SOU01
2004 08 05.92	x&	B	7.5	TT	22.5	L	7	111	4	s5	0.16	70	MOZ
2004 08 05.93		B	7.3	TJ	8.0	B		18	8	4			CHE03

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 05.98		S	6.5	TK	8.0	B		20		3			AMO01
2004 08 06.34		S	6.6	AA	10.0	B		25					SEA
2004 08 06.50	x	M	6.9	TK	3.5	B		7	11	5			YOS02
2004 08 06.77		M	6.0	HD	6	R	10	30	7	5			KOZ02
2004 08 06.85		B	7.4	HD	11	L	8	32	7	4			SER
2004 08 06.86		M	6.4	TI	8.0	B		10	15	3	1	70	LEH
2004 08 06.86		M	6.9	S	19	L	5	38	7	5			SHU
2004 08 06.87	x	B	7.3	TJ	8.0	B		20	& 7	s4			SPE01
2004 08 06.90		S	6.5	TK	8.0	B		11	5	4			SOU01
2004 08 06.94	x	S	7.3	TI	10	R	7	50	3	3			SZW
2004 08 06.95		B	7.0	TJ	8.0	B		18	8	4			CHE03
2004 08 07.50	x	M	6.3	TT	8.0	B		11					TSU02
2004 08 07.70		E	6.8	HV	6	R	10	30	3.3	2			SEM02
2004 08 07.80		M	6.1	HD	6	R	10	30	6	4/			KOZ02
2004 08 07.81		M	6.4	TK	5.0	B		10	15	3			BAR06
2004 08 07.83	x	B	7.1	TT	6.6	B		20	& 7	5			FIL04
2004 08 07.83	x	B	7.6	HS	26.5	L	4	38	7	3/			TUR01
2004 08 07.84		B	7.3	HD	11	L	8	32	7	3			SER
2004 08 07.84		M	6.2	HD	11	B		20	7	5			NEV
2004 08 07.85		B	7.2	TJ	12.0	R	5	27	8	3			SIE
2004 08 07.86		M	6.4	TI	8.0	B		10	15	3	1	70	LEH
2004 08 07.89		M	6.8	TK	8.0	B		15	8	5	0.4	103	BOU
2004 08 07.89		M	6.9	TK	8.0	B		15	9	5/	22 m	94	DIJ
2004 08 07.91		S	6.5	TK	8.0	B		11	5	4			DES01
2004 08 07.94		M	6.5	TK	15.2	L	5	38	6	4/			GRA04
2004 08 07.94		M	6.9	TJ	19	L	5	38	7	6			SHU
2004 08 08.46	x	S	7.3	HV	8.0	B		11	6	4			MIY01
2004 08 08.47	x	B	6.9	TT	8.0	B		20	4	4			PEA
2004 08 08.77		M	6.1	HD	6	R	10	10	6	5			KOZ02
2004 08 08.81		M	6.3	TK	5.0	B		10	16	3			BAR06
2004 08 08.84		B	7.1	HD	11	L	8	32	7	4			SER
2004 08 08.84	x	B	7.1	TT	5.0	B		10	& 9	4			SCI
2004 08 08.86		B	6.9	TJ	8.0	B		18	8	5			CHE03
2004 08 08.86		M	6.3	TI	8.0	B		10	15	3			LEH
2004 08 08.86		M	6.8	TK	10.0	B		20	7	5			MEY
2004 08 08.87		B	7.2	TK	5.0	B		10	11.1	3			HAS02
2004 08 08.87		S	6.5	TJ	5.0	B		20	4	5			DIE02
2004 08 08.87	x	S	7.2	TJ	6.0	B		20	6	4			KID01
2004 08 08.88		M	6.7	TK	8.0	B		15	8	5			BOU
2004 08 08.89		M	6.9	TK	6.0	B		15	10	5			DIJ
2004 08 08.89		S	6.3	HV	6.3	B		9	13	3			KAM01
2004 08 08.91		S	6.5	TK	8.0	B		11	5	4/			DES01
2004 08 08.92		S	6.8	TT	8.0	B		15	&10	4			SCH04
2004 08 08.93		S	6.4	TK	5.0	B		7	10	6			AMO01
2004 08 09.48	x	B	6.9	TT	8.0	B		20	7	4/			PEA
2004 08 09.81		M	6.3	TK	5.0	B		10	16	3			BAR06
2004 08 09.87		M	7.0	TK	10.0	B		20	7	5			MEY
2004 08 09.88		B	7.3	TK	10.0	R	5	20	5.2	4			HAS02
2004 08 09.88		B	7.4	TK	5.0	B		10					HAS02
2004 08 09.90		B	6.9	TJ	8.0	B		18	9	5			CHE03
2004 08 09.90		M	6.7	TK	8.0	B		15	7.5	5			BOU
2004 08 09.91		S	6.5	TK	8.0	B		11	5	4/			DES01
2004 08 09.95		M	6.4	TI	5.2	B		7	9	6			MAN04
2004 08 09.97		S	6.5	TK	8.0	B		11	5	5			SOU01
2004 08 10.36		M	6.6	AA	5.0	B		10	6				SEA
2004 08 10.47	x	B	6.9	TT	8.0	B		20	7	5			PEA
2004 08 10.80	x	B	6.5	TJ	35	L	6	105	& 3	D5			CHR
2004 08 10.82	x	B	7.4	TT	6.6	B		20	& 7	6			FIL04
2004 08 10.82		M	6.8	TJ	19	L	5	38	4	4			SHU
2004 08 10.86		B	7.1	TJ	12.0	R	5	27	7	4			SIE
2004 08 10.87	x	B	7.2	TJ	8.0	B		20	& 7	s4			SPE01
2004 08 10.88	x	B	6.6	TT	6.0	B		30	8	4			POW01
2004 08 10.88		M	6.3	TI	8.0	B		10	15	3			LEH

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 10.91		B	6.6	TJ	5.0	B		7	8	5			CHE03
2004 08 10.91		S	6.4	TK	8.0	B		11	7	5			DES01
2004 08 10.91		S	6.5	TK	8.0	B		20	9	4			SHA02
2004 08 10.94		S	6.7	TK	8.0	B		20	7	5			AMO01
2004 08 11.35		S	6.6	AA	5.0	B		10					SEA
2004 08 11.80	x	B	6.5	TJ	35	L	6	105	& 3	D5			CHR
2004 08 11.83	x	B	7.1	TT	5.0	B		10	& 9	5	&0.53	67	SCI
2004 08 11.83	x	M	7.0	TT	5	R	6	20	10	4/			GRA09
2004 08 11.84		M	6.1	HD	11	B		20	6	5/	0.2	70	NEV
2004 08 11.84	x&	B	6.9	TT	8.0	B		20	7	s4/	&0.1	80	KIS03
2004 08 11.85		B	6.5	TI	8.0	B		11	11	6	15 m		LAB02
2004 08 11.85		M	6.7	TK	10.0	B		20	9	6	0.2	98	MEY
2004 08 11.86		B	7.1	TJ	12.0	R	5	27	7	4			SIE
2004 08 11.86		M	6.3	TJ	5	R		20	5.1	5			SHU
2004 08 11.89		S	6.5	TJ	5.0	B		10	4	5			DIE02
2004 08 11.90	&	S	6.9	TT	8.0	B		15	13	4			SCH04
2004 08 11.91		B	6.5	TJ	5.0	B		7	6	5			CHE03
2004 08 11.91		S	6.4	TK	8.0	B		11	7	5/			DES01
2004 08 11.91		S	6.5	TK	8.0	B		20	8	6			AMO01
2004 08 11.93		M	6.7	TK	5.0	B		7	7	4			GRA04
2004 08 12.48	x	M	6.8	TJ	10.0	B		20	8	6	0.5	70	NAG08
2004 08 12.49	x	M	6.7	TJ	3.5	B		7	9	5			NAG08
2004 08 12.54	x	B	7.1	HV	7.0	B		16	4.2	6	0.6	75	NAG04
2004 08 12.81		S	7.3	TJ	7.0	B		16	5	6			GIA01
2004 08 12.82		M	6.2	TK	5.0	B		10	15	4			BAR06
2004 08 12.83	x&	B	7.2	TT	8.0	B		20	6	s4/			KIS03
2004 08 12.84	x	B	7.3	TT	5.0	B		10	& 6	4			SCI
2004 08 12.88		M	6.4	TI	10	B	4	25	10	3			LEH
2004 08 12.89		S	6.4	TK	5.0	B		7	11	6			GON05
2004 08 12.90		S	6.5	TK	8.0	B		20	9	4	0.3	100	SHA02
2004 08 12.90		S	6.6	TK	10.0	B		25	8	6	0.4	100	GON05
2004 08 12.91		S	6.4	TK	8.0	B		11	7	5/			DES01
2004 08 12.91		S	6.6	TK	8.0	B		11	5	4			SOU01
2004 08 12.94		S	6.5	TK	8.0	B		20	8	6			AMO01
2004 08 13.36		S	6.4	AA	2.5	B		2					SEA
2004 08 13.78		M	6.1	HD	6	R	10	10	6	4			KOZ02
2004 08 13.82	x	B	6.5	TJ	35	L	6	105	& 3	D5	7 m		CHR
2004 08 13.83	x	B	6.9	TT	5.0	B		7	&11	6/			FIL04
2004 08 13.88		M	6.7	S	7.0	B		10	6	6			SAN04
2004 08 13.90		M	6.4	S	7.0	B		10	7	7			MAR02
2004 08 13.90		S	6.5	TK	8.0	B		11	6	5			SOU01
2004 08 13.91		S	6.4	TK	8.0	B		11	7	6			DES01
2004 08 13.95		S	6.4	TK	5.0	B		7	10	5			AMO01
2004 08 14.37		S	6.5	AA	5.0	B		10					SEA
2004 08 14.85	x	B	6.7	TJ	6.0	B		20	12	4			SIW
2004 08 14.85		B	7.0	TJ	12.0	R	5	27	7	4			SIE
2004 08 14.85		M	6.7	TJ	19	L	5	38	8	5			SHU
2004 08 14.86		S	6.5	TI	8.0	B		11	11	7	20 m		LAB02
2004 08 14.87		M	6.6	S	7.0	B		10	6	7			MAR02
2004 08 14.91		M	6.4	TK	7.0	R	7	24	8	4/			GRA04
2004 08 14.91		S	6.4	TK	8.0	B		11	7	6			DES01
2004 08 14.91		S	6.5	TK	8.0	B		11	8	6			SOU01
2004 08 15.82	x	B	7.3	TJ	31.7	L	4	78	& 4	4	0.2		ADA02
2004 08 15.83	x	B	6.8	TT	6.0	B		30	6	4			POW01
2004 08 15.83		B	7.0:	TJ	12.0	R	5	27	6	3			SIE
2004 08 15.83	x	B	7.3	TJ	25	L	6	54	5	4			SWI
2004 08 15.83	x	B	7.5	TT	6.0	B		20	& 6	4			SCI
2004 08 15.83	x&	B	7.1	TT	8.0	B		20	5	s5	&0.1	75	KIS03
2004 08 15.84		M	6.3	TK	5.0	B		10	13	4			BAR06
2004 08 15.85					44.0	L	5	63	5.3	4	0.08	85	HAS02
2004 08 15.85	x	B	7.2	TJ	8.0	B		20	& 5	s4			SPE01
2004 08 15.85		B	7.2	TK	5.0	B		10	7.5	3			HAS02
2004 08 15.85	x	B	7.3	TT	6.6	B		20	& 7	6	&0.28	80	FIL04

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 15.85	x&	B	7.9	TT	8.0	B		20	& 5	d3	&0.05	64	SIK01
2004 08 15.86		M	6.6	S	7.0	B		10	6	6/			MAR02
2004 08 15.90		S	6.4	TK	8.0	B		11	8	6			SOU01
2004 08 15.90		S	6.4	TK	8.0	B		20	8	5			AMO01
2004 08 15.91		S	6.4	TK	8.0	B		11	7	6			DES01
2004 08 16.67		S	6.6	HI	15	L	8	48	10	6			GRI01
2004 08 16.82		M	6.5	TK	5.0	B		10	10	4			BAR06
2004 08 16.83	x	S	7.0	TT	6.0	B		20	& 4	3			SCI
2004 08 16.87		M	6.7	TK	8.0	B		15	8	5	0.5	102	BOU
2004 08 16.90		M	6.8	TK	6.0	B		15	9	4/			DIJ
2004 08 16.91		S	6.4	TK	8.0	B		11	7	6			DES01
2004 08 16.91		S	6.4	TK	8.0	B		11	8	6			SOU01
2004 08 17.75		M	6.5	TJ	19	L	5	10	6	3	0.1m		KOZ02
2004 08 17.83		M	6.6	TK	5.0	B		10	8	4			BAR06
2004 08 17.88		M	6.8	S	7.0	B		10	6	6/			MAR02
2004 08 17.91		S	6.4	TK	8.0	B		11	8	4			SOU01
2004 08 17.92		S	6.4	TK	8.0	B		11	7	6			DES01
2004 08 18.83		M	6.5	TK	5.0	B		10	8	4			BAR06
2004 08 18.85		S	6.9	TI	8.0	B		11	8	5			LAB02
2004 08 18.86	x&	B	7.4	TT	22.5	L	7	111	5	D4	0.42	94	MOZ
2004 08 18.92		S	6.4	TK	8.0	B		11	7	6			DES01
2004 08 19.46	x	S	6.8	HV	8.0	B		11	5	4/			MIY01
2004 08 19.67	s	S	6.4	HI	15	L	8	48	9	6			GRI01
2004 08 19.84		B	6.9:	TJ	12.0	R	5	27	6	3			SIE
2004 08 19.85	x	B	7.0	TK	10	M	10	35	5	6			DOR02
2004 08 19.85	&	S	6.4	TT	8.0	B		15	&10	6			SCH04
2004 08 19.86		S	6.9	TJ	15.0	R	8	75	4	5			DIE02
2004 08 19.88		M	6.8	TK	6.0	B		15	8	5			DIJ
2004 08 19.88	&	S	6.5	TT	4.0	B		8	11	6	0.3	95	RIE
2004 08 19.89		M	6.8	TK	8.0	B		15	7.5	4/			BOU
2004 08 19.90		S	6.4	TK	5.0	B		7	10	6			GON05
2004 08 19.90		S	6.5	TK	8.0	B		11	5	4			SOU01
2004 08 19.91		S	6.5	TK	10.0	B		25	7	6	0.4	90	GON05
2004 08 19.92		S	6.4	TK	8.0	B		11	7	6			DES01
2004 08 20.46		S	7.1	TJ	40.0	L	4	75	3.1	7			YOS04
2004 08 20.75		M	6.6:	HD	6	R	10	10	& 5	2			KOZ02
2004 08 20.81		B	7.9	HD	11	L	7	32	5	3			SER
2004 08 20.89		S	6.4	VB	8.0	B		20	6	3			SHA02
2004 08 20.90		S	6.4	TK	8.0	B		11	5	4			SOU01
2004 08 20.92		S	6.3	TK	8.0	B		11	7	6			DES01
2004 08 21.82		B	6.5:	TJ	8.0	B		18	3	2			CHE03
2004 08 21.83		B	6.9:	TJ	12.0	R	5	27	6	4			SIE
2004 08 21.85		M	6.7	TK	8.0	B		15	8	5	0.4	90	BOU
2004 08 21.86		M	6.9	TK	8.0	B		15	7	5	0.4	90	DIJ
2004 08 21.87	&	S	6.4	TT	8.0	B		15	8	6			SCH04
2004 08 21.90		S	6.5	TK	8.0	B		11	5	4			SOU01
2004 08 21.91		S	6.3	TK	8.0	B		11	7	6			DES01
2004 08 22.81	x	B	6.5	TT	6.0	B		20	8	4			POW01
2004 08 22.82	x	S	7.1	TT	6.6	B		20	& 7	5	&0.25	105	FIL04
2004 08 22.83	x	B	6.9	TJ	6.0	B		20	6	5			SIW
2004 08 22.83		S	6.5	TK	13.0	L	7	45	5	5			RES
2004 08 22.84	x$	B	7.1:	TT	22.5	L	7	111	4.5	6	&0.33	78	MOZ
2004 08 23.81	x	B	6.6	TT	6.0	B		20	& 8	4			POW01
2004 08 23.83	x	B	6.7	TK	10	M	10	35	4	5	0.4	94	DOR02
2004 08 23.84	xs	S	6.8	TT	6.6	B		20	& 6	5			FIL04
2004 08 23.85		M	6.7	TK	8.0	B		15	7	4/			BOU
2004 08 23.86		B	7.0:	TJ	12.0	R	5	27	6	4			SIE
2004 08 23.88		M	6.3	TK	15.2	L	5	38	5	4/			GRA04
2004 08 24.71		M	7.0:	HD	6	R	10	10	& 2	1			KOZ02
2004 08 24.80	s	M	6.6	TJ	5	R		20	6	3/			SHU
2004 08 25.83	x	B	7.2	TK	10	M	10	35	5	5			DOR02
2004 08 27.88	!	S	5.8:	TK	8.0	B		20	6	4			SHA02
2004 08 28.83		S	6.8:	TK	6.0	B		15	6	5			DIJ

Comet C/2003 K4 (LINEAR) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 29.86	!	S	6.0:	TK	8.0	B		20	6	3			SHA02
2004 08 29.93		S	6.4	TK	8.0	B		11	5	5			SOU01
2004 08 30.92		S	6.4	TK	8.0	B		11	5	5			SOU01
2004 08 31.91		S	6.5	TK	8.0	B		11	5	4			SOU01
2004 09 01.78	xs	S	6.6:	TT	6.0	B		20	& 3	2/			SCI
2004 09 02.91		S	6.4:	TK	8.0	B		11					SOU01
2004 09 09.91		S	6.4:	TK	8.0	B		11					SOU01
2004 10 26.30		S	7.3	TK	8.0	B		20	3	7			AMO01

Comet C/2003 T3 (Tabur)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 14.02	x&	S	10.1:	TT	20	L	8	60	& 1	3			PAC03
2004 05 16.98	x	S	10.5	TT	20	L	5	50	2	3			POW01
2004 07 20.91	x	S	11.5	TT	20	L	5	110	2	2			POW01
2004 07 23.91		S	12.6	TK	30	L	5	100	0.5	2			NEV
2004 07 26.91		S	12.3	TK	30	L	5	100	0.7	2			NEV
2004 08 07.86		S	12.8	HS	30	L	5	100	0.7	2			NEV
2004 08 08.91		S	11.2	TK	31.0	J	6	89	1.7	2/			BOU
2004 08 08.92		S	11.1	TK	31.0	J	6	89	1.8	3			DIJ
2004 08 09.92		S	11.3	TK	25.4	J	6	88	1.7	3			BOU
2004 08 11.86		S	13.0	HS	30	L	5	100	0.5	2			NEV
2004 08 12.91		S	11.0	TK	36	L	6	70	2	3			BAR06
2004 08 13.12		S	11.3	TK	20.3	T	10	100	2	3			GON05
2004 08 15.88		S	11.5	TK	36	L	6	70	1.7	3			BAR06
2004 08 16.89		S	11.4	TK	25.4	J	6	72	2.0	3			BOU
2004 08 16.91		S	11.5	TK	36	L	6	70	1.6	3			BAR06
2004 08 17.91		S	11.7	TK	36	L	6	70	1.8	3			BAR06
2004 08 19.90		S	11.5	TK	31.0	J	6	89	1.5	3			BOU
2004 08 19.90		S	11.8	TK	31.0	J	6	89	1.6	1			DIJ
2004 09 12.07		S	12.7	HS	36	L	6	70	1.4	3			BAR06
2004 09 17.17		S	11.7	TK	20.3	T	10	100	2	3			GON05
2004 09 17.79		S	12.1	HS	40.0	L	4	144	0.7	2			YOS04
2004 09 19.07		S	12.3	HS	36	L	6	70	0.8	2			BAR06
2004 09 19.10		S	11.5	TI	23.5	T	10	94	2	3			LAB02
2004 10 12.14	a	S	12.5	HN	31.0	J	6	89	1.5	2/			BOU

Comet C/2003 T4 (LINEAR)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 19.94		S	14.1	HS	31.0	J	6	143	0.5	4/			BOU
2004 08 19.94		S	14.4	HS	31.0	J	6	143	0.5	3/			DIJ
2004 09 08.88		S	13.7:	HN	31.0	J	6	109	0.7	4			BOU
2004 09 08.88		S	13.9:	HN	31.0	J	6	109	0.7	4			DIJ
2004 09 17.79		S	14.2	HS	30	L	5	180	0.3	3			NEV
2004 09 19.88		S	13.3	HN	25.4	J	6	115	1	3			DIJ
2004 09 19.88		S	13.6	HN	25.4	J	6	115	0.7	3			BOU
2004 10 08.86		S	13.0	SK	31.0	J	6	109	0.9	4			BOU
2004 10 08.86		S	13.3	SK	31.0	J	6	109	0.6	4			DIJ
2004 10 10.85		S	13.1	SK	31.0	J	6	109	1.1	3/			BOU
2004 10 10.86		S	13.0	SK	31.0	J	6	109	0.9	4			DIJ
2004 10 11.81		S	13.1	SK	25.4	J	6	115	1.1	3/			BOU
2004 10 12.80		S	13.2	SK	31.0	J	6	109	1	3			DIJ
2004 10 12.81		S	13.1	SK	31.0	J	6	109	1.0	3/			BOU
2004 10 13.81		S	13.6	HS	30	L	5	180	0.5	2			NEV
2004 10 15.76		S	13.7:	HS	40.0	L	4	144	0.8	5			YOS04
2004 10 19.82		S	12.8	HN	31.0	J	6	89	1.2	3/			BOU
2004 10 21.95		S	12.7	SK	31.0	J	6	109	1.2	3/			BOU

Comet C/2004 F4 (Bradfield)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 04 23.79	x$	S	4.5	TJ	7.0	B		10		7	2		MOM

Comet C/2004 F4 (Bradfield) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 04 24.79	x$	S	4.7	TJ	4.0	B		8		8			MOM
2004 04 26.06	x	B	5.0:	TT	5.0	B		20	1	8	1		DOR02
2004 04 26.06	x&	B	5.3:	TT	6	R	6	20	1		&1.3	303	SIK01
2004 04 27.05	x&	B	5.1	S	6.0	B		20	& 1	6	1.2	300	TUR01
2004 04 27.06	x	B	5.3	TT	6.0	B		30	& 2	7	0.7	305	POW01
2004 04 27.06	x	B	5.7	TT	5.0	B		20	1	8	&1	300	DOR02
2004 04 27.78	x$	M	5.0	TJ	3.5	B		7	3	7	10	305	NAG08
2004 04 27.81	xa	M	4.9	TK	3.5	B		7		7	&2.0	305	YOS02
2004 04 28.05	x	B	5.2	TK	5.0	B		7	2	8	&5	305	DOR02
2004 04 28.11	*a	S	4.6	TK	5.0	B		10	1.5	5	3.8	305	HAS02
2004 04 28.77	x$	M	5.5	HV	3.5	B		7	2	7/	6	305	MIT
2004 04 28.78	xa	M	5.5	TJ	3.5	B		7	3	6	6	305	NAG08
2004 04 28.78	xa	M	5.6	HV	15.0	B		25	2	7/	5.5	305	MIT
2004 04 28.79	x$	M	4.7	TK	3.5	B		7		7	6.0	300	YOS02
2004 04 29.05	x	B	5.6	TK	5.0	B		20	2	7	&1	303	DOR02
2004 04 29.78	xa	M	5.9	TJ	8.0	B		11	3	6	&5	305	NAG08
2004 04 30.05	x	B	5.8	TK	5.0	B		20	2	7	&4	305	DOR02
2004 04 30.05	x	B	6.2	TT	20	L	5	30	1	8	0.25	304	POW01
2004 04 30.06	x&	B	6.6	TJ	6.0	B		20	2	7			SIW
2004 05 01.04	x	B	6.4	TT	5	R	6	20	2	S8	&0.80	305	GRA09
2004 05 01.05	x	B	6.3	TK	5.0	B		20	2	7	&1.5	300	DOR02
2004 05 01.06	x	B	6.2	TT	6.0	B		20	2	D8	1.5	300	PAR03
2004 05 01.07	x	B	5.8	TJ	7.0	B		15		7			SWI
2004 05 04.04	x	B	6.8:	TK	5.0	B		30	& 3	6	&0.5		DOR02
2004 05 04.06	x	B	7.2	TJ	6	R	6	20	2.5	3	0.2	307	SIK01
2004 05 10.04	x&	S	6.5:	TT	6.6	B		20	& 5	4			FIL04
2004 05 12.33		B	7.7	AC	5.0	B		10	8	4	3	270	NOW
2004 05 12.96	x	B	7.7	S	6.0	B		20	& 2	3/	&1	313	TUR01
2004 05 12.98	x	B	8.3	TK	5.0	B		20	4	3	0.5	300	DOR02
2004 05 14.01	x	S	9.4	TT	20	L	8	60	2	s3/	0.25	300	PAC03
2004 05 14.98	x	B	9.0	TK	10	M	10	35	5	2	0.3	310	DOR02
2004 05 16.95	x	B	9.2	TJ	20	L	5	50	1.8	4/	0.33	294	BUR04
2004 05 16.96	x	S	9.6	TT	20	L	5	30	2	3	0.27	308	POW01
2004 05 17.28		B	8.7	AC	10.0	B		20	4	3	1.5	270	NOW
2004 05 17.97	x	B	9.9	TK	10	M	10	35	3	2	&0.25	300	DOR02
2004 05 20.98	x	B	10.2	TK	10	M	10	35	3	2	0.3	280	DOR02
2004 05 25.02	x	S	11.1	TK	25	L	5	100	0.7	3			BOH02
2004 05 27.98	x	S	11.6:	TK	25	L	5	100	0.5	2/			BOH02

Comet C/2004 H6 (SWAN)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 14.39		S	7.8:	TK	10	B		25	3	7			MAT08
2004 05 14.44	x	S	7.9	TT	20	L	4	45	2.5	5			PEA
2004 05 20.84		S	7.5	TK	10	B		25	3	7			MAT08
2004 05 21.84		S	7.4	TK	10	B		25	3	7			MAT08
2004 05 29.15	x	M	7.6:	HI	20.3	L	5	40		2/	5 m	200	VAN15
2004 05 31.15	x	M	7.7	TK	20.3	L	5	40		2/			VAN15
2004 05 31.15		S	7.4:	S	20.0	L	8	89	2.5	5			COO02
2004 06 01.15	x	S	7.4:	HI	20.3	L	5	40		3/			VAN15
2004 06 02.14		S	7.2	S	40.0	T	10	101	5	5			STR03
2004 06 04.13	x	S	7.2	TK	20.3	L	5	40	2	4			VAN15
2004 06 07.84		S	7.7	TK	10	B		25	2.5	6			MAT08
2004 06 12.12	x	S	7.1	TK	20.3	L	5	40	3	4/			VAN15
2004 06 20.11	x	S	7.0	TK	20.3	L	5	40		3			VAN15
2004 07 13.03	x	S	8.6	TK	20.3	L	5	40		1			VAN15
2004 07 16.10		S	9.6:	TJ	12.0	R	7	25	5	0			CHE03
2004 07 16.11	x	S	8.6	TK	20.3	L	5	40	7	2			VAN15
2004 07 17.60		S	8.9	TK	10	B		25	8	2			MAT08
2004 07 17.85	x	S	9.0	TT	8.0	B		20	8.5	2			PEA
2004 07 17.85	x	S	9.1	TT	20	L	4	45	6.5	1/			PEA
2004 07 20.98	x	S	11.0	TT	20	L	5	50	2.5	1			POW01
2004 07 23.92	x	S[	9.4	TK	20.3	L	5	40					VAN15

Comet C/2004 H6 (SWAN) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 05.53		S	11.8:	AU	25.4	L	4	46	3	1			YOS02
2004 08 06.52		S	11.7:	AU	25.4	L	4	46	3	1			YOS02
2004 08 07.49		S	11.5:	TK	45	L	4	90	4	1			MAT08
2004 08 08.90		S	10.5:	TK	31.0	J	6	58	6	0/			DIJ
2004 08 08.91		S	11.0:	TK	31.0	J	6	58	5	0/			BOU
2004 08 09.91		S[	10.0	TJ	8.0	R	4	28	! 3				CHE03
2004 08 10.92	x	S	12.0	TT	20	L	5	50	1.5	1/			POW01
2004 08 12.90		S	11.0:	TK	36	L	6	70	1.7	3			BAR06
2004 08 12.97		S[	11.0	TK	10	B		25					SHA02
2004 08 14.89		B	11.3	TI	23.5	T	10	57	4	1			LAB02
2004 08 15.87		S[	12.0	HS	44.0	L	5	100					HAS02
2004 08 15.88		S	11.5	TK	36	L	6	70	3	1/			BAR06
2004 08 16.95		S	11.7	TK	36	L	6	70	3	1/			BAR06
2004 08 17.93		S	11.9:	TK	36	L	6	70	2	1/			BAR06
2004 08 19.92		S	11.9:	AU	31.0	J	6	72	1.8	0			DIJ
2004 08 19.92		S	12.0:	AU	31.0	J	6	72	& 3.5	0			BOU
2004 08 20.48		S	12.3	AU	40.0	L	4	144	1.6	1			YOS04
2004 08 21.06		S	12.2	TK	20.3	T	10	77	2	0			GON05
2004 08 23.89		S[	12.5	HS	34.0	L	4	120	! 1				CHE03

Comet C/2004 Q1 (Tucker)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 26.14		S	12.9	TK	20.3	T	10	100	1.5	3			GON05
2004 09 08.95		S	12.6	AU	31.0	J	6	89	1.5	3/			BOU
2004 09 08.95		S	12.6	AU	31.0	J	6	89	1.3	2/			DIJ
2004 09 10.84	x	S	12.6	TT	20	L	4	45	1.8	4			PEA
2004 09 11.78		S	12.0	AU	32.0	L	5	58	1.8	6/			NAG08
2004 09 11.83	x	S	12.6	TT	20	L	4	45	1.8	3/			PEA
2004 09 12.01		S	11.8	HS	36	L	6	80	1.5	3			BAR06
2004 09 13.99		S	11.7	HS	36	L	6	80	1.8	3			BAR06
2004 09 13.99		S	12.8	HS	30	L	5	60	1	3			NEV
2004 09 14.69		S	12.1	AU	25.4	L	4	113	1.8	4			YOS02
2004 09 14.69	x	B	11.8	TJ	30.4	L	5	100	0.85	4			NAG04
2004 09 14.96		S	12.5	AU	25.4	J	6	88	1.6	3/			BOU
2004 09 15.77	x	S	11.4	TJ	32.0	L	5	87	1.9	5			NAG08
2004 09 15.79	x	S	11.4	TJ	31.7	L	6	63	2.0	4			MIY01
2004 09 15.87		S	11.6	HS	36	L	6	80	2.2	4			BAR06
2004 09 16.79	x	S	11.3	HS	31.7	L		63	1.5	4			MIY01
2004 09 17.01		S	12.1	TK	20.3	T	10	77	2.2	3			GON05
2004 09 17.73		S	11.8	TJ	40.0	L	4	144	1.7	6/			YOS04
2004 09 17.78	x	S	10.7:	HS	31.7	L		63	2.0	3/			MIY01
2004 09 17.86	x	S	12.5	TT	20	L	4	100	1.2	3			PEA
2004 09 17.95		S	11.8	TK	30	L	5	60	1.5	3			NEV
2004 09 17.99		S	11.5	HS	20	L	5	70	1.8	3			BAR06
2004 09 17.99		S	11.8	TK	13.0	L	7	45	1	4			RES
2004 09 18.97		S	11.4	HS	36	L	6	80	2.0	3			BAR06
2004 09 18.97		S	11.9	TI	23.5	T	10	188	2	2			LAB02
2004 09 18.98		S	11.6	TK	13.0	L	7	45	1	4			RES
2004 09 19.85		M	12.4	TJ	41	L	4	89	0.8	4			SHU
2004 09 21.79	x	S	11.6	HS	31.7	L	6	63	1.0	5			MIY01
2004 09 23.01		S	11.5:	HS	20	L	5	70	2	3			BAR06
2004 09 23.01		S	11.5:	HS	20	L	5	70	2	3			BAR06
2004 09 24.85	x	S	11.5	TT	20	L	4	45	2.3	2			PEA
2004 10 04.88		S	11.5	TK	30.5	T	10	75	1.1	5			KAM01
2004 10 05.81		S	11.6	AU	25.4	J	6	88	1.8	4			BOU
2004 10 05.90		S	11.3	TK	30.5	T	10	75	1.2	5			KAM01
2004 10 05.99		S	11.5:	HS	20	L	5	70	1.8	2			BAR06
2004 10 06.53	x	S	10.8	TK	25.4	L	4	46	2.7	5			YOS02
2004 10 06.61	x	M	11.3	TT	12.5	L	6	60	2.0	3			TSU02
2004 10 06.77	x	S	11.6	HS	31.7	L	6	63	1.6	6			MIY01
2004 10 07.59	x	S	10.9:	HS	31.7	L	6	63	1.2	5			MIY01
2004 10 07.87		M	11.6	AU	31.0	J	6	109	1.6	5			BOU

Comet C/2004 Q1 (Tucker) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 10 07.88		S	11.3	AU	31.0	J	6	109	2.1	4			DIJ
2004 10 08.92		M	11.3	AU	31.0	J	6	72	2.1	4/			BOU
2004 10 08.92		S	11.4	AU	31.0	J	6	72	1.8	5			DIJ
2004 10 10.27		M	10.7	TJ	25.6	L	4	68	2.7	3/			MOR
2004 10 10.53	x	S	10.4	TK	45.7	L	4	68	3.3	6			MUR02
2004 10 10.61	x	M	10.7	TJ	32.0	L	5	58	2.0	6			NAG08
2004 10 10.87		M	11.0	AU	31.0	J	6	72	2.1	4/			DIJ
2004 10 10.87		M	11.2	AU	31.0	J	6	72	2.2	5			BOU
2004 10 11.60	x	M	10.7	TK	25.4	L	4	46	2.9	6			YOS02
2004 10 11.83		M	11.1	AU	25.4	J	6	72	2.3	5			BOU
2004 10 12.82		M	11.1	AU	31.0	J	6	72	2.2	5			BOU
2004 10 12.83		M	10.9	AU	31.0	J	6	72	2.1	5			DIJ
2004 10 12.87		S	11.1	TK	13.0	L	7	45	2	4			RES
2004 10 13.79	x	S	11.0	HS	31.7	L	6	63	1.4	5			MIY01
2004 10 13.84		S	10.3	TK	30	L	5	60	1.3	4			NEV
2004 10 13.86		S	11.0	TK	13.0	L	7	45	2	4			RES
2004 10 13.93		S	10.4	TK	30.5	T	10	75	1.5	5/			KAM01
2004 10 14.79	x	S	10.9	TJ	31.7	L	6	63	2.0	5			MIY01
2004 10 15.01		S	10.8	HS	20	L	5	70	1.9	2			BAR06
2004 10 15.46		S	11.1	GA	25.4	L	4	71					SEA
2004 10 15.52		M	10.2	TJ	40.0	L	4	75	1.9	6/	4	m 190	YOS04
2004 10 15.60	x	M	9.8	TT	25.0	L	6	47	3	5			TSU02
2004 10 15.66	x	M	10.7	TJ	32.0	L	5	58	2.8	6			NAG08
2004 10 15.75	x	B	11.2	TJ	30.4	L	5	79	1.6	4/			NAG04
2004 10 16.51		S	11.1	GA	25.4	L	4	71					SEA
2004 10 16.53	x	M	10.6	TJ	32.0	L	5	58	2.7	6			NAG08
2004 10 16.95		B	11.3	TI	23.5	T	10	57	2	5			LAB02
2004 10 17.77	x	S	10.9	TJ	31.7	L	6	63	1.8	5/			MIY01
2004 10 18.89		M	10.6	AU	31.0	J	6	72	2.5	5			BOU
2004 10 18.89		S	10.3	TK	30.5	T	10	75	2.0	5/			KAM01
2004 10 18.90		M	10.6	AU	31.0	J	6	72	2.7	4/			DIJ
2004 10 19.83		M	10.5	AU	31.0	J	6	72	2.5	5			BOU
2004 10 19.89		S	10.4	TJ	15.0	R	15	75	2	6			DIE02
2004 10 21.76	x	B	11.1	TJ	30.4	L	5	79	1.5	4/			NAG04
2004 10 21.82		S	10.3	TJ	15.0	R	15	75	2	6			DIE02
2004 10 21.92		M	10.4	AU	31.0	J	6	72	2.8	5			BOU
2004 10 22.76	x	S	10.6	TJ	31.7	L	6	63	1.8	5			MIY01
2004 10 23.78	x	M	10.8	TJ	32.0	L	5	58	2.4	6			NAG08
2004 10 23.86		S	9.9	TK	5.6	B		10	& 3	1/			BUS01

Comet C/2004 Q2 (Machholz)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 08 28.16		S	10.9	TK	20.3	T	10	77	2.3	4			GON05
2004 08 30.88	x	S	11.0	TT	41	L	4	90	1.8	4			PEA
2004 09 04.12		S	10.3	TK	13.0	L	7	45	2	3			RES
2004 09 07.08		M	10.1	TK	20	L	5	70	4	3			BAR06
2004 09 09.14		S	9.9	TK	25.4	J	6	58	3.1	3/			DIJ
2004 09 09.14		S	10.2	TK	25.4	J	6	58	2	4			BOU
2004 09 09.79	x	S	10.8	TT	41	L	4	90	1.6	4/			PEA
2004 09 10.86	x	S	10.4	TT	20	L	4	45	2.7	5	0.08	255	PEA
2004 09 11.05		M	10.0	TK	20	L	5	70	4	3			BAR06
2004 09 11.79	x	S	9.8	TJ	32.0	L	5	87	1.7	6			NAG08
2004 09 11.85	x	S	10.5	TT	20	L	4	45	2	5/			PEA
2004 09 12.08		M	9.8	TK	36	L	6	80	4	4		271	BAR06
2004 09 12.85	x	S	10.5	TT	20	L	4	45	1.6	4			PEA
2004 09 13.76	x	M	10.0	TK	25.4	L	4	46	2.0	6			YOS02
2004 09 13.86	x	S	10.4	TT	20	L	4	45	2.4	4			PEA
2004 09 14.07		S	9.5:	TJ	15.0	R	5	25	4	2			CHE03
2004 09 14.31		S	10.2	TK	20.3	T	10	57	2.5	4			ROB06
2004 09 14.35		B	10.1	AC	10.0	B		20	3	3			NOW
2004 09 14.73	x	B	10.3	TJ	30.4	L	5	61	1.8	5			NAG04
2004 09 14.78	x	M	9.7	TT	12.5	L	6	60	2.5	4			TSU02

Comet C/2004 Q2 (Machholz) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 14.80	x	M	10.0	TK	25.4	L	4	46	2.0	6	5 m	270	YOS02
2004 09 15.07		S[	9.2	TJ	15.0	R	5	25	! 2				CHE03
2004 09 15.78	x	S	9.7	TJ	32.0	L	5	58	2.6	6			NAG08
2004 09 15.78	x	S	10.6	TJ	31.7	L	6	63	1.2	5			MIY01
2004 09 16.06		M	10.1	TK	36	L	6	80	3	3		271	BAR06
2004 09 16.13		S	10.2	TK	25.4	J	6	72	2.0	3/			BOU
2004 09 16.14		S	9.8	TK	14.3	L	6	40	2	2			AMO01
2004 09 16.60		S	10.1	AA	10.0	B		25					SEA
2004 09 16.70		S	9.9	TT	20	L	6	48	2	4			RAE
2004 09 16.78	x	S	10.6	TJ	31.7	L		63	1.7	5/			MIY01
2004 09 16.86	x	S	10.4	TT	20	L	4	45	2.3	4/			PEA
2004 09 17.18		S	10.0	TK	20.3	T	10	77	2.5	5			GON05
2004 09 17.75		S	9.8	TJ	40.0	L	4	75	2.5	6/			YOS04
2004 09 17.84	x	S	10.2	TT	20	L	4	45	3.2	4			PEA
2004 09 18.08		M	10.3	TK	36	L	6	80	3	3			BAR06
2004 09 18.79	x	S	10.8	TJ	31.7	L	6	63	1.6	5			MIY01
2004 09 19.06		B	10.3	TI	23.5	T	10	94	2	4			LAB02
2004 09 19.06		B	10.5	TK	44.0	L	5	63	1.5	3			HAS02
2004 09 19.09		M	10.4	TK	36	L	6	80	3.5	3			BAR06
2004 09 20.06		M	10.3	HD	41	L	4	89	1.5	4/			SHU
2004 09 20.18		S	10.0	TK	20.3	T	10	57	2.5	4			ROB06
2004 09 21.50		S	9.8	TK	20	L	4	107	1.8	5			LIN04
2004 09 21.78	x	S	10.4	TJ	31.7	L	6	63	1.6	5/			MIY01
2004 09 21.86	x	S	9.9	TT	20	L	4	45	3.2	4/			PEA
2004 09 24.86	x	S	9.5	TT	20	L	4	45	5	6	0.1	265	PEA
2004 09 24.87	x	S	9.2	TT	8.0	B		20	6	4			PEA
2004 09 30.78	x	S	10.0	TJ	31.7	L	6	63	1.6	5			MIY01
2004 10 05.55		S	9.0	AA	5.0	B		10					SEA
2004 10 06.79	x	S	9.6	TJ	31.7	L	6	63	2.4	5			MIY01
2004 10 07.10		S	9.5	TK	8.0	B		20	4	6			AMO01
2004 10 07.47		S	9.1	TK	20	L	4	107	2.0	5	2 m	260	LIN04
2004 10 07.53		S	8.9	AA	10.0	B		25	3	4			SEA
2004 10 08.07		S	9.4	TK	8.0	B		20	3	6			AMO01
2004 10 09.47		S	9.1	TK	37	L	3	60	4.0	5	3 m	260	LIN04
2004 10 10.54		M	9.0	AA	10.0	B		25					SEA
2004 10 10.76	x	S	9.0	TJ	32.0	L	5	58	3.0	6			NAG08
2004 10 11.17		S	8.7:	TK	5.6	B		10	& 4	5			BUS01
2004 10 11.52		S	8.8	AA	5.0	B		10					SEA
2004 10 11.71	x	M	8.8	TK	10.0	B		20	3.5	6			YOS02
2004 10 12.12		M	9.2	TK	31.0	J	6	72	3	4			BOU
2004 10 12.16		S	8.6	TK	5.6	B		10	& 4	5			BUS01
2004 10 12.45		S	9.1	TK	37	L	3	60	4.0	5	3 m	260	LIN04
2004 10 12.53		S	8.8	AA	5.0	B		10					SEA
2004 10 13.10		B	8.8	TK	20.3	T	10	57	4	7	> 5 m	275	ROB06
2004 10 13.16		S	8.2	TK	5.6	B		10	&11	4			BUS01
2004 10 13.53		S	8.7	AA	10.0	B		25					SEA
2004 10 13.79	x	S	9.8	TJ	31.7	L	6	63	1.9	5			MIY01
2004 10 13.96		M	8.9	TK	36	L	6	80	4	3			BAR06
2004 10 14.16		S	8.1	TK	5.6	B		10	>11	3/	0.2	290	BUS01
2004 10 14.78	x	S	9.7	TJ	31.7	L	6	63	3.0	5			MIY01
2004 10 15.50		S	8.2	AA	5.0	B		10					SEA
2004 10 15.68	xa	S	8.7	TJ	8.0	B		11	5	5			NAG08
2004 10 15.72	x	M	8.3	TT	5.0	R	5	7	15	4			TSU02
2004 10 15.73		S	8.1	TJ	40.0	L	4	36	6.5	6			YOS04
2004 10 15.82	x	B	8.6	HV	30.4	L	5	47	3.8	5/	6 m	270	NAG04
2004 10 16.16		S	8.1	TK	5.6	B		10	>11	3/	0.1	290	BUS01
2004 10 16.56		S	7.9	AA	3.5	B		6					SEA
2004 10 17.05		B	9.0	TI	23.5	T	10	57	4	5			LAB02
2004 10 17.16		S	8.0	TK	5.6	B		10	>11	3/			BUS01
2004 10 17.17		S	7.9	TK	4.2	B		7	&13	3			BUS01
2004 10 17.34		B	8.6	TK	20.3	T	10	57	4	7	4 m	265	ROB06
2004 10 17.76	x	S	10.2	TJ	31.7	L	6	63	2.2	5			MIY01
2004 10 18.54		S	7.8	AA	3.5	B		6	15				SEA

Comet C/2004 Q2 (Machholz) [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 10 20.11		S	8.2	TK	8.0	B		20	5	6			AMO01
2004 10 20.11		S	8.3	TK	5.0	B		7					AMO01
2004 10 21.17		S	8.3	TK	8.0	B		20	5	5			AMO01
2004 10 21.80	x	B	8.3	HV	30.4	L	5	47	3.5	6	5	m 260	NAG04
2004 10 22.75	x	S	8.7	TJ	31.7	L	6	48	2.7	5			MIY01
2004 10 23.16		S	7.6	TK	4.2	B		7	&13	3			BUS01
2004 10 23.16		S	7.7	TK	5.6	B		10	>11	3/	0.1	300	BUS01
2004 10 23.82	xa	S	8.0	TJ	8.0	B		11	8	5			NAG08
2004 10 25.34		B	8.5:	TK	20.3	T	10	57	> 4	6			ROB06
2004 10 26.11		S	8.0	TK	8.0	B		20	4	5			AMO01
2004 10 28.10		S	7.8	TK	8.0	B		20	5	4/			AMO01
2004 10 28.11		B	8.6	TI	10.2	T	5	20	4	5			LAB02
2004 10 28.19		M	9.0	TI	11.4	L	8	23	1	8			ADD
2004 10 28.19		M	9.0	TI	11.4	L	8	23	1	8			ADD
2004 10 29.05		S	8.0	TK	8.0	B		20	3	4			AMO01

Comet C/2004 R2 (ASAS)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 09 10.68		S	9.7	TT	20	L	6	48	3	2			RAE
2004 09 10.86	x	S	9.6	TT	20	L	4	45	2.0	3			PEA
2004 09 11.81	x$	S	9.2:	TJ	32.0	L	5	58	2	5			NAG08
2004 09 11.85	x	S	9.2	TT	20	L	4	45	3.2	3			PEA
2004 09 12.86	x	S	9.5	TT	20	L	4	45	2.2	3			PEA
2004 09 14.35		S	9.5	TK	20.3	T	10	57	3.0	1			ROB06
2004 09 14.70		M	8.7	TT	20	L	6	48	2	3/			RAE
2004 09 15.66		S	8.4	AA	10.0	B		25	3				SEA
2004 09 15.70		M	8.4	TT	20	L	6	48	2.4	3/			RAE
2004 09 16.32		S	8.7	TK	8.0	B		20	4	7			AMO01
2004 09 16.68		M	8.5	TT	20	L	6	48	2.3	6			RAE
2004 09 16.87	x	S	8.5	TT	20	L	4	45	2.5	5			PEA
2004 09 17.84	x	S	8.5	TT	20	L	4	45	3.7	5			PEA
2004 09 17.87	x	B	8.4	TT	8.0	B		20	4	5			PEA
2004 09 19.87	x	B	8.1	TT	8.0	B		20	4.5	5			PEA
2004 09 20.76		M	8.7	AA	10.0	B		25					SEA
2004 09 21.87	x	B	8.1	TT	8.0	B		20	4	5			PEA
2004 09 24.86	x	B	7.9	TT	8.0	B		20	5	6			PEA

Comet C/2004 S1 (Van Ness)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 10 08.97		S	12.9	AU	31.0	J	6	89	1.6	1			BOU
2004 10 08.97		S	13.3:	AU	31.0	J	6	89	1.6	0			DIJ
2004 10 10.91		S	12.8	AU	31.0	J	6	89	2	0/			BOU
2004 10 10.91		S	13.1	AU	31.0	J	6	89	1.7	0			DIJ

Comet P/2004 T1 (LINEAR-NEAT)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 10 08.94		S	13.5	AU	31.0	J	6	143	0.6	2			DIJ
2004 10 08.94		S	13.6	AU	31.0	J	6	143	0.7	3			BOU
2004 10 10.64		S[	13.2	AU	32.0	L	5	58	! 1.0				NAG08
2004 10 10.93		S	13.5	AU	31.0	J	6	143	0.7	1/			DIJ
2004 10 10.93		S	13.5	AU	31.0	J	6	143	0.7	3/			BOU
2004 10 15.50		S	13.3	AU	40.0	L	4	144	0.8	3			YOS04

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Non-Visual Data (new format)

TABULATED NON-VISUAL DATA

The new format for non-visual data was introduced in the October 2001 issue of the *ICQ*, chiefly to help researchers make more sense of comet photometry obtained with CCD cameras, to determine what effects various instrumental factors play (spectral responses, exposure times, photometric aperture sizes, etc.). As described in that issue, almost all of the new information is added to the original observation records in columns 81-129, thereby leaving the first 80 columns essentially unchanged (except that in the "coma-diameter" column, true coma diameters are now given without exception in the new format; the old format allowed CCD users to put instead an aperture size in the "coma-diameter" column, but this is now allowed for in columns 87-93 of the new-format records). See also page 208 of the July 2002 issue.

Most of the columns below are as for the visual data (described on pages 201-202 of this issue). While electronic magnitudes *can* be submitted to 0.01 magnitude, for many reasons it is highly advised to continue giving total comet magnitudes only to 0.1 mag. Similarly, it is advised to continue giving all times to 0.01 day, as 0.001 day is usually unnecessary for cometary photometry.

The headings for the tabulated data are as follows: The date (UT), notes, magnitude method (including filters for CCDs, and "P" for photographs), magnitude, reference, instrument aperture, instrument type, instrument *f*-ratio, exposure time, coma diameter, degree of condensation, tail length and position angle, and observer are all as described for the visual tabulation. The column headed "APERTUR" gives the photometric aperture, preceded by "S" for square aperture and "C" for circular aperture, and followed by "d" for degrees, "m" for arcmin, and "s" for arcsec. The column "Chp" contains the 3-character code for the computer chip, given to indicate spectral response of the CCD camera. This column will also be used to indicate photographic emulsion when such information is provided for photographic photometry. The column "Sfw" contains the 3-character code for the software used to actually perform the photometric measures (not solely to extract comparison-star magnitudes). A lower-case "a" between these two columns indicates an anti-blooming CCD. The column headed "C" gives a number as follows: 0 = no correction; 1 = correction for bias (bias subtracted); 2 = flat-field corrected (flat-fielded); 3 = 1 + 2; 4 = dark-subtracted (and bias-subtracted) 5 = 2 + 4. The column headed "P" includes a P if the images used to measure the photometry were also measured for astrometry *and* those astrometric measures were published in the *Minor Planet Circulars* (meaning they were refereed); a U in this column indicates that the respective astrometric was sent to the MPC for publication but that either (a) they are unpublished at the time of reporting the photometry or (b) the observer is unaware of the publication status; a blank in this column indicates that no astrometry was measured. The 3-character CCD-camera code is listed under "Cam".

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Comet 2P/Encke

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2003 10 19.77		C	14.1	HS	60.0	C	4	a120	0.13	D7			S23.0 m		A41	5	U	S1C	BOR04
2004 09 13.56	a	C	20.1:	GA	60.0	Y	6	a240		9			S 0.25m	SIA	IPL	5	U	Ap7	NAK01

Comet 29P/Schwassmann-Wachmann

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 20.70	x	C	13.7	TJ	25.0	L	5	a120	1.2				S 1.2 m	K42	SI4	5	U	SE7	OHS
2004 09 08.59		C	12.7	GA	60.0	Y	6	a120	2.9	2/			S 2.9 m	SIA	IPL	5	U	Ap7	NAK01
2004 09 08.59		c	16.3	GA	60.0	Y	6	a120					S10.0 s	SIA	IPL	5	U	Ap7	NAK01
2004 09 08.62	ax	C	11.3	HV	35.0	C	10	a360	3.5	7			S 4.84m	KAIaSI4		5		ST2	TSU02
2004 10 05.84		C	11.5	UO	13.0	L	7	a 45	0.3	8/			S 1.50m	KAIaA32		3		ST7	RES
2004 10 06.52	ax	C	11.3	HV	35.0	C	10	a 90	3	8			S 3.92m	KAIaSI4		5		ST2	TSU02
2004 10 06.59		C	12.8	GA	60.0	Y	6	a120	3.4	8			S 0.35m	SIA	IPL	5	U	Ap7	NAK01
2004 10 06.59		c	13.2	GA	60.0	Y	6	a120					S10.0 s	SIA	IPL	5	U	Ap7	NAK01
2004 10 07.86		C	12.4	UO	13.0	L	7	a 60	0.5	7			S 1.50m	KAIaA32		3		ST7	RES
2004 10 10.86		C	14.0	UO	11.0	L	7	a240	0.58	4			C 0.58m	T25	A32	4		PIX	SHU
2004 10 11.82		C	12.4	UO	13.0	L	7	a 50	0.9	6			S 1.50m	KAIaA32		3		ST7	RES
2004 10 12.54		C	12.5	GA	60.0	Y	6	a120	4.1	7			S 0.75m	SIA	IPL	5	U	Ap7	NAK01
2004 10 12.54		c	14.5	GA	60.0	Y	6	a120					S10.0 s	SIA	IPL	5	U	Ap7	NAK01
2004 10 12.77		C	12.5	UO	13.0	L	7	a120	1.2	4/			S 1.50m	KAIaA32		3		ST7	RES
2004 10 12.85		C	15.1	UO	11.0	L	7	a180	0.55	5			C 0.55m	T25	A32	4		PIX	SHU
2004 10 13.81		C	14.7	UO	11.0	L	7	a120	0.53	5			C 0.53m	T25	A32	4		PIX	SHU
2004 10 14.88		C	15.3	UO	11.0	L	7	a240	0.91	3			C 0.91m	T25	A32	4		PIX	SHU

Comet 29P/Schwassmann-Wachmann [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 15.82		C	15.0	UO	11.0	L	7	a300	0.8	4			C 0.8 m	T25	A32	4		PIX	SHU
2004 10 16.57		C	12.5	GA	60.0	Y	6	a120	4.9	5			S 0.95m	SIA	IPL	5	U	Ap7	NAK01
2004 10 16.57		c	15.1	GA	60.0	Y	6	a120					S10.0 s	SIA	IPL	5	U	Ap7	NAK01
2004 10 17.48	x	C	12.4	TJ	25.0	L	5	a120	1.8				S 1.8 m	K42	SI4	5	U	SE7	OHS
2004 10 21.58		C	12.6	GA	60.0	Y	6	a120	3.9	2			S 1.2 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 21.58		c	15.5	GA	60.0	Y	6	a120					S10.0 s	SIA	IPL	5	U	Ap7	NAK01
2004 10 21.78		C	13.5	UO	13.0	L	7	a120	1.6	4/			S 2.50m	KAIaA	32	3		ST7	RES
2004 10 22.96		C	13.3	UO	13.0	L	7	a120	1.5	4/			S 2.50m	KAIaA	32	3		ST7	RES

Comet 32P/Comas Solá

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 14.76	ax	C	15.6	HV	35.0	C	10	a480	0.3	4			S 0.90m	KAIaSI	4	5		ST2	TSU02
2004 10 06.97		C	15.1	UO	11.0	L	7	a360	0.25	3			C 0.25m	T25	A32	4		PIX	SHU
2004 10 12.90		C	15.5	UO	13.0	L	7	a250	0.6	4/	1.8m	270	S 1.50m	KAIaA	32	3		ST7	RES
2004 10 13.92		C	15.6	UO	11.0	L	7	a300	0.21	3			C 0.21m	T25	A32	4		PIX	SHU
2004 10 15.01		C	14.7	UO	11.0	L	7	a360	0.42	5			C 0.42m	T25	A32	4		PIX	SHU
2004 10 15.78	x	C	15.6	TJ	25.0	L	5	a120	0.4		1.2m	253	S 0.4 m	K42	SI4	5	U	SE7	OHS
2004 10 16.67		C	14.6	GA	60.0	Y	6	a120	0.85		3.5m	251	S 0.85m	SIA	IPL	5	U	Ap7	NAK01
2004 10 21.89		C	15.1	UO	13.0	L	7	a110	0.6	4/			S 1.50m	KAIaA	32	3		ST7	RES
2004 10 22.92		C	14.8	UO	13.0	L	7	a140	0.6	4			S 1.50m	KAIaA	32	3		ST7	RES
2004 10 23.69		C	14.5	GA	60.0	Y	6	a120	0.8		2.7m	253	S 0.8 m	SIA	IPL	5	U	Ap7	NAK01

Comet 42P/Neujmin

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 11.59	ax	C	16.8	HV	35.0	C	10	A200	0.3	5			S 0.33m	KAIaSI	4	5		ST2	TSU02
2004 09 08.50	ax	C	16.5	HV	35.0	C	10	A440	0.3	4			S 0.41m	KAIaSI	4	5		ST2	TSU02
2004 10 06.49	a	C	17.2	GA	60.0	Y	6	a240	0.4				S 0.4 m	SIA	IPL	5	U	Ap7	NAK01

Comet 48P/Johnson

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 11.53	ax	C	14.9	HV	35.0	C	10	a120	0.3	5			S 0.89m	KAIaSI	4	5		ST2	TSU02
2004 08 12.60	x	C	15.4	TJ	25.0	L	5	a120	0.2				S 0.2 m	K42	SI4	5	U	SE7	OHS
2004 08 13.57	a	C	15.0:	GA	60.0	Y	6	a120	0.6				S 0.6 m	SIA	IPL	5	U	Ap7	NAK01
2004 09 08.48	ax	C	15.6	HV	35.0	C	10	a120	0.3	4			S 0.35m	KAIaSI	4	5		ST2	TSU02
2004 10 06.47	ax	C	15.5	HV	35.0	C	10	a120	0.3	4			S 0.77m	KAIaSI	4	5		ST2	TSU02
2004 10 06.48	x	C	15.5	HV	60.0	Y	6	a120	0.7				S 0.7 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 17.46	x	C	15.1	TJ	25.0	L	5	a120	0.3				S 0.3 m	K42	SI4	5	U	SE7	OHS

Comet 49P/Arend-Rigaux

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 06.57	ax	C	16.8	HV	35.0	C	10	a120	0.3	5			S 0.68m	KAIaSI	4	5		ST2	TSU02
2004 10 06.65	x	C	16.2	HV	60.0	Y	6	a120	0.3	8/			S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 21.60	a	C	16.0	GA	60.0	Y	6	a120	0.35	8/			S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet 53P/Van Biesbroeck

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 12.58	a	C	16.4	GA	60.0	Y	6	a240	0.6		1.5m	256	S 0.6 m	SIA	IPL	5	U	Ap7	NAK01

Comet 56P/Slaughter-Burnham

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 11.64	ax	C	16.7	HV	35.0	C	10	A620	0.2	5			S 0.55m	KAIaSI	4	5		ST2	TSU02
2004 09 08.58	ax	C	15.3	HV	35.0	C	10	A620	0.3	4			S 1.30m	KAIaSI	4	5		ST2	TSU02
2004 09 08.60		C	16.2	GA	60.0	Y	6	a120	0.4		1.0m	241	S 0.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 06.50	ax	C	15.5	HV	35.0	C	10	a120	0.4	5			S 1.05m	KAIaSI	4	5		ST2	TSU02
2004 10 06.56		C	16.0	GA	60.0	Y	6	a120	0.65			220	S 0.65m	SIA	IPL	5	U	Ap7	NAK01
2004 10 10.92		C	16.5	UO	11.0	L	7	a420	0.33	3			C 0.33m	T25	A32	4		PIX	SHU
2004 10 12.81		C	16.5	UO	13.0	L	7	a330	0.5	2			S 1.50m	KAIaA	32	3		ST7	RES

Comet 65P/Gunn

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 07.01		C	16.1	UO	11.0	L	7	a420	0.5	2			C 0.5 m	T25	A32	4		PIX	SHU
2004 10 16.61		C	15.6	GA	60.0	Y	6	a120	0.75		4.4m	242	S 0.75m	SIA	IPL	5	U	Ap7	NAKO1
2004 10 17.64	ax	C	17.0	TJ	25.0	L	5	a120	0.2				S 0.2 m	K42	SI4	5		SE7	OHS
2004 10 21.80		C	15.5	UO	13.0	L	7	a220	0.7	0/			S 1.50m	KAIa	A32	3		ST7	RES

Comet 69P/Taylor

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 23.80		C	16.4	GA	60.0	Y	6	a240	0.6		> 1.9m	279	S 0.6 m	SIA	IPL	5	U	Ap7	NAKO1

Comet 74P/Smirnova-Chernykh

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 06.53	a	C	18.6	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAKO1

Comet 78P/Gehrels

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 16.76	ax	C	14.1	HV	35.0	C	10	a 90	0.5	5	2.5m	255	S 1.15m	KAIa	SI4	5		ST2	TSU02
2004 08 10.00		C	14.6	UO	15.0	L	5	a240	0.18	3	2 m	248	C 0.18m	T25	A32	4		PIX	SHU
2004 09 13.82		C	14.2	UO	11.0	L	7	a300	0.5	5			C 0.5 m	T25	A32	4		PIX	SHU
2004 09 14.63	ax	C	12.3	HV	35.0	C	10	a 90	1.3	5	> 8.0m	257	S 1.76m	KAIa	SI4	5		ST2	TSU02
2004 09 17.99		C	14.9	UO	11.0	L	7	a300	0.26	6	1.3m	255	C 0.26m	T25	A32	4		PIX	SHU
2004 10 06.63	ax	C	11.2	HV	35.0	C	10	a120	2.2	5	> 8.0m	260	S 3.93m	KAIa	SI4	5		ST2	TSU02
2004 10 06.94		C	14.0	UO	11.0	L	7	a180	0.6	6			C 0.6 m	T25	A32	4		PIX	SHU
2004 10 10.07		C	12.6	UO	13.0	L	7	a330	1.0	6	2.8m	263	S 1.50m	KAIa	A32	3		ST7	RES
2004 10 12.92		C	12.5	UO	13.0	L	7	a330	0.9	6	2.5m	266	S 1.50m	KAIa	A32	3		ST7	RES
2004 10 14.93		C	13.5	UO	11.0	L	7	a120	0.50	8			C 0.50m	T25	A32	4		PIX	SHU
2004 10 16.73		C	11.1	GA	60.0	Y	6	a120	3.1		> 7.9m	259	S 3.1 m	SIA	IPL	5	U	Ap7	NAKO1
2004 10 17.65	ax	C	11.5	TJ	25.0	L	5	a120	1.9		6.0m	259	S 1.9 m	K42	SI4	5	U	SE7	OHS
2004 10 21.91		C	11.8	UO	13.0	L	7	a 70	1.0	6	3.5m	261	S 1.50m	KAIa	A32	3		ST7	RES
2004 10 22.91		C	11.7	UO	13.0	L	7	a 70	1.0	6	3.7m	259	S 1.50m	KAIa	A32	3		ST7	RES

Comet 81P/Wild

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 28.79	a	C	15.2	GA	60.0	Y	6	a120	0.65		1.4m	247	S 0.65m	SIA	IPL	5	U	Ap7	NAKO1

Comet 88P/Howell

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 16.77	ax	C	13.3	HV	35.0	C	10	a 90	1.2	5	3.5m	244	S 1.55m	KAIa	SI4	5		ST2	TSU02
2004 08 20.74	x	C	14.8	TJ	25.0	L	5	a120	0.6		4.0m	250	S 0.6 m	K42	SI4	5	U	SE7	OHS
2004 09 08.64		C	14.1	GA	60.0	Y	6	a120	1.1		3.2m	247	S 1.1 m	SIA	IPL	5	U	Ap7	NAKO1
2004 09 14.61	ax	C	14.6	HV	35.0	C	10	a120	0.7	5			S 0.89m	KAIa	SI4	5		ST2	TSU02
2004 10 06.61	ax	C	13.8	HV	35.0	C	10	a120	0.7	5	3 m	251	S 1.98m	KAIa	SI4	5		ST2	TSU02
2004 10 12.89		C	15.2	UO	13.0	L	7	a160	0.7	3			S 1.50m	KAIa	A32	2		ST7	RES
2004 10 15.76	x	C	15.6	TJ	25.0	L	5	a120	0.4		0.8m	253	S 0.4 m	K42	SI4	5	U	SE7	OHS
2004 10 16.64		C	14.1	GA	60.0	Y	6	a120	1.3		5.1m	245	S 1.3 m	SIA	IPL	5	U	Ap7	NAKO1
2004 10 17.58	ax	C	14.9	TJ	25.0	L	5	a120	0.7				S 0.7 m	K42	SI4	5	U	SE7	OHS

Comet 116P/Wild

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 13.58	a	C	19.0:	GA	60.0	Y	6	a240	0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAKO1

Comet 119P/Parker-Hartley

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 08.64	ax	C	17.3	HV	35.0	C	10	A 80	0.2	4	1.0m	252	S 0.89m	KAIa	SI4	5		ST2	TSU02
2004 09 08.65		C	18.0	GA	60.0	Y	6	a240	0.3	8	1.1m	250	S 0.3 m	SIA	IPL	5	U	Ap7	NAKO1
2004 10 06.55	ax	C	16.7	HV	35.0	C	10	a960	0.2	4	1.0m	246	S 0.87m	KAIa	SI4	5		ST2	TSU02
2004 10 16.59		C	16.9	GA	60.0	Y	6	a240	0.55		3.5m	250	S 0.55m	SIA	IPL	5	U	Ap7	NAKO1

Comet 119P/Parker-Hartley [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 22.71	x	C	17.0	HS	25.0L		5	a120	0.3				S 0.3 m	K42	SI4	5		SE7	OHS

Comet 120P/Mueller

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 21.63		C	19.3	GA	60.0Y		6	a240	0.25				S 0.25m	SIA	IPL	5	U	Ap7	NAK01

Comet 129P/Shoemaker-Levy

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 23.78		C	18.8	GA	60.0Y		6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet 131P/Mueller

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 08.62		C	18.9	GA	60.0Y		6	a240	0.25				S 0.25m	SIA	IPL	5	U	Ap7	NAK01
2004 10 12.57		C	17.8	GA	60.0Y		6	a240	0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet 152P/Helin-Lawrence

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 06.57	a	C	18.2	GA	60.0Y		6	a240	0.3		1.3m	263	S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet 160P/LINEAR

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 05.76		C	16.1	UO	13.0L		7	a220	0.5	3			S 1.50m	KAIaA32		3		ST7	RES
2004 10 06.54		C	17.2	GA	60.0Y		6	a240	0.45				S 0.45m	SIA	IPL	5	U	Ap7	NAK01
2004 10 07.77		C	16.0	UO	13.0L		7	a200	0.5	2			S 1.50m	KAIaA32		3		ST7	RES
2004 10 12.74		C	15.7	UO	13.0L		7	a220	0.7	2			S 1.50m	KAIaA32		3		ST7	RES
2004 10 13.75		C	16.0	UO	13.0L		7	a250	0.6	2			S 1.50m	KAIaA32		3		ST7	RES

Comet C/1999 F1 (Catalina)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 16.65	a	C	16.9	GA	60.0Y		6	a240	0.6		2.0m	137	S 0.6 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2001 HT_50 (LINEAR-NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 16.74	ax	C	14.7	HV	35.0C		10	a 90	0.5	5			S 1.38m	KAIaSI4		5		ST2	TSU02
2004 08 11.65	ax	C	14.3	HV	35.0C		10	a180	0.6	5			S 1.08m	KAIaSI4		5		ST2	TSU02
2004 08 20.76	x	C	14.9	TJ	25.0L		5	a120	0.7				S 0.7 m	K42	SI4	5	U	SE7	OHS
2004 09 02.89		C	15.3	UO	15.0L		5	a120	0.5	3			C 0.5 m	T25	A32	4		PIX	SHU
2004 09 08.58		C	14.2	GA	60.0Y		6	a120	0.75				S 0.75m	SIA	IPL	5	U	Ap7	NAK01
2004 09 08.60	ax	C	14.3	HV	35.0C		10	a180	0.8	4			S 1.74m	KAIaSI4		5		ST2	TSU02
2004 09 08.89		C	15.7	UO	15.0L		5	a300	0.33	4			C 0.33m	T25	A32	4		PIX	SHU
2004 09 13.86		C	15.8	UO	11.0L		7	a600	0.5	4			C 0.5 m	T25	A32	4		PIX	SHU
2004 09 17.84		C	15.6	UO	11.0L		7	a300		3				T25	A32	4		PIX	SHU
2004 09 24.89		C	15.9	UO	11.0L		7	a240	0.58	3			C 0.58m	T25	A32	4		PIX	SHU
2004 10 05.80		C	15.8	UO	13.0L		7	a120	0.5	3			S 1.50m	KAIaA32		3		ST7	RES
2004 10 06.48	ax	C	14.7	HV	35.0C		10	a120	0.5	4			S 0.94m	KAIaSI4		5		ST2	TSU02
2004 10 06.55		C	14.6	GA	60.0Y		6	a120	1.0				S 1.05m	SIA	IPL	5	U	Ap7	NAK01
2004 10 06.85		C	16.5	UO	11.0L		7	a300	0.58	2			C 0.58m	T25	A32	4		PIX	SHU
2004 10 07.80		C	15.5	UO	13.0L		7	a150	0.7	4			S 1.50m	KAIaA32		3		ST7	RES
2004 10 10.84		C	16.5	UO	11.0L		7	a300	0.46	3			C 0.46m	T25	A32	4		PIX	SHU
2004 10 12.76		C	16.6	UO	11.0L		7	a300	0.46	3			C 0.46m	T25	A32	4		PIX	SHU
2004 10 12.77		C	15.9	UO	13.0L		7	a140	0.5	4			S 1.50m	KAIaA32		3		ST7	RES
2004 10 17.50	x	C	15.8	TJ	25.0L		5	a120	0.3		0.6m	180	S 0.3 m	K42	SI4	5	U	SE7	OHS

Comet C/2001 K5 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2003 10 19.80		C	16.3	HS	60.0C	4	a300		0.22	d4	3.5m	207	S23.0 m		A41	5	U	S1C	BOR04
2004 10 13.45		C	18.3:	GA	60.0Y	6	a240		0.3		0.9m	247	S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2001 Q4 (NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 02.50	ax	C	9.1	HV	35.0C	10	a 90		4.8	5			S 6.48m	KAIa	SI4	5		ST2	TSU02
2004 08 12.58	x	C	10.6	TJ	25.0L	5	a120		1.8				S 1.8 m	K42	SI4	5	U	SE7	OHS
2004 09 08.44	ax	C	10.6	HV	35.0C	10	a120		3.8	5			S 4.83m	KAIa	SI4	5		ST2	TSU02
2004 10 06.42	ax	C	10.7	HV	35.0C	10	a120		2	4			S 6.85m	KAIa	SI4	5		ST2	TSU02
2004 10 13.43	a	C	11.7	GA	60.0Y	6	a120		2.7		> 5.5m	194	S 2.7 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 17.42	ax	C	12.1	TJ	25.0L	5	a120		1.7		>13.4m	201	S 1.7 m	K42	SI4	5	U	SE7	OHS

Comet C/2002 V2 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 16.63		C	18.7	GA	60.0Y	6	a240		0.3			80	S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2003 E1 (NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 28.76		C	17.7:	GA	60.0Y	6	a240		0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 08 13.54		C	17.8	GA	60.0Y	6	a240		0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2003 G1 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 13.55		C	18.1	GA	60.0Y	6	a240		0.3		1.1m	186	S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 06.46		C	18.0	GA	60.0Y	6	a240		0.35		1.2m	187	S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2003 H3 (NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 12.47		C	17.6:	GA	60.0Y	6	a240		0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2003 K4 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 16.54	ax	C	8.3	HV	35.0C	10	a 60		5.3		> 8.0m	85	S 5.33m	KAIa	SI4	5		ST2	TSU02
2004 08 02.46	ax	C	7.9	HV	35.0C	10	a 60		6	5			S 6.21m	KAIa	SI4	5		ST2	TSU02
2004 08 09.48	ax	C	7.6	HV	10.0R	4	a180		10	5	1.2	99	S14.11m	KAIa	SI4	5		ST2	TSU02
2004 08 11.46	ax	C	7.5	HV	10.0R	4	a180		13	5	>1.3	91	S16.56m	KAIa	SI4	5		ST2	TSU02

Comet C/2003 O1 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 28.75		C	17.6	GA	60.0Y	6	a240		0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 08 16.51		C	17.8	GA	60.0Y	6	a240		0.3		1.2m	96	S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2003 S3 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 16.69		C	20.0:	GA	60.0Y	6	a240			9			S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 23.70		C	20.1:	GA	60.0Y	6	a240		0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2003 T3 (Tabur)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 16.79	ax	C	12.0	HV	35.0C	10	a 60		0.6	4	2.4m	332	S 1.37m	KAIa	SI4	5		ST2	TSU02
2004 09 14.83	ax	C	13.5	HV	35.0C	10	a 90		0.4	4			S 1.11m	KAIa	SI4	5		ST2	TSU02
2004 10 15.06		C	15.2	UO	11.0L	7	a300		0.33	4			C 0.33m	T25	A32	4		PIX	SHU
2004 10 17.74	ax	C	14.6	TJ	25.0L	5	a120		0.4		6.7m	341	S 0.4 m	K42	SI4	5		SE7	OHS

Comet C/2003 T4 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 14.80	ax	C	14.1	HV	35.0	C	10	a120	0.8	5			S 1.37m	KAIa	SI4	5		ST2	TSU02

Comet C/2003 WT_42 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 23.75		C	15.8	GA	60.0	Y	6	a240	0.4				S 0.4 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 B1 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 23.77		C	16.7	GA	60.0	Y	6	a240	0.45		0.6m	339	S 0.45m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 D1 (NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 23.74		C	17.8	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 DZ_61 (Catalina-LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 06.43		C	18.7	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 F2 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 28.72		C	18.1	GA	60.0	Y	6	a240	0.35			205	S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2004 F3 (NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 25.68	x	C	15.6	TJ	25.0	L	5	a120	0.3				S 0.3 m	K42	SI4	5	U	SE7	OHS
2004 08 02.47	ax	C	15.4	HV	35.0	C	10	a 60	0.25	6			S 0.59m	KAIa	SI4	5		ST2	TSU02
2004 08 13.46	x	C	15.5	HV	60.0	Y	6	a120	0.4				S 0.4 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 F4 (Bradfield)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 28.79		C	5.9	TJ	25.0	L	5	a 80	5.6		>21	m305	S 5.6 m	K26	SI4	5	U	ST9	KAD02
2004 04 29.78		C	6.3	TJ	25.0	L	5	a120	4.8		>17	m306	S 4.8 m	K26	SI4	5	U	ST9	KAD02

Comet P/2004 H2 (Larsen)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 28.70		C	18.6:	GA	60.0	Y	6	a240	0.25				S 0.25m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2004 H3 (Larsen)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 28.68		C	18.6	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 H6 (SWAN)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 16.72	ax	C	11.8	HV	35.0	C	10	a 60	2.2	4	4	m210	S 2.22m	KAIa	SI4	5		ST2	TSU02
2004 08 02.61	ax	C	13.1	HV	35.0	C	10	a 90	1.2	2	3.5m	150	S 1.42m	KAIa	SI4	5		ST2	TSU02
2004 08 11.61	ax	C	13.1	HV	35.0	C	10	a480	1.2	2	> 5.4m	147	S 2.07m	KAIa	SI4	5		ST2	TSU02
2004 08 16.57		C	13.4	GA	60.0	Y	6	a240	2.2		5.0m	130	S 2.2 m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2004 HC_18 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 13.50		C	17.5	GA	60.0	Y	6	a240	0.4				S 0.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 09 13.47		C	18.1	GA	60.0	Y	6	a240	0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2004 HC_18 (LINEAR) [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 12.44		C	19.1:	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 K1 (Catalina)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 16.55		C	17.3	GA	60.0	Y	6	a120	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2004 K2 (McNaught)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 16.72		C	18.5	GA	60.0	Y	6	a240	0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 L1 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 08 13.47	x	C	18.2	HV	60.0	Y	6	a240	0.3		1.0m	92	S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 P1 (NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 08.57		C	19.3	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 06.51		C	19.5	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 13.47		C	19.5	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 Q1 (Tucker)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 08.64		C	13.2	GA	60.0	Y	6	a120	1.5		1.5m	230	S 1.5 m	SIA	IPL	5	U	Ap7	NAK01
2004 09 08.66	ax	C	12.5	HV	35.0	C	10	a 90	2.3	5			S 2.36m	KAIa	SI4	5		ST2	TSU02
2004 09 18.02		C	13.9	UO	11.0	L	7	a480	0.58	4			C 0.58m	T25	A32	4		PIX	SHU
2004 10 02.87		C	13.4	UO	11.0	L	7	a300	0.66	8			C 0.66m	T25	A32	4		PIX	SHU
2004 10 03.89		C	12.6	UO	13.0	L	7	a 45	1.4	5	1.5m	207	S 2.50m	KAIa	A32	2		ST7	RES
2004 10 05.89		C	12.9	UO	13.0	L	7	a 55	1.3	5			S 2.50m	KAIa	A32	2		ST7	RES
2004 10 06.59	ax	C	11.1	HV	35.0	C	10	a 90	3.0	5	4	m205	S 4.44m	KAIa	SI4	5		ST2	TSU02
2004 10 06.66		C	11.3	GA	60.0	Y	6	a120	3.2		5.3m	204	S 3.2 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 06.88		C	14.3	UO	11.0	L	7	a 60	0.75	4			C 0.75m	T25	A32	4		PIX	SHU
2004 10 07.87		C	12.3	UO	13.0	L	7	a 65	1.4	5/	1.5m	233	S 2.50m	KAIa	A32	2		ST7	RES
2004 10 10.95		C	13.5	UO	11.0	L	7	a240	0.41	8			C 0.41m	T25	A32	4		PIX	SHU
2004 10 12.94		C	14.1	UO	11.0	L	7	a180	0.46	8			C 0.46m	T25	A32	4		PIX	SHU
2004 10 13.79		C	13.8	UO	11.0	L	7	a120	0.73	8			C 0.73m	T25	A32	4		PIX	SHU
2004 10 14.91		C	13.4	UO	11.0	L	7	a180	0.48	8			C 0.48m	T25	A32	4		PIX	SHU
2004 10 16.61		C	10.7	GA	60.0	Y	6	a120	4.4		> 6.0m	190	S 4.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 17.68	ax	C	11.4	TJ	25.0	L	5	a120	1.5				S 1.5 m	K42	SI4	5	U	SE7	OHS

Comet C/2004 Q2 (Machholz)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 14.78	ax	C	10.4	HV	35.0	C	10	a 90	2.0	5	7	m240	S 3.59m	KAIa	SI4	5		ST2	TSU02
2004 10 06.72	ax	C	9.5	HV	35.0	C	10	a 90	4.2	5	> 8	m249	S 4.32m	KAIa	SI4	5		ST2	TSU02
2004 10 16.76	a	C	8.7:	GA	60.0	Y	6	a120	6.9				S 6.9 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 17.72	ax	C	10.9	TJ	25.0	L	5	a120	4.7		5.5m	259	S 4.7 m	K42	SI4	5	U	SE7	OHS

Comet P/2004 R1 (McNaught)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 09 13.46	x	C	17.4	HV	60.0	Y	6	a240	0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2004 R3 (LINEAR-NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 06.61		C	18.6	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 12.56		C	18.5	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 21.59		C	18.6	GA	60.0	Y	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 S1 (Van Ness)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 06.63		C	15.9	GA	60.0Y		6	a120	0.75		1.5m	201	S 0.75m	SIA	IPL	5	U	Ap7	NAK01
2004 10 06.92		C	16.5	UO	11.0L		7	a480	0.4	3			C 0.4 m	T25	A32	4		PIX	SHU
2004 10 12.53		C	15.8	GA	60.0Y		6	a120	0.6		2.5m	120	S 0.6 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 12.81		C	16.3	UO	11.0L		7	a420	0.41	4			C 0.41m	T25	A32	4		PIX	SHU
2004 10 13.84		C	16.9	UO	11.0L		7	a600	0.30	2			C 0.30m	T25	A32	4		PIX	SHU

Comet P/2004 T1 (LINEAR-NEAT)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 12.59	a	C	14.3	GA	60.0Y		6	a120	1.0		4.5m	248	S 1.0 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 12.93		C	15.1	UO	11.0L		7	a180	0.36	5			C 0.36m	T25	A32	4		PIX	SHU
2004 10 14.95		C	15.1	UO	11.0L		7	a300	0.16	3			C 0.16m	T25	A32	4		PIX	SHU
2004 10 16.58	a	C	13.9	GA	60.0Y		6	a120	1.3		3.9m	251	S 1.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 10 17.55	ax	C	14.9	TJ	25.0L		5	a120	0.6		1.2m	251	S 0.6 m	K42	SI4	5	U	SE7	OHS

Comet C/2004 U1 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 10 23.82		C	17.9:	GA	60.0Y		6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

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DESIGNATIONS OF RECENT COMETS

Listed below, for handy reference, are the last 15 comets to have been given designations in the new system. The name, preceded by a star (⋆) if the comet was a new discovery (compared to a recovery from predictions of a previously-known short-period comet) or a # if a re-discovery of a 'lost' comet. (The 'P/' prefix for designations is used for new comets with orbital periods < 30 yr; otherwise, 'C/' is used.) Also tabulated below are such values as the orbital period (in years) for periodic comets, date of perihelion, T (month/date/year), and the perihelion distance (q, in AU). Four-digit numbers in the last column indicate the *IAU Circular* (4-digit number) containing the discovery/recovery or permanent-number announcement.

Not included below are numerous recently-discovered comets observed only with the SOHO spacecraft — and seen only close to the sun with the SOHO instruments — most of which are presumed to be no longer in existence. Earlier lists and references to such comets appeared in the July 2002 issue (p. 219) and references therein.

Note that the designation and name P/2004 NL_{159} (LINEAR-Catalina) was changed to P/2004 V5 (LINEAR-Hill); cf. *IAUC* 8438 (the original designation was not deleted, but P/2004 V5 is considered the primary designation until permanent numbering occurs).

[This list updates that in the July 2004 issue, p. 182.]

	New-Style Designation	*P*	*T*	*q*	*IAUC*
⋆	C/2004 S1 (Van Ness)		12/8/04	0.68	8412
⋆	P/2004 T1 (LINEAR-NEAT)	6.47	11/7/04	1.71	8416
⋆	C/2004 T3 (Siding Spring)		4/13/03	8.86	8421
⋆	C/2004 U1 (LINEAR)		12/8/04	2.66	8421
⋆	P/2004 V1 (Skiff)	9.96	12/8/04	1.42	8426
	161P/2004 V2 (Hartley-IRAS)	21.5	6/20/05	1.28	8428
⋆	P/2004 V3 (Siding Spring)	19.0	11/12/04	3.94	8429
⋆	P/2004 V4 (NEAT)	7.01	1/31/05	1.92	8429
⋆	P/2004 V5 (LINEAR-Hill)	22.4	2/28/05	4.41	8433
⋆	162P/2004 TU_{12} (Siding Spring)	5.32	11/10/04	1.23	8436
⋆	C/2004 RG_{113} (LINEAR)		3/3/05	1.94	8444
⋆	P/2004 WR_9 (LINEAR)	15.0	1/11/05	1.92	8448
⋆	P/2004 X1 (LINEAR)	5.98	11/02/04	0.79	8449
⋆	C/2004 X2 (LINEAR)		8/23/04	3.79	8450
⋆	P/2004 VR_8 (LONEOS)	10.7	9/2/05	2.38	8451