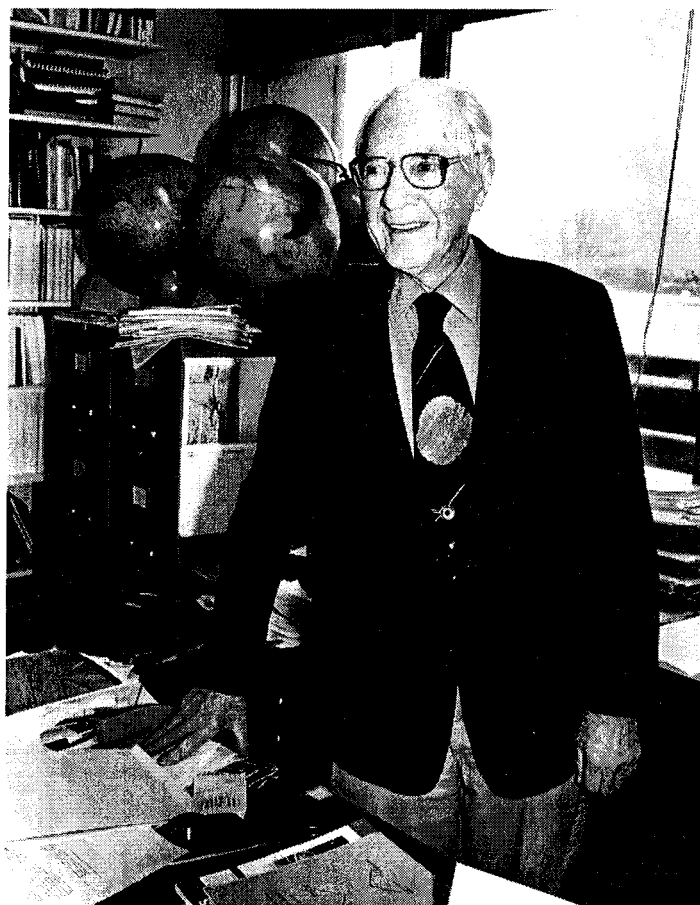

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Fred L. Whipple



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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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Cometary observations should be sent to the Editor in Cambridge; all data intended for publication in the *ICQ* that is not sent via computer electronic mail should be sent on standard *ICQ* observation report forms, which can be obtained upon request from the Editor. Those who can send observational data (or manuscripts) in machine-readable form are encouraged to do so [especially through e-mail via the computer networks SPAN (6700::DAN) or Internet (ICQ@CFA.HARVARD.EDU), or via floppy disks that can be read on an IBM PC], and should contact the Editor for further information. The *ICQ* has extensive information for comet observers on the World Wide Web, including the Keys to Abbreviations used in data tabulation (see URL <http://cfa-www.harvard.edu/icq/icq.html>). In early 1997, the *ICQ* published a 225-page *Guide to Observing Comets*; this edition is now out of print, but a revised edition is under preparation.

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PROCEEDINGS FROM IWCA III

The third International Workshop on Cometary Astronomy, held in Paris in early June, was a grand success, with attendees from around the globe. A tentative deadline of 2004 Nov. 1 was established for those speakers wishing to contribute papers to a special proceedings issue of the *ICQ*, to be published sometime in 2005. — *The Editor*

Fred Lawrence Whipple (1906-2004)

Fred L. Whipple, legendary 20th-century cometary astronomer, died on 2004 August 30 in a hospital in Cambridge, Massachusetts, at age 97. He had been in declining health for some years but still had remarkable mental capacity. Just a few months ago, for example, he gave an extensive oral history of his career to Ursula Marvin of the Smithsonian Astrophysical Observatory (which has been published in *Meteoritics & Planet. Sci.* 39, Suppl., A199). Earlier taped, transcribed-but-unpublished career Smithsonian interviews of Whipple were made by Owen Gingerich some 15 years ago, by David DeVorkin in the 1970s, and by Pam Henson.

While my personal knowledge of Fred Whipple only encompasses the last quarter of his long, illustrious life, I realize that I did get to know Fred fairly well. I initially requested Marsden to write an *ICQ* obituary for Fred, because he had known Fred for twice as long as I had. But he observed that I worked with Fred quite closely, too, inferring that I should be able to put down some useful remembrances that would be unique to me. Thus, I humbly jot down some notes here, adding that some fill-in-the-blanks information comes from Marsden and others at the CfA who knew Fred; I thank DeVorkin for sending a transcript of his April 1977 interview with Whipple, from which some information about Fred's early life were gleaned.

Only in the last couple of months of Whipple's life — due to his inability to walk easily to his large corner top-floor former-Director's office, on the southeast corner of B building here at the Harvard College Observatory (a 1950s-era building that has no elevator) — were his files, books, and papers boxed up in preparation for passing the office on to another astronomer. For decades into his 80s, Whipple rode his bicycle every day the 3-or-so miles from his home in Belmont to the Observatory. His daily routine in the 1980s typically included a 1-block lunch-time walk to nearby Armando's pizzeria, where he was well liked, to get a hot sandwich.

I had the pleasure of knowing Fred for more than two decades in my tenure here at the Harvard-Smithsonian Center for Astrophysics (CfA). For a young cometary astronomer, it was a real treat for me to work alongside what are arguably the three most preeminent cometary scientists of the 20th century: Whipple, Zdenek Sekanina, and Brian Marsden (Sekanina moved to California in 1980, two years after my first arrival in Cambridge). Though I spoke with him occasionally in the years after my first visit to Cambridge in 1978, my first real dealings with Fred occurred in 1982 in connection with the *ICQ's* first American Workshop on Cometary Astronomy, which was held at Harvard College Observatory (see the report of that AWCA by C. S. Morris 1982, *ICQ* 4, 39). I had talked with Fred to get him to be one of the speakers, which he kindly agreed to, but late on that Saturday afternoon, I ran into Fred in a hallway in A building, and he commented on what "a great job Dan Green has done" to pull the meeting together. He was then 75, and I thought that his memory was really going, to have not recognized me there. But I assumed later that this was probably just the typical short-term memory loss that we all face as we enter our senior years, for Fred was certainly full of wonderful memory to his final days.

Not long after that first AWCA in 1982, Fred asked me to work with him on a book that the Smithsonian Institution Press (SIP) was soliciting from him as part of their series entitled "Smithsonian Library of the Solar System": a popular account of comets, in preparation for the widely heralded forthcoming 1985-1986 apparition of Halley's comet. Being some fifty years younger than Fred, I agreed to help him when he pleaded that he could not do such a book at his age without a knowledgeable assistant. My main task was to do research for various aspects of the book, including especially illustrations, but I ended up editing the entire book and writing part of it (including much of the chapter on comet discovery).¹ One illustration that we got for the book, that of Minoru Honda, was the topic of a short story in itself. It was well-known that Honda, who had served in the Japanese military in World War II, was not favorable to Americans, even decades after the war, and it was hard to get photographs of him. A *National Geographic* (*N.G.*) photographer had somehow managed to do so, and I found a *N.G.* article that had contained a nice photograph of Honda. So I approached *N.G.* to get the photograph and permission to republish it in our book, and they pointed me to the free-lance San Francisco photographer, saying that it was his photograph and therefore his decision. But the free-lance *N.G.* photographer wanted a huge sum of money to re-use the photograph of Honda (and we had only a tiny budget for such matters); even when I argued that an SIP book would give more favorable exposure to him as a photographer, and that we had little money for this sort of thing, he refused to lower his high fee. So I ended up getting a helpful Japanese amateur astronomer to take the photograph that we ended up using in our book, at no charge! (It's bizarre how silly people can be sometimes, isn't it? I still can't figure out the thinking of that free-lance *N.G.* photographer.)

My wife, Lina, contributed by creating the book's index. In fact, Lina's connection to Fred goes back to late 1981, before she and I even met: she was working for RAI (Italian television) out of Manhattan then as a translator and producer for a weekly science "news magazine" Italian TV show entitled "Quark", and she telephoned to arrange interviews of both Marsden and Whipple for a piece on Halley's comet that they were planning. She ended up getting both interviews, and it was during that visit to the Boston area in which she and I met.

¹ Fred kindly told me in the later stages of writing the book that he could not have done it without my help, and he generously requested to SIP that my name be added to his as a co-author. I was honored, but SIP balked and said that they wanted only Fred's name; the compromise was to put the words "Assisted by Daniel W. E. Green" on the title page and cover, though the cover action was somehow not accomplished.

I spent much time with Fred working on that book, which was titled *The Mystery of Comets* and published in 1985 (first in hardcover and later in paperback). As intelligent as he was, Fred never liked working with the then-new interactive computers and relied on others to help him. He wrote his manuscript out in long hand and had secretaries type it into a computer for him. He told me that he was just too old to learn this new technology. One of my memories of working with Fred in his office over a couple of years on creating *The Mystery of Comets* was his heavy smoking. Fred smoked cigarettes like a chimney — coming from that by-gone era when it seemed that most people smoked. His office always smelled of smoke even if he wasn't actually smoking. I remember marvelling on how healthy he seemed for a man in his late 70s, considering that he had smoked heavily for most of his adult life. For many years dating back to his college years, Fred had also been an active tennis player. But Fred's health started to become a problem soon after we finished that book, including a bout with pneumonia, and his physician 'forced' Fred to stop smoking. Fred continued to ride his bicycle into the Observatory until one day, evidently forgetting to take his medications, he blacked out on Huron Avenue enroute to the Observatory. Though Huron Ave. is a busy street, Fred was fortunate in that nobody hit him while on the ground.

Though he continued riding for a bit after this, a bothersome sciatica condition made Fred realize that he could no longer ride his bicycle, but he would still drive his Volvo (with the personalized Massachusetts license plate reading "COMETS")² into Cambridge. Fred remained actively engaged in research on comets until just he last few years, working especially on the light curves of comets (trying to develop an "activity index"), and he continued to consult with Marsden, me, and others in discussing his results during the last decade. The Observatory put on a big birthday bash in November 1996 at the Harvard Faculty Club to commemorate Fred's 90th birthday. Among the people who sat with Lina and me at our table at that memorable event were Gene and Carolyn Shoemaker, Brian and Nancy Marsden, and Zdenek Sekanina (Gene was killed only a few months later).

Among my strongest memories of that birthday party were Richard McCrosky's very humorous remarks about his memories of Fred. McCrosky, who at various times directed the Observatory's Prairie meteor network and its Agassiz/Oak Ridge and Mount Hopkins observatory stations, was one of the many people that Whipple brought to the CfA. In fact, by bringing the Smithsonian Astrophysical Observatory (SAO) to Harvard in 1955, Whipple transformed the HCO and the SAO into what would soon become the world's largest astronomical center, now employing some 300 scientists.³ By exploiting the availability of government funds for establishing a satellite tracking system in the late 1950s, Whipple brought many new employees to the Observatory in Cambridge. In his remarks to the invited guests at his 90th-birthday party, Fred said that his philosophy in expanding the Observatory staff was to bring a lot of good minds into the fold and then to let them have complete independence to pursue astronomical problems as each scientist saw fit — with a minimum of "meddling" from any administrative people. This fostered a creative atmosphere at the Observatory and encouraged more than a few astronomers to come and stay for many years.

Whipple enticed a young Brian Marsden to come and work at SAO in 1965, upon completion of his Ph.D. thesis at Yale, rather than take a job with Kuiper (who also courted him) in Tucson. Marsden notes that many things would be very different in planetary science and astronomy if it weren't for Whipple, including the career paths of many scientists (including Marsden, and thus, myself!). When it was announced in 1964, at a Commission 6 meeting at the International Astronomical Union's General Assembly in Hamburg, that K. A. Thernöe was retiring and the Central Bureau for Astronomical Telegrams would have to leave its original home in Copenhagen, Whipple got up to say that the SAO could take on the production of the *IAU Circulars*. For four decades, the Observatory had been publishing the *Harvard Announcement Cards* as the North American version of the *IAUCs*, so there was already a staff in place for this work. And so it happened that Owen Gingerich became the first CBAT Director in Cambridge at the beginning of 1965, succeeded only three years later by Marsden. Whipple continued to build the center at Cambridge, serving as Director of the SAO during 1955-1973 and helping to fuse the HCO and SAO into the CfA in 1973.

Whipple himself started out concentrating at Harvard on meteors for the first 15-20 years of his post-graduate career. The study of meteors as atmospheric probes proved to be very important to the impending (and then fledgling) spacecraft program. Some 750 pages of Whipple's two-volume collected works (published in 1972) contain his many published papers on meteors. Though he was computing orbits of comets as a student in the late 1920s and scrutinized the Harvard plates for comets in the 1930s, Whipple really came to embrace comet research in the late 1940s, culminating in his well-known papers on his icy-conglomerate model of a cometary nucleus, in which he showed that jetting effects were causing the nongravitational effects seen in the orbit of comet 2P/Encke, and expanding this to discuss the effects of solar radiation on small interplanetary objects (Whipple 1950, *Ap.J.* **111**, 375; 1951, *Ap.J.* **113**, 464; 1955, *Ap.J.* **121**, 750).

In the 1950s and 1960s, Whipple built up an eastern-U.S. powerhouse for planetary science — particularly for meteor and cometary astronomy — which was complementary to the Lunar and Planetary Laboratory created by Whipple's good friend Gerard Kuiper at the University of Arizona.⁴ To take nothing away from Kuiper's work — as I have stated in

² a photograph of which (though on an earlier car) appears on page 88 of Nigel Calder's 1981 book *The Comet is Coming!* (New York: Viking Press).

³ The bringing of SAO to Cambridge from Washington, DC, is discussed in numerous sources, including *Lighthouse of the Skies — The Smithsonian Astrophysical Observatory: Background and History 1846-1955* by B. Z. Jones (1965, Washington, DC: Smithsonian Institution), pp. 290ff; and *Solar System Astronomy in America: Communities, Patronage, and Interdisciplinary Research, 1920-1960* by R. E. Doel (1996, Cambridge University Press), pp. 202ff.

⁴ See Doel (*op.cit.*). I remember once talking with Fred about Kuiper, and he told me the powerful story of how the two of them were together in Mexico City when Kuiper died in Whipple's arms of a heart attack in Kuiper's hotel room on Christmas Eve 1973. That incident had a strong effect on Fred, as shown by how touched he still was when relating the story to me many years later. Whipple had the highest regard for Kuiper.

these pages (see *ICQ* 21, 45) — the many transneptunian objects found since 1992 (giving meaning to the discovery of Pluto in 1930) were predicted to be there by Whipple and *not* by Kuiper. Whipple⁵ and Al Cameron⁶ (a leading planetary cosmogonist who joined Whipple and company at the CfA) conjectured separately in the 1960s that even today “there must be a tremendous mass of small solid material” between $r = 40$ and 50 AU, and Whipple illustrated his hypothesis by showing some members of the “comet ring” as close as $r = 30$ –35 AU and out to 50 AU (see accompanying figure). Whipple stated clearly in a 1972 paper⁷ that his thinking on this was spawned independent of the work by Cameron and by Kuiper, and Whipple pleaded with astronomers not to forget that there might be now a detectable belt of objects beyond Neptune. Whipple’s concept may have germinated as early as the 1930s, when his undergraduate mentor at UCLA proposed just such a group of object beyond Neptune (though Whipple said no to this when asked this recently): Frederick C. Leonard (1930, *Leaflet Astron. Soc. Pacific* No. 30, pp. 121–124) questioned, “Is it not likely that in Pluto there has come to light the *first* of a *series* of ultra-Neptunian bodies, the remaining members of which still await discovery but which are destined eventually to be detected?” I have argued that the TNOs, if named after any person, should be named for Whipple and not Kuiper, because, Kuiper said that TNOs may have existed early in the solar system’s history but probably not now — and Fred kept urging astronomers in print and at meetings to not forget to look for the elusive objects.

Whipple never considered Kuiper to have stated that there was currently a region of TNOs waiting to be discovered.⁸ It is very strange, indeed, that Whipple would omit mention of something so significant (were it true!) as the Fernández/Duncan-purported claim that Kuiper should be credited for coming up with the idea that TNOs exist. After all, Kuiper was a close friend of Whipple’s, and friends in a small field such as planetary astronomy not only know what each other is doing and has done, but they would take care to credit each other where appropriate. Fred never credited Kuiper with what Fernández, Duncan, and their successors credited to Kuiper — for good reason!⁹ Fred also told me that he always thought it to have been ridiculous that the astronomical community called Pluto a major planet.¹⁰ Of course, he had intimate dealings with it — having been among the first to compute orbits for it upon its discovery in 1930, while he was an astronomy graduate student at Berkeley, and this showed that Pluto’s orbit was more like that of a minor planet or a comet than a major planet (and which, combined with its brightness at such a large distance, suggested a very small size for Pluto).

Whipple was also instrumental in establishing a group to support early astronomical satellites at Cambridge, and he was involved heavily in the observation program at HCO’s Agassiz Station (later SAO’s Oak Ridge Observatory) and was key in creating SAO’s observatory at Mount Hopkins (in southern Arizona), now named the Fred Lawrence Whipple Observatory. In the process of looking at survey plates taken at Agassiz Station (located some 40 km west of Cambridge, where light pollution decades ago was minimal), Whipple found the six comets named for him, including 36P/Whipple. Comet C/1942 X1 (Whipple-Fedtke-Tevzadze) became the brightest of his comets, reaching total visual mag ≈ 3.5 in February 1943. Also, minor planet (1940), discovered in 1975 at Agassiz, was named for Whipple. He received numerous other honors, including medals awarded by the National Academy of Sciences, the Royal Astronomical Society, the U.S. Air Force (for his contribution to radar countermeasures during and after World War II), Presidents Harry Truman and John F. Kennedy, and the Smithsonian Institution.

Whipple was born, evidently on his parents’ farm near the small town of Red Oak, Iowa, some 50 miles southeast of Omaha, on 1906 Nov. 5. His early schooling in Iowa occurred in a one-room schoolhouse that had generally fewer

⁵ 1964, *Proc. National Acad. Sci.* 51, 711; 1964, *A.J.* 69, 563.

⁶ A. G. W. Cameron 1962, *Icarus* 1, 13; 1978, in *The Origin of the Solar System* (ed. by S. F. Dermott; Chichester: John Wiley and Sons), pp. 61ff.

⁷ in *The Motion, Evolution of Orbits, and Origin of Comets* (ed. by G. A. Chebotarev *et al.*), p. 401.

⁸ The current-day myth that Kuiper predicted the TNO belt observed today was apparently begun erroneously with a much-cited 1980 paper by Julio Fernández (*MNRAS* 192, 481), in which Fernández unfortunately appears not to have done very extensive searching of the literature on the matter (though he did more than most others that followed him). The flood gates apparently opened in earnest due to the paper by Duncan *et al.* in 1987 (*A.J.* 94, 1330); prior to that, authors actually looked at the earlier papers, with proper credit on theorizing about TNOs going to Cameron and Whipple [*e.g.*, Hamid *et al.* (1968, *A.J.* 73, 727), Marsden (1974, *Ann. Rev. Astron. Astrophys.* 12, 1), Eneev (1980, *Sov. Astron. Lett.* 6, 163), Bailey (1983, *MNRAS* 205, 47P)]. The real problem was that Fernández (and, thus, the authors following Fernández’s lead without checking to see what Kuiper actually wrote) did not look beyond this one early paper that Kuiper had written on the speculations about the origins of the solar system for a general book, in which Kuiper said precious little about the topic at all. That Kuiper’s thoughts on a region of small bodies beyond Neptune were very minor parts of Kuiper’s work is reflected in the powerful lack of citing Kuiper on this topic by most other pre-1987 authors, such as Cameron, Whipple, and T. Yamamoto (1984, *A.Ap.* 142, 31). When Kuiper was cited on this topic prior to 1987 (*e.g.*, Biermann and Michel 1978, *Moon and Planets* 18, 447), it was in reference to his placing comets as having formed originally at or beyond Neptune, without comment on Kuiper’s stance on the evolution of the placement of those original comets. Furthermore, none of his obituary writers — mostly contemporary planetary scientists who should have known the situation well — made any mention to Kuiper speculating on objects in a region just beyond Neptune, despite including lengthy lists of notable accomplishments by Kuiper in his planetary-science career [see Cruikshank 1974, *Sky Telesc.* 47, 159; Owen and Sagan 1974, *Mercury* 3(2-3), 16; Whitaker 1974, *Physics Today* 27(3), 85; Sagan 1974, *Icarus* 22, 117; Anonymous 1974, *Nature* 248, 539]; indeed, though numerous of Kuiper’s significant publications were cited in the obituaries, there is no mention of Kuiper’s chapter in Hynek’s book that is so highly cited by “Kuiper-belt” proponents today.

⁹ See Whipple’s discussion on theorizing about comets beyond Neptune in his papers and in his books *Orbiting the Sun* (1981, Harvard University Press, pp. 298ff) and *The Mystery of Comets*.

¹⁰ His views were put into print, as in *Orbiting the Sun*, p. 298, where he surmised that Pluto and Triton are “effectively large comets”.

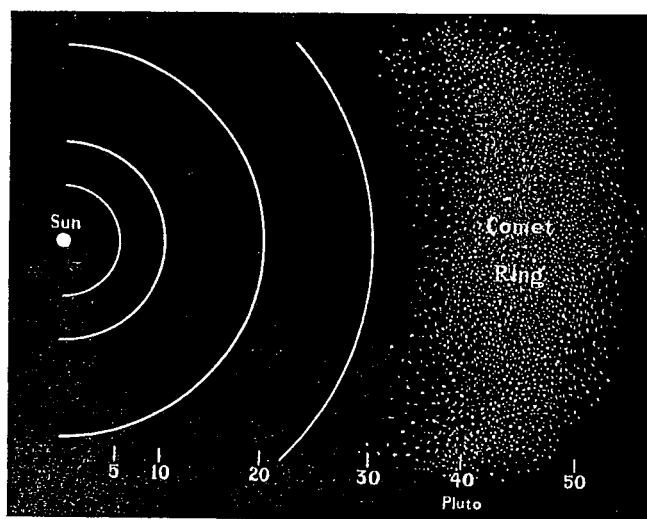
than eight students for grades 1-8 at any one time. After 3.5 years at Emerson High School, Fred's family moved to Long Beach, California, when he was 15, where his father became a grocer. Fred started college at Occidental College near Pasadena, before transferring to the University of California, Los Angeles, from which he graduated with a major in mathematics. His astronomy professor at UCLA, Leonard, encouraged Fred to do graduate work in astronomy. After obtaining his Ph.D. at the University of California at Berkeley, Fred's parents were not very happy with his choices of leaving the Presbyterian school (Occidental) and going into astronomy; as he told Devorkin that he "was the type of youngster . . . in those days" such that his parents "knew it was futile to argue with" him: "When I'd made up my mind to do something, I went ahead and did it, and there wasn't any argument about it." Whipple recalled then that his teaching fellowship at Berkeley paid him \$600 for nine months, which he said was plenty for him to live on in 1930.

Fred Whipple accepted an offer in 1931 to serve as head of the observing program at HCO. Upon choosing to work at Harvard over Lick Observatory (where he also had a job offer), Whipple told DeVorkin: "I made a decision then that I would rather be . . . a small frog in the big puddle than a big frog in the little puddle", saying in 1977 that he was happy at Harvard. In the 1930s, the Harvard astronomy teaching load fell mostly to Whipple, Bart Bok, Donald Menzel, and Cecilia Payne. He held teaching posts on the Harvard faculty for some 45 years, eventually being made Phillips Professor of Astronomy at Harvard University for some years until his formal retirement in 1977. Whipple never really wrote an autobiography, as many elder astronomers do for publications such as *Annual Reviews of Astronomy and Astrophysics*. *The Mystery of Comets* is possibly the closest thing to an autobiography of him, in which he discusses the development of cometary science in the 20th century from his perspective (and including much of his own input into the field); a more technical assessment of the same concept was given as the Henry Norris Russell prize lecture to the American Astronomical Society in January 1988 (published as Whipple 1989, *Ap.J.* 341, 1). In my hours spent with Fred over the last 20 years, there were three names in cometary science that he mentioned over and over as astronomers whose work and friendships he greatly admired and respected — Ernst Öpik, Sekanina, and Marsden.

Whipple occasionally wrote for the *ICQ*, as with his review of the January 1984 meeting on "Ices in the Solar System" in Nice, France (*ICQ* 6, 35). I was pleased that Fred wrote the Foreword to the *ICQ's* 1997 *Guide to Observing Comets*. He continued to be rather active in research, though at a much slower pace, in the 1990s. He continued to read over the *ICQ* and extract magnitude data for his work on a comet-activity index based on comet brightness, and he maintained a large handwritten card file in his office of orbital and photometric data on comets. Fred regularly commented to me that it was such a pain getting older; he regretted that his body was giving out on him while his mind was still pretty strong. The physical ailments of the last decade or two clearly (which were mainly problems associated with old age) made him very unhappy. But Fred was always eager to see the ongoing developments in cometary astronomy — especially those wonderful images and results from the spacecraft that have flown by comets in recent years. We had all hoped that Fred would live to be 100 and that he could enjoy another big birthday bash. But his ailments are now at an end, and we are fortunate to have had him in our midst for so long. Cometary astronomy will always owe a large debt to Fred Whipple.

Daniel W. E. Green

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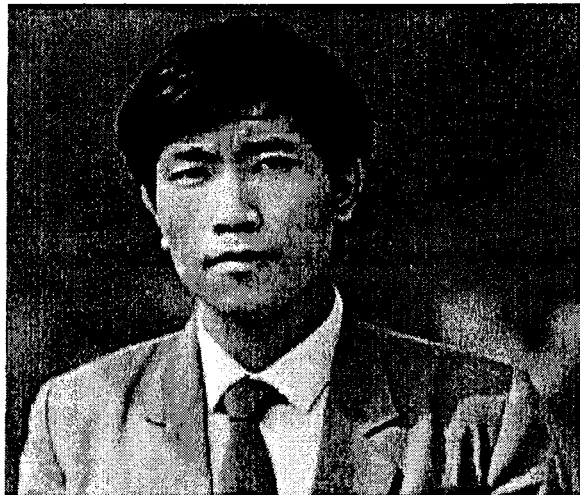
Fred Whipple's "Comet Ring" figure, depicting his vision of a belt of comets orbiting beyond Neptune (whose orbit is drawn as the outermost arc, closest to the "Comet Ring"). Note that Pluto's orbit is not depicted, in line with Whipple's consideration of Pluto as a member of the transneptunian belt of comets. This figure was published by Whipple in at least two places: in 1964, in *Proc. [U.S.A.] National Acad. Sci.* 52, 585; and in 1972, in *The Motion, Evolution of Orbits, and Origin of Comets* (ed. by G. A. Chebotarev et al.), p. 401.

Xingming Zhou (1965-2004)

Early on the morning of 2004 August 5 (Beijing Time), we were shocked by the sad news that Xing-ming Zhou, one of the most outstanding Chinese amateur astronomers, died from a traffic accident at age 39. On the way back to his home (in Liancheng County) from attending the sixth Cross-Strait Astronomy Popularization and Education Workshop in Fuzhou city (all in Fujian Province), Zhou's motorcycle happened to be struck by another at 8:30 p.m. on August 4, which caused a fatal head injury. Despite valiant attempts to save his life at a local hospital, Zhou died eventually at 5 a.m. on August 5. The bad news spread quickly via the Internet, shocking many in the astronomy community worldwide.

On 1965 March 6, Zhou was born in the 89th District of Bole Production Constructive Unit, Xinjiang Province, in northwest China. He had two elder brothers and one younger brother. In 1985, he graduated from Lanzhou Meteorology School, then joined the Xinjiang A'lashankou Meteorology Station (which bordered Kazakhstan to the north). In 1993, he worked as computer network administrator in the State Aerography Bureau in Bole City, Xinjiang Province. Zhou was engaged in operation management and was concerned with (a) the development and establishment of a meteorological weather-forecast audio and video system; (b) the development of an editing and broadcasting system, the 9210 project (Meteorological Information Combine Analysis Process System); (c) computer-network maintenance and administration; (d) application software for meteorological operation; and (e) network-service system application. Zhou lived and worked in Bole, where he had a happy family — his wife, Yu Xin, and his ten-year-old daughter, Ying-zhen Zhou.

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Photograph of Xing-ming Zhou (courtesy Dong-hua Chen).

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Zhou took great interest in astronomy beginning in 1979, when he was only 14 years old. On 1983 May 11, after observing the comet C/1983 H1 (IRAS-Araki-Alcock), he transferred his efforts to comet searching and observation. Before 1989 June 22, Zhou used a 55-mm-diameter (25×) aerological theodolite to search for comets. After this date, he used a self-made 150-mm-aperture $f/5.3$ refractor at 25× (the objective lens provided by NATRC) to watch the skies. From 1985 Sept. 1, when Zhou formally started comet searching, until 2004 Apr. 15, he had searched comets on 1705 different occasions, with 1728 hours and 7 minutes of accumulated searching time. During the time he searched for comets, especially in the early and middle periods, Zhou found 20 comets independently and observed many known comets, despite having little access to comet ephemerides (A'lashankou, Bole, is a remote place where transportation and communication are difficult). On 1985 Oct. 17, he independently discovered the comet C/1985 R1, and this achievement was honored by the Purple Mountain Observatory as the first Chinese amateur finding since the founding of the People's Republic of China. Zhou's independent discoveries of comets C/1990 N1 and C/1995 S1 were recognized (cf. *IAUC* 5058; *ICQ* 17, 161), though the news arrived too late for either comet to be named for him.

Starting in 2001, Zhou became one of the most successful SOHO-website comet hunters. Altogether, he found 63 SOHO comets and the SWAN comet C/2004 H6, ranking fourth in the world in this regard. Among the SOHO comets found by Zhou, C/2001 U9 was one of the brightest Kreutz-sungazing comets and C/2003 G3 was one of the



Five comet hunters of mainland China as seen at the Astronomy Workshop last month in Fuzhou City. From left to right are Xing-ming Zhou, Yong-liang Ge (co-discoverer of P/1988 V1 Ge-Wang), Dong-hua Chen, Da-qing Zhang (co-discoverer of C/2002 C1 Ikeya-Zhang) and Jin Zhou (co-discoverer of C/1997 L1 Zhou-Balam).

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brightest non-Kreutz comets. The finding of the SWAN comet encouraged him to pursue the new goal of finding minor planets. Unfortunately, this dream did not come true due to his untimely death. In order to honor his achievement on searching of SOHO comets, the well-known American-Chinese astronomer Cheng-yuan Shao bestowed him with a set of the Millennium Star Altas.

Zhou was also an active meteor observer. He observed many meteor showers and accumulated more than 50 hours' worth of observations that were collected by the International Meteor Organization and utilized by research astronomers in China and elsewhere. Zhou was a member of the Chinese Astronomical Society, councillor of the Xinjiang Astronomical Society, and the editor of the Chinese *Amateur Astronomer* magazine. His website 'Silk Road Astronomy Pages' (in Chinese, <http://comet.lamost.org/>) conveys a wealth of valuable information on meteors, SOHO comets, and non-SOHO comets, as well as his observing data and articles — and has become the best comet website in China. Moreover, *Amateur Astronomer* magazine frequently published Zhou's insights and instructions regarding astronomical observing. Xing-ming Zhou's untimely passing is a great loss to Chinese amateur astronomy and to the international comet community.

Dong-hua Chen

Φ Φ Φ

Nikolaj Stepanovich Chernykh (1931-2004)

Nikolaj Stepanovich Chernykh died of a heart attack on May 26 while on a visit to Moscow. With his wife Lyudmila and other colleagues he carried out a very successful photographic observing program for minor planets and comets at the Crimean Astrophysical Observatory (CrAO).

Born on 1931 October 6 in Usman', in the Lipetsk region of Russia some 450 km southeast of Moscow, he completed his courses at the Pedagogic Institute in Irkutsk, some 3000 km farther to the east, in 1949. In 1961 he began his post-graduate studies at the Institute for Theoretical Astronomy (ITA) in Leningrad (now St. Petersburg). While still a student, he traveled to Nauchnyj in late 1963 to conduct a pilot program of astrometric observations of minor planets at the CrAO at the request of the ITA astronomers in connection with their responsibility for the publication of the annual volume of *Ephemerides of Minor Planets*. By the end of 1964, the observing program at Nauchnyj began in earnest as a joint effort between CrAO and ITA. Until the early 1950s there had been a Crimean program at the old Simeis site (near Yalta) and, given the demise of the famous European observing programs (such as those at Heidelberg and Turku), there was clearly a severe need for a new European program to complement the world's other leading program — namely, the one initiated by Indiana University at the Goethe Link Observatory in 1949. After the Indiana program terminated in 1966, the Nauchnyj program was clearly the leading one in the world for the next dozen years, and it remained a

dominant force throughout the 1980s.

In 1965 the observation of comets was added to the CraO routine, for the purposes of both astrometry and physical studies. The instrument used was a 40-cm Zeiss double astrograph that gave a plate scale of 129"/mm and therefore a field 10° square on the 30-cm square plates. The limiting magnitude for moving objects was initially around blue magnitude 17, improving by about one magnitude on the 90-minute exposures that became standard around the mid-1970s. Nikolaj Chernykh was credited with the discovery or codiscovery of two comets on these plates, both of them of short period: 74P/Smirnova-Chernykh in March 1975 and 101P/Chernykh in August 1977.

No stranger to orbital calculations, he received his "candidate" (Ph.D.) degree in 1971 for his determination of the mass of Jupiter from observations of (10) Hygiea.

I met Nikolaj several times, many of them during the Cold War, and we became good friends, already on the first occasion, which was during IAU Symposium No. 45 (*The Motion, Evolution of Orbits, and Origin of Comets*), which was held in Leningrad in 1970. During the closing banquet, a jolly event at the Hotel Metropol that at times merged with a wedding reception in the next room — I was dancing with the bride at one point — Nikolaj and I swapped ties. While I ended up with a rather somber stringy thing, he took my flamboyant red, orange, yellow and black neckwear back to the Crimea, whence he was still writing a year and a half later later that "your tie is well! It is an object of the envy and admiration of my friends". I did find another one just like it, but my wife always thought it too gaudy and one day spirited it away.

After the IAU General Assembly in Patras, Greece, in August 1982 I took up a longstanding invitation to the CraO and visited Nikolaj and Lyudmila in Nauchnyj. After a pleasant dinner already on the day I arrived, I was then pressed into guiding two 90-minute exposures with the 40-cm astrograph. We found three new minor planets on these plates (1982 QP₃, QQ₃, and QR₃), and the event was memorable to me because it is the only time I have ever been directly credited as a discoverer. QR₃ was identified with a 1949 discovery and numbered (4423), QQ₃ remained what we irreverently call a "one-night stand". The fate of QP₃ is mentioned at the end of this article.

I last saw Nikolaj at the "Asteroids III" meeting in Palermo in June 2001. Lyudmila had been credited with the discovery of (10001) 1969 TM₁. Since the meeting was being held at that time and in that place to celebrate the discovery of (1) Ceres in that Sicilian city just two centuries earlier, Lyudmila and Nikolaj decided to give to (10001) the name "Palermo". There was a pleasant ceremony attended by the local dignitaries and press, and I participated in it as director of the Minor Planet Center.

So back now to 1982 QP₃. It was accidentally rediscovered in 1999, and in March 2002 it received the number (37556). In characteristic fashion, Nikolaj invited me to propose a name for the object. After some thought, I came up with the name "Svyaztie". The citation, which was published on Minor Planet Circular No. 45750 two years to the day before Nikolaj Chernykh died, reads as follows: "From Russian and English words meaning 'connection', Svyaztie honors the enduring astronomical collaborations and friendships that transcend national boundaries and political philosophies. The name also acknowledges the exchange of neckwear by the codiscoverers on their first meeting at IAU Symposium No. 45 in 1970."

Brian G. Marsden

Φ Φ Φ

Tabulation of Comet Observations

Due to a computer crash on June 24 involving *ICQ* data and to travelling by the *ICQ* Editor in the last few months, the observations contributed on paper via postal mail in recent months are being delayed to the October issue, so as to get this issue to press more quickly.

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 June 30.73: *B-V* values of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].
- ◊ Comet 10P/Tempel ⇒ 2004 May 24.57: *B-V* values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01].
- ◊ Comet 28P/Neujmin ⇒ 2004 Jan. 22.95, 24.02, 24.89, Feb. 11.89, and 20.86: stellar appearance [HOR02]. Jan. 22.95: size same as stellar images of same approx. brightness ($\approx 10''$) [HOR02]. Jan. 24.02: size same as stellar images of same approx. brightness ($\approx 11''$) [HOR02]. Jan. 24.02, 24.89, and Feb. 20.86: dense star field [HOR02]. Jan. 24.89: size same as stellar images of same approx. brightness ($\approx 8''$) [HOR02]. Feb. 11.89 and 20.86: size same as stellar images of same approx. brightness ($\approx 12''$) [HOR02].
- ◊ Comet 29P/Schwassmann-Wachmann ⇒ 2004 June 26.99 and 28.99: low alt. [SRB]. June 27.08 and 30.10: outburst [GON05]. June 30.74: *B-V* values of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].
- ◊ Comet 40P/Väisälä ⇒ 2004 Apr. 12.95: central cond. 0'.6 from a star of mag 14.5 [SRB]. Apr. 15.01: limiting mag ≈ 16 (162 \times); second confirming obs. on Apr. 15.06 UT [LEH]. Apr. 16.66, May 11.62, 14.58, June 14.58, and July

6.59: **Guide 8.0** software used for comp.-star mags [TSU02]. Apr. 16.66: comp. star has $B-V = +0.64$ [TSU02]. May 11.62: comp. star has $B-V = +0.60$ [TSU02]. May 14.58: comp. star has $B-V = +0.44$ [TSU02]. May 27.62: $B-V$ values of comp. stars were +0.32, +0.66, +0.76, and +0.84 [NAK01]. June 7.97: moonlight [SRB]. June 8.01: star of $R = 15.1$ located $20''$ from central cond.; moonlight [HOR02]. June 13.98: outer edge of coma within $12''$ star of mag $R = 11.4$ [HOR02]. June 14.58: comp. star has $B-V = +0.42$ [TSU02]. July 6.59: comp. star has $B-V = +0.61$ [TSU02].

◊ *Comet 42P/Neujmin* \Rightarrow 2004 July 8: w/ 25.4-cm L (71 \times and 114 \times), nothing visible at the predicted position to mag 13.5 [SEA]. July 13.67: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◊ *Comet 43P/Wolf-Harrington* \Rightarrow 2004 Feb. 7.85: moonlight [SRB]. Feb. 7.85, Mar. 22.85, 30.85, Apr. 8.84, and 12.85: low alt. [SRB]. Mar. 14.80: second faint tail $0'.8$ long in p.a. 293° ; faint fan-shaped outer coma [HOR02]. Mar. 17.79: second tail $> 4'.0$ long in p.a. 292° ; fan-shaped outer coma [HOR02]. Apr. 8.82: second tail $2'.5$ long in p.a. 300° ; fan-shaped outer coma [HOR02]. Apr. 8.84 and 15.82: central cond. $0'.5$ from a 14th-mag star [SRB]. Apr. 12.43 and 21.44: **Guide 8.0** software used for comp.-star mags [TSU02]. Apr. 12.43: comp. star has $B-V = +0.49$ [TSU02]. Apr. 12.85: field-of-view affected by the light of a 1st-mag star on the edge of the frame [SRB]. Apr. 12.99: comet $15'$ from α Tau [HOR02]. Apr. 21.44: comp. star has $B-V = +0.51$ [TSU02].

◊ *Comet 48P/Johnson* \Rightarrow 2004 May 24.73: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. June 16.69: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.54 and +0.74 [OHS]. June 30.69: $B-V$ values of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. July 8: w/ 25.4-cm L (71 \times and 114 \times), nothing visible at the predicted position to mag 13.5 [SEA]. July 13.63: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◊ *Comet 78P/Gehrels* \Rightarrow 2004 June 29.03: low alt. [SRB]. June 30.76: **Guide 8.0** software used for comp.-star mags; comp. star has $B-V = +0.52$ [TSU02]. July 28.04: small, well condensed object; comp. stars with good V mags used from nearby AAVSO sequence for TT Ari [BOU].

◊ *Comet 81P/Wild* \Rightarrow 2004 May 24.71: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. June 16.67: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.54 and +0.74 [OHS]. July 13.60: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◊ *Comet 88P/Howell* \Rightarrow 2004 Apr. 23.11: small, circular coma, not very condensed [COO02]. May 2.3: comp. stars have $V = 9.43$ ($B-V = +1.30$) and 10.84 ($B-V = +0.58$) [AMO01]. May 3.36: comp. stars have $V = 9.84$ ($B-V = +0.36$) and $V = 10.69$ ($B-V = +0.49$) [AMO01]. May 4.87: comet located only $15'$ from the galaxy NGC 7606 [PEA]. May 24.78 and June 13.76: **Guide 8.0** software used for comp.-star mags [YOS02]. May 25.76 and June 16.75: **Guide 8.0** software used for comp.-star mags [NAG04]. June 14.75: *StellaNavigator* ver. 6 software used for comp.-star mags [NAG08]. June 16.67: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.54 and +0.80 [OHS].

◊ *Comet 94P/Russell* \Rightarrow 2004 May 24.63: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01].

◊ *Comet 117P/Helin-Roman-Alu* \Rightarrow 2004 May 21.57: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.69, +0.69, +0.90 [OHS].

◊ *Comet 118P/Shoemaker-Levy* \Rightarrow 2004 Mar. 31.01: moonlight [HOR02]. Apr. 9.01: moonlight; outer edge of coma within $5''$ of a star of mag $R = 16.1$ [HOR02]. Apr. 16.57: **Guide 8.0** software used for comp.-star mags; comp. star has $B-V = +0.40$ [TSU02].

◊ *Comet 123P/West-Hartley* \Rightarrow 2004 Feb. 7.91: low alt.; moonlight [SRB]. Mar. 30.91: central cond. $1'.5$ from a bright (mag 9.7) star [SRB]. Mar. 31.07: moonlight; fan-shaped tail [HOR02]. Apr. 14.88: limiting mag ≈ 15.5 (81 \times); second confirming obs. on Apr. 14.92 UT [LEH]. Apr. 16.55, May 11.59, 14.54, June 14.52, and July 6.50: **Guide 8.0** software used for comp.-star mags [TSU02]. Apr. 16.55: comp. star has $B-V = +0.48$ [TSU02]. Apr. 21.85: close to bright star (mag 9.9); limiting mag ≈ 15.5 (81 \times); no confirming second detection, due to this relatively bright star [LEH]. May 11.59: comp. star has $B-V = +0.44$ [TSU02]. May 14.54: comp. star has $B-V = +0.38$ [TSU02]. June 14.52: comp. star has $B-V = +0.57$ [TSU02]. July 6.50: comp. star has $B-V = +0.57$ [TSU02].

◊ *Comet 130P/McNaught-Hughes* \Rightarrow 2004 July 13.56: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◊ *Comet C/2001 HT₅₀ (LINEAR-NEAT)* \Rightarrow 2004 June 16.73: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.54 and +0.74 [OHS]. June 27.01 and 29.01: low alt. [SRB]. June 30.73: **Guide 8.0** software used for comp.-star mags; comp. star has $B-V = +0.65$ [TSU02].

◊ *Comet C/2001 K5 (LINEAR)* \Rightarrow 2004 May 25.75: $B-V$ values of comp. stars were +0.68, +0.72, and +0.73 [NAK01]. May 29.99: dense star field, moonlight [HOR02]. June 29.95: moonlight [HOR02].

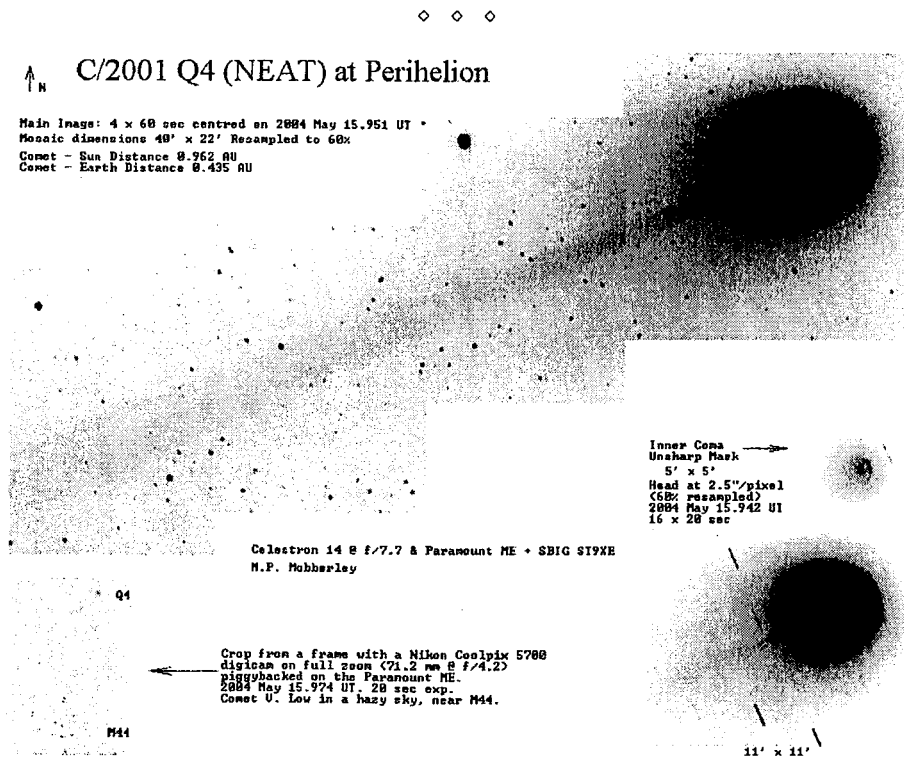
◊ *Comet C/2001 Q4 (NEAT)* \Rightarrow 2004 Apr. 22.72: some cloud, but clear in the area of the comet [BEG01]. Apr. 22.74: w/ 30-cm $f/10$ T (75 \times), compact central core; 1° tail (the first $35'$ of which is prominent) [STR03]. Apr. 24.72: some moonlight interference now [BEG01]. Apr. 26.72: comet visible to the unaided eye w/ direct vision despite moonlight, $m_1 = 3.9$; appeared stellar w/ a faint surrounding outer coma; in binoculars, leading edge of coma slightly elliptical w/

the bright central cond. displaced in the sunward direction; tail much more obvious and slightly curved [BEG01]. Apr. 26.73: “comet appears much brighter than yesterday; moon and haze made obs. a little difficult” [VAN17]. Apr. 28.70: “obs. conducted while waiting for an open-air Opera Gala performance to begin; I was amused by the close scrutiny of my actions by at least eight Zimbabwe Republic Police officers, very ‘wary’ of my binoculars, red flashlight, and note-taking! — memorable obs. indeed!” [BEG01]. Apr. 28.75: comet only slightly fainter via naked eye than nearby β Pic [PRI04]. Apr. 30.39: tail fairly obvious in 25×100 B and 10×50 B, in bright moonlight; in contrast to earlier obs. (Apr. 25), the N edge of the tail appeared more sharply defined now [SEA]. Apr. 30.51, May 2.47, 11.50, 22.59, 23.58, June 13.55, and July 13.57: Guide 8.0 software used for comp.-star mags [NAG04]. Apr. 30.75: “inner coma highly condensed, w/ a large, diffuse outer coma; this in bright moonlight, together w/ a bright star near the central cond., forced me to use the VBS method for this estimate” [BEG01].

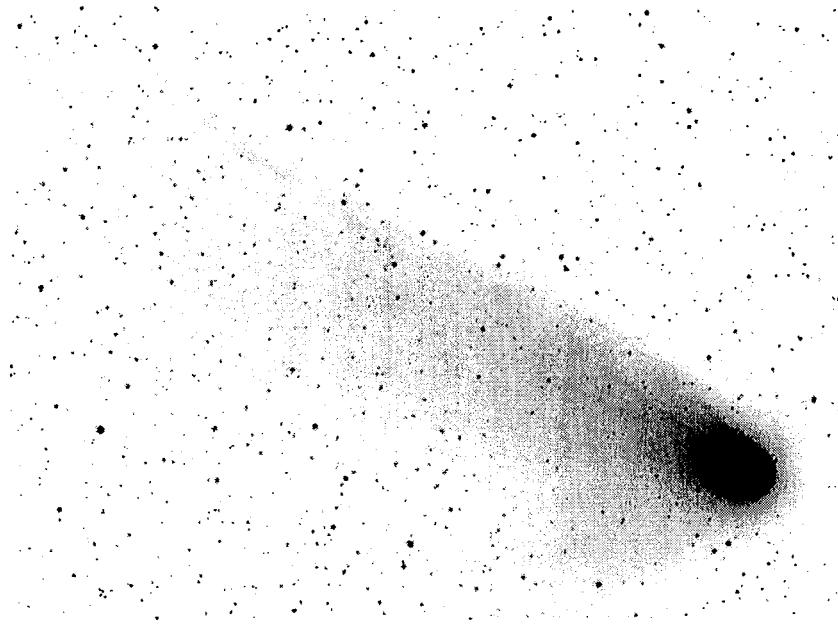
May 1.39: tail traced for 3°-4° in 10×50 B [SEA]. May 1.71: tail probably considerably longer but lost in bright moonlight; the p.a. is given for brightest portion of the tail; conditions hazy, but comet easily visible to naked eye [COO02]. May 2.07: alt. 10° [AMO01]. May 2.07, 2.90, 26.88, 27.90, 28.89, 29.89, and 30.89: moonlight [AMO01]. May 2.4: bright moonlight, but tail could be marginally glimpsed by naked eye for short distance; coma slightly enhanced with Swan Band filter (in 25×100 B), but central cond. appeared less starlike and more diffuse with filter; very sharp central cond. w/o filter [SEA]. May 2.72: w/ 10×50 B, the tail appears as a bright narrow spike; w/ 40-cm L (150×), the bright core is absolutely stellar in appearance, surrounded by large diffuse coma of DC = 3 [COO02]. May 2.73: comet easily visible w/ the unaided eye w/ direct vision ($m_1 = 3.3$, coma dia. 15', DC = 6); averted vision showed a significantly larger coma and a hint of tail [BEG01]. May 2.89, 3.90, and 28.98: moonlight [DES01]. May 2.89: beautiful bluish-white color [SOU01]. May 3.26: comet visible to the naked eye in spite of strong moonlight (naked-eye mag est. 3.7) [DAH]. May 3.4: tail > 4° in 10×50 B, despite bright moonlight [SEA]. May 3.71: obs. made w/ full moon in cloud cover; to naked eye, comet slightly fainter than nearby κ CMa ($V = 3.5$) [PRI04]. May 3.87: diffuse coma; easily visible in 7×50 B, despite 7° alt., an almost-full moon, and twilight (sun 12° below horizon); comet appeared almost equal in brightness to nearby κ CMa [GRA04]. May 4.40: obs. through high cloud and full moonlight [SEA]. May 4.73: obs. made before lunar eclipse [BEG01]. May 4.80: comet obs. during the partial phase of the total lunar eclipse [PRI04]. May 4.83: “obs. made during lunar-eclipse totality, but w/ the comet much lower in alt.; inner coma had a distinct green hue; it was interesting to note that my mag estimate was very similar to the one made in full moonlight, despite the fact that over twice the coma dia. was recorded during totality” [BEG01]. May 4.88: tail appeared faint and of moderate width; obs. formally during total lunar eclipse at 9° alt. (then it was also faintly seen w/ naked eye), and the comet was imaged w/ a digital camera; comet first seen when the sun was 8° below horizon (May 4.853 UT), and last detected 73 min later at true alt. 3°; obs. from 261 m elevation [GRA04].

May 5.46, 11.47, 14.49, 18.47, 24.48, June 5.51, 14.5, July 5.49, and 16.51: Guide 8.0 software used for comp.-star mags [YOS02]. May 5.72: tail broad and slightly curved; via naked eye, strong stellar central cond. surrounded by a large, quite-bright, outer coma [BEG01]. May 6.03 and 15.95: comet visible to naked eye [BAL07]. May 6.03: very faint tail, only visible with averted vision [BAL07]. May 6.03 and 7.03: coma has two levels of brightness (a bright central region of dia. 8' and a fainter outer ring of dia. 12'); moonlight interference; comp. stars ξ Pup and 3 Pup [BAL07]. May 6.25: “the comet’s tail is extremely faint to the naked eye, even from my dark observing site at altitude \simeq 3600 feet in Volcano, Hawaii; w/ a 4-inch f/5 R (23×), however, the comet’s dust tail is beautiful! — a curving yellowish scimitar; the pseudo-nucleus is the color of η Car (sort of tangerine) and very bright and stellar; the ion tail had, perhaps, a disconnection event, because, though very dim, it had an irregular diffuse patch near the comet’s head; at high power, the nucleus displays a water sprinkler of bright jets! — not since C/1995 O1 (Hale-Bopp) have I seen such clear and bright jet activity!; this comet is close to earth now, so you can also see it move against the background stars over the course of minutes” [OME]. May 6.34: tail seen to 4° in 10×50 B before moonrise [SEA]. May 6.45, 7.45, 11.47, 14.48, 17.48, 18.50, 23.47, 24.51, 25.49, 29.54, June 1.48, 3.48, 4.48, 5.49, 13.50, 14.50, 15.51, 16.50, 20.49, July 6.50, 11.48, 14.49, and 20.48: StellaNavigator 6.1 software used for comp.-star mags [NAG08]. May 6.46: comet obs. prior to moonrise [PEA]. May 6.46, 20.47, 21.45, 28.48, June 14.50, July 6.48, 8.49: Guide 8.0 software used for comp.-star mags; comp. star has $B-V = +0.64$ [TSU02]. May 6.70: “via naked eye, 2°4 tail in p.a. 118°; large, diffuse outer coma visible in a dark sky; since I am short-sighted, I assessed the in-focus coma, and then removed my spectacles to assess the comp. stars (VBS method); very impressive sight in binoculars; there seemed to be another broad, very faint tail feature 0°5 long, lagging behind the coma, in p.a. 140° — seen w/ averted vision; through a 20-cm f/9 L (76×), the coma filled the eyepiece, w/ the central cond. displaced towards the leading edge of the coma; central cond. not quite stellar in appearance, but instead a tiny elliptical disk distinctly pale salmon-pink in color; the coma showed a smooth transition of fading from the cond. outwards, except for a small, vague hood of material maybe 20'' from the central cond. in the sunward direction; motion very rapid, and I could see in real time the central cond. sliding past the 7th-mag star HIP 35922” [BEG01]. May 6.73: tab. p.a. represents the main tail, which spans p.a. 108°-120°; there is also a bright section emanating from the coma at p.a. 146° and extending to \simeq 20' [COO02]. May 7.00, 8.02, 8.97, and 9.97: easily visible to naked eye [MAN04]. May 7.00: coma has two levels of brightness — a bright central cond. and a fainter outer ring; moonlight interference [MAN04]. May 7.03, 7.98, and 9.03: comet easily visible to naked eye [BAL07]. May 7.29: the comet was a more obvious naked-eye object than ω Cen; no obvious tail was seen w/ the naked eye [DAH]. May 7.30: the comet formed a nice group w/ M46 and M47, all within the same binocular field-of-view; the tail appeared fan-shaped [DAH]. May 7.34: tail seen to about 4° in 10×50 B; visible to naked eye w/ averted vision, but length difficult to determine due to Milky Way [SEA]. May 7.45, 11.47, 14.49, 21.49, 25.48, June 3.49, 4.49, 5.51, 13.52, 15.49, 20.49, and July 11.49: The Sky ver. 5 software used for comp.-star mags [MIT]. May 7.72: “comet very obvious to naked eye ($m_1 = 3.0$, coma dia. 28', DC = 7, tail 1°3 long in p.a. 131°); w/ 7×50 B, type-I tail 2°6 long in p.a. 122°, type-II tail 1°3 long in p.a. 132°, type-III(?) tail 40' long in centered on p.a. 169°; a magnificent sight near M46 and

M47; the strange tail feature (type III?) is fainter but more extensive and broad" [BEG01]. May 7.83: very clear sky; mag estimate corrected for atmospheric extinction w/ *ICQ* summer table; low alt. $\sim 3^\circ$ [RES]. May 7.88: "bluish coma w/ a bright central part; tail was broad (first half-degree of it was quite bright); comet easily visible to naked eye at total mag 3.4 (ref: TK) and dia. $\approx 15'$; due to clouds, however, the comet was only observed for a couple of min; alt. 24° ; this obs. (and those from May 8.87 and 9.91) were made from Pico da Cruz (261 m above sea level)" [GRA04]. May 7.95: w/ 20-cm T (62 \times), 1° tail in p.a. 120° and 0.3° tail in p.a. $185\text{--}190^\circ$ (bluish-green color) [SOU01]. May 7.98: multiple tails visible (main tail tab.); also tails or jets $25'$ long in p.a. 70° , $35'$ long in p.a. 90° , $55'$ long in p.a. 100° , $1.6'$ long in p.a. 120° , $42'$ long in p.a. 141° , and $30'$ long in p.a. 165° ; fan-shaped coma with a starlike pseudo-nucleus and two levels of brightness (a bright central region and a fainter outer ring $25'$ in dia. — extended to $30'$ between p.a. 70° and 165°); comp. stars ξ Pup, β CMi, and ζ CMa [BAL07]. May 8.02 and 8.97: coma has two levels of brightness and a very bright central cond. [MAN04]. May 8.70: "w/ naked eye, $m_1 = 2.9$, coma dia. $15'$, DC = 7; tail 6.5° long in p.a. 121° — tail very slightly curved, first 5° easily seen w/ direct vision, the rest easily w/ averted vision; $40'$ fan-like extension to coma in central p.a. 155° ; through 20-cm $f/9$ L (76 \times), the central cond. was visible through a haze of material that made it less sharply defined than two nights ago" [BEG01]. May 8.86: mountain location; clear sky; astron. twilight [GON05]. May 8.87: "comet showed a coma that was distinctly bluer than the nearby K5-type star HR 3014; within the coma, there was an apparently stellar central cond. of mag ≈ 6.5 (ref: TK); the brightness and extent of coma was quite similar to ω Cen; a rather broad tail was directed towards the SE; comet first seen w/ 7 \times 50 B and naked eye at solar alt. -7° and -10° , respectively; formal obs. made when the sun was $12^\circ\text{--}13^\circ$ below the true horizon (clouds later)" [GRA04]. May 8.97: ref stars β CMi and ϵ Hya; total mag 2.7 to naked eye [MAN04]. May 9.03, 14.98, and 15.95: coma had two levels of brightness (a bright central region and a fainter outer ring) [BAL07]. May 9.03: coma has a pseudo-nucleus starlike point; comp. star ξ Pup [BAL07]. May 9.10: poor conditions — haze and scattered nuisance clouds; w/ 16 \times 80 B, 2.5° tail in p.a. 120° [CRE01]. May 9.27: the first 6° of tail were quite bright and obvious to the naked eye, while the last 5° were exceedingly faint; the comet was far enough outside the bright zodiacal light cone to be seen against a dark sky; a prominent starlike 'nucleus' was seen within the coma; obs. from an elevation of 2900 m at the S slope of Mauna Kea [DAH]. May 9.29: "a long, narrow (ion?) tail component was seen superposed on a shorter, more diffuse (dust?) component; the tab. values for the tail refer to the longest component; a narrow streamer within the tail was particularly well-defined at a distance of $2^\circ\text{--}3^\circ$ from the coma; a third, very diffuse tail component w/ a length of 1.5° in p.a. 176° ; obs. at elevation 2900 m at the south slope of Mauna Kea" [DAH]. May 9.50: faint, broad, fan tail $45'$ long centered on p.a. 168° [PEA]. May 9.69: tail overall rather tenuous, N edge quite sharply defined, S edge brighter — spans p.a. $111^\circ\text{--}125^\circ$, but main direction centered at p.a. 119° [COO02]. May 9.74: w/ 8 \times 40 B, the coma appears to be roughly $20'$ wide; DC = 5; 1.3° tail in p.a. 120° [VAN17]. May 9.82: twilight [HOR02]. May 9.91: 7 \times 50 B showed an apparently stellar central cond. of mag ≈ 6.0 (ref: TK); comet was an easy naked-eye object [GRA04]. May 9.97: ref stars β CMi and ζ CMa [MAN04].



Unfiltered CCD image of comet C/2001 Q4 taken by Martin Mobberley (Cockfield, U.K.) with a 35.6-cm T on 2004 May 15.95 UT. He sent several images showing shells in the inner coma with unsharp masking (see inset at center right). The larger mosaic image above is $40'$ from left to right.

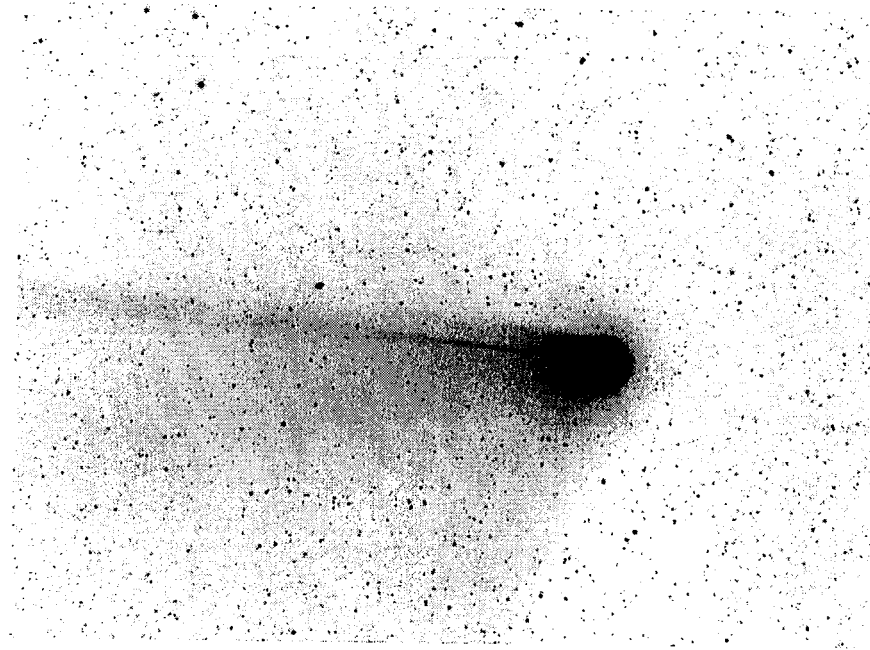


CCD image of comet C/2001 Q4 taken by Michael Jäger and Gerald Rhemann with an APO 280-mm-f.l. f/4 telephoto lens (with ultraviolet and infrared filters) on 2004 May 16.75 UT. A short, diffuse dust tail emanates from the comet's head toward the lower left.

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May 10.09: w/ 16×80 B, 3° tail in p.a. 120°; “another ‘plume’ (tail?) extending 45’ in p.a. 135°, and what appears to be a faint 30’ extension in p.a. 175°” [CRE01]. May 10.32: “an additional, very diffuse, tail component, w/ a length of 1°2 in p.a. 173°; the surface brightness of the tail appears slightly higher than yesterday; obs. at elevation 1000 m, close to Kilauea Caldera within Hawaii Volcanoes National Park” [DAH]. May 10.35: w/ 25.4-cm L (71×), false nucleus very sharp and starlike; in 25×100 B and 10×50 B, a possible ‘cloud’ (disconnection event?) was suspected $\simeq 3^\circ$ from coma [SEA]. May 10.45: total visual mag 2.9 through reversed 2.5×25 B [SEA]. May 10.82, 10.83, 17.87 and 17.88: light pollution [HOR02]. May 11.38: “tail length determined w/ averted vision, but there were moments when I glimpsed greater lengths; once or twice, I was convinced that I fleetingly glimpsed some 23° of tail; in 25×100 B, a second, broad tail tail of $\approx 1^\circ$ was observed in p.a. 180°, plus a third vague feature of $\simeq 10'$ -15’ in p.a. 265°; there appeared to be a slight brightening of the main tail $\simeq 4^\circ$ from coma — possibly the same feature as seen last night” [SEA]. May 11.46, 14.46, June 3.47, 4.48, 5.48, 7.48, 13.49, 14.49, 15.48, and 16.48: Guide 7.0 software used for comp.-star mags [MIY01]. May 11.50: 2°8-long tail in p.a. 110° [NAG04]. May 11.85 and June 16.88: high clouds [HOR02]. May 11.9, 14.9, and 16.9: mountain location; very clear sky [GON05]. May 12.38: at times, the naked-eye tail was strongly suspected out to lengths of $\approx 19^\circ$ [SEA]. May 12.48: hurried obs. between clouds [PEA]. May 12.70: ion tail in p.a. 106°; dust tail spans p.a. 110°-130° (longest 2°4 in p.a. 120°) [COO02]. May 12.71: w/ naked eye, $m_1 = 3.1$, DC = 7, tail 1°0 long in p.a. 130°; w/ 7×50 B, short fan-shaped extension to coma 15’ long in p.a. 190° [BEG01]. May 12.837: six unfiltered coadded 15-sec CCD images (0.35-m reflector) show (after processing by unsharp masking) five dust jets (streamers) forming a dust tail; two main jets, in [apparent] combination with the rotation of the nucleus, are forming parabolic dust shells in the anti-solar direction; four dust shells visible, the distances of the outermost edges of each shell (as measured from the optical ‘nucleus’ in the anti-solar direction) being 29”, 55”, 79”, and 110” [HOR02]. May 12.92: mag. somewhat uncertain due to bright sky, some thin cloud streaks, and only one comp. star (β Cnc); no tail was seen; the coma showed an apparently stellar nucleus and appeared blue compared to the type-K4 star β Cnc [SKI]. May 12.93: fairly easily seen despite 8°5 alt. and twilight (sun 11° below horizon); comp. stars ζ Hya (faintly seen via naked eye) and ϵ Hya at almost same alt. as comet [GRA04]. May 13.18: w/ 10×50 B, 2°5 tail in p.a. 155° [MOR]. May 13.38: some high cloud began to drift in; secondary tail visible in both 10×50 B and 25×100 B [SEA]. May 13.72: also a hazy extension 50’ long in central p.a. 142°; w/ 20-cm f/9 L (76×), there was a small hood or shell visible near the central cond. in the sunward direction; w/ naked eye, $m_1 = 3.6$, coma dia. 20’, DC = 7, tail 3°0 long in p.a. 120° [BEG01]. May 14.03 and 27.90: low altitude [AMO01]. May 14.08: w/ 8×40 B, ion tail 5° long in p.a. 110° and dust tail 2° long in p.a. 125° [RIE]. May 14.38: in 25×100 B, secondary tail visible to 0°6, in p.a. 165° and extending around to main tail [SEA]. May 14.70: tail very broad (tab. p.a. given for longest central region) [PRI04]. May 14.72: “fan-like extension to coma 20’ long in p.a. 174°; an extremely pleasing view, w/ the comet just S of the Beehive Cluster”; w/ naked eye, $m_1 = 3.6$, coma dia. 20’, DC = 8 [BEG01]. May 14.89: in 15×80 B, tail 1°5 long; comet close to M44 [SCH04]. May 14.90 and 16.91: w/ 7×50 B, 5° ion tail and a broader, 1°-long dust tail [GON05]. May 14.96: ref stars β and δ Cnc; comet appears to be fading rather rapidly [MAN04]. May 14.98: comet visible to naked eye w/ averted vision; very humid and hazy night;



CCD image of comet C/2001 Q4 taken by Jäger and Rhemann with an APO 180-mm-f.l. $f/3.3$ telephoto lens (+ green filter) on 2004 May 17.77 UT. The short, fainter diffuse dust tail emanates from the comet's head downward, while a higher-surface-brightness broad dust tail surrounds the narrow ion tail toward the left.

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fan-shaped coma with a starlike pseudo-nucleus only visible w/ averted vision; coma extended to 20' between p.a. 100° and 130°; comp. star δ Cnc [BAL07].

May 15.06: w/ 8×40 B, ion tail 7°5 long in p.a. 110° and dust tail 1°5 in p.a. 125° [RIE]. May 15.69: "tail 1°5 long spans p.a. 105°-120°, moving through M44" [PRI04]. May 15.72: "coma very condensed and more compact now; faint fan 30' long centered at p.a. 160°; a superb binocular spectacle w/ the tail superimposed on the Beehive Cluster"; w/ naked eye, $m_1 = 3.9$, coma dia. 15', DC = 7; tail 50' long in p.a. 124° [BEG01]. May 15.83: ion tail and dust tail 3° long, w/ 10×56 B; estimation w/ 135-mm $f/4$ telephoto lens and 26-mm ocular [BUS01]. May 15.85: "wonderful view next to M44, embedded in δ , γ , and η Cnc" complex [KAN05]. May 15.88: comet faintly visible w/ naked eye; view w/ 20×60 B more impressive, w/ tail just touching M44 [GIL01]. May 15.89: obs. in twilight, coma very condensed; faint straight tail in 10×50 B [COM]. May 15.90: fine object close to the Beehive Cluster (M44); tail broad and rather faint [BOU]. May 15.90: in 15×80 B, tail 1°5 long; comet close to M44 [SCH04]. May 15.94: coma clearly bluer than type-K3 star η Cnc; comet faintly seen by naked eye; the 'N' estimate w/ the 15.2-cm L refers to a stellar false nucleus; solar alt. -10°6 [GRA04]. May 15.95: wide tail visible, reaches 1°3 long in p.a. 110°, and 50' long in p.a. 130°; fan-shaped coma with a pseudo-nucleus starlike point visible w/ averted vision; coma extended to 20' between p.a. 80° to p.a. 160°; comp. stars ϵ Hya and δ Cnc [BAL07]. May 16.35: in 25×100 B, secondary tail traced to 1°3 in p.a. 170° and extending around to main tail [SEA]. May 16.71: very faint ion tail 2°8 long in p.a. 110°, and large diffuse fan trailing the coma 1°2 long centered at p.a. 140°; w/ naked eye, $m_1 = 4.0$, coma dia. 15', DC = 8 [BEG01]. May 16.85: experimental measurement with short-focus photographic 50-mm $f/4$ Pentacon objective; plasma tail > 160' long in p.a. 107°; primary dust tail longer than 170' in p.a. 123°; wide secondary dust-tail component longer than 60' in p.a. 170° [SRB]. May 16.87: faint, thin ion tail 7°5 long in p.a. 112°; broad dust tail 3° long centered at p.a. 122°; faint type-III tail centered at p.a. 170° (excellent conditions — naked-eye limiting mag 6.5 near the comet) [GUZ]. May 16.88: comet better visible to naked eye than on previous day [GIL01]. May 16.88: w/ 20-cm T (50×), a bright starlike false nucleus was the only detail seen within the coma [KAM01]. May 16.89: ion tail and dust tail 3° long, w/ 10×56 B [BUS01]. May 16.89, 17.89, and 18.89: "estimation w/ 135-mm $f/4$ telephoto lens and 26-mm ocular" [BUS01]. May 16.89: w/ 8×30 B, coma dia. 25', tails of length 0°7 in p.a. 120° and 0°4 ("type III, rather obvious") in p.a. 175° [HOE]. May 16.91: straight tail — broad and quite faint in 10×50 B [COM]. May 16.91: tail rather broad with sharper N edge; type-III tail faintly visible as a broad faint glow, \approx 0°8 long in p.a. \approx 160° [BOU]. May 17.72: broad fan trailing the coma 40' long centered at p.a. 147°; w/ naked eye, $m_1 = 4.2$, coma dia. 12', DC = 7 [BEG01]. May 17.85: a little blue color seen in coma [SHU]. May 17.89: ion tail and dust tail 2° long, w/ 10×56 B [BUS01]. May 17.89: in 15×80 B, tail 1°5 long [SCH04]. May 17.92: w/ 30.5-cm T (56×), fine short and broad tail with streamers [COM]. May 18.70: dust tail spans p.a. 105°-130°; in 20-cm L (89×), pseudo-nucleus of mag \approx 11 is much faded from previous obs. and indistinctly shrouded in coma [COO02]. May 18.72: faint fan of material 30' long in central p.a. 139° [BEG01]. May 18.89: ion tail and dust tail 3° long, w/ 10×56 B; stars 55 and 53 Cnc in coma [BUS01]. May 18.90: in 15×80 B, ion tail 2° long in p.a. 100° and dust tail 0°6 long in p.a. 120°

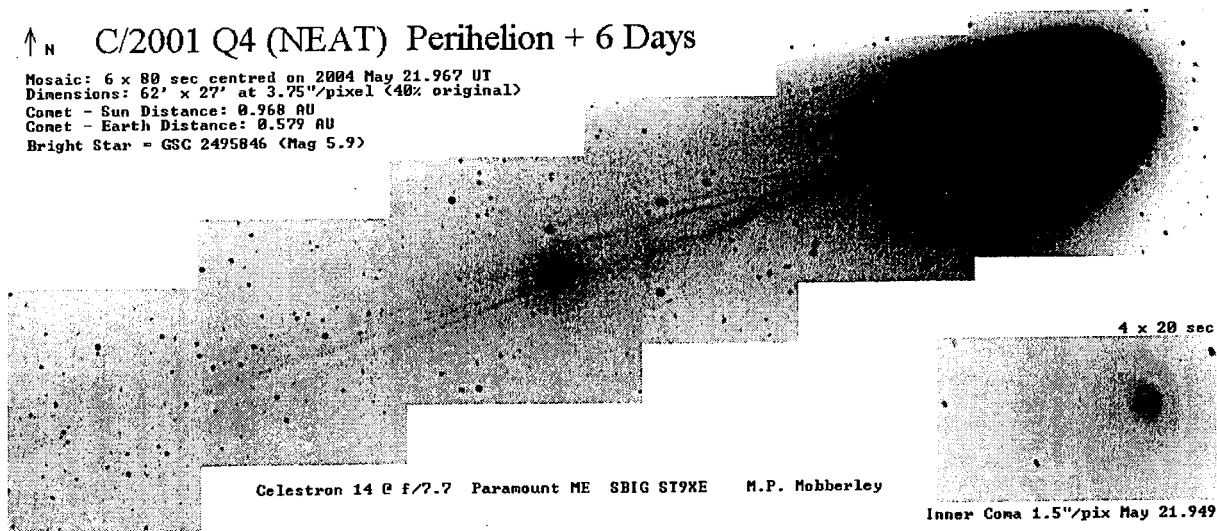
[SCH04]. May 18.93 and 19.90: w/ 11.4-cm $f/8$ L (36 \times), coma dia. 7', DC = 7 [BRO04]. May 18.94: besides a 3 $^{\circ}5$ gas tail in p.a. 105 $^{\circ}$, a faint broad dust tail could be followed to $\approx 2^{\circ}5$ in p.a. 120 $^{\circ}$; a type-III tail was also suspected, but the glare of the nearby star pair ρ_1 and 53 Cnc interfered; comet still was a very easy object to the naked eye [BOU]. May 18.97: diffuse blue-green coma w/ a bright central cond. (mag 6.7 in 7 \times 50 B, ref: TK); broad tail suspected towards E; comet appeared larger and considerably brighter than M13, but was not seen via naked eye; also obs. w/ 7.0-cm $f/6.8$ R (15 \times), yielding total mag 4.6 (M, TK), coma dia. 11', and DC = 6; solar alt. -10 $^{\circ}3$ [GRA04]. May 19.35: in 25 \times 100 B, main tail 2.6 $^{\circ}$ long in p.a. 105 $^{\circ}$; secondary tail 0 $^{\circ}6$ long in p.a. 165 $^{\circ}$ [SEA]. May 19.97: low alt. [SRB]. May 19.88: second faint tail 0 $^{\circ}9$ long in p.a. 160 $^{\circ}$ [HOR02]. May 19.97: comet remains an easy binocular object; solar alt. -10 $^{\circ}5$ [GRA04].

May 20.08: tail slightly wedge-shaped [RIE]. May 20.08, 21.07, and 22.06: w/ 8 \times 40 B, tail 4 $^{\circ}$ long in p.a. 105 $^{\circ}$ [RIE]. May 20.72: faint dust fan 40' long in p.a. 145 $^{\circ}$; tail broad and short, but quite high surface brightness [BEG01]. May 21.90 and 23.93: w/ 11.4-cm $f/8$ L (36 \times), coma dia. 6', DC = 6 [BRO04]. May 21.91 and 22.91: obs. from Lyngby, Denmark [COM]. May 21.92: in 15 \times 80 B, ion tail 0 $^{\circ}6$ long in p.a. 105 $^{\circ}$ and broad dust tail 0 $^{\circ}3$ long in p.a. 105 $^{\circ}$ -155 $^{\circ}$ [SCH04]. May 22.90: w/ 11.4-cm $f/8$ L (36 \times), coma dia. 6', DC = 5 [BRO04]. May 22.92: in 10 \times 56 B, ion tail and dust tail > 2 $^{\circ}$ long [BUS01]. May 22.87: again three tails visible — 5 $^{\circ}$ gas tail in p.a. 107 $^{\circ}$; 2 $^{\circ}$ -long, broad, slightly curved dust tail in p.a. 116 $^{\circ}$; type-III tail at least 1 $^{\circ}$ long in p.a. 170 $^{\circ}$ [GUZ]. May 22.96: solar alt. -9 $^{\circ}4$ [GRA04]. May 22.99: mag. refers to an apparently stellar nucleus [GRA04]. May 23.88, 23.89, 24.89, 24.90, 26.87, 29.87, and 30.87: moonlight [HOR02]. May 23.9, 30.92, and June 2.93: moonlight [GON05]. May 23.91: some moonlight interference [GUZ]. May 24.08: w/ 8 \times 40 B, tail 3 $^{\circ}5$ long in p.a. 105 $^{\circ}$; at same time, comet C/2002 T7 visible w/ naked eye [RIE]. May 24.89, 26.90, and 27.92: interfering moonlight [BRO04]. May 24.89: w/ 11.4-cm $f/8$ L (36 \times), coma dia. 4', DC = 6 [BRO04]. May 26.87: starlike nuclear cond. of mag 10.2 [SHU]. May 26.90 and 27.92: w/ 11.4-cm $f/8$ L (72 \times), coma dia. 5', DC = 7 [BRO04]. May 26.91: in 15 \times 80 B, tail > 1 $^{\circ}$ long [SCH04]. May 26.91: moonlight interference [SOU01]. May 26.92, 26.96, 28.93-28.97, and June 29.96: moonlight [DIJ, BOU]. May 26.97: only faintly visible due to a bright sky; visibility similar to M13, though M13 was seen under a darker sky background; solar alt. -8 $^{\circ}7$ [GRA04]. May 27.85: strong moonlight interference and some haze [GUZ]. May 27.90: w/ 20 \times 80 B, 0 $^{\circ}5$ tail in p.a. 100 $^{\circ}$ [AMO01]. May 27.91: moonlight; sun alt. -12 $^{\circ}$ [GIL01]. May 27.93: clouds and moonlight [SOU01]. May 28.48: comp. star has $B-V = +0.46$ [TSU02]. May 28.88: also short tail 0 $^{\circ}4$ long in p.a. 148 $^{\circ}$ [RES]. May 28.89: w/ 20 \times 80 B, 0 $^{\circ}1$ tail in p.a. 100 $^{\circ}$ [AMO01]. May 29.85: very clear sky [ZNO]. May 29.87 and 30.87: moonlight [HOR02]. May 29.89: also short tail 0 $^{\circ}58$ long in p.a. 160 $^{\circ}$ [RES]. May 29.89: tail > 0 $^{\circ}5$ long in p.a. 156 $^{\circ}$; star of mag 9.1 located 2 $^{\circ}9$ from central cond.; star of mag 8.2 located 4 $^{\circ}2$ from central cond.; moonlight [SRB]. May 29.89: interference from clouds [AMO01]. May 30.84: strong moonlight interference, comet between clouds [GUZ]. May 30.87: tail > 0 $^{\circ}5$ long in p.a. 153 $^{\circ}$; four stars of mag 10-12 < 6' from central cond.; moonlight [SRB]. May 30.96-30.99: barely visible, not seen in 7 \times 50 B; better seen w/ 20.3-cm T (62 \times) and 15.2-cm L (38 \times); strong twilight (solar alt. around -8 $^{\circ}0$) [GRA04]. May 31.87 and June 1.85: moonlight interference [GUZ].

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↑_N C/2001 Q4 (NEAT) Perihelion + 6 Days

Mosaic: 6 \times 80 sec centred on 2004 May 21.967 UT
 Dimensions: 62' \times 27' at 3.75"/pixel (40% original)
 Comet - Sun Distance: 0.968 AU
 Comet - Earth Distance: 0.579 AU
 Bright Star = GSC 2495846 (Mag 5.9)



CCD image of comet C/2001 Q4 taken by Moberley on 2004 May 21.967 UT. Fine structure in the ion tail is evident in this exposure with the comet's coma overexposed. The mosaic containing six 80-sec exposures has a length of 62'.

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June 5.91: strong light pollution; obs. made in Paris during IWCA III [GUZ]. June 6.9: comet a little brighter than comparison stars HD 82380 and HD 83869 [KAN05]. June 6.91: rather compact object; tail faint but not difficult; w/ 30-cm T (75 \times), medium-bright starlike false nucleus [KAM01]. June 6.94: in 15 \times 80 B, tail 1 $^{\circ}3$ long in p.a. 93 $^{\circ}$ [SCH04]. June 7.88: second tail > 20' in p.a. 151 $^{\circ}$ [SRB]. June 7.88 and 28.91: moonlight [SRB]. June 9.89, 12.89, 13.90, 14.89, and 15.90: light pollution [AMO01]. June 13.88: second tail > 9' long in p.a. 141 $^{\circ}$ [HOR02]. June 13.90, 15.90, 17.91, 21.90, and 22.88: some light pollution [GUZ]. June 14.50: comp. star has $B-V = +0.51$ [TSU02]. June 14.87 and 21.88:

Guide 7.0 software used for comp.-star mags [SAR02]. June 15.97: gas tail $0^{\circ}9$ long in p.a. 95° ; fanned dust tail $0^{\circ}3$ long in p.a. 150° [GON05]. June 16.80: under very good conditions, faint dust tail glimpsed some $0^{\circ}25$ long, fanning out to p.a. $\approx 145^{\circ}$; obs. from near Agios Nikolaos, Crete [BOU]. June 16.9: comet fits best in brightness to comparison star HD 86942 (fainter than HD 86274 and HD 87243; brighter than HD 87258 and HD 86871) [KAN05]. June 21.87 and 26.88: twilight [SRB]. June 21.87: second tail $> 22'$ in p.a. 142° [SRB]. June 24.90: fan tail $> 13'$ long spanning p.a. 81° - 149° [HOR02]. June 24.91, 25.90, 26.91, 27.91, 28.95, 29.9 and 30.95: moonlight [HOR02]. June 25.95: w/ 30-cm L ($60\times$), short, broad tail $\approx 0^{\circ}1$ long in p.a. 100° - 140° [SCH04]. June 26.87: fan tail $> 13'$ long spanning p.a. 75° - 157° [HOR02]. June 26.88: low alt. [SOU01]. June 26.88: second tail $> 12'$ in p.a. 110° [SRB]. June 28.91: second tail $> 11'$ in p.a. 105° [SRB]. June 29.89: fan tail $> 14'$ long spanning p.a. 65° - 140° [HOR02]. June 29.96: twilight [BOU].

July 6.48: comp. star has $B-V = +0.59$ [TSU02]. July 8.49: comp. star has $B-V = +0.64$ [TSU02]. July 11.56: Guide 8.0 software used for comp.-star mags; comp. star has $B-V = +0.89$ [OHS]. July 13.47: $B-V$ values of comp. stars were $+0.50$, $+0.66$, $+0.75$, $+0.76$, $+0.77$, and $+0.84$ [NAK01]. July 14.95: fanned tail spanning p.a. 90° - 140° [GON05]. July 20.96: w/ 20-cm T ($50\times$), brighter inner coma, which turned out at $161\times$ to be a small knot of material of diameter $\approx 30''$; no starlike false nucleus definitely seen [KAM01].

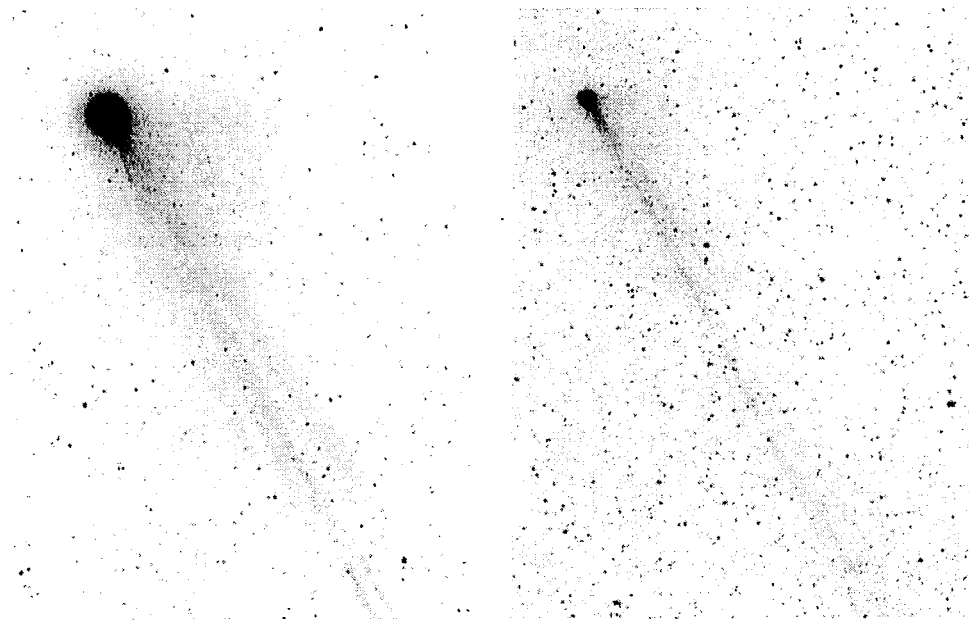
◊ Comet C/2002 J5 (LINEAR) \implies 2004 May 24.68: $B-V$ values of comp. stars were $+0.51$, $+0.63$, $+0.68$, $+0.72$, $+0.73$, and $+0.85$ [NAK01]. May 30.02 and June 7.99: moonlight [HOR02]. July 13.51: $B-V$ values of comp. stars were $+0.50$, $+0.66$, $+0.75$, $+0.76$, $+0.77$, and $+0.84$ [NAK01].

◊ Comet C/2002 R3 (LONEOS) \implies 2004 May 24.75: $B-V$ values of comp. stars were $+0.51$, $+0.63$, $+0.68$, $+0.72$, $+0.73$, and $+0.85$ [NAK01].

◊ Comet P/2002 T5 (LINEAR) \implies 2004 Jan. 24.86: outer edge of coma within $25''$ of a star of mag $R = 14.6$ [HOR02]. May 19.90: low alt. [HOR02].

◊ Comet P/2002 T6 (NEAT-LINEAR) \implies 2004 Jan. 23.02, 23.99, Apr. 8.83, 12.83, and 14.85: dense star field [HOR02]. Jan. 23.02: outer edge of coma within $10''$ of a star of mag $R = 15.6$ [HOR02]. Apr. 8.83: two stars (of the same brightness as the coma) situated at outer edge of coma [HOR02].

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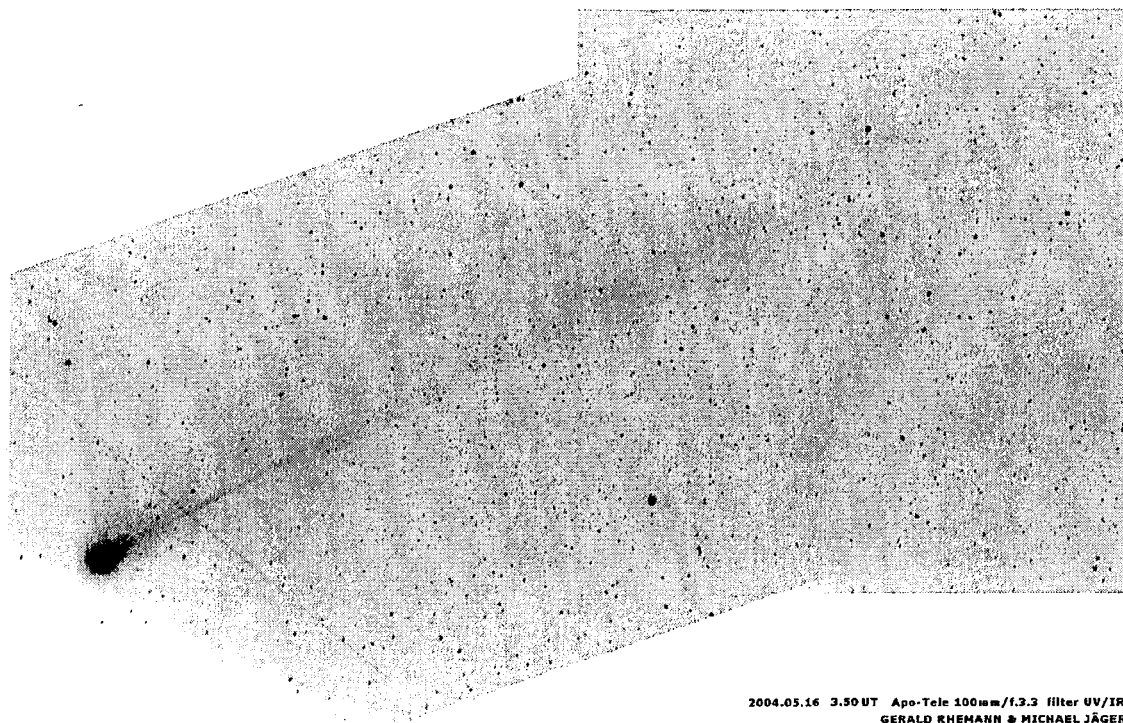


CCD images of comet C/2002 T7 by Jäger and Rhemann with 180-mm (left) and 50-mm (right) camera lenses, taken on 2004 May 15.17 UT, showing fine structure in the ion tail and a faint, diffuse dust tail fanned from along the ion tail around to the right side of the coma.

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◊ Comet C/2002 T7 (LINEAR) \implies 2004 Jan. 24.74: thin jet in p.a. $72^{\circ}4$ (longer than $3'$); bright star (mag 10.2) located $3'6$ from central cond. [SRB]. Jan. 24.80: two main tail streamers, in p.a. 52° and 62° [HOR02]. Jan. 30.75, 31.75, Feb. 2.78, and Mar. 5.75: moonlight [HOR02]. Jan. 30.77: moonlight [HOR02]. Feb. 7.72: twilight; very good air transparency [HOR02]. Feb. 7.77: second tail $7'5$ long in p.a. 62° [SRB]. Feb. 20.72 and 21.74: zodiacal-light interference [GUZ]. Feb. 25.72: moonlight; hazy sky [GUZ]. Mar. 5.74: bright moonlight; comet only 9° above horizon [GUZ]. Mar. 5.75: low alt. [HOR02]. Mar. 6.74: moonlight; comet only 8° above horizon; coma elongated \perp to tail axis [GUZ].

Apr. 21.13 "comet visible to naked eye using averted vision, but I can't detect the tail; tail much more obvious than on the 19th in 8x40 B; in 20-cm L, very narrow, $70'$ -long tail in p.a. 250° widens very slightly over its length; near the coma, the tail seems to consist of several sharp spikes; the 'anti-tail' was again visible and more obvious, extending for \approx



2004.05.16 3.50 UT Apo-Tele 100mm/f.3.3 filter UV/IR
GERALD RHEMANN & MICHAEL JÄGER

CCD image of comet C/2002 T7 taken by Jäger and Rhemann with an APO 100-mm-f.l. f/3.3 telephoto lens (+ ultraviolet and infrared filters) on 2004 May 16.16 UT. The comet was near the horizon, with a naked-eye tail some 3°-4° long visible.

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[text continued from page 128]

10' in p.a. 30°, about as wide as the coma itself (brightest at its E edge, where it seems to end sharply rather than fade away, as it does at the W edge — this 'abrupt' dimming, together with the tail's S edge, sometimes makes the comet appear to have a wide, fan-like tail spanning p.a. 30°-250° counterclockwise, with the longest and brightest part at p.a. 250°) [VAN17]. Apr. 23.11: tail easily visible to 1°8, faint to 3°0, bright and narrow, like searchlight beam; sharpish coma, not quite stellar; w/ 30-cm f/10 T (75×), very different appearance — bright core surrounded by considerable thin coma, distinct ice-blue color; anti-tail very prominent in p.a. \simeq 52° [COO02]. Apr. 23.11: coma diameter 6' in 30-cm f/10 T (75×), w/ frosty blue core, surrounded by bright envelope of 2', all surrounded by considerable soft coma [STR03]. Apr. 27.13: w/ 20-cm L (40×), the brightest part of the tail is 30' long; the tail starts narrower than the coma, and widens to \simeq 10' after 1°9; there is a hint of curvature to N [VAN17]. Apr. 28.13: w/ 20-cm L (40×), the tail seems to be thinner, or more condensed towards the middle, than before; comet is clearly visible to the naked eye, but the tail is not obvious [VAN17]. Apr. 28.80, May 20.43, 21.42, June 14.46, 22.46, and July 6.47: Guide 8.0 software used for comp.-star mags [TSU02]. Apr. 29.12: comet appeared stellar to the unaided eye — no tail visible; slight haze [BEG01]. Apr. 29.13: "an impressive binocular sight; small, bright coma w/ a distinct blue-green color; tail within the first 2° of the coma is of high surface brightness" [BEG01]. Apr. 30.78: "in 25×100 B and 10×50 B, tail \simeq 4° long in p.a. 250°; type-III tail not seen, but a faint and indefinite 'glow' was observed to the N of the tail, extending for a few (possibly 3-4) arcmin and continuing around to the main tail — this looked rather like a faint extended coma, but seemed to be only on the N side of comet; central cond. and coma still intense and quite green in color" [SEA]. Apr. 30.85: Guide 8.0 software used for comp.-star mags [NAG04].

May 1.84, 2.83, and June 13.50: Guide 8.0 software used for comp.-star mags [NAG04]. May 1.88: best view is through 20×80 B, which shows a lot of detail within the tail structure — first 3° of tail is of a very high surface brightness, while 6° of tail easily seen with the naked eye despite the zodiacal-light background [PEA]. May 2.12: w/ naked eye, $m_1 = 4.0$ [PRI04]. May 2.15: "tail narrow, like a pencil; easily visible to naked eye, like a star seen in haze" [COO02]. May 2.35: w/ 14-cm L (112×) and 6-cm R (100×), central cond. diffuse w/ DC = 3 [AMO01]. May 4.12: brief obs. due to advancing cloud [PRI04]. May 4.132: moon setting behind cloud, and before twilight was strong; tail surface brightness still high despite moonlight [BEG01]. May 4.23: this comet appeared smaller and somewhat fainter than C/2001 Q4 did on May 3.87 (seen under similar conditions); 7.0-cm f/6.8 R (24×) showed a bright central cond. in a diffuse coma, but no tail; total mag is somewhat uncertain, as it is only based on a single comp. star (33 Psc); obs. at alt. 9°-10°, w/ the sun 11°-12° below horizon [GRA04]. May 4.88: all comets obs. this morning during totality of May 4/5 lunar eclipse, so the sky was very dark at time of the obs.; very long and straight tail was quite striking and obvious with the naked eye; coma was a distinct bluish hue in 20×80 B [PEA]. May 6.15: no tail measurements attempted due to

Comet 2002 T7 (LINEAR)
 (and NGC 3115 & PGC 29300 (in tall))
 Copyright © John Drummond
 www.possunobservatory.co.nz
 41cm (f6.7) f4.5 Meade SF Newt
 FOV = 43' x 27' (North @ 2 o'clock)
 Canon EOS 10D @ 3200 ASA
 1 x 1 minute
 Mon 21.31 June 2004 (UT)

Image of comet C/2001 Q4 taken by John Drummond (Gisborne, New Zealand) on 2004 June 21.31 with a 41-cm f/4.5 reflector and a Canon EOS 10D camera (at 3200 ASA). The field-of-view is 43' x 27', with north toward a two-o'clock position. The galaxy NGC 3115 is at lower right.

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[text continued from page 129]

bright moonlight [COO02]. May 7.13: w/ 20-cm L (40×), blue-green color prominent, even w/ moonlight; no tail visible at all in moonlight; via naked eye, $m_1 = 3.8$ [VAN17]. May 9.35, 10.34, 11.34, 26.90, 27.91, 28.90, 29.88, 30.88, June 3.88, 23.90, 29.90, and 30.89: moonlight [AMO01]. May 10.15: conditions very hazy; no attempt made to measure tail parameters [COO02]. May 10.61: no obvious tail was visible, and the comet was not visible with certainty to the naked eye (moonlight, haze, and twilight); the comet was obs. at alt. 7°; comp. stars η and ι Cet [DAH]. May 11.79: tail 5° long in p.a. 250° via 10×50 B (suspected to this length also via naked eye, but difficult to be sure in bright moonlight) [SEA]. May 12.13: w/ 8×40 B, tail dimly visible in moonlight [VAN17]. May 13.13: “w/ naked eye, $m_1 = 3.2$, coma dia. 6', DC = 8, tail 0°5 long in p.a. 220°; despite moonlight interference and low alt. of the comet, the coma displays a distinct blue-green color and is significantly larger through binoculars than when last seen on May 4; tail narrow, the first degree or so of quite high surface brightness, but not as prominent as previously” [BEG01]. May 13.87: the surface brightness of the tail has decreased quite markedly in the last 9 days, and it also has become broader; the coma has also enlarged quite significantly and the appearance has ‘softened’ somewhat [PEA]. May 14.12: moonlight interference and comet at low alt. (13° above horizon) [PRI04].

May 15.12: moonlight interference and comet at very low altitude (10°) — last chance to view it in the morning sky [PRI04]. May 17.36: alt. 5° [AMO01]. May 17.87: comet alt. ~ 6° [SOU01]. May 18.89: alt. 10° [AMO01]. May 19.35: in 10×50 B, tail to $\approx 13^\circ$ in p.a. 160° (also suspected via naked eye); comet quite strongly enhanced with Swan Band filter [SEA]. May 20.36: “tail faintly seen via naked eye for $\approx 1^\circ$; via 25×100 B, tail 4° long in p.a. 165° (there also appeared to be a faint and broad secondary tail in p.a. $\approx 260^\circ$ — this may have extended to 1° or even longer, but a chain of stars in same position may have contributed to an illusion of length, although I think that the feature itself was real)” [SEA]. May 20.69: perfectly spherical blue-green coma; faint-but-clearly-discernible tail; via naked eye, $m_1 = 2.8$, coma dia. 25', DC = 7; slightly hazy conditions [BEG01]. May 21.35: in 10×50 B, tail 6°-7° long in p.a. 145°; in 25×100 B, probable extension of $\approx 20'$ in p.a. $\approx 230^\circ$ and coma dia. 20'; in 25.4-cm L, central cond. pronounced but clearly non-stellar at 71× and 114× [SEA]. May 22.69: “tail faint, tenuous, and narrow, but broader than pencil-thin (as noted previously in the morning sky)” [COO02]. May 22.74: “I waited for nearly an hour to grab a 6-min perfectly clear gap in an otherwise overcast sky; it was worth the wait! — large, spherical emerald-green coma in the same field-of-view as Sirius and M41; tail faint but quite sharply defined” [BEG01]. May 22.87: obs. only 30 min after sunset [SOU01]. May 23.06: w/ 8×40 B, tail 1°5 long in p.a. 135°; big coma with clear central cond. of mag ≈ 5 [RIE]. May 24.07: w/ 8×40 B, tail 3° long in p.a. 130°; less central cond. than previously; at same time, comet C/2001 Q4 visible w/ naked eye [RIE]. May 24.90: clouds interfering [AMO01]. May 26.89: moonlight interference [SOU01]. May 26.90: w/ 20×80 B, 0°6 tail in p.a. 120° [AMO01]. May 26.95 and 27.96: ref stars ρ , 11, and 16 Pup; moonlight [MAN04]. May 26.97 and 27.98: comet detected via naked eye only w/ averted vision; moonlight interference [BAL07]. May 26.97: round coma with a starlike pseudo-nucleus, only visible w/ averted vision; coma has two levels of brightness; no tail detected; comp. star 11 Pup [BAL07]. May 26.98: moonlight [DES01]. May 27.88: interference from clouds [SOU01]. May 27.98: short tail visible, somewhat broad but not fan-shaped, 25' long in p.a. 125°; round coma with two levels of brightness; comp. stars 3 Pup and 11 Pup [BAL07]. May 28.94: tail narrow and very faint [ADD]. May 30.99: clouds and moonlight [SOU01].

June 1.47, 3.47, 4.47, 5.47, 13.48, and 15.48: StellaNavigator ver. 6 software used for comp.-star mags [NAG08].

June 3.47, 4.46, 5.47, 14.48, and 16.47: **Guide 7.0** software used for comp.-star mags [MIY01]. June 3.47, 4.48, and 13.49: **The Sky ver. 5** software used for comp.-star mags [MIT]. June 5.33: comet faintly detected with naked eye (*editor's comment: the '8' in the coma-dia. column may have been incorrectly transmitted by the observer, and it may instead belong in the DC column*) [SEA]. June 5.49 and 14.5: **Guide 8.0** software used for comp.-star mags [YOS02]. June 6.36: in 25×100 B, tail traced to 1°1 in p.a. $\approx 130^\circ$ (tail was brighter in comparison with coma than it had been around closest approach to earth) [SEA]. June 8.02: comp. stars γ Sex and HIP 46744; interference from nearby spotlight [BAL07]. June 8.35: tail clearly visible as a straight, narrow ray of light [SEA]. June 8.91, 13.9, and 15.9: comp. stars at same low alt. as the comet [GON05]. June 11.99: small and uniform coma; comp. stars γ Sex and 34 Hya [BAL07]. June 13.45: in 25×100 B, 0°6 of tail visible in p.a. 118° (tail rather bright near coma and appearing as a well-defined pencil of light) [SEA]. June 14.46: comp. star has $B-V = +0.48$ [TSU02]. June 16.44: in 25×100 B, tail 1° long; comet a striking object [SEA]. June 17.40: in 25×100 B, tail bright for about half a degree, but could be traced for at least 1°; comet a very impressive object in 25×100 B and in 25.5-cm L (71×); just a little enhanced through Swan Band filter [SEA]. June 20.34: "tail could be traced for possibly 2°5 in 25×100 B; comet surprisingly spectacular for an object fainter than mag 7!" [SEA]. June 22.35: "tail appeared less intense than on previous nights, but that may, at least in part, be due to moonlight" [SEA]. June 22.46: comp. star has $B-V = +0.43$ [TSU02]. June 23.93, 30.94, and July 1.90: moonlight [SOU01]. June 26.89: "in outburst?" [SOU01]. June 27.33: tail faint in moonlight; coma somewhat enhanced through Swan Band filter [SEA].

July 4.34: tail still visible as a faint, straight, pencil of light to $\approx 0^\circ 5$ [SEA]. July 6.47: comp. star has $B-V = +0.42$ [TSU02]. July 6.89: comp. stars have $V = 8.66$ ($B-V = +1.18$) and 9.60 ($B-V = +0.33$) [AMO01].

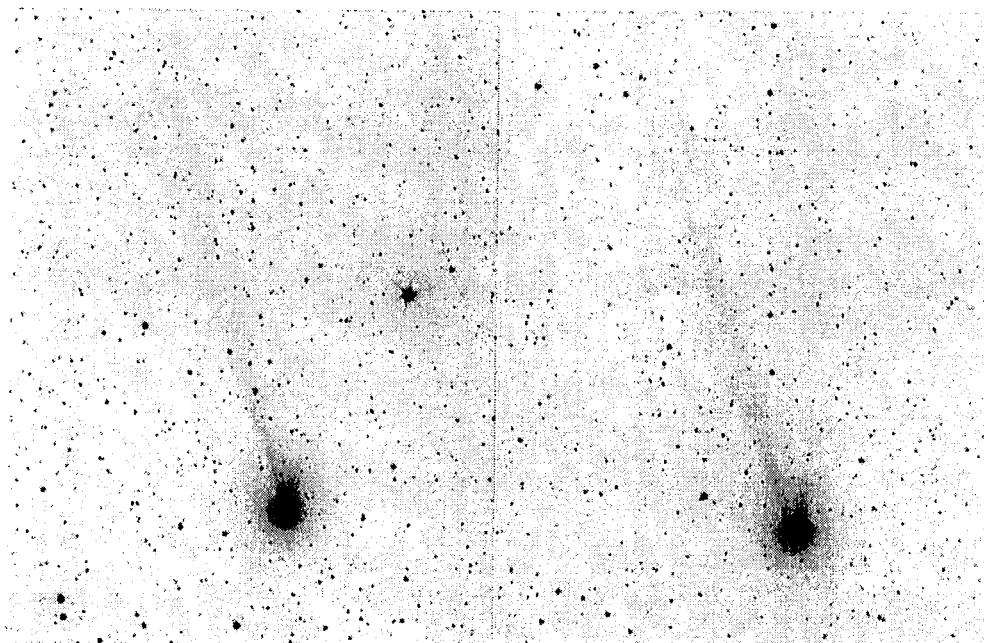
◊ *Comet C/2003 E1 (NEAT)* \implies 2004 May 25.73: $B-V$ values of comp. stars were +0.68, +0.72, and +0.73 [NAK01].

◊ *Comet C/2003 H1 (LINEAR)* \implies 2004 Feb. 21.14: comet only 14° above horizon [GUZ]. Mar. 22.92: low alt. [SRB]. Apr. 8.87: central cond. 0°6 from a bright (mag 10.5) star [SRB]. Apr. 12.53, 16.45, and 21.47: **Guide 8.0** software used for comp.-star mags [TSU02]. Apr. 12.53: comp. star has $B-V = +0.43$ [TSU02]. Apr. 16.45: comp. star has $B-V = +0.35$ [TSU02]. Apr. 21.47: comp. star has $B-V = +0.54$ [TSU02]. May 6.47: $B-V$ values of comp. stars were +0.45, +0.59, +0.63, +0.83, and +0.85 [NAK01].

◊ *Comet C/2003 K4 (LINEAR)* \implies 2004 Feb. 21.15: some light pollution [GUZ]. Mar. 23.05, 31.02, Apr. 8.99, 12.97, 13.97, 14.97, May 16.96, 20.02, 20.90, and 29.93: dense star field [SRB]. Mar. 31.12, Apr. 15.08, May 20.00, 29.96, and 30.91: dense star field [HOR02]. Mar. 31.12 and Apr. 15.08: elliptical coma [HOR02]. Apr. 8.99: central cond. 0°7 from a bright (mag 11.4) star [SRB]. Apr. 8.99 and 12.97: elongated coma in p.a. 45° [SRB]. Apr. 13.97: two 13th-mag stars located 0°5 from central cond. [SRB]. Apr. 14.97: central cond. located 0°5 from a mag-12.5 star [SRB]. Apr. 16.75, May 11.54, 25.74, June 14.7, 23.56, 28.48, July 6.54, and 8.56: **Guide 8.0** software used for comp.-star mags [TSU02]. Apr. 16.75: comp. star has $B-V = +0.52$ [TSU02]. Apr. 23.12: very small, definite sign of strong cond. towards center [COO02]. May 11.54: comp. star has $B-V = +0.70$ [TSU02]. May 14.64, June 10.53, 13.53, 15.51, 20.51, July 10.61, 11.55, and 20.52: **The Sky ver. 5** software used for comp.-star mags [MIT]. May 14.77, 24.73, June 4.50, 5.49, 13.54, and 16.48: **Guide 7.0** software used for comp.-star mags [MIY01]. May 18.71: **MegaStar 5.0** software used for comp.-star mags [MUR02]. May 20.00: only slight enhancement w/ a Lumicon Swan Band Filter [MEY]. May 20.01: dense star field [HOR02]. May 20.02: two mag-12.6 stars located $\approx 0^\circ 9$ from central cond. [SRB]. May 20.90: star of mag 12.7 located 0°8 from central cond. [SRB]. May 23.56, June 16.68, July 13.59, and 23.63: **Guide 8.0** software used for comp.-star mags [NAG04]. May 24.71: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. May 24.73, June 11.70, 12.58, 13.7, July 5.52, and 16.50: **Guide 8.0** software used for comp.-star mags [YOS02]. May 25.73, June 5.50, 13.51, 14.70, 15.52, 20.51, 29.74, July 6.49, 11.51, 14.50, 18.64, and 20.49: **StellaNavigator 6.1** software used for comp.-star mags [NAG08]. May 25.74: comp. star has $B-V = +0.53$ [TSU02]. May 25.90: starlike nuclear cond. of mag 12.5 [SHU]. May 28.98: moonlight, but comet well visible [BOU]. May 29.03: pseudo-nucleus of mag 13.9 (ref: HS) [RES]. May 29.93: coma extended in p.a. 161° [RES]. May 29.93: star of mag 9.7 located 1°2 from central cond. [SRB]. May 29.96 and 30.91: moonlight [HOR02]. May 29.96: second tail 3°1 long in p.a. 149° [HOR02]. May 30.91: second tail 3°8 long in p.a. 148° [HOR02]. June 1.99: moonlight [GUZ]. June 2.95: moonlight [GON05]. June 7.91, 24.90, 26.91, and 28.95: moonlight [SRB]. June 7.91: second tail $> 4'$ in p.a. 148° [SRB]. June 13.81: comet close to star of mag 7.5 (ref: TK); obs. from near Agios Nikolaos, Crete [BOU]. June 13.91: bright 2'-3' central cond. surrounded by large outer halo [GUZ]. June 13.92: wide fan tail $> 11'$ long spanning p.a. 133° - 202° ; dense star field [HOR02]. June 14.68: comp. star has $B-V = +0.43$ [TSU02]. June 15.92: small, bright central cond. surrounded by very large and diffuse halo [GUZ]. June 15.94: elongated coma [GON05]. June 16.68: fan-shaped tail in p.a. 70° - 180° [NAG04]. June 16.90: high clouds [HOR02]. June 17.95, 21.95, 25.02, and 26.01: **Guide 7.0** software used for comp.-star mags [SAR02]. June 21.87: second tail $> 5'$ in p.a. 123° ; 12th-mag star situated 0°4 from central cond. [SRB]. June 21.91: coma assymmetric; thin, faint tail barely visible [GUZ]. June 21.99: second tail $> 13'$ long in p.a. 115° [HOR02]. June 22.89 and 23.90: coma elongated in p.a. 125° [GUZ]. June 23.56: another 3°5-long tail in p.a. 166° ; comp. star has $B-V = +0.72$ [TSU02]. June 24.90, 26.91, and 28.95: dense star field [SRB]. June 24.94: second tail $> 12'$ long in p.a. 109° [HOR02]. June 25.92, 27.93, 28.97, and 29.91: moonlight [HOR02]. June 25.98: w/ 30-cm L (60×), short tail $\approx 0^\circ 1$ long in p.a. 107° [SCH04]. June 26.91: second tail $> 6'$ in p.a. 114° [SRB]. June 26.92: second tail $> 13'$ long in p.a. 104° [HOR02]. June 27.12 and 30.13: fanned tail [GON05]. June 28.48: another tail $> 7'$ long in p.a. 157° ; comp. star has $B-V = +0.48$ [TSU02]. June 28.95: second tail $> 6'$ in p.a. 108° [SRB]. June 29.91: second tail $> 13'$ long in p.a. 101° [HOR02]. June 29.97: comet easily visible, despite moonlight and twilight [BOU]. July 5.52: 20' narrow tail in p.a. 125° , w/ 20×100 B [YOS02]. July 6.54: another tail in p.a. 126° ; comp. star has $B-V = +0.55$ [TSU02]. July 8.43: comet at low alt.; through 25×100 B, it appeared well condensed ($DC = 6$) and was little changed (though possibly a little fainter) through Swan Band filter;

through 25.4-cm L (71 \times), central cond. was at least as pronounced as that of C/2001 Q4 at similar r [SEA]. July 8.56: another tail in p.a. 127 $^\circ$; comp. star has $B-V = +0.48$ [TSU02]. July 11.03: ref stars SAOC 45491 (TI mag 6.9) and SAOC 45483 (TI mag 7.87) [MAN04]. July 13.01: asymmetric coma; dust tail 0 $^\circ$ 3 long in p.a. 95 $^\circ$ [GON05]. July 13.59: 17'-long tail in p.a. 80 $^\circ$ and DC = 6-7, w/ 30.4-cm L [NAG04]. July 15.01: visible to naked eye w/ averted vision; w/ 25 \times 100 B, dust tail 0 $^\circ$ 4 long in p.a. 95 $^\circ$ [GON05]. July 16.97: w/ 30-cm T (75 \times), faint 0 $^\circ$ 2 tail in p.a. 80 $^\circ$, deviating from the anti-solar direction; at 242 \times , starlike false nucleus of mag ≈ 11.5 was visible [KAM01]. July 20.96: w/ 20-cm T (50 \times), conspicuous central cond. w/ starlike false nucleus [KAM01]. July 22.90, 23.91, and 26.9: moonlight interference [AMO01]. July 23.63: 0 $^\circ$ 4 tail visible w/ 30.4-cm L [NAG04]. July 23.96, 25.94, 27.00, and 28.97: moonlight [SOU01].

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CCD images of comet C/2003 K4 by Jäger and Rhemann on 2004 July 16.88 UT (left) and July 19.90 (right), taken with a 20-cm f/1.5 Schmidt camera.

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◇ Comet C/2003 O1 (LINEAR) \Rightarrow 2004 May 24.69 and June 13.65: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01].

◇ Comet C/2003 T3 (Tabur) \Rightarrow 2004 May 16.12: comp. stars at same low alt. as the comet [GON05]. May 25.75, June 14.74, and July 13.75: StellaNavigator 6.1 software used for comp.-star mags [NAG08]. May 25.75: Guide 8.0 software used for comp.-star mags [NAG04]. May 25.78 and June 30.78: Guide 8.0 software used for comp.-star mags [TSU02]. May 25.78: comp. star has $B-V = +0.65$ [TSU02]. May 28.99: moonlight, and comet at low alt. of 12 $^\circ$ [BOU]. June 2.02: moonlight; some light pollution [GUZ]. June 13.99, 22.01, and 23.99: light pollution [GUZ]. June 16.07: difficult obs. (comet briefly obs. in twilight at low alt. in windy conditions); obs. from near Agios Nikolaos, Crete [BOU]. June 22.01: comet near star of mag 11 [GUZ]. June 30.78: comp. star has $B-V = +0.52$ [TSU02].

◇ Comet C/2003 T4 (LINEAR) \Rightarrow 2004 Jan. 23.95: outer edge of coma within 0 $^\circ$ 8 of a star of mag $R = 8.0$ [HOR02]. Mar. 17.95: dense star field; two stars of mag $R = 15.8$ and 17.6 situated in outer part of coma [HOR02]. Mar. 30.89: moonlight; two stars of mag $R = 15.7$ and 16.7 situated 23 $''$ from central cond. [HOR02]. Apr. 12.47: Guide 8.0 software used for comp.-star mags; comp. star has $B-V = +0.57$ [TSU02]. Apr. 14.89: star of mag $R = 13.9$ situated 26 $''$ from central cond. [HOR02]. May 30.98: moonlight [SRB]. July 11.53: Guide 8.0 software used for comp.-star mags; comp. star has $B-V = +0.89$ [OHS]. July 27.99: small, nearly stellar object with faint nebulosity, obs. at calc. position (orbital elements from MPC 52315 for epoch 2004 July 14 used), close to star of mag 14.5 (ref: HS); Digitized Sky Survey shows nothing but that single mag-14.5 star near this position [BOU].

◇ Comet C/2003 V1 (LINEAR) \Rightarrow 2004 Feb. 11.81: outer edge of coma within 0 $^\circ$ 3 of a star of mag $R = 11.7$ [HOR02]. Apr. 8.95: moonlight; outer edge of coma within 6 $''$ of a star of mag $R = 16.0$ [HOR02]. May 29.90: stellar appearance — size same as stellar images of same approx. brightness ($\approx 12''$); moonlight [HOR02].

◇ Comet P/2004 A1 \Rightarrow 2004 Jan. 22.88, 24.92, and Feb. 12.88: stellar appearance [HOR02]. Jan. 22.88 and 24.92: size same as stellar images of same approx. brightness ($\approx 13''$) [HOR02]. Feb. 12.88: size same as stellar images of same approx. brightness ($\approx 12''$) [HOR02].

◇ Comet C/2004 DZ₆₁ (Catalina-LINEAR) \Rightarrow 2004 May 14.55: $B-V$ values of comp. stars were +0.32, +0.51,

+0.63, +0.66, +0.84, and +0.85 [NAK01]. June 13.50: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. July 13.50: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◊ *Comet P/2004 EW₃₈ (Catalina-LINEAR)* \Rightarrow 2004 May 14.57: $B-V$ values of comp. stars were +0.32, +0.51, +0.63, +0.66, +0.84, and +0.85 [NAK01].

◊ *Comet C/2004 F2 (LINEAR)* \Rightarrow 2004 May 14.66: $B-V$ values of comp. stars were +0.32, +0.51, +0.63, +0.66, +0.84, and +0.85 [NAK01]. May 24.67 and June 13.62: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01].

◊ *Comet P/2004 F3 (NEAT)* \Rightarrow 2004 Mar. 31.09 and May 29.94: moonlight [HOR02]. Apr. 8.91 and 14.91: stellar appearance [SRB]. Apr. 16.57, May 11.60, June 14.60, and July 6.52: **Guide 8.0** software used for comp.-star mags [TSU02]. Apr. 16.57 and May 11.60: comp. star has $B-V = +0.40$ [TSU02]. May 14.56: $B-V$ values of comp. stars were +0.32, +0.51, +0.63, +0.66, +0.84, and +0.85 [NAK01]. May 21.61: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.69, +0.69, +0.90 [OHS]. May 24.58 and June 13.51: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. May 29.97, 30.95, and June 7.90: moonlight [SRB]. June 13.51: faint tail toward SE [NAK01]. June 14.60: comp. star has $B-V = +0.63$ [TSU02]. June 29.87: moonlight [HOR02]. July 6.52: comp. star has $B-V = +0.50$ [TSU02].

◊ *Comet C/2004 F4 (Bradfield)* \Rightarrow 2004 Apr. 24.79: 20° tail and nuclear mag 2.8 visually [Yoshio Kushida, Yatsugatake South Base Observatory, Japan; via S. Nakano]. Apr. 26.09 and 27.08: obs. made near the center of Warsaw — strong light pollution and twilight [GUZ]. Apr. 26.10: dawn [HOR02]. Apr. 28.07: bright, long, slightly curved tail visible even when the coma was behind clouds; coma was apparently green in color [GUZ]. Apr. 28.77: **StellaNavigator ver. 6** software used for comp.-star mags [MOM]. Apr. 28.80, 29.80, and May 25.77: **Guide 8.0** software used for comp.-star mags [TSU02]. Apr. 29.04: no tail seen; alt. 9°; obs. in poor conditions (street lights and poor transparency) [GRA04]. May 1.07: coma was green in color [GUZ]. May 1.77, 14.75, 25.74, and June 14.72: **StellaNavigator ver. 6** software used for comp.-star mags [NAG08]. May 2.03: coma more diffuse than before; comet alt. 12° and sun 12°5 below horizon [GRA04]. May 4.07 and 5.08: moonlight [HOR02]. May 4.07: bright moonlight [GUZ]. May 4.22 and 5.22: obs. from Funchal, Madeira [GRA04]. May 4.22: rather pale, but seen w/ certainty; alt. 18° and sun 13° below horizon; moonlight [GRA04]. May 5.22: rather weak, but certainly seen; moon [GRA04]. May 8.09: thin cirrus clouds; strong twilight [RES]. May 10.05: tail still rather long in a dark sky [GUZ]. May 13.01: only barely visible, but seen at correct position; twilight (solar alt. -11°) [GRA04]. May 14.73: **The Sky ver. 5** software used for comp.-star mags [MIT]. May 14.76 and 24.74: **Guide 7.0** software used for comp.-star mags [MIY01]. May 16.02: some interference from nearby 41 And; tail very faint [BOU]. May 16.98: w/ 31.0-cm J (72×), tail 0°3 long in p.a. 300° [DIJ]. May 20.01: ill-defined coma; no enhancement w/ a Lumicon Swan Band Filter [MEY]. May 24.76: **Guide 8.0** software used for comp.-star mags [YOS02]. May 25.72: **Guide 8.0** software used for comp.-star mags [NAG04]. May 25.77: comp. star has $B-V = +0.93$ [TSU02]. May 25.79: **Guide 8.0** software used for comp.-star mags; comp. star has $B-V = +0.53$ [NAK01]. May 28.99: moonlight interference [BOU]. May 31.02 and June 8.00: twilight [SRB]. June 2.01: moonlight [GUZ]. June 14.00 and 29.98: dense star field [HOR02]. June 16.71: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.54 and +0.74 [OHS]. June 30.76: $B-V$ values of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

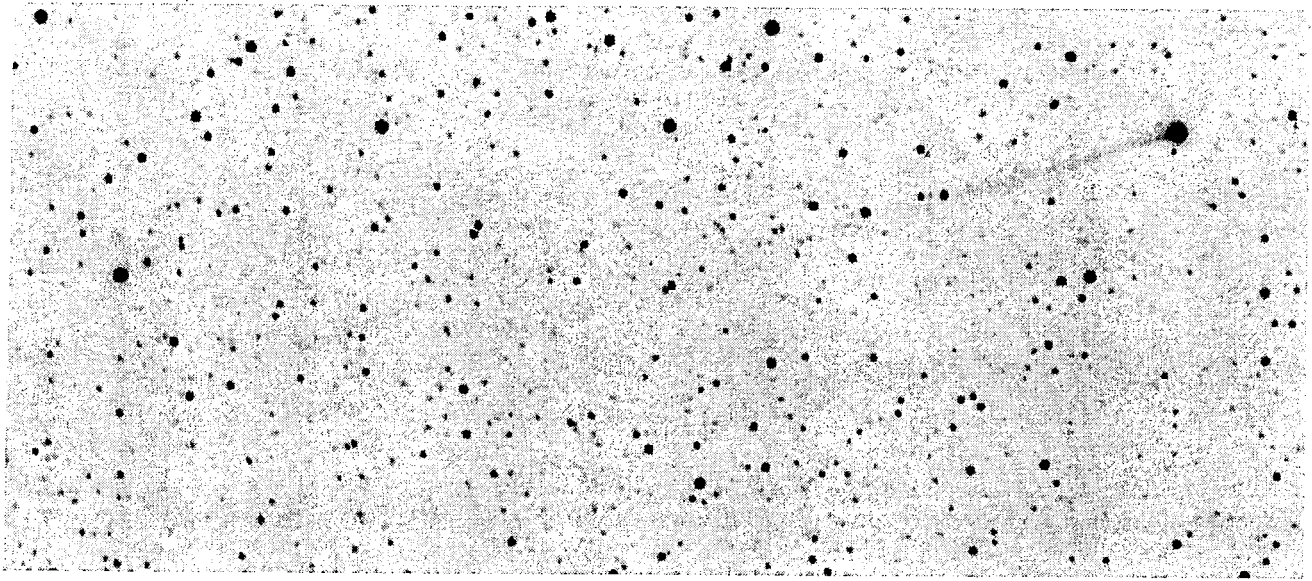
◊ *Comet P/2004 H2 (Larsen)* \Rightarrow 2004 May 14.63: $B-V$ values of comp. stars were +0.32, +0.51, +0.63, +0.66, +0.84, and +0.85 [NAK01]. May 24.65 and June 13.63: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01].

◊ *Comet P/2004 H3 (Larsen)* \Rightarrow 2004 May 14.59: $B-V$ values of comp. stars were +0.32, +0.51, +0.63, +0.66, +0.84, and +0.85 [NAK01]. May 24.67 and June 13.56: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01].

◊ *Comet C/2004 H6 (SWAN)* \Rightarrow 2004 May 30.80: “tail was very marginal, but I think real” [SEA]. June 10.36, 13.36, and July 6.20: moonlight interference [AMO01]. June 29.76 and July 13.76: **StellaNavigator 6.1** software used for comp.-star mags [NAG08]. July 6.75: **Guide 8.0** software used for comp.-star mags; comp. star has $B-V = +0.65$ [TSU02]. July 10.73: **The Sky ver. 5** software used for comp.-star mags [MIT]. July 13.08: diffuse; coma enhanced with Swan band filter [GON05]. July 13.71: **Guide 8.0** software used for comp.-star mags [NAG04]. July 14.60: slightly enhanced through Swan Band filter [SEA]. July 15.14: diffuse; astron. twilight [GON05].

◊ *Comet C/2004 HC₁₈ (LINEAR)* \Rightarrow 2004 May 14.61: $B-V$ values of comp. stars were +0.32, +0.51, +0.63, +0.66, +0.84, and +0.85 [NAK01]. May 24.62 and June 13.53: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. May 27.63: $B-V$ values of comp. stars were +0.32, +0.66, +0.76, and +0.84 [NAK01]. July 8.58: **Guide 8.0** software used for comp.-star mags; comp. star has $B-V = +0.45$ [TSU02]. July 13.52: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◊ *Comet C/2004 K1 (Catalina)* \Rightarrow 2004 May 25.77: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.44, +0.48, and +0.54 [NAK01]. May 27.69: $B-V$ values of comp. stars were +0.32, +0.66, +0.76, and +0.84 [NAK01]. June 13.68: $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. June 30.71: $B-V$ values of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01]. July 13.62: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].



Unfiltered CCD image of comet C/2004 H6 taken by Vello Tabur (Wanniassa, A.C.T., Australia) with a Nikon 140-mm-f.l. f/2.8 telephoto lens on 2004 May 27.82 UT. The scale is 13"/pixel, and Tabur found a V magnitude of 8.0 for the comet, noting a $2^{\circ}.25$ tail in p.a. 198° . The field above is $2^{\circ}.5$ wide, with north to the right.

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[text continued from page 133]

◇ Comet P/2004 K2 (McNaught) \Rightarrow 2004 June 30.78: $B-V$ values of comp. stars were +0.68, +0.72, +0.73, and +0.87 [NAK01].

◇ Comet C/2004 K3 (LINEAR) \Rightarrow 2004 June 13.60: faint tail expands southward; $B-V$ values of comp. stars were +0.51, +0.63, +0.68, +0.72, +0.73, and +0.85 [NAK01]. July 13.49: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◇ Comet C/2004 L1 (LINEAR) \Rightarrow 2004 July 13.54: $B-V$ values of comp. stars were +0.50, +0.66, +0.75, +0.76, +0.77, and +0.84 [NAK01].

◇ Comet C/2004 L2 (LINEAR) \Rightarrow 2004 July 13.59: Guide 8.0 software used for comp.-star mags; $B-V$ values of comp. stars were +0.50 and +0.56 [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. Neuski and S. E. Shurpakov, Vitebsk); 48 = Ukrainian observers (c/o Denis A. Svehkarev); etc.]:

*ADA05 23	Martin Adamovsky, Czech Rep.	COO02	Tim P. Cooper, South Africa
*ADD	Gerardo Addiego, Uruguay	COR01 40	Ana P. da S. Correia, Portugal
ALV 35	Avelino A. Alves, Brazil	CRE01	Phillip J. Creed, OH, U.S.A.
AMO01 35	Alexandre Amorim, Brazil	DAH 24	Haakon Dahle, Norway
BAC03 45	Antonio Bachi, Uruguay	DES01	Jose G. de Souza Aguiar, Brazil
BAL07 35	Gustavo E. Ballan, Argentina	DIE02	Alfons Diepvens, Belgium
BEG01 15	Mike Begbie, Harare, Zimbabwe	DIJ	Edwin van Dijk, The Netherlands
BOU	Reinder J. Bouma, Netherlands	END 16	Tsunenobu Endo, Matsumoto, Japan
BRO04 27	Eric Broens, Belgium	*FIN	Stefano Finazzi, Pisa, Italy
BUS01 11	E. P. Bus, The Netherlands	GIA01	Antonio Giambersio, Italy
CHE03 33	Kazimieras T. Cernis, Lithuania	GIL01 11	Guus Gilein, Netherlands
COM 11	Georg Comello, The Netherlands	GON05	Juan Jose Gonzalez, Spain

GRA04 24	Bjoern Haakon Granslo, Norway	NEV 42	Vitali S. Nevski, Belarus
*GRI01 42	Igor B. Grinevich, Russia	OME 05	Stephen O'Meara, MA, U.S.A.
GUZ 18	Piotr Guzik, Krosno, Poland	PEA 14	Andrew R. Pearce, Australia
HAS02	Werner Hasubick, Germany	*PEN02 15	Gerrit Penning, S. Africa
HOE	Sebastian F. Hoenig, Germany	PRI04 15	David Pringle-Wood, Zimbabwe
HOR02 23	Kamil Hornoch, Czech Rep.	PRO01	Karel Prokes, Berlin, Germany
HOR03 23	Petr Horalek, Czech Republic	RES 18	Maciej Reszelski, Poland
JAN03 23	Otto Janousek, Czech Republic	RIB 40	José Rodrigues Ribeiro, Portugal
JOH01	C. Johannink, The Netherlands	RIE 11	Hermanus Rietveld, Netherlands
JON 09	Albert F. Jones, New Zealand	ROB06	Walter R. Robledo, Argentina
JON07 15	Tony Jones, South Africa	ROM 42	Aleksandr M. Romancev, Belarus
KAM01	Andreas Kammerer, Germany	ROS04 35	Carlos Rossatti, Uruguay
KAN05	Ralf Kannenberg, Switzerland	SAL03	Raul Salvo, Montevideo, Uruguay
KOZ02 42	Alexandr Kozlovski, Russia	SAR02 32	Krisztián Sárneckzy, Hungary
KUG	Francois Kugel, France	SCA02	Toni Scarmato, Calabria, Italy
LAB02	C. Labordena, Castellon, Spain	SCH04 11	Alex H. Scholten, Netherlands
LEH	Martin Lehky, Czech Republic	SEA 14	David A. J. Seargent, Australia
LIN04	Mike Linnolt, HI, U.S.A.	SER 42	Ivan M. Sergey, Belarus
MAC05 33	Mindaugas Macijauskas, Lithuania	SER02	Jérôme Serant, Chevillon, France
*MAC06	Luca Maccarini, Milan, Italy	SHU 42	Sergey E. Shurpakov, Belarus
MAN02 23	Roman Maňák, Lipov, Czech Rep.	SIE 33	Henryk Sielewicz, Lithuania
MAN04	Luis A. Mansilla, Argentina	SKI 24	Oddleiv Skilbrei, Norway
MEY 28	Maik Meyer, Germany	SOU01 35	Willian Carlos de Souza, Brazil
MIC 36	Marco Micheli, Pompiano, Italy	SOW 16	Toshihide Sowa, Wakayama, Japan
MIL02	Giannantonio Milani, Italy	STR03 15	Magda Streicher, South Africa
MIT 16	Shigeo Mitsuma, Honjo, Japan	TIC	Milos Tichy, Czech Republic
MIY01 16	Osamu Miyazaki, Yasato, Japan	TSU02 16	Mitsunori Tsumura, Japan
MOM 16	Masahiko Momose, Nagano, Japan	VAN15 15	Koos van Zyl, South Africa
MOR	Charles S. Morris, U.S.A.	VAN16	David Vansteelant, Belgium
MOR09	Philippe Morel, France	*VAN17 15	Jacques van Delft, South Africa
MUR02 16	Shigeki Murakami, Niigata, Japan	YOS02 16	Katsumi Yoshimoto, Hirao, Japan
NAG04 16	Kazuro Nagashima, Nara, Japan	YOS04 16	Seiichi Yoshida, Ibaraki, Japan
NAG08 16	Yoshimi Nagai, Matsumoto, Japan	ZAN01 11	W. T. Zanstra, The Netherlands
NEK	Andrey N. Nekrasov, Belarus	ZNO 23	Vladimír Znojil, Czech Republic

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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 abbreviations 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 167 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 06 24.00		S	11.9	TK	20.3	L	6	63	0.5	6			GUZ
2004 06 27.01		M	11.4	TT	11	R	15	47	1	8			LEH
2004 06 27.08		S	11.8	TK	20.3	T	10	77	1.2	6			GON05
2004 06 30.10		S	11.5	TK	20.3	T	10	77	1.5	6			GON05
2004 07 13.10		S	12.2	TK	20.3	T	10	100	1.2	4			GON05
2004 07 15.08		S	12.3	TK	20.3	T	10	100	1	4			GON05
2004 07 17.06		S	12.4	HS	44.0	L	5	156	0.7	4			HAS02
2004 07 18.96		M	12.6	TJ	41	L	4	89	0.5	5			SHU
2004 07 23.92		S	13.2	HS	30	L	5	100	0.7	2			NEV
2004 07 26.11		S	12.3	TK	20.3	T	10	100	1	3			GON05
2004 07 28.00		S	12.7	AU	31.0	J	6	89	1.2	2/			BOU
2004 07 28.01		S	12.8	AU	31.0	J	6	89	1	2/			DIJ

Comet 40P/Vaisala

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 04 15.01		B	14.8	HS	42	L	5	162	0.6	4			LEH

Comet 43P/Wolf-Harrington

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 02 20.74		M	12.0	TK	20.3	L	6	63	1.5	4			GUZ

Comet 43P/Wolf-Harrington [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 04 08.78		S	12.4	HN	20.3	L	6	63	1.2	4			GUZ
2004 04 14.79		S	12.5	HN	20.3	L	6	63	1.2	3			GUZ

Comet 78P/Gehrels

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 28.04		S	13.3	AC	31.0	J	6	143	0.7	4			DIJ
2004 07 28.04		S	13.4	AC	31.0	J	6	143	0.6	5			BOU

Comet 88P/Howell

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 04 23.11		S	9.9	TI	30.0	T	10	94	2.3	3			COO02
2004 04 23.11		S	10.5	TI	30.0	T	10	94	4.0	3/			STR03
2004 05 02.31		S	9.9	TK	14.3	L		35	1.5	5			AMO01
2004 05 02.32		S	9.4	TK	8.0	B		20	2	4			AMO01
2004 05 03.36		S	9.9	TK	8.0	B		20	1.5	4			AMO01
2004 05 04.86	x	S	10.3	TT	20	L	4	45	3.6	3			PEA
2004 05 04.87	x	S	10.0	TT	8.0	B		20	5	2			PEA
2004 05 14.86	x	S	10.3	TT	20	L	4	45	3.5	2			PEA
2004 05 15.79		S	9.9	GA	10.0	B		25	3				SEA
2004 05 24.78	xa	S	10.9:	TK	25.4	L	4	46	2.7	2			YOS02
2004 05 25.76	x	B	10.8	TJ	30.4	L	5	61	1.9	2			NAG04
2004 05 29.31		S	10.4	TK	14.3	L	6	80	2	2			AMO01
2004 06 13.11		S	10.5	TK	20.3	T	10	77	2	3			GON05
2004 06 13.76	x	S	11.0	TK	25.4	L		46	1.8	1			YOS02
2004 06 14.75	x	S	11.1	TJ	32.0	L	5	87	1.4	2			NAG08
2004 06 16.75	x	B	12.3	TJ	30.4	L	5	61	0.6	2			NAG04
2004 06 24.01		S	10.5:	TK	20.3	L	6	63	2	3			GUZ
2004 07 15.12		S	11.5	TK	20.3	T	10	77	2	2			GON05
2004 07 28.05		S	11.3	AU	31.0	J	6	89	1.3	2/			DIJ
2004 07 28.05		S	11.4	AU	31.0	J	6	89	2.2	2/			BOU

Comet 123P/West-Hartley

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 02 21.02		S	13.7	HS	20.3	L	6	125	! 0.5				GUZ
2004 04 14.88		B	13.8	HS	42	L	5	81	1.3	4			LEH
2004 04 15.04		S	14.1	HS	35	L	5	237	1.0	2/			HOR02
2004 04 21.85		B	14.0	HS	42	L	5	81	1	4			LEH

Comet C/2001 Q4 (NEAT)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2003 12 01.62		S	11.5	AU	31.7	L	5	64	1	2			JON
2003 12 14.42		S	11.2	AU	31.7	L	5	97	1	3			JON
2003 12 15.45		S	11.3	AU	31.7	L	5	64	1	5			JON
2003 12 18.42		S	11.3	AU	31.7	L	5	64	1	5			JON
2004 01 10.41		S	10.6	AU	31.7	L	5	64	1.5	3			JON
2004 01 15.44		S	10.3	AU	31.7	L	5	64	1	3			JON
2004 01 16.43		S	11.0	AU	31.7	L	5	64	1.5	3			JON
2004 01 23.41		S	10.5	AU	31.7	L	5	64	2	4			JON
2004 01 30.40		S	10.0	TK	31.7	L	5	64	1.5	6			JON
2004 02 18.41		S	9.0	TK	31.7	L	5	64	2.5	5			JON
2004 02 24.38		S	8.4	TK	7.8	R	8	30	3	3			JON
2004 02 25.38		S	8.2	TK	7.8	R	8	30	3	3			JON
2004 03 01.69		S	7.9	TK	7.8	R	8	30	3				JON
2004 03 03.68		S	7.8	TK	7.8	R	8	30	4				JON
2004 03 11.36		S	7.7	TK	7.8	R	8	30	4				JON
2004 03 14.35		S	7.7	TK	7.8	R	8	30	6	5			JON
2004 03 20.34		S	7.2	TK	7.8	R	8	30	4				JON
2004 03 21.39		S	7.1	TK	4.5	R	6	13	7				JON
2004 03 21.39		S	7.2	TK	7.8	R	8	30	6				JON

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 03 22.34		S	6.8	TK	4.5	R	6	13	7	6			JON
2004 03 23.35		S	6.7	TK	4.5	R	6	13	6	6			JON
2004 03 25.33		S	6.9	TK	4.5	R	6	13	6	5			JON
2004 03 26.70		S	6.7	TK	4.5	R	6	13	6	6			JON
2004 03 27.72		S	6.6	TK	4.5	R	6	13	6	5			JON
2004 04 18.77		M	5.5	S	5.0	B		12	9	4	55 m	154	PEN02
2004 04 20.78		M	5.2	S	5.0	B		12	11	4	1.1	152	PEN02
2004 04 21.70		S	4.2	S	5.0	B		10	10	5/	55 m	140	STRO3
2004 04 21.70		S	4.5	S	5.0	B		10	8	6	1.3	138	COO02
2004 04 22.69		M	4.4	AA	5.0	B		10	12	7	1.0	150	PRI04
2004 04 22.72		B	4.2	AA	5.0	B		7	14	7	1.1	145	BEG01
2004 04 22.74		S	4.2	S	5.0	B		10		6/			STRO3
2004 04 22.74		S	4.6	S	5.0	B		10	14	6	1.2	146	COO02
2004 04 22.80		M	5.2	S	5.0	B		12	12	4/	1.0	144	PEN02
2004 04 23.80		M	5.2	S	5.0	B		12	13	4/			PEN02
2004 04 24.70		M	4.3	AA	5.0	B		10	16	7	1.0	142	PRI04
2004 04 24.72		M	4.2	AA	5.0	B		7	11	7	50 m	138	BEG01
2004 04 25.73		S	4.7:	S	4.0	B		8		3	40 m	135	VAN15
2004 04 25.81		M	5.0	S	5.0	B		12	14	5			PEN02
2004 04 26.71		M	4.1	AA	5.0	B		10	16	6	1.0	130	PRI04
2004 04 26.72		M	4.0	AA	5.0	B		7	15	7	3.2	144	BEG01
2004 04 26.73		S	4.3:	S	4.0	B		8		3			VAN15
2004 04 26.83		M	4.9	S	5.0	B		12	14	5/	1.0	143	PEN02
2004 04 27.03		B	4.4	SC	5.0	B		10	11	5	0.5		ROS04
2004 04 27.03		B	4.6	SC	5.0	B		10	11	5	0.5		ADD
2004 04 27.03		B	4.6	SC	5.0	B		10	11	5	0.5		BAC03
2004 04 28.70		M	4.1	AA	5.0	B		7	11	7	2.5	131	BEG01
2004 04 28.75		M	4.0	AA	5.0	B		10	15	6	1.5	136	PRI04
2004 04 28.84		M	4.7	S	5.0	B		12	16	5/	1.2	135	PEN02
2004 04 29.80		M	4.0	AA	5.0	B		7	11	7	1.0	130	BEG01
2004 04 29.81		S	4.5	S	5.0	B		7	11	5			VAN17
2004 04 30.39		S	3.7	AA	0.0	E		1					SEA
2004 04 30.51	x	B	3.8	HV	5.0	B		10	12	6	1.9	130	NAG04
2004 04 30.75		M	4.0	AA	5.0	B		10	12	6	1.5	130	PRI04
2004 04 30.75		S	3.9	AA	5.0	B		7	15	7	1.5	130	BEG01
2004 05 01.39		S	3.5	AA	0.0	E		1					SEA
2004 05 01.71		S	3.8:	S	5.0	B		10	14	6	1.5	118	COO02
2004 05 01.75		M	3.6	AA	5.0	B		7	10	7	1.0	128	BEG01
2004 05 01.82		M	4.5	S	5.0	B		12	12	5/	1.2	132	PEN02
2004 05 01.89		S	3.7	YG	8.0	B		11	25	5/			DES01
2004 05 01.89		S	3.8	YG	8.0	B		11	20	5/	1	125	SOU01
2004 05 01.89		S	3.8	YG	3.0	B		8	20	5	0.5	125	SOU01
2004 05 01.96		M	3.9:	TK	5	R	7	10	&12	6	>1.5	120	ROB06
2004 05 02.07		M	3.7	YG	5.0	B		7	10	5			AMO01
2004 05 02.39		S	3.4	AA	0.0	E		1					SEA
2004 05 02.41		B	3.6	AA	3.0	R		1					SEA
2004 05 02.47	x	B	3.6	HV	5.0	B		10	11	7	2.1	120	NAG04
2004 05 02.72		S	3.8	S	5.0	B		10	9	5	1.2	112	COO02
2004 05 02.73		M	3.3	AA	5.0	B		7	23	7	1.8	125	BEG01
2004 05 02.75		M	4.4	S	5.0	B		12	14	5/	1.2	127	PEN02
2004 05 02.89		S	3.5	YG	0.0	E		1	10	6			AMO01
2004 05 02.89		S	3.6	YG	8.0	B		11	25	6	1	120	SOU01
2004 05 02.89		S	3.6	YG	3.0	B		8	25	5	0.5	120	SOU01
2004 05 02.89		S	3.7	YG	8.0	B		11	20	5			DES01
2004 05 02.90		M	3.8	YG	5.0	B		7	15	5	0.33	120	AMO01
2004 05 03.26		M	3.7	TK	6.3	B		9	9	5	3.0	125	DAH
2004 05 03.35		S	3.4	AA	0.0	E		1					SEA
2004 05 03.40		B	3.4	AA	2.8	B		4					SEA
2004 05 03.71		M	3.6	AA	5.0	B		7	10	7	1.5	130	BEG01
2004 05 03.71		M	3.7	AA	5.0	B		10	9	6	1.2	140	PRI04
2004 05 03.73		M	4.0	S	5.0	B		7	21	5			VAN17
2004 05 03.74		S	3.6:	S	4.0	B		8		3			VAN15
2004 05 03.87		M	3.8	TK	5.0	B		7	12	5/			GRA04

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 03.89		S	3.5	YG	3.0	B		8	25	5	0.5	120	SOU01
2004 05 03.90		S	3.6	YG	8.0	B		11	20	5			DES01
2004 05 03.90		S	3.7	YG	0.0	E		1					DES01
2004 05 04.26		S	3.8	TK	5.0	B		10	8	5	10 m	130	LINO4
2004 05 04.40		S	3.3	AA	5.0	B		10					SEA
2004 05 04.49	x	B	3.4	TT	4.0	B		8	15	7/	3.5	120	PEA
2004 05 04.49	x	B	3.8	TT	0.0	E		1	21	6			PEA
2004 05 04.73		M	3.5	AA	5.0	B		7	8	7	2	130	BEG01
2004 05 04.77		S	3.1	TI	5.0	B		7	25	s4			SCA02
2004 05 04.80		B	3.6	S	5.0	B		8	4	6	3	130	JON07
2004 05 04.80		M	3.6	AA	5.0	B		10	12	7	1.6	130	PRI04
2004 05 04.88		M	3.7	TK	5.0	B		7	16	5/	1.5	125	GRA04
2004 05 05.25		S	3.5	TK	5.0	B		10	11	6	20 m	140	LINO4
2004 05 05.46		B	3.0	AA	5.0	B		7	20	6			SOW
2004 05 05.46	xa	M	3.8	TK	3.5	B		7	12	6	0.6	125	YOS02
2004 05 05.71		M	3.4	AA	5.0	B		7	24	7	4.5	120	BEG01
2004 05 05.72		S	3.3	S	5.0	B		10		6			COO02
2004 05 05.79		M	4.5	TT	10	R	4	20	1.7	6	0.04	124	HOR03
2004 05 05.83		B	4.4	TI	8.0	B		11	7	7	25 m	126	LAB02
2004 05 06.01		B	3.7	TI	5.0	B		10	12	4	0.5		BAC03
2004 05 06.01		B	3.7	TI	5.0	B		10	12	4	0.5		ROS04
2004 05 06.01		B	3.7	TI	5.0	B		10	12	4	0.5		ADD
2004 05 06.03		B	3.5	HV	5.0	B		7	12	7	1.2	120	BAL07
2004 05 06.16	a	M	3.4	TJ	5.0	B		10	17	6/	3.5		MOR
2004 05 06.25		M	3.0	HV	0.0	E		1			2	130	OME
2004 05 06.25		S	3.2	TK	5.0	B		10	12	6	150 m	120	LINO4
2004 05 06.34		S	2.9	AA	0.0	E		1					SEA
2004 05 06.45	xs	M	3.6	TJ	3.5	B		7	11	6	0.5	115	NAG08
2004 05 06.46	x	B	3.3	TT	0.0	E		1	28	6			PEA
2004 05 06.46	x	B	3.4	TT	4.0	B		8	18	7	4.5	124	PEA
2004 05 06.46	x	M	3.6	TT	3.5	B		7					TSU02
2004 05 06.70		M	3.4	AA	5.0	B		7	14	8	7	120	BEG01
2004 05 06.71		M	3.1	AA	5.0	B		10	13	6	1.8	130	PRI04
2004 05 06.73		S	3.5	S	5.0	B		10		6	1.2	114	COO02
2004 05 06.74		B	3.1:	S	0.0	E		1		3			VAN15
2004 05 06.81		S	2.9	TI	5.0	B		7	30	s5/	1	100	SCA02
2004 05 06.83		B	4.1	TI	8.0	B		11	8	8	25 m	100	LAB02
2004 05 07.00		M	3.4	TI	5.2	B		7	15	7/	1.7	115	MAN04
2004 05 07.03		B	3.4	HV	5.0	B		7	12	7	1.9	115	BAL07
2004 05 07.27		S	3.2	TK	5.0	B		10	15	6	150 m	120	LINO4
2004 05 07.29		B	3.1	TK	0.7	E		1	13	6/			DAH
2004 05 07.30		M	3.4	TK	6.3	B		9	10	6/	2.3	119	DAH
2004 05 07.34		S	2.9	AA	0.0	E		1					SEA
2004 05 07.36	&	B	4.1	HK	5.0	B		10	10	D6			COR01
2004 05 07.37	&	B	4.0	HK	6.0	B		12	11	D7			RIB
2004 05 07.45	xs	M	3.5	HV	8.0	B		11	12	5			MIT
2004 05 07.45	xs	M	3.6	TJ	3.5	B		7	12	6	0.5	115	NAG08
2004 05 07.45	s	S	3.5	TJ	3.0	B		6	12	6			END
2004 05 07.46	xs	I	3.4	TJ	0.0	E		1		8			NAG08
2004 05 07.46	x	B	2.9	TT	0.0	E		1	25	8			PEA
2004 05 07.46	x	B	3.2	TT	4.0	B		8	14	7	2.7	125	PEA
2004 05 07.47		S	3.5	TJ	3.2	B		6	20	6	40 m		MOM
2004 05 07.72		M	3.2	AA	5.0	B		7	20	8	2.6	122	BEG01
2004 05 07.79		B	3.0:	S	0.0	E		1		3			VAN15
2004 05 07.80		M	4.0	S	5.0	B		12	18	6	2.8	125	PEN02
2004 05 07.81		S	2.7	TI	0.0	E		1		s8	1	100	SCA02
2004 05 07.83	\$	S	3.5:	AC	3.5	B		7	&10	4			RES
2004 05 07.88		M	3.4	TK	5.0	B		7	17	6	1.8		GRA04
2004 05 07.89		S	3.2	YG	3.0	B		8	25	6	0.5	120	SOU01
2004 05 07.89		S	3.4	YG	8.0	B		11	25	4/	1.92	125	DES01
2004 05 07.89		S	3.5	YG	0.0	E		1					DES01
2004 05 07.97		I	3.2	YG	0.0	E		1	10	6			AMO01
2004 05 07.98		B	2.9	HV	5.0	B		7	25	8	2.5	112	BAL07

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 07.99		M	3.1	TK	5	R	7	10	12	6	>1.5	115	ROB06
2004 05 08.02		M	2.9	TI	5.2	B		7	20	8	2.6	110	MAN04
2004 05 08.17	a	M	3.2	TJ	5.0	B		10	17	7	3.5		MOR
2004 05 08.26		S	3.0	TK	5.0	B		10	16	7	120	m 120	LIN04
2004 05 08.35		S	2.9	AA	0.0	E		1					SEA
2004 05 08.38		B	3.8	HK	5.0	B		10	12	D6	0.5	130	COR01
2004 05 08.39		B	3.7	HK	6.0	B		12	15	D7	0.5	135	RIB
2004 05 08.70		B	3.0:	S	0.0	E		1					VAN15
2004 05 08.70		M	3.0	AA	5.0	B		7	13	8	5.2	118	BEG01
2004 05 08.71		M	3.3	AA	5.0	B		10	15	7	2	130	PRI04
2004 05 08.78		M	3.6	S	5.0	B		12	20	6	3.5	121	PEN02
2004 05 08.81		S	2.7	TI	0.0	E		1	45	s8	1	100	SCAO2
2004 05 08.83		I	3.0:	S	0.0	E		1					TIC
2004 05 08.85		B	3.8	TI	8.0	B		11	10	8	100	m 110	LAB02
2004 05 08.86		B	3.1	TK	5.0	B		7	25	7	2.0	110	GON05
2004 05 08.87		I	2.9	TK	0.0	E		1	30	7			GON05
2004 05 08.87		M	3.3	TJ	3.0	B		8	22	7			ADA05
2004 05 08.87		M	3.5	TK	5.0	B		7	17	6	3		GRA04
2004 05 08.89		S	3.2	YG	3.0	B		8	20	6	0.5	120	SOU01
2004 05 08.90		M	2.9	YG	5.0	B		7	20	5	1.9	130	AMO01
2004 05 08.90		S	2.8	YG	0.0	E		1	20	5			AMO01
2004 05 08.90		S	3.1	YG	0.0	E		1					DES01
2004 05 08.90		S	3.2	YG	8.0	B		11	25	4/	2.88	120	DES01
2004 05 08.93		B	3.0	AA	4.0	B		10		7			ALV
2004 05 08.97		M	2.9	TI	5.2	B		7	20	7/	2.2	110	MAN04
2004 05 09.03		B	3.3	HV	5.0	B		7	13	8	2.4	110	BAL07
2004 05 09.10	s	B	3.2:	HV	0.0	E		1	15	7			CRE01
2004 05 09.19	a	M	2.9	TJ	5.0	B		10	17.5	7/	7.25		MOR
2004 05 09.19	a	S	2.9	TJ	0.7	E		1		8	6		MOR
2004 05 09.26		S	2.9	TK	5.0	B		10	17	7	135	m 120	LIN04
2004 05 09.27		B	3.0	TK	0.7	E		1	19	7	11	115	DAH
2004 05 09.29		M	3.2	TK	6.3	B		9	19	6	11	116	DAH
2004 05 09.50	x	B	3.1	TT	4.0	B		8	17	7	3.5	124	PEA
2004 05 09.50	x	B	3.1	TT	0.0	E		1	25	8			PEA
2004 05 09.69		S	3.3	AA	5.0	B		10	16	6/	1.8	119	COO02
2004 05 09.74		B	3.3:	TK	0.0	E		1					VAN15
2004 05 09.76		M	3.4	S	5.0	B		12		6/	2.7	120	PEN02
2004 05 09.80		S	2.5	TI	0.0	E		1	50	s8	2.5	110	SCAO2
2004 05 09.82		M	3.2	TK	5.0	B		10	15	7	2.5	120	GUZ
2004 05 09.82	w	S	3.2	TT	0.8	E		1	30	4/			HOR02
2004 05 09.83		B	3.0:	SC	5.0	B		7	&15	DO/			MAC06
2004 05 09.83		M	3.0	TK	0.0	E		1	20	8			GUZ
2004 05 09.83	w	M	3.4	TT	8.0	B		10	25	5/	3	115	HOR02
2004 05 09.89		S	3.1	YG	0.0	E		1					DES01
2004 05 09.89		S	3.1	YG	8.0	B		11	25	5	>2.88	120	DES01
2004 05 09.90		M	3.0	YG	5.0	B		7	15	5	1.6	125	AMO01
2004 05 09.90		S	2.8	YG	0.0	E		1	15	6			AMO01
2004 05 09.90		S	3.1	YG	3.0	B		8	20	7	1	120	SOU01
2004 05 09.91		B	3.4	TK	0.7	E		1	15	5			GRA04
2004 05 09.91		M	3.4	TK	5.0	B		7	15	6	1.7	120	GRA04
2004 05 09.97		B	3.1	TI	0.0	E		1	18	7	1.0	110	MAN04
2004 05 09.97		B	3.2	TI	5.2	B		7	20	7/	1.5	110	MAN04
2004 05 10.09		B	2.8	HV	0.0	E		1	25	8	0.5	120	CRE01
2004 05 10.19		M	2.9	TJ	5.0	B		10	17.5	7/	6		MOR
2004 05 10.19		S	2.9	TJ	0.7	E		1		8	6		MOR
2004 05 10.31		B	3.0	TK	0.7	E		1	19	7	7.9	117	DAH
2004 05 10.32		M	3.1	TK	6.3	B		9	17	6/	9.2	117	DAH
2004 05 10.35		S	2.8	AA	0.0	E		1	30	6	7	120	SEA
2004 05 10.39		B	3.5	HK	5.0	B		10	13	D7	30	m 135	COR01
2004 05 10.40		B	3.5	HK	6.0	B		12	15	D7	35	m 135	RIB
2004 05 10.74		M	3.1	HD	15	L	10	75	10	6	30	m	KOZ02
2004 05 10.79		M	4.2:	TK	4.0	B							VAN15
2004 05 10.80		M	3.4	S	5.0	B		12		6/	1.5	120	PEN02

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.	
2004 05 10.82		M	3.6	HD	3.0	B		8	12	7			SHU	
2004 05 10.82		S	2.5	TI	0.0	E		1	45	s8	3	110	SCA02	
2004 05 10.82	w	S	3.0	TT	0.8	E		1	25	3/			HOR02	
2004 05 10.83	w	M	3.4	TT	5.0	B		10	22	5	1.5	110	HOR02	
2004 05 10.84		B	3.0:	SC	10	M	13	66	&20	DO/			MAC06	
2004 05 10.85	!	S	3.6	TK	15	L	5	30	12	4/			MIC	
2004 05 10.85	!	S	3.7	TK	5.0	B		20	12	4			MIC	
2004 05 10.85	!	S	3.7	TK	15	L	5	30	10	4/			FIN	
2004 05 10.86					5.0	B		10	9.0	4	1.6	112	HAS02	
2004 05 10.86		S	3.0:	TT	4.0	B		8	&15	6			SCH04	
2004 05 10.86	a	I	3.2	TK	0.8	E		1					HAS02	
2004 05 10.88		M	3.0	YG	5.0	B		7	10	5	0.8	125	AMO01	
2004 05 10.88		S	2.8	YG	0.0	E		1		7			AMO01	
2004 05 11.18		M	3.0	TJ	5.0	B		10	17.5	8	3		MOR	
2004 05 11.18		S	3.0	TJ	0.7	E		1		8	3		MOR	
2004 05 11.25		S	2.9	TK	5.0	B		10	16	6	210	m 110	LIN04	
2004 05 11.37		B	3.3	HK	5.0	B		10	14	D7	40	m 135	COR01	
2004 05 11.38		B	3.2	HK	6.0	B		12	15	D7	50	m 135	RIB	
2004 05 11.38		S	2.9	AA	0.0	E		1			10		110	SEA
2004 05 11.46	x	S	4.2:	HV	5.0	B		7	15	6	1	120	MIY01	
2004 05 11.47		B	3.4	AA	5.0	B		7	30	6			SOW	
2004 05 11.47	xs	M	3.5	TK	3.5	B		7	20	6	0.9	110	YOS02	
2004 05 11.47	s	S	3.4	YG	5.0	R		10	13	6/			YOS04	
2004 05 11.47	x	M	3.4	HV	3.5	B		7	18	6	2.3	115	MIT	
2004 05 11.47	x	M	3.4	TJ	3.5	B		7	&20	7/	1.5	110	NAG08	
2004 05 11.50	s	S	3.6	TJ	3.0	B		6	15	6			END	
2004 05 11.50	x	B	3.5	HV	5.0	B		10	19	6/	3.5	120	NAG04	
2004 05 11.72		M	4.2:	TK	4.0	B		8		6	0.7	130	VAN15	
2004 05 11.81		M	3.2	S	5.0	B		12	17	6/	1.4	122	PEN02	
2004 05 11.83		M	2.9	TT	5.0	B		7	35	3/	1.5	105	ZNO	
2004 05 11.83		M	3.2	TT	0.8	E		1	25	7			LEH	
2004 05 11.83		M	3.4	TT	3.0	B		8	30	6			MAN02	
2004 05 11.83		S	2.3	TI	0.0	E		1	55	s8	4	110	SCA02	
2004 05 11.84		M	3.2	TJ	5.0	B		7	20	7			ADA05	
2004 05 11.84		M	3.2	TI	3.0	B		30	29	7	3.5	95	HOR03	
2004 05 11.84		M	3.4	TT	5.0	B		10	20	6	2.5	100	LEH	
2004 05 11.85					5.0	B		10	19	4	2.2	111	HAS02	
2004 05 11.85		S	3.1	TK	3.0	B		8					HOE	
2004 05 11.85	a	I	3.4	TK	0.8	E		1					HAS02	
2004 05 11.85	w	S	3.2	TT	0.8	E		1	30	4			HOR02	
2004 05 11.86		M	3.7	HD	3.0	B		8	11	7			SHU	
2004 05 11.86	w	M	3.5	TT	5.0	B		10	24	5	2.2	110	HOR02	
2004 05 11.88	s	B	3.9	TI	5.0	B		7	20	6	2	110	SER02	
2004 05 11.89		M	3.1	YG	5.0	B		7	12	5	1.5	120	AMO01	
2004 05 11.89		S	3.0	YG	0.0	E		1		5			AMO01	
2004 05 11.90		B	2.9	TK	5.0	B		7	25	6	2.5	115	GON05	
2004 05 11.90		S	3.1	YG	0.0	E		1					DES01	
2004 05 11.90		S	3.2	YG	8.0	B		11	20	5	>2.88	120	DES01	
2004 05 11.91		I	2.8	TK	0.0	E		1	30	6	1.5	115	GON05	
2004 05 11.93			2.8	YG	0.0	E		1	25	7			SOU01	
2004 05 11.93		S	3.0	YG	3.0	B		8	20	6	1	115	SOU01	
2004 05 12.19		M	3.4	TJ	5.0	B		10	17	7	3		MOR	
2004 05 12.19		S	3.4	TJ	0.7	E		1		8	3		MOR	
2004 05 12.38		S	3.0	AA	0.0	E		1			8	110	SEA	
2004 05 12.41	&	B	3.3	HK	5.0	B		10	13	D7	35	m 125	COR01	
2004 05 12.42	&	B	3.3	HK	6.0	B		12	14	D7	45	m 130	RIB	
2004 05 12.48	x	B	3.4	TT	4.0	B		8		6			PEA	
2004 05 12.70		M	3.0	AA	5.0	B		10	17	6	1.8	115	PRI04	
2004 05 12.70		S	3.6	AA	5.0	B		10	16	5/	2.4	120	COO02	
2004 05 12.71		M	3.3	AA	5.0	B		7	16	7	4.5	136	BEG01	
2004 05 12.76		M	4.2	HI	4.0	B		8		6/			VAN15	
2004 05 12.79		S	3.6	TJ	5.0	B		7	15	6			GIA01	
2004 05 12.82		B	3.5	TJ	5.0	B		7	11	6	1	100	CHE03	

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 12.83		M	3.1	TT	5.0	B		7	30	4/	1.5	100	ZNO
2004 05 12.83	w	S	3.2	TT	0.8	E		1	30	4			HORO2
2004 05 12.84		M	3.1	TK	0.0	E		1	25	7	0.5	110	GUZ
2004 05 12.84	w	M	3.5	TT	5.0	B		10	25	5	1.8	110	HORO2
2004 05 12.85		B	3.7	TJ	12.0	R	5	27	12	7	1	100	SIE
2004 05 12.85		M	3.2	TK	5.0	B		10	20	6	4.5	105	GUZ
2004 05 12.86	s	B	4.0	TI	5.0	B		7	15	6	1	110	SERO2
2004 05 12.87		B	3.4	TJ	0.0	E		1		7	0.5		CHEO3
2004 05 12.89	s	B	3.6	TI	0.0	E		1	20	6			SERO2
2004 05 12.90		S	3.0	YG	0.0	E		1					DES01
2004 05 12.90		S	3.1	YG	8.0	B		11	20	5	>2.88	120	DES01
2004 05 12.92		M	3.7:	TK	5.0	B		7	15	6			SKI
2004 05 12.93		M	3.5	TK	5.0	B		7	17	6			GRA04
2004 05 13.18		M	3.3	TJ	5.0	B		10	17	7	7.25	113	MOR
2004 05 13.18		S	3.3	TJ	0.7	E		1		8	6.25	113	MOR
2004 05 13.38		S	3.1	AA	0.0	E		1			6	110	SEA
2004 05 13.39		B	3.7	HK	5.0	B		10	15	D7	40 m	120	COR01
2004 05 13.40		B	3.8	HK	6.0	B		12	15	D7	40 m	140	RIB
2004 05 13.48	x	B	3.4	TT	4.0	B		8	13	6	1.7	112	PEA
2004 05 13.48	x	B	3.4	TT	0.0	E		1		8			PEA
2004 05 13.70		M	3.0	AA	5.0	B		10	16	7	1.5	115	PRI04
2004 05 13.72		M	3.7	AA	5.0	B		7	13	8	2.5	121	BEG01
2004 05 13.76		M	2.9	HD	6	R		10	11	7	30 m		KOZ02
2004 05 13.81		M	3.4	S	5.0	B		7	10	7			VAN17
2004 05 13.83		B	3.6	TJ	5.0	B		7	12	6	0.5	98	CHEO3
2004 05 13.83		S	3.3	AC	3.5	B		7	22	6/	2.5	105	RES
2004 05 13.84		M	3.2	S	5.0	B		12		7	2.6	111	PEN02
2004 05 13.85		B	3.9	TJ	12.0	R	5	27	12	7	0.5	97	SIE
2004 05 13.88		S	3.0	YG	3.0	B		8					SOU01
2004 05 13.88		S	4.0:	TK	5.0	B		7	10	6			JOH01
2004 05 13.90		B	3.4	GA	8.0	B		12	&10	5	&40 m	120	MOR09
2004 05 13.90		S	3.1	YG	8.0	B		11	22	5	>2.88	120	DES01
2004 05 13.90		S	3.2	YG	0.0	E		1					DES01
2004 05 14.03		M	3.2	YG	5.0	B		7	10	4			AMO01
2004 05 14.08		S	2.8	TT	0.0	E		1	25	7			RIE
2004 05 14.38		S	3.4	AA	0.0	E		1			8	115	SEA
2004 05 14.46	x	I	4.0	HV	0.0	E		1	40	5			MIY01
2004 05 14.46	x	S	4.0	HV	5.0	B		7	15	6	0.9	115	MIY01
2004 05 14.47		S	3.6	TJ	3.2	B		6	15	6	2.5		MOM
2004 05 14.47	s	I	3.4	TJ	0.0	E		1		7			END
2004 05 14.48	x	M	3.7	TJ	3.5	B		7	&15	7	&2	100	NAG08
2004 05 14.49	xa	M	3.5	HV	3.5	B		7	18	6/	2.5	110	MIT
2004 05 14.49	x	M	3.8	TK	3.5	B		7	13	7	1.2	105	YOS02
2004 05 14.50		B	3.9	AA	5.0	B		7	30	7	3	100	SOW
2004 05 14.50	s	S	3.5	TJ	3.0	B		6	17	6	1.3	110	END
2004 05 14.52	x	B	3.8	TT	4.0	B		8	12	7	1.7	108	PEA
2004 05 14.52	x	B	3.8	TT	0.0	E		1		8			PEA
2004 05 14.66		M	3.4	HD	15	L	8	48	16	6			GRI01
2004 05 14.70		M	3.0	AA	5.0	B		10	20	7	2	110	PRI04
2004 05 14.72		M	3.7	AA	5.0	B		7	13	8	2.5	116	BEG01
2004 05 14.73		M	4.3	HI	4.0	B		8	13		0.6	120	VAN15
2004 05 14.83		S	3.5	AC	3.5	B		7	23	7	3.2	105	RES
2004 05 14.84		I	3.5:	S	0.0	E		1					TIC
2004 05 14.84		M	3.2:	TT	3.0	B		8	19	6	0.7	100	MANO2
2004 05 14.85		M	3.3	TK	0.0	E		1	20	7	2	105	GUZ
2004 05 14.85		M	3.6	TT	5.0	B		7	25	4/	2.0	105	ZNO
2004 05 14.85		M	3.8	TT	0.8	E		1	30	7			LEH
2004 05 14.86		B	3.3	TI	8.0	B		11	20	7	200 m	118	LAB02
2004 05 14.86		M	3.4	TK	5.0	B		10	15	7	4	105	GUZ
2004 05 14.86		M	3.5	TK	5.0	B		10	&11	5	0.5		MEY
2004 05 14.86		M	4.0	TT	5.0	B		10	20	6/	4	100	LEH
2004 05 14.86	w	S	3.4	TT	0.8	E		1	27	4			HORO2
2004 05 14.87	s	B	4.3	TI	5.0	B		7	15	6	1	110	SERO2

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 14.87	w	M	3.6	TT	5.0	B		10	22	5/	3.5	105	HOR02
2004 05 14.89		M	3.9	TI	25	L	5	25	28	7	3.3	93	HOR03
2004 05 14.89		S	3.2	YG	0.0	E		1					DES01
2004 05 14.89		S	3.3	YG	8.0	B		11	22	5	>2.88	120	DES01
2004 05 14.89		S	3.5	TT	4.0	B		8	&10	7	&0.5	100	SCH04
2004 05 14.89		S	4.0	TK	5.0	B		7	8	6			JOH01
2004 05 14.90		B	3.3	TK	5.0	B		7	17	6	5.0	115	GON05
2004 05 14.90		S	3.4	YG	3.0	B		8	15	6	1	110	SOU01
2004 05 14.90		S	3.5	YG	0.0	E		1	15	7			SOU01
2004 05 14.90		S	3.7	AA	5.0	B		20	10	7	1	90	DIE02
2004 05 14.91		I	3.1	TK	0.0	E		1	25	6	2.5	115	GON05
2004 05 14.92		M	3.4	TI	5.0	B		7	21	7	2.9	94	HOR03
2004 05 14.96		M	3.7	TI	5.2	B		7	18	6	0.5	105	MAN04
2004 05 14.97		M	3.6	TI	0.0	E		1	20	6			MAN04
2004 05 14.98		M	3.8:	HV	5.0	B		7	6	7/	1.0	125	BAL07
2004 05 15.06		S	2.9	TT	0.0	E		1	25	7			RIE
2004 05 15.38		B	4.8	HK	5.0	B		10	10	D7	30 m	110	COR01
2004 05 15.39		B	4.9	HK	6.0	B		12	12	D7	30 m	120	RIB
2004 05 15.69		M	3.3	AA	5.0	B		10	18	7	1.5	114	PRI04
2004 05 15.72		M	4.0	AA	5.0	B		7	12	8	1.5	122	BEG01
2004 05 15.72		M	4.3	HI	4.0	B		8		4	1	110	VAN15
2004 05 15.83		S	3.1	TI	0.0	E		1	25	s7	2	110	SCA02
2004 05 15.83		S	3.4	TK	3.4	B	4	5	&20	6	&3	100	BUS01
2004 05 15.84		S	3.6	AC	3.5	B		7	20	7	1.5	100	RES
2004 05 15.84		S	4.7	TT	5.0	B		10	46	3	1.5	90	ZAN01
2004 05 15.85		B	3.5	SC	5.0	B		7					MAC06
2004 05 15.85		B	4.5:	SC	5.0	B		10	&15	4			KAN05
2004 05 15.86		M	3.7	TK	5.0	B		10	&10	5/	0.5		MEY
2004 05 15.86	!	S	4.0	TK	7.0	B		11	14	3/			MIC
2004 05 15.87		S	3.5	TJ	5.0	B		7	20	6	1.5	118	GIA01
2004 05 15.87		S	3.7	AA	5.0	B		20	14	7	1.5	90	DIE02
2004 05 15.88		S	3.9	TK	5.0	B		10	16	7	1.4	110	GIL01
2004 05 15.89		M	4.2	TK	5.0	B		10	>10	7	&1.5		COM
2004 05 15.89		S	4.2	TK	5.0	B		7	6	7			JOH01
2004 05 15.90		M	3.8	TK	5.0	B		7	13	8	5.8	118	DIJ
2004 05 15.90		M	3.8	TK	5.0	B		7	17	6	2.1	107	BOU
2004 05 15.90		M	3.9	YG	5.0	B		7	10	5	2.2	115	AMO01
2004 05 15.90		S	3.7	YG	0.0	E		1		5			AMO01
2004 05 15.90		S	4.2	TT	0.0	E		1	&15	7			SCH04
2004 05 15.94		B	4.4	TI	5.0	B		10	11		0.4		ADD
2004 05 15.94		M	3.8	TK	5.0	B		7	16	6/	1.0	105	GRA04
2004 05 15.94		N	8.9	TK	15.2	L	5	44	11	6/	0.8		GRA04
2004 05 15.94	&	B	4.2	GA	5.0	B		7	& 7	4	&1	105	MOR09
2004 05 15.95		B	3.1	TI	8.0	B		11	20	7	240 m	117	LAB02
2004 05 15.95		M	3.8	HV	5.0	B		7	10	7/	1.3	110	BAL07
2004 05 16.35		B	3.7	AA	0.0	E		1			4	108	SEA
2004 05 16.68		M	3.9	HD	15	L	8	48	13	5/			GRI01
2004 05 16.69		M	3.5	AA	5.0	B		10	18	7	1.8	110	PRI04
2004 05 16.71		M	4.2	AA	5.0	B		7	12	8	2.6	116	BEG01
2004 05 16.84		M	3.4	TI	10	B		25	17	6/	2.6	96	HOR03
2004 05 16.85		B	4.5:	SC	5.0	B		10	&15	4			KAN05
2004 05 16.86					5.0	B		10	13.8	6	4.1	119	HAS02
2004 05 16.86		I	3.4:	S	0.0	E		1					TIC
2004 05 16.86		I	3.5	TK	0.8	E		1					HAS02
2004 05 16.86		M	3.6	TK	0.0	E		1	15	7	3	120	GUZ
2004 05 16.87		M	3.8	TK	5.0	B		10	12	7	7.5	112	GUZ
2004 05 16.88		B	4.2	TJ	5.0	B		7	10	6	0.5		CHE03
2004 05 16.88		B	4.3	TJ	12.0	R	5	27	10	7	1	95	SIE
2004 05 16.88		B	4.4	HV	6.3	B		9	14	7	2.2	105	KAM01
2004 05 16.88		M	4.1	TT	0.8	E		1	30	7			LEH
2004 05 16.88		S	4.0	TK	5.0	B		10	16	8	1.3	105	GIL01
2004 05 16.89		M	3.7	TK	5.0	B		10	11	5/	1.5		MEY
2004 05 16.89		M	3.7	YG	5.0	B		7	10	5	1.5	110	AMO01

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 16.89		M	4.3	TT	5.0	B		10	20	6	4	100	LEH
2004 05 16.89		S	3.5	TK	3.4	B	4	5	&20	6	&3	100	BUS01
2004 05 16.89		S	3.6	AA	5.0	B		20	14	6	1.5	110	DIE02
2004 05 16.89		S	3.6	TK	0.6	E		1		5			MEY
2004 05 16.90		B	4.2	GA	5.0	B		7	& 7	4	&2.4	102	MOR09
2004 05 16.90		M	3.7	TJ	3.0	B		8	15	8			ADA05
2004 05 16.90		S	4.0	TK	5.0	B		10	7	6	1.0	100	BR004
2004 05 16.91		B	3.5	TK	5.0	B		7	15	7	5.0	115	GON05
2004 05 16.91		M	3.9	TK	5.0	B		7	14	6/	3.5	106	BOU
2004 05 16.91		M	3.9	TK	5.0	B		10	&15	7	>2.0		COM
2004 05 16.91		S	4.5	TT	5.0	B		10	45	3	2	90	ZAN01
2004 05 16.92		I	3.3	TK	0.0	E		1	20	6	2.0	115	GON05
2004 05 16.92		M	3.9	TK	5.0	B		7	21	8	5	105	DIJ
2004 05 16.93		S	3.8	YG	5.0	B		7	15	4	1	110	SOU01
2004 05 17.25		S	3.7	TK	5.0	B		10	10	5	105 m	90	LIN04
2004 05 17.38		B	4.7	HK	5.0	B		10	8	D7	30 m	110	COR01
2004 05 17.39		B	4.7	HK	6.0	B		12	10	D7	35 m	105	RIB
2004 05 17.48		S	4.2	AA	4.0	B		8	12	5	&1	120	MOM
2004 05 17.48	x	M	4.1	TJ	3.5	B		7	18	7	&2	105	NAG08
2004 05 17.53	s	S	4.2	TJ	3.0	B		6	17	6	&2	110	END
2004 05 17.69		M	3.5	AA	5.0	B		10	18	7	1.8	110	PRI04
2004 05 17.72		M	4.4	AA	5.0	B		7	10	7	1.9	116	BEG01
2004 05 17.75		M	4.4:	HI	4.0	B		8					VAN15
2004 05 17.83		M	3.8	TI	5.0	B		7	16	7	1.9	98	HOR03
2004 05 17.83		M	4.6	HD	3	O		8	12	7	0.10	81	SER
2004 05 17.83		S	3.9	AC	6.0	B		7	19	6	1.8	100	RES
2004 05 17.84		M	3.9	TT	5.0	B		7	22	4/	2.5	100	ZNO
2004 05 17.84		O	3.9	TT	0.8	E		1	15	4			ZNO
2004 05 17.85					5.0	B		10	9.2	5	3.8	102	HAS02
2004 05 17.85		B	4.0	TK	3.2	B		8					HAS02
2004 05 17.85		B	4.3	SC	5.0	B		7					MAC06
2004 05 17.85		I	4.0	TK	0.8	E		1					HAS02
2004 05 17.85		M	4.0	HD	3	R		6	15	8	45 m		SHU
2004 05 17.85		S	4.2	TK	5.0	B		20	6	4			MIC
2004 05 17.86		B	4.2	TK	3.0	B		8		4			HOE
2004 05 17.87		B	4.6	TJ	12.0	R	5	27	10	6	0.5	95	SIE
2004 05 17.87	w	S	3.8	TT	0.8	E		1	25	4			HOR02
2004 05 17.88		M	3.7	HD	11	B		20	10	s6	2	95	NEV
2004 05 17.88		M	3.9	TK	5.0	B		10	15	D7	1		MEY
2004 05 17.88		S	3.7	TK	0.6	E		1		7			MEY
2004 05 17.88	w	M	4.1	TT	5.0	B		10	22	6	2.5	100	HOR02
2004 05 17.89		B	4.2	TJ	5.0	B		7	12	6	0.5		CHE03
2004 05 17.89		B	4.6	HV	6.3	B		9	10	7	1.6	105	KAM01
2004 05 17.89		S	3.7	TK	3.4	B	4	5	&15	6/	&2	100	BUS01
2004 05 17.89		S	3.9	YG	3.0	B		8	15	5	1	110	SOU01
2004 05 17.89		S	4.0	AA	5.0	B		20	14	7	1	112	DIE02
2004 05 17.89		S	4.0	TT	4.0	B		8	&18	6	&0.5	100	SCH04
2004 05 17.89		S	4.2	TK	5.0	B		10	12	8	1.3	108	GIL01
2004 05 17.91		M	3.8	TJ	3.0	B		8	12	7			ADA05
2004 05 17.91		M	4.0	TK	5.0	B		7	14	6/	2.5	109	BOU
2004 05 17.91		M	4.0	TK	6.0	B		15	15	8	4	108	DIJ
2004 05 17.91		S	4.0	TK	5.0	B		10	7	6	1.0	105	BR004
2004 05 17.91		S	4.3	TT	5.0	B		10	19	3	0.8	114	ZAN01
2004 05 17.92		B	4.2:	SC	5.0	B		10	&11	4			KAN05
2004 05 17.92		M	4.4	TK	5.0	B		10	&15	7	2		COM
2004 05 18.47	x	M	4.1	TK	3.5	B		7	13	7	1.6	105	YOS02
2004 05 18.49		B	4.0	AA	5.0	B		7	20	6			SOW
2004 05 18.49	s	S	4.1	TJ	5.0	B		7	17	7/	&1.0	105	END
2004 05 18.50	x	M	4.1	TJ	3.5	B		7	18	7	1.5	100	NAG08
2004 05 18.70		S	4.6	AA	5.0	B		10	5	6/	0.9	120	COO02
2004 05 18.72		M	4.2	AA	5.0	B		7	6	7	1.3	123	BEG01
2004 05 18.76		M	3.5	HD	6	R		10	10	6			KOZ02
2004 05 18.82		S	3.9	TI	5.0	B		7	20	s7	5	100	SCA02

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 18.86		B	4.1	TK	5.0	B		10					HAS02
2004 05 18.86		B	4.6	SC	5.0	B		7					MAC06
2004 05 18.86		S	4.3	TJ	5.0	B		7	10	6			GIA01
2004 05 18.86	w	S	3.9	TT	0.8	E		1	25	4			HOR02
2004 05 18.87		S	4.2	AA	5.0	B		20	12	7	1	112	DIE02
2004 05 18.87	w	M	4.1	TT	5.0	B		10	20	5/	2.2	95	HOR02
2004 05 18.89		M	3.9	TJ	5.0	B		7	12	7	0.5	120	ADA05
2004 05 18.89		S	3.7:	TK	3.4	B	4	5	&18	6/	&3	100	BUS01
2004 05 18.90		M	4.3	YG	5.0	B		7	7	5	0.75	110	AMO01
2004 05 18.90		S	4.3	TT	4.0	B		8	&15	6/	&0.5	100	SCH04
2004 05 18.90		S	4.3	TT	5.0	B		10	19	3	0.8	114	ZAN01
2004 05 18.90		S	4.3	TK	5.0	B		10	12	7	1.5	109	GIL01
2004 05 18.93		M	4.1	TK	5.0	B		7	14	7	3.6	114	DIJ
2004 05 18.93		M	4.3	TI	5.0	B		7	16	6	1.7	96	HOR03
2004 05 18.93		S	4.2	TK	5.0	B		10			0.7	100	BR004
2004 05 18.94		M	4.0	TK	5.0	B		7	13	7	3.5	105	BOU
2004 05 18.94		M	4.3	TI	25	L	5	25	25	7	2.3	96	HOR03
2004 05 18.97		M	4.4	TK	5.0	B		7	12	6			GRA04
2004 05 19.35		S	4.1	AA	0.0	E		1					SEA
2004 05 19.42		B	4.8	HK	5.0	B		10	6	D7	15 m	90	CCR01
2004 05 19.44		B	5.0	HK	6.0	B		12	10	D7	20 m	95	RIB
2004 05 19.68		M	4.5	HI	4.0	B		8					VAN15
2004 05 19.82		S	3.7	TI	0.0	E		1	25	s7	3	100	SCA02
2004 05 19.82		S	3.9	TI	5.0	B		7	20	s7	5	100	SCA02
2004 05 19.85		M	4.4	TT	0.8	E		1	20	8			LEH
2004 05 19.86		M	4.2	TT	3.0	B		8	15	6/	1.3	95	HOR03
2004 05 19.86		M	4.3	TT	5.0	B		7	20	5	2.0	100	ZNO
2004 05 19.86		M	4.5	TT	5.0	B		10	15	6	1	100	LEH
2004 05 19.87		B	4.2	TK	3.2	B		8					HAS02
2004 05 19.87		O	4.2	TT	0.8	E		1	15	5			ZNO
2004 05 19.87	w	S	4.3	TT	0.8	E		1	25	3/			HOR02
2004 05 19.88	w	S	4.9	TI	5.0	B		7	10	7	1	100	SER02
2004 05 19.88	w	M	4.5	TT	5.0	B		10	22	5	4.5	95	HOR02
2004 05 19.89		S	4.3	AA	5.0	B		20	10	7	1	110	DIE02
2004 05 19.89	s	B	4.7	TI	0.0	E		1	10	7			SER02
2004 05 19.90		M	4.0	TJ	10	B		25	15	7	1.1	120	ADA05
2004 05 19.90		M	4.7	TT	5.0	B		7	10	5	0.6	81	JAN03
2004 05 19.90		S	4.3	TK	5.0	B		10			0.7	100	BR004
2004 05 19.91		B	4.1	TK	5.0	B		7	12	7	2.5	115	GON05
2004 05 19.92		I	3.9	TK	0.0	E		1	15	6	1.0	115	GON05
2004 05 19.97		B	4.6	HV	6.3	B		9	13	7	1.6	100	KAM01
2004 05 19.97		M	4.6	TK	5.0	B		7	11	6			GRA04
2004 05 19.98		M	4.2	TK	5.0	B		7	14	6/	2.8	118	BOU
2004 05 20.08		S	3.8	TT	0.0	E		1	20	6			RIE
2004 05 20.35		S	4.2	AA	0.0	E		1					SEA
2004 05 20.47	x	M	4.3	TT	0.0	E		1					TSU02
2004 05 20.72		M	5.0	AA	5.0	B		7	13	7	1.6	117	BEG01
2004 05 20.82		S	4.0	TI	5.0	B		7	15	s7	3	100	SCA02
2004 05 20.84		B	5.0	SC	5.0	B		7					MAC06
2004 05 20.85		M	4.0	TK	0.0	E		1	15	7	2	110	GUZ
2004 05 20.86		M	4.2	TK	5.0	B		10	12	7	3	110	GUZ
2004 05 20.86		M	4.6	TT	5.0	B		10	15	6	1	95	LEH
2004 05 20.87		B	3.9	TI	8.0	B		11	12	7	200 m	63	LAB02
2004 05 20.87		M	4.3	HD	3.0	B		8	12	7	40 m	105	NEK
2004 05 20.87	w	S	4.4	TT	0.8	E		1	25	3/			HOR02
2004 05 20.88		B	5.0	TJ	12.0	R	5	27	10	6	0.5	90	SIE
2004 05 20.88		S	4.5	AA	5.0	B		20	10	7	1	115	DIE02
2004 05 20.88	w	M	4.6	TT	5.0	B		10	19	5	2.7	95	HOR02
2004 05 20.89		M	4.2	TJ	3.0	B		8	12	7			ADA05
2004 05 20.90		M	4.2	HD	3	R		6	10	6	45 m	99	SHU
2004 05 20.90		M	4.8	TT	5.0	B		7	12	5	0.6	84	JAN03
2004 05 21.07		S	3.9	TT	0.0	E		1	20	6			RIE
2004 05 21.35		B	4.6	AA	5.0	B		10					SEA

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 21.45	x	M	4.5	TT	0.0	E		1					TSU02
2004 05 21.49		M	4.8	TJ	12.5	B		20	12	7	0.4	100	YDS04
2004 05 21.49	x	M	4.4	HV	3.5	B		7	12	7	2.0	100	MIT
2004 05 21.53	s	S	4.8	TJ	5.0	B		7	15	7	0.7	110	END
2004 05 21.83		S	4.0	TI	5.0	B		7	18	s7	4	100	SCAO2
2004 05 21.87		M	4.2	HD	5	R	6	20	8	6			SHU
2004 05 21.90		S	4.3	AC	3	R	6	7	20	5	0.5	105	RES
2004 05 21.90		S	4.5	TK	5.0	B		10					BRO04
2004 05 21.90		S	4.5	TK	5.0	B		7	6	8			JOH01
2004 05 21.91		M	4.4	TK	5.0	B		10	>12	6/	2		COM
2004 05 21.92		S	4.5	TT	4.0	B		8	&17	6/	&0.3	105	SCH04
2004 05 21.92		S	4.5	TT	5.0	B		10	19	3	0.7	100	ZAN01
2004 05 22.06		S	4.1	TT	0.0	E		1	18	6			RIE
2004 05 22.41		B	5.3	HK	6.0	B		12	7	D7			COR01
2004 05 22.42		B	5.2	HK	6.0	B		12	9	D7			RIB
2004 05 22.47		S	4.7	TJ	5.0	B		7	15	6/	1.0	110	END
2004 05 22.59	x	B	4.9	HV	5.0	B		10	9	7	1.7	120	NAG04
2004 05 22.70		S	4.7	AA	5.0	B		10	7	6/	1.2	107	CDD02
2004 05 22.76		M	4.5	HD	6	R		30	8	5	30 m		KOZO2
2004 05 22.82		S	4.1	TI	5.0	B		7	15	s7	2.5	100	SCAO2
2004 05 22.85		M	4.7	TT	0.8	E		1	15	7			LEH
2004 05 22.86		M	4.4	TT	5.0	B		7	15	5	0.8	92	JAN03
2004 05 22.86		M	4.5	HD	3	R		6	8	4/			SHU
2004 05 22.86		M	4.9	TT	5.0	B		10	10	6	1	95	LEH
2004 05 22.87		M	4.3	TK	0.0	E		10	12	7	2	110	GUZ
2004 05 22.87		M	4.3	TK	5.0	B		1	12	6	5	107	GUZ
2004 05 22.87		M	5.2	HD	3	O		8	8	7	0.57	100	SER
2004 05 22.88		M	4.7	TT	5.0	B		7	14	7	2.2	97	HOR03
2004 05 22.88	w	S	4.3	TT	0.8	E		1	23	4			HOR02
2004 05 22.89	w	M	4.5	TT	5.0	B		10	20	5/	3.5	100	HOR02
2004 05 22.90					5.0	B		10	10	4	0.4	105	HOE
2004 05 22.90		M	4.2	TJ	10	B		25	9	7	1.7	105	ADA05
2004 05 22.90		S	4.3	TK	3.4	B	4	5	&14	6			BUS01
2004 05 22.90		S	4.4	TK	5.0	B		10					BRO04
2004 05 22.90		S	4.5	TK	5.6	B		10	&12	6/	>2	100	BUS01
2004 05 22.90		S	4.6	AA	5.0	B		20	10	7	1	112	DIE02
2004 05 22.91		I	4.5	TK	0.6	E		1		6/			MEY
2004 05 22.91		M	4.6	TK	5.0	B		10	>10	6	&1.0		COM
2004 05 22.91		S	4.5	TT	5.0	B		10	19	3	0.7	100	ZAN01
2004 05 22.92		B	4.7	TJ	5.0	B		7	10	5	0.3		CHE03
2004 05 22.96		M	4.5	TK	5.0	B		7	10	5/			GRA04
2004 05 22.99		M	4.3	TK	5.0	B		7	16	6	2.5	107	DIJ
2004 05 22.99		N	10.3	TK	20.3	T	10	118		6/			GRA04
2004 05 23.01		M	4.5	TK	5.0	B		7	14	7	2.2	106	BOU
2004 05 23.26		S	4.5	TK	5.0	B		10	9	7	120 m	100	LIN04
2004 05 23.47		B	4.6	AA	5.0	B		7	30	7	1	100	SOW
2004 05 23.47	x	M	4.7	TJ	5.0	B		12	15	6	1	105	NAG08
2004 05 23.58	x	B	4.9	HV	5.0	B		10	11	7	2.1	110	NAG04
2004 05 23.85		M	4.6	TT	3.0	B		8	10	5	0.5	100	MAN02
2004 05 23.86					5.0	B		10	8.4	6	2.4	100	HAS02
2004 05 23.86		B	4.9	TK	3.2	B		8					HAS02
2004 05 23.86		I	4.9	TK	0.8	E		1					HAS02
2004 05 23.88	w	S	4.5	TT	0.8	E		1	20	3			HOR02
2004 05 23.89		M	4.5	TJ	3.0	B		8	10	6			ADA05
2004 05 23.89		S	4.7	AA	5.0	B		20	10	7	1	110	DIE02
2004 05 23.89		S	4.7	TT	4.0	B		8	&10	7			SCH04
2004 05 23.89	w	M	4.8	TT	8.0	B		10	18	4	3.1	100	HOR02
2004 05 23.90		B	4.8	HV	6.3	B		9	14	6/	1.6	100	KAM01
2004 05 23.90		B	4.9	TJ	5.0	B		7	10	5	0.3		CHE03
2004 05 23.91		M	4.5	TK	5.0	B		10	10	7	3.2	105	GUZ
2004 05 23.92		B	4.5	TK	5.0	B		7	12	7	1.5	115	GON05
2004 05 23.93		B	4.9	GA	5.0	B		7	& 7	2	&30 m	91	MOR09
2004 05 23.93		I	4.4	TK	0.0	E		1		7			GON05

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 23.93		S	4.5	TK	5.0	B		10					BRO04
2004 05 23.98		B	4.3	HI	7.0	R	5	12	20	6	2.0	110	PRO01
2004 05 24.08		S	4.5	TT	0.0	E		1	16	6			RIE
2004 05 24.47		B	4.7	AA	5.0	B		7	30	7	1	100	SOW
2004 05 24.48	x	M	4.8	TK	3.5	B		7	14	6/	0.9	110	YOSO2
2004 05 24.51	x	M	5.2	TJ	8.0	B		11	13	6	1	100	NAG08
2004 05 24.83		S	4.2	TI	5.0	B		20	12	s6	1	100	SCAO2
2004 05 24.85		B	5.0	TK	3.2	B		8					HASO2
2004 05 24.86		M	4.8	TK	5.0	B		20	5	4/			MIC
2004 05 24.86		M	5.1	HD	3	O		8	5.5	6	0.65	90	SER
2004 05 24.89		S	4.8	TK	5.0	B		10					BRO04
2004 05 24.89	w	S	4.6	TT	0.8	E		1	22	3			HORO2
2004 05 24.90	w	M	5.0	TT	5.0	B		10	18	5	2.5	100	HORO2
2004 05 24.91		S	4.7	AA	5.0	B		20	10	7	1	110	DIEO2
2004 05 24.92		S	4.5	TT	5.0	B		10	19	3	0.7	100	ZANO1
2004 05 24.93		M	4.7	TK	6.0	B		15	12	5/	1.6	105	DIJ
2004 05 25.47		S	5.4	TJ	5.0	B		7	10	6	0.5	110	END
2004 05 25.48	x	M	5.0	HV	3.5	B		7	10	6			MIT
2004 05 25.49		S	5.5	TJ	7.0	B		10	12	6	0.7	110	END
2004 05 25.49	x	M	5.3	TJ	3.5	B		7	13	6	1	100	NAG08
2004 05 25.50		B	5.0	AA	5.0	B		7	30	7	1	100	SOW
2004 05 25.83		S	4.4	TI	5.0	B		7	10	s6	1.5	100	SCAO2
2004 05 25.86					5.0	B		10	6.9	5	3.3	95	HASO2
2004 05 25.86		B	5.1	TK	3.2	B		8					HASO2
2004 05 25.88		M	4.8	HD	5	R	6	20	6	5/			SHU
2004 05 25.89		S	4.5	TT	5.0	B		10	19	3	0.7	100	ZANO1
2004 05 26.26		B	4.8	TK	5.0	B		10	7	7	60	m 110	LINO4
2004 05 26.42		B	5.6	HK	6.0	B		12	5	D6			COR01
2004 05 26.43		B	5.5	HK	6.0	B		12	6	D7			RIB
2004 05 26.83		S	4.5	TI	5.0	B		7	10	s6	2	105	SCAO2
2004 05 26.86		M	5.4	S	3	R	7	6	7.5	5			SHU
2004 05 26.87		M	5.3	HD	11	L	7	40	5	6	55	m 104	SHU
2004 05 26.87	w	M	5.4	TT	5.0	B		10	15	4/	1.7	100	HORO2
2004 05 26.88		S	4.6	AC	3.7	B		7	16	5/	0.5	105	RES
2004 05 26.88		S	5.0	YG	5.0	B		7	10	6	0.5	100	AM001
2004 05 26.89		S	4.7	AA	5.0	B		20	8	7			DIEO2
2004 05 26.90		S	5.4	TK	5.0	B		10					BRO04
2004 05 26.91		S	4.7	TT	5.0	B		10	15	3	0.5	100	ZANO1
2004 05 26.91		S	5.0	TT	4.0	B		8	&12	6/	&0.5	100	SCH04
2004 05 26.91		S	5.2	YG	5.0	B		7	10	5			SOU01
2004 05 26.92		M	4.9	TK	6.0	B		15	13	5/	2.2	103	DIJ
2004 05 26.96		M	4.9	TK	5.0	B		7	12	6/	1.5	105	BOU
2004 05 26.97		S	4.8	TK	5.0	B		7	9	5			GRA04
2004 05 26.98		S	3.0	YG	0.0	E		1					DES01
2004 05 26.98		S	3.1	YG	8.0	B		11	20	4/			DES01
2004 05 27.51		B	5.3	AA	5.0	B		7	20	6			SOW
2004 05 27.83		S	4.8	TI	5.0	B		7	11	s6	2	100	SCAO2
2004 05 27.85		M	5.1	TK	5.0	B		10	10	6	0.8	105	GUZ
2004 05 27.85		M	5.1	TT	5.0	B		7	15	7	1.2	91	HORO3
2004 05 27.86		M	5.0	TK	0.0	E		1	12	5			GUZ
2004 05 27.90		M	5.3	TT	5.0	B		7	15	5	0.65	110	JAN03
2004 05 27.90		M	5.6	S	3	R		6	8	5			SHU
2004 05 27.90		S	4.8	AC	3.7	B		7	15	5/	1.2	105	RES
2004 05 27.90		S	5.0	YG	5.0	B		7	10	6			AM001
2004 05 27.91		S	5.2	TK	5.0	B		10	12	7	1.3	105	GIL01
2004 05 27.92		S	5.1	TT	4.0	B		8	&12	7			SCH04
2004 05 27.92		S	5.5	TK	5.0	B		10					BRO04
2004 05 27.93		S	5.4	YG	8.0	B		11	10	2			SOU01
2004 05 27.94		S	4.7	TT	5.0	B		10	15	3	0.5	100	ZANO1
2004 05 27.98		S	5.3	AT	8.0	B		11	15	5/			DES01
2004 05 28.47		S	5.4	TJ	5.0	B		7	10	6	0.3	100	END
2004 05 28.47		S	5.4	TJ	7.0	B		10	12	6	0.5	100	END
2004 05 28.50		B	5.6	AA	5.0	B		7	15	6			SOW

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 28.82		S	4.8	TI	5.0	B		7	12	s6	2	100	SCA02
2004 05 28.86		M	5.3	TT	10	B		25	14	7	1.4	90	HOR03
2004 05 28.87		M	5.1	TT	0.8	E		1	15	8			LEH
2004 05 28.88		M	5.3	TT	10	B	4	25	10	7	1	100	LEH
2004 05 28.88		S	4.8	TK	3.5	B		7	16	5/	0.9	105	RES
2004 05 28.89		M	4.8	TJ	10	B		25	6	6			ADA05
2004 05 28.89		S	5.3	YG	5.0	B		7	5	4			AM001
2004 05 28.90		M	5.2	TT	5.0	B		7	12	5	0.65	101	JAN03
2004 05 28.90		S	5.1	AA	5.0	B		20	8	7			DIE02
2004 05 28.91		S	4.9	TT	5.0	B		10	18		0.5	97	ZAN01
2004 05 28.93		M	5.0	TK	6.0	B		15	13	5	1.5	103	DIJ
2004 05 28.97		M	5.3	TK	5.0	B		7	10	5/	1.4	103	BOU
2004 05 28.98		S	5.3	AT	8.0	B		11	15	6			DES01
2004 05 29.41		B	5.6	HK	6.0	B		12	7	D5			COR01
2004 05 29.42		B	5.6	HK	6.0	B		12	8	D6			RIB
2004 05 29.49		S	5.5	TJ	5.0	B		7	12	6	0.3	100	END
2004 05 29.50		S	5.6	TJ	7.0	B		10	13	6	0.5	100	END
2004 05 29.54	x	M	5.4	TJ	8.0	B		11	11	7			NAG08
2004 05 29.85		M	5.1	TT	5.0	B		7	16	5	1.8	90	ZNO
2004 05 29.85		M	5.3	TT	3.0	B		8	10	5			MAN02
2004 05 29.87		B	5.7	TK	5.0	B		10					HAS02
2004 05 29.87		M	5.1	TT	0.8	E		1	15	8			LEH
2004 05 29.87		M	5.6	HD	3	D		8	8	5	0.72	120	SER
2004 05 29.87	w	M	5.5	TT	8.0	B		10	15	4	1.2	90	HOR02
2004 05 29.88		M	5.3	TT	10	B	4	25	10	7	1	100	LEH
2004 05 29.89		M	5.8	TT	5.0	B		7	10	5	0.55	101	JAN03
2004 05 29.89		S	4.8	TK	3.5	B		7	15	5/	0.8	105	RES
2004 05 29.89		S	5.2	YG	5.0	B		7	8	4			AM001
2004 05 29.98		M	5.3	TJ	10	B		25	10	6	0.9	101	ADA05
2004 05 30.26		B	5.2	TK	5.0	B		10	8	6	45 m	100	LIN04
2004 05 30.48	x	M	5.7	HV	3.5	B		7	9	6			MIT
2004 05 30.84		M	5.3	TK	5.0	B		10	10	6			GUZ
2004 05 30.85		M	5.4	TT	3.0	B		8	10	5			MAN02
2004 05 30.88		M	5.6	S	3	R		6	7	6			SHU
2004 05 30.89		S	5.3	YG	8.0	B		20	5	5			AM001
2004 05 30.89	w	M	5.6	TT	8.0	B		10	13	4/	1.2	90	HOR02
2004 05 30.92		B	5.4	TK	5.0	B		7	10	6			GON05
2004 05 30.98		S	5.6	TK	7.0	R	7	24	5	4			GRA04
2004 05 30.99		S	5.6	TK	15.2	L	5	38	5	4/			GRA04
2004 05 31.87		M	5.2	TK	0.0	E		1	12	5			GUZ
2004 05 31.87		M	5.3	TK	5.0	B		1	10	6	1.2	100	GUZ
2004 05 31.88		M	5.4	S	3	R		6	9	5/			SHU
2004 05 31.89		E	3.0	HD	6.0	B		20	8	d3	60 m		ROM
2004 06 00.02		B	6.3	HI	7.0	R	5	14	8	5	0.8	100	PRO01
2004 06 01.38		B	6.0	HK	6.0	B		12	6	D5			COR01
2004 06 01.39		B	6.1	HK	6.0	B		12	6	D6			RIB
2004 06 01.48	x	M	5.5	TJ	8.0	B		11	11	7			NAG08
2004 06 01.85		M	5.4	TK	5.0	B		10	10	6	0.8	100	GUZ
2004 06 01.88		M	5.4	TJ	3	R		6	8	6			SHU
2004 06 02.87		B	5.4	TI	8.0	B		11	8	5			LAB02
2004 06 02.90		M	5.4	TJ	3	R		6	8	6			SHU
2004 06 02.93		B	5.6	TK	5.0	B		7	8	6			GON05
2004 06 03.47		B	5.7	AA	5.0	B		7	10	6			SOW
2004 06 03.47	x	S	6.3	HV	5.0	B		7	10	6	2	105	MIY01
2004 06 03.48	x	M	5.7	TJ	10.0	B		20	8	7/			NAG08
2004 06 03.49	x	M	6.0	HV	3.5	B		7	6	7			MIT
2004 06 03.87		B	5.3	TI	8.0	B		11	8	5	30 m	107	LAB02
2004 06 04.47		S	5.7	TJ	7.0	B		10	12	6	2.0	115	END
2004 06 04.48	x	M	5.8	TJ	3.5	B		7	12	7	0.8	110	NAG08
2004 06 04.48	x	S	6.4	HV	5.0	B		7	10	6	2.5	125	MIY01
2004 06 04.49		B	5.7	AA	5.0	B		7	10	6			SOW
2004 06 04.49	x	M	5.9	HV	8.0	B		11	10	6/	0.8	110	MIT
2004 06 05.48	x	S	6.4	HV	5.0	B		7	7	6	1.8	110	MIY01

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 05.49		S	5.6	TJ	7.0	B		10	11	6	3.0	115	END
2004 06 05.49	x	M	5.6	TJ	3.5	B		7	12	7/	2.5	100	NAG08
2004 06 05.51	x	M	5.7	TK	3.5	B		7	11	7	0.5	105	YOS02
2004 06 05.51	x	M	6.1	HV	8.0	B		11	7	6			MIT
2004 06 05.82		S	5.4	TI	5.0	B		7	12	s7	1	110	SCA02
2004 06 05.87		B	5.9	HD	3	O		8	8	5	0.22	80	SER
2004 06 05.89		B	5.8	TI	8.0	B		11	8	5	30 m		LAB02
2004 06 05.89		S	5.9	YG	5.0	B		7	5	3			SOU01
2004 06 05.91		M	5.9	TK	5.0	B		10	8	5			GUZ
2004 06 05.92		S	5.8	TT	5.0	B		10	24	3			ZAN01
2004 06 05.96		M	5.8	TK	5.0	B		7	9	6	1.5	102	BOU
2004 06 06.83		S	5.3	TI	5.0	B		7	12	s7	2.5	110	SCA02
2004 06 06.87		M	5.9	TK	5.0	B		7	8.5	5/	1.4	100	BOU
2004 06 06.87		M	6.3	TK	5.0	B		7	13	5/	1.2	98	DIJ
2004 06 06.87		S	6.4	TK	7.0	B		11	7	3			MIC
2004 06 06.88		S	6.0	YG	5.0	B		7	4	6			AM001
2004 06 06.90		B	5.7:	SC	5.0	B		10	&10	4			KAN05
2004 06 06.90		S	6.0	YG	8.0	B		11	5	4			SOU01
2004 06 06.91		B	6.5	HV	6.3	B		9	8	7	1.1	95	KAM01
2004 06 06.91		S	5.8	AA	5.0	B		20	7	5			DIE02
2004 06 06.94		S	6.0	TT	4.0	B		8	&12	6			SCH04
2004 06 07.40		B	6.7	HK	6.0	B		12	4	D5			COR01
2004 06 07.41		B	6.6	HK	6.0	B		12	5	D5			RIB
2004 06 07.48	x	S	6.9:	HV	5.0	B		7	10	6	>0.5	110	MIY01
2004 06 07.79		M	5.9	TK	5.0	B		7	10	6	1.7	103	BOU
2004 06 07.80		M	6.1	TK	5.0	B		7	13	5/	0.5	97	DIJ
2004 06 07.83		S	5.5	TI	5.0	B		7	10	s7	3	110	SCA02
2004 06 07.87		B	6.5	TK	5.0	B		10	4.0	4	0.45	95	HAS02
2004 06 07.88		M	5.8	TT	10	B	4	25	10	6	1	110	LEH
2004 06 07.88		M	6.0	TT	3.0	B		8	10	5	0.37	100	MAN02
2004 06 07.88		M	6.0:	TT	5.0	B		7	15	6	0.7	102	JAN03
2004 06 07.88		M	6.7	S	3	R		6	9	5/			SHU
2004 06 07.90		S	6.2	YG	8.0	B		11	5	3			SOU01
2004 06 07.92		M	5.9	TJ	10	B		25	4	5	0.25	100	ADA05
2004 06 07.92		S	5.8	AA	5.0	B		20	7	6			DIE02
2004 06 07.93		S	6.0	TT	0.8	E		1	10	8			HOR02
2004 06 07.94		M	6.2	TT	8.0	B		10	11	6	1.1	95	HOR02
2004 06 08.79		M	6.0	TK	5.0	B		7	9	6	1.6	106	BOU
2004 06 08.79		M	6.2	TK	5.0	B		7	15	6	1.2	103	DIJ
2004 06 08.86		B	6.2	HD	3	O		8	8	5	0.18	110	SER
2004 06 08.86		S	5.7	TI	5.0	B		7	8	s7	3	110	SCA02
2004 06 08.88		M	6.7	TJ	11	L	7	40	3	5	55 m	90	SHU
2004 06 08.89		B	6.6	TK	5.0	B		10	4.5	4	1.2	100	HAS02
2004 06 08.90		B	6.5	HV	6.3	B		9	9	6	0.4	90	KAM01
2004 06 08.95		B	5.9	TK	5.0	B		7	8	7	1.3	95	GON05
2004 06 09.80		M	6.1	TK	5.0	B		7	8	6/	1.5	104	BOU
2004 06 09.80		M	6.3	TK	5.0	B		7	10	5	1.0	96	DIJ
2004 06 09.82		S	5.7	TI	5.0	B		7	8	s7	2.5	110	SCA02
2004 06 09.89		S	6.4	YG	8.0	B		20	4	2			AM001
2004 06 10.80		M	6.1	TK	5.0	B		7	8	6/	1.2	99	BOU
2004 06 10.81		M	6.3	TK	5.0	B		7	10	5	1.3	96	DIJ
2004 06 10.83		S	6.0	TI	5.0	B		7	7	s7	1	110	SCA02
2004 06 11.80		M	6.2	TK	8.0	B		15	7	6/	0.9	94	BOU
2004 06 11.80		M	6.5	TK	8.0	B		15	8	5	0.5	97	DIJ
2004 06 11.85		S	6.0	TI	5.0	B		7	7	s7	1	110	SCA02
2004 06 11.87		B	6.9	TK	3.2	B		8	5.1	4			HAS02
2004 06 11.89		M	6.9	TJ	11	L	7	40	4	5			SHU
2004 06 11.89		S	6.1	TK	3.5	B		7	9	5/	0.1	90	RES
2004 06 11.89		S	6.5	YG	8.0	B		11	3	2			SOU01
2004 06 12.81		M	6.2	TK	8.0	B		15	5.5	6/	1.0	98	BOU
2004 06 12.81		M	6.4	TK	8.0	B		15	8	5/	0.5	96	DIJ
2004 06 12.87		B	6.6	HD	3	O		8	5	5			SER
2004 06 12.88		S	6.3	TK	3.5	B		7	9	5	0.5	85	RES

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 12.89		B	6.5	TK	8.0	B		20	3	6			AM001
2004 06 12.93		M	6.6	TJ	3.0	B		8	10	5			ADA05
2004 06 13.02		B	6.2	TK	5.0	B		7	8	7	0.8	105	GON05
2004 06 13.49	x	S	6.8	HV	5.0	B		7	8	5	1	90	MIY01
2004 06 13.50	x	M	6.5	TJ	3.5	B		7	10	7/	0.4	120	NAG08
2004 06 13.52	x	M	6.8	HV	8.0	B		11	8	6/	0.6		MIT
2004 06 13.55	x	B	6.6	HV	10.0	B		26	4.3	6/	11	m 105	NAG04
2004 06 13.79		M	6.3	TK	8.0	B		15	5	6	0.8	98	BOU
2004 06 13.80		M	6.6	TK	8.0	B		15	10	5	0.6	94	DIJ
2004 06 13.88		S	6.4	TK	3.5	B		7	7	5	0.8	80	RES
2004 06 13.89		M	6.4	TT	8.0	B		10	11	6	1.0	90	HOR02
2004 06 13.90		B	6.7	TK	8.0	B		20	3	6			AM001
2004 06 13.90		M	6.4	TK	5.0	B		10	7	6	1.3	110	GUZ
2004 06 13.91		S	6.4	AA	5.0	B		20	5	5			DIE02
2004 06 13.92		B	6.9	TJ	5.0	B		7	6	5			ADA05
2004 06 13.94		B	6.2	TK	5.0	B		7	8	7	0.9	105	GON05
2004 06 13.94		M	6.3	TT	3.0	B		8	11	6			MAN02
2004 06 13.94		S	6.3	TT	4.0	B		8	9	7	0.5	95	RIE
2004 06 13.94		S	6.8	TT	8.0	B		15	8	6/	&0.2	90	SCH04
2004 06 14.49	x	S	6.4	HV	5.0	B		7	9	5	0.7	90	MIY01
2004 06 14.50	x	M	6.6	TJ	5.0	B		12	8	7			NAG08
2004 06 14.52	x	M	6.3	TK	3.5	B		7	6	6			YOSO2
2004 06 14.53	x	M	6.6	TK	10.0	B		20	6	7	0.5	95	YOSO2
2004 06 14.54	s	S	6.5	TJ	7.0	B		10	8	6	0.5	100	END
2004 06 14.80		M	6.4	TK	8.0	B		15	5	6	0.9	98	BOU
2004 06 14.80		M	6.6	TK	8.0	B		15	8	5	0.7	93	DIJ
2004 06 14.87		M	6.6	TI	5.0	B		12	7	d7	0.3	85	SAR02
2004 06 14.87		S	6.3	TI	8.0	B		11	8	4			LAB02
2004 06 14.88		M	6.3	TT	3.0	B		8	7	5			MAN02
2004 06 14.88		S	7.0	TK	5.0	B		10	4.4	4			HAS02
2004 06 14.89		S	6.5	YG	8.0	B		20	4	3			AM001
2004 06 14.92		B	6.9	TJ	5.0	B		7	7	5			ADA05
2004 06 14.92		M	6.5	TT	8.0	B		10	11	5/	0.8	90	HOR02
2004 06 14.93		S	6.0	TT	5.0	B		10	12	1			ZAN01
2004 06 14.94		S	6.4	AA	5.0	B		20	5	5			DIE02
2004 06 15.48	x	S	6.7	HV	5.0	B		7	9	5	0.8	80	MIY01
2004 06 15.49	x	M	6.9	HV	8.0	B		11	8	6			MIT
2004 06 15.51	x	M	6.6	TJ	5.0	B		12	8	7/	0.5	90	NAG08
2004 06 15.53		S	6.8	TJ	40.0	L	4	36	7	7			YOSO4
2004 06 15.80		M	6.5	TK	8.0	B		15	8	5/	0.7	93	DIJ
2004 06 15.80		M	6.5	TK	8.0	B		15	5	6	0.9	100	BOU
2004 06 15.88		M	6.5	TT	8.0	B		10	10	6	0.8	90	HOR02
2004 06 15.88		S	6.7	YG	8.0	B		11	4	3			SOU01
2004 06 15.90		M	6.4	TK	5.0	B		10	7	6	1.1	105	GUZ
2004 06 15.90		S	6.5	YG	8.0	B		20	4	4			AM001
2004 06 15.96		B	6.4	TK	5.0	B		7	7	7	0.9	95	GON05
2004 06 15.97		B	6.6	TK	10.0	B		25	6	7	0.9	95	GON05
2004 06 16.42		B	6.8	HK	6.0	B		12	4	D5			COR01
2004 06 16.43		B	7.0	HK	6.0	B		12	4	D5			RIB
2004 06 16.48	x	S	6.7	HV	5.0	B		7	9	5	0.6	90	MIY01
2004 06 16.50	x	M	6.7	TJ	5.0	B		12	9	7/	0.7	85	NAG08
2004 06 16.80		M	6.6	TK	8.0	B		15	5	6	1.1	96	BOU
2004 06 16.80		M	6.7	TK	8.0	B		15	7	5	0.85	85	DIJ
2004 06 16.88		M	6.5	TT	8.0	B		10	11	6	0.7	90	HOR02
2004 06 16.89		S	6.3	TI	5.0	B		7	6	s5/			SCA02
2004 06 16.90		B	6.9:	SC	5.0	B		10	&10	4			KAN05
2004 06 16.96		M	7.0:	TT	5.0	B		7	15	5	0.50	76	JAN03
2004 06 16.97		M	6.8	TJ	5.0	B		7	8	5			ADA05
2004 06 17.80		M	6.7	TK	8.0	B		15	5.5	6	1.0	96	BOU
2004 06 17.80		M	6.7	TK	8.0	B		15	10	5	0.9	85	DIJ
2004 06 17.88		M	6.6	TT	8.0	B		10	10	6/	1.3	88	HOR02
2004 06 17.88		M	6.6	TJ	8.0	B		11	5	3			SOU01
2004 06 17.89		M	6.5	TT	3.0	B		8	15	5			MAN02

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 17.90		B	7.0:	SC	5.0	B		10	&10	4			KAN05
2004 06 17.91		M	6.5	TK	5.0	B		10	7	6	0.7	105	GUZ
2004 06 18.79		M	6.8	TK	8.0	B		15	5	6	0.7	96	BOU
2004 06 18.80		M	6.8	TK	8.0	B		15	7	5	0.8	86	DIJ
2004 06 18.83		M	6.7	HD	6	R	10	30	4	4			KOZ02
2004 06 19.80		M	6.8	TK	8.0	B		15	5	6	0.7	94	BOU
2004 06 19.81		M	6.7	TK	8.0	B		15	7.5	5/	1.0	80	DIJ
2004 06 19.87		S	6.5	TI	5.0	B		7	6	s5			SCA02
2004 06 19.93		S	6.4	TJ	5.0	B		20	5	6			DIE02
2004 06 20.49	x	M	6.8	TJ	8.0	B		11	8	7	0.7	85	NAG08
2004 06 20.49	x	M	7.2	HV	15.0	B		25	6	6	0.3	90	MIT
2004 06 20.73		M	6.1	HD	15	L	8	48	4.5	6		74	GRIO1
2004 06 20.89		S	6.9	TK	6.0	B		11	7	3			MIC
2004 06 20.98		S	6.3	TT	5.0	B		10	16	2			ZAN01
2004 06 21.26		S	6.7	TK	5.0	B		10	6	6			LIN04
2004 06 21.88		M	7.3	TI	6.0	B		20	8	d6	0.8	110	SAR02
2004 06 21.90		M	6.7	TK	5.0	B		10	6	5	0.6	100	GUZ
2004 06 21.92		B	6.7	TK	5.0	B		7	8	7	0.4	100	GON05
2004 06 21.94		M	6.5	TT	8.0	B		10	9	6/	0.8	85	HOR02
2004 06 22.85		B	7.0	TJ	5.0	B		7	8	6			ADA05
2004 06 22.88		M	6.8	TK	5.0	B		10	7	6	0.6	95	GUZ
2004 06 22.89		M	6.6	TT	8.0	B		10	7.5	7	0.5	80	HOR02
2004 06 22.91		M	7.0	TJ	11	L	7	40	4	5			SHU
2004 06 23.85		S	6.9	TI	5.0	B		7	6	s5			SCA02
2004 06 23.94		M	7.2	TJ	11	L	5	40	2	4/			SHU
2004 06 24.85		M	7.9	TJ	11	L	7	40	2	4/			SHU
2004 06 24.87		S	7.0	TI	5.0	B		7	5	s5			SCA02
2004 06 24.91		M	6.8	TT	8.0	B		10	8	6	0.5	80	HOR02
2004 06 25.85		S	7.0	TI	5.0	B		7	5	s5			SCA02
2004 06 25.90		M	6.9	TT	8.0	B		10	7	6	0.5	85	HOR02
2004 06 25.91		M	7.9	TJ	11	L	7	40	3	4			SHU
2004 06 25.93		M	6.5	TT	3.0	B		8	6.5	5			MAN02
2004 06 25.93		M	7.0	TT	6	R	10	30	3.5	5			MAN02
2004 06 25.95		S	7.2	TT	8.0	B		15	9	5/			SCH04
2004 06 26.87		S	7.0	TI	5.0	B		7	5	s5/			SCA02
2004 06 26.88		S	7.5:	TJ	8.0	B		11					SOU01
2004 06 26.91		M	6.8	TT	8.0	B		10	8	5/	0.4	85	HOR02
2004 06 26.91		M	7.3	TT	10	B	4	25	8	3			LEH
2004 06 26.98		S	6.8	TK	5	R	6	7	5	6			RES
2004 06 27.10		B	7.0	TK	5.0	B		7	8	7	0.2	100	GON05
2004 06 27.87		S	6.8	TI	8.0	B		11	6	4	15 m		LAB02
2004 06 27.91		M	6.9	TT	8.0	B		10	8	5/			HOR02
2004 06 27.92		S	6.6	TJ	15.0	R	8	75	4	6			DIE02
2004 06 28.85		M	7.6:	TJ	11	L	7	40	2	3/			SHU
2004 06 28.87		S	7.2	TI	5.0	B		7	4	s4/			SCA02
2004 06 28.91		M	7.2	TT	6	R	10	30	6.0	5			MAN02
2004 06 28.93		S	6.6	TJ	15.0	R	8	75	4	6			DIE02
2004 06 28.95		M	7.0	TT	8.0	B		10	7	5			HOR02
2004 06 28.97		S	7.2	TK	6.0	B		15	8	3/			DIJ
2004 06 29.93		M	7.1	TT	5.0	B		10	7	5			HOR02
2004 06 29.96		M	7.3	TK	8.0	B		15	5	4/			BOU
2004 06 30.11		B	7.0	TK	5.0	B		7	8	7			GON05
2004 06 30.12		B	7.0	TK	10.0	B		25	8	6	0.2	100	GON05
2004 06 30.88		M	8.5	TJ	11	L	7	40	2	4			SHU
2004 06 30.95		M	7.1	TT	5.0	B		10	8.5	4/			HOR02
2004 07 01.90		M	8.5	TJ	11	L	7	40	2	4/			SHU
2004 07 02.92		S	7.0	TJ	5.0	B		20	4	6			DIE02
2004 07 03.87		M	8.8	S	11	L	7	40	2	4/			SHU
2004 07 03.89		S	7.6	TK	3.0	B		11	7	2/			MIC
2004 07 03.91		S	7.2	TK	13	L	7	45	4	5			RES
2004 07 03.96		M	7.5	TK	8.0	B		15	4.5	4			BOU
2004 07 04.83		S	7.8	TI	5.0	B		7	4	s4			SCA02
2004 07 04.89		M	8.7	TJ	11	L	7	40	2	4			SHU

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 04.90		S	7.0	TI	8.0	B		11	5	3			LAB02
2004 07 04.91		B	8.1	TK	5.0	B		10	5.4	4			HAS02
2004 07 05.49	x	M	7.2	TK	10.0	B		20	6	6	12 m	70	YOS02
2004 07 05.83		S	7.6	TI	5.0	B		7	5	s4/			SCA02
2004 07 05.92		S	7.3	TJ	5.0	B		20	4	5			DIE02
2004 07 05.94		M	7.3	TT	5.0	B		10	7	5			HOR02
2004 07 05.95		S	7.6	TK	6.0	B		15	4	4			DIJ
2004 07 05.96		M	7.6	TK	8.0	B		15	5	4/			BOU
2004 07 06.50	x	M	7.5	TJ	8.0	B		11	8	6			NAG08
2004 07 06.87		M	7.4	TT	10	B	4	25	8	4			LEH
2004 07 06.92		M	7.4	TT	8.0	B		10	8	5			HOR02
2004 07 06.96		M	7.6	TK	8.0	B		15	4.5	4/			BOU
2004 07 06.96		S	7.6	TK	6.0	B		15	7	4			DIJ
2004 07 07.83		S	7.8	TI	5.0	B		7	4	s4			SCA02
2004 07 07.88		M	8.7	TJ	11	L	7	40	2	4/			SHU
2004 07 07.91		S	7.2	TJ	15.0	R	8	75	4	6			DIE02
2004 07 08.91		M	8.4	TJ	11	L	7	40	3	5			SHU
2004 07 09.83		S	8.0	TI	5.0	B		7	3	s3/			SCA02
2004 07 10.88		M	7.5	TT	10	B	4	25	8	4			LEH
2004 07 10.93		M	7.6	TT	8.0	B		10	6	6			HOR02
2004 07 10.93		S	7.3	TJ	5.0	B		20	4	6			DIE02
2004 07 11.48	x	M	7.5	TJ	8.0	B		11	7	5/			NAG08
2004 07 11.49	x	M	8.0	HV	15.0	B		25	5	5			MIT
2004 07 12.97		B	7.4	TK	5.0	B		7	7	7			GON05
2004 07 12.98		B	7.6	TK	10.0	B		25	6	6	0.2	90	GON05
2004 07 13.57	x	B	8.1	HV	30.4	L	5	47	3.7	6			NAG04
2004 07 13.92		S	7.3	TJ	5.0	B		20	4	6			DIE02
2004 07 14.49	x	M	7.6	TJ	8.0	B		11	6	6			NAG08
2004 07 14.94		B	7.4	TK	5.0	B		7	8	7			GON05
2004 07 14.95		B	7.6	TK	10.0	B		25	7	6	0.2	90	GON05
2004 07 16.51	x	M	8.0	TK	10.0	B		20	5	6			YOS02
2004 07 16.88		M	7.6	TT	8.0	B		10	7	5			HOR02
2004 07 16.89		B	7.6	TI	8.0	B		11	7	5	9 m		LAB02
2004 07 16.89		S	7.6	HV	6.3	B		9	7	4			KAM01
2004 07 16.91		M	7.6	TT	5.0	B		10	9	4			LEH
2004 07 16.92		B	7.6:	SC	5.0	B		10	&10	3/			KAN05
2004 07 16.92		S	7.4	TJ	5.0	B		20	4	6			DIE02
2004 07 17.87		M	7.6	TT	10	B	4	25	7	4			LEH
2004 07 17.87		M	7.7	TT	8.0	B		10	8	4/			HOR02
2004 07 17.89		B	7.5	TI	8.0	B		11	8	5	10 m		LAB02
2004 07 17.89		S	8.3	HV	8.0	B	5	20	5	6			MIL02
2004 07 17.90		M	7.8	TT	5.0	B		7	8	4/			ZNO
2004 07 18.88		M	7.8	TT	8.0	B		10	7	4/			HOR02
2004 07 19.73		M	8.7	HD	15	L	8	48	3.7	3			GRI01
2004 07 19.88		M	7.7	TT	10	B	4	25	7	4			LEH
2004 07 19.88		M	7.8	HD	11	B		20	4	3			NEV
2004 07 19.91		M	7.8	TT	8.0	B		10	6	5			HOR02
2004 07 19.95		M	8.5	TJ	11	L	7	40	2	4			SHU
2004 07 20.48	x	M	7.9	TJ	8.0	B		11	5	5			NAG08
2004 07 20.90		B	8.3	TK	5.0	B		10	3.7	4			HAS02
2004 07 20.91		S	8.0	TJ	15.0	R	8	75	3	5			DIE02
2004 07 20.92		M	7.8	TT	8.0	B		10	7	4/			HOR02
2004 07 20.94		S	7.5	TK	5.0	B		7	7	5			GON05
2004 07 20.95		M	8.1	TK	8.0	B		15	4	5/			BOU
2004 07 20.95		S	8.2	TK	6.0	B		15	6	3/			DIJ
2004 07 20.96		S	7.8	HV	6.3	B		9	7	4			KAM01
2004 07 21.88		M	7.9	TT	10	B	4	25	7	4			LEH
2004 07 21.89		M	8.4	TJ	19	L	5	38	3	6			SHU
2004 07 21.92		M	7.8	TT	8.0	B		10	8	4/			HOR02
2004 07 22.74		M	8.9	HI	15	L	8	48	3.4	4/			GRI01
2004 07 22.89		B	8.4	TK	5.0	B		10	2.5	4			HAS02
2004 07 22.89		M	7.8	TT	8.0	B		10	6.5	5			HOR02
2004 07 22.92		M	8.2	TJ	19	L	5	53	3	6			SHU

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 23.85		M	8.2	TT	5.0	B		7	6	3/			ZNO
2004 07 23.89		M	7.8	HD	11	B		20	3	5			NEV
2004 07 23.90		M	8.9	TJ	19	L	5	53	3	6			SHU
2004 07 23.91		S	8.0	TJ	15.0	R	8	75	3	5			DIE02
2004 07 23.95		B	8.2	HD	11	L	7	32	3	2			SER
2004 07 23.95		M	8.3	TK	8.0	B		15	4	5			BOU
2004 07 23.97		S	8.4	TK	6.0	B		15	6	3			DIJ
2004 07 24.99		B	8.1	HD	11	L	7	32	4	3			SER
2004 07 25.88		B	8.4	HD	11	L	7	32	4	3			SER
2004 07 25.94		M	9.1	TJ	19	L	5	38	3	4			SHU
2004 07 25.99		S	7.7	TK	5.0	B		7	7	5			GON05
2004 07 26.00		S	7.9	TK	10.0	B		25	5	5	0.1	85	GON05
2004 07 26.92		S	8.2	TJ	15.0	R	8	75	2	5			DIE02
2004 07 27.96		M	8.4	TK	8.0	B		15	4.5	4/			BOU
2004 07 27.96		S	8.6	TK	8.0	B		15	6	3			DIJ
2004 07 28.01		S	8.4	TK	8.0	B		15	& 7	5/			COM
2004 07 28.93		S	8.2	TJ	15.0	R	8	75	2	4			DIE02
2004 07 28.97		M	8.4	TK	8.0	B		15	4.2	4			BOU
2004 07 29.87		M	9.2	TJ	19	L	5	38	2.6	5			SHU
2004 07 30.83		M	8.1	TT	10	B	4	25	8	3			LEH
2004 07 30.92		M	9.2	TJ	19	L	5	38	2.2	4			SHU

Comet C/2002 T7 (LINEAR)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 01 14.73		M	8.8	TT	25	L	5	50	13	6/	0.4	61	HOR03
2004 01 14.76		M	7.7	TT	6	R	10	30	7.0	5	0.23	80	MAN02
2004 01 14.77		S	7.5	TT	3.0	B		8	9.0	4			MAN02
2004 01 15.88		M	8.0	TT	3.0	B		8	11	7	0.3	60	HOR03
2004 01 17.75		M	10.0	TT	25	L	5	50	5	6	0.2	60	HOR03
2004 01 20.76		S	7.4:	TT	3.0	B		8	6.5	4			MAN02
2004 01 21.71		M	7.6	TT	6	R	10	30	6.0	4			MAN02
2004 01 21.73		M	9.5	TT	25	L	5	50	6.1	6/	0.2	59	HOR03
2004 01 22.71		M	8.7	TT	25	L	5	50	9.7	6/	0.3	59	HOR03
2004 01 22.72		M	7.4	TT	6	R	10	30	5.0	4	0.20	50	MAN02
2004 01 23.77		M	7.4	TT	6	R	10	30	7.5	4	0.21	60	MAN02
2004 01 23.77		S	7.4	TT	3.0	B		8	10	3			MAN02
2004 01 23.82		M	9.4	TT	5.0	B		7	7.5	6	0.2	59	HOR03
2004 01 23.84		M	7.7	TJ	10	B		25	5	4			ADA05
2004 01 24.76		M	7.2	TT	6	R	10	30	6.0	5	0.22	60	MAN02
2004 01 24.76		M	8.1	TT	10	B		25	9.2	5	0.4	58	HOR03
2004 01 25.76		M	7.3	TT	6	R	10	30	5.0	5			MAN02
2004 01 29.81		M	8.4	TT	25	L	5	50	6.2	7	0.4	58	HOR03
2004 01 30.75		M	7.2	TT	8.0	B		10	13	3			HOR02
2004 01 31.75		M	7.1	TT	8.0	B		10	15	3			HOR02
2004 02 02.78		M	7.2	TT	8.0	B		10	14	3			HOR02
2004 02 07.72		M	6.9	TT	8.0	B		10	11	4	0.4	55	HOR02
2004 02 07.73		M	7.1	TT	6	R	10	30	7.5	4	0.33	70	MAN02
2004 02 08.76		M	6.9	TT	8.0	B		10	10	5	0.6	60	HOR02
2004 02 08.78		M	7.0	TT	5.0	B		7	18	5	0.4	55	HOR03
2004 02 09.75		M	6.9	TT	8.0	B		10	12	4/	0.4	55	HOR02
2004 02 09.77		M	7.1	TT	6	R	10	30	6.0	5	0.45	65	MAN02
2004 02 09.77		S	7.2	TT	3.0	B		8	8.5	3			MAN02
2004 02 11.74		M	6.8	TT	8.0	B		10	12	5	0.6	55	HOR02
2004 02 11.76		M	7.2:	TT	6	R	10	30	7	6			MAN02
2004 02 11.77		S	7.1:	TT	3.0	B		8	11	3			MAN02
2004 02 12.75		M	6.9	TT	8.0	B		10	10	5	0.5	60	HOR02
2004 02 12.76		M	7.1	TT	6	R	10	30	7.5	6			MAN02
2004 02 12.77		S	7.0	TT	3.0	B		8	11	3			MAN02
2004 02 16.75		M	6.8	TT	5.0	B		7	15	4			ZNO
2004 02 16.76		M	6.9	TT	6	R	10	30	4	5			MAN02
2004 02 16.76		S	6.9	TT	3.0	B		8	10	3			MAN02
2004 02 16.77		M	7.3	TJ	10	B		25	6	5			ADA05

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 02 16.81		M	6.6	TT	5.0	B		7	12	5	0.4	39	HOR03
2004 02 19.74		B	6.5:	TJ	7.6	L	10	35	2	6			MAC05
2004 02 20.72		M	7.1	TK	5.0	B		10	8	6	1	50	GUZ
2004 02 20.74		B	8.0:	TT	11	L	7	32	5	5			MAN02
2004 02 20.74		M	6.9	TT	11	L	7	32	5	5			MAN02
2004 02 20.75		M	6.8	TT	8.0	B		10	11	5	0.8	50	HOR02
2004 02 20.75		N	11.3	TI	15.5	R	16	46					MAN02
2004 02 20.79		M	6.8	TT	10	B		25	12	7	0.3	35	HOR03
2004 02 21.74		M	7.0	TK	5.0	B		7	8	5	0.5	55	GUZ
2004 02 24.78		M	7.2:	TJ	10	B		25	& 6	4			ADA05
2004 02 25.72		M	6.8	TK	5.0	B		10	7	5/			GUZ
2004 03 03.76		M	6.8	TT	25	L	5	50	24	7	0.5	12	HOR03
2004 03 05.74	!	M	6.8	TK	20.3	L	6	63	4	6	0.2	55	GUZ
2004 03 05.75		M	6.6	TT	8.0	B		10	10	3/			HOR02
2004 03 05.77		M	6.8:	TJ	10	B		25	& 6	4			ADA05
2004 03 06.74	!	M	6.7	TK	20.3	L	6	63	4	6	0.2	50	GUZ
2004 04 13.12		S[	3.0	TK	5.0	B		10					GUZ
2004 04 16.12		S[	4.0	TK	20.3	L	6	63					GUZ
2004 04 21.13		B	4.6	S	4.0	B		8		7/	1.1	250	VAN15
2004 04 22.13		B	4.5	S	4.0	B		8		7/	1.1	250	VAN15
2004 04 23.11		B	4.0	TI	5.0	B		10		8			STRO3
2004 04 23.11		B	4.5	TI	5.0	B		10	4.2	8	3.0	260	COO02
2004 04 23.13		B	4.5	S	4.0	B		8		7/	1.9	250	VAN15
2004 04 24.13		B	4.5	S	4.0	B		8		7/			VAN15
2004 04 27.13		B	4.4	S	4.0	B		8		7/	1.9	250	VAN15
2004 04 28.13		B	4.4	S	4.0	B		8		7/	1.9	250	VAN15
2004 04 28.80	xa	M	4.1	TT	3.5	B		7					TSU02
2004 04 29.12		B	4.0	AA	0.0	E		1		9			BEG01
2004 04 29.13		B	4.3	AA	5.0	B		7	5	8	5.7	250	BEG01
2004 04 30.12		B	4.4:	S	4.0	B		8		7/			VAN15
2004 04 30.78		S	3.9	AA	0.0	E		1					SEA
2004 04 30.85	x	B	4.0	HV	5.0	B		10	8.5	7/	3.8	250	NAG04
2004 05 01.12		B	4.1	AA	5.0	B		10	6	8	2.5	245	PRI04
2004 05 01.84	x	B	4.0	HV	5.0	B		10	8	8	6.1	245	NAG04
2004 05 02.12		B	4.0	AA	5.0	B		10	5	8	2.5	250	PRI04
2004 05 02.12		B	4.2	S	4.0	B		8		7/	2.7	250	VAN15
2004 05 02.15		B	4.2	S	5.0	B		10	7	8	1.3	248	COO02
2004 05 02.35		B	3.9	YG	0.0	E		1		8			AM001
2004 05 02.35		B	4.1	YG	5.0	B		7	8	7	1.8	250	AM001
2004 05 02.79		B	3.8	AA	0.0	E		1					SEA
2004 05 02.83	x	B	4.1	HV	5.0	B		10	9	7/	6.3	250	NAG04
2004 05 03.12		B	3.7	AA	5.0	B		7	5	8	6.8	245	BEG01
2004 05 03.12		B	4.0	AA	5.0	B		10	5	8	2.3	250	PRI04
2004 05 03.15		B	4.1	S	4.0	B		8		7/	2.3	250	VAN15
2004 05 03.35		B	3.9	YG	0.0	E		1		7			AM001
2004 05 03.35		B	4.2	YG	5.0	B		7	7	7	2.3	245	AM001
2004 05 04.12		B	3.9:	AA	5.0	B		10	5	8	2.0	245	PRI04
2004 05 04.13		B	3.5	AA	5.0	B		7	5	8	7.2	238	BEG01
2004 05 04.23		M	4.1	TK	5.0	B		7	7	6/			GRA04
2004 05 04.88	x	B	3.8	TT	8.0	B		20	6	8	13	248	PEA
2004 05 04.88	x	B	3.8	TT	4.0	B		8	8	8	13	248	PEA
2004 05 04.88	x	B	3.8	TT	0.0	E		1			7		PEA
2004 05 06.15		B	3.9	S	5.0	B		10	6	7			COO02
2004 05 07.13		M	4.0:	S	4.0	B		8					VAN15
2004 05 09.13		B	3.7:	S	0.0	E		1					VAN15
2004 05 09.35		B	3.5	YG	0.0	E		1		8			AM001
2004 05 09.35		B	3.6	YG	5.0	B		7	15	6/	1.6	237	AM001
2004 05 09.36		S	3.9	YG	8.0	B		11	5	7	1.5	235	SQU01
2004 05 10.12		B	3.5:	TK	4.0	B		8		8			VAN15
2004 05 10.15		B	3.4:	AA	5.0	B		10					COO02
2004 05 10.34		B	3.5	YG	0.0	E		1		8			AM001
2004 05 10.34		B	3.5	YG	5.0	B		7	10	6	1.0	245	AM001
2004 05 10.61	s	M	3.3	TK	6.3	B		9	11	6			DAH

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 11.34		B	3.5	YG	0.0	E		1		7			AM001
2004 05 11.34		B	3.6	YG	5.0	B		7	10	5	1.3	230	AM001
2004 05 11.79		S	3.0	AA	0.0	E		1					SEA
2004 05 12.13		M	3.5	HI	4.0	B		8	10	8	1	230	VAN15
2004 05 13.13		& M	3.3	AA	5.0	B		7	10	8	3.2	220	BEG01
2004 05 13.87	x	B	3.3	TT	0.0	E		1					PEA
2004 05 13.87	x	B	3.4	TT	8.0	B		20	10	6	5.6	225	PEA
2004 05 13.87	x	B	3.4	TT	4.0	B		8	10	7	5.6	225	PEA
2004 05 14.12	&	M	3.3	AA	5.0	B		10	9	7	1.3	240	PRI04
2004 05 14.14		M	3.4	HI	4.0	B		8	15	8	1.6	230	VAN15
2004 05 14.88	x	B	3.2	TT	0.0	E		1					PEA
2004 05 14.88	x	B	3.2	TT	4.0	B		8	13	7	6.4	219	PEA
2004 05 15.12		M	3.3	AA	5.0	B		10	9	7	1.0	210	PRI04
2004 05 15.15	&	M	3.6	HI	4.0	B		8					VAN15
2004 05 15.34		M	3.4	YG	5.0	B		7	10	5	1.0	220	AM001
2004 05 15.34		S	3.3	YG	0.0	E		1		6			AM001
2004 05 15.81		B	2.7	AA	0.0	E		1					SEA
2004 05 16.36		M	3.4	YG	5.0	B		7	10	5	1.0	220	AM001
2004 05 16.36		S	3.2	YG	0.0	E		1	5	7			SOU01
2004 05 16.36		S	3.4	YG	8.0	B		11	10	6	1	210	SOU01
2004 05 17.36		M	3.3	YG	5.0	B		7	10	5	0.5	220	AM001
2004 05 17.87		S	3.5	YG	8.0	B		11	5	5	0.2	185	SOU01
2004 05 18.89		M	3.4	YG	5.0	B		7	10	5			AM001
2004 05 19.35		S	2.4	AA	0.0	E		1					SEA
2004 05 19.68		M	3.7:	HI	4.0	B		8					VAN15
2004 05 19.69		B	3.1	AA	5.0	B		10	10	7			COO02
2004 05 20.36		S	2.5	AA	0.0	E		1					SEA
2004 05 20.43	x	M	2.3	TT	0.0	E		1					TSU02
2004 05 20.68		M	2.8	AA	5.0	B		10	9	6	1.6		PRI04
2004 05 20.69		M	2.8	AA	5.0	B		7	25	7	1.6	150	BEG01
2004 05 20.96		B	3.3	TI	5.0	B		10	16	6	1.3	210	ADD
2004 05 21.35		S	2.7	AA	0.0	E		1					SEA
2004 05 21.42	x	M	2.0	TT	0.0	E		1					TSU02
2004 05 21.70		M	3.4	TK	5.0	B		12	16	6/	2.2	150	PEN02
2004 05 22.06		S	2.8:	TT	4.0	B		8	25	6			RIE
2004 05 22.69		S	3.2	AA	5.0	B		10	11	6	1.2	128	COO02
2004 05 22.74		M	3.0	AA	5.0	B		7	15	7	1.5	134	BEG01
2004 05 22.87		S	2.8	YG	8.0	B		11	10	5			SOU01
2004 05 22.95		B	3.6	TI	5.0	B		10	7	6	1		ADD
2004 05 23.06		S	2.9	TT	0.0	E		1	30	6			RIE
2004 05 23.25		S	3.3	TK	5.0	B		10	10	5	20	m 140	LIN04
2004 05 24.07		S	3.1	TT	0.0	E		1	28	6			RIE
2004 05 24.90		M	3.0	YG	5.0	B		7	10	5			AM001
2004 05 24.90		M	3.2	YG	0.0	E		1		7			AM001
2004 05 25.95		M	4.2:	TK	5	R	7	14	&10	5			ROB06
2004 05 26.89		B	3.5	YG	0.0	E		1		7			AM001
2004 05 26.89		S	3.3	YG	0.0	E		1	15	6			SOU01
2004 05 26.89		S	3.5	YG	3.0	B		8	15	6			SOU01
2004 05 26.90		M	3.6	YG	5.0	B		7	10	4			AM001
2004 05 26.90		S	3.5	YG	8.0	B		11	15	6	1.5	130	SOU01
2004 05 26.96		M	3.1	TI	5.2	B		7	11	5			MAN04
2004 05 26.97		M	4.2	HV	5.0	B		7	15	7			BAL07
2004 05 26.97		S	3.9	TI	5.0	B		10	6	6			ADD
2004 05 26.98		S	5.1	YG	8.0	B		11	15	6/			DES01
2004 05 27.26		B	4.2	TK	5.0	B		10	10	6	30	m 120	LIN04
2004 05 27.88		S	3.6	YG	8.0	B		11	15	5			SOU01
2004 05 27.91		B	3.6	YG	0.0	E		1		4			AM001
2004 05 27.91		M	3.6	YG	5.0	B		7	11	5	1.4	110	AM001
2004 05 27.94		S	4.1	TI	5.0	B		10	6	5			ADD
2004 05 27.96		M	3.5	TI	5.2	B		7	12	5			MAN04
2004 05 27.98		M	4.1	HV	5.0	B		7	15	6	0.42	125	BAL07
2004 05 27.98		S	3.2	AT	0.0	E		1					DES01
2004 05 28.34		S	4.1	AA	0.0	E		1					SEA

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DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 28.80		S	3.8	TI	5.0	B		7	8	s3			SCA02
2004 05 28.90		B	3.8	YG	0.0	E		1		3			AM001
2004 05 28.90		M	3.8	YG	5.0	B		7	10	4	0.5	100	AM001
2004 05 28.90		M	4.0	YG	5.0	B		7	10	4			AM001
2004 05 28.94		M	4.5	TI	5.0	B		10	6	5	0.3	120	ADD
2004 05 28.98		S	3.3	AT	8.0	B		11	20	5			DES01
2004 05 30.88		M	4.5	YG	5.0	B		7	8	5			AM001
2004 05 30.99		S	4.0	YG	5.0	B		7	10	4/			SOU01
2004 06 01.47	xs	M	4.5:	TJ	8.0	B		11	10	6			NAG08
2004 06 01.86		B	5.8	TI	8.0	B		11	5	3			LAB02
2004 06 02.86		B	5.9	TI	8.0	B		11	5	3			LAB02
2004 06 03.47	xa	S	5.5	HV	5.0	B		7	9	4/	0.7	80	MIY01
2004 06 03.47	xs	M	5.2	TJ	10.0	B		20	10	5			NAG08
2004 06 03.47	xs	M	5.9	HV	15.0	B		25	6	4			MIT
2004 06 03.47	s	S	6.0	TJ	7.0	B		10	10	4/			END
2004 06 03.87		B	5.4	TI	8.0	B		11	5	3	5	m 117	LAB02
2004 06 03.88		M	5.3	YG	5.0	B		7	5	6			AM001
2004 06 03.99		S	5.5	TI	5.0	B		10	4	2			ADD
2004 06 04.46	xa	S	5.9	HV	8.0	B		11	7	5	0.9	80	MIY01
2004 06 04.47	xs	M	5.4	TJ	5.0	B		12	11	5			NAG08
2004 06 04.47	s	S	5.8	TJ	7.0	B		10	13	5	0.3	135	END
2004 06 04.48	xs	M	5.8	HV	8.0	B		11	10	5			MIT
2004 06 05.33		B	5.8	AA	5.0	B		10	8		2.0	127	SEA
2004 06 05.45	s	S	6.0	TJ	7.0	B		10	11	4/			END
2004 06 05.47	xa	S	6.2	HV	8.0	B		11	5.5	5	0.5	55	MIY01
2004 06 05.47	xs	M	5.7	TJ	8.0	B		11	9	5			NAG08
2004 06 05.49	xa	M	5.7	TK	3.5	B		7	12	4			YOS02
2004 06 05.83		S	4.2	TI	5.0	B		7	18	s3			SCA02
2004 06 05.90		S	6.0	YG	5.0	B		7	5	5			SOU01
2004 06 05.91		S	5.8	AT	8.0	B		11	18	5			DES01
2004 06 06.36		S	5.7	AA	0.0	E		1					SEA
2004 06 06.81		S	4.4	TI	5.0	B		7	15	s3			SCA02
2004 06 06.89		M	6.3	YG	5.0	B		7	8	5			AM001
2004 06 06.91		S	5.9	AT	8.0	B		11	18	5/			DES01
2004 06 06.91		S	6.2	YG	8.0	B		11	5	5			SOU01
2004 06 06.93		S	6.2	YG	8.0	B		20	5	4	0.3	120	AM001
2004 06 07.30		S	6.8	TK	4.5	R	6	13	6	5			JON
2004 06 07.78		M	6.1	TK	8.0	B		15	7	5	1.1	123	BOU
2004 06 07.79		M	6.2	TK	8.0	B		15	10	4/	0.7	114	DIJ
2004 06 07.82		S	4.2	TI	5.0	B		7	15	s3			SCA02
2004 06 07.92		S	6.2	AT	8.0	B		11	16	5/			DES01
2004 06 07.92		S	6.4	YG	8.0	B		11	5	4/			SOU01
2004 06 08.01		M	6.1	YG	5.0	B		7	8	6			AM001
2004 06 08.01		S	6.0	YG	8.0	B		20	6	5	0.3	120	AM001
2004 06 08.02		M	5.9	HV	5.0	B		7	10	5	0.25	120	BAL07
2004 06 08.32		S	6.8	TK	4.5	R	6	13	6	5			JON
2004 06 08.35		B	6.6	AA	5.0	B		10					SEA
2004 06 08.78		M	6.7	TK	8.0	B		15	9	4/	0.9	123	DIJ
2004 06 08.79		M	6.4	TK	8.0	B		15	6.5	4/	0.8	126	BOU
2004 06 08.90		S	6.3	YG	8.0	B		11	5	4			SOU01
2004 06 08.91		S	6.0	TK	8.0	B		11	8	3			GON05
2004 06 08.91		S	6.3	AT	8.0	B		11	16	5/			DES01
2004 06 09.79		M	6.5	TK	8.0	B		15	6.5	4/	0.8	130	BOU
2004 06 09.79		M	6.6	TK	8.0	B		15	7	4/	0.8	116	DIJ
2004 06 09.82		S	4.8	TI	5.0	B		7	10	s3			SCA02
2004 06 09.89		S	6.5	TK	8.0	B		20	5	4	0.6	110	AM001
2004 06 09.89		S	6.6	TK	5.0	B		7	8	4	0.8	110	AM001
2004 06 10.79		M	6.7	TK	8.0	B		15	6	4	0.8	122	BOU
2004 06 10.79		M	6.8	TK	8.0	B		15	10	3/	0.8	111	DIJ
2004 06 10.82		S	5.2	TI	5.0	B		7	8	s3			SCA02
2004 06 11.79		M	6.9	TK	8.0	B		15	5.5	4	0.6	126	BOU
2004 06 11.79		S	6.9	TK	8.0	B		15	7	3	0.35	112	DIJ
2004 06 11.88		S	6.7	YG	8.0	B		11	4	3			SOU01

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 11.99		S	6.1	HV	5.0	B		7	5	2	0.83	120	BAL07
2004 06 12.79		M	7.0	TK	8.0	B		15	6	4	0.8	125	BOU
2004 06 12.79		S	7.1	TK	8.0	B		15	7.5	3	0.9	116	DIJ
2004 06 13.01		S	6.9	TK	5.0	B		7	10	5			AM001
2004 06 13.01		S	7.0	TK	8.0	B		20	7	4	0.3	110	AM001
2004 06 13.45		S	6.8	AA	3.5	B		6					SEA
2004 06 13.48	xs	M	7.1	TJ	8.0	B		11	8	6	0.5	105	NAG08
2004 06 13.49	xa	M	7.0	HV	8.0	B		11	9	5	0.4	125	MIT
2004 06 13.50	x	B	7.6	HV	10.0	B		26	4.9	3			NAG04
2004 06 13.79		M	7.1	TK	8.0	B		15	6	3/	0.6	119	BOU
2004 06 13.79		S	7.0	TK	8.0	B		15	8	4	0.4	122	DIJ
2004 06 13.90		S	6.3	TK	5.0	B		7	8	3			GON05
2004 06 13.91		S	6.3	TK	8.0	B		11	8	4	0.4	120	GON05
2004 06 13.91		S	6.9	TJ	8.0	B		11	8	5			DES01
2004 06 13.93		S	6.8	TK	5.0	B		7	8	6			AM001
2004 06 13.93		S	7.0	TK	8.0	B		20	5	5	0.4	110	AM001
2004 06 13.97		S	7.0	TJ	8.0	B		11	4	4			SOU01
2004 06 14.48	a	S	6.9	HV	8.0	B		11	10	3/			MIY01
2004 06 14.49	xa	S	7.1	TK	3.5	B		7	&10	3			YOS02
2004 06 14.50	xa	S	7.1	TK	10.0	B		20	9	3			YOS02
2004 06 14.79		S	7.0	TK	8.0	B		15	5	3	0.4	113	DIJ
2004 06 14.79		S	7.3	TK	8.0	B		15	4.5	3	0.5	124	BOU
2004 06 14.93		S	7.1	TK	5.0	B		7	7	5			AM001
2004 06 14.93		S	7.2	TK	8.0	B		20	5	4	0.4	120	AM001
2004 06 15.48	xs	M	7.2	TJ	8.0	B		11	9	6			NAG08
2004 06 15.79		M	7.4	TK	8.0	B		15	4.5	4	0.75	120	BOU
2004 06 15.79		S	7.1	TK	8.0	B		15	7	3/	0.5	116	DIJ
2004 06 15.89		S	7.2	YG	8.0	B		11	3	4			SOU01
2004 06 15.90		S	6.4	TK	5.0	B		7	8	3			GON05
2004 06 15.90		S	7.2	TK	5.0	B		7	8	5			AM001
2004 06 15.90		S	7.3	TK	8.0	B		20	5	4	0.5	120	AM001
2004 06 15.91		S	6.7	TK	10.0	B		25	8	4	0.4	120	GON05
2004 06 15.91		S	6.9	TJ	8.0	B		11	8	5/			DES01
2004 06 16.44		S	6.9	AA	10.0	B		25	3		1.0		SEA
2004 06 16.47	a	S	7.9	HV	15.0	R	5	21	3.3	3/			MIY01
2004 06 16.79		M	7.5	TK	8.0	B		15	5	3/	0.6	125	BOU
2004 06 16.79		S	7.2	TK	8.0	B		15	8	3	0.7	125	DIJ
2004 06 16.92		S	7.0	TJ	8.0	B		11	6	5/			DES01
2004 06 16.93		S	7.2	TK	5.0	B		7		5			AM001
2004 06 16.93		S	7.3	TK	8.0	B		20	5	3	0.3	120	AM001
2004 06 16.93		S	7.3	YG	8.0	B		11	3	4			SOU01
2004 06 17.40		S	7.1	AA	3.5	B		6					SEA
2004 06 17.89		S	7.3	TJ	8.0	B		11	3	5	0.1	11	SOU01
2004 06 17.91		S	7.2	TJ	8.0	B		11	6	5/			DES01
2004 06 17.91		S	7.3	TK	8.0	B		20	5	3	0.4	120	AM001
2004 06 17.91		S	7.3	TK	5.0	B		7		4			AM001
2004 06 18.92		S	7.3	TJ	8.0	B		11	6	5/			DES01
2004 06 19.79		M	7.7	TK	8.0	B		15	5	3/	0.5	124	BOU
2004 06 19.79		M	7.8	TK	8.0	B		15	7	2/	0.4	120	DIJ
2004 06 19.88		S	7.4	TJ	8.0	B		11	3	4			SOU01
2004 06 19.89		S	7.2	TK	5.0	B		7	8	6			AM001
2004 06 19.89		S	7.3	TK	8.0	B		20	5	3	0.4	120	AM001
2004 06 19.92		S	7.3	TJ	8.0	B		11	6	4			DES01
2004 06 20.34		S	7.6	AA	5.0	B		10					SEA
2004 06 20.91		S	7.2	TK	8.0	B		20	5	3/	0.3	120	AM001
2004 06 20.91		S	7.3	TK	5.0	B		7		5			AM001
2004 06 20.92		S	7.3	TJ	8.0	B		11	5	4			DES01
2004 06 20.99		S	7.5	TJ	8.0	B		11	3	5			SOU01
2004 06 21.91		S	7.3	TK	5.0	B		7					AM001
2004 06 21.91		S	7.4	TK	8.0	B		20	6	3	0.25	120	AM001
2004 06 21.91		S	7.5	TJ	8.0	B		11	3	5			SOU01
2004 06 21.92		S	7.4	TJ	8.0	B		11	5	4			DES01
2004 06 21.97		S	7.7	TK	20.3	T	10	57	3.5	5	0.5	120	ROB06

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 22.35		S	7.8	AA	10.0	B		25	3	5	1.0	117	SEA
2004 06 22.88		S	7.6	TJ	8.0	B		11	3	4			SOU01
2004 06 22.90		S	7.5	TK	8.0	B		20	4	3	0.15	120	AMO01
2004 06 22.91		S	7.4	TJ	8.0	B		11	5	4			DES01
2004 06 23.90		S	7.4	TK	8.0	B		20	4	3			AMO01
2004 06 23.91		S	7.4	TJ	8.0	B		11	5	3/			DES01
2004 06 23.93		S	7.8	TJ	8.0	B		11	3	4			SOU01
2004 06 24.91		S	7.5	TJ	8.0	B		11	5	3/			DES01
2004 06 26.89		S	7.1	TJ	8.0	B		11	3	7			SOU01
2004 06 27.33		S	8.1	AA	10.0	B		25			1.0	118	SEA
2004 06 28.89		S	8.2	TJ	8.0	B		11	3	6			SOU01
2004 06 29.89		S	8.2	TJ	8.0	B		11	2	5			SOU01
2004 06 29.90		S	8.0	TK	8.0	B		20	2	2			AMO01
2004 06 30.89		S	8.0	TK	14.3	L	6	45	3	1			AMO01
2004 06 30.94		S	8.2	TJ	8.0	B		11	2	4			SOU01
2004 07 01.90		S	8.2	TJ	8.0	B		11	2	3			SOU01
2004 07 02.88		S	8.1	TJ	8.0	B		11	2	4			SOU01
2004 07 03.89		S	8.2	TJ	8.0	B		11	2	4			SOU01
2004 07 04.34		S	8.9	AA	10.0	B		25					SEA
2004 07 05.38		S	8.6	AA	10.0	B		25			0.7	110	SEA
2004 07 05.98		S	8.6:	TK	14.3	L	6	45		1			AMO01
2004 07 06.89		S	9.0	TK	14.3	L	6	45	1	2			AMO01
2004 07 11.91		S	8.8	TK	8.0	B		20	2	2			AMO01
2004 07 12.91		S	9.1	TK	8.0	B		11	1	3			SOU01
2004 07 12.91		S	9.2	TK	20	T	10	63	1	2			SOU01
2004 07 13.90		S	9.0	TK	8.0	B		11	1	3			SOU01
2004 07 14.91		S	9.1	TK	8.0	B		11	1	3			SOU01
2004 07 14.91		S	9.3	TK	20	T	10	77	1	2			SOU01
2004 07 21.90		S	11.0:	TK	14.3	L	6	45		1			AMO01

Comet C/2003 H1 (LINEAR)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 02 21.14		S	12.3:	HS	20.3	L	6	63	1.2	3			GUZ
2004 04 14.81		M	12.1	HS	42	L	5	81	1.7	3			LEH
2004 04 14.81		S	12.6	HS	20.3	L	6	63	1.2	4			GUZ
2004 04 22.73		B	[12.0	TI	30.0	T	10	214					COO02

Comet C/2003 K4 (LINEAR)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 02 21.15		S	12.5:	HS	20.3	L	6	63	0.6	3			GUZ
2004 04 13.05		M	11.6	SK	20.3	L	6	63	0.8	5			GUZ
2004 04 13.07		M	11.2	TT	10	B	4	25	1.5	6			LEH
2004 04 15.09		M	11.3	TI	42	L	5	81	1.3	7			LEH
2004 04 15.09		M	11.6	HS	35	L	5	68	0.8	6/			HORO2
2004 04 17.01		B	11.5	HS	25	L	5	50	1.1	6	0.06	291	HORO3
2004 04 19.99		E	10.3	NP	20	L		33	5	4			ROM
2004 04 22.09		M	11.1	TT	10	B	4	25	1.4	6/			LEH
2004 04 23.12		S	11.4	TI	30.0	T	10	214	0.8	5			COO02
2004 04 25.99		E	10.2	NP	20	L		33	5	4			ROM
2004 04 30.04		M	11.0	TT	42	L	5	81	1.4	7			LEH
2004 05 01.02		S	10.9	AC	13	L	7	45	1.0	3			RES
2004 05 01.05		M	11.0	TT	11	R	15	47	1.2	7/			LEH
2004 05 01.05		M	11.0	TT	11	R	15	47	1.2	7/			LEH
2004 05 01.06		M	11.2	TK	20.3	L	6	63	0.7	6			GUZ
2004 05 04.86	x	S	11.3	TT	20	L	4	90	1.0	5			PEA
2004 05 04.88		S	10.7	TK	30	L	5	60	2	4			NEV
2004 05 08.01		S	10.8	AC	13	L	7	45	1.2	3			RES
2004 05 11.01		M	9.9	TJ	11	L	7	40	2	3			SHU
2004 05 11.91		M	10.6	TJ	11	L	7	40	0.83	3			SHU
2004 05 13.86	x	S	11.1	TT	20	L	4	90	1.1	4			PEA
2004 05 14.64	x	S	10.8	TJ	15.0	B		25	1	6			MIT

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 14.77	x	S	10.6	TJ	31.7	L	6	63	1.2	4			MIY01
2004 05 14.86	x	S	11.1	TT	20	L	4	90	1.0	4			PEA
2004 05 15.05		M	10.8	TK	20.3	L	6	63	1.0	5			GUZ
2004 05 15.12		S	11.1	TI	23.5	T	10	94	1	3			LAB02
2004 05 15.99		M	11.0	TK	25.4	J		88	1.2	5/			BOU
2004 05 16.00		S	10.9	TK	25.4	J		88	1.2	5			DIJ
2004 05 16.04		S	10.6	AC	13	L	7	45	1.2	3			RES
2004 05 16.05		S	10.8	TK	20.3	T	10	100	1.5	5			GON05
2004 05 16.10		S	11.1	TI	20	T	5	80	1	3			LAB02
2004 05 16.90		S	11.4	TK	44.0	L	5	156	1.1	5			HAS02
2004 05 16.94		S	10.3	TK	10.0	B		25	2.5	5			GON05
2004 05 16.95		M	10.7	TK	31.0	J		72	1	5			DIJ
2004 05 16.95		M	10.9	TK	31.0	J		72	1.5	6			BOU
2004 05 17.90		S	10.4	TK	30	L	5	60	1.5	4			NEV
2004 05 17.94		M	11.1	TJ	11	L	7	40	1.2	3/			SHU
2004 05 18.71	x	S	11.0	TK	45.7	L	4	68	1	4			MUR02
2004 05 18.95		B	9.3	HD	11	L	7	32	1.5	8			SER
2004 05 18.96		M	10.7	TK	25.4	J		72	1.5	6			BOU
2004 05 18.96		S	10.8	TK	25.4	J		72	1	4/			DIJ
2004 05 19.04		S	10.8	TT	20.0	L	4	80	& 1	7			SCH04
2004 05 19.98		M	10.7	TK	25.4	J		72	1.5	6			BOU
2004 05 20.00		S	10.2	AA	15.0	R	15	30	1.5	5			DIE02
2004 05 20.00		S	10.4	TK	15.0	R	5	38	2.0	4/			MEY
2004 05 20.01		M	10.3	TK	35	L	5	68	1.9	5/			HOR02
2004 05 20.91		S	10.2	AA	15.0	R	15	30	1.5	6			DIE02
2004 05 20.94		M	9.5	TJ	11	L	7	40	1.5	4			SHU
2004 05 21.94		S	10.8	TT	30.0	L	5	60	& 2	7			SCH04
2004 05 21.95		M	9.4	TJ	41	L	4	89	1.6	5			SHU
2004 05 22.01		S	10.5	AC	13	L	7	45	1.5	3			RES
2004 05 22.88		M	10.3	TK	20.3	L	6	63	1.5	6			GUZ
2004 05 22.89		M	10.0:	TK	5.0	B		10	2	7			GUZ
2004 05 22.89		S	10.4	TK	15.2	R		38	1.5	7			HOE
2004 05 22.90		S	10.6	TK	15.0	R	5	38	3.1	4			MEY
2004 05 22.91		S	9.9	AA	15.0	R	15	75	2	7			DIE02
2004 05 22.97		M	10.6	TK	25.4	J		72	1.7	6			BOU
2004 05 22.98		M	10.6	TK	25.4	J		72	1.3	5			DIJ
2004 05 22.99		B	9.2	HD	11	L	7	32	1.2	9			SER
2004 05 23.56	x	B	10.5	TJ	20.0	L	4	96	0.7	5			NAG04
2004 05 23.88		E	8.6	HD	20	L		33	5	d4			ROM
2004 05 23.99		S	9.9	AA	15.0	R	15	75	2	7			DIE02
2004 05 24.73	x	M	10.1	TK	25.4	L	4	46	1.5	6			YOS02
2004 05 24.73	x	S	9.8	TJ	31.7	L	6	63	1.8	5			MIY01
2004 05 24.88		B	9.6	HD	11	L	7	32	1.5	0			SER
2004 05 24.98		S	9.8	AA	15.0	R	15	75	2	6			DIE02
2004 05 25.73	x	M	10.3	TJ	32.0	L	5	58	1.5	7			NAG08
2004 05 25.90		M	9.6	TJ	41	L	4	89	1.8	5			SHU
2004 05 26.92		M	10.0	TJ	11	L	7	40	1.9	4/			SHU
2004 05 26.96		M	10.3	TK	25.4	J		58	1.9	5/			BOU
2004 05 26.96		S	10.2	AC	13	L	7	45	1.5	3			RES
2004 05 27.01		S	9.5	AA	15.0	R	15	75	2	6			DIE02
2004 05 27.88		M	9.7	TJ	11	L	7	40	2.0	4/			SHU
2004 05 27.88		S	9.1	TI	25.0	T	5	48	4	s4			SCA02
2004 05 27.99		S	10.1	AC	13	L	7	45	1.6	3			RES
2004 05 28.98		M	10.2	TK	25.4	J		58	2.0	5			BOU
2004 05 29.00		M	10.1	TT	10	B	4	25	2.5	6			LEH
2004 05 29.03		S	10.1	AC	13	L	7	45	1.5	3			RES
2004 05 29.07		B	8.8	S	21.0	L	5	66	& 2	6	3	m 180	KUG
2004 05 29.22		S	9.9	TK	14.3	L	6	80	1.5	2			AMO01
2004 05 29.93		S	9.9	AC	13	L	7	45	1.5	3			RES
2004 05 29.99		M	10.0	TT	10	B	4	25	2.5	6			LEH
2004 05 30.90		M	9.6	TJ	11	L	7	40	1.9	5			SHU
2004 05 30.93		M	9.6	TT	35	L	5	68	2.5	4			HOR02
2004 05 31.90		M	10.6	TJ	11	L	7	40	1.4	4/			SHU

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 01.90		M	9.8	TJ	11	L	7	40	1.7	5			SHU
2004 06 01.99		M	10.2	TK	20.3	L	6	63	1.8	6			GUZ
2004 06 02.95		S	10.2	TK	20.3	T	10	77	2	5			GON05
2004 06 03.65		M	9.2	TJ	40.0	L	4	75	2.0	S4			YOS04
2004 06 03.90		M	9.6	TJ	11	L	7	40	1	4			SHU
2004 06 04.50	x	S	9.7	HS	15.0	R	5	21	2.6	4/			MIY01
2004 06 04.68		M	9.2	TJ	40.0	L	4	75	3.5	s6			YOS04
2004 06 05.49	x	S	8.6	TJ	15.0	R	5	21	2.4	5/			MIY01
2004 06 05.50	s	S	8.8	TJ	10.0	B		20	1	7			END
2004 06 05.50	x	M	9.6	TJ	32.0	L	5	58	3.5	6			NAG08
2004 06 05.90		S	8.5	TI	5.0	B		7	4	s3			SCA02
2004 06 05.93		S	9.9	TI	23.5	T	10	94	3	3			LAB02
2004 06 05.96		M	9.5	TK	25.4	J	6	58	2.5	6			BOU
2004 06 06.85		S	8.5	TI	5.0	B		7	5	s4			SCA02
2004 06 06.92		S	9.0	AC	15.0	R	15	75	3	6			DIE02
2004 06 07.85		S	8.2	TI	5.0	B		7	8	s4			SCA02
2004 06 07.86		M	8.7	TT	11	L	7	32	4.0	6			MAN02
2004 06 07.88		S	9.1	TK	10.0	R	5	20	3.7	3			HAS02
2004 06 07.93		S	8.9	AC	15.0	R	15	75	3	6			DIE02
2004 06 07.96		M	8.8	TT	8.0	B		10	6.5	4/			HOR02
2004 06 07.96		M	9.6	TT	10	B	4	25	3	5/			LEH
2004 06 08.80		M	9.1	TK	8.0	B		15	3.3	4			BOU
2004 06 08.81		S	9.1	TK	8.0	B		15	4	4/			DIJ
2004 06 08.86		S	8.2	TI	5.0	B		7	10	s4			SCA02
2004 06 08.89		S	9.1	TK	30.0	T	10	60	2.0	4			HAS02
2004 06 08.92		B	8.4	HD	11	L	7	32	3	2			SER
2004 06 08.93		S	8.5	TK	10.0	B		25	4	5			GON05
2004 06 08.96		S	8.3	TK	8.0	B		11	5	5			GON05
2004 06 09.79		S	9.1	TK	8.0	B		15	3.8	4/			DIJ
2004 06 09.80		M	9.1	TK	8.0	B		15	3.8	4/			BOU
2004 06 09.85		S	8.3	TI	5.0	B		7	7	s3			SCA02
2004 06 10.53	x	M	9.4	TJ	15.0	B		25	5	4			MIT
2004 06 10.80		M	9.0	TK	8.0	B		15	5	4/			BOU
2004 06 10.80		S	9.0	TK	8.0	B		15	4	4			DIJ
2004 06 10.84		S	7.9	TI	5.0	B		7	10	s4			SCA02
2004 06 11.00		B	8.8	GA	40.6	L	4	193	1.8	4	& 4	m 200	MOR09
2004 06 11.70	x	S	8.6	TK	10.0	B		20	4	5			YOS02
2004 06 11.79		M	9.0	TK	8.0	B		15	5	4/			BOU
2004 06 11.80		S	9.0	TK	8.0	B		15	4.5	3/			DIJ
2004 06 11.85		S	8.0	TI	5.0	B		7	8	s4			SCA02
2004 06 11.91		M	9.2	TJ	11	L	7	40	3	4/			SHU
2004 06 11.91		S	8.9	AC	13	L	7	45	2	3			RES
2004 06 12.69	x	M	8.2	TK	10.0	B		20	5	6			YOS02
2004 06 12.80		M	8.9	TK	8.0	B		15	5	4			BOU
2004 06 12.80		S	9.0	TK	8.0	B		15	5	4/			DIJ
2004 06 12.86		M	8.2	TK	5.0	B		10	5	5			GUZ
2004 06 12.92		B	8.7	HD	11	L	7	32	3	2			SER
2004 06 13.06		S	8.1	TK	5.0	B		7	5	5			GON05
2004 06 13.51	x	S	8.7	TJ	8.0	B		11	5	5			NAG08
2004 06 13.53	x	M	9.0	TJ	15.0	B		25	6	5/			MIT
2004 06 13.54	x	S	9.5	TJ	33.0	L	5	53	2.2	5			MIY01
2004 06 13.71	x	M	8.3	TK	10.0	B		20	5	6			YOS02
2004 06 13.72	x	M	8.8	TK	25.4	L		46	4.2	s6			YOS02
2004 06 13.81		M	9.1	TK	11.0	L	5	31	3.8	5			BOU
2004 06 13.82		S	9.0	TK	11.0	L	5	31	4	3/			DIJ
2004 06 13.91		M	7.8	TT	8.0	B		10	11	4			HOR02
2004 06 13.91		M	8.2	TK	5.0	B		10	5	D6			GUZ
2004 06 13.92		S	8.6	AC	13	L	7	45	2	3			RES
2004 06 13.92		S	8.7	TJ	15.0	R	15	75	3	6			DIE02
2004 06 13.95		S	8.1	TK	5.0	B		7	6	5			GON05
2004 06 13.95		S	8.8	TT	8.0	B		15	& 9	5			SCH04
2004 06 13.96		S	8.2	TT	8.0	B		15	7	4			RIE
2004 06 14.06		S	9.9	TK	14.3	L	6	45	2	2			AMO01

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 14.56		S	8.6	TJ	10.0	R		40	3.8	6/			END
2004 06 14.58		S	8.8	TJ	10.0	B		20	4	5			END
2004 06 14.66	x	M	9.8	TT	12.5	L	6	60	3	5			TSU02
2004 06 14.66	x	M	9.8	TT	12.5	L		60	3.0	5			TSU02
2004 06 14.70	x	S	8.4	TJ	8.0	B		11	7	5			NAG08
2004 06 14.80		M	8.9	TK	8.0	B		15	5	4/			BOU
2004 06 14.81		M	8.9	TK	8.0	B		15	4.5	4			DIJ
2004 06 14.90		M	8.7	TT	6	R	10	30	6	4			MAN02
2004 06 14.91		S	8.2	TI	8.0	B		11	2	3			LAB02
2004 06 14.94		M	7.8	TT	8.0	B		10	10	4			HOR02
2004 06 14.94		S	8.4	TJ	15.0	R	15	75	3	6			DIE02
2004 06 15.51	x	M	8.6	TJ	15.0	B		25	6	5			MIT
2004 06 15.52	x	S	8.1	TJ	5.0	B		12	11	5			NAG08
2004 06 15.56		M	8.7	TJ	40.0	L	4	75	3.2	7			YOS04
2004 06 15.80		M	8.8	TK	8.0	B		15	5.5	4/			BOU
2004 06 15.81		M	8.9	TK	8.0	B		15	4	4			DIJ
2004 06 15.89		M	8.0	TT	3.0	B		8	7	5			MAN02
2004 06 15.90		M	7.6	TT	8.0	B		10	13	4			HOR02
2004 06 15.92		M	8.0	TK	5.0	B		10	7	D5			GUZ
2004 06 15.93		S	8.1	TK	5.0	B		7	8	5			GON05
2004 06 15.94		S	8.4	TK	10.0	B		25	7	5			GON05
2004 06 16.48	x	S	9.3	TJ	15.0	R	5	21	2.7	5			MIY01
2004 06 16.68	x	B	8.7	TJ	30.4	L	5	61	3.8	6/	5	m 130	NAG04
2004 06 16.81		M	8.7	TK	8.0	B		15	5	5			BOU
2004 06 16.81		M	8.8	TK	8.0	B		15	5	4			DIJ
2004 06 16.89		S	7.6	TI	5.0	B		7	9	s4			SCA02
2004 06 16.90		M	7.6	TT	8.0	B		10	12	3/			HOR02
2004 06 17.85		M	8.7	TK	8.0	B		15	5	5			BOU
2004 06 17.85		M	8.8	TK	8.0	B		15	4.5	4			DIJ
2004 06 17.88		M	8.4	TT	6	R	10	30	6	6			MAN02
2004 06 17.89		M	8.3	TT	3.0	B		8	11	4			MAN02
2004 06 17.90		M	7.6	TT	8.0	B		10	15	3			HOR02
2004 06 17.92		M	8.0	TK	5.0	B		10	8	d5			GUZ
2004 06 17.95		S	8.7	TI	6.0	B		20	8	3/			SAR02
2004 06 18.82		M	8.5	HD	6	R	10	30	5	1			KOZ02
2004 06 18.87		M	8.6	TK	8.0	B		15	4.5	4/			BOU
2004 06 18.87		M	8.7	TK	8.0	B		15	4	4/			DIJ
2004 06 19.80		M	8.5	TK	8.0	B		15	4.5	5			BOU
2004 06 19.80		M	8.6	TK	8.0	B		15	5	4/			DIJ
2004 06 19.87		S	7.4	TI	5.0	B		7	12	s4/			SCA02
2004 06 19.94		S	8.0	TJ	15.0	R	8	75	5	4			DIE02
2004 06 20.51	x	M	8.4	HV	15.0	B		25	8	5			MIT
2004 06 20.51	x	S	8.2	TJ	8.0	B		11	9	5			NAG08
2004 06 21.49		S	8.3	TJ	7.0	B		10	9	6			END
2004 06 21.91		M	8.0	TK	5.0	B		10	8	d5	0.2	165	GUZ
2004 06 21.93		S	8.0	TK	5.0	B		7	9	5			GON05
2004 06 21.95		S	8.3	TI	6.0	B		20	10	3/			SAR02
2004 06 21.99		M	7.5	TT	8.0	B		10	18	3			HOR02
2004 06 22.84		B	8.1	TJ	5.0	B		7	10	4/			ADA05
2004 06 22.89		M	8.0	TK	5.0	B		10	7	d5	0.3	165	GUZ
2004 06 22.91		M	7.4	TT	8.0	B		10	17	3			HOR02
2004 06 22.95		M	8.0	TJ	11	L	7	40	4	5			SHU
2004 06 23.85		S	7.5	TI	5.0	B		7	11	s4/			SCA02
2004 06 23.90		M	7.9	TK	5.0	B		10	9	d5	0.4	170	GUZ
2004 06 24.87		S	7.3	TI	5.0	B		7	12	s4/			SCA02
2004 06 24.88		M	8.0	S	11	L	7	40	3.5	5			SHU
2004 06 24.97		M	7.3	TT	3.0	B		8	14	4			MAN02
2004 06 24.97		M	7.4	TT	8.0	B		10	18	3			HOR02
2004 06 24.97		M	7.5	TT	6	R	10	30	9.0	5			MAN02
2004 06 25.02		S	7.5	TI	6.0	B		20	9	4	0.2	135	SAR02
2004 06 25.87		S	7.2	TI	5.0	B		7	14	s5			SCA02
2004 06 25.92		M	7.3	TT	8.0	B		10	16	3			HOR02
2004 06 25.93		M	7.3	TT	3.0	B		8	12.5	4			MAN02

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 06 25.93		M	8.2	HD	11	L	7	40	3	4/			SHU
2004 06 25.98		S	8.0	TT	8.0	B		15	6	4			SCH04
2004 06 26.01		S	7.6	TI	6.0	B		20	9	3/			SAR02
2004 06 26.87		S	7.3	TI	5.0	B		7	12	s5			SCA02
2004 06 26.88		M	7.7	TT	10	B	4	25	6	4			LEH
2004 06 26.88		M	8.0	HD	6	R		10	5	1			KOZ02
2004 06 26.98		S	7.6	TK	5	R	6	7	3	5			RES
2004 06 26.99		M	7.3	TT	8.0	B		10	17	3			HOR02
2004 06 27.11		S	7.6	TK	5.0	B		7	11	5			GON05
2004 06 27.12		S	8.0	TK	20.3	T	10	77	6	5	0.2	150	GON05
2004 06 27.91		S	7.4	TJ	15.0	R	8	75	4	6			DIE02
2004 06 27.93		M	7.3	TT	8.0	B		10	15	3/			HOR02
2004 06 27.95		S	8.2	TI	8.0	B		11	3	4	3	m	LAB02
2004 06 28.87		S	7.4	TI	5.0	B		7	10	s5			SCA02
2004 06 28.88		M	8.4	TJ	11	L	7	40	4	5			SHU
2004 06 28.97		M	7.3	TT	8.0	B		10	15	3/			HOR02
2004 06 28.98		M	7.4	TT	3.0	B		8	15	4			MAN02
2004 06 28.98		S	7.3	TJ	5.0	B		20	5	6			DIE02
2004 06 28.99		S	7.9	TK	6.0	B		15	7	4			DIJ
2004 06 29.74	x	M	7.8	TJ	8.0	B		11	8	5			NAG08
2004 06 29.97		M	7.7	TK	8.0	B		15	7	5/			BOU
2004 06 30.12		S	7.3	TK	5.0	B		7	12	5			GON05
2004 06 30.13		S	7.5	TK	10.0	B		25	10	5	0.2	140	GON05
2004 06 30.89		M	8.5	TJ	11	L	7	40	4.5	5			SHU
2004 07 01.91		M	7.9	TJ	11	L	7	40	3	5			SHU
2004 07 02.93		S	7.3	TJ	5.0	B		20	5	6			DIE02
2004 07 03.88		M	8.0	S	11	L	7	40	4	5			SHU
2004 07 03.92		S	7.4	TK	13	L	7	45	3.5	5/	0.1	125	RES
2004 07 03.96		M	7.7	TK	8.0	B		15	6.5	5			BOU
2004 07 04.88		S	6.8	TI	5.0	B		7	20	s5			SCA02
2004 07 04.90		B	8.0	TK	5.0	B		10	9.3	3			HAS02
2004 07 04.90		M	7.8	TJ	11	L	7	40	5	6			SHU
2004 07 04.92		S	7.6	TI	8.0	B		11	4	4	5	m	LAB02
2004 07 05.40		S	7.0	AA	10.0	B		25					SEA
2004 07 05.52	x	M	7.0	TK	3.5	B		7	15	5			YOS02
2004 07 05.83		S	6.9	TI	5.0	B		7	18	s5			SCA02
2004 07 05.91		S	7.7	TK	30	L	4	60	6	7			VAN16
2004 07 05.93		S	7.2	TJ	5.0	B		20	6	6			DIE02
2004 07 05.96		M	7.4	TK	6.0	B		15	7	5			DIJ
2004 07 05.97		M	7.5	TK	8.0	B		15	9.5	5	0.3	130	BOU
2004 07 06.00		S	7.8	TK	8.0	B		20	5	5			AM001
2004 07 06.49	x	M	7.2	TJ	8.0	B		11	10	5			NAG08
2004 07 06.90		M	7.6	TT	10	B	4	25	9	3			LEH
2004 07 06.90		S	7.5	TK	8.0	B		20	5	4/			AM001
2004 07 06.94		M	7.1	TT	8.0	B		10	17	4			HOR02
2004 07 06.97		M	7.3	TK	6.0	B		15	9	5			DIJ
2004 07 06.97		M	7.4	TK	8.0	B		15	9	5	0.3	125	BOU
2004 07 07.83		S	6.8	TI	5.0	B		7	18	s5			SCA02
2004 07 07.90		M	8.0	TJ	11	L	7	40	4	6			SHU
2004 07 07.93		S	7.0	TJ	5.0	B		20	6	6			DIE02
2004 07 08.43		S	6.8	AA	3.5	B		6	12				SEA
2004 07 08.56	x	M	7.7	TT	12.5	L	6	23	10	4			TSU02
2004 07 08.92		M	7.5	TJ	11	L	7	40	4.5	6			SHU
2004 07 09.83		S	6.6	TI	5.0	B		7	20	s5			SCA02
2004 07 10.61	x	M	7.3	HV	8.0	B		11	13	5			MIT
2004 07 10.90		M	7.6	TT	10	B	4	25	10	3			LEH
2004 07 10.91		M	7.0	TT	8.0	B		10	20	4			HOR02
2004 07 10.91		M	7.7	TJ	5	R		20	7	6			SHU
2004 07 10.91		M	7.8	TJ	41	L	4	89	3.5	6	20	m 140	SHU
2004 07 10.93		S	6.9	TJ	5.0	B		20	7	6			DIE02
2004 07 11.03		S	7.0	TI	8.0	B		20	6	5	0.1		MAN04
2004 07 11.51	x	M	6.8	TJ	3.5	B		7	14	6			NAG08
2004 07 11.55	x	M	7.2	HV	8.0	B		11	13	5			MIT

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.	
2004 07 11.90		M	7.0	TT	8.0	B		10	18	4			HOR02	
2004 07 11.92		S	7.5	TK	8.0	B		20	4	5			AM001	
2004 07 12.89		S	7.0	HV	8.0	B	5	20	10	5			MILO2	
2004 07 12.91		M	6.9	TT	8.0	B		10	19	4			HOR02	
2004 07 13.00		S	6.9	TK	5.0	B		7	15	5			GON05	
2004 07 13.01		S	7.1	TK	10.0	B		25	10	5	0.3	95	GON05	
2004 07 13.59	x	B	7.0	HV	5.0	B		10	8.2				NAG04	
2004 07 13.92		S	6.7	TJ	5.0	B		20	7	6			DIE02	
2004 07 14.50	x	M	6.6	TJ	8.0	B		11	12	5			NAG08	
2004 07 15.01		I	6.6	TK	0.0	E		1		7			GON05	
2004 07 15.01		S	6.8	TK	8.0	B		11	10	5			SOU01	
2004 07 15.02		B	6.6	TK	5.0	B		7	16	5			GON05	
2004 07 15.03		B	6.9	TK	10.0	B		25	10	6	0.4	95	GON05	
2004 07 16.17		M	7.0	HV	8.0	B		16	12	6	0.4	95	CRE01	
2004 07 16.50	x	M	7.3	TK	3.5	B		7	14	5			YOS02	
2004 07 16.89		B	7.3	TI	8.0	B		11	9	6	15	m	LAB02	
2004 07 16.90		M	6.8	TT	8.0	B		10	17	4			HOR02	
2004 07 16.92		B	7.2	SC	5.0	B		10	&12	4			KAN05	
2004 07 16.92		S	6.3	TJ	5.0	B		20	7	5			DIE02	
2004 07 16.93		M	7.4	TT	5.0	B		10	15	3			LEH	
2004 07 16.96		S	7.1	HV	6.3	B		9	11	4			KAM01	
2004 07 17.05		B	7.5	TK	5.0	B		10	6.4	4			HAS02	
2004 07 17.88		S	7.2	HV	8.0	B	5	20	10	5			MILO2	
2004 07 17.89		B	7.2	TI	8.0	B		11	10	6	18	m	LAB02	
2004 07 17.89		M	6.5	TT	5.0	B		7	20	5	0.6	105	ZNO	
2004 07 17.90		M	6.7	TT	8.0	B		10	16	4			HOR02	
2004 07 17.94		M	7.4	TT	8.0	B		10	15	3			LEH	
2004 07 18.64	x	M	6.9	TJ	8.0	B		11	13	5/			NAG08	
2004 07 18.89		M	7.2	TJ	5	R		20	7	5			SHU	
2004 07 18.90		M	6.6	TT	8.0	B		10	18	4	0.5	100	HOR02	
2004 07 19.73		M	7.4	HD	15	L	5	48	4.7	3			GRI01	
2004 07 19.89		M	6.4	HD	11	B		20	7	5	0.2	95	NEV	
2004 07 19.93		M	6.7	TT	8.0	B		10	17	4	0.6	105	HOR02	
2004 07 19.93		M	7.3	TT	8.0	B		10	15	3			LEH	
2004 07 19.96		M	7.2	TJ	11	L	7	40	10	6			SHU	
2004 07 19.97		S	6.8	TK	20.3	T	10	57	10	5	>0.5	110	ROB06	
2004 07 20.49	x	M	6.8	TJ	3.5	B		7	13	6			NAG08	
2004 07 20.52	x	M	7.1	HV	8.0	B		11	13	5			MIT	
2004 07 20.90		B	7.3	TK	5.0	B		10	10.7	4			HAS02	
2004 07 20.90		S	6.6	TJ	5.0	B		20	6	6			DIE02	
2004 07 20.93		S	6.7	TK	5.0	B		7	17	5			GON05	
2004 07 20.94		M	6.6	TT	8.0	B		10	18	4	0.6	100	HOR02	
2004 07 20.94		M	6.8	TK	8.0	B		15	11	5	0.4	95	BOU	
2004 07 20.96		S	6.8	HV	6.3	B		9	12	4/			KAM01	
2004 07 20.97		M	7.3	TK	6.0	B		15	11	5/	20	m	90	DIJ
2004 07 21.90		S	7.1	TK	8.0	B		20	7	4			AM001	
2004 07 21.90		S	7.3	TK	5.0	B		7					AM001	
2004 07 21.92		M	7.1	TT	8.0	B		10	15	3			LEH	
2004 07 21.94		M	6.6	TT	8.0	B		10	16	4/	0.5	100	HOR02	
2004 07 21.95		M	6.8	HD	19	L	5	38	9	6			SHU	
2004 07 22.75		M	7.6	HI	15	L	8	48	7	4			GRI01	
2004 07 22.89		B	7.4	TK	5.0	B		10	8.1	4			HAS02	
2004 07 22.90		S	7.1	TK	8.0	B		20	7	5			AM001	
2004 07 22.90		S	7.2	TK	5.0	B		7					AM001	
2004 07 22.91		M	6.7	TT	8.0	B		10	16	4/	0.9	100	HOR02	
2004 07 22.94		M	6.2	HD	19	L	5	53	5.3	6			SHU	
2004 07 23.63	x	B	7.0	HV	10.0	B		26					NAG04	
2004 07 23.86		M	6.4	TT	5.0	B		7	18	4/	1.2	105	ZNO	
2004 07 23.87		B	6.8	HD	11	L	7	32	6	3	0.05	212	SER	
2004 07 23.90		M	6.3	HD	11	B		20	7	4/			NEV	
2004 07 23.91		S	6.6	TJ	5.0	B		20	6	6			DIE02	
2004 07 23.91		S	7.1	TK	8.0	B		20	7	5			AM001	
2004 07 23.91		S	7.2	TK	5.0	B		7	8	7			AM001	

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 23.92		M	6.5	HD	3	R		6	5	3			SHU
2004 07 23.95		M	6.9	TK	8.0	B		15	10	5/	0.4	110	BOU
2004 07 23.96		S	7.0	TK	8.0	B		11	8	5			SOU01
2004 07 23.97		M	7.0	TK	6.0	B		15	9	5/	20	m 102	DIJ
2004 07 24.90		B	7.6	HD	11	L	7	32	5	4			SER
2004 07 25.88		B	7.4	HD	11	L	7	32	3	4			SER
2004 07 25.94		S	6.8	TK	8.0	B		11	8	6			SOU01
2004 07 26.01		S	6.7	TK	5.0	B		7	15	5			GON05
2004 07 26.02		S	6.9	TK	10.0	B		25	10	5	0.3	100	GON05
2004 07 26.90		S	6.7	TK	8.0	B		20	8	5			AMO01
2004 07 26.91		S	6.9	TK	5.0	B		7		6			AMO01
2004 07 26.93		S	6.7	TJ	5.0	B		20	5	6			DIE02
2004 07 26.95		M	6.9	TK	8.0	B		15	11	5/	0.4	105	BOU
2004 07 26.97		M	7.0	TK	6.0	B		15	8	5	0.25	100	DIJ
2004 07 27.00		S	6.8:	TK	8.0	B		11					SOU01
2004 07 27.95		M	6.8	TK	8.0	B		15	9	5			BOU
2004 07 27.95		M	7.2	TK	8.0	B		15	9	5	0.2	100	DIJ
2004 07 27.96		B	6.9	TI	8.0	B		11	6	6			LAB02
2004 07 28.93		S	6.7	TJ	5.0	B		20	5	6			DIE02
2004 07 28.96		M	6.9	TK	8.0	B		15	9	5			BOU
2004 07 28.97		S	6.7	TK	8.0	B		11	5	6			SOU01
2004 07 29.93		M	7.2	HD	3	R		6	4.3	3/			SHU
2004 07 30.85		M	6.8	TI	8.0	B		10	18	3			LEH
2004 07 30.93		M	7.2	TJ	19	L	5	38	6	5/			SHU

Comet C/2003 T3 (Tabur)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 15.13		S	9.4	TI	23.5	T	10	57	2	2			LAB02
2004 05 16.03		S	10.1	TK	25.4	J		72	2.5	2			DIJ
2004 05 16.04		S	9.7	TK	25.4	J		72	2.0	2/			BOU
2004 05 16.12		S	9.7	TK	20.3	T	10	77	3	5			GON05
2004 05 17.92		S	10.7	TK	30	L	5	60	1	2			NEV
2004 05 19.00		S	9.7	TK	25.4	J		72		2			DIJ
2004 05 19.00		S	9.8	TK	25.4	J		72	1.7	3			BOU
2004 05 22.94		S	9.0	TJ	15.0	R	5	25					CHE03
2004 05 25.75	x	B	10.9	TJ	30.4	L	5	100	0.75	3			NAG04
2004 05 25.75	x	M	10.5	TJ	32.0	L	5	87	1.8	3			NAG08
2004 05 27.04		S	9.3	AC	13	L	7	45	1	4			RES
2004 05 28.99		S	9.7	TK	25.4	J		72	2.0	3			BOU
2004 05 29.04		S	9.2	AC	13	L	7	45	1.0	2/			RES
2004 05 30.03		M	9.2	TT	10	B	4	25	5	3			LEH
2004 06 02.02		S	9.7	TK	20.3	L	6	63	2	4			GUZ
2004 06 04.75		S	9.4	TJ	40.0	L	4	144	2.2	3			YOS04
2004 06 08.02		M	9.9	TT	10	B	4	25	5	3			LEH
2004 06 13.10		S	10.1	TK	20.3	T	10	77	2	4			GON05
2004 06 13.99		S	9.9	TK	20.3	L	6	63	2	3			GUZ
2004 06 14.74	x	S	10.3	TJ	32.0	L	5	58	2.4	4/			NAG08
2004 06 16.07		S	9.9:	TK	11.0	L	5	31		3			BOU
2004 06 22.01		S	10.0:	TK	20.3	L	6	63	2	3			GUZ
2004 06 23.99		S	10.1	TK	20.3	L	6	63	2	3			GUZ
2004 06 27.03		M	10.8	TT	11	R	15	47	3	3			LEH
2004 06 27.09		S	10.3	TK	20.3	T	10	77	3	4			GON05
2004 07 07.03		M	10.9	TT	11	R	15	47	2	3			LEH
2004 07 11.03		M	10.9	TT	11	R	15	47	2	3			LEH
2004 07 11.99		M	10.4	TK	13	L	8	69	2.4	3			HOR02
2004 07 13.13		S	10.9	TK	20.3	T	10	77	3	4			GON05
2004 07 13.75	x	S	10.9	TJ	32.0	L	5	87	1.4	4			NAG08
2004 07 23.97		S	10.8	TK	25.4	J	6	72	2.0	3			BOU
2004 07 26.09		S	10.9	TK	20.3	T	10	77	2	3			GON05
2004 07 28.01		S	10.9	TK	31.0	J	6	89	2	3			DIJ
2004 07 28.01		S	11.2	TK	31.0	J	6	89	1.7	3/			BOU

Comet C/2003 T4 (LINEAR)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 27.99		S	14.5	HS	31.0	J	6	143	& 0.3	6			BOU
2004 07 27.99		S	14.7	HS	31.0	J	6	143	0.5	7			DIJ

Comet C/2004 F4 (Bradfield)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 04 26.09		B	4.8	TK	5.0	B		10	1	8/			GUZ
2004 04 26.10		M	5.0	TT	8.0	B		10	1.5	8			HOR02
2004 04 27.04		B	5.1	TJ	5.0	B		7	3	5	0.5		CHE03
2004 04 27.08		B	5.3	TK	5.0	B		10	1	8			GUZ
2004 04 27.10		\$ S	5.1	TK	3.0	B		8		6/	1.5	305	HOE
2004 04 27.11		& S	5.0	TT	8.0	B		15	& 5	7	&0.5	300	SCH04
2004 04 27.49		a B	4.8	TJ	5.0	B		10		9	8		MOR
2004 04 28.07		B	5.2	TK	5.0	B		10	2	S8	5.5	300	GUZ
2004 04 28.07		S	5.0	TK	0.0	E		1		9	2	300	GUZ
2004 04 28.11		a S	4.6	TK	5.0	B		10	1.5	5	3.8	125	HAS02
2004 04 28.49		B	5.2	TJ	8.0	B		20		9	6	300	MOR
2004 04 28.49		B	5.2	TJ	5.0	B		10		9	6	300	MOR
2004 04 28.77		x S	5.3	TJ	12.0	R		22		6			MOM
2004 04 28.80		x M	5.5	TT	3.5	B		7					TSU02
2004 04 29.04		M	5.5	TK	15.2	L	5	44	1.5	7			GRA04
2004 04 29.08		M	5.5	TT	8.0	B		10	3	7/	3	300	HOR02
2004 04 29.80		x M	6.1	TT	3.5	B		7					TSU02
2004 04 30.08		M	5.8	TT	5.0	B		10	4	7	3.5	290	HOR02
2004 04 30.08		M	6.0	TT	10	B	4	25	3	7			LEH
2004 04 30.08		& M	6.5	TT	11	L	7	32	2.0	7	0.17	300	MAN02
2004 05 01.07		M	5.9	TK	5.0	B		10	3	S7	0.6	305	GUZ
2004 05 01.08		M	6.0	TT	5.0	B		10	4	6			LEH
2004 05 01.08		M	6.1	TT	10	B	4	25	3	7	0.58	319	LEH
2004 05 01.08		S	5.8	AC	6.0	B		7	& 2	5/	0.2	310	RES
2004 05 01.09		M	5.8	TK	6.0	B		15		7	0.5	296	DIJ
2004 05 01.09		M	6.8	TT	10	B	4	25	4	7	0.6	307	HOR03
2004 05 01.13		B	6.6	TI	8.0	B		12	2	6	15 m	300	SER02
2004 05 01.48		M	6.2	TJ	8.0	B		20		8	5.5	300	MOR
2004 05 01.77		xa M	6.1	TJ	14.1	B		25	3	7	&3	305	NAG08
2004 05 02.03		M	6.3	TK	7.0	R	7	24	2.5	6/			GRA04
2004 05 02.13		a B	6.6	TI	8.0	B		12	2	7	0.4	300	SER02
2004 05 02.48		a M	6.4	TJ	8.0	B		20		8	2.5	300	MOR
2004 05 04.07		M	6.7	TK	5.0	B		10	4	6			GUZ
2004 05 04.07		M	6.7	TT	5.0	B		10	5	6/			HOR02
2004 05 04.22		M	6.8	TK	7.0	R	7	24	3	6			GRA04
2004 05 05.08		M	6.9	TT	5.0	B		10	6	6	0.5	300	HOR02
2004 05 05.22		M	7.0	TK	7.0	R	7	24	2.5	5			GRA04
2004 05 08.08		S	7.8	AC	6.0	B		7	& 2	3			RES
2004 05 09.14		B	7.0	TI	8.0	B		11	3	5			LAB02
2004 05 10.05		M	7.8	TK	5.0	B		10	4	5	2.3	300	GUZ
2004 05 10.98		M	7.8	TJ	11	L	7	40	2	6	30 m		SHU
2004 05 11.87		M	8.1	TJ	11	L	7	40	2	6			SHU
2004 05 12.04		M	7.9	TT	5.0	B		10	7.5	3/	1.1	300	HOR02
2004 05 13.01		S	8.2	TK	20.3	T	10	77	3	4			GRA04
2004 05 14.73		xa M	8.5	TJ	15.0	B		25	4	4	1.5	305	MIT
2004 05 14.75		x S	8.8	TJ	10.0	B		20	3	5	0.5	300	NAG08
2004 05 14.76		x S	9.4	TJ	31.7	L		63	1.5	4			MIY01
2004 05 14.99		E	6.9	HD	6	L		20	4	4/			ROM
2004 05 15.03		S	8.3	TK	6.0	B		15	4.5	3			DIJ
2004 05 15.04		M	8.5	TK	20.3	L	6	63	4	5	0.5	300	GUZ
2004 05 15.06		S	8.2	AC	13	L	7	45	2	3			RES
2004 05 15.13		B	8.6	TI	23.5	T	10	57	4	3	20 m	311	LAB02
2004 05 16.01		M	8.4	TK	25.4	J		58	3.4	3/	0.25	312	DIJ
2004 05 16.02		S	8.5	TK	25.4	J		58	2.8	4	0.3	305	BOU
2004 05 16.06		S	8.4	AC	13	L	7	45	2	3/			RES
2004 05 16.08		S	9.4	AA	15.0	R	15	30	2	8			DIE02
2004 05 16.10		S	8.3	TK	20.3	T	10	77	3	6	0.5	310	GON05

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 16.11		B	8.7	TI	20	T	5	40	4	3	20	m 310	LAB02
2004 05 16.11		S	8.1	TK	8.0	B		11	3	7	0.7	310	GON05
2004 05 16.97		M	8.5	TK	31.0	J		72	3.3	4	0.25	302	BOU
2004 05 16.98		S	8.4	TK	8.0	B		15	4.5	4			DIJ
2004 05 16.98		S	8.6	TK	8.0	B		15	4.2	3			BOU
2004 05 17.91		S	9.9	HD	30	L	5	60	1.5	3	0.2	305	NEV
2004 05 17.92		S	8.9	TJ	15.0	R	5	25	2	2			CHE03
2004 05 17.97		M	9.6	TJ	11	L	7	40	1.5	4/			SHU
2004 05 18.03		M	8.7	TT	5.0	B		10	6.5	4			HOR02
2004 05 18.04		S	9.8	TK	10.0	R	5	25	4.3	4			HAS02
2004 05 18.98		S	8.6	TK	25.4	J		58	2.0	3/	23	m 295	DIJ
2004 05 18.98		S	8.7	TK	25.4	J		58	3.2	4	0.3	300	BOU
2004 05 19.05		S	9.2	TT	20.0	L	4	42	& 2	5			SCH04
2004 05 20.01		S	8.8	TK	15.0	R	5	38	5.3	3/			MEY
2004 05 20.03		M	8.9	TT	8.0	B		10	6	3/	0.5	300	HOR02
2004 05 20.04		S	9.7	AA	15.0	R	15	30	1	6			DIE02
2004 05 20.97		M	10.5	TJ	11	L	7	40	1.5	3/			SHU
2004 05 22.93		S	9.1:	TJ	15.0	R	5	25	2	1			CHE03
2004 05 23.00		S	9.2	TK	25.4	J		58	2.8	3			BOU
2004 05 23.00		S	9.2	TK	25.4	J		58	2.1	2/			DIJ
2004 05 23.98		E	9.2	HD	6.0	B		20	2	4			ROM
2004 05 24.10		B	10.6	TI	20	T	10	80	2	2			LAB02
2004 05 24.74	x	S	10.2	TJ	31.7	L		63	2.5	3/			MIY01
2004 05 24.76	x	S	10.2	TK	25.4	L	4	46	2.2	2/	8	m 315	YOSO2
2004 05 25.72	x	B	10.1	TJ	30.4	L	5	61	2.6	1/			NAG04
2004 05 25.74	x	M	11.4	TJ	32.0	L	5	87	0.8	5	3	m 290	NAG08
2004 05 27.02		S	10.3	AC	13	L	7	45	1.0	2			RES
2004 05 28.99		S	10.1	TK	25.4	J		72	2.2	2/			BOU
2004 05 29.01		S	10.8	AC	13	L	7	45	1.0	1/			RES
2004 05 29.04		M	9.6	TT	10	B	4	25	3	6			LEH
2004 05 30.01		M	9.8	TT	10	B	4	25	3	6			LEH
2004 05 30.01		S	11.0	AC	13	L	7	45	0.8	2			RES
2004 05 31.04		M	9.8	TT	13	L	8	69	1.9	3			HOR02
2004 06 02.01		S	10.8	TK	20.3	L	6	63	1.5	4			GUZ
2004 06 13.08		S	11.5	TK	20.3	T	10	100	1.2	3			GON05
2004 06 13.98		S	11.4	TK	20.3	L	6	63	2	3			GUZ
2004 06 14.72	x	S	12.7:	TJ	32.0	L	5	87	1.2	3			NAG08
2004 06 21.99		S	12.0	TK	20.3	L	6	63	1.5	2/			GUZ
2004 06 23.98		S	12.2	TK	20.3	L	6	63	1.5	2			GUZ
2004 07 10.94		M	12.7	TJ	41	L	4	159	1	2/			SHU
2004 07 18.93		M	13.6	TJ	41	L	4	198	0.56	2/			SHU

Comet C/2004 H6 (SWAN)

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 05 28.80		B	7.3	AA	10.0	B		25	3	7			SEA
2004 05 29.35		S	7.3	TK	8.0	B		20	4	7			AM001
2004 05 30.80		B	7.6	AA	10.0	B		25	3	7	0.3	145	SEA
2004 06 10.36		S	7.6	TK	8.0	B		20	4	6/			AM001
2004 06 13.36		B	7.6	TK	8.0	B		20	3	6			AM001
2004 06 14.37		S	7.5	TK	8.0	B		20	4	3/			AM001
2004 06 16.36		S	7.6	TK	8.0	B		20	4	6			AM001
2004 06 20.74		S	7.8	AA	5.0	B		10					SEA
2004 06 21.37		S	7.8	TK	8.0	B		20	3	3			AM001
2004 06 25.75		S	7.9	AA	5.0	B		10	6	4			SEA
2004 06 29.76	xs	M	8.3:	TJ	10.0	B		20	4				NAG08
2004 07 06.20		S[	8.7	TK	14.6	L		45					AM001
2004 07 10.73	xs	M	9.3	HV	15.0	B		25	6	3			MIT
2004 07 12.04	w	M	8.3	TT	8.0	B		10	8	4			HOR02
2004 07 12.22		S	9.0	TK	8.0	B		20	3	1			AM001
2004 07 13.08		S	8.9	TK	10.0	B		25	5	2			GON05
2004 07 13.09		S[	8.5	TJ	8.0	R	4	28					CHE03
2004 07 13.71	x	S	8.9	HV	10.0	B		26	5.5	1/			NAG04

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

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2004 07 13.76	x	S	9.2	TJ	32.0	L	5	58	4.5	1			NAG08
2004 07 14.60		S	9.4	AA	10.0	B		25	4	3			SEA
2004 07 15.08		S[	8.5	TJ	8.0	R	4	28					CHE03
2004 07 15.13		S	8.8	TK	10.0	B		25	6	3			GON05
2004 07 15.14		S	8.6	TK	8.0	B		11	6	2			GON05
2004 07 15.14		S	9.2	TK	20.3	T	10	77	6	2			GON05
2004 07 16.09		S	10.8	TJ	40.0	R	15	100	4	0			CHE03
2004 07 17.04		S	8.4	TT	8.0	B		10	8	3			HOR02
2004 07 18.04		M	8.7	TT	10	B	4	25	8	2/			LEH
2004 07 18.09		S	8.2	TI	23.5	T	10	57	4	2	2	m	LAB02
2004 07 19.20		S	9.4	TK	20.3	T	10	57	4	1			ROB06
2004 07 20.02		S	8.7	TT	8.0	B		10	7	2			HOR02
2004 07 21.05		S	8.7	TK	8.0	B		11	6	2			GON05
2004 07 21.96		M	9.6	TJ	19	L	5	38	1.5	3			SHU
2004 07 22.02		S	8.7	TT	8.0	B		10	8	1/			HOR02
2004 07 23.09		S	10.3	TJ	14.6	L		45		7			AMO01
2004 07 24.01		S	9.6	TK	25.4	J	6	47	5.5	1/			BOU
2004 07 26.08		S	10.5	TK	20.3	T	10	77	6	2			GON05
2004 07 28.03		S	9.8	TK	31.0	J	6	58	6.5	0/			DIJ
2004 07 28.03		S	10.2	TK	31.0	J	6	58	5.5	1			BOU

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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 135-136 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.
2004 06 30.73		C	18.7	:GA	60.0Y	6	a240			9			S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet 10P/Tempel

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 24.57		C	18.6	GA	60.0Y	6	a240			9			S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet 22P/Kopff

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 01 22.84		d	k[18.5	LA	35	L	5	a900					C 0.30m	T24	GAI	5*		ST6	HOR02

Comet 28P/Neujmin

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 01 22.95		d	k	18.2	LA	35	L	5	a960				C 0.17m	T24	GAI	5*		ST6	HOR02
2004 01 24.02		d	k	18.2	LA	35	L	5	a840				C 0.18m	T24	GAI	5*		ST6	HOR02
2004 01 24.89		d	k	18.4	LA	35	L	5	A080				C 0.13m	T24	GAI	5*		ST6	HOR02
2004 02 11.89		d	k	18.3	LA	35	L	5	a960				C 0.20m	T24	GAI	5*		ST6	HOR02
2004 02 20.86		d	k	18.8	LA	35	L	5	a960				C 0.20m	T24	GAI	5*		ST6	HOR02

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 06 26.99		d	C	12.1	LB	6.3M	8	a900	1.6				C 3.20m	K40	GAI	5*		ST7	SRB
2004 06 26.99		d	C	12.2	LB	6.3M	8	a900	1.6				C 2.00m	K40	GAI	5*		ST7	SRB
2004 06 26.99		d	C	12.4	LB	6.3M	8	a900	1.6				C 1.60m	K40	GAI	5*		ST7	SRB
2004 06 26.99		d	C	12.5	LB	6.3M	8	a900	1.6				C 1.00m	K40	GAI	5*		ST7	SRB
2004 06 26.99		d	C	13.2	LB	6.3M	8	a900	1.6				C 0.50m	K40	GAI	5*		ST7	SRB
2004 06 28.99		d	C	11.6	LB	6.3M	8	a900	1.6				C 2.00m	K40	GAI	5*		ST7	SRB
2004 06 28.99		d	C	11.7	LB	6.3M	8	a900	1.6				C 3.20m	K40	GAI	5*		ST7	SRB
2004 06 28.99		d	C	11.9	LB	6.3M	8	a900	1.6				C 1.60m	K40	GAI	5*		ST7	SRB
2004 06 28.99		d	C	12.3	LB	6.3M	8	a900	1.6				C 1.00m	K40	GAI	5*		ST7	SRB
2004 06 28.99		d	C	13.1	LB	6.3M	8	a900	1.6				C 0.50m	K40	GAI	5*		ST7	SRB
2004 06 30.74		C	12.5	:GA	60.0Y	6	a120		1.6	7			S 1.6 m	SIA	IPL	5	U	Ap7	NAK01
2004 06 30.74		c	14.8	:GA	60.0Y	6	a120						S10.0 s	SIA	IPL	5	U	Ap7	NAK01

Comet 40P/Väisälä

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 03 22.96		d	C	13.8	LB	6.3M	8	a900	0.6				C 1.25m	K40	GAI	5*		ST7	SRB
2004 03 22.96		d	C	14.2	LB	6.3M	8	a900	0.6				C 0.75m	K40	GAI	5*		ST7	SRB
2004 03 22.96		d	C	14.7	LB	6.3M	8	a900	0.6				C 0.50m	K40	GAI	5*		ST7	SRB
2004 03 30.97		d	C	14.9	LB	6.3M	8	a900	0.6				C 1.25m	K40	GAI	5*		ST7	SRB
2004 03 30.97		d	C	15.2	LB	6.3M	8	a900	0.6				C 0.75m	K40	GAI	5*		ST7	SRB
2004 03 30.97		d	C	15.3	LB	6.3M	8	a900	0.6				C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 08.95		d	C	14.5	LB	6.3M	8	a900	0.7				C 1.50m	K40	GAI	5*		ST7	SRB
2004 04 08.95		d	C	14.9	LB	6.3M	8	a900	0.7				C 0.75m	K40	GAI	5*		ST7	SRB
2004 04 12.95		d	C	15.0	LB	6.3M	8	a900	0.6				C 0.60m	K40	GAI	5*		ST7	SRB
2004 04 12.95		d	C	15.3	LB	6.3M	8	a900	0.6				C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 13.93		d	C	14.7	LB	6.3M	8	a900	0.7				C 1.50m	K40	GAI	5*		ST7	SRB
2004 04 13.93		d	C	14.7	LB	6.3M	8	a900	0.7		0.6m284		C 1.00m	K40	GAI	5*		ST7	SRB
2004 04 13.93		d	C	14.8	LB	6.3M	8	a900	0.7		0.6m284		C 0.75m	K40	GAI	5*		ST7	SRB
2004 04 13.93		d	C	15.3	LB	6.3M	8	a900	0.7		0.6m284		C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 14.93		d	C	14.1	LB	6.3M	8	a900	0.6				C 1.00m	K40	GAI	5*		ST7	SRB
2004 04 14.93		d	C	14.4	LB	6.3M	8	a900	0.6				C 0.75m	K40	GAI	5*		ST7	SRB
2004 04 14.93		d	C	14.9	LB	6.3M	8	a900	0.6				C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 16.66		ax	C	15.2	HV	35.0C	10	a240	0.5	5	3.5m267		S 0.69m	KAIaSI4	5		ST2	TSU02	
2004 05 11.62		ax	C	15.3	HV	35.0C	10	a120	0.5	4	1.0m230		S 0.90m	KAIaSI4	5		ST2	TSU02	
2004 05 14.58		ax	C	15.8	HV	35.0C	10	a120	0.4	5	1.5m260		S 1.03m	KAIaSI4	5		ST2	TSU02	
2004 05 20.06		d	k	15.4	LA	35	L	5	a400	0.67			C 0.67m	T24	GAI	5*		ST6	HOR02
2004 05 20.06		d	k	15.5	LA	35	L	5	a400	0.67			C 0.50m	T24	GAI	5*		ST6	HOR02
2004 05 27.62		C	15.5	GA	60.0Y	6	a120		0.8				S 0.8 m	SIA	IPL	5	U	Ap7	NAK01

Comet 40P/Väisälä [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 30.04	d	k	14.9	LA	35	L	5	a240	0.63		2.1m267	C	2.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 30.04	d	k	15.3	LA	35	L	5	a240	0.63		2.1m267	C	1.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 30.04	d	k	15.6	LA	35	L	5	a240	0.63		2.1m267	C	0.63m	T24	GAI	5*P	ST6	HOR02	
2004 06 07.97	d	C	15.0	LB	6.3M		8	a900	0.6			C	0.75m	K40	GAI	5*	ST7	SRB	
2004 06 07.97	d	C	15.2	LB	6.3M		8	a900	0.6			C	0.60m	K40	GAI	5*	ST7	SRB	
2004 06 07.97	d	C	15.5	LB	6.3M		8	a900	0.6			C	0.50m	K40	GAI	5*	ST7	SRB	
2004 06 08.01	d	k	16.0	LA	35	L	5	a360	0.62			C	0.62m	T24	GAI	5*P	ST6	HOR02	
2004 06 13.98	d	k	16.2	LA	35	L	5	a400	0.48			C	0.48m	T24	GAI	5*	ST6	HOR02	
2004 06 14.58	axC		15.7	HV	35.0C		10	a120	0.4	4		S	1.26m	KAIaSI4		5	ST2	TSU02	
2004 06 21.97	d	C	14.9	LB	6.3M		8	a720	0.8			C	1.00m	K40	GAI	5*	ST7	SRB	
2004 06 21.97	d	C	15.3	LB	6.3M		8	a720	0.8			C	0.80m	K40	GAI	5*	ST7	SRB	
2004 06 21.97	d	C	15.7	LB	6.3M		8	a720	0.8			C	0.50m	K40	GAI	5*	ST7	SRB	
2004 06 26.96	d	k	16.4	LA	35	L	5	a400	0.52			C	0.52m	T24	GAI	5*	ST6	HOR02	
2004 07 06.59	axC		17.2	HV	35.0C		10	a840	0.3			S	0.65m	KAIaSI4		5	ST2	TSU02	

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 07 13.67		C	16.4	GA	60.0Y		6	a240	0.55				S	0.55m	SIA	IPL	5	U	Ap7	NAK01

Comet 43P/Wolf-Harrington

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.	
2004 01 22.78	d	k	12.7	LA	35	L	5	a540	2.00		4.3m	47	C	2.00m	T24	GAI	5*P	ST6	HOR02	
2004 01 22.78	d	k	13.1	LA	35	L	5	a540	2.00		4.3m	47	C	1.00m	T24	GAI	5*P	ST6	HOR02	
2004 01 22.78	d	k	13.6	LA	35	L	5	a540	2.00		4.3m	47	C	0.50m	T24	GAI	5*P	ST6	HOR02	
2004 01 23.77	d	k	12.5	LA	35	L	5	a540	1.80		3.3m	49	C	3.00m	T24	GAI	5*P	ST6	HOR02	
2004 01 23.77	d	k	12.7	LA	35	L	5	a540	1.80		3.3m	49	C	1.80m	T24	GAI	5*P	ST6	HOR02	
2004 01 23.77	d	k	13.1	LA	35	L	5	a540	1.80		3.3m	49	C	1.10m	T24	GAI	5*P	ST6	HOR02	
2004 01 23.77	d	k	13.6	LA	35	L	5	a540	1.80		3.3m	49	C	0.50m	T24	GAI	5*P	ST6	HOR02	
2004 01 24.79	d	k	12.7	LA	35	L	5	a540	1.70		3.9m	45	C	3.00m	T24	GAI	5*P	ST6	HOR02	
2004 01 24.79	d	k	12.8	LA	35	L	5	a540	1.70		3.9m	45	C	1.70m	T24	GAI	5*P	ST6	HOR02	
2004 01 24.79	d	k	13.1	LA	35	L	5	a540	1.70		3.9m	45	C	1.00m	T24	GAI	5*P	ST6	HOR02	
2004 01 24.79	d	k	13.6	LA	35	L	5	a540	1.70		3.9m	45	C	0.50m	T24	GAI	5*P	ST6	HOR02	
2004 02 07.85	d	C	12.9	LB	6.3M		8	a600	0.9		1.2m	53	C	1.50m	K40	GAI	5*	ST7	SRB	
2004 02 07.85	d	C	13.0	LB	6.3M		8	a600	0.9		1.2m	53	C	0.90m	K40	GAI	5*	ST7	SRB	
2004 02 07.85	d	C	13.2	LB	6.3M		8	a600	0.9		1.2m	53	C	0.75m	K40	GAI	5*	ST7	SRB	
2004 02 07.85	d	C	13.6	LB	6.3M		8	a600	0.9		1.2m	53	C	0.50m	K40	GAI	5*	ST7	SRB	
2004 02 20.83	d	k	12.6	LA	35	L	5	a720	1.5		2.5m	45	C	1.50m	T24	GAI	5*P	ST6	HOR02	
2004 02 20.83	d	k	12.9	LA	35	L	5	a720	1.5		2.5m	45	C	1.00m	T24	GAI	5*P	ST6	HOR02	
2004 02 20.83	d	k	13.5	LA	35	L	5	a720	1.5		2.5m	45	C	0.50m	T24	GAI	5*P	ST6	HOR02	
2004 03 14.80	d	k	12.5	LA	35	L	5	a480	2.0		1.7m	53	C	2.00m	T24	GAI	5*P	ST6	HOR02	
2004 03 14.80	d	k	12.9	LA	35	L	5	a480	2.0		1.7m	53	C	1.00m	T24	GAI	5*P	ST6	HOR02	
2004 03 14.80	d	k	13.3	LA	35	L	5	a480	2.0		1.7m	53	C	0.50m	T24	GAI	5*P	ST6	HOR02	
2004 03 17.79	d	k	12.1	LA	35	L	5	a540	3.4		3.3m	55	C	3.40m	T24	GAI	5*P	ST6	HOR02	
2004 03 17.79	d	k	12.3	LA	35	L	5	a540	3.4		3.3m	55	C	2.00m	T24	GAI	5*P	ST6	HOR02	
2004 03 17.79	d	k	12.8	LA	35	L	5	a540	3.4		3.3m	55	C	1.00m	T24	GAI	5*P	ST6	HOR02	
2004 03 17.79	d	k	13.2	LA	35	L	5	a540	3.4		3.3m	55	C	0.50m	T24	GAI	5*P	ST6	HOR02	
2004 03 22.85	d	C	11.9	LB	6.3M		8	a900	1.0		1.5m	63	C	1.75m	K40	GAI	5*	ST7	SRB	
2004 03 22.85	d	C	12.0	LB	6.3M		8	a900	1.0		1.5m	63	C	1.25m	K40	GAI	5*	ST7	SRB	
2004 03 22.85	d	C	12.1	LB	6.3M		8	a900	1.0		1.5m	63	C	1.00m	K40	GAI	5*	ST7	SRB	
2004 03 22.85	d	C	12.2	LB	6.3M		8	a900	1.0		1.5m	63	C	0.75m	K40	GAI	5*	ST7	SRB	
2004 03 22.85	d	C	12.7	LB	6.3M		8	a900	1.0		1.5m	63	C	0.50m	K40	GAI	5*	ST7	SRB	
2004 03 30.85	d	C	11.3	LB	6.3M		8	a900	0.9		> 1	m	63	C	1.50m	K40	GAI	5*	ST7	SRB
2004 03 30.85	d	C	11.5	LB	6.3M		8	a900	0.9		> 1	m	63	C	1.00m	K40	GAI	5*	ST7	SRB
2004 03 30.85	d	C	12.0	LB	6.3M		8	a900	0.9		> 1	m	63	C	0.75m	K40	GAI	5*	ST7	SRB
2004 03 30.85	d	C	12.6	LB	6.3M		8	a900	0.9		> 1	m	63	C	0.50m	K40	GAI	5*	ST7	SRB
2004 04 08.82	d	k	12.2	LA	35	L	5	a480	2.1		2.3m	59	C	2.10m	T24	GAI	5*P	ST6	HOR02	
2004 04 08.82	d	k	12.7	LA	35	L	5	a480	2.1		2.3m	59	C	1.00m	T24	GAI	5*P	ST6	HOR02	
2004 04 08.82	d	k	13.3	LA	35	L	5	a480	2.1		2.3m	59	C	0.50m	T24	GAI	5*P	ST6	HOR02	
2004 04 08.84	d	C	12.6	LB	6.3M		8	a900	0.8		> 1	m	53	C	1.50m	K40	GAI	5*	ST7	SRB
2004 04 08.84	d	C	12.8	LB	6.3M		8	a900	0.8		> 1	m	53	C	1.25m	K40	GAI	5*	ST7	SRB
2004 04 08.84	d	C	13.2	LB	6.3M		8	a900	0.8		> 1	m	53	C	0.75m	K40	GAI	5*	ST7	SRB

Comet 43P/Wolf-Harrington [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 08.84	d	C	14.0	LB	6.3M	8	a900	0.8			> 1	m 53	C 0.35m	K40	GAI	5*	ST7	SRB	
2004 04 12.43	ax	C	13.6	HV	35.0C	10	a180	0.6		5	0.8m	70	S 0.61m	KAIa	SI4	5	ST2	TSU02	
2004 04 12.81	d	k	12.7	LA	35	L	5 a320	> 1.4					C 1.40m	T24	GAI	5*P	ST6	HOR02	
2004 04 12.81	d	k	12.9	LA	35	L	5 a320	> 1.4					C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 04 12.81	d	k	13.3	LA	35	L	5 a320	> 1.4					C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 04 12.85	d	C	12.1	LB	6.3M	8	a840	1.0			> 1	m 54	C 1.50m	K40	GAI	5*	ST7	SRB	
2004 04 12.85	d	C	12.2	LB	6.3M	8	a840	1.0			> 1	m 54	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 12.85	d	C	13.1	LB	6.3M	8	a840	1.0			> 1	m 54	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 15.82	d	C	12.4	LB	6.3M	8	a900	0.7			> 1	m 53	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 04 15.82	d	C	13.2	LB	6.3M	8	a900	0.7			> 1	m 53	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 15.82	d	C	13.6	LB	6.3M	8	a900	0.7			> 1	m 53	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 21.44	ax	C	13.0	HV	35.0C	10	a 90	0.5		4			S 1.18m	KAIa	SI4	5	ST2	TSU02	

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 05 24.73	a	C	17.1	GA	60.0Y	6	a240	0.35					S 0.35m	SIA	IPL	5	U	Ap7	NAK01
2004 06 16.69	sx	C	16.6	TJ	25.0L	5	a120	0.2					S 0.2 m	K42	SI4	5	U	SE7	OHS
2004 06 30.69	a	C	16.2	GA	60.0Y	6	a120	0.35					S 0.35m	SIA	IPL	5	U	Ap7	NAK01
2004 07 13.63		C	15.3	GA	60.0Y	6	a120	0.5			1.7m	276	S 0.5 m	SIA	IPL	5	U	Ap7	NAK01

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 06 29.03	d	C	14.5	LB	6.3M	8	a600	0.8					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 29.03	d	C	14.6	LB	6.3M	8	a600	0.8					C 0.80m	K40	GAI	5*	ST7	SRB	
2004 06 29.03	d	C	15.0	LB	6.3M	8	a600	0.8					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 30.76	ax	C	14.8	HV	35.0C	10	a600	0.3		5	1.2m	260	S 0.73m	KAIa	SI4	5	ST2	TSU02	

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 05 24.71	a	C	15.5	GA	60.0Y	6	a240	0.65					S 0.65m	SIA	IPL	5	U	Ap7	NAK01
2004 06 16.67	x	C	16.3	TJ	25.0L	5	a120	0.2					S 0.2 m	K42	SI4	5	U	SE7	OHS
2004 07 13.60		C	15.6	GA	60.0Y	6	a240	0.5					S 0.5 m	SIA	IPL	5	U	Ap7	NAK01

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 06 16.74	sx	C	13.4	TJ	25.0L	5	a120	0.6			1.6m	248	S 0.6 m	K42	SI4	5	U	SE7	OHS

Comet 94P/Russell

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 24.63	a	C	18.3	GA	60.0Y	6	a240	0.25					S 0.25m	SIA	IPL	5	U	Ap7	NAK01

Comet 117P/Helin-Roman-Alu

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 21.57	x	C	17.4	TJ	25.0L	5	a120	0.2					S 0.2 m	K42	SI4	5	U	SE7	OHS

Comet 118P/Shoemaker-Levy

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 03 31.01	d	k	15.1	LA	35	L	5 a540	0.67			0.5m	277	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 03 31.01	d	k	15.2	LA	35	L	5 a540	0.67			0.5m	277	C 0.67m	T24	GAI	5*P	ST6	HOR02	
2004 03 31.01	d	k	15.3	LA	35	L	5 a540	0.67			0.5m	277	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 04 09.01	d	k	15.0	LA	35	L	5 a900	1.0			1.9m	275	C 1.50m	T24	GAI	5*P	ST6	HOR02	
2004 04 09.01	d	k	15.2	LA	35	L	5 a900	1.0			1.9m	275	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 04 09.01	d	k	15.5	LA	35	L	5 a900	1.0			1.9m	275	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 04 12.99	d	k	15.1	LA	35	L	5 a320	0.83			2.6m	278	C 1.50m	T24	GAI	5*	ST6	HOR02	
2004 04 12.99	d	k	15.4	LA	35	L	5 a320	0.83			2.6m	278	C 0.83m	T24	GAI	5*	ST6	HOR02	
2004 04 12.99	d	k	15.8	LA	35	L	5 a320	0.83			2.6m	278	C 0.50m	T24	GAI	5*	ST6	HOR02	

Comet 123P/West-Hartley [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 14.54	axC		15.1	HV	35.0C	10	a120	0.7	5		2.0m299	S	1.13m	KAIaSI4	5		ST2	TSU02	
2004 05 19.94	d k		13.3	LA	35	L	5 a400	1.2			7.5m309	C	4.00m	T24	GAI	5*	ST6	HOR02	
2004 05 19.94	d k		13.5	LA	35	L	5 a400	1.2			7.5m309	C	3.00m	T24	GAI	5*	ST6	HOR02	
2004 05 19.94	d k		14.0	LA	35	L	5 a400	1.2			7.5m309	C	2.00m	T24	GAI	5*	ST6	HOR02	
2004 05 19.94	d k		14.5	LA	35	L	5 a400	1.2			7.5m309	C	1.20m	T24	GAI	5*	ST6	HOR02	
2004 05 19.94	d k		15.4	LA	35	L	5 a400	1.2			7.5m309	C	0.50m	T24	GAI	5*	ST6	HOR02	
2004 05 19.99	d C		15.4	LB	6.3M	8	a900	0.6					1.00m	K40	GAI	5*	ST7	SRB	
2004 05 19.99	d C		15.8	LB	6.3M	8	a900	0.6					0.50m	K40	GAI	5*	ST7	SRB	
2004 06 13.90	d k		15.6	LA	35	L	5 a400	0.57			2.1m302	C	1.00m	T24	GAI	5*	ST6	HOR02	
2004 06 13.90	d k		16.2	LA	35	L	5 a400	0.57			2.1m302	C	0.57m	T24	GAI	5*	ST6	HOR02	
2004 06 14.52	axC		15.6	HV	35.0C	10	a120	0.4	4				1.53m	KAIaSI4	5		ST2	TSU02	
2004 07 06.50	axC		16.4	HV	35.0C	10	A 80	0.5	2				1.05m	KAIaSI4	5		ST2	TSU02	

Comet 130P/McNaught-Hughes

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 13.56		C	17.0:	GA	60.0Y	6	a240	0.35					S 0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2000 SV_74 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 15.07	d k		16.1	LA	35	L	5 a520	0.57					C 1.00m	T24	GAI	5*	ST6	HOR02	
2004 04 15.07	d k		16.5	LA	35	L	5 a520	0.57					C 0.57m	T24	GAI	5*	ST6	HOR02	
2004 05 19.95	d k		16.9	LA	35	L	5 a660	0.55					C 1.00m	T24	GAI	5*	ST6	HOR02	
2004 05 19.95	d k		17.2	LA	35	L	5 a660	0.55					C 0.55m	T24	GAI	5*	ST6	HOR02	

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 01 22.79	d k		13.3	LA	35	L	5 a540	1.03			> 5.7m	75	C 2.00m	T24	GAI	5*	ST6	HOR02	
2004 01 22.79	d k		13.4	LA	35	L	5 a540	1.03			> 5.7m	75	C 1.03m	T24	GAI	5*	ST6	HOR02	
2004 01 22.79	d k		13.7	LA	35	L	5 a540	1.03			> 5.7m	75	C 0.50m	T24	GAI	5*	ST6	HOR02	
2004 01 24.78	d k		13.1	LA	35	L	5 a660	1.3			10.1m	75	C 2.00m	T24	GAI	5*	ST6	HOR02	
2004 01 24.78	d k		13.3	LA	35	L	5 a660	1.3			10.1m	75	C 1.30m	T24	GAI	5*	ST6	HOR02	
2004 01 24.78	d k		13.4	LA	35	L	5 a660	1.3			10.1m	75	C 1.00m	T24	GAI	5*	ST6	HOR02	
2004 01 24.78	d k		13.7	LA	35	L	5 a660	1.3			10.1m	75	C 0.50m	T24	GAI	5*	ST6	HOR02	
2004 06 16.73	sxC		15.2	TJ	25.0L	5	a120	0.3			0.5m170	S	0.3 m	K42	SI4	5	U	SE7	OHS
2004 06 27.01	d C		14.7	LB	6.3M	8	a900	0.8					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 27.01	d C		14.9	LB	6.3M	8	a900	0.8					C 0.80m	K40	GAI	5*	ST7	SRB	
2004 06 27.01	d C		15.2	LB	6.3M	8	a900	0.8					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 29.01	d C		14.1	LB	6.3M	8	a900	0.8					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 29.01	d C		14.4	LB	6.3M	8	a900	0.8					C 0.80m	K40	GAI	5*	ST7	SRB	
2004 06 29.01	d C		14.7	LB	6.3M	8	a900	0.8					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 30.73	axC		14.6	HV	35.0C	10	A200	0.5	5				S 1.02m	KAIaSI4	5		ST2	TSU02	

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.
2004 01 22.76	d k		16.3	LA	35	L	5 a600	0.42			2.0m251	C	0.42m	T24	GAI	5*	ST6	HOR02	
2004 05 25.75		C	17.5:	GA	60.0Y	6	a240	0.35			1.9m264	S	0.35m	SIA	IPL	5	U	Ap7	NAK01
2004 05 29.99	d k		17.1	LA	35	L	5 a840	0.33			2.8m267	C	0.50m	T24	GAI	5*	ST6	HOR02	
2004 05 29.99	d k		17.5	LA	35	L	5 a840	0.33			2.8m267	C	0.33m	T24	GAI	5*	ST6	HOR02	
2004 06 29.95	d k		17.4	LA	35	L	5 a540	0.38			2.2m266	C	0.50m	T24	GAI	5*	ST6	HOR02	
2004 06 29.95	d k		17.5	LA	35	L	5 a540	0.38			2.2m266	C	0.38m	T24	GAI	5*	ST6	HOR02	

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 05 16.85	d C		4.0	LB	1.3A	4	a 20	>30			>3	123	C 1.32d	K40	GAI	5*	ST7	SRB	
2004 05 16.85	d C		4.2	LB	1.3A	4	a 20	>30			>3	123	C 0.66d	K40	GAI	5*	ST7	SRB	
2004 05 16.85	d C		4.4	LB	1.3A	4	a 20	>30			>3	123	C 0.33d	K40	GAI	5*	ST7	SRB	
2004 05 16.85	d C		4.9	LB	1.3A	4	a 20	>30			>3	123	C 9.90m	K40	GAI	5*	ST7	SRB	
2004 05 16.85	d C		5.6	LB	1.3A	4	a 20	>30			>3	123	C 4.95m	K40	GAI	5*	ST7	SRB	

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

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 19.86	d	k	5.2	LA	35	L	5	a450	>15.5		> 9	m102	C 8.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 19.86	d	k	5.7	LA	35	L	5	a450	>15.5		> 9	m102	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 19.86	d	k	6.4	LA	35	L	5	a450	>15.5		> 9	m102	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 19.86	d	k	7.2	LA	35	L	5	a450	>15.5		> 9	m102	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 19.86	d	k	8.1	LA	35	L	5	a450	>15.5		> 9	m102	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 05 19.97	d	C	4.8	LB			8	a300	>15		>1	107	C 0.54d	K40	GAI	5*	ST7	SRB	
2004 05 19.97	d	C	5.1	LB			8	a300	>15		>1	107	C 0.26d	K40	GAI	5*	ST7	SRB	
2004 05 19.97	d	C	5.3	LB			8	a300	>15		>1	107	C 7.90m	K40	GAI	5*	ST7	SRB	
2004 05 19.97	d	C	5.6	LB			8	a300	>15		>1	107	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 05 19.97	d	C	6.3	LB			8	a300	>15		>1	107	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 19.97	d	C	7.1	LB			8	a300	>15		>1	107	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 19.97	d	C	8.1	LB			8	a300	>15		>1	107	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 20.87	d	C	5.0	LB			8	a150	>15		>33	m105	C 0.26d	K40	GAI	5*	ST7	SRB	
2004 05 20.87	d	C	5.3	LB			8	a150	>15		>33	m105	C 7.90m	K40	GAI	5*	ST7	SRB	
2004 05 20.87	d	C	5.8	LB			8	a150	>15		>33	m105	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 05 20.87	d	C	6.4	LB			8	a150	>15		>33	m105	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 20.87	d	C	7.3	LB			8	a150	>15		>33	m105	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 20.87	d	C	8.3	LB			8	a150	>15		>33	m105	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 25.47	a	H	5.7	LA	30.0L		6	a180	5.5				S 7.4 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 25.47	a	H	9.6	LA	30.0L		6	a180	5.5				C 0.2 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 25.47	a	L	6.2	LA	30.0L		6	a180	7.4				S 7.4 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 25.47	a	L	11.0	LA	30.0L		6	a180	7.4				C 0.2 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 25.47	a	V	5.9	LA	30.0L		6	a180	7.4				S 7.4 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 25.47	a	V	10.2	LA	30.0L		6	a180	7.4				C 0.2 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 25.47	a	k	6.1	LA	30.0L		6	a180	5.5				S 7.4 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 25.47	a	k	10.1	LA	30.0L		6	a180	5.5				C 0.2 m	SIA	MIm	5*U	Ap7	EZA	
2004 05 28.48	ax	C	6.2	HV	35.0C		10	a 30	4.5	5			S 6.67m	KAIa	SI4	5	ST2	TSU02	
2004 05 29.87	d	k	5.9	LA	35	L	5	a390	>15		>11	m 95	C 8.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 29.87	d	k	6.4	LA	35	L	5	a390	>15		>11	m 95	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 29.87	d	k	7.0	LA	35	L	5	a390	>15		>11	m 95	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 29.87	d	k	7.7	LA	35	L	5	a390	>15		>11	m 95	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 29.87	d	k	8.6	LA	35	L	5	a390	>15		>11	m 95	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 05 29.89	d	C	5.8	LB			8	a480	> 5		>50	m100	C 0.26d	K40	GAI	5*	ST7	SRB	
2004 05 29.89	d	C	6.2	LB			8	a480	> 5		>50	m100	C 7.90m	K40	GAI	5*	ST7	SRB	
2004 05 29.89	d	C	6.4	LB			8	a480	> 5		>50	m100	C 4.95m	K40	GAI	5*	ST7	SRB	
2004 05 29.89	d	C	6.6	LB			8	a480	> 5		>50	m100	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 05 29.89	d	C	7.2	LB			8	a480	> 5		>50	m100	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 29.89	d	C	8.0	LB			8	a480	> 5		>50	m100	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 29.89	d	C	8.9	LB			8	a480	> 5		>50	m100	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	C	5.8	LB			8	a480	> 6.7		>1.1	105	C 0.22d	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	C	6.2	LB			8	a480	> 6.7		>1.1	105	C 7.90m	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	C	6.3	LB			8	a480	> 6.7		>1.1	105	C 4.95m	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	C	6.6	LB			8	a480	> 6.7		>1.1	105	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	C	7.1	LB			8	a480	> 6.7		>1.1	105	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	C	7.9	LB			8	a480	> 6.7		>1.1	105	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	C	8.9	LB			8	a480	> 6.7		>1.1	105	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 30.87	d	k	5.9	LA	35	L	5	a600	>13		>11	m 99	C 8.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 30.87	d	k	6.4	LA	35	L	5	a600	>13		>11	m 99	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 30.87	d	k	7.0	LA	35	L	5	a600	>13		>11	m 99	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 30.87	d	k	7.7	LA	35	L	5	a600	>13		>11	m 99	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 30.87	d	k	8.6	LA	35	L	5	a600	>13		>11	m 99	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 06 03.47	a	H	6.7	LA	30.0L		6	a360	4.6				S 5.0 m	SIA	MIm	5*U	Ap7	EZA	
2004 06 03.47	a	H	9.9	LA	30.0L		6	a360	4.6				C 0.2 m	SIA	MIm	5*U	Ap7	EZA	
2004 06 03.47	a	V	6.7	LA	30.0L		6	a360	5.0				S 5.0 m	SIA	MIm	5*U	Ap7	EZA	
2004 06 03.47	a	V	10.5	LA	30.0L		6	a360	5.0				C 0.2 m	SIA	MIm	5*U	Ap7	EZA	
2004 06 07.88	d	C	6.6	LB			8	a600	> 5		>35	m101	C 9.85m	K40	GAI	5*	ST7	SRB	
2004 06 07.88	d	C	6.7	LB			8	a600	> 5		>35	m101	C 7.90m	K40	GAI	5*	ST7	SRB	
2004 06 07.88	d	C	6.9	LB			8	a600	> 5		>35	m101	C 4.95m	K40	GAI	5*	ST7	SRB	
2004 06 07.88	d	C	7.0	LB			8	a600	> 5		>35	m101	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 06 07.88	d	C	7.6	LB			8	a600	> 5		>35	m101	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 06 07.88	d	C	8.4	LB			8	a600	> 5		>35	m101	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 07.88	d	C	9.3	LB			8	a600	> 5		>35	m101	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 07.96	d	k	6.6	LA	35	L	5	a800	>12		>10	m101	C 8.00m	T24	GAI	5*P	ST6	HOR02	

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

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 06 07.96	d	k	7.0	LA	35	L	5	a800	>12		>10	m101	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 07.96	d	k	7.5	LA	35	L	5	a800	>12		>10	m101	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 07.96	d	k	8.2	LA	35	L	5	a800	>12		>10	m101	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 07.96	d	k	9.0	LA	35	L	5	a800	>12		>10	m101	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 06 13.88	d	k	6.8	LA	35	L	5	a440	>12		>10	m 95	C 8.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 13.88	d	k	7.2	LA	35	L	5	a440	>12		>10	m 95	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 13.88	d	k	7.8	LA	35	L	5	a440	>12		>10	m 95	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 13.88	d	k	8.4	LA	35	L	5	a440	>12		>10	m 95	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 13.88	d	k	9.2	LA	35	L	5	a440	>12		>10	m 95	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 06 14.50	ax	C	7.3	HV	35.0C	10	a	90	5.0	5		S 5.25m	KAIaSI4	5		ST2	TSU02		
2004 06 21.87	d	C	7.6	LB	6.3M	8	a	840	4.7		>30	m 92	C 9.40m	K40	GAI	5*	ST7	SRB	
2004 06 21.87	d	C	7.7	LB	6.3M	8	a	840	4.7		>30	m 92	C 7.90m	K40	GAI	5*	ST7	SRB	
2004 06 21.87	d	C	7.8	LB	6.3M	8	a	840	4.7		>30	m 92	C 4.70m	K40	GAI	5*	ST7	SRB	
2004 06 21.87	d	C	7.9	LB	6.3M	8	a	840	4.7		>30	m 92	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 06 21.87	d	C	8.4	LB	6.3M	8	a	840	4.7		>30	m 92	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 06 21.87	d	C	9.1	LB	6.3M	8	a	840	4.7		>30	m 92	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 21.87	d	C	9.9	LB	6.3M	8	a	840	4.7		>30	m 92	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 24.90	d	k	7.4	LA	35	L	5	a440	>14		>13	m115	C 8.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 24.90	d	k	7.7	LA	35	L	5	a440	>14		>13	m115	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 24.90	d	k	8.3	LA	35	L	5	a440	>14		>13	m115	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 24.90	d	k	9.0	LA	35	L	5	a440	>14		>13	m115	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 24.90	d	k	9.8	LA	35	L	5	a440	>14		>13	m115	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 06 26.87	d	k	7.2	LA	35	L	5	a640	12		>13	m116	C12.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 26.87	d	k	7.5	LA	35	L	5	a640	12		>13	m116	C 8.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 26.87	d	k	8.0	LA	35	L	5	a640	12		>13	m116	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 26.87	d	k	8.5	LA	35	L	5	a640	12		>13	m116	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 26.87	d	k	9.2	LA	35	L	5	a640	12		>13	m116	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 26.87	d	k	10.0	LA	35	L	5	a640	12		>13	m116	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 06 26.88	d	C	7.6	LB	6.3M	8	a	840	5.2		>25	m143	C 0.17d	K40	GAI	5*	ST7	SRB	
2004 06 26.88	d	C	7.6	LB	6.3M	8	a	840	5.2		>25	m143	C 7.90m	K40	GAI	5*	ST7	SRB	
2004 06 26.88	d	C	7.8	LB	6.3M	8	a	840	5.2		>25	m143	C 5.20m	K40	GAI	5*	ST7	SRB	
2004 06 26.88	d	C	8.0	LB	6.3M	8	a	840	5.2		>25	m143	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 06 26.88	d	C	8.6	LB	6.3M	8	a	840	5.2		>25	m143	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 06 26.88	d	C	9.3	LB	6.3M	8	a	840	5.2		>25	m143	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 26.88	d	C	10.2	LB	6.3M	8	a	840	5.2		>25	m143	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 28.91	d	C	7.7	LB	6.3M	8	a	780	4.6		>25	m141	C 9.10m	K40	GAI	5*	ST7	SRB	
2004 06 28.91	d	C	7.9	LB	6.3M	8	a	780	4.6		>25	m141	C 4.60m	K40	GAI	5*	ST7	SRB	
2004 06 28.91	d	C	8.9	LB	6.3M	8	a	780	4.6		>25	m141	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 06 28.91	d	C	9.3	LB	6.3M	8	a	780	4.6		>25	m141	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 28.91	d	C	10.2	LB	6.3M	8	a	780	4.6		>25	m141	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 29.89	d	k	7.3	LA	35	L	5	a480	12		>14	m103	C12.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 29.89	d	k	7.6	LA	35	L	5	a480	12		>14	m103	C 8.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 29.89	d	k	8.0	LA	35	L	5	a480	12		>14	m103	C 4.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 29.89	d	k	8.6	LA	35	L	5	a480	12		>14	m103	C 2.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 29.89	d	k	9.3	LA	35	L	5	a480	12		>14	m103	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 29.89	d	k	10.0	LA	35	L	5	a480	12		>14	m103	C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 07 06.48	ax	C	8.5	HV	35.0C	10	a	120	3.5	5	8.0m	74	S 5.68m	KAIaSI4	5		ST2	TSU02	
2004 07 08.49	ax	C	8.6	HV	35.0C	10	a	120	4.0	5	> 7.7m	69	S 4.38m	KAIaSI4	5		ST2	TSU02	
2004 07 11.56	sx	C	8.1	TJ	25.0L	5	a	120	6.8				S 6.8 m	K42	SI4	5 U	SE7	OHS	
2004 07 13.47		C	8.5	GA	60.0Y	6	a	30	5.0		> 5.4m	74	S 5.0 m	SIA	IPL	5 U	Ap7	NAK01	

Comet C/2002 J5 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 24.68		C	17.2	GA	60.0Y	6	a	240	0.45		1.9m	106	S 0.45m	SIA	IPL	5 U	Ap7	NAK01	
2004 05 30.02	d	k	16.7	LA	35	L	5	a480	0.40		1.7m	110	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 30.02	d	k	17.0	LA	35	L	5	a480	0.40		1.7m	110	C 0.40m	T24	GAI	5*P	ST6	HOR02	
2004 06 07.99	d	k	16.7	LA	35	L	5	a600	0.45		1.3m	104	C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 07.99	d	k	16.9	LA	35	L	5	a600	0.45		1.3m	104	C 0.45m	T24	GAI	5*P	ST6	HOR02	
2004 07 13.51		C	17.4	GA	60.0Y	6	a	240	0.45		1.4m	99	S 0.45m	SIA	IPL	5 U	Ap7	NAK01	

Comet C/2002 R3 (LONEOS)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.	
2004 05 24.75		C	18.0	GA	60.0Y		6	a240	0.35			110	S	0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2002 T5 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.	
2004 01 23.00	d	k	15.4	LA	35	L	5	a660	0.50		1.3m237	C	1.00m	T24	GAI	5*	P	ST6	HOR02	
2004 01 23.00	d	k	15.7	LA	35	L	5	a660	0.50		1.3m237	C	0.50m	T24	GAI	5*	P	ST6	HOR02	
2004 01 23.97	d	k	15.4	LA	35	L	5	a660	0.47		1.1m243	C	1.00m	T24	GAI	5*	P	ST6	HOR02	
2004 01 23.97	d	k	15.7	LA	35	L	5	a660	0.47		1.1m243	C	0.47m	T24	GAI	5*	P	ST6	HOR02	
2004 01 24.86	d	k	15.5	LA	35	L	5	a660	0.45		1.0m242	C	1.00m	T24	GAI	5*	P	ST6	HOR02	
2004 01 24.86	d	k	15.8	LA	35	L	5	a660	0.45		1.0m242	C	0.45m	T24	GAI	5*	P	ST6	HOR02	
2004 02 11.95	d	k	15.6	LA	35	L	5	a450	0.53		1.1m237	C	1.50m	T24	GAI	5*	P	ST6	HOR02	
2004 02 11.95	d	k	15.7	LA	35	L	5	a450	0.53		1.1m237	C	1.00m	T24	GAI	5*	P	ST6	HOR02	
2004 02 11.95	d	k	16.0	LA	35	L	5	a450	0.53		1.1m237	C	0.53m	T24	GAI	5*	P	ST6	HOR02	
2004 02 20.93	d	k	15.8	LA	35	L	5	a660	0.57		2.4m238	C	1.50m	T24	GAI	5*	P	ST6	HOR02	
2004 02 20.93	d	k	15.9	LA	35	L	5	a660	0.57		2.4m238	C	1.00m	T24	GAI	5*	P	ST6	HOR02	
2004 02 20.93	d	k	16.0	LA	35	L	5	a660	0.57		2.4m238	C	0.57m	T24	GAI	5*	P	ST6	HOR02	
2004 03 14.82	d	k	15.9	LA	35	L	5	a660	0.55				C	1.00m	T24	GAI	5*	P	ST6	HOR02
2004 03 14.82	d	k	16.0	LA	35	L	5	a660	0.55				C	0.55m	T24	GAI	5*	P	ST6	HOR02
2004 03 17.88	d	k	15.9	LA	35	L	5	a660	0.57				C	1.00m	T24	GAI	5*	P	ST6	HOR02
2004 03 17.88	d	k	16.1	LA	35	L	5	a660	0.57				C	0.57m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.85	d	k	16.4	LA	35	L	5	a720	0.60		0.6m220	C	1.00m	T24	GAI	5*	P	ST6	HOR02	
2004 04 08.85	d	k	16.5	LA	35	L	5	a720	0.60		0.6m220	C	0.60m	T24	GAI	5*	P	ST6	HOR02	
2004 04 12.85	d	k	16.4	LA	35	L	5	a480	0.58				C	1.00m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.85	d	k	16.6	LA	35	L	5	a480	0.58				C	0.58m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.87	d	k	16.3	LA	35	L	5	a540	0.57				C	1.00m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.87	d	k	16.6	LA	35	L	5	a540	0.57				C	0.57m	T24	GAI	5*	P	ST6	HOR02
2004 05 19.90	d	k	17.1	LA	35	L	5	a480	0.35				C	0.35m	T24	GAI	5*	P	ST6	HOR02

Comet P/2002 T6 (NEAT-LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.	
2004 01 23.02	d	k	15.3	LA	35	L	5	a540	0.45				C	0.45m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.99	d	k	15.4	LA	35	L	5	a900	0.45				C	0.45m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.83	d	k	16.2	LA	35	L	5	a720	0.63				C	0.63m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.83	d	k	16.6	LA	35	L	5	a480	0.55				C	0.55m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.85	d	k	16.5	LA	35	L	5	a720	0.50				C	0.50m	T24	GAI	5*	P	ST6	HOR02

Comet C/2002 T7 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.	
2004 01 22.81	d	k	9.0	LA	35	L	5	a630	9.5		>15.5m	63	C	8.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.81	d	k	9.3	LA	35	L	5	a630	9.5		>15.5m	63	C	4.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.81	d	k	9.7	LA	35	L	5	a630	9.5		>15.5m	63	C	2.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.81	d	k	10.2	LA	35	L	5	a630	9.5		>15.5m	63	C	1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.81	d	k	10.8	LA	35	L	5	a630	9.5		>15.5m	63	C	0.50m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.78	d	k	8.9	LA	35	L	5	a520	9.4		>13.9m	62	C	8.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.78	d	k	9.2	LA	35	L	5	a520	9.4		>13.9m	62	C	4.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.78	d	k	9.6	LA	35	L	5	a520	9.4		>13.9m	62	C	2.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.78	d	k	10.1	LA	35	L	5	a520	9.4		>13.9m	62	C	1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.78	d	k	10.7	LA	35	L	5	a520	9.4		>13.9m	62	C	0.50m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.72	d	C	8.8	LB			6.3M	8	a600	2.7	11	m	65	C	7.40m	K40	GAI	5*	ST7	SRB
2004 01 24.72	d	C	9.0	LB			6.3M	8	a600	2.7	11	m	65	C	4.95m	K40	GAI	5*	ST7	SRB
2004 01 24.72	d	C	9.4	LB			6.3M	8	a600	2.7	11	m	65	C	2.70m	K40	GAI	5*	ST7	SRB
2004 01 24.72	d	C	9.7	LB			6.3M	8	a600	2.7	11	m	65	C	1.75m	K40	GAI	5*	ST7	SRB
2004 01 24.72	d	C	10.0	LB			6.3M	8	a600	2.7	11	m	65	C	1.25m	K40	GAI	5*	ST7	SRB
2004 01 24.80	d	k	8.9	LA	35	L	5	a680	> 8.0		>13.9m	57	C	8.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.80	d	k	9.2	LA	35	L	5	a680	> 8.0		>13.9m	57	C	4.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.80	d	k	9.6	LA	35	L	5	a680	> 8.0		>13.9m	57	C	2.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.80	d	k	10.1	LA	35	L	5	a680	> 8.0		>13.9m	57	C	1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.80	d	k	10.7	LA	35	L	5	a680	> 8.0		>13.9m	57	C	0.50m	T24	GAI	5*	P	ST6	HOR02
2004 01 30.77	d	k	8.8	LA	35	L	5	a750	> 4.7		>15.1m	61	C	4.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 30.77	d	k	9.5	LA	35	L	5	a750	> 4.7		>15.1m	61	C	2.00m	T24	GAI	5*	P	ST6	HOR02

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

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 01 30.77	d	k	10.0	LA	35	L	5	a750	> 4.7		>15.1m	61	C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 30.77	d	k	10.6	LA	35	L	5	a750	> 4.7		>15.1m	61	C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 02 07.77	d	C	8.4	LB	6.3M		8	a600	3.2		>28	m 58	C 7.40m	K40	GAI	5*		ST7	SRB
2004 02 07.77	d	C	8.6	LB	6.3M		8	a600	3.2		>28	m 58	C 4.95m	K40	GAI	5*		ST7	SRB
2004 02 07.77	d	C	8.8	LB	6.3M		8	a600	3.2		>28	m 58	C 3.10m	K40	GAI	5*		ST7	SRB
2004 02 07.77	d	C	9.0	LB	6.3M		8	a600	3.2		>28	m 58	C 2.45m	K40	GAI	5*		ST7	SRB
2004 02 07.77	d	C	9.5	LB	6.3M		8	a600	3.2		>28	m 58	C 1.25m	K40	GAI	5*		ST7	SRB
2004 06 14.46	axC		8.1	HV	35.0C		10	a 60	3.7	5	>10	m125	S 4.80m	KAIaSI4	5		ST2	TSU02	
2004 06 22.46	axC		8.8	HV	35.0C		10	a 60	2.8	5	>10	m122	S 3.64m	KAIaSI4	5		ST2	TSU02	
2004 07 06.47	axC		10.7	HV	35.0C		10	a 60	0.6	4	1.3m	124	S 1.45m	KAIaSI4	5		ST2	TSU02	

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 05 25.73		C	17.8	GA	60.0Y		6	a240	0.3				S 0.3 m	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 06 13.94	d	k	17.1	LA	35	L	5	a540	0.32		1.2m	211	C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 06 13.94	d	k	17.3	LA	35	L	5	a540	0.32		1.2m	211	C 0.32m	T24	GAI	5*	P	ST6	HOR02

Comet C/2003 H1 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 03 22.92	d	C	11.5	LB	6.3M		8	a900	1.0		> 4	m 66	C 1.75m	K40	GAI	5*		ST7	SRB
2004 03 22.92	d	C	11.5	LB	6.3M		8	a900	1.0		> 4	m 66	C 1.00m	K40	GAI	5*		ST7	SRB
2004 03 22.92	d	C	12.0	LB	6.3M		8	a900	1.0		> 4	m 66	C 0.75m	K40	GAI	5*		ST7	SRB
2004 03 22.92	d	C	12.4	LB	6.3M		8	a900	1.0		> 4	m 66	C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 08.87	d	C	13.0	LB	6.3M		8	a300	0.7		> 2.5m	80	C 0.90m	K40	GAI	5*		ST7	SRB
2004 04 08.87	d	C	13.3	LB	6.3M		8	a300	0.7		> 2.5m	80	C 0.75m	K40	GAI	5*		ST7	SRB
2004 04 08.87	d	C	13.8	LB	6.3M		8	a300	0.7		> 2.5m	80	C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 12.53	axC		14.1	HV	35.0C		10	a120	0.5	4	4.0m	88	S 0.67m	KAIaSI4	5		ST2	TSU02	
2004 04 12.87	d	C	13.8	LB	6.3M		8	a900	1.0				C 1.50m	K40	GAI	5*		ST7	SRB
2004 04 12.87	d	C	14.6	LB	6.3M		8	a900	1.0				C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 15.84	d	C	13.8	LB	6.3M		8	a900	0.7		> 3.5m	87	C 1.50m	K40	GAI	5*		ST7	SRB
2004 04 15.84	d	C	13.9	LB	6.3M		8	a900	0.7		> 3.5m	87	C 0.75m	K40	GAI	5*		ST7	SRB
2004 04 15.84	d	C	14.3	LB	6.3M		8	a900	0.7		> 3.5m	87	C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 16.45	axC		14.0	HV	35.0C		10	a 90	0.7	4	7.0m	88	S 1.26m	KAIaSI4	5		ST2	TSU02	
2004 04 21.47	axC		14.9	HV	35.0C		10	a480	0.4	4	4.0m	88	S 0.89m	KAIaSI4	5		ST2	TSU02	
2004 05 06.47	a	C	15.2	GA	60.0Y		6	a120	0.65		> 5.7m	95	S 0.65m	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 03 23.05	d	C	11.5	LB	6.3M		8	a900	0.9				C 2.00m	K40	GAI	5*		ST7	SRB
2004 03 23.05	d	C	11.6	LB	6.3M		8	a900	0.9				C 1.50m	K40	GAI	5*		ST7	SRB
2004 03 23.05	d	C	11.7	LB	6.3M		8	a900	0.9				C 1.00m	K40	GAI	5*		ST7	SRB
2004 03 23.05	d	C	11.8	LB	6.3M		8	a900	0.9				C 0.75m	K40	GAI	5*		ST7	SRB
2004 03 23.05	d	C	12.1	LB	6.3M		8	a900	0.9				C 0.50m	K40	GAI	5*		ST7	SRB
2004 03 31.02	d	C	11.7	LB	6.3M		8	a900	0.9				C 1.75m	K40	GAI	5*		ST7	SRB
2004 03 31.02	d	C	11.9	LB	6.3M		8	a900	0.9				C 1.25m	K40	GAI	5*		ST7	SRB
2004 03 31.02	d	C	12.0	LB	6.3M		8	a900	0.9				C 1.00m	K40	GAI	5*		ST7	SRB
2004 03 31.02	d	C	12.1	LB	6.3M		8	a900	0.9				C 0.75m	K40	GAI	5*		ST7	SRB
2004 03 31.02	d	C	12.4	LB	6.3M		8	a900	0.9				C 0.50m	K40	GAI	5*		ST7	SRB
2004 03 31.12	d	k	12.4	LA	35	L	5	a510	1.4				C 1.40m	T24	GAI	5*	P	ST6	HOR02
2004 03 31.12	d	k	12.5	LA	35	L	5	a510	1.4				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 03 31.12	d	k	12.7	LA	35	L	5	a510	1.4				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.99	d	C	11.5	LB	6.3M		8	a600	1.0				C 2.00m	K40	GAI	5*		ST7	SRB
2004 04 08.99	d	C	11.7	LB	6.3M		8	a600	1.0				C 1.00m	K40	GAI	5*		ST7	SRB
2004 04 08.99	d	C	12.4	LB	6.3M		8	a600	1.0				C 0.50m	K40	GAI	5*		ST7	SRB
2004 04 09.10	d	k	12.1	LA	35	L	5	a420	1.0				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 04 09.10	d	k	12.3	LA	35	L	5	a420	1.0				C 0.50m	T24	GAI	5*	P	ST6	HOR02

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

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 04 12.97	d	C	11.6	LB	6.3M	8	a840	0.8					C 2.00m	K40	GAI	5*	ST7	SRB	
2004 04 12.97	d	C	11.8	LB	6.3M	8	a840	0.8					C 1.50m	K40	GAI	5*	ST7	SRB	
2004 04 12.97	d	C	12.0	LB	6.3M	8	a840	0.8					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 12.97	d	C	12.4	LB	6.3M	8	a840	0.8					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 13.97	d	C	11.9	LB	6.3M	8	a900	1.1					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 13.97	d	C	12.0	LB	6.3M	8	a900	1.1					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 04 13.97	d	C	12.4	LB	6.3M	8	a900	1.1					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 14.97	d	C	11.6	LB	6.3M	8	a780	0.8					C 2.00m	K40	GAI	5*	ST7	SRB	
2004 04 14.97	d	C	11.7	LB	6.3M	8	a780	0.8					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 14.97	d	C	11.8	LB	6.3M	8	a780	0.8					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 04 14.97	d	C	12.1	LB	6.3M	8	a780	0.8					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 15.08	d	k	11.9	LA	35	L	5	a240	1.1				C 1.10m	T24	GAI	5*P	ST6	HORO2	
2004 04 15.08	d	k	12.2	LA	35	L	5	a240	1.1				C 0.50m	T24	GAI	5*P	ST6	HORO2	
2004 04 16.75	axC		12.2	HV	35.0C	10	a	90	0.8	6			S 0.95m	KAIaSI4	5		ST2	TSU02	
2004 05 11.64	axC		12.0	HV	35.0C	10	a	120	0.8	6			S 1.10m	KAIaSI4	5		ST2	TSU02	
2004 05 16.96	d	C	10.2	LB	6.3M	8	a900	1.4				1.0m157	C 1.75m	K40	GAI	5*	ST7	SRB	
2004 05 16.96	d	C	10.4	LB	6.3M	8	a900	1.4				1.0m157	C 1.40m	K40	GAI	5*	ST7	SRB	
2004 05 16.96	d	C	10.7	LB	6.3M	8	a900	1.4				1.0m157	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 16.96	d	C	11.3	LB	6.3M	8	a900	1.4				1.0m157	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 20.00	d	k	10.5	LA	35	L	5	a300	2.2				C 2.20m	T24	GAI	5*P	ST6	HORO2	
2004 05 20.00	d	k	10.7	LA	35	L	5	a300	2.2				C 1.50m	T24	GAI	5*P	ST6	HORO2	
2004 05 20.00	d	k	11.1	LA	35	L	5	a300	2.2				C 1.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 20.00	d	k	11.4	LA	35	L	5	a300	2.2				C 0.50m	T24	GAI	5*P	ST6	HORO2	
2004 05 20.02	d	C	10.6	LB	6.3M	8	a900	1.2				1.1m174	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 20.02	d	C	10.9	LB	6.3M	8	a900	1.2				1.1m174	C 1.25m	K40	GAI	5*	ST7	SRB	
2004 05 20.02	d	C	11.0	LB	6.3M	8	a900	1.2				1.1m174	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 20.02	d	C	11.7	LB	6.3M	8	a900	1.2				1.1m174	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 20.90	d	C	10.8	LB	6.3M	8	a240	1.4				1.2m163	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 20.90	d	C	10.9	LB	6.3M	8	a240	1.4				1.2m163	C 1.50m	K40	GAI	5*	ST7	SRB	
2004 05 20.90	d	C	11.1	LB	6.3M	8	a240	1.4				1.2m163	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 20.90	d	C	11.7	LB	6.3M	8	a240	1.4				1.2m163	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 24.71		C	10.5	GA	60.0Y	6	a	120	3.6				S 3.6 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 25.74	axC		10.8	HV	35.0C	10	a	60	1.4	5			S 1.45m	KAIaSI4	5		ST2	TSU02	
2004 05 29.93	d	C	10.1	LB	6.3M	8	a900	2.0				0.9m153	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 05 29.93	d	C	10.3	LB	6.3M	8	a900	2.0				0.9m153	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 29.93	d	C	10.8	LB	6.3M	8	a900	2.0				0.9m153	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 29.93	d	C	11.5	LB	6.3M	8	a900	2.0				0.9m153	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 29.96	d	k	9.8	LA	35	L	5	a540	4.6			5.6m224	C 4.60m	T24	GAI	5*P	ST6	HORO2	
2004 05 29.96	d	k	10.0	LA	35	L	5	a540	4.6			5.6m224	C 3.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 29.96	d	k	10.2	LA	35	L	5	a540	4.6			5.6m224	C 2.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 29.96	d	k	10.6	LA	35	L	5	a540	4.6			5.6m224	C 1.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 29.96	d	k	11.2	LA	35	L	5	a540	4.6			5.6m224	C 0.50m	T24	GAI	5*P	ST6	HORO2	
2004 05 30.91	d	C	10.1	LB	6.3M	8	a900	2.8				2.0m172	C 3.95m	K40	GAI	5*	ST7	SRB	
2004 05 30.91	d	C	10.2	LB	6.3M	8	a900	2.8				2.0m172	C 2.80m	K40	GAI	5*	ST7	SRB	
2004 05 30.91	d	C	10.3	LB	6.3M	8	a900	2.8				2.0m172	C 2.00m	K40	GAI	5*	ST7	SRB	
2004 05 30.91	d	C	10.8	LB	6.3M	8	a900	2.8				2.0m172	C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 30.91	d	C	11.5	LB	6.3M	8	a900	2.8				2.0m172	C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 30.91	d	k	9.6	LA	35	L	5	a420	5.7			8.8m226	C 5.60m	T24	GAI	5*P	ST6	HORO2	
2004 05 30.91	d	k	9.7	LA	35	L	5	a420	5.7			8.8m226	C 4.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 30.91	d	k	9.9	LA	35	L	5	a420	5.7			8.8m226	C 3.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 30.91	d	k	10.1	LA	35	L	5	a420	5.7			8.8m226	C 2.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 30.91	d	k	10.6	LA	35	L	5	a420	5.7			8.8m226	C 1.00m	T24	GAI	5*P	ST6	HORO2	
2004 05 30.91	d	k	11.2	LA	35	L	5	a420	5.7			8.8m226	C 0.50m	T24	GAI	5*P	ST6	HORO2	
2004 06 07.91	d	C	9.8	LB	6.3M	8	a900	2.7				> 5	m184	C 3.95m	K40	GAI	5*	ST7	SRB
2004 06 07.91	d	C	9.9	LB	6.3M	8	a900	2.7				> 5	m184	C 2.70m	K40	GAI	5*	ST7	SRB
2004 06 07.91	d	C	10.0	LB	6.3M	8	a900	2.7				> 5	m184	C 2.00m	K40	GAI	5*	ST7	SRB
2004 06 07.91	d	C	10.5	LB	6.3M	8	a900	2.7				> 5	m184	C 1.00m	K40	GAI	5*	ST7	SRB
2004 06 07.91	d	C	11.3	LB	6.3M	8	a900	2.7				> 5	m184	C 0.50m	K40	GAI	5*	ST7	SRB
2004 06 13.92	d	k	8.8	LA	35	L	5	a360	12			>11	m168	C 8.00m	T24	GAI	5*P	ST6	HORO2
2004 06 13.92	d	k	9.2	LA	35	L	5	a360	12			>11	m168	C 4.00m	T24	GAI	5*P	ST6	HORO2
2004 06 13.92	d	k	9.7	LA	35	L	5	a360	12			>11	m168	C 2.00m	T24	GAI	5*P	ST6	HORO2
2004 06 13.92	d	k	10.2	LA	35	L	5	a360	12			>11	m168	C 1.00m	T24	GAI	5*P	ST6	HORO2
2004 06 13.92	d	k	10.9	LA	35	L	5	a360	12			>11	m168	C 0.50m	T24	GAI	5*P	ST6	HORO2

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

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 06 14.68	axC		9.5	HV	35.0C	10	a	60	3.7	5	4.5m130	S	4.64m	KAIaSI4	5		ST2	TSU02	
2004 06 21.90	d	C	8.9	LB	6.3M	8	a	900	5.7		>20	m167	C	0.19d	K40	GAI	5*	ST7	SRB
2004 06 21.90	d	C	9.0	LB	6.3M	8	a	900	5.7		>20	m167	C	7.90m	K40	GAI	5*	ST7	SRB
2004 06 21.90	d	C	9.1	LB	6.3M	8	a	900	5.7		>20	m167	C	5.70m	K40	GAI	5*	ST7	SRB
2004 06 21.90	d	C	9.5	LB	6.3M	8	a	900	5.7		>20	m167	C	3.95m	K40	GAI	5*	ST7	SRB
2004 06 21.90	d	C	9.6	LB	6.3M	8	a	900	5.7		>20	m167	C	2.00m	K40	GAI	5*	ST7	SRB
2004 06 21.90	d	C	10.2	LB	6.3M	8	a	900	5.7		>20	m167	C	1.00m	K40	GAI	5*	ST7	SRB
2004 06 21.90	d	C	11.0	LB	6.3M	8	a	900	5.7		>20	m167	C	0.50m	K40	GAI	5*	ST7	SRB
2004 06 21.99	d	k	8.5	LA	35	L	5	a	390	>13	>10	m164	C	8.00m	T24	GAI	5*P	ST6	HOR02
2004 06 21.99	d	k	9.0	LA	35	L	5	a	390	>13	>10	m164	C	4.00m	T24	GAI	5*P	ST6	HOR02
2004 06 21.99	d	k	9.5	LA	35	L	5	a	390	>13	>10	m164	C	2.00m	T24	GAI	5*P	ST6	HOR02
2004 06 21.99	d	k	10.1	LA	35	L	5	a	390	>13	>10	m164	C	1.00m	T24	GAI	5*P	ST6	HOR02
2004 06 21.99	d	k	10.8	LA	35	L	5	a	390	>13	>10	m164	C	0.50m	T24	GAI	5*P	ST6	HOR02
2004 06 23.56	axC		9.2	HV	35.0C	10	a	60	3.3	5	4.5m120	S	3.49m	KAIaSI4	5		ST2	TSU02	
2004 06 24.90	d	C	8.5	LB	6.3M	8	a	240	3.9		>5	m117	C	7.90m	K40	GAI	5*	ST7	SRB
2004 06 24.90	d	C	8.9	LB	6.3M	8	a	240	3.9		>5	m117	C	3.90m	K40	GAI	5*	ST7	SRB
2004 06 24.90	d	C	9.4	LB	6.3M	8	a	240	3.9		>5	m117	C	2.00m	K40	GAI	5*	ST7	SRB
2004 06 24.90	d	C	10.0	LB	6.3M	8	a	240	3.9		>5	m117	C	1.00m	K40	GAI	5*	ST7	SRB
2004 06 24.90	d	C	10.9	LB	6.3M	8	a	240	3.9		>5	m117	C	0.50m	K40	GAI	5*	ST7	SRB
2004 06 24.94	d	k	8.4	LA	35	L	5	a	390	>15	>8	m161	C	8.00m	T24	GAI	5*P	ST6	HOR02
2004 06 24.94	d	k	8.9	LA	35	L	5	a	390	>15	>8	m161	C	4.00m	T24	GAI	5*P	ST6	HOR02
2004 06 24.94	d	k	9.4	LA	35	L	5	a	390	>15	>8	m161	C	2.00m	T24	GAI	5*P	ST6	HOR02
2004 06 24.94	d	k	10.0	LA	35	L	5	a	390	>15	>8	m161	C	1.00m	T24	GAI	5*P	ST6	HOR02
2004 06 24.94	d	k	10.7	LA	35	L	5	a	390	>15	>8	m161	C	0.50m	T24	GAI	5*P	ST6	HOR02
2004 06 26.91	d	C	8.6	LB	6.3M	8	a	900	4.4		>20	m163	C	8.90m	K40	GAI	5*	ST7	SRB
2004 06 26.91	d	C	8.9	LB	6.3M	8	a	900	4.4		>20	m163	C	4.40m	K40	GAI	5*	ST7	SRB
2004 06 26.91	d	C	9.5	LB	6.3M	8	a	900	4.4		>20	m163	C	2.00m	K40	GAI	5*	ST7	SRB
2004 06 26.91	d	C	10.1	LB	6.3M	8	a	900	4.4		>20	m163	C	1.00m	K40	GAI	5*	ST7	SRB
2004 06 26.91	d	C	11.0	LB	6.3M	8	a	900	4.4		>20	m163	C	0.50m	K40	GAI	5*	ST7	SRB
2004 06 26.92	d	k	8.3	LA	35	L	5	a	600	>12	>9	m152	C	8.00m	T24	GAI	5*P	ST6	HOR02
2004 06 26.92	d	k	8.8	LA	35	L	5	a	600	>12	>9	m152	C	4.00m	T24	GAI	5*P	ST6	HOR02
2004 06 26.92	d	k	9.3	LA	35	L	5	a	600	>12	>9	m152	C	2.00m	T24	GAI	5*P	ST6	HOR02
2004 06 26.92	d	k	9.9	LA	35	L	5	a	600	>12	>9	m152	C	1.00m	T24	GAI	5*P	ST6	HOR02
2004 06 26.92	d	k	10.6	LA	35	L	5	a	600	>12	>9	m152	C	0.50m	T24	GAI	5*P	ST6	HOR02
2004 06 28.48	axC		8.9	HV	35.0C	10	a	60	3.8	5	7.5m112	S	4.68m	KAIaSI4	5		ST2	TSU02	
2004 06 28.95	d	C	8.6	LB	6.3M	8	a	900	3.9		>25	m147	C	7.90m	K40	GAI	5*	ST7	SRB
2004 06 28.95	d	C	9.1	LB	6.3M	8	a	900	3.9		>25	m147	C	3.90m	K40	GAI	5*	ST7	SRB
2004 06 28.95	d	C	9.5	LB	6.3M	8	a	900	3.9		>25	m147	C	2.00m	K40	GAI	5*	ST7	SRB
2004 06 28.95	d	C	10.1	LB	6.3M	8	a	900	3.9		>25	m147	C	1.00m	K40	GAI	5*	ST7	SRB
2004 06 28.95	d	C	11.0	LB	6.3M	8	a	900	3.9		>25	m147	C	0.50m	K40	GAI	5*	ST7	SRB
2004 06 29.91	d	k	8.3	LA	35	L	5	a	560	>14	>11	m143	C	8.00m	T24	GAI	5*P	ST6	HOR02
2004 06 29.91	d	k	8.7	LA	35	L	5	a	560	>14	>11	m143	C	4.00m	T24	GAI	5*P	ST6	HOR02
2004 06 29.91	d	k	9.3	LA	35	L	5	a	560	>14	>11	m143	C	2.00m	T24	GAI	5*P	ST6	HOR02
2004 06 29.91	d	k	9.9	LA	35	L	5	a	560	>14	>11	m143	C	1.00m	T24	GAI	5*P	ST6	HOR02
2004 06 29.91	d	k	10.6	LA	35	L	5	a	560	>14	>11	m143	C	0.50m	T24	GAI	5*P	ST6	HOR02
2004 07 06.54	axC		8.8	HV	35.0C	10	a	60	4.4	5	>7.5m	94	S	5.19m	KAIaSI4	5		ST2	TSU02
2004 07 08.56	axC		8.8	HV	35.0C	10	a	60	4.5	5	>8.5m	93	S	4.56m	KAIaSI4	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 05 24.69		C	17.6	GA	60.0Y	6	a	240	0.3		0.7m123	S	0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.65		C	17.5	GA	60.0Y	6	a	240	0.35		1.2m110	S	0.35m	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 05 25.78	axC		10.8	HV	35.0C	10	a	60	0.7	5	1.0m288	S	1.88m	KAIaSI4	5		ST2	TSU02	
2004 06 30.78	axC		12.4	HV	35.0C	10	a	120	0.5	4	1.2m331	S	1.03m	KAIaSI4	5		ST2	TSU02	

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 01 22.98	d	k	16.1	LA	35	L	5	a810	0.62				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.98	d	k	16.3	LA	35	L	5	a810	0.62				C 0.62m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.95	d	k	16.2	LA	35	L	5	a900	0.63				C 0.63m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.96	d	k	15.8	LA	35	L	5	A260	0.62				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.96	d	k	16.1	LA	35	L	5	A260	0.62				C 0.62m	T24	GAI	5*	P	ST6	HOR02
2004 03 17.95	d	k	16.5	LA	35	L	5	a900	0.67				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 03 30.89	d	k	16.2	LA	35	L	5	a720	0.77				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.87	d	k	15.6	LA	35	L	5	a900	0.63				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.87	d	k	15.7	LA	35	L	5	a900	0.63				C 0.63m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.47	axC		16.3	HV	35	OC	10	A800	0.4	4			S 0.59m	KAIaSI4	5		ST2	TSU02	
2004 04 12.86	d	k	15.6	LA	35	L	5	a480	0.70				C 0.70m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.86	d	k	15.7	LA	35	L	5	a480	0.70				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.89	d	k	15.7	LA	35	L	5	a810	0.67				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 07 11.53	sxC		15.6	TJ	25	OL	5	a120	0.3				S 0.3 m	K42	SI4	5	U	SE7	OHS

Comet C/2003 V1 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 01 22.90	d	k	15.4	LA	35	L	5	A080	0.57		0.8m300		C 2.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.90	d	k	15.7	LA	35	L	5	A080	0.57		0.8m300		C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.90	d	k	16.2	LA	35	L	5	A080	0.57		0.8m300		C 0.57m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.93	d	k	16.0	LA	35	L	5	a810	0.58		1.0m295		C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 23.93	d	k	16.3	LA	35	L	5	a810	0.58		1.0m295		C 0.58m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.84	d	k	15.4	LA	35	L	5	a900	0.45		0.7m292		C 2.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.84	d	k	15.7	LA	35	L	5	a900	0.45		0.7m292		C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.84	d	k	16.2	LA	35	L	5	a900	0.45		0.7m292		C 0.45m	T24	GAI	5*	P	ST6	HOR02
2004 02 11.81	d	k	16.2	LA	35	L	5	a540	0.53		0.5m270		C 0.53m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.95	d	k	17.2	LA	35	L	5	a900	0.47		0.4m275		C 0.47m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.91	d	k	16.9	LA	35	L	5	A080	0.42		0.3m278		C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.91	d	k	17.2	LA	35	L	5	A080	0.42		0.3m278		C 0.42m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.93	d	k	16.7	LA	35	L	5	a900	0.45		0.3m280		C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.93	d	k	17.1	LA	35	L	5	a900	0.45		0.3m280		C 0.45m	T24	GAI	5*	P	ST6	HOR02
2004 05 29.90	d	k	18.3	LA	35	L	5	a960		9			C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 05 29.90	d	k	18.5	LA	35	L	5	a960		9			C 0.20m	T24	GAI	5*	P	ST6	HOR02

Comet P/2004 A1

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 01 22.88	d	k	18.5	LA	35	L	5	A320		9			C 0.22m	T24	GAI	5*	P	ST6	HOR02
2004 01 22.88	d	k	18.6	LA	35	L	5	A320		9			C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 01 24.92	d	k	18.3	LA	35	L	5	A140		9			C 0.20m	T24	GAI	5*	P	ST6	HOR02
2004 02 11.86	d	k	18.0	LA	35	L	5	a720	0.23				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 02 11.86	d	k	18.1	LA	35	L	5	a720	0.23				C 0.23m	T24	GAI	5*	P	ST6	HOR02
2004 02 12.88	d	k	18.5	LA	35	L	5	a900		9			C 0.20m	T24	GAI	5*	P	ST6	HOR02
2004 02 20.91	d	k	17.9	LA	35	L	5	A200	0.27				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 02 20.91	d	k	18.0	LA	35	L	5	A200	0.27				C 0.27m	T24	GAI	5*	P	ST6	HOR02
2004 03 17.90	d	k	18.3	LA	35	L	5	A140	0.27				C 0.27m	T24	GAI	5*	P	ST6	HOR02
2004 03 17.90	d	k	18.4	LA	35	L	5	A140	0.27				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.90	d	k	18.2	LA	35	L	5	a900	0.33				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 04 08.90	d	k	18.3	LA	35	L	5	a900	0.33				C 0.33m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.96	d	k	18.3	LA	35	L	5	a480	0.27				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 04 12.96	d	k	18.4	LA	35	L	5	a480	0.27				C 0.27m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.91	d	k	18.3	LA	35	L	5	a840	0.28				C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 04 14.91	d	k	18.5	LA	35	L	5	a840	0.28				C 0.28m	T24	GAI	5*	P	ST6	HOR02

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 05 14.55		C	18.0	GA	60	OY	6	a240	0.25	8			S 0.25m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.50		C	17.5	GA	60	OY	6	a240	0.4				S 0.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 07 13.50		C	17.8	GA	60	OY	6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01

Comet P/2004 EW_38 (Catalina-LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 05 14.57	C		20.0	GA	60.0Y	6	a240	0.25	8				S 0.25m	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 05 14.66	C		18.6	GA	60.0Y	6	a240	0.3					S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 24.67	C		19.0	GA	60.0Y	6	a240	0.25	8				S 0.25m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.62	C		19.5	GA	60.0Y	6	a240	0.25	8				S 0.25m	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 03 30.89	d	C	14.8	LB	6.3M	8	a900	0.6					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 03 30.89	d	C	15.3	LB	6.3M	8	a900	0.6					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 03 30.89	d	C	15.5	LB	6.3M	8	a900	0.6					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 03 31.09	d	k	16.1	LA	35 L	5	A020	0.55			0.7m270		C 0.55m	T24	GAI	5*P	ST6	HOR02	
2004 04 08.91	d	C	15.8	LB	6.3M	8	a900	0.6					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 08.91	d	C	16.0	LB	6.3M	8	a900	0.6					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 09.09	d	k	15.4	LA	35 L	5	a480	0.43			0.7m268		C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 04 09.09	d	k	15.6	LA	35 L	5	a480	0.43			0.7m268		C 0.43m	T24	GAI	5*P	ST6	HOR02	
2004 04 12.90	d	C	15.0	LB	6.3M	8	a900	0.9					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 12.90	d	C	15.3	LB	6.3M	8	a900	0.9					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 04 12.90	d	C	15.6	LB	6.3M	8	a900	0.9					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 13.88	d	C	15.6	LB	6.3M	8	a900	0.6					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 13.88	d	C	15.6	LB	6.3M	8	a900	0.6					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 04 13.88	d	C	15.8	LB	6.3M	8	a900	0.6					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 14.91	d	C	15.2	LB	6.3M	8	a900	0.4					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 04 14.91	d	C	15.3	LB	6.3M	8	a900	0.4					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 04 14.91	d	C	15.6	LB	6.3M	8	a900	0.4					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 15.05	d	k	15.4	LA	35 L	5	a320	0.45			0.4m270		C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 04 15.05	d	k	15.5	LA	35 L	5	a320	0.45			0.4m270		C 0.45m	T24	GAI	5*P	ST6	HOR02	
2004 04 15.87	d	C	15.6	LB	6.3M	8	a900	0.7					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 04 15.87	d	C	15.7	LB	6.3M	8	a900	0.7					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 04 16.57	axC		15.9	HV	35.0C	10	a180	0.4		6			S 0.94m	KAIaSI4	5		ST2	TSU02	
2004 05 11.60	axC		15.9	HV	35.0C	10	a120	0.2		8			S 0.73m	KAIaSI4	5		ST2	TSU02	
2004 05 14.56	C		15.7	GA	60.0Y	6	a120	0.4					S 0.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 19.97	d	k	15.2	LA	35 L	5	a480	0.50					C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 19.97	d	k	15.2	LA	35 L	5	a480	0.50					C 0.50m	T24	GAI	5*P	ST6	HOR02	
2004 05 20.04	d	C	14.4	LB	6.3M	8	a900	0.7					C 1.50m	K40	GAI	5*	ST7	SRB	
2004 05 20.04	d	C	15.0	LB	6.3M	8	a900	0.7					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 20.04	d	C	15.5	LB	6.3M	8	a900	0.7					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 21.61	x	C	15.2	TJ	25.0L	5	a120	0.3					S 0.3 m	K42	SI4	5	U	SE7	OHS
2004 05 24.58	C		15.6	GA	60.0Y	6	a120	0.4					S 0.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 29.94	d	k	15.0	LA	35 L	5	a480	0.40					C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 05 29.94	d	k	15.1	LA	35 L	5	a480	0.40					C 0.40m	T24	GAI	5*P	ST6	HOR02	
2004 05 29.97	d	C	15.3	LB	6.3M	8	a900	0.5					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 29.97	d	C	15.5	LB	6.3M	8	a900	0.5					C 0.75m	K40	GAI	5*	ST7	SRB	
2004 05 29.97	d	C	15.6	LB	6.3M	8	a900	0.5					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 05 30.95	d	C	14.8	LB	6.3M	8	a900	0.7					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 05 30.95	d	C	14.9	LB	6.3M	8	a900	0.7					C 0.70m	K40	GAI	5*	ST7	SRB	
2004 05 30.95	d	C	15.3	LB	6.3M	8	a900	0.7					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 07.90	d	C	14.2	LB	6.3M	8	a900	1.0					C 2.00m	K40	GAI	5*	ST7	SRB	
2004 06 07.90	d	C	14.7	LB	6.3M	8	a900	1.0					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 07.90	d	C	15.3	LB	6.3M	8	a900	1.0					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 13.51	C		15.5	GA	60.0Y	6	a120	0.5					S 0.5 m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.91	d	k	15.1	LA	35 L	5	a400	0.53					C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 13.91	d	k	15.2	LA	35 L	5	a400	0.53					C 0.53m	T24	GAI	5*P	ST6	HOR02	
2004 06 14.60	axC		15.7	HV	35.0C	10	a 90	0.3		6			S 0.59m	KAIaSI4	5		ST2	TSU02	
2004 06 21.92	d	C	15.3	LB	6.3M	8	a900	0.5					C 1.00m	K40	GAI	5*	ST7	SRB	
2004 06 21.92	d	C	15.4	LB	6.3M	8	a900	0.5					C 0.50m	K40	GAI	5*	ST7	SRB	
2004 06 24.92	d	k	14.9	LA	35 L	5	a400	0.53					C 1.00m	T24	GAI	5*P	ST6	HOR02	
2004 06 24.92	d	k	15.0	LA	35 L	5	a400	0.53					C 0.53m	T24	GAI	5*P	ST6	HOR02	
2004 06 29.87	d	k	14.9	LA	35 L	5	a600	0.66					C 1.00m	T24	GAI	5*P	ST6	HOR02	

Comet P/2004 F3 (NEAT) [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 06 29.87	d	k	15.0	LA	35	L	5	a600	0.66				C 0.66m	T24	GAI	5*	P	ST6	HOR02
2004 07 06.52	ax	C	15.7	HV	35.0C		10	a120	0.2	6			S 0.55m	KAIaSI4		5		ST2	TSU02

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 05 25.77	ax	C	12.0	HV	35.0C		10	a 60	1.3	4	> 9.0m	309	S 1.34m	KAIaSI4		5		ST2	TSU02
2004 05 25.79	x	C	11.1	TJ	60.0Y		6	a120	2.2		> 8.0m	309	S 2.2 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 31.02	d	C	11.7	LB	6.3M		8	a900	1.7		>20	m310	C 2.45m	K40	GAI	5*		ST7	SRB
2004 05 31.02	d	C	12.0	LB	6.3M		8	a900	1.7		>20	m310	C 2.00m	K40	GAI	5*		ST7	SRB
2004 05 31.02	d	C	12.1	LB	6.3M		8	a900	1.7		>20	m310	C 1.70m	K40	GAI	5*		ST7	SRB
2004 05 31.02	d	C	12.9	LB	6.3M		8	a900	1.7		>20	m310	C 1.00m	K40	GAI	5*		ST7	SRB
2004 05 31.02	d	C	14.0	LB	6.3M		8	a900	1.7		>20	m310	C 0.50m	K40	GAI	5*		ST7	SRB
2004 06 08.00	d	C	12.8	LB	6.3M		8	a900	0.9		>10	m321	C 2.00m	K40	GAI	5*		ST7	SRB
2004 06 08.00	d	C	13.9	LB	6.3M		8	a900	0.9		>10	m321	C 1.00m	K40	GAI	5*		ST7	SRB
2004 06 08.00	d	C	14.1	LB	6.3M		8	a900	0.9		>10	m321	C 0.85m	K40	GAI	5*		ST7	SRB
2004 06 08.00	d	C	14.9	LB	6.3M		8	a900	0.9		>10	m321	C 0.50m	K40	GAI	5*		ST7	SRB
2004 06 14.00	d	k	13.4	LA	35	L	5	a600	1.9		>13.3m	308	C 1.90m	T24	GAI	5*		ST6	HOR02
2004 06 14.00	d	k	14.0	LA	35	L	5	a600	1.9		>13.3m	308	C 1.00m	T24	GAI	5*		ST6	HOR02
2004 06 14.00	d	k	15.0	LA	35	L	5	a600	1.9		>13.3m	308	C 0.50m	T24	GAI	5*		ST6	HOR02
2004 06 16.71	sx	C	16.8	TJ	25.0L		5	a120	0.2				S 0.2 m	K42	SI4	5	U	SE7	OHS
2004 06 21.97	d	C	14.1	LB	6.3M		8	a780	1.0				C 1.50m	K40	GAI	5*		ST7	SRB
2004 06 21.97	d	C	14.8	LB	6.3M		8	a780	1.0				C 1.00m	K40	GAI	5*		ST7	SRB
2004 06 21.97	d	C	15.5	LB	6.3M		8	a780	1.0				C 0.50m	K40	GAI	5*		ST7	SRB
2004 06 26.98	d	k	15.8	LA	35	L	5	a600	1.3		> 6	m315	C 1.30m	T24	GAI	5*	P	ST6	HOR02
2004 06 26.98	d	k	15.9	LA	35	L	5	a600	1.3		> 6	m315	C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 06 26.98	d	k	16.3	LA	35	L	5	a600	1.3		> 6	m315	C 0.50m	T24	GAI	5*	P	ST6	HOR02
2004 06 30.76		C	16.5	GA	60.0Y		6	a240	0.5				S 0.5 m	SIA	IPL	5	U	Ap7	NAK01

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 05 14.63		C	18.6	GA	60.0Y		6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 24.65		C	18.9	GA	60.0Y		6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.63		C	19.3	GA	60.0Y		6	a240	0.3				S 0.3 m	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 05 14.59		C	18.7	GA	60.0Y		6	a240	0.25				S 0.25m	SIA	IPL	5	U	Ap7	NAK01
2004 05 24.67		C	18.7	GA	60.0Y		6	a240	0.3				S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.56		C	19.7	GA	60.0Y		6	a240	0.25				S 0.25m	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 06.75	ax	C	10.2	HV	35.0C		10	a 60	2.0	5			S 3.73m	KAIaSI4		5		ST2	TSU02

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 05 14.61		C	17.1	GA	60.0Y		6	a240	0.4				S 0.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 24.62		C	17.0	GA	60.0Y		6	a240	0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01
2004 05 27.63		C	16.9	GA	60.0Y		6	a240	0.4				S 0.4 m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.53		C	17.0	GA	60.0Y		6	a240	0.35				S 0.35m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.96	d	k	16.7	LA	35	L	5	a400	0.33				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 06 13.96	d	k	16.9	LA	35	L	5	a400	0.33				C 0.33m	T24	GAI	5*	P	ST6	HOR02
2004 06 21.97	d	k	16.7	LA	35	L	5	a280	0.38				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 06 21.97	d	k	16.8	LA	35	L	5	a280	0.38				C 0.38m	T24	GAI	5*	P	ST6	HOR02
2004 06 24.96	d	k	16.9	LA	35	L	5	a400	0.38				C 0.38m	T24	GAI	5*	P	ST6	HOR02
2004 06 26.95	d	k	16.7	LA	35	L	5	a480	0.43				C 1.00m	T24	GAI	5*	P	ST6	HOR02
2004 06 26.95	d	k	16.8	LA	35	L	5	a480	0.43				C 0.43m	T24	GAI	5*	P	ST6	HOR02
2004 07 08.58	ax	C	16.9	HV	35.0C		10	A 80	0.3	4			S 0.76m	KAIaSI4		5		ST2	TSU02

Comet P/2004 HC₁₈ (LINEAR) [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 13.52		C	17.1	GA	60.0Y	6	a240	0.4					S 0.4 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 05 25.77	x	C	18.0	TJ	60.0Y	6	a240			9			S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 05 27.69	a	C	18.2	GA	60.0Y	6	a240			9			S 0.25m	SIA	IPL	5	U	Ap7	NAK01
2004 06 13.68	a	C	18.0	GA	60.0Y	6	a240	0.3		8/			S 0.3 m	SIA	IPL	5	U	Ap7	NAK01
2004 06 30.71		C	17.8	GA	60.0Y	6	a240	0.25					S 0.25m	SIA	IPL	5	U	Ap7	NAK01
2004 07 13.62		C	17.3	GA	60.0Y	6	a240	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 06 30.78		C	17.8	GA	60.0Y	6	a240	0.4					S 0.4 m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 K3 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 06 13.60	a	C	17.6	GA	60.0Y	6	a240	0.5					S 0.5 m	SIA	IPL	5	U	Ap7	NAK01
2004 07 13.49		C	17.1	GA	60.0Y	6	a240	0.55					S 0.55m	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 07 13.54		C	17.7	GA	60.0Y	6	a240	0.35				80 S	0.35m	SIA	IPL	5	U	Ap7	NAK01

Comet C/2004 L2 (LINEAR)

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2004 07 13.59	x	C	17.6	HV	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. [This list updates that in the April 2004 issue, p. 112.]

	<i>New-Style Designation</i>	<i>P</i>	<i>T</i>	<i>q</i>	<i>IAUC</i>
*	C/2004 HV ₆₀ (Spacewatch)		12/21/03	3.10	8337
*	C/2004 K1 (Catalina)		7/5/05	3.40	8343
*	C/2004 H6 (SWAN)		5/12/04	0.78	8346
*	P/2004 K2 (McNaught)	5.51	6/16/04	1.55	8348
*	C/2004 K3 (LINEAR)		6/30/04	1.10	8350
*	C/2004 L1 (LINEAR)		3/30/05	2.05	8352
*	C/2004 L2 (LINEAR)		11/14/05	3.78	8356
*	C/2004 P1 (NEAT)		8/8/03	6.01	8383
*	C/2004 Q1 (Tucker)		12/6/04	2.05	8393
*	C/2004 Q2 (Machholz)		1/24/05	1.21	8394
*	P/2004 R1 (McNaught)	5.42	8/30/04	0.99	8398
*	C/2004 R2 (ASAS)		10/7/04	0.11	8402
*	P/2004 R3 (LINEAR-NEAT)	7.53	5/24/04	2.14	8407
*	160P/2004 NL ₂₁ (LINEAR)	7.95	10/13/04	2.08	8408
*	C/2004 S1 (Van Ness)		12/8/04	0.68	8412