INTERNATIONAL COMET QUARTERLY

Whole Number 146 APRIL 2008 Vol. 30, No. 2

— *Table of Contents* —

SMITHSONIAN ASTROPHYSICAL OBSERVATORY
60 Garden Street · Cambridge, MA 02138 · U.S.A.

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 (now in odd-numbered years); the *ICQ* is also indexed in *Astronomy and Astrophysics Abstracts* and in *Science Abstracts Section A*.

The regular (invoiced) subscription rate is US$60.00 per year for North American and for overseas surface-mail delivery (price includes the annual *Comet Handbook*; the price without the *Handbook* is US$45.00 per year). Subscribers who do not wish to be billed may subscribe at the special rate of US$45.00 per year for surface-mail delivery (rate is $30.00 without *Handbook*). Add $30.00/year to each of these rates for overseas airmail delivery. These rates became valid as of Nov. 2007. [The last set of digits (after the hyphen) on the top line of the mailing address label gives the Whole Number that signifies the last *ICQ* issue which will be sent under the current subscription status. An asterisk after these numbers indicates credit for the next annual Comet Handbook. The first five digits represent the subscriber's account number.] Make checks or money orders payable in U.S. funds (and drawn on a U.S. bank) to *International Comet Quarterly* and send to Mail Stop 18; Smithsonian Astrophysical Observatory; 60 Garden St.; Cambridge, MA 02138, U.S.A.

Credit cards may be used for payment of subscriptions, though a minimum of US$20.00 can be accepted for each charge. Credit-card orders may be placed by e-mail (to iausubs@cfa.harvard.edu), by fax (to USA 617-495-7231), or by telephone (to USA 617-495-7280, generally between 14:00 and 21:00 UT, Monday to Friday). When sending orders by fax or e-mail, please include the following information: (1) your name (as given on the credit card); (2) card type (MasterCard, Visa, or Discover); (3) credit-card number and expiration date; (4) address at which the card is registered; (5) which services you wish to subscribe to; (6) if the payment is for the renewal of a current or expired account, please include your account number.

Group subscription rates available upon request. Back issues are $15.00 each — *except* for "current" *Comet Handbooks*, which are available for $20.00 ($15.00 to subscribers if ordered with their *ICQ* subscription; see above). Up-to-date information concerning comet discoveries, orbital elements, and ephemerides can be obtained by subscribing to the *IAU Circulars* and/or the *Minor Planet Circulars* (via postal mail and also available via computer access); for further information, contact the above e-mail address (or the *ICQ* at the above postal address).

Manuscripts will be reviewed/refereed for possible publication; authors should first obtain a copy of "Information and Guidelines for Authors" from the *ICQ* website or from the Editor. Cometary observations should be sent to the Editor in Cambridge; again, see the *ICQ* website or contact the Editor for the proper format. Those who can send observational data (or manuscripts) in machine-readable form are encouraged to do so [especially through e-mail via the Internet (ICQ@CFA.HARVARD.EDU)]. 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://www.cfa.harvard.edu/icq/icq.html). The *ICQ* published a 225-page *Guide to Observing Comets* in early 1997 that is now out of print; a revised edition is in preparation.

Most of the Observation Coordinators (OCs) listed below have e-mail contacts with the *ICQ* Editor; observers in the general area of such OCs who lack access to e-mail networks may send data to the OC for relay to the *ICQ* in electronic form.

++++++++++++

This issue is No. 146 of the publication originally called *The Comet* (founded March 1973) and is Vol. 30, No. 2, of the *ICQ*. *[ISSN 0736-6922]*

****

CORRIGENDA.

- In the Jan. 2008 issue, page 26, second full paragraph, line 3, *for* terrain, one by is an efficient *read* terrain, one by one, is an efficient

- In the *2007 Comet Handbook*, p. H45, the predicted photometric parameters for C/2006 YC were given incorrectly as $H_{10} = 7.5$, whereas they should read $H_{7.5} = 10.0$ (and the ephemeris magnitudes are also thus in need of correction accordingly).

FOURTH INTERNATIONAL WORKSHOP ON COMETARY ASTRONOMY

The fourth International Workshop on Cometary Astronomy (IWCA IV) was originally scheduled to be held in Japan near the time of the long total solar eclipse of 2009 July 22, in the hopes of drawing international participants travelling to view the eclipse. Unfortunately, there was very little interest expressed by potential attendees from outside Japan, apparently because the path of totality does not cross the large Japanese islands. When the meeting in Japan was cancelled, the *ICQ* approached cometary astronomers in China (with the path of totality crossing the southern part of the large eastern city of Shanghai) about the possibility of holding the IWCA IV in Shanghai, and the response has been good — both in that the Chinese Astronomical Society and the Beijing Planetarium have agreed to co-host the IWCA IV with the *ICQ* in Shanghai and that numerous international cometary observers have indicated already that they will plan to attend the one-day meeting on the day after the eclipse (*i.e.*, on Thursday, 2009 July 23). After some discussion with the Chinese astronomers, it has been decided that both Chinese and non-Chinese astronomers will meet together for half the day, with that portion of the meeting conducted in English; the other half-day will see the Chinese attendees conducting their meeting in Chinese, with the non-Chinese attendees continuing their discussions in English in another room. Additional details will be posted at the *ICQ* website as they become known.

Φ Φ Φ

On a Forgotten 1836 Explosion from Halley's Comet, Reminiscent of 17P/Holmes' Outbursts

Zdenek Sekanina

Jet Propulsion Laboratory; California Institute of Technology; Pasadena, CA 91109; U.S.A.

Abstract. *Although it is often affirmed that the outbursts displayed by comet 17P/Holmes, including the megaburst of 2007, have never been observed in any other comet, I find that about ten weeks after its 1835 perihelion, comet 1P/Halley experienced a similarly massive explosion in late January 1836, at 1.44 AU from the sun, with a peak intrinsic magnitude of at least +0.3, midway between the limits on the outbursts of 17P/Holmes. Predictably, this outburst of Halley's comet accompanied the formation of a disk-shaped, sharply-bounded dust halo, which was steadily expanding at a rate of 0.575 km/s into a feature of nearly-parabolic outlines, very similar in appearance to the halos of 17P/Holmes in 1892-1893 and 2007. The 1836 episode of Halley's comet and its aftermath thus compare favorably with the 17P/Holmes events in all respects.*

1. Introduction

There is a general understanding that the enormous explosions, or outbursts, that accompanied episodes of a rapidly expanding, sharply-bounded dust halo of comet 17P/Holmes in 1892-1893 and again in October 2007 have never been observed in any other comet. While the 2007 megaburst still remains unrivaled as the most powerful event of this kind on record, the uniqueness of 17P/Holmes is a myth. As demonstrated in this paper, another member of this peculiar group of objects is — of all comets — 1P/Halley!

The explosive events of comet 17P/Holmes, examined in a recent paper (Sekanina 2008 — hereafter referred to as Paper 1), begin with the appearance of a starlike, rapidly brightening nuclear condensation that is soon to be recognized as a sharply-bounded disk, expanding steadily at an essentially constant rate. Reaching its peak at the end of the event's active phase, the light curve begins to display a slowly declining post-event plateau. In the meantime, the growing disk-shaped condensation evolves into a halo, with its boundary on the antisolar side gradually becoming more diffuse and elongated. The halo's surface brightness progressively diminishes with time until the feature eventually disappears, completing the last phase of outburst development.

This paper uses the same terminology for outbursts and their properties as Paper 1. In particular, the brightness — corrected for personal and instrumental bias and referred to a geocentric distance Δ of 1 AU by a Δ^{-2} law — is described by a normalized magnitude H_Δ. A normalized magnitude referred to a heliocentric distance r of 1 AU by an r^{-2} law is called an intrinsic magnitude H_0. The normalized and intrinsic magnitudes at maximum light, which occurs shortly after the explosion begins, are called, respectively, the peak normalized magnitude $(H_\Delta)_{\rm peak}$ and the peak intrinsic magnitude $(H_0)_{\rm peak}$. The event's early phase is described by the self-explanatory onset time $t_{\rm onset}$, identical with the time when the halo begins to expand; by the rise time $\Delta t_{\rm rise}$, which is the time interval between the onset time and the time of peak brightness $t_{\rm peak}$; and by the amplitude $\Delta H_{\rm peak}$, which is the difference between the magnitudes at the onset and at maximum brightness. The rate of expansion of the dust halo is described by a (projected) expansion velocity $v_{\rm exp}$.

For the three events of comet 17P/Holmes, the nominal range of the critical parameters was found to be as follows (Paper 1): onset time between 143 and 216 days after perihelion; rise time between 1.8 and 6 days; amplitude between 4 and 14 magnitudes; peak intrinsic magnitude between +1.9 and −0.5 (before phase-angle corrections); mass of 10^{13}-10^{14} g of dust injected into the atmosphere; and expansion velocity between 0.28 and 0.50 km/s. The 1892-1893 outbursts were found to be less powerful than the megaburst of 2007 in terms of both the peak intrinsic brightness (by 1.7 to 2.4 magnitudes) and the expansion velocity (by 0.12 to 0.22 km/s). It was shown in Paper 1 that the explosions of 17P/Holmes differ significantly from all other outbursts, including the very powerful flare-ups of comet 29P/Schwassmann-Wachmann, in that they must originate from emission sources of a fairly large extent on the nucleus and, from the very beginning, are features of nearly global proportions on the scale of the nucleus. It is proposed that any emission episode during which the mass of dust suddenly injected into the atmosphere amounts to 10^{13} g or more — and the comet begins to display the characteristic, rapidly expanding halo whose shape gradually changes from a sharply-bounded disk to a catenary-like and/or parabolic feature — be called a super-massive explosion or explosive event. The expanding cloud's peak intrinsic magnitude $(H_0)_{\rm peak} \leq 2$ mag (before a correction for the phase effect) can serve as a fair proxy constraint. The rest of this paper is focused on providing evidence that Halley's comet experienced a super-massive explosion in 1836.

2. The Forgotten Explosion of Comet 1P/Halley in 1836

While showing continually-changing jet morphology in the coma during the apparitions of 1835, 1910, and 1986 (e.g., Bessel 1836, Bobrovnikoff 1931, Rahe *et al.* 1969, Larson *et al.* 1987), Halley's comet was not reported to undergo a major outburst in 1910 (e.g., Bobrovnikoff 1941a, 1941b; Morris and Green 1982; Bortle and Morris 1984; Marcus 1986) or 1986 (e.g., Green and Morris 1987), until a flare-up more than 5 mag in amplitude was observed 5 years past perihelion, in February 1991, at 14.3 AU from the sun (West *et al.* 1991).

At the 1835-1836 apparition, the comet was first detected by Dumouchel (1836) on 1835 August 5 UT and observed extensively at various sites through its perihelion point (1835 November 16.44 UT) until late November, when it was less than 20° from the sun. After solar conjunction, which occurred on December 5, the comet was first detected in Milan (Kreil 1837) and New Haven (Loomis 1836, 1848) on December 31 UT, about 32° from the sun, and by January 22 it was also observed at Padua (Santini 1836), Geneva (Müller 1842), Munich (Lamont 1837), Mannheim (Nicolai 1836), Cambridge (Airy 1847), and elsewhere. The comet during this period of time was poorly placed for observation, relatively faint, and not a naked-eye object (see section 4 of this paper).

John Herschel, who between 1834 and 1838 was conducting his southern-sky observations with a powerful 46-cm *f*/13 reflector and a 13-cm *f*/17 equatorial from Feldhausen (an old estate at Wynberg, a suburb of Cape of Good Hope, located on the southeastern side of the Table Mountain), saw the comet for the first time on 1835 October 28 UT, when he compared its naked-eye brightness to that of a third-magnitude star (Herschel 1847). He continued to observe the comet until November 10 UT, when, in strong twilight, he estimated its brightness at magnitude 2-3 or 3. After the conjunction, Herschel unsuccessfully searched for Halley's comet on the mornings of December 22 and 26, but had no more search opportunities before he received word from Thomas Maclear, of the Cape Observatory, who detected the tailless comet on the morning of January 25 (Maclear 1838). There is an ambiguity about the brightness: on page 92 of his report, Maclear noted that to the naked eye the comet was as bright as a star of magnitude 2-3 or 3, while in a log on page 114 he remarked that the comet was "to the naked eye equal to a star of 2 magnitude".[1] Herschel (1847) found the comet the next morning "as a bright star of the 4th, or small one of the 3rd magnitude", which to the naked eye "offered the aspect of a star"; in the night-glass "its appearance was that of a highly condensed globular nebula"; in the equatorial it looked like "a bright, round, and a very nearly uniform nebulous disc", more sharply defined on its eastern, sunward side; and in the reflector, the comet was "a most singular and remarkable object", a total change compared to its aspect at the time of pre-perihelion observations.

Continuing his remarks on the comet's appearance in the eyepiece of the large reflector, Herschel (1847) commented on "the extraordinary sharpness of termination of the head, a phenomenon ... quite unique in the history of comets". He noticed "a vividly luminous nucleus, or rather ... a miniature comet having a nucleus, head and tail of its own" and pointed out that the whole (i.e., including the disk-shaped feature) "was encircled with a strong *coma* [Herschel's emphasis], which nearly filled the field of view (15′ diameter)." [2]

A strong similarity with the appearance of 17P/Holmes during and after its 2007 megaburst is fairly obvious from this description alone. The confirmation of the two comets exhibiting the same kind of phenomenon is provided by observational details secured by both Herschel (1847) and Maclear (1838). During the very first night of his observing, Herschel became confounded when finding, with the equatorial, that his two measurements of the disk-like head's sharply-defined breadth taken 2^h14^m apart differed by nearly 15″, implying that *"the comet was actually increasing in dimensions*

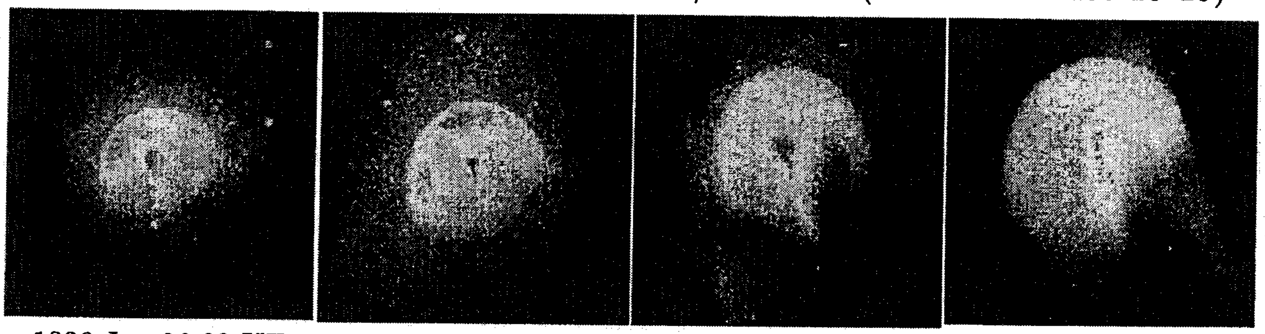
[1] A nominal magnitude of 2.5 has been adopted for Maclear's observation on Jan. 25 UT in this paper.

[2] To avoid confusion, a few words about the used terminology. The term "coma", as employed by Herschel, refers to the extent of (presumably gas) emissions in the atmosphere observed both before and after the unusual developments began after Jan. 23. For example, Müller (1842) reported a coma 2′-3′ in diameter on Jan. 15, and 4′ in diameter on Jan. 21 UT. The diameter of nearly 15′ mentioned by Herschel in the morning of Jan. 26 was likely to be a combined effect of an increased size of the physical coma and of a greater power of his telescope — compared to instruments used by other observers. This is generally in line with the result by Maclear, who, observing with the 34-cm *f*/12 reflector of the Cape Observatory on the morning of Jan. 25, recorded a "total" coma diameter of 8′.2, while the disk of expanding dust was less than 3′ in diameter. The relationship between the coma and the disk (or halo) of Halley's comet was similar to that for 17P/Holmes in late 2007 (cf. Figure 2 in Paper 1). In Herschel's terminology, the disk evolved into an expanding envelope. This term is rather unfortunate, because the envelope was actually smaller than the coma until the latter's disappearance.

with such rapidity that it might ... be seen to grow!" [Herschel's emphasis]. Only after convincing himself that his determinations were not in error, did he believe this result. The conclusions that the phenomena in 1P/Halley and 17P/Holmes are of the same nature and refer to a rapidly expanding dust halo are further strengthened by sets of drawings that accompany both Herschel's treatise and Maclear's account. To illustrate this evidence, I present digitally processed renditions of four of Herschel's drawings of the dust halo, from 1836 January 26-29 UT, in Figure 1. They are compared with four images of comet 17P/Holmes taken by Peter Vasey of England during November 2007 in Figure 2 to show how impressive the correspondence really is!

◇ ◇ ◇

DUST HALO EXPANSION IN COMET 1P/HALLEY (1836 JANUARY 26–29)



1836 Jan 26.09 UT **1836 Jan 27.11 UT** **1836 Jan 28.09 UT** **1836 Jan 29.12 UT**

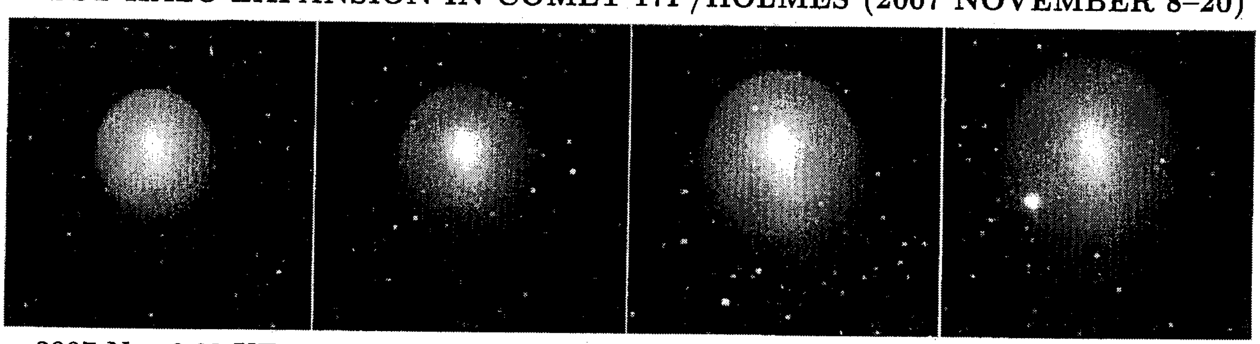
0 **0.5** **1**

LINEAR SCALE (10^6 km)

Above: Figure 1. Steady expansion of the sharply-bounded dust halo of comet 1P/Halley between 1836 January 26 and 29, following the comet's outburst that began on January 23. Noted is a striking similarity with the appearance of comet 17P/Holmes in Figure 2, even though the linear scales are different. The frames are digitally processed drawings made by J. F. W. Herschel, showing the comet as it appeared to him in the eyepiece of his 46-cm f/13 reflector at Feldhausen, Cape of Good Hope, South Africa. The images were taken, respectively, 2.82, 3.84, 4.82, and 5.85 days after the onset of halo expansion. The nuclear condensation appearing darker than the surrounding halo is an artifact of the image inversion process applied. East is up, and south is to the left. The sun is in a direction slightly south of east. (From Herschel 1847.)

Below: Figure 2. Steady expansion of the sharply-bounded dust halo of comet 17P/Holmes between 2007 Nov. 8 and 20, following the comet's megaburst that began on Oct. 23. Noted is a striking similarity with the appearance of comet 1P/Halley in Figure 1, even though the linear scales are different. In the first frame on the left, the diameter of the halo is about equal to the diameter of the sun. The images — referring to the times of, respectively, 16.2, 19.3, 22.3, and 27.3 days after the onset of halo expansion — were taken by P. Vasey, Plover Hill Observatory, Hexham, Northumberland, U.K. He used his Canon 350D camera with a William Optics ZS66 6.6-cm f/5.9 refractor and a reducer that brought the focal length down from 39 cm to about 30 cm. North is up, and east is to the left. The direction to the sun rotates from the north-northeast in the first frame to very slightly west of the north in the last frame. (Reproduced by permission.)

DUST HALO EXPANSION IN COMET 17P/HOLMES (2007 NOVEMBER 8–20)



2007 Nov 8.93 UT **2007 Nov 11.99 UT** **2007 Nov 14.95 UT** **2007 Nov 20.04 UT**

0 **2** **4**

LINEAR SCALE (10^6 km)

3. 1P/Halley's Expanding Dust Halo

It is most fortunate that 1P/Halley's dust halo began to expand just shortly before Maclear detected the comet for the first time after its conjunction with the sun and that Herschel immediately recognized the significance of the observed physical changes and made, with his powerful telescope, a lasting contribution toward learning the nature of this phenomenon.

Herschel's (1847) treatise provides not only a bulk of information on the halo, but also describes attempts at analyzing his own observations, the applied technique showing his intuitive mind. Noticing that the rate of expansion of the rapidly growing halo (which he referred to as an envelope) was "nearly uniform during the whole interval embraced by [the] observations", he extrapolated the trend back in time to arrive "at the singular conclusion that on [January 21.52 UT] the envelope *had no magnitude* [Herschel's emphasis], that in short, at that moment, a most important physical change commenced in the comet's state. Previous to that instant, it must have consisted of a mere nucleus, a stellar point, more or less bright, and a coma more or less dense and extensive. At that instant, the formation of the envelope commenced, and continued in the manner and at the rate above described."

If Herschel went one step further and converted the angular dimensions into linear dimensions, his "mean rate of dilatation" of 21″ per diem would have yielded a projected expansion velocity of $\sim$ 0.3 km/s, a value that by modern standards is distinctly more typical for microscopic dust ejecta from comets than Bessel's (1836) ejection velocity of 1.1 km/s that was derived from the extent of the head of Halley's comet in the sunward direction. Herschel's considerations of an expanding halo were based on his measurements of a vertex distance, that is, the distance from the nuclear condensation to the halo's sunward end. The vertex distance was generally smaller than the halo's half-breadth, yielding a somewhat lower expansion velocity. In addition, Herschel did not fit his data points with a straight line, a circumstance that affected his determination of the time of "the physical change in the comet's state", that is, the onset time of expansion.

Herschel's effort to determine this onset time also happens to illustrate the role of personal contacts among 19th-century astronomers. An intriguing section of his 1847 treatise describes a debate that developed between him and Palm H. L. von Boguslawski, Director of the Breslau Observatory. On the occasion of a visit to H. Wilhelm M. Olbers in July 1838, Herschel got acquainted with a letter from Boguslawski to Olbers that mentioned Boguslawski's observation of Halley's comet in the morning of January 23 at Breslau.[3] In response to his request for more information, Herschel received, in September 1838, a letter in which Boguslawski stated that on that date he had "actually observed the comet *as a star* [Herschel's emphasis] of the 6th magnitude, a bright, concentrated point, which showed no disc with a magnifying power of 140," adding that the object was at the comet's predicted position and, because of its day-to-day motion, it could not be a field star. Boguslawski further reported to Herschel that he was inspecting the comet for about 27 minutes around January 23.196 UT and that he derived January 22.90 UT for the time when the expansion had begun, that is, about 33 hours later than Herschel originally found. [The local mean times have been converted to UT by the author of this paper.] Herschel concurred with Boguslawski's arguments that this later time better fitted Herschel's own measurements of the vertex distance.

There are several circumstances about this observation by Boguslawski that are unusual. One, I am aware of no report in the literature by Boguslawski himself on this subject; if Herschel did not mention it in his treatise, this information would have been lost. No one else observed the comet on January 23 and 24 UT, the nearest previous observations having come from January 22 (Lamont 1837). Two, the brightness reported by Boguslawski on Jan. 23 (magnitude 6) suggests that the comet was more than 3 magnitudes fainter than two days later, when observed by Maclear (1838); this indicates that, like with 17P/Holmes, the halo formation was accompanied by an outburst. Three, Boguslawski's onset time of expansion, nearly 0.3 day before his observation on January 23, appears to be incorrect for two reasons: (i) as he himself admitted in the letter to Herschel, the halo should have been, at the time of his Breslau observation, 19″ in diameter, while the object was seen to be starlike and definitely less than 3″.5 in diameter, and (ii) as the light increase is the steepest at the very beginning of the outburst, the comet's brightness should have already been strongly elevated, at least a halfway to the level reported by Maclear on January 25 UT, if the event were in progress; an examination of the light curve in Sec. 4 suggests that it was not. And four, it strikes one as strange that after Boguslawski conclusively satisfied himself, 24 hours later, that the "star" indeed was the comet, he did not consider it important enough to record any follow-up information on the comet's appearance and/or brightness in the morning of January 24; all he was focused on was the comet's motion. If he provided additional physical information from that morning, a more complete history of the event would be available.

Having an occasion to read the remarks by Loomis (1848), of which I had until recently been unaware, I noticed that he felt baffled by the circumstances of Boguslawski's observation as well. Loomis first described his and D. Olmsted's telescopic observations of Halley's comet in the mornings of January 14-16, when it appeared in moonlight as an object of ragged outlines and a few arcminutes across.[4] Loomis then pointedly asked how could these observations be reconciled with Boguslawski's a week later, bringing up the question of whether it was possible that "Boguslawski mistook a *fixed star* [Loomis' emphasis] for the comet?" In this context, Loomis noted that the comet "must have been difficult to observe in Breslau, being only 10° above the horizon when on the meridian, and the comet did not come upon the meridian until about *sunrise*" [Loomis' emphasis]. He also pointed out that Boguslawski "does not state that he found the comet at

[3] Herschel was aware of the possibility of an inadvertent error in the date of Boguslawski's observation. In particular, Herschel noted that an erroneous date in a British Astronomical Association's Report for 1838-1839 was subsequently corrected.

[4] As mentioned in Sec. 2, Müller (1842) reported the comet to have a coma 4′ in diameter only 48 hours before Boguslawski's controversial observation.

all" in the morning of January 24, adding that the used "language might be construed as implying that he did not." Loomis then carried his argument to its logical conclusion: "If such were the case, would not this circumstance afford a presumption that he [Boguslawski] had mistaken his object the preceding night? — for it is difficult to suppose that the comet had vanished entirely ..."[5] Since none of the observers who saw the comet between December 31 and January 22 reported it to be a naked-eye object, the case of a mistaken identity for the object observed by Boguslawski on January 23 implies that Halley's comet was that morning probably fainter than magnitude 6.

As is apparent from the results of Herschel's and Maclear's observations and their implications (Sec. 5), the halo's nearly-circular outlines were short-lived, acquiring soon catenary-like and later quasi-parabolic boundaries. Under these circumstances and also because of the phase-angle range involved (Sec. 5), it is questionable whether the vertex distance, used by Herschel and Boguslawski, is the most appropriate parameter to measure an expansion rate. Revisiting this issue, I prefer instead to employ the breadth of the halo, in part also because Maclear (1838) measured this dimension more often than the vertex distance, so that more data by Herschel and by Maclear could be combined into one set.

Maclear's (1838) first halo measurement, from the morning of January 25 UT, does not fit the expansion curve based mostly on Herschel's measurements. Maclear described the comet's appearance in the 34-cm $f/12$ reflector, the largest instrument at his disposal, as "an opaque, circular, planetary disc", whose diameter was 131″. He did not give an exact time, but from his astrometric observations it should have been about January 25.10 UT. Maclear did not record the feature's diameter the next morning, so that direct comparison with Herschel's results is not possible. However, C. Piazzi Smyth, an assistant at the Cape Observatory, made, under Maclear's guidance, careful drawings on these two days of the disk's circular appearance, from which it follows that the diameter on the 25th was 0.59 the diameter on the 26th. Judging from his astrometry on the 26th, Maclear observed the comet at almost exactly the time of Herschel's second measurement of the breadth, 252″, so that the diameter on the 25th comes out to be 0.59 × 252″ = 149″, fully 18″ greater than measured by Maclear and more in line with Herschel's measurements.

◇ ◇ ◇

Table 1. Breadth of the dust halo following the outburst of comet 1P/Halley in January 1836.

Date 1836 (UT)	Reported halo's breadth: apparent (arcsec)	Reported halo's breadth: linear (10^3 km)	Residual $O-C$ (10^3 km)	Observer
Jan 25.104	149[a]	173	−9	Maclear
26.042	237.3[b]	274	−1	Herschel
26.135	252.0	291	+6	Herschel
27.049	328.9[b]	378	+3	Herschel
27.051	333.5	383	+7	Herschel
28.060	422.2[b]	481	+5	Herschel
29.064	497.2[b]	563	−13	Herschel
31.134	702	783	+2	Maclear
Feb 2.067	823.3[b]	906	(−67)	Herschel
2.101	988	1086	(+109)	Maclear
3.076	835.3	912	(−162)	Herschel
3.077	939.2[b]	1025	(−49)	Herschel
5.074	937.7	1008	(−264)	Herschel
6.119	1334.2	1423	(+47)	Maclear
13.059	2088	2114	(+48)	Maclear
19.018	2448	2376	(−282)	Maclear

[a] Corrected by calibrating the halo diameter on Piazzi Smyth's drawings from Jan 25 and 26 with Herschel's breadth measurement on Jan 26.
[b] Measured along the meridian.

[5] One may pursue this controversy a step further by asking "which star may have Boguslawski observed"? The comet's calculated position for 1836 Jan. 23.196 UT is $\alpha = 15^h58^m.4$, $\delta = -29°05'$ (equinox 2000.0). The nearest bright star was ρ Scorpii, 22′ to the west-southwest and of apparent visual magnitude 3.9. The next star brighter than magnitude 8-9 was nearly 37′ away and of magnitude 7.3, an unlikely candidate. Even though there is no magnitude 6 star at the comet's position calculated for the critical time, Loomis' hypothesis may still be plausible, if Boguslawski confused star fields and underestimated (near the horizon) the brightness of ρ Sco by $\sim$ 2 mag, both distinct possibilities. It turns out that a mix-up by Boguslawski is strongly supported by a surprising finding that $<$ 24 hours later, when the object was supposed to be gone, the comet was in fact passing by ρ Sco to within 1′!

Table 1 compiles the available halo-breadth measurements, with corresponding linear dimensions, and presents the residuals from a fit of a uniformly expanding cloud to the data points between January 25 and 31. As the halo grew in size and became progressively fainter, the measurements were increasingly less accurate and the residuals much too large. Table 2, which compares the parameters of 1P/Halley's 1836 explosion with those for the 2007 megaburst of 17P/Holmes (Paper 1), shows that the expansion velocities were very similar, 0.575 km/s for 1P versus 0.50 km/s for 17P, even though 1P was only 1.44 AU from the sun, fully 1 AU closer than 17P.

◇ ◇ ◇

Table 2. Comparison of the explosion of comet 1P/Halley in 1836 and the megaburst of comet 17P/Holmes in 2007.

Source of data	Event's parameter	Comet 1P/Halley	Comet 17P/Holmes[a]
Expanding halo	Date of event's onset, $t_{\rm onset}$ (UT)	1836 Jan 23.27 ± 0.07	2007 Oct 23.7 ± 0.2
	Time after perihelion, $t_{\rm onset} - T$ (days)	67.83 ± 0.07	172.2 ± 0.2
	Heliocentric distance, $r_{\rm onset}$ (AU)	1.443 ± 0.001	2.435 ± 0.001
	Initial expansion velocity, $v_{\rm exp}$ (km/s)	0.575 ± 0.009	0.50 ± 0.02
Light curve	Peak intrinsic magnitude, $(H_0)_{\rm peak}$ (mag)	+0.3 ± 0.5[b,c,d]	−0.53 ± 0.12[c,e]
	Amplitude, $\Delta H_{\rm peak}$ (mag)	>3.5	14 ± 0.5[b]
	Rise time, $\Delta t_{\rm rise}$ (days)	2–5	1.8 ± 0.4[b]
	Post-event plateau	very likely	persistent
	Dust injected into coma during event[f]:		
	Total cross-sectional area, $X_{\rm dust}$ (km^2)	5×10^7	8×10^7
	Total mass, $\mathcal{M}_{\rm dust}$ (g)	0.6×10^{14}	1.0×10^{14}

[a] From Sekanina (2008).
[b] Estimated mean error.
[c] Not corrected for phase effect.
[d] Estimating from Divine *et al.* (1986) a magnitude correction of -0.7 ± 0.3 for phase angle of 37°, a corrected peak intrinsic magnitude is $(H_0)_{\rm peak}({\rm corr}) = -0.4 \pm 0.6$.
[e] Estimating from Divine *et al.* (1986) a magnitude correction of -0.4 ± 0.2 for phase angle of 17°, a corrected peak intrinsic magnitude is $(H_0)_{\rm peak}({\rm corr}) = -0.9 \pm 0.2$.
[f] With phase factor Φ estimated from Divine *et al.* (1986) at 0.53 for 1P and 0.68 for 17P, and taking particle geometric albedo, particle bulk density, and particle mass distribution function from Sekanina (2008).

◇ ◇ ◇

The 1836 halo expansion curve of Halley's comet is compared in Figure 3 with the expansion curves of 17P/Holmes (from Paper 1) following its 2007 megaburst and the 1892 and 1893 events. It is noted that by late February, the breadth of Halley's halo was about twice the diameter of the sun. Herschel (1847) remarked that all trace of the halo's outline disappeared in his reflector by March 18, some 4 months after perihelion, when the comet was 2.23 AU from the sun and the halo was expected to reach 5.5 million km across.

My result for the onset time of expansion, 1836 January 23.27 ± 0.07 UT (Table 2), has implications for Boguslawski's controversial January 23 observation. The beginning and end of the 27-minute interval during which he stated he was inspecting the comet are at Jan. 23.187 and 23.206, respectively — suggesting that, even if he observed the comet, he may have missed the event. At a 1-σ level, the halo would have begun to expand just before his observing terminated; a pre-event observation would be consistent with the fact that Boguslawski mentioned no brightening to Herschel. By contrast, expectation is that the comet should have been much harder to miss (even low above the horizon) in the morning of January 24 when the event was unquestionably in progress.

4. The Light Curve

As far as I am aware, Loomis (1836) was the first person who noticed that Halley's comet was during the 1835-1836 apparition intrinsically brighter after perihelion than before. Referring primarily to reports on naked-eye sightings, Holetschek (1896) arrived at the same conclusion in his review investigation. However, for unknown reasons, he considered Herschel's (1847) magnitude estimate from January 26 UT "not very reliable" and altogether ignored Maclear's (1838) still brighter estimate from the previous morning (Sec. 2). Holetschek rightfully complained that most reported magnitudes referred to the nuclear condensation rather than to the comet as a whole, but bright post-perihelion nuclear magnitudes necessarily made the perihelion asymmetry even more pronounced.

Contrary to Holetschek (1896), I concluded 25 years ago that 1P/Halley was in outburst in January 1836, some 70 days after perihelion, and that the formation of "an unusually bright halo" correlated with this event (Sekanina 1983), even though I did not, at the time, recognize the similarities with 17P/Holmes in 1892-1893. In Figure 1 of Sekanina (1983), based in part on naked-eye sightings at five pre-1835 apparitions, the amplitude of Halley's outburst appeared to slightly exceed 3 magnitudes.

◇ ◇ ◇

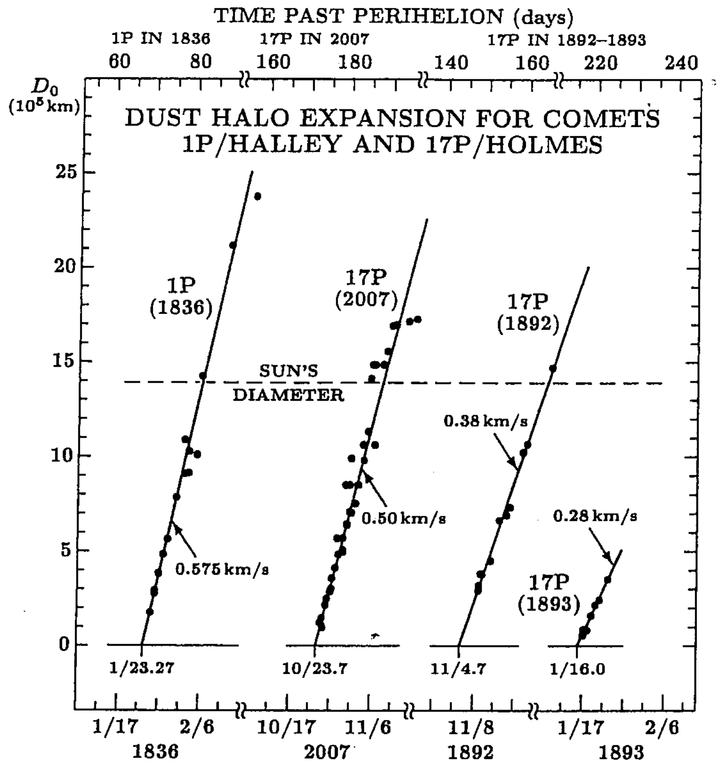


Figure 3. Expansion of the dust halo with time in the aftermath of an outburst: D_0 is the halo's linear diameter or breadth. The January 1836 event of comet 1P/Halley is compared with three similar episodes of comet 17P/Holmes: its 2007 megaburst and the 1892 and 1893 outbursts. It is only a matter of time for the expanding halo to exceed the sun's diameter, even though the mass involved is only about 10^{-20} of the sun's mass.

◇ ◇ ◇

On the assumption that the pre-outburst behavior of Halley's comet in 1835-1836 was the same as in 1986, it is clearly beneficial to compare the light curves from the two apparitions. To define the light curve in the critical period of time between 50 and ~ 150 days after perihelion, which covered the 1836 outburst and a possible post-outburst plateau, I collected, from issues of the *International Comet Quarterly*, more than 600 magnitude observations made by 20 selected observers between 1986 April 1 and July 14. These data were all corrected for personal and instrumental bias and reduced to a common magnitude scale of an average naked eye. In Figure 4 they are plotted as dots.

Herschel's (1847) brightness estimate from 1835 October 28 [18.7 days before perihelion (cf. Sec. 2)], when compared with the 1986 light curve at the same time from perihelion, can be used to "calibrate" his personal magnitude scale. For this purpose, I collected 10 magnitude observations made by 6 observers (all using binoculars 3 to 5 cm in aperture and all among the 20 already selected observers) between 1986 January 21.1 and 22.4 UT, or 19.36 to 18.06 days before perihelion. The normalized magnitude (as defined in Sec. 1) averaged over the 10 data points was $H_\Delta = 3.09 \pm 0.16$. Halley's nominal normalized magnitude from Herschel's observation on 1835 October 28 was 3.9, implying −0.8 mag for his personal correction. On 1836 January 26.1, Herschel estimated that the comet looked "as a bright star of the 4th, or small one of the 3rd magnitude" (Sec. 2), which, interpreted to indicate an apparent magnitude about 3.7 and a nominal normalized magnitude 2.7, gives a standard-scale normalized magnitude of $H_\Delta = 1.9$. Boguslawski's controversial observation in the morning of 1836 January 23 (Sec. 3) fits the 1986 light curve with a correction of merely −0.2 mag, yielding $H_\Delta = 4.7$. Considering the doubts expressed by Loomis (1848) about the comet's stellar appearance on 1836 January 23 (Sec. 3), one would surely expect a larger magnitude correction, comparable to or greater than Herschel's. This argument corroborates the skepticism about the authenticity of Boguslawski's observation and suggests that the comet was fainter than magnitude 6 by perhaps 0.5 to 1 mag. For Maclear's (1838) magnitude estimate of January 25, I arbitrarily adopted a correction of −0.3 (it is unlikely that the comet's brightness was overestimated by Maclear, so the correction cannot be positive; yet he estimated the comet to be much brighter than Herschel 24 hours later). This compromise leads to a standard-scale normalized magnitude of $H_\Delta = 1.2$ for January 25.1 UT, which is still 0.7 mag brighter than Herschel's corrected estimate. As it is unlikely that the comet would have faded by a factor of ~ 2 in 24 hours, the difference between the two estimates may reflect a decrease in the surface brightness of the expanding disk, in which much of the comet's light was concentrated. Indeed, if the integrated brightness on January 25 and 26 were the same, the ratio of the projected surface areas of 2.9 (Table 1) would imply a surface-brightness difference of 1.2 mag, exactly the discrepancy between Maclear's and Herschel's uncorrected magnitudes. From late January on, the difficulties experienced with estimating the brightness of Halley's comet were, because of the ever expanding halo, identical with those confronting observers of 17P/Holmes in 2007-2008. Unfamiliar with the concept of integrated (total) brightness of extended objects, the early-19th-century observers were helpless. And although it is true, as Holetschek (1896) remarked, that the threshold for naked-eye sightings was a good measure for the comet's integrated brightness near magnitude 6, even this may not have applied for an extremely extended object, which Halley's comet became from February 1836 on.

◊ ◊ ◊

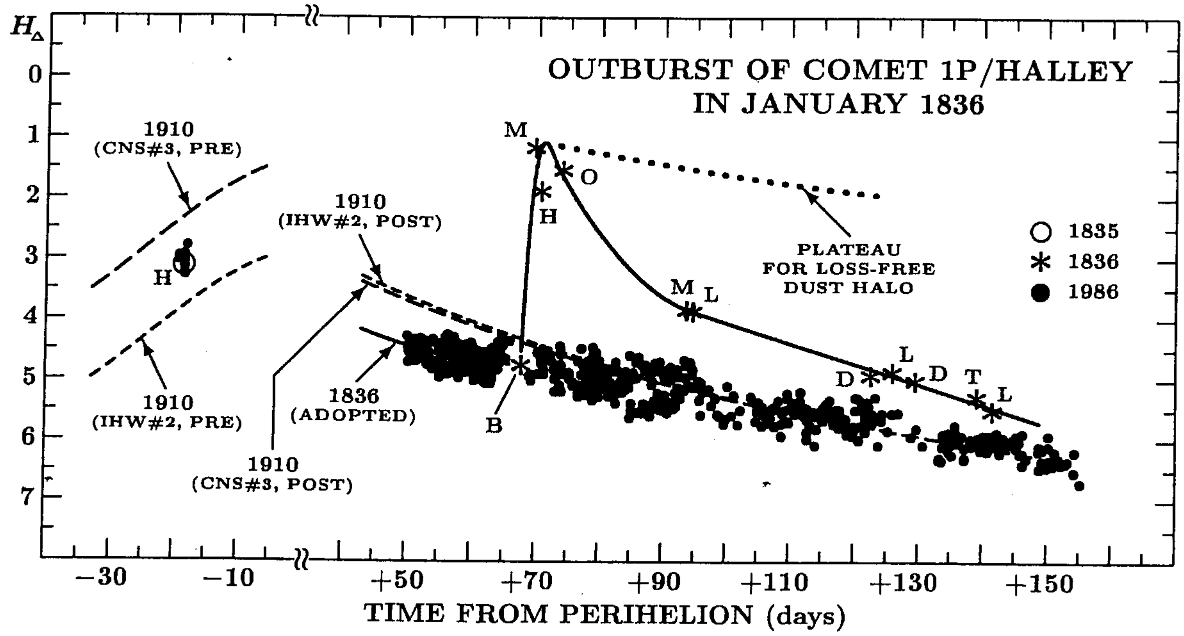


Figure 4. Light curve of comet 1P/Halley at the apparitions of 1835-1836, 1910, and 1986. Plotted versus time from perihelion is H_Δ, the visual magnitude corrected for personal and instrumental bias and normalized to a unit geocentric distance by an inverse-square power law. More than 600 magnitude estimates from 1986 April 1 through July 14 (50 through ~ 150 days after perihelion) and 10 additional ones from 1986 January 21.1-22.4 UT (about 18-19 days before perihelion) are plotted as dots. They were taken from several issues of the International Comet Quarterly. — Pre-perihelion and post-perihelion branches of two light-curve solutions for the 1910 apparition, IHW#2 and CNS#3, are shown, respectively, by the short-dashed and long-dashed curves (see text for more details). — The 1835-1836 observers whose reported magnitude estimates or naked-eye sightings of the comet are shown in the figure are marked by letters, as follows: B = P. von Boguslawski, D = É. Dumouchel, H = J. Herschel, L = E. Loomis, M = T. Maclear, O = D. Olmsted, and T = T. Taylor. Herschel's (1847) pre-perihelion magnitude estimate from 1835 October 28, plotted as a large open circle, was corrected for personal bias by comparing it with the 1986 pre-perihelion estimates from January 21-22 and used to calibrate Herschel's magnitude estimate during the outburst. The 1836 post-perihelion observations, mostly naked-eye sightings, are plotted as large asterisks. The solid curve is a model for the post-outburst light curve in 1836. Prior to the outburst the 1836 post-perihelion light curve is assumed to fit the 1986 light curve and is used to derive a magnitude correction for Boguslawski's controversial observation on 1836 January 23.2 UT, nearly 68 days after perihelion. The dotted curve is a theoretical light curve of an 1836 post-outburst plateau on the assumption of a halo that retains all the mass of injected dust. The most probable post-outburst light curve of the comet in 1836 lies in between the solid and dotted curves.

◊ ◊ ◊

In spite of these problems, the naked-eye sightings in 1836 showed that Halley's comet was much brighter after perihelion than before and that it was fading very slowly after the outburst. Loomis (1836, 1848) reported that D. Olmsted, his colleague at Yale, saw the comet "distinctly with his naked eye" in the morning of January 29 (near Jan. 29.4 UT). The word "distinctly" indicates that the comet (with the halo close to 10′ across at the time) was unquestionably much brighter than magnitude 5-6 and could have perhaps been of magnitude 2-3. Loomis continued by saying that during February and March he saw the comet with his naked eye about a dozen different times, last time on March 21 UT. His account is confirmed by other observers: Maclear (1838) reported that the comet was "still visible to the naked eye" on February 18.1, while Dumouchel (1836) saw it with the naked eye in the period March 17-24. In reference to the last observation of Halley's comet at Madras, on 1836 April 3.6, Taylor (1836) reported that his assistant "'fancied he could see it without the assistance of the telescope when pointed out to him. — I could not see it ...". This comment may indicate a detection difference between people with sharp eyes and others; the comet's integrated brightness may have been just below magnitude 6. This is consistent with a statement by Loomis (1836) that in the evening of April 5 the comet "could not probably be seen by the naked eye; it was still visible in the finder" of a Yale telescope; it should have been brighter than magnitude 7.

The post-perihelion brightness observations in 1836 and 1986 are, in terms of the normalized magnitude H_Δ, compared in Figure 4. In addition, two solutions for the comet's light curve in 1910 are also plotted. Solution IHW#2, a light curve published by Bortle and Morris (1984), was one of the solutions used by the *International Halley Watch*. The pre-perihelion branch of this light curve came from the original work by Morris and Green (1982), while the post-perihelion branch was nearly identical with the CNS#3 solution, which was developed by Marcus in several papers in the *Comet News Service* and summarized in Marcus (1986). The pre-perihelion branch of the CNS#3 solution is about 1.5 mag brighter than the IHW#2 solution. Comparison shows that the 1986 pre-perihelion magnitude observations are about midway between the two 1910 solutions, while the 1986 post-perihelion magnitudes are generally in good agreement with either of the two 1910 solutions except when closer to perihelion, where the solutions make the comet brighter than it actually was. However, this difference in the period 50-70 days after perihelion is less than 1 mag (see Fig. 4).

Returning to the 1835-1836 light curve, Herschel's corrected and normalized "calibration" pre-perihelion data point from 1835 October 28, $H_\Delta = 3.1$, is plotted in Figure 4 as a large open circle. The 1836 post-perihelion naked-eye sightings, depicted by large asterisks, were (besides the already discussed observations by Maclear on January 25 and by Herschel on January 26) assigned a variety of magnitudes. The mid-February observations by Maclear (1838) and by Loomis (1836, 1848) were assigned magnitude 4.5, the March ones by Loomis and by Dumouchel (1836) magnitudes 5.5-5.7, and the early April ones by Taylor (1836) and by Loomis magnitudes 6.2-6.5. The dotted curve shows the decrease of the normalized brightness along a post-outburst plateau on the assumption of a constant intrinsic magnitude.

Since even the last points on the 1836 light curve, some 140 days after perihelion, lie well above the 1986 light curve, the presence of a post-outburst plateau in 1836 is very probable (Table 2). On the basis of available information, it is hard to estimate the elevation of the plateau. However, in Figure 4 the February points ($\sim$ 95 days after perihelion) are only 2-2$\frac{1}{2}$ magnitudes and the March points (120-130 days after perihelion) only 3 magnitudes below the expected loss-free plateau. Given the enormous dimensions of the expanding halo, it is conceivable that the comet was brighter than adopted in Figure 4. On the other hand, the rapid rate of Halley's halo dissipation (Sec. 5) implies that the post-outburst plateau could not survive as long as did the megaburst plateau of 17P/Holmes.

The amplitude of the outburst associated with the halo formation in Halley's comet in 1836 appears to exceed 3.5 magnitudes (Table 2). By how much is hard to say, but the amplitude was probably less than 4 magnitudes and certainly less than 5 magnitudes. In Figure 4 the nominal amplitude is 3.6 magnitudes, with a peak normalized magnitude $(H_\Delta)_{\rm peak} = +1.1$, implying a peak intrinsic magnitude $(H_0)_{\rm peak} = +0.3$, with an estimated uncertainty of about ± 0.5 mag. This result does not include the unknown phase effect and is 0.8 magnitude fainter than the peak intrinsic magnitude for the megaburst of 17P/Holmes. Using Divine *et al.*'s (1986) phase function, the corrected peak intrinsic magnitude for Halley's outburst becomes $(H_0)_{\rm peak}({\rm corr}) = -0.4$, still by about 0.5 magnitude fainter than for the megaburst of 17P/Holmes. If the particles' geometric albedo, bulk density, mass distribution function, and phase law for the two events were similar, one can crudely estimate (Table 2) that the amount of dust injected into the atmosphere of 1P/Halley during the 1836 outburst was about 60 million tons in mass, with a cross-sectional area of some 50 million km^2. This is approximately 60 percent of the amount of dust injected into the atmosphere of 17 P/Holmes during the 2007 megaburst.

Because of the light-curve uncertainties, the time of maximum brightness and the rise time in 1836 can only be estimated. The light curve probably peaked during the first four days of Maclear's and Herschel's observations, between January 25.1 and 28.1 UT, which would imply a rise time of between about 2 and 5 days (Table 2). This would be consistent with most other outbursts, including the 2007 megaburst and the 1892-1893 events of 17P/Holmes.

5. Results, Comparisons, Implications, and Conclusions

The most important result of this study is a finding that Halley's comet underwent a super-massive explosion in January 1836 that gave rise to a rapidly expanding dust halo with sharp boundaries and showed up in the light curve as a sudden flare-up followed by a prolonged, very gradual fading. The most impressive similarity is found between this event and the October 2007 megaburst of comet 17P/Holmes, including the comet's appearance and morphology during the explosion and in its aftermath, the halo's expansion velocity, and the peak intrinsic brightness. I conclude that comparable amounts of microscopic dust were injected into the atmosphere during the two events: 6×10^{13} g for 1P/Halley in 1836 and 10^{14} g for 17P/Holmes during the 2007 megaburst.

The importance of 1P/Halley as a second comet to experience a super-massive explosion *cannot be overstated*. Besides the fact that 17P/Holmes is *not unique*, Halley's example shows that the occurrence of these events is not limited to the Jupiter-family comets, with a potentially major implication for the internal structure of cometary nuclei. The example of Halley's comet also shows that super-massive explosions are not restricted *only* to objects that stay beyond 2 AU from the sun at all times and/or are slow rotators. While 17P/Holmes may or may not be spinning slowly, Halley's comet is not. The rotation state of 1P/Halley has been approximated by an excited, axially symmetric prolate spheroid (Belton *et al.* 1991), whose long axis rotates around the angular-momentum vector with a period of 3.7 days — which, with the spin around the long axis, produces a total spin period of 2.84 days.

Even though the similarities between the explosion of 1P and the megaburst of 17P cannot be in doubt, their temporal evolutions were not identical. Cursory comparison of the halos in Figures 1 and 2 suggests that the near-perfect roundness of Halley's halo became distorted already in $\sim$ 4 days after the onset of its expansion. The halo of comet 17P/Holmes began to show signs of elongated shape only $\sim$ 10 days after the onset of its expansion.

This difference further strengthens the evidence in favor of the two halos being of the same type, because it is expected on account of (i) different heliocentric distances of the two events and (ii) different phase angles under which the observations were made. A uniformly expanding cloud of dust gets distorted by solar-radiation pressure γ, which accelerates the particles in the tailward direction. During a limited period of time, $t - t_{\rm onset}$, when this effect becomes detectable, the contribution to particle motions in the direction away from the sun can be approximated by an expression proportional to $\frac{1}{2}\gamma_{\rm onset}(t - t_{\rm onset})^2$, where $\gamma_{\rm onset} = \gamma(t_{\rm onset})$. In projection onto the plane of the sky, the measured component of the effect is proportional to $\frac{1}{2}\gamma_{\rm onset} \sin\alpha_{\rm onset}(t - t_{\rm onset})^2$, where $\alpha_{\rm onset}$ is the phase angle at time $t_{\rm onset}$. Since γ varies inversely as the square of heliocentric distance r, one has $\gamma_{\rm onset} \sim r_{\rm onset}^{-2}$, and the first signs of elongated outlines of an expanding dust halo are expected to show up at time $t_{\rm elong}$, for which

$$t_{\rm elong} - t_{\rm onset} \sim (\gamma_{\rm onset} \sin\alpha_{\rm onset})^{-\frac{1}{2}} \sim \frac{r_{\rm onset}}{\sqrt{\sin\alpha_{\rm onset}}}. \qquad (1)$$

Since $r_{\rm onset}$ = 1.44 AU and $\alpha_{\rm onset}$ = 37° for the 1836 outburst of 1P/Halley and, respectively, 2.44 AU and 17° for the megaburst of 17P/Holmes, the first signs of halo elongation should be detected, as measured from the onset of expansion, 2.43 times sooner for 1P than for 17P, in excellent agreement with the observations (4 days vs. 10 days). The difference between 1P and 17P is thus fully understood in terms of (i) the dependence on heliocentric distance of the radiation-pressure accelerations to which microscopic dust in the expanding halos is subjected and (ii) the effects of broadside-viewing geometry for the terrestrial observer at the time.

Other differences between the two events are due to the much-greater nuclear dimensions and considerably higher level of "normal" activity of Halley's comet. This activity accounts for a lesser amplitude of the outburst: even though the amounts of injected dust were almost comparable, 1P/Halley brightened during the explosion only by a factor of ~ 30, at most 40, rather than 400,000, as 17P/Holmes did during the megaburst. The mass of the injected dust cloud was only about a 1/4000-th part of Halley's nucleus mass (rather than more than a 1/50-th part, as in the case of 17P), when one adopts a bulk density of 0.4 g/cm³ (used in Paper 1) and Keller *et al.*'s (1987) estimate for the volume of the nucleus.

◇ ◇ ◇

Table 3. Cone angle of vectorial distribution of expansion velocities of dust in the cloud of disintegrated layer 0.15 km³ in volume lifted off from an end of the long axis of Halley's nucleus[a] as a function of the layer's thickness and base area.

Thickness (meters)	Base area (km²)	Fraction[b] (percent)	Cone angle
50	3	1½	51°
30	5	2½	69
15	10	5	90
10	15	7½	104
7½	20	10	114
5	30	15	128

[a] Modeled as a prolate spheroid 8 km by 4 km by 4 km.
[b] Fraction of a hemispherical surface area of Halley's comet (200 km²).

◇ ◇ ◇

The expanding halo of Halley's comet on Herschel's and Piazzi Smyth's drawings does not show morphology typical for ejections from small, isolated sources of activity. Thus, just as with the megaburst of 17P/Holmes, one must conclude that the dust halo of 1P/Halley was made up of inert material from an extended source on the nuclear surface and released into the atmosphere over a wide range of injection angles, mimicking an event of nearly global proportions on the scale of the nucleus. If the bulk density of 1P/Halley's nucleus is assumed to be 0.4 g/cm³, the volume of material injected into the atmosphere during the explosion (Table 2) was 0.15 km³. The question that needs to be addressed is this: Under what conditions on 1P/Halley's nucleus can this volume of surface terrain disintegrate and be lifted off to offer the spectacle of a cloud of microscopic dust that is scattered into a wide cone of space? This is a critical issue, given that the amount of dust in 1P/Halley's explosion is about 60 percent of the amount in the 17P megaburst and that 1P/Halley's nucleus — approximated by a prolate spheroid 16 km by 8 km by 8 km across (Keller *et al.* 1987) — is much larger than the nucleus of 17P (about 3.3 km across; see Paper 1). It turns out that the maximum desired effect on 1P/Halley is achieved when the material is removed from one of the two ends of the nucleus' long axis. The cone angle that confines the ejecta depends on the thickness of the removed block of terrain relative to the base area: the cone angle increases with decreasing thickness. Table 3 shows that, at an end of 1P/Halley's long axis, the disintegration of a layer of material 15 km^2 in area and 10 meters thick would scatter dust into a cone more than 100° wide, comparable to the effect of a layer of 5-6 km^2 in area and 50 meters thick, considered in Paper 1 for comet 17P/Holmes. Thus, the amount of released material was sufficient to mimick an extended source even on the scale of 1P/Halley's nuclear size. It should be recalled in this context that both Herschel (1847) and Maclear (1838) reported on several occasions that the nuclear condensation was nearer the halo's southern limb than the northern one and that the surface brightness varied from spot to spot in the halo. While this information cannot be exploited for quantitative modeling, it indicates an asymmetry in the vectorial distribution of expansion velocities and fluctuations in the amount of mass injected in different directions, with implications for inhomogeneities in the morphology of the extended source and azimuthal changes in the cone angle.

The orbital position of Halley's comet at the time of the 1836 explosion, 67.8 days after perihelion and 1.44 AU from the sun (Table 2), is in line with the results in Paper 1 for both the 2007 megaburst and the 1892-1893 events of comet 17P/Holmes, and it is favorable to the physical scenario proposed in Paper 1. Because of substantial lags necessarily involved in the process of penetration by a thermal wave into the interior of the nucleus, the post-perihelion occurrence of these episodes is indeed to be expected. Information available on 1P/Halley's explosion is broadly consistent with the injection mechanism in which the trigger is an exothermic reaction caused by a transition of water ice from amorphous phase to cubic phase in a subsurface reservoir, located under the layer of terrain that is to disintegrate into the cloud of microscopic dust. As with the events of 17P/Holmes, the precipitous crumbling must occur almost instantly upon the lift-off from the surface, in order that a large fraction of dust particles can be accelerated to subkilometer-per-second velocities. For the related issues of the nature of lifted material and other details the reader is referred to Paper 1.

For the sake of comparison, the major outburst that Halley's comet was observed to have experienced in 1991 some 14 AU from the sun, with a surviving crescent-shaped halo (West *et al.* 1991), cannot rival the 1836 event. The expansion velocity was a factor of 40 lower, and the mass of dust injected was a factor of nearly 10^3 smaller. Regardless of the mechanism involved (Prialnik and Bar-Nun 1992, Sekanina *et al.* 1992), that episode was distinctly a local event.

One can expect that, in due time, more comets enduring super-massive explosions will be discovered and recognized. It is hoped that the relationships among these comets, ordinary split comets, and comets subjected to cataclysmic fragmentation will prove helpful in providing more insights in our quest to understand the processes of aging and disintegration of these bizarre solar-system members.

Acknowledgements

I thank P. Vasey, Plover Hill Observatory, for permission to reproduce his images of 17P/Holmes. I am grateful to S. Bosken and G. Shelton, U.S. Naval Observatory Library, for their assistance in finding some old references. I thank D. W. E. Green and B. G. Marsden for reading the manuscript of this paper and for their most helpful comments, and to Dr. Green also for his editorial work. This research was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

REFERENCES

Airy, G. B. (1847). "Reduction of the Observations of Halley's Comet Made at the Cambridge Observatory in the Years 1835 and 1836", *Mem. Roy. Astron. Soc.* **16**, 337-347.

Belton, M. J. S.; W. H. Julian; A. J. Anderson; and B. E. A. Mueller (1991). "The Spin State and Homogeneity of Comet Halley's Nucleus", *Icarus* **93**, 183-193.

Bessel, F. W. (1836). "Beobachtungen über die physische Beschaffenheit des Halley'schen Kometen und dadurch veranlasste Bemerkungen", *Astron. Nachr.* **13**, 185-232.

Bobrovnikoff, N. T. (1931). "Halley's Comet in Its Apparition of 1909-1911", *Publ. Lick Obs.* **17**, 305-482.

Bobrovnikoff, N. T. (1941a). "Investigations of the Brightness of Comets, Part I", *Contr. Perkins Obs.* No. 15, 1-139.

Bobrovnikoff, N. T. (1941b). "Investigations of the Brightness of Comets, Part II", *Contr. Perkins Obs.* No. 16, 1-112.

Bortle, J. E.; and C. S. Morris (1984). "Brighter Prospects for Halley's Comet", *Sky Tel.* **67**, 9-12.

Divine, N.; H. Fechtig; T. I. Gombosi; M. S. Hanner; H. U. Keller; S. M. Larson; D. A. Mendis; R. L. Newburn; R. Reinhard; Z. Sekanina; and D. K. Yeomans (1986). "The Comet Halley Dust and Gas Environment", *Space Sci. Rev.* **43**, 1-104.

Dumouchel, É. (1836). "Beobachtungen des Halleyschen Cometen in Rom auf der Sternwarte des Collegio Romano", *Astron. Nachr.* **13**, 341-344.

Green, D. W. E.; and C. S. Morris (1987). "The Visual Brightness Behavior of P/Halley During 1981-1987", *Astron. Astrophys.* **187**, 560-568.

Herschel, J. (1847). *Results of Astronomical Observations Made During the Years 1834, 5, 6, 7, 8, at the Cape of Good Hope*, (London: Smith, Elder and Co., Cornhill), Chapter 5, pp. 393-413.

Holetschek, J. (1896). "Untersuchungen über die Grösse und Helligkeit der Kometen und Ihrer Schweife, I.", *Denkschr. Akad. Wiss. Wien* (Math.-Naturwiss. Kl.) **63**, 246-250.

Keller, H. U.; W. A. Delamere; W. F. Huebner; H. J. Reitsema; H. U. Schmidt; F. L. Whipple; K. Wilhelm; W. Curdt; R. Kramm; N. Thomas; C. Arpigny; C. Barbieri; R. M. Bonnet; S. Cazes; M. Coradini; C. B. Cosmovici; D. W. Hughes; C. Jamar; D. Malaise; K. Schmidt; W. K. H. Schmidt; and P. Seige (1987). "Comet P/Halley's Nucleus and Its Activity", *Astron. Astrophys.* **187**, 807-823.

Kreil, K. (1837). (Letter to the Editor), *Astron. Nachr.* **14**, 367-370.

Lamont, J. (1837). "Ueber die Beobachtungen des Halley'schen Cometen mit dem grossen Refraktor der k. Sternwarte bei München", *Astron. Nachr.* **14**, 57-58.

Larson, S. M.; Z. Sekanina; D. Levy; S. Tapia; and M. Senay (1987). "Comet P/Halley Near-Nucleus Phenomena in 1986", *Astron. Astrophys.* **187**, 639-644.
Loomis, E. (1836). "Observations on the Comet of Halley, Made at Yale College", *Amer. J. Sci. Arts* **30** (Ser. 1), 209-221.
Loomis, E. (1848). "Note Respecting Halley's Comet", *Amer. J. Sci. Arts* **5** (Ser. 2), 370-372.
Maclear, T. (1838). "Observations of Halley's Comet, Made at the Royal Observatory, Cape of Good Hope, in the Years 1835 and 1836", *Mem. Roy. Astron. Soc.* **10**, 91-155.
Marcus, J. (1986). "Halley's True Brightness in 1909-1911 and Comparison to 1985-86", in *Exploration of Halley's Comet*. ESA SP-250, R. Reinhard, ed., ESTEC, Noordwijk, Netherlands, Vol. 3, pp. 307-312.
Morris, C. S.; and D. W. E. Green (1982). "The Light Curve of Periodic Comet Halley 1910 II", *Astron. J.* **87**, 918-923.
Müller, M. (1842). "Observations de la Comète de Halley, faites à l'Observatoire de Genève, en 1835 et 1836", *Mem. Roy. Astron. Soc.* **12**, 388-407.
Nicolai, F. B. G. (1836). (Letter to the Editor), *Astron. Nachr.* **13**, 309-310.
Prialnik, D.; and A. Bar-Nun (1992). "Crystallization of Amorphous Ice As the Cause of Comet P/Halley's Outburst at 14 AU", *Astron. Astrophys.* **258**, L9-L12.
Rahe, J.; B. Donn; and K. Wurm (1969). *Atlas of Cometary Forms*, (Washington, D.C.: Gov. Print. Office), NASA SP-198, 128 pp.
Santini, G. (1836). "Osservazioni della Cometa di Halley fatte nel I. R. Osservatorio di Padova dopo la sua congiunzione col Sole nel ritorno al Perielio dell' anno 1835", *Astron. Nachr.* **13**, 303-310.
Sekanina, Z. (1983). "The Halley Dust Model", *Adv. Space Res.* **2**, No. 12, 121-131.
Sekanina, Z. (2008). "Exploding Comet 17P/Holmes", *Int. Comet Quart.* **30**, 3-28. (Paper 1.)
Sekanina, Z.; S. M. Larson; O. Hainaut; A. Smette; and R. M. West (1992). "Major Outburst of Periodic Comet Halley at a Heliocentric Distance of 14 AU", *Astron. Astrophys.* **263**, 367-386.
Taylor, T. G. (1836). "Halley's Comet", *Madras Astron. Obs.* **3**, 81-84.
West, R. M.; O. Hainaut; and A. Smette (1991). "Post-Perihelion Observations of P/Halley. III. An Outburst at 14.3 AU", *Astron. Astrophys.* **246**, L77-L80.

Φ Φ Φ

Tabulation of Comet Observations

As noted in the January issue, all of the tabulated data attached to that issue consisting of observations of comet 17P in February and March have their descriptive information given below.

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 8P/Tuttle* ⟹ 2007 Nov. 28.74, Dec. 4.77, 13.68, 2008 Jan. 4.71, 11.83, and 12.73: `Guide 8.0` software used for comp.-star mags [SAN07]. 2007 Nov. 30.73: `Guide 8.0` software used for comp.-star mags [MAJ01]. Dec. 3.84, 4.81, 5.80, 6.74, and 13.73: `Guide 8.0` software used for comp.-star mags [VAS06]. Dec. 13.81: GUIDE 7.0 software used for comp.-star mags [SAR02]. Dec. 19.04, 2008 Jan. 6.74, 7.84, 8.75, 10.75, 15.72, and 26.74: `Guide 8.0` software used for comp.-star mags [SZA]. 2008 Jan. 7.84, 8.85, and 26.75: `Guide 8.0` software used for comp.-star mags [TOT03]. Jan. 13.39 and 26.39: `The Sky` ver. 5 software used for comp.-star mags [MIT]. Jan. 14.47, 24.45, and 27.41: `StellaNavigator` ver. 8.1 software used for comp.-star mags [NAG08]. Jan. 17.06: comet also seen in 8×56 B; fairly diffuse, no tail [NOW]. Jan. 24.45: B–V values of comp. stars were +0.60, +0.61, and +0.78 [NAG08]. Feb. 1.08: comp. stars have V = 6.67 (B–V = +0.16) and 7.20 (−0.01) [GOI]. Feb. 1.98, 2.99, 6.01, 7.03, and 8.98: comp. stars have V = 6.67 (B–V = +0.16) and 6.87 (+0.96) [AMO01]. Feb. 1.98 and 3.97: comp. stars have V = 6.67 (B–V = +0.16) and 7.20 (−0.01) [GOI]. Feb. 4.97 and 5.99: comp. stars have V = 6.67 (B–V = +0.16) and 7.29 (+0.54) [GOI]. Feb. 5.47: hazy high cloud [SEA]. Feb. 8.04 and 13.97: clouds interfering [GOI]. Feb. 8.04: comp. stars have V = 6.76 (B–V = +0.54) and 7.29 (+0.54) [GOI]. Feb. 9.00, 10.97, and 13.97: comp. stars have V = 6.76 (B–V = +0.54) and 7.29 (+0.54) [GOI]. Feb. 13.97, 18.99, 19.97, Mar. 16.97, 18.01, 20.95, Apr. 16.98, 17.95, and 18.96: moonlight [GOI]. Feb. 13.97, 15.98, 16.97, and 18.97: comp. stars have V = 6.52 (B–V = −0.01) and 6.85 (+0.37) [AMO01]. Feb. 15.98, 16.97, 24.97, and 25.99: clouds interfering [AMO01]. Feb. 18.97, 19.98, Mar. 13.97, 16.99, Apr. 14.95, and 18.00: moonlight interference [AMO01]. Feb. 18.97: comp. star has V = 7.59 (B–V = +0.39) [AMO01]. Feb. 18.99 and 19.97: comp. stars have V = 6.72 (B–V = +0.46) and 7.31 (+0.26) [GOI]. Feb. 19.98: comp. stars have V = 6.85 (B–V = +0.37) and 7.59 (+0.39) [AMO01]. Feb. 24.97 and 25.99: comp. stars have V = 6.85 (B–V = +0.37) and 7.11 (+0.54) [AMO01]. Feb. 24.98, 26.01, and 26.98: comp. stars have V = 7.11 (B–V = +0.54) and 7.55 (+0.54) [GOI].

Mar. 1.98: comp. stars have V = 7.33 (B–V = +0.83) and 7.73 (−0.12) [GOI]. Mar. 2.00: moonlight interference [SOU01]. Mar. 2.97: comp. stars have V = 7.33 (B–V = +0.83) and 7.55 (+0.58) [GOI]. Mar. 4.00, 4.96, and 6.00: comp. stars have V = 7.73 (B–V = −0.12) and 7.55 (+0.58) [GOI]. Mar. 7.96: comp. stars have V = 7.11 (B–V = +0.54) and 7.73 (−0.12) [GOI]. Mar. 8.96, 9.95, and 13.97: comp. stars have V = 7.33 (B–V = +0.83) and 7.84 (+0.23) [AMO01]. Mar. 8.97: comp. stars have V = 7.53 (B–V = +0.40) and 7.73 (−0.12) [GOI]. Mar. 16.97, 18.01, and 20.95: comp.

stars have $V = 7.32$ ($B-V = +0.20$) and 7.99 (+0.11) [GOI]. Mar. 16.99: comp. stars have $V = 7.32$ ($B-V = +0.20$) and 7.98 (+0.42) [AMO01]. Mar. 23.97: comp. stars have $V = 8.68$ ($B-V = +0.43$) and 7.99 (+0.11) [GOI]. Mar. 25.96 and 26.96: comp. stars have $V = 8.09$ ($B-V = +0.39$) and 8.47 (+0.31) [GOI]. Mar. 26.94: comp. stars have $V = 7.99$ ($B-V = +0.11$) and 8.47 (+0.31) [AMO01]. Mar. 28.97: comp. stars have $V = 8.78$ ($B-V = +0.14$) and 8.47 (+0.31) [GOI]. Mar. 29.07 and 31.02: comp. stars have $V = 8.24$ ($B-V = +0.25$) and 8.78 (+0.14) [AMO01]. Mar. 29.98: comp. stars have $V = 8.36$ ($B-V = +0.05$) and 8.83 (+0.74) [GOI]. Mar. 30.99: comp. stars have $V = 8.83$ ($B-V = +0.74$) and 8.49 (+0.31) [GOI]. Apr. 1.96: comp. stars have $V = 8.30$ ($B-V = +1.11$) and 8.78 (+0.14) [AMO01]. Apr. 4.98 and 5.96: comp. stars have $V = 8.75$ ($B-V = +0.46$) and 9.27 (+0.07) [GOI]. Apr. 5.92: comp. stars have $V = 8.75$ ($B-V = +0.46$) and 9.27 (+0.07) [AMO01]. Apr. 8.95: comp. stars have $V = 8.75$ ($B-V = +0.46$) and 9.27 (+0.07) [AMO01]. Apr. 10.97: comp. stars have $V = 9.56$ ($B-V = +0.71$) and 9.80 (+0.47) [AMO01]. Apr. 11.93: comp. stars have $V = 9.19$ ($B-V = +0.41$) and 9.28 (+0.46) [GOI]. Apr. 14.95: comp. stars have $V = 9.58$ ($B-V = +0.24$) and 9.69 (+0.34) [AMO01]. Apr. 16.98: comp. stars have $V = 9.75$ ($B-V = +0.39$) and 9.99 (+0.12) [GOI]. Apr. 17.95: comp. stars have $V = 9.99$ ($B-V = +0.12$) and 10.87 (+0.51) [GOI]. Apr. 18.00: comp. stars have $V = 9.27$ ($B-V = -0.09$) and 9.99 (+0.12) [AMO01]. Apr. 18.96: comp. stars have $V = 9.99$ ($B-V = +0.64$) and 9.35 (+0.60) [GOI]. Apr. 23.94: comp. stars have $V = 10.04$ ($B-V = +0.54$) and 10.57 (+0.75) [GOI]. Apr. 25.92: comp. stars have $V = 10.13$ ($B-V = +0.56$) and 10.57 (+0.75) [AMO01]. Apr. 26.94: comp. stars have $V = 10.36$ ($B-V = +0.51$) and 10.47 (+0.51) [GOI]. Apr. 27.93: comp. stars have $V = 10.46$ ($B-V = +0.26$) and 10.55 (+0.48) [GOI].

◇ *Comet 17P/Holmes* ⟹ 2007 Oct. 26.08: coma dia. 3'.5, DC = 9 (though this was tab. w/ naked-eye obs., it was presumably made w/ 11×70 B, wherein comet was reported as "perfectly round" w/ a "very sharp coma", no tail, and a round nuclear cond. appearing as a disk) [NOW]. Oct. 26.17, 26.75, and 26.88, 30.73, Nov. 1.75, 3.77, 5.81, 13.75, 26.68, 28.76, 29.71, Dec. 4.75, 5.75, 13.71, 14.73, 18.68, 2008 Jan. 25.76, 26.79, 28.78, and Mar. 2.75: `Guide 8.0` software used for comp.-star mags [SAN07]. 2007 Oct. 29.84, 31.74, 2008 Jan. 8.79, and Feb. 5.90: `Guide 8.0` software used for comp.-star mags [TOT03]. 2007 Oct. 31.79, Nov. 12.82, 13.69, 19.83, 28.79, Dec. 2.82, 2008 Jan. 6.75, 7.82, and 26.74: `Guide 8.0` software used for comp.-star mags [SZA]. 2007 Nov. 4.77, 7.16, 28.71, 29.70, Dec. 4.79, and 6.73: `Guide 8.0` software used for comp.-star mags [VAS06]. Nov. 5.84 and 28.72: `Guide 8.0` software used for comp.-star mags [SOM]. Nov. 11.08: w/ 11×70 B, coma dia. 45', DC = 9 [NOW]. Nov. 12.08: in 20×90 B, coma dia. 45', DC = 7; nuclear cond. elongated [NOW]. Nov. 18.36: comet has become greatly elongated and faded; very faint trace of tail in 20×90 B (uncertain which binoculars were used for tab. tail info, though they were given for the smaller instrument) [NOW]. Nov. 28.76 and Dec. 7.01: GUIDE 7.0 software used for comp.-star mags [SAR02]. Dec. 4.75: w/ 10×50 B, 13° tail in p.a. 200° [SAN07]. Dec. 5.75: w/ 10×50 B, 14° tail in p.a. 200° [SAN07]. Dec. 13.71: w/ 10×50 B, 13° tail in p.a. 150°-160° [SAN07].

2008 Jan. 26.79: w/ 10×50 B, 15° tail in p.a. 100° [SAN07]. Jan. 26.83: central region of comet [SZA]. Jan. 28.77: w/ 10×80 B, 5°-6° tail [UJV]. Jan. 28.78: central region of comet [TOT03]. Jan. 28.78: w/ 10×50 B, 3°-4° tail in p.a. 90°-100° [SAN07]. Jan. 29.07: very diffuse; no tail; visible well in 8×56 B [NOW]. Feb. 1.43: $B-V$ values of comp. stars were +0.61, +0.74, and +0.86 [NAG08]. Feb. 1.43 and 7.47: `StellaNavigator` ver. 8.1 software used for comp.-star mags [NAG08]. Feb. 1.54: `The Sky` ver. 5 software used for comp.-star mags [MIT]. Feb. 1.79: w/ naked eye, coma dia. 40', DC = 2 [DIE02]. Feb. 1.79, 4.77, and 8.90: 3×24 R; clouds [PAR03]. Feb. 2.81: very clear sky [GON05]. Feb. 2.81, 22.82, Mar. 30.87, Apr. 3.90: zodiacal light [GON05]. Feb. 2.84: comp. w/ τ, ι, and π Per, plus HIP 14043; stars of mag 6-8 in and around coma, hampering dia. est.; comet seen between two stars of mag 6.0 w/ the naked eye [PER01]. Feb. 4.87: comp. chiefly w/ τ and π Per, plus HIP 14043; comet seen w/ the naked eye (dia. 1°.5, DC = 0/); good transparency (stars of mag 6.1 visible via naked eye near comet; cirrus elsewhere in the sky not affecting obs.); in 14×100 B, dia. 1°.5 (nearly half the field!), DC = 0/, broad tail > 2° long [PER01]. Feb. 4.98: comp. stars have $V = 4.21$ ($B-V = +0.33$) and 4.68 (+0.06) [GOI]. Feb. 5.76 and Mar. 9.83: haze [PAR03]. Feb. 6.77: w/ 8×50 B, coma dia. 45', DC = 2 [DIE02]. Feb. 6.95: comp. chiefly w/ τ and π Per, plus HIP 14043; comet near limit of naked-eye visibility; good, dry conditions [PER01]. Feb. 6.95, 7.97, and Mar. 6.95: stars of mag 6.6 visible to naked eye near comet [PER01]. Feb. 7.97: comp. chiefly w/ τ and π Per, plus HIP 14043; comet no longer visible w/ naked eye [PER01]. Feb. 8.97: comp. chiefly w/ τ and π Per, plus HIP 14043; "comet only became visible towards the end of my standard dark-adaptation period (20 min)" [PER01]. Feb. 9.82: "comet was faintly, but definitely, seen w/ naked eye, and it appeared similar in size to (but considerably fainter than) M44; 17P was, however, quite easily seen through 3×18 R and 7×50 B as an ill-defined glow; using the latter instrument, its surface brightness was markedly inferior to that of M33; from images using Digital SLR camera (+ 100-mm-f.l. lens), 17P's surface brightness was comparable with the Merope nebula in M45; dark sky but obs. was shortly afterwards interupted by fog" [GRA04]. Feb. 9.89: w/ 25×100 B, coma dia. 90' (elongated towards the very diffuse SE boundary); inner, brighter region extends 30' from central cond. in p.a. 110° [GON05].

Feb. 10.02: comp. w/ τ and π Per, plus HIP 14043; "the outer coma (beyond dia. ~ 60') is extraordinarily faint but was suspected to dia. ~ 105'; defocusing comp. stars to these extreme values yields total mag 4.8 and 4.4, respectively" [PER01]. Feb. 10.61: coma dia. 74' × 79'; `Guide 8.0` software used for comp.-star mags [NAG04]. Feb. 12.16: "obs. made just after moonset; comet's surface brightness is dropping rapidly, and for the last month I've had to observe from rural central Massachusetts because the comet is no longer visible from bright surbaban skies" [GRE]. Feb. 13.02: comet still visible w/ naked eye; obs. after moonset [GON05]. Feb. 13.02, 22.82, Mar. 10.94, 30.87, Apr. 3.90, and 23.92: mountain location, very clear sky [GON05]. Feb. 22.82: obs. before moonrise [GON05]. Feb. 23.42, 27.46, 29.46, Mar. 5.50, and 8.49: `Guide 8.0` software used for comp.-star mags [MIY01]. Feb. 24: (no time given); "very diffuse; comet looks like a piece of the Milky Way" [NOW]. Feb. 25.86: comp. w/ τ and π Per, plus HIP 14043; several stars of mag 6-8 in and around coma; comet and nearby star of mag $V = 6.45$ ($B-V = +1.20$) glimpsed w/ the naked eye, while another nearby star of mag $V = 6.60$ ($B-V = +0.28$) was not seen [PER01]. Feb. 26.00 and Mar. 3.99: comp. stars have $V = 4.97$ ($B-V = -0.05$) and 5.54 (−0.07) [GOI]. Feb. 27.46, 28.48, and Mar. 10.55: `Guide 8.0` software used for comp.-star mags [YOS02]. Feb. 29.96: comp. w/ τ and π Per, plus HIP 14043; star of mag 6.6 in coma seriously hampering obs.; uncertainty in total mag is ±0.2 mag; comet not seen w/ naked eye (though the mag-6.6 star is visible) [PER01].

Mar. 1.51: $B-V$ values of comp. stars were +0.54, +0.57, +0.69, and +0.76 [NAG08]. Mar. 1.51 and 5.42: **StellaNavigator** ver. 8.1 software used for comp.-star mags [NAG08]. Mar. 1.86: "comp. with π Per, HIP 14043, and HIP 17460; star of mag 6.6 in outer coma; comet seen w/ naked eye as a diffuse patch (the nearby mag-6.6 star is not visible tonight, but from checking alignments, I am sure what was seen was the comet)" [PER01]. Mar. 1.86 and 4.91: stars of mag ~ 6.3 seen via naked eye near comet [PER01]. Mar. 1.88: w/ naked eye, comet faintly seen w/ direct vision; mountain location, clear sky [GON05]. Mar. 2.76 and 26.80: clouds [PAR03]. Mar. 4.91: "comp. with π Per, HIP 14043, and HIP 17460; comet still possibly glimpsed w/ naked eye, but could not be sure" [PER01]. Mar. 5.45: hardly visible w/ naked eyes (only a hint of a nebulous object was detectable); however, it is still very bright through a 5-cm R as a large, nebulous, diffuse comet clearly visible [YOS04]. Mar. 5.48 and 8.45: **Guide 8.0** software used for comp.-star mags [MIY01]. Mar. 5.86: comp. with π Per, 40 Per, HIP 14043, and HIP 17460; in 14×100 B, the coma (DC = 2) could extend as much as 100′ westwards; zodiacal light seen up to ~ 40° above the horizon; comet not visible w/ naked eye [PER01]. Mar. 5.89: comet faintly seen w/ direct vision [GON05]. Mar. 6.06: w/ 7×50 B, coma dia. ~ 90′, DC = 0; "a totally diffuse, vaguely circular, nebulous mist at the threshold of detection; there was no practical way to determine the total mag" [BOR]. Mar. 6.95: comp. with 40 Per, HIP 14043, and HIP 17460; 9th-mag stars in and around coma; comet faintly visible w/ naked eye [PER01]. Mar. 6.98: suburban location, very clear sky [GON05]. Mar. 9.77: mag of nuclear cond. was 14.6 [SHU]. Mar. 26.95: comp. stars have V = 5.73 ($B-V$ = +0.01) and 5.88 (−0.05) [GOI]. Mar. 27.75: nuclear cond. of mag 13.9 visible via CCD (dia. 1′.4) w/ weak 3′ tail in p.a. 281° emanating from cond. [SHU]. Mar. 28.93: suburban location, clear sky; some light pollution in the area of the comet; comet not visible w/ naked eye; alt. 27° [GON05]. Mar. 30.87: stars of mag ~ 6.0 visible near comet via naked eye; comet faintly seen with naked-eye direct vision; total mag difficult to est. due to stars inside the coma (mag 6.4 and 6.8; ref: TK) [GON05].

Apr. 3.90: via naked eye, comet faintly seen w/ direct vision (stars of mag ~ 6.5 were visible to naked eye near comet) [GON05]. Apr. 23.92: comet not seen w/ 6×50 R and 10×50 B — washed out by the zodiacal light; nonetheless, in 25×100 B, the obs. dia. of the very faint coma was ≈ 40′ (not allowing a mag est.), w/ a somewhat-brighter area of ~ 15′ [GON05].

◇ *Comet 26P/Grigg-Skjellerup* ⟹ 2008 Jan. 22.76: stacked (via **Astrometrica 4.4.1.364**) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show circular coma of dia. 20″ and total mag 17.6, in moonlight (comp.-star ref. presumably UCAC-2) [R. H. McNaught]. Feb. 13.81: **Guide 8.0** software used for comp.-star mags; $B-V$ values of comp. stars were +0.53, +0.54, and +0.57 [YOS02]. Mar. 9.22: comp. star has V = 12.87 (GSC 7366-0682) [AMO01]. Mar. 15.83, Apr. 8.80, and 11.82: **Guide 8.0** software used for comp.-star mags [TSU02]. Mar. 15.83: comp. star has $B-V$ = +0.65 [TSU02]. Apr. 6.18 and 12.17: nearby field stars checked via Digitized Sky Survey [GON05]. Apr. 6.18: motion checked during a 50-min period; faint, diffuse outer coma, slightly enhanced through Swan Band filter; limiting stellar magnitude near comet 14.5 (Henden); mountain location, very clear sky; alt. 28° [GON05]. Apr. 8.80: comp. star has $B-V$ = +0.50 [TSU02]. Apr. 11.82: comp. star has $B-V$ = +0.62 [TSU02]. Apr. 12.17: motion checked during a 60-min period; faint outer coma is difficult to observe with higher magnifications; limiting stellar mag near comet 14.5 (Henden); rural location, Palencia; very clear sky; alt. 32° [GON05]. Apr. 12.25: comp. stars have V = 11.27 ($B-V$ = +0.27) and 11.55 (+0.33) [GOI].

◇ *Comet 29P/Schwassmann-Wachmann* ⟹ 2008 Jan. 25.90: moonlight; comet has a high DC and bright 'inner'-disk area at ≈ dia. 0′.5, while coma extends to dia. ≈ 1′.8; profile shows a sharp center peak with a flat top area [QVA]. Feb. 1.46: $B-V$ values of comp. stars were +0.51, +0.60, and +0.71 [NAG08]. Feb. 1.46 and 7.47: **StellaNavigator** ver. 8.1 software used for comp.-star mags [NAG08]. Feb. 1.98: comp. star has V = 12.03 (GSC 2405-1720) [AMO01]. Feb. 5.98 and 6.99: comp. star has V = 12.44 (GSC 1874-0052) [AMO01]. Feb. 7.08: several stars in coma, the brightest being of mag 12.4 (GSC) [GON05]. Feb. 13.95: moonlight [QVA]. Feb. 19.88: the coma has (nearly) uniform surface brightness [SHU]. Mar. 1.92: mountain location, clear sky [GON05]. Mar. 5.51: two months after its Jan. outburst; diffuse, nebulous comet w/ no cond. but still bright [YOS04].

◇ *Comet 46P/Wirtanen* ⟹ 2008 Jan. 8.75, 26.76, and Feb. 7.81: **Guide 8.0** software used for comp.-star mags [TOT03]. Jan. 17.72-22.72: obs. in moonlight; this caused a rather bright sky background and images with notable brightness gradients; comet alt. 21°-28° [QVA]. Jan. 28.73: **Guide 8.0** software used for comp.-star mags [SAN07]. Jan. 25.73: **Guide 8.0** software used for comp.-star mags [MAJ01]. Jan. 26.40: **The Sky** ver. 5 software used for comp.-star mags [MIT]. Jan. 26.76: **Guide 8.0** software used for comp.-star mags [SZA]. Jan. 27.42, 31.42, Feb. 1.41, 7.46, 16.47, Mar. 1.44, and 5.42: **StellaNavigator** ver. 8.1 software used for comp.-star mags [NAG08].

Feb. 1.41: $B-V$ values of comp. stars were +0.64, +0.74, and +0.78 [NAG08]. Feb. 1.44: comp. star has $B-V$ = +1.1 [TSU02]. Feb. 1.44, 25.44, and Apr. 11.50: **Guide 8.0** software used for comp.-star mags [TSU02]. Feb. 1.96: comp. stars have V = 9.04 ($B-V$ = +0.53) and 9.61 (+0.25) [AMO01]. Feb. 2.80 and 22.80: very clear sky [GON05]. Feb. 2.80, 9.88, 22.80, Mar. 5.87 : zodiacal light [GON05]. Feb. 2.82, 8.78, and 9.77: light pollution (tab. data publ. via Jan. 2008 issue; *cf. ICQ* **30**, 51) [HOR03]. Feb. 5.97: comp. stars have V = 8.33 ($B-V$ = +0.27) and 9.38 (+0.48) [AMO01]. Feb. 6.98: comp. stars have V = 9.05 ($B-V$ = +0.51) and 9.99 (+0.50) [AMO01]. Feb. 8.78 and 9.77: fog (tab. data publ. via Jan. 2008 issue; *cf. ICQ* **30**, 51) [HOR03]. Feb. 8.97: comp. stars have V = 8.86 ($B-V$ = +0.44) and 9.36 (+1.04); clouds interfering [AMO01]. Feb. 8.97: comp. stars have V = 9.24 ($B-V$ = +0.52) and 8.75 (+0.43) [GOI]. Feb. 10.51: **Guide 8.0** software used for comp.-star mags [NAG04]. Feb. 10.79: unfiltered and Bessell-B-band CCD images show a faint tail of length ≈ 3′ in p.a. 70°; this feature was not evident in the V-band images [QVA]. Feb. 10.92: alt. 10° [SCH04]. Feb. 10.96: comp. stars have V = 9.27 ($B-V$ = +0.33) and 9.18 (+0.37) [GOI]. Feb. 16.47: $B-V$ values of comp. stars were

+0.70, +0.79, and +0.82 [NAG08]. Feb. 16.73: tail 2'.5 in p.a. 69° [SHU]. Feb. 19.96 and Mar. 16.95: moonlight [GOI]. Feb. 19.96: comp. stars have $V = 9.61$ ($B-V = +0.65$) and 9.96 (+0.59) [GOI]. Feb. 22.80: mountain location; estimates made before moonrise [GON05]. Feb. 24.96: comp. stars have $V = 9.48$ ($B-V = +0.49$) and 9.82 (+0.41) [AMO01]. Feb. 25.44: comp. star has $B-V = +0.48$ [TSU02]. Feb. 26.97: comp. stars have $V = 9.44$ ($B-V = +0.58$) and 9.74 (+0.75) [GOI]. Feb. 27.51 and Mar. 31.5: `Guide 8.0` software used for comp.-star mags [YOS02].

Mar. 1.44: $B-V$ values of comp. stars were +0.57, +0.64, and +0.66 [NAG08]. Mar. 1.86: mountain location, clear sky [GON05]. Mar. 1.96: comp. stars have $V = 9.48$ ($B-V = 0.00$) and 9.94 (+0.62) [GOI]. Mar. 2.95: comp. stars have $V = 9.48$ ($B-V = 0.00$) and 9.66 (+0.46) [GOI]. Mar. 3.83: "difficult estimation (underestimated) because comet was close to star of mag 9.8 (TYC 1801-0185)" [SCH04]. Mar. 4.95: comp. star has $V = 9.46$ ($B-V = +0.08$) [AMO01]. Mar. 4.95: comp. stars have $V = 9.47$ ($B-V = +0.31$) and 9.72 (+0.46) [GOI]. Mar. 5.46: "large; strongly condensed and easy to see" [YOS04]. Mar. 5.47 and 8.46: `Guide 8.0` software used for comp.-star mags [MIY01]. Mar. 5.95: comp. stars have $V = 9.75$ ($B-V = +0.73$) and 10.12 (+0.72) [AMO01]. Mar. 6.82: "obs. during my first Messier marathon; saw three comets with binoculars within 5 min (including 17P/Holmes)" [KAR02]. Mar. 8.95: comp. stars have $V = 9.76$ ($B-V = +0.34$) and 9.14 (+0.20) [GOI]. Mar. 9.96: comp. stars have $V = 9.68$ ($B-V = +0.47$) and 9.83 (+0.60) [GOI]. Mar. 16.95: comp. stars have $V = 9.85$ ($B-V = +0.50$) and 9.62 (+0.54) [GOI]. Mar. 17.84: moonlight [QVA]. Mar. 23.95: comp. stars have $V = 9.74$ ($B-V = +0.54$) and 10.43 (+0.24) [GOI]. Mar. 24.49: LONEOS NGC 4699 sequence used for comp.-star mags [YOS02]. Mar. 24.83: difficult estimate; diffuse comet close to stars of mag 10.2 and 11.4 [SCH04]. Mar. 29.97: comp. stars have $V = 10.54$ ($B-V = 0.00$) and 10.73 (+0.06) [GOI]. Mar. 30.97: comp. stars have $V = 10.37$ ($B-V = +0.60$) and 10.87 (+0.43) [GOI]. Mar. 31.51: $B-V$ values of comp. stars were +0.49, +0.62, and +0.84 [YOS02]. Apr. 5.95: comp. stars have $V = 10.44$ ($B-V = +0.53$) and 10.92 (+0.36) [GOI]. Apr. 11.50: comp. star has $B-V = +0.5$ [TSU02].

⋄ *Comet 50P/Arend* ⟹ 2008 Feb. 28.48: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.71$ [TSU02].

⋄ *Comet 70P/Kojima* ⟹ 2008 Mar. 10.65: comp. star has $B-V = +0.45$ [TSU02]. Mar. 10.65 and Apr. 11.60: `Guide 8.0` software used for comp.-star mags [TSU02]. Apr. 11.60: comp. star has $B-V = +0.48$ [TSU02].

⋄ *Comet 79P/du Toit-Hartley* ⟹ 2008 Mar. 10.46: comp. star has $B-V = +0.61$ [TSU02]. Mar. 10.46 and Apr. 11.51: `Guide 8.0` software used for comp.-star mags [TSU02]. Apr. 11.51: comp. star has $B-V = +0.54$ [TSU02].

⋄ *Comet 93P/Lovas* ⟹ 2008 Feb. 1.49: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.45$ [TSU02]. Feb. 3.83 and 10.79: nearby field stars checked via Palomar Sky Survey (DSS) [LEH]. Mar. 5.48: "still bright and still easily visible" [YOS04].

⋄ *Comet 99P/Kowal* ⟹ 2007 Aug. 14.44: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show moderately condensed circular coma of dia. 12″ and total mag 17.4 (comp.-star ref. presumably UCAC-2) [R. H. McNaught].

⋄ *Comet 110P/Hartley* ⟹ 2008 Feb. 1.51: comp. star has $B-V = +0.72$ [TSU02]. Feb. 1.51 and 28.50: `Guide 8.0` software used for comp.-star mags [TSU02]. Feb. 10.88: at 162×, limiting mag ~ 15.5; nearby field stars checked via Palomar Sky Survey (DSS) [LEH]. Feb. 28.50: comp. star has $B-V = +0.53$ [TSU02]. Mar. 11.51: `Guide 8.0` software used for comp.-star mags; $B-V$ values of comp. stars were +0.59, +0.64, and +0.73 [YOS02].

⋄ *Comet 173P/Mueller* ⟹ 2008 Feb. 28.59 and Mar. 10.50: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.45$ [TSU02].

⋄ *Comet 180P/2006 U3 (NEAT)* ⟹ 2008 Mar. 10.55: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.50$ [TSU02].

⋄ *Comet 183P/2006 Y1 (Korlevič-Jurič)* ⟹ 2008 Mar. 10.60: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.51$ [TSU02].

⋄ *Comet 192P/2007 T3 (Shoemaker-Levy)* ⟹ 2008 Feb. 1.42: comp. star has $B-V = +0.54$ [TSU02]. Feb. 1.42 and 25.41: `Guide 8.0` software used for comp.-star mags [TSU02]. Feb. 3.76: ephemeris from Minor Planet Center's ephemeris service; checked with Digitized Sky Survey (limiting stellar mag 15.5) [HAS02]. Feb. 25.41: comp. star has $B-V = +0.46$ [TSU02].

⋄ *Comet 194P/2007 W2 (LINEAR)* ⟹ 2008 Feb. 28.57: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.49$ [TSU02].

⋄ *Comet C/2005 EL_{173} (LONEOS)* ⟹ 2007 Nov. 20.50: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show circular coma of dia. 30″ and total mag 16.0-16.1 (comp.-star ref. presumably UCAC-2) [R. H. McNaught]. 2008 Jan. 7.47: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show "narrow 5'.6 tail in p.a. 104° (8° spread)" [R. H. McNaught].

⋄ *Comet C/2005 L3 (McNaught)* ⟹ 2008 Feb. 13.83: `Guide 8.0` software used for comp.-star mags; $B-V$ values of comp. stars were +0.56, +0.56, and +0.70 [YOS02]. Feb. 13.84: H1722+119 sequence used for comp.-star mags [YOS02]. Mar. 5.80: very strongly condensed [YOS04]. Mar. 15.80: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V = +0.38$ [TSU02].

◇ *Comet C/2006 K1 (McNaught)* ⟹ 2008 Jan. 10.54: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show moderately condensed circular coma of dia. 0'.6 and total mag 16.4 (comp.-star ref. presumably UCAC-2) [R. H. McNaught].

◇ *Comet C/2006 Q1 (McNaught)* ⟹ 2008 Feb. 3.16: comp. stars have V = 11.69 ($B-V$ = +0.58) and 12.21 (+0.28) [AMO01]. Feb. 5.25: comp. stars have V = 12.53 (GSC 8180-914) and 13.03 (GSC 8180-2417) [AMO01]. Feb. 7.02: comp. stars have V = 12.92 (ASAS 094312-5124.4) and 13.17 (ASAS 094256-5122.9) [AMO01]. Feb. 26.13: comp. stars have V = 12.20 ($B-V$ = +0.59) and 11.88 (+0.49) [GOI]. Mar. 2.14 and 2.98: comp. stars have V = 11.90 ($B-V$ = +0.57) and 11.66 (+0.80) [GOI]. Mar. 4.14: comp. stars have V = 11.72 ($B-V$ = +0.36) and 12.08 (+0.73) [GOI]. Mar. 5.12: comp. stars have V = 11.22 ($B-V$ = +0.38) and 12.17 (−0.05) [AMO01]. Mar. 5.18: comp. stars have V = 11.72 ($B-V$ = +0.26) and 11.30 (+0.49) [GOI]. Mar. 5.56: "extremely low, but I could see it" [YOS04]. Mar. 9.21: comp. stars have V = 11.57 ($B-V$ = +0.31) and 11.82 (+0.88) [AMO01]. Mar. 17.14, 22.19, 26.08, 27.12, 28.16, Apr. 16.99, 18.04, and 18.94: moonlight [GOI]. Mar. 17.14: comp. stars have V = 11.48 ($B-V$ = +0.53) and 11.57 (+0.32) [GOI]. Mar. 22.19: comp. stars have V = 11.39 ($B-V$ = +0.31) and 11.70 (+0.26) [GOI]. Mar. 26.08: comp. stars have V = 11.45 ($B-V$ = +0.88) and 11.51 (+0.38) [GOI]. Mar. 26.98: comp. stars have V = 11.90 ($B-V$ = +0.16) and 12.30 (+0.88) [AMO01]. Mar. 27.12 and 28.16: comp. stars have V = 11.39 ($B-V$ = +0.89) and 11.51 (+0.38) [GOI]. Mar. 29.14: comp. stars have V = 11.69 ($B-V$ = +0.83) and 12.59 (+1.02), near TYC7695-00591-1 [AMO01]. Mar. 30.13: comp. stars have V = 11.13 ($B-V$ = +0.42) and 11.46 (+0.48) [GOI]. Mar. 30.99: comp. stars have V = 11.30 ($B-V$ = +0.43) and 11.70 (+0.25) [GOI]. Apr. 2.03: comp. stars have V = 10.20 ($B-V$ = +0.72) and 10.99 (+0.03) [AMO01]. Apr. 3.92: mountain location, very clear sky; alt. 10° [GON05]. Apr. 4.10: comp. stars have V = 10.81 ($B-V$ = +0.82) and 11.09 (+0.20) [AMO01]. Apr. 4.19: comp. stars have V = 11.54 ($B-V$ = +0.32) and 10.75 (+0.22); clouds [GOI]. Apr. 6.13: comp. stars have V = 11.13 ($B-V$ = +0.43) and 11.58 (+0.12) [AMO01]. Apr. 7.08: comp. stars have V = 11.15 ($B-V$ = +0.17) and 10.60 (+0.39) [GOI]. Apr. 8.94: comp. stars have V = 11.72 ($B-V$ = +0.18) and 12.08 (+0.79) [AMO01]. Apr. 10.02: comp. stars have V = 11.56 ($B-V$ = +0.27) and 10.84 (+0.88) [GOI]. Apr. 12.14: comp. stars have V = 11.01 ($B-V$ = +0.77) and 10.95 (+0.48) [GOI]. Apr. 14.94: comp. stars have V = 10.94 ($B-V$ = +0.17) and 11.49 (+0.60); moonlight [AMO01]. Apr. 16.99: comp. stars have V = 11.30 ($B-V$ = +0.41) and 10.78 (+0.40) [GOI]. Apr. 18.04: comp. stars have V = 11.07 ($B-V$ = +0.74) and 10.21 (+0.59) [GOI]. Apr. 18.94: comp. stars have V = 11.11 ($B-V$ = +0.37) and 10.40 (+0.93) [GOI]. Apr. 24.02: comp. stars have V = 11.06 ($B-V$ = +0.08) and 10.86 (+0.37) [GOI]. Apr. 27.96: comp. stars have V = 11.17 ($B-V$ = +0.49) and 10.95 (+0.54) [GOI].

◇ *Comet C/2006 S5 (Hill)* ⟹ 2008 Jan. 14.55: comp. star has $B-V$ = +0.40 [TSU02]. Jan. 14.55 and Apr. 11.53: `Guide 8.0` software used for comp.-star mags [TSU02]. Feb. 9.77: ephemeris from Minor Planet Center's ephemeris service; checked with Digitized Sky Survey (limiting stellar mag 15.5) [HAS02]. Feb. 12.88: nearby field stars checked via Palomar Sky Survey (DSS) [LEH]. Mar. 5.55: much fainter than in Jan. [YOS04]. Mar. 11.53: `Guide 8.0` software used for comp.-star mags; $B-V$ values of comp. stars were +0.45, +0.61, and +0.74 [YOS02]. Mar. 11.54: LONEOS PKS 0754+101 sequence used for comp.-star mags [YOS02]. Apr. 11.53: comp. star has $B-V$ = +0.54 [TSU02].

◇ *Comet C/2006 VZ$_{13}$ (LINEAR)* ⟹ 2007 July 7.67: city light pollution; clouds [XU].

◇ *Comet C/2006 W3 (Christensen)* ⟹ 2008 Feb. 12.84: nearby field stars checked via Palomar Sky Survey (DSS) [LEH]. Mar. 5.54: near a star; very faint, near limit; "very difficult to see" [YOS04].

◇ *Comet C/2007 B2 (Skiff)* ⟹ 2008 Feb. 10.08: mountain location, very clear sky; nearby field stars checked via Digitized Sky Survey; comp. stars taken from Henden photometry near GP Com; limiting stellar mag near comet 15.2 (HN) [GON05]. Mar. 5.70: very small and faint [YOS04]. Apr. 3.94: comp. stars taken from Henden photometry near GP Com [GON05]. Apr. 5.62: `Guide 8.0` software used for comp.-star mags; $B-V$ values of comp. stars were +0.42 and +0.77 [YOS02]. Apr. 11.68: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.52 [TSU02].

◇ *Comet C/2007 E2 (Lovejoy)* ⟹ 2007 Apr. 17.88: city pollution [XU]. Apr. 21.29: featureless, brightening slightly toward center, roughly circular; just barely seen in 10×50 B [NOW]. Apr. 22.32: comet dimmed a bit by weak aurora, yet comet was easily visible in 11×70 B; round shape [NOW]. May 22.95: bright star in coma [HOR03].

◇ *Comet C/2007 F1 (LONEOS)* ⟹ 2007 Oct. 13.73 and 15.73: `Guide 8.0` software used for comp.-star mags [TOT03]. Oct. 14.73, 15.72, and 17.72: `Guide 8.0` software used for comp.-star mags [SAN07]. Oct. 14.73 and 16.73: `Guide 8.0` software used for comp.-star mags [MAJ01].

◇ *Comet C/2007 G1 (LINEAR)* ⟹ 2008 Mar. 15.85: `Guide 8.0` software used for comp.-star mags; comp. star has $B-V$ = +0.45 [TSU02].

◇ *Comet C/2007 O1 (LINEAR)* ⟹ 2007 Oct. 3.46: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show 20" coma, total mag 18.0 (comp.-star ref. presumably UCAC-2) [R. H. McNaught].

◇ *Comet C/2007 Q3 (Siding Spring)* ⟹ 2008 Feb. 26.45: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show strongly condensed, circular coma of dia. 20", total mag 16.1 (comp.-star ref. presumably UCAC-2) [R. H. McNaught].

◇ *Comet C/2007 T1 (McNaught)* ⟹ 2008 Feb. 1.11: comp. stars have V = 9.29 ($B-V$ = +0.43) and 8.91 (+0.68) [GOI]. Feb. 1.99: comp. stars have V = 8.20 ($B-V$ = −0.01) and 9.05 (+0.14) [AMO01]. Feb. 2.14: comp. stars have V

= 9.05 ($B-V = +0.14$) and 9.39 (+0.20) [GOI]. Feb. 4.29: comp. stars have V = 9.36 ($B-V = +0.32$) and 9.26 (+0.37) [GOI]. Feb. 5.24: comp. stars have V = 9.15 ($B-V = +0.16$) and 9.77 (+0.40) [AMO01]. Feb. 6.00: comp. stars have V = 8.64 ($B-V = +0.47$) and 9.62 (+0.54) [AMO01]. Feb. 7.00: comp. stars have V = 9.03 ($B-V = +0.14$) and 9.46 (+0.20); very close to star HD 49036 [AMO01]. Feb. 8.99: comp. stars have V = 8.86 ($B-V = +1.10$) and 9.06 (+0.34); clouds interfering [AMO01]. Feb. 26.06: comp. stars have V = 10.01 ($B-V = +0.26$) and 10.56 (+0.88) [GOI]. Feb. 27.08: comp. stars have V = 10.13 ($B-V = +0.10$) and 10.47 (+0.59) [GOI]. Feb. 29.51-29.54: stacked (via `Astrometrica 4.4.1.364`) CCD images taken w/ 50-cm Uppsala T at Siding Spring show 5′ coma of total mag 13.3 w/ diffuse 7′ tail in p.a. 140° and strong central cond. (comp.-star ref. presumably UCAC-2) [R. H. McNaught]. Mar. 1.83: alt. 8° [GON05]. Mar. 1.98: comp. stars have V = 10.02 ($B-V = +0.47$) and 10.60 (+0.36) [GOI]. Mar. 2.96: comp. stars have V = 10.34 ($B-V$ = +0.59) and 10.42 (+0.50) [GOI]. Mar. 5.14: comp. stars have V = 10.34 ($B-V = +0.43$) and 10.75 (+0.48) [GOI]. Mar. 5.41: very low, but clearly visible [YOS04]. Mar. 5.84: alt. 13° [GON05]. Mar. 6.08: comp. stars have V = 10.30 ($B-V = +0.70$) and 10.58 (+0.18) [GOI]. Mar. 6.98: comp. stars have V = 10.98 ($B-V = +0.29$) and 11.44 (+0.31) [AMO01]. Mar. 7.98: comp. stars have V = 10.25 ($B-V = +0.70$) and 10.55 (+0.43) [GOI]. Mar. 8.96: comp. stars have V = 10.29 ($B-V = +0.23$) and 10.88 (+0.36) [GOI]. Mar. 8.98: comp. stars have V = 11.14 ($B-V = +0.43$) and 11.56 (+0.81) [AMO01]. Mar. 9.97: comp. stars have V = 10.29 ($B-V = +0.46$) and 10.81 (+0.65) [GOI]. Mar. 9.98: comp. stars have V = 10.81 ($B-V = +0.65$) and 11.54 (+0.52) [AMO01]. Mar. 13.04: comp. stars have V = 10.69 ($B-V$ = +0.55) and 10.92 (+0.63) [GOI]. Mar. 16.96 and 20.96: moonlight [GOI]. Mar. 16.96: comp. stars have V = 10.54 ($B-V$ = +0.25) and 10.92 (+0.32) [GOI]. Mar. 20.96: comp. stars have V = 10.80 ($B-V = +0.60$) and 11.26 (+0.78) [GOI]. Mar. 23.96: comp. stars have V = 11.36 ($B-V = +0.41$) and 11.47 (+0.26) [GOI].

⋄ *Comet C/2007 W1 (Boattini)* ⟹ 2008 Feb. 7.13, Mar. 6.08, and Apr. 28.94: mountain location, very clear sky [GON05]. Feb. 7.13: nearby field stars checked via Digitized Sky Survey; limiting stellar mag near comet 15.3 (HN) [GON05]. Feb. 7.13 and Mar. 6.08: comp. stars taken from Henden photometry (G020305) [GON05]. Feb. 13.79: $B-V$ values of comp. stars were +0.59, +0.72, and +0.79 [YOS02]. Feb. 13.79, Mar. 11.58, 31.53, and Apr. 5.55: `Guide 8.0` software used for comp.-star mags [YOS02].

Mar. 5.70: "easy to see" [YOS04]. Mar. 9.19: comp. star has V = 12.56 (GSC 5534-0728) [AMO01]. Mar. 11.58: $B-V$ values of comp. stars were +0.46 and +0.79 [YOS02]. Mar. 11.60: LONEOS NGC 4699 sequence used for comp.-star mags [YOS02]. Mar. 15.55: comp. star has $B-V = +0.49$ [TSU02]. Mar. 15.55 and Apr. 11.58: `Guide 8.0` software used for comp.-star mags [TSU02]. Mar. 17.12: comp. stars have V = 11.56 ($B-V = +0.60$) and 11.38 (+0.40) [GOI]. Mar. 17.12, 22.16, 26.06, 27.11, 28.15, Apr. 17.00, 18.18, 19.18, 22.98, and 24.14: moonlight [GOI]. Mar. 22.16: comp. stars have V = 11.24 ($B-V = +0.51$) and 11.79 (+0.60) [GOI]. Mar. 26.06: comp. stars have V = 10.80 ($B-V = +0.71$) and 11.21 (+0.71) [GOI]. Mar. 26.42: seen only briefly between cloudy periods [SEA]. Mar. 27.11: comp. stars have V = 11.02 ($B-V = +0.54$) and 11.54 (+0.80) [GOI]. Mar. 27.41: under more favorable conditions than previous night, comet appeared much larger, though very diffuse and of low surface brightness (and a little enhanced w/ Swan-band filter) [SEA]. Mar. 28.15: comp. stars have V = 10.65 ($B-V = +0.38$) and 10.49 (+0.69) [GOI]. Mar. 29.07: comp. stars have V = 10.49 ($B-V = +0.69$) and 9.98 (+0.43) [GOI]. Mar. 29.15: comp. stars have V = 11.29 ($B-V = +0.50$) and 11.87 (+1.34) [AMO01]. Mar. 29.40: "close to stars, but had the impression that it was more condensed than previously" [SEA]. Mar. 30.12: comp. stars have V = 9.49 ($B-V = +0.37$) and 9.97 (+0.43) [GOI]. Mar. 30.90: `Guide 8.0` software used for comp.-star mags [SAN07]. Mar. 31.02: comp. stars have V = 9.91 ($B-V = +0.42$) and 9.52 (+0.55) [GOI]. Mar. 31.53: possible tail to NW; $B-V$ values of comp. stars were +0.49, +0.62, and +0.84 [YOS02].

Apr. 2.03: comp. stars have V = 10.20 ($B-V = +0.51$) and 10.52 (+0.71) [AMO01]. Apr. 4.08: comp. stars have V = 9.43 ($B-V = -0.01$) and 9.97 (+0.51) [AMO01]. Apr. 5.23: comp. stars have V = 9.68 ($B-V = +0.52$) and 9.08 (+0.54); clouds [GOI]. Apr. 5.47: possibly glimpsed in hand-held 10×50 B [SEA]. Apr. 5.55: $B-V$ values of comp. stars were +0.54, +0.55, and +0.76 [YOS02]. Apr. 6.01: comp. stars have V = 9.08 ($B-V = +0.54$) and 9.99 (+0.43) [AMO01]. Apr. 6.12: comp. stars have V = 9.90 ($B-V = +0.51$) and 9.68 (+0.53) [GOI]. Apr. 7.12: comp. stars have V = 9.08 ($B-V$ = +0.54) and 9.68 (+0.52) [GOI]. Apr. 7.94: comp. stars have V = 8.84 ($B-V = +0.31$) and 9.91 (+0.84) [AMO01]. Apr. 8.14: comp. stars have V = 9.03 ($B-V = +0.33$) and 9.54 (+0.17) [GOI]. Apr. 10.09: comp. stars have V = 9.44 ($B-V$ = +0.15) and 8.93 (+0.24) [GOI]. Apr. 10.98: comp. stars have V = 8.93 ($B-V = +0.24$) and 9.44 (+0.15) [AMO01]. Apr. 11.58: comp. star has $B-V = +0.41$ [TSU02]. Apr. 12.00: comp. stars have V = 8.75 ($B-V = +0.41$) and 9.26 (+0.51) [GOI]. Apr. 12.07: obs. from León after moonset; alt. 17° [GON05]. Apr. 13.25: comp. star has V = 8.69 ($B-V = +0.38$) [GOI]. Apr. 15.02 and 18.00: comp. stars have V = 8.77 ($B-V = +0.45$) and 9.57 (+0.54); moonlight [AMO01]. Apr. 17.00: comp. stars have V = 8.55 ($B-V = +0.42$) and 8.15 (+0.54) [GOI]. Apr. 18.18 and 19.18: comp. stars have V = 8.23 ($B-V = +0.88$) and 8.82 (+0.41) [GOI]. Apr. 22.98, 24.14, and 24.96: comp. stars have V = 8.08 ($B-V = +0.33$) and 7.54 (+0.53) [GOI]. Apr. 23.98: comp. stars have V = 8.08 ($B-V = +0.33$) and 8.31 (+0.31) [GOI]. Apr. 25.91: comp. stars have V = 7.95 ($B-V = +0.25$) and 8.83 (+0.17) [AMO01]. Apr. 26.45: now quite obvious in 10×50 B [SEA]. Apr. 26.99: comp. stars have V = 7.71 ($B-V = +0.03$) and 7.54 (+0.53) [GOI]. Apr. 27.97 and 28.97: comp. stars have V = 7.54 ($B-V = +0.53$) and 7.32 (+0.08) [GOI]. Apr. 27.98: comp. stars have V = 8.12 ($B-V = +0.53$) and 7.32 (+0.08) [GOI]. Apr. 28.00: comp. stars have V = 7.32 ($B-V = +0.08$) and 7.71 (+0.03) [AMO01]. Apr. 28.94: stars of mag 8.6 and 9.3 (ref: TK) in coma [GON05]. Apr. 30.93: comp. stars have V = 7.04 ($B-V = +0.61$) and 7.71 (+0.23) [AMO01].

⋄ *Comet C/2008 A1 (McNaught)* ⟹ 2008 Jan. 26.48: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show circular coma of dia. 35″, total mag 15.0-15.1 (comp.-star ref. presumably UCAC-2) [R. H. McNaught]. Feb. 7.50: stacked (via `Astrometrica 4.4.1.364`) CCD images taken by G. J. Garradd and R. H. McNaught with 50-cm Uppsala T at Siding Spring show circular coma of dia. 60″, total mag 14.8 (comp.-star ref. presumably UCAC-2) [R. H. McNaught]. Feb. 29.52: stacked (via `Astrometrica 4.4.1.364`) CCD images taken w/ 50-cm Uppsala T at Siding Spring show circular coma of dia. 80″ and total mag 14.4

(comp.-star ref. presumably UCAC-2) [R. H. McNaught]. Apr. 17.94: comp. stars have $V = 11.41$ ($B-V = +0.24$) and 11.98 (+0.30); moonlight [GOI]. Apr. 17.94: comp. stars have $V = 11.41$ ($B-V = +0.34$) and 11.65 (+0.68) [GOI]. Apr. 26.96 and 27.94: comp. stars have $V = 11.33$ ($B-V = +0.28$) and 11.65 (+0.68) [GOI].

⋄ *Comet C/2008 C1 (Chen-Gao)* ⟹ 2008 Feb. 2.99: "movement of comet compared to nearby star of mag 11.1 (confirmed visual obs.)" [SCH04]. Feb. 4.89: motion checked during an 85-min period; nearby field stars checked via Digitized Sky Survey [GON05]. Feb. 4.89, 13.05, 22.81, Mar. 10.95: mountain location, very clear sky [GON05]. Feb. 6.96: "comet significantly brighter than two days ago" [GON05]. Feb. 9.91: "brightening trend continues" [GON05]. Feb. 11.93: "comet in rich star field (composed of stars with mag in the range 11.5-12); difficult estimation" [SCH04]. Feb. 13.05: obs. after moonset [GON05]. Feb. 19.83: very compact object [SHU]. Feb. 22.81: obs. before moonrise [GON05]. Feb. 22.81, 30.89, Apr. 3.96, and 23.90: zodiacal light [GON05]. Feb. 25.46 and Apr. 11.46: `Guide 8.0` software used for comp.-star mags [TSU02]. Feb. 25.46: comp. star has $B-V = +0.68$ [TSU02]. Feb. 27.46, Mar. 11.47, and 31.48: `Guide 8.0` software used for comp.-star mags [YOS02]. Mar. 1.85: mountain location, clear sky [GON05]. Mar. 5.48 and 8.47: `Guide 8.0` software used for comp.-star mags [MIY01]. Mar. 5.49: "a large nebulous comet with a very weak cond." [YOS04]. Mar. 6.83: "obs. during my first Messier marathon; saw three comets with binoculars within 5 min (including 17P/Holmes)" [KAR02]. Mar. 11.47: $B-V$ values of comp. stars were +0.51, +0.58, and +0.62 [YOS02]. Mar. 11.49: LONEOS 4C 47.08 sequence used for comp.-star mags [YOS02]. Mar. 22.53: `MegaStar` ver. 5.0 software used for comp.-star mags [MUR02]. Mar. 24.47: LONEOS NGC 4699 sequence used for comp.-star mags [YOS02]. Mar. 30.79: `Guide 8.0` software used for comp.-star mags [SAN07]. Mar. 30.89: comet close to star of mag 10.7 (TK) [GON05]. Mar. 31.48: $B-V$ values of comp. stars were +0.49, +0.62, and +0.84 [YOS02]. Apr. 3.40: comet only suspected — very faint and indistinct, only confirmed the following evening [SEA]. Apr. 11.46: comp. star has $B-V = +0.54$ [TSU02].

⋄ *Comet C/2008 E3 (Garradd)* ⟹ 2008 Mar. 10.76: stacked (via `Astrometrica 4.4.1.366`) CCD images taken w/ 50-cm Uppsala T at Siding Spring show coma (or tail) extended to NW and moderate central cond. (crowded field) [R. H. McNaught].

⋄ ⋄ ⋄

Key to observers with observations published in this issue — except for observations of 17P whose data were summarized in the last three issues (for which the observer tables in those issues must be consulted) — *with 2-digit numbers between Observer Code and Observer's Name indicating source [16 = Japanese observers (via Akimasa Nakamura, Kuma, Ehime); 32 = Hungarian observers (via Krisztián Sárneczky, Budapest); etc.]:*

AMO01		Alexandre Amorim, Brazil
BUS01	11	E. P. Bus, The Netherlands
CSU	32	Mátyás Csukás, Salonta, Romania
DES01		Jose G. de Souza Aguiar, Brazil
DIE02		Alfons Diepvens, Belgium
GOI		Marco A. C. Goiato, Brazil
GON05		J. J. Gonzalez, Asturias, Spain
HAS02		Werner Hasubick, Germany
HOR03	23	Petr Horalek, Czech Republic
KAR02	21	Timo Karhula, Virsbo, Sweden
KES01	32	Sándor Keszthelyi, Pécs, Hungary
KOC03	32	Antal Kocsis, Hungary
LAB02		Carlos Labordena, Spain
LEH		Martin Lehky, Czech Republic
LIN04		Michael Linnolt, HI, U.S.A.
MAJ01	32	L. Majzik, Tápióbicske, Hungary
MAR02		Jose Carvajal Martinez, Spain
MIT	16	S. Mitsuma, Honjo, Saitama, Japan
MIY01	16	Osamu Miyazaki, Ibaraki, Japan
MUR02	16	Shigeki Murakami, Niigata, Japan
NAG04	16	Kazuro Nagashima, Nara, Japan
NAG08	16	Yoshimi Nagai, Gunma, Japan
NAG09	32	Miklós Nagy, Csenger, Hungary
NEV		Vitali S. Nevski, Belarus
NOV01		Artyom O. Novichonok, Russia
NOW		Gary T. Nowak, VT, U.S.A.
PAR03	18	Mieczyslaw L. Paradowski, Poland
PIL01		Uwe Pilz, Leipzig, Germany
QVA	24	Jan Qvam, Horten, Norway
RAE		Stuart T. Rae, New Zealand
RIE	11	Hermanus Rietveld, Netherlands
ROB06		W. R. Robledo, Cordoba, Argentina
SAJ	32	Andras Sajtz, Satu-Nou, Romania
SAN07	32	G. Sánta, Kisujszállás, Hungary
SAR02	32	K. Sárneczky, Budapest, Hungary
SCA02		Toni Scarmato, Calabria, Italy
SCH04	11	Alex H. Scholten, The Netherlands
SEA		David A. J. Seargent, Australia
SHU	42	Sergey E. Shurpakov, Belarus
SOM	32	Béla M. Somosvári, Hungary
SOU01		W. C. de Souza, Sao Paulo, Brazil
SZA	32	Sándor Szabó, Sopron, Hungary
TOT03	32	Zoltán Tóth, Hungary
TSU02	16	M. Tsumura, Wakayama, Japan
UJV	32	Antal Ujvárosy, Hungary
VAS06	32	Lászlő Vastagh, Nőtincs, Hungary
YOS02	16	K. Yoshimoto, Yamaguchi, Japan
YOS04	16	Seiichi Yoshida, Kanagawa, Japan
ZAJ	32	György Zajácz, Debrecen, Hungary

⋄ ⋄ ⋄

Full-Format Visual Data of Comet 17P

As noted in the January 2008 issue, we are making the unusual exception here of publishing the full-format data for comet 17P. All photometric observations of 17P at its current apparition on hand through April 2008 — including those summarized in the July 2007, October 2007, and January 2008 issues — are published in their entirety below. The full-format CCD data for 17P appear beginning on page 111 of this issue. All other observations of other comets are summarized in the (new) usual manner beginning on page 113 of this issue.

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

"MM" = the method employed for estimating the total (visual) magnitude; see article on page 186 of the Oct. 1996 issue [B = VBM method, M = Morris method, S = VSS or In-Out method, I = in-focus, C = unfiltered CCD, c = same as 'C', but for 'nuclear' magnitudes, V = electronic observations — usually CCD — with Johnson *V* filter, *etc.*]. "MAG." = total (visual) magnitude estimate; a colon indicates that the observation is only approximate, due to bad weather conditions, *etc.*; a left bracket ([) indicates that the comet was not seen, with an estimated limiting magnitude given (if the comet IS seen, and it is simply estimated to be fainter than a certain magnitude, a "greater-than" sign (>) must be used, not a bracket). "RF" = reference for total magnitude estimates (see pages 98-100 of the October 1992 issue, and Appendix C of the *ICQ Guide to Observing Comets*, for all of the 1- and 2-letter codes; an updated list is also maintained at the *ICQ* World Wide Website). "AP." = aperture in centimeters of the instrument used for the observations, usually given to tenths. "T" = type of instrument used for the observation (R = refractor, L = Newtonian reflector, B = binoculars, C = Cassegrain reflector, A = camera, T = Schmidt-Cassegrain reflector, S = Schmidt-Newtonian reflector, E = naked eye, *etc.*). "F/" and "PWR" are the focal ratio and power or magnification, respectively, of the instrument used for the observation — given to nearest whole integer (round even); note that for CCD observations, in place of magnification is given the exposure time in seconds [see page 11 of the January 1997 issue; a lower-case "a" indicates an exposure time under 1000 seconds, an upper-case "A" indicates an exposure time of 1000-1999 seconds (with the thousands digit replaced by the "A"), an upper-case "B" indicates an exposure time of 2000-2999 seconds (with the thousands digit replaced by the "B"), etc.].

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

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

◇ ◇ ◇

Comet 17P/Holmes

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 05 23.43		I	[14.0:		41	L	4	229					HAL
2007 06 19.43		S	[14.3	NP	41	L	4	229	0.5				HAL
2007 07 14.09		S	[14.5	HN	20.3	T	10	222	! 0.5				GON05
2007 07 25.12		S	14.7	HN	20.3	T	10	160	0.4	4			GON05

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 08 15.03		S	14.4	HS	50.8	L	5	164	1.0	1/			TOT03
2007 10 05.74		S	[14.1	HS	40.0	L	4	257	! 0.4				YOS04
2007 10 06.67		S	[14.1	TA	40.0	L	4	257	! 0.4				YOS04
2007 10 13.92		S	[15.0	HS	50.8	L	5	273	! 1				SZA
2007 10 24.52	x	I	3.8	HV	5.0	B		7	< 1	9			MIY01
2007 10 24.54		B	4.0	SC	0.0	E		1	0.0	9			HAL
2007 10 24.55		I	3.5	YG	0.0	E		1		9			YOS04
2007 10 24.55		I	3.7	YG	6.6	R		10		9			YOS04
2007 10 24.60	x	I	3.5	HV	3.5	B		7		9			MIT
2007 10 24.63		I	3.0	YG	0.0	E		1		9			YOS04
2007 10 24.63		I	3.2	YG	6.6	R		10		9			YOS04
2007 10 24.68		M	3.0	TJ	0.0	E		1		9			SHU
2007 10 24.68		M	3.0	TJ	3.0	R	6	6		8/			SHU
2007 10 24.71		I	2.9	YG	6.6	R		10		9			YOS04
2007 10 24.71		S	2.8	S	9.0	R		50	0.2	8/			KOZ02
2007 10 24.72		I	2.8	YG	0.0	E		1		9			YOS04
2007 10 24.72	G	M	2.8	S	0.0	E		1					KOZ02
2007 10 24.78		I	3.0	HV	0.0	E		1		9			FUK02
2007 10 24.79		B	2.7	HD	0.0	E		1		9			NEV
2007 10 24.80		I	2.7	TJ	0.0	E		1		8			GIA01
2007 10 24.80		I	2.7	TK	0.0	E		1		9			GON05
2007 10 24.80		I	2.8	YG	0.0	E		1		9			YOS04
2007 10 24.80		I	2.9	YG	6.6	R		10		9			YOS04
2007 10 24.81	x	I	2.8	HV	0.0	E		1		9			YOS02
2007 10 24.82		I	2.8	HV	0.0	E		1		9			FUK02
2007 10 24.83		B	2.8	HV	0.0	E		1	1	9			BIV
2007 10 24.83		S	2.6	TI	0.0	E		1		s9			SCA02
2007 10 24.87		I	2.9	YG	0.0	E		1		9			CHE09
2007 10 24.87		S	2.4	TI	0.0	E		1		s9			SCA02
2007 10 24.88		B	2.7	HV	5.0	B		7	1	9			BIV
2007 10 24.89		B	2.4	AA	0.0	E		1	2	9			KOC03
2007 10 24.89		B	2.7	YG	5.0	B		10	& 0.5	9			GRA04
2007 10 24.89		I	2.6	YG	0.7	E		1		9			GRA04
2007 10 24.89		S	2.5	TI	0.0	E		1		s9			SCA02
2007 10 24.91		B	2.8	HV	0.0	E		1	1	9			BIV
2007 10 24.93		I	2.7	TK	0.7	E		1		9			DAH
2007 10 24.93	G	B	2.5	TK	0.0	E		1		9			SER
2007 10 24.95		M	2.8	TJ	0.0	E		1		9			SHU
2007 10 25.06		B	2.6	HD	0.0	E		1		9			NEV
2007 10 25.08		I	2.4	TK	0.0	E		1		9			GON05
2007 10 25.15		I	2.6	HV	0.0	E		1		9			CRE01
2007 10 25.21	x	I	2.9	AE	0.0	E		1		9			FER04
2007 10 25.22		B	2.7	SC	0.0	E		1		8/			HAL
2007 10 25.33		I	2.7	TK	0.0	E		1		7			LIN04
2007 10 25.42	x	S	2.8	TK	5.0	B		8	< 2	8			MUR02
2007 10 25.42	x	S	2.8	TK	45.7	L	4	68	1.4	S5	0.2m	242	MUR02
2007 10 25.44		I	2.6	AC	0.0	E		1		9			MOM
2007 10 25.52	x	I	2.3:	HV	5.0	B		7	3	1			MIY01
2007 10 25.53		B	2.6	SC	0.0	E		1		8/			HAL
2007 10 25.6		B	3.2	TK	5.0	B		7					YE
2007 10 25.60	x	I	2.4	HV	0.0	E		1		9			YOS02
2007 10 25.61	x	I	2.3	TT	0.0	E		1		9			TSU02
2007 10 25.66		M	2.4	TJ	3.0	B		8	1	8/			SHU
2007 10 25.70		M	2.6	TJ	0.0	E		1		9			SHU
2007 10 25.75		B	2.4	YG	0.7	E		1		9			SKI
2007 10 25.75		B	2.4	YG	5.0	B		7	0.7				SKI
2007 10 25.75		B	2.6	YG	5.0	B		10	2	8			GRA04
2007 10 25.75		I	2.6	YG	0.7	E		1		9			GRA04
2007 10 25.76		N	5.0	TK	7.0	R	7	20	2.5				GRA04
2007 10 25.77		B	2.5	HD	0.0	E		1	& 1.5	8			NEV
2007 10 25.80		I	2.6	TK	0.0	E		1		9			GON05

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 10 25.81		B	2.6	TK	8.0	B		11	4	9			WAR01
2007 10 25.81		M	2.7	TK	5.0	B		10	1.7	8			GON05
2007 10 25.83		S	2.3	TJ	3.0	B		7	1	7			BRU
2007 10 25.84		I	2.3	S	0.0	E		1	1	9			MAR02
2007 10 25.89		S	2.5	TI	0.0	E		1					LAB02
2007 10 25.93		B	2.5	AA	0.0	E		1	2.5	9			NAG09
2007 10 25.94		B	2.8	AA	0.0	E		1	3.5	D7			CSU
2007 10 26.05		B	2.2	HV	0.0	E		1	3	8			CRE01
2007 10 26.07	x	B	2.7	TJ	5.0	B		10	2.8	8			BOR
2007 10 26.07		I	2.6	TJ	0.0	E		1		8			PER01
2007 10 26.07	x	I	2.7	TJ	0.0	E		1		9			BOR
2007 10 26.08		B	2.5	AC	0.0	E		1					NOW
2007 10 26.12			2.6	AE	0.0	E		1					MAR03
2007 10 26.16		B	2.5	TK	0.0	E		1					WAR01
2007 10 26.17		B	2.5	HI	0.0	E		1	2.5	9			SAN07
2007 10 26.19		B	2.7	SC	0.0	E		1		8/			HAL
2007 10 26.20		B	2.6	AE	0.0	E		1					GRE
2007 10 26.39		I	2.3	AA	0.0	E		1					WHE01
2007 10 26.58		S	2.4	AA	5.0	B		10	3				SEA
2007 10 26.67		B	2.2	TJ	0.0	E		1		9			CHE03
2007 10 26.68	G	M	2.0	S	0.0	E		1					KOZ02
2007 10 26.71		B	2.6	AA	0.0	E		1	3.5	9			NAG09
2007 10 26.71		S	2.0	S	9.0	R		100	4	8			KOZ02
2007 10 26.72		S	2.5	AA	0.0	E		1	2	8			ZAJ
2007 10 26.73		B	2.3	TJ	5.0	B		7	3	8/			CHE03
2007 10 26.75		B	2.5	HI	0.0	E		1	3	9			SAN07
2007 10 26.78		B	2.9:	TT	0.8	E		1		7			KOU
2007 10 26.80		M	2.5	TJ	0.0	E		1	1	8/			SHU
2007 10 26.80		M	2.5	TJ	3.0	B		8	4	6/			SHU
2007 10 26.81		S	2.3	TJ	3.0	B		7	1.5	5			BRU
2007 10 26.82		S	2.6	AA	0.0	E		1					GOB01
2007 10 26.83		B	2.5	AA	0.0	E		1	7	8			KOC03
2007 10 26.83		I	2.6	TK	0.7	E		1	1	9			DAH
2007 10 26.84		M	2.4	TJ	10.0	R	7	28	2.5	8			XU
2007 10 26.85	x	I	2.4	HV	0.0	E		1		9			YOS02
2007 10 26.86		S	1.9	TI	0.0	E		1		s9			SCA02
2007 10 26.88		B	2.5	HI	13.6	L	5	26	8	D8			SAN07
2007 10 26.90		I	2.4	S	0.0	E		1		9			MAR02
2007 10 26.91		S	2.1	TI	0.0	E		1		s9			SCA02
2007 10 26.91		S	2.4	TI	0.0	E		1					LAB02
2007 10 26.92		B	2.4:	TT	0.8	E		1		7			KOU
2007 10 26.93		B	2.3:	TT	6	L	6	25	> 1	7			KOU
2007 10 27.00	G	M	2.1	TI	0.8	E		1	2	9			HOR03
2007 10 27.01		M	2.2	TI	5.0	B		10	4.7	8/			HOR03
2007 10 27.05		B	2.6:	TT	0.8	E		1		7			KOU
2007 10 27.06		B	2.5:	TT	6	L	6	25	1.5	7			KOU
2007 10 27.07		I	2.5	TJ	0.0	E		1		8			PER01
2007 10 27.10	s	B	1.9	YG	5.0	B		7	7	8			AMO01
2007 10 27.11		B	2.5	SC	0.0	E		1		8/			HAL
2007 10 27.12	s	M	2.3	YG	8.0	B		20	6	7			AMO01
2007 10 27.16		I	2.4	TK	0.0	E		1	4	8/			GON05
2007 10 27.16		S	2.5	AA	0.0	E		1					GOB01
2007 10 27.16	s	B	2.2	YG	3.0	B		8	8	8			SOU01
2007 10 27.16	s	I	2.2	YG	0.5	E		1					SOU01
2007 10 27.16	s	M	2.3	YG	8.0	B		11	8	7			SOU01
2007 10 27.17		M	2.5	TK	5.0	B		10	4	8			GON05
2007 10 27.20		I	2.6	AA	0.0	E		1					WHE01
2007 10 27.25	x	M	2.9	HV	0.0	E		1					OME
2007 10 27.51	x	I	2.4	HV	0.0	E		1		9			YOS02
2007 10 27.51	x	S	2.5	HV	3.5	B		7	5	8			YOS02
2007 10 27.57		M	2.4	YG	3.5	B		7	5	7/			NAG08
2007 10 27.63		I	2.4	YG	0.0	E		1		9			NAG08
2007 10 27.71		B	2.6	TJ	0.0	E		1		9			CHE03
2007 10 27.72	x	I	2.5	HV	0.0	E		1		9			MIT
2007 10 27.74		I	2.5	YG	0.0	E		1		9			YOS04

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 10 27.74		S	2.1	AA	5.0	B		10	8	7			FOG
2007 10 27.74		S	2.7	YG	6.6	R		10	3.5	D2			YOS04
2007 10 27.76		B	2.7	TJ	5.0	B		7	5	8			CHE03
2007 10 27.76		I	2.6	TT	0.8	E		1		9			LEH
2007 10 27.79		S	2.1	TI	0.0	E		1	3	s8			SCA02
2007 10 27.79		S	2.8	AA	0.0	E		1					GOB01
2007 10 27.80		B	2.7	HV	0.0	E		1	3	8			BIV
2007 10 27.80		I	2.6	AA	0.0	E		1		9			KAN
2007 10 27.81		M	2.8	TK	10.0	B		25	11	7			GON05
2007 10 27.82		I	2.5	S	0.0	E		1	1	8			MAR02
2007 10 27.85		I	2.4	TK	0.0	E		1	4	8/			GON05
2007 10 27.86		S	2.6	TI	0.0	E		1					LAB02
2007 10 27.86	G	M	2.1	TI	0.8	E		1	3	9			HOR03
2007 10 27.87		M	2.3	TI	5.0	B		10	6.3	8			HOR03
2007 10 27.91		B	2.4	TT	20.3	L	6	48	4.0	S5			PAR03
2007 10 27.91		B	2.8	HV	5.0	B		7	4	7			BIV
2007 10 27.92		B	2.5	TK	0.7	E		1	1.5	8			DAH
2007 10 27.92		B	2.8	HV	0.0	E		1	2	8			BIV
2007 10 27.92		S	2.6	TJ	0.7	E		1					PIL01
2007 10 27.94		B	2.4	TT	3.5	B		7	& 5	D6			PAR03
2007 10 27.95		I	2.4	TT	0.0	E		1	& 3	D9			PAR03
2007 10 27.99	x	B	2.6	TJ	5.0	B		10	8	8			BOR
2007 10 27.99	x	I	2.7	TJ	0.0	E		1					BOR
2007 10 28.01		M	2.6	TJ	3.0	B		8	7	6/			SHU
2007 10 28.03		I	2.6	TJ	0.0	E		1	4	8			SHU
2007 10 28.07		I	2.5	TJ	0.0	E		1		8			PER01
2007 10 28.10		S	2.5	RA	3.5	B		7					RAO
2007 10 28.13	s$	I	2.1	YG	0.5	E		1					DES01
2007 10 28.14	s$	S	2.2	YG	8.0	B		11	5				DES01
2007 10 28.15		B	2.5	AE	0.0	E		1					GRE
2007 10 28.15	s	I	2.6	YG	0.5	E		1		9			AMO01
2007 10 28.16	s	B	2.7	YG	5.0	B		7	8	7/			AMO01
2007 10 28.16	s	M	2.4	YG	8.0	B		20	8	6/			AMO01
2007 10 28.20		S	2.8	AA	0.0	E		1					GOB01
2007 10 28.23		B	2.5	HV	0.0	E		1	3	8			CRE01
2007 10 28.43	x	B	2.5	TJ	0.0	E		1					BOR
2007 10 28.43	x	S	2.5	TK	5.0	B		8	6	7			MUR02
2007 10 28.46		I	2.4	YG	0.0	E		1		9			YOS04
2007 10 28.46		S	2.4	YG	6.6	R		10	5	6			YOS04
2007 10 28.48	x	B	2.5	HV	5.0	B		10	8	8			NAG04
2007 10 28.54	x	I	2.6	HV	0.0	E		1		8/			YOS02
2007 10 28.54	x	S	2.6	HV	3.5	B		7	8	S6			YOS02
2007 10 28.67		M	2.5	YG	3.5	B		7	7	7			NAG08
2007 10 28.69		B	2.5	AA	0.0	E		1	15	D7/			NAG09
2007 10 28.71		I	2.8	TJ	0.0	E		1		8			GIA01
2007 10 28.72	x	I	2.7	HV	0.0	E		1		9			MIT
2007 10 28.73	x	B	2.6	HV	3.5	B		7	7	8			MIT
2007 10 28.74		S	2.4	HV	6.3	B		9	7	9			KAM01
2007 10 28.75		B	2.5	TK	0.7	E		1	4	8/			DAH
2007 10 28.79		I	2.8	S	0.0	E		1	1	7			MAR02
2007 10 28.79		S	2.4	TJ	0.7	E		1					PIL01
2007 10 28.81		M	2.7	TK	5.0	B		7	5	7			GON06
2007 10 28.81		S	2.6	TI	0.0	E		1					LAB02
2007 10 28.82		S	2.4	TI	0.0	E		1	4	s8			SCA02
2007 10 28.82		S	2.8	TJ	4.0	B		2		6			BRU
2007 10 28.87		S	2.8	TJ	3.0	B		7		5			BRU
2007 10 28.92		B	2.8	HV	0.0	E		1	5	7			BIV
2007 10 28.92		I	2.5	TK	0.8	E		1					HAS02
2007 10 28.94		S	2.9	HV	5.0	B		7	6	7			BIV
2007 10 28.98	x	B	2.6	TJ	5.0	B		10	9	7			BOR
2007 10 29.04		B	2.5	HV	0.0	E		1	3	8			CRE01
2007 10 29.04	G	B	2.5	TK	0.0	E		1		9			SER
2007 10 29.11		M	2.2	TJ	5.0	B		10					MOR
2007 10 29.11		S	2.0	TJ	0.7	E		1		8			MOR
2007 10 29.12		S	2.5	RA	0.0	E		1					RAO

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 10 29.18		I	3.0	AA	0.0	E		1					WHE01
2007 10 29.20		B	2.4	AE	0.0	E		1					GRE
2007 10 29.42	x	B	2.6	TJ	0.0	E		1	&12	8			BOR
2007 10 29.45	x	I	2.5	HV	0.0	E		1	10	8			MIY01
2007 10 29.45	x	S	2.8	HV	5.0	B		7	9.8	5			MIY01
2007 10 29.47		I	2.7	AA	0.0	E		1		8			KAN
2007 10 29.47		M	2.4	YG	3.5	B		7	8	7			NAG08
2007 10 29.49	x	B	2.6	HV	3.5	B		7	7	7			MIT
2007 10 29.49	x	I	2.6	HV	0.0	E		1		8			MIT
2007 10 29.54		I	2.3	YG	0.0	E		1		8/			YOS04
2007 10 29.54		S	2.5	YG	6.6	R		10	6.5	d6			YOS04
2007 10 29.67		B	2.5	HD	0.0	E		1	6	7			NEV
2007 10 29.70		S	2.8	TJ	4.0	B		2		3			BRU
2007 10 29.73		M	2.6	TT	6	L	6	25	7	6/			KOU
2007 10 29.76		I	2.2	YG	0.0	E		1	10	8/			NAG08
2007 10 29.76		S	2.2	TI	0.0	E		1	10	s7			SCA02
2007 10 29.76	G	M	2.3	TK	0.8	E		1	2.0	8			URB01
2007 10 29.77		I	2.5	TK	0.0	E		1	& 5	8			RIE
2007 10 29.77		S	2.4	TK	4.0	B		8	8	7			RIE
2007 10 29.79		B	2.2	TT	0.8	E		1	10	7			KOU
2007 10 29.79		I	2.5	TK	0.8	E		1					HAS02
2007 10 29.84		B	2.6	HI	0.0	E		1	8	8			TOT03
2007 10 29.84		I	2.3	TK	0.0	E		1		9			DIJ
2007 10 29.84		M	2.5	TK	5.0	B		7	10	8			DIJ
2007 10 29.86		B	2.4	HD	0.0	E		1		9			GOL
2007 10 29.87		I	2.4	TK	0.0	E		1		8/			BUS01
2007 10 29.87		I	2.7	S	0.0	E		1		7			MAR02
2007 10 29.87		S	2.3	TK	4.4	B		7	& 8	8			BUS01
2007 10 29.88		B	2.4	TT	5.0	B		7	8.8	D5			PAR03
2007 10 29.88		S	2.9	AA	0.0	E		1					GOB01
2007 10 29.89		B	2.4	TT	6.0	B		20	8.7	D5			PAR03
2007 10 29.89		I	2.6	TK	0.0	E		1		9			GIL01
2007 10 29.90		I	2.4	TT	0.0	E		1	&10	D9			PAR03
2007 10 29.91		B	2.2	TK	0.7	E		1		8			SKI
2007 10 29.91		B	2.8	TJ	0.0	E		1		9			CHE03
2007 10 29.91		B	2.8	TJ	5.0	B		7	8	7			CHE03
2007 10 29.92		B	2.4	TT	10.0	M	10	50	8.5	S5			PAR03
2007 10 29.95		S	2.6	TI	0.0	E		1					LAB02
2007 10 29.98	x	B	2.6	TJ	0.0	E		1					BOR
2007 10 29.98		I	2.6	TJ	0.0	E		1	6	4/			SHU
2007 10 29.98		M	2.6	TJ	3.0	B		8	9	3/			SHU
2007 10 29.99		B	2.4	YG	0.7	E		1	&10	7/			GRA04
2007 10 29.99	x	B	2.6	TJ	0.0	E		1					BOR
2007 10 29.99		M	2.5	YG	5.0	B		10	9	7			GRA04
2007 10 30.01		B	2.6	HV	0.0	E		1	6	7			BIV
2007 10 30.03		B	2.4	TK	0.0	E		1		7/			BOU
2007 10 30.03		B	2.4	TK	5.0	B		7	11	D3			BOU
2007 10 30.04		I	2.5	TJ	0.0	E		1		7			PER01
2007 10 30.05		B	2.6	HV	0.0	E		1	8	8			CRE01
2007 10 30.05		I	2.8	TK	0.0	E		1		9			COM
2007 10 30.05		N	9.2	TA	20.3	T	10	100	7	D3			GRA04
2007 10 30.09		B	2.5	SC	0.0	E		1		8			HAL
2007 10 30.10		I	2.4	TK	0.0	E		1	& 8	8			SCH04
2007 10 30.11		M	2.4	TJ	5.0	B		10					MOR
2007 10 30.11		S	2.2	TJ	0.7	E		1		8			MOR
2007 10 30.15		B	2.6	HV	0.0	E		1	8	7			BIV
2007 10 30.16		S	2.7	HV	5.0	B		7	10	7			BIV
2007 10 30.20		B	2.4	AE	0.0	E		1					GRE
2007 10 30.24		S	3.0	AA	0.0	E		1					GOB01
2007 10 30.32		I	2.5	TK	0.0	E		1		7			LIN04
2007 10 30.45		I	2.6	AA	0.0	E		1					WHE01
2007 10 30.45		I	2.6	YG	0.0	E		1		9			YOS04
2007 10 30.45		S	2.5	YG	6.6	R		10	8	6			YOS04
2007 10 30.54	x	I	2.4	HV	0.0	E		7		8			YOS02
2007 10 30.54	x	M	2.2	HV	3.5	E		7	16	S7			YOS02

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 10 30.62	G	M	2.5	S	0.0	E		1	4	8			KOZ02
2007 10 30.63		S	2.5	S	9.0	R		50	7	8			KOZ02
2007 10 30.64		M	2.6	HI	5.0	B		7	11	6			NOV01
2007 10 30.64	G	M	2.7	TJ	0.0	E		1	7	4/			SHU
2007 10 30.69		B	2.5	HD	0.0	E		1	7	7			NEV
2007 10 30.70		B	2.6	TJ	0.0	E		1		9			CHE03
2007 10 30.70		S	2.9	AA	0.0	E		1	10	5			ZAJ
2007 10 30.71		B	2.7	AA	5.0	B		10	25	7			SAJ
2007 10 30.71		S	2.9	TJ	3.0	B		7		3			BRU
2007 10 30.72		B	2.5	AA	0.0	E		1	30	D7			NAG09
2007 10 30.73		M	2.7	HI	0.0	E		1	25	D6/			SAN07
2007 10 30.74		S	2.1	TK	5.0	B		10	24	6			ZAN01
2007 10 30.76		B	2.4	TK	0.0	E		1		8			KAR02
2007 10 30.76		I	2.5	TK	0.0	E		1	10	8			GIL01
2007 10 30.76		I	2.7	TK	0.0	E		1		8/			COM
2007 10 30.77		B	2.4	TK	5.0	B		7	&25	D4			BOU
2007 10 30.77		B	2.5	TK	0.0	E		1		7/			BOU
2007 10 30.77		I	2.5	TK	0.0	E		1		8			DIJ
2007 10 30.77		I	2.5	TK	0.0	E		1	&10	7			RIE
2007 10 30.77		M	2.6	TK	5.0	B		7	12	8			DIJ
2007 10 30.77		S	2.5	TK	5.0	B		10	12	7			GIL01
2007 10 30.77	G	M	2.3	TK	0.8	E		1	2.0	8			URB01
2007 10 30.78		B	2.5	TJ	5.0	B		7	10	6			CHE03
2007 10 30.78		S	2.3	TK	5.0	B		20	12	9			DIE02
2007 10 30.79		I	2.4	TK	0.0	E		1		8/			BUS01
2007 10 30.79		I	2.4	TK	0.0	E		1	&10	7/			SCH04
2007 10 30.79		S	2.3	TK	4.4	B		7	& 9	8			BUS01
2007 10 30.80		B	2.7	HV	0.0	E		1	10	7			BIV
2007 10 30.81		B	2.6	HD	0.0	E		1	5	7			GOL
2007 10 30.81	x	I	2.6	HV	0.0	E		1		8			MIT
2007 10 30.82		B	2.6	TK	3.0	O		8	10	8			SER
2007 10 30.82	x	B	2.6	HV	3.5	B		7	10	7			MIT
2007 10 30.83		S	2.5	HV	6.3	B		9	12	7			KAM01
2007 10 30.83		S	3.0	TJ	4.0	B		2		3/			BRU
2007 10 30.84		S	2.6	TI	0.0	E		1					LAB02
2007 10 30.85		S	2.2	TJ	0.7	E		1					PIL01
2007 10 30.85		S	3.0	AA	0.0	E		1					GOB01
2007 10 30.86		S	1.8	TI	0.0	E		1	15	s7			SCA02
2007 10 30.90		B	2.2	TK	0.7	E		1		7/			SKI
2007 10 30.91		B	2.2	TK	8.0	B		11	20	4			WAR01
2007 10 30.92		M	2.7	TJ	3.0	B		8	9	4			SHU
2007 10 30.98	x	B	2.7	TJ	0.0	E		1	&17	8			BOR
2007 10 31.00		B	2.4	TK	0.7	E		1		D8			MEY
2007 10 31.00		M	2.6	TK	5.0	B		10	10	7/			MEY
2007 10 31.07		B	2.3	YG	0.7	E		1	21	7			GRA04
2007 10 31.08		M	2.5	YG	5.0	B		7	25	D7			GRA04
2007 10 31.10		N	9.0	TK	10.0	R	6	25	21	D7			GRA04
2007 10 31.13		B	2.4	SC	0.0	E		1		8			HAL
2007 10 31.14		B	2.7	HV	0.0	E		1	8	7			BIV
2007 10 31.21		M	2.4	TJ	5.0	B		10					MOR
2007 10 31.21		S	2.3	TJ	0.7	E		1		8			MOR
2007 10 31.21		S	3.0	AA	0.0	E		1					GOB01
2007 10 31.22		B	2.5	AE	0.0	E		1					GRE
2007 10 31.43		I	2.5	AA	0.0	E		1					WHE01
2007 10 31.47		I	2.7	YG	0.0	E		1		8			YOS04
2007 10 31.47		S	2.4	YG	6.6	R		10	9	6			YOS04
2007 10 31.52	x	I	2.1	TT	0.0	E		1		9			TSU02
2007 10 31.57		I	2.4	YG	0.0	E		1	&10	8			NAG08
2007 10 31.60	x	B	2.6	HV	5.0	B		10	11	7			NAG04
2007 10 31.74		B	2.4	TT	3.5	B		7	24	D5			PAR03
2007 10 31.74		S	2.7	HI	0.0	E		1	25	7			TOT03
2007 10 31.74		S	3.1	TJ	4.0	B		2		3			BRU
2007 10 31.75		I	2.4	TT	0.0	E		1	&15	D7			PAR03
2007 10 31.75		S	1.9	TJ	0.7	E		1					PIL01
2007 10 31.76		B	2.5	TJ	0.0	E		1		9			CHE03

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 10 31.77		B	2.4	TT	0.8	E		1	15	7			KOU
2007 10 31.77		M	2.5	TT	6	L	6	25	18	6			KOU
2007 10 31.77		S	2.3	TK	5.0	B		20	12	9			DIE02
2007 10 31.78		I	2.3	TK	0.0	E		1	25	7			GON05
2007 10 31.79		B	2.4	TT	10.0	B		25	30	D5			PAR03
2007 10 31.79		M	2.5	TT	5	N		1	10	7/			HOR02
2007 10 31.79		S	2.6	HI	0.0	E		1	22	8			SZA
2007 10 31.79	G	M	2.5	TT	0.8	E		1	10	7/			HOR02
2007 10 31.80		B	2.4	TK	0.7	E		1		D8			MEY
2007 10 31.80		B	2.7	HV	0.0	E		1	10	7			BIV
2007 10 31.80		M	2.4	TT	8.0	B		10	35	4			HOR02
2007 10 31.80		S	2.4	HV	6.3	B		9	13	7			KAM01
2007 10 31.81		B	2.5	TJ	5.0	B		7	11	6			CHE03
2007 10 31.81		B	3.0	TJ	6.0	B		10	8	D5			RZE
2007 10 31.81		I	2.4	TK	0.8	E		1					HAS02
2007 10 31.81		M	2.5	TK	5.0	B		10	11	D7/			MEY
2007 10 31.81		M	2.8	TK	10.0	B		25	28	D6/			GON05
2007 10 31.81		S	2.0	TI	0.0	E		1	15	s7			SCA02
2007 10 31.81		S	3.0	AA	0.0	E		1					GOB01
2007 10 31.81	G	M	2.3	TI	0.8	E		1	8	7/			HOR03
2007 10 31.82		M	2.3	TI	5.0	B		10	30	5			HOR03
2007 10 31.85		I	2.6	TT	0.8	E		1		9			LEH
2007 10 31.86		B	2.3	GA	5.0	B		10	6	9			MOR09
2007 10 31.86	G	B	2.8	TK	0.0	E		1		9			SER
2007 10 31.88		I	2.4	TJ	0.0	E		1		8			PER01
2007 10 31.88	G	B	2.4	TJ	0.0	E		1		8			PER01
2007 10 31.90		I	2.7	S	0.0	E		1	15	6			MAR02
2007 10 31.90		M	2.5	TT	3.0	B		8	17	8			MAN02
2007 10 31.91		M	2.7	HI	5.0	B		7	12	6			NOV01
2007 10 31.92		B	2.4	TT	20.3	L	6	48	13	D5			PAR03
2007 10 31.93		M	2.6	TT	6	L	6	25	14	6			KOU
2007 10 31.94		B	2.3	TT	0.8	E		1	15	7			KOU
2007 10 31.97		B	2.4	TT	20.3	L	6	200	11	D5			PAR03
2007 11 01.04		B	2.1	YG	0.7	E		1		7			SKI
2007 11 01.05	x	B	2.7	TJ	0.0	E		1	&21	7			BOR
2007 11 01.07		B	2.6	HV	0.0	E		1	12	6			BIV
2007 11 01.08		M	2.3	YG	0.7	E		1	25	7			GRA04
2007 11 01.08		M	2.5	YG	5.0	B		7	30	6/			GRA04
2007 11 01.08		N	9.2	TK	15.2	L	5	29	30				GRA04
2007 11 01.08	s	S	3.3	YG	8.0	B		20	8	2			AMO01
2007 11 01.09	s	B	3.4	YG	5.0	B		7	7	4			AMO01
2007 11 01.15	s	I	2.5	YG	0.5	E		1					SOU01
2007 11 01.16	s	B	2.6	YG	3.0	B		8	8	6			SOU01
2007 11 01.16	s	M	2.8	YG	8.0	B		11	12	7			SOU01
2007 11 01.21		M	2.4	TJ	5.0	B		10					MOR
2007 11 01.21		S	2.5	TJ	0.7	E		1		8			MOR
2007 11 01.22		B	2.5	AE	0.0	E		1					GRE
2007 11 01.45		I	2.5	AA	0.0	E		1					WHE01
2007 11 01.69		M	2.7	HI	0.5	E		1		8			NOV01
2007 11 01.70	G	M	2.5	TI	0.8	E		1	8	7/			HOR03
2007 11 01.71		M	2.4	TI	5.0	B		10	20	5			HOR03
2007 11 01.75		I	2.6	TT	0.8	E		1		9			LEH
2007 11 01.75		S	2.3	HI	0.0	E		1	30	S7			SAN07
2007 11 01.76		B	2.2	TK	0.0	E		1		8			KAR02
2007 11 01.76		B	2.6	TT	0.8	E		1	15	6/			KOU
2007 11 01.77		M	2.8	TT	6	L	6	25	22	6			KOU
2007 11 01.79		I	2.3	TK	0.0	E		1	25	7			GON05
2007 11 01.80	x	I	2.8	HV	0.0	E		1		8			YOS02
2007 11 01.80	x	M	2.6	HV	3.5	B		7	20	6			YOS02
2007 11 01.83		M	2.8	TK	10.0	B		25	30	D6/			GON05
2007 11 01.83		S	3.0	AA	5.0	B		10	10	5			ZAJ
2007 11 01.84		B	2.5	TI	0.0	E		1					LAB02
2007 11 01.85		M	3.0	TK	20.3	T	10	77	33	D6	0.6	210	GON05
2007 11 01.85		S	2.1	TI	0.0	E		1	15	s7			SCA02
2007 11 01.86		I	2.5	TK	0.8	E		1					HAS02

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 01.87		B	2.7	TT	0.8	E		1	15	6/			KOU
2007 11 01.90		S	2.5	HV	6.3	B		9	16	7			KAM01
2007 11 01.90		S	3.0	AA	0.0	E		1					GOB01
2007 11 01.92		M	2.4	S	2.0	B		4	19	6			MAR02
2007 11 01.93		B	2.9	TT	0.8	E		1	15	6/			KOU
2007 11 01.94		M	2.8	TT	6	L	6	25	20	5/			KOU
2007 11 01.94		M	3.1	TT	11.4	L	4	25	18	4/			KOU
2007 11 01.96		I	2.4	TJ	0.0	E		1		7			PER01
2007 11 01.96	G	B	2.4	TJ	0.0	E		1		7			PER01
2007 11 01.97	G	M	2.4	TI	0.8	E		1	10	7			HOR03
2007 11 01.98	x	B	2.7	TJ	0.0	E		1	21	7			BOR
2007 11 02.09		M	2.3	YG	0.7	E		1	30	7			GRA04
2007 11 02.09		M	2.5	YG	5.0	B		7	35	6			GRA04
2007 11 02.17		B	2.3	SC	0.0	E		1		8			HAL
2007 11 02.17		B	2.5	AE	0.0	E		1					GRE
2007 11 02.17	G	B	2.8	TK	0.0	E		1		9			SER
2007 11 02.41	x	B	2.6	TJ	0.0	E		1	22	7			BOR
2007 11 02.51	x	I	2.9	HV	0.0	E		1		8/			YOS02
2007 11 02.51	x	M	2.6	HV	3.5	B		7	32	6			YOS02
2007 11 02.60	x	B	2.7	HV	5.0	B		10	16	6/			NAG04
2007 11 02.63	x	I	2.6	TT	0.0	E		1					TSU02
2007 11 02.64	G	M	2.7	TJ	0.0	E		1	10	5/			SHU
2007 11 02.67		B	2.4	TJ	0.0	E		1		8			CHE03
2007 11 02.68		B	2.6	HD	0.0	E		1	10	6			NEV
2007 11 02.68		B	2.6	TJ	5.0	B		7	14	6			CHE03
2007 11 02.73		M	2.7	TJ	3.0	B		8	20	6/			SHU
2007 11 02.76		B	2.4	TT	25.4	S	4	41	36	D5			PAR03
2007 11 02.81		B	2.6	TJ	6.0	B		10	15	D5			RZE
2007 11 02.82		I	2.6	TK	0.8	E		1					HAS02
2007 11 02.82		S	2.9	TJ	4.0	B		2		3			BRU
2007 11 02.83		I	2.4	TT	0.0	E		1	&15	D6			PAR03
2007 11 02.83		S	1.9	TI	0.0	E		1	20	s7			SCA02
2007 11 02.90		S	2.9	AA	0.0	E		1					GOB01
2007 11 02.96		I	2.5	TJ	0.0	E		1		7/			PER01
2007 11 02.96	G	B	2.5	TJ	0.0	E		1		7/			PER01
2007 11 02.96	G	B	2.9	TK	0.0	E		1		9			SER
2007 11 02.99		B	2.6	S	0.0	E		1	22	6			MAR02
2007 11 03.26		M	2.5	TJ	5.0	B		10					MOR
2007 11 03.26		S	2.6	TJ	0.7	E		1		8			MOR
2007 11 03.46	x	S	2.4	HV	3.2	B		7	13	4/			MIY01
2007 11 03.48		B	2.1	YG	0.0	E		1	20	8			YOS04
2007 11 03.48		S	2.4	YG	7.0	R		10	36	D0			YOS04
2007 11 03.49		I	2.8	AA	0.0	E		1		6/			KAN
2007 11 03.49	x	M	2.6	HV	3.5	B		7	30	6			YOS02
2007 11 03.54	x	I	2.9	HV	0.0	E		1		7			YOS02
2007 11 03.60		M	2.7	YG	3.5	B		7	20	7			NAG08
2007 11 03.62	x	B	2.7	HV	5.0	B		10	18	6/			NAG04
2007 11 03.62	x	M	2.5	HV	3.5	B		7	15	6			MIT
2007 11 03.72	x	I	2.8	TT	0.0	E		1					TSU02
2007 11 03.74		B	2.5	TK	0.0	E		1		7			KAR02
2007 11 03.74		S	2.0	TI	0.0	E		1	20	s7			SCA02
2007 11 03.75		S	3.1	AA	5.0	B		10	15	4			ZAJ
2007 11 03.77		S	2.5	HI	0.0	E		1	15	S6			SAN07
2007 11 03.78		I	2.3	TK	0.0	E		1	30	7			GON05
2007 11 03.81		I	2.6	YG	0.0	E		1	&20	8			NAG08
2007 11 03.81		M	2.8	TK	10.0	B		25	35	D6			GON05
2007 11 03.82		I	2.6	TK	0.0	E		1	12	7			GIL01
2007 11 03.82		M	3.1	TK	20.3	T	10	77	34	D6	0.9	210	GON05
2007 11 03.83		I	2.4	TK	0.0	E		1		8			BUS01
2007 11 03.83		S	2.3	TK	4.4	B		7	&15	5/			BUS01
2007 11 03.84		I	2.3	TK	0.0	E		1	&13	7			RIE
2007 11 03.84		S	2.2	TK	4.0	B		8	16	6/			RIE
2007 11 03.87		B	2.5	TK	0.0	E		1					BOU
2007 11 03.87		B	2.8	TK	5.0	B		7	16	D3			BOU
2007 11 03.87		I	2.6	TJ	0.0	E		1		8			GIA01

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 03.87		M	2.4	TK	5.0	B		7	15	8/			DIJ
2007 11 03.88		B	2.7	TI	0.0	E		1					LAB02
2007 11 03.88		I	2.7	TK	0.0	E		1		9			DIJ
2007 11 03.91		M	2.6	HI	0.5	E		1		7			NOV01
2007 11 03.91	G	M	2.5	TI	0.8	E		1	20	6			HOR03
2007 11 03.91	G	M	2.6	TT	0.8	E		1	15	6			HOR02
2007 11 03.92		B	2.1	YG	0.7	E		1		6/			SKI
2007 11 03.92		M	2.6	TT	5	N		1	15	6			HOR02
2007 11 03.92		S	2.2	TK	5.0	B		10	32	6			ZAN01
2007 11 03.94		I	2.5	TK	0.0	E		1	&20	7			SCH04
2007 11 03.95		M	2.3	YG	0.7	E		1	&30	6/			GRA04
2007 11 03.99		B	2.6	S	0.0	E		1	20	6			MAR02
2007 11 04.01	G	B	2.6	TJ	0.0	E		1		6			PER01
2007 11 04.09					41	L	5	57	16.3	6	0.4	222	BOR
2007 11 04.09	x	B	2.8	TJ	0.0	E		1	36	6			BOR
2007 11 04.12		I	2.4	TT	0.0	E		1	&15	D7			PAR03
2007 11 04.13		B	2.4	TT	10.0	B		25	39	D5			PAR03
2007 11 04.16		I	2.7	AA	0.0	E		1					WHE01
2007 11 04.20		B	2.6	HV	0.0	E		1	30	7			CRE01
2007 11 04.21		B	2.5	SC	0.0	E		1		8			HAL
2007 11 04.23		B	2.6	AE	0.0	E		1					GRE
2007 11 04.25		S	3.2	AA	0.0	E		1					GOB01
2007 11 04.42	x	B	2.6	TJ	5.0	R	4	1					BOR
2007 11 04.42	x	B	2.7	TJ	0.0	E		1	36	7			BOR
2007 11 04.50		I	3.0	YG	0.0	E		1		8			YOS04
2007 11 04.50		S	2.5	YG	6.6	R		10	15	5			YOS04
2007 11 04.64		M	2.7	HI	0.5	E		1		8			NOV01
2007 11 04.73		S	2.2	TI	0.0	E		1	25	s6			SCA02
2007 11 04.74		M	2.5	TT	3.0	B		8	22	7			MAN02
2007 11 04.76	G	M	3.2	TK	0.8	E		1	15	7			URB01
2007 11 04.77		S	3.1	HI	10.0	B		25	14	5			VAS06
2007 11 04.77		S	3.3	AA	5.0	B		10	15	4			ZAJ
2007 11 04.79		M	2.6	TT	5	N		1	15	5/			HOR02
2007 11 04.79	G	M	2.6	TT	0.8	E		1	20	6			HOR02
2007 11 04.82		B	2.8	TT	0.8	E		1	20	3/			KOU
2007 11 04.83	G	M	2.6	TI	0.8	E		1	15	6/			HOR03
2007 11 04.84		S	2.5	HD	0.0	E		1	11	6			NEV
2007 11 04.89		M	3.0	TT	6	L	6	25	20	3			KOU
2007 11 04.90		M	2.7	TK	0.0	E		1	&20	7/			COM
2007 11 04.92		S	2.8	HV	0.0	E		1	15	6			BIV
2007 11 05.01		I	2.5	TJ	0.0	E		1		6			PER01
2007 11 05.01	G	B	2.6	TJ	0.0	E		1		6			PER01
2007 11 05.11		B	2.7	TJ	0.0	E		1		8			CHE03
2007 11 05.14		S	2.7	HV	0.0	E		1	15	6			BIV
2007 11 05.18		B	2.8	TJ	5.0	B		7	18	6			CHE03
2007 11 05.22		S	3.3	AA	0.0	E		1					GOB01
2007 11 05.26		B	2.6	AE	0.0	E		1					GRE
2007 11 05.32					7.0	B		15	20	5	0.7	231	BOR
2007 11 05.32	x	B	2.7	TJ	0.0	E		1	&40	6			BOR
2007 11 05.49		I	3.0	AA	0.0	E		1					WHE01
2007 11 05.65		M	2.5	HI	5.0	B		7	19	5/			NOV01
2007 11 05.67	G	B	2.9	TK	0.0	E		1		9			SER
2007 11 05.68		B	3.1	TK	3.0	O		8	22	8			SER
2007 11 05.69		I	2.6	TJ	0.0	E		1	20	7			XU
2007 11 05.70		M	2.4	TJ	5.0	B		15	31	6			XU
2007 11 05.72		S	2.4	TT	3.0	B		8	29	8			MAN02
2007 11 05.74	G	M	2.7	TT	0.8	E		1	20	5/			HOR02
2007 11 05.75		B	2.7	TT	0.8	E		1	10	8			LEH
2007 11 05.75		M	2.7	TT	5	N		1	20	5/			HOR02
2007 11 05.75		S	3.5	AA	5.0	B		10	20	3			ZAJ
2007 11 05.77		S	2.6	HD	0.0	E		1	12	5			NEV
2007 11 05.79		B	2.9	TT	0.8	E		1	15	3			KOU
2007 11 05.80		M	2.4	TI	8.0	B		10	30	5			HOR03
2007 11 05.80		M	3.2	TT	6	L	6	25	18	3			KOU
2007 11 05.81		B	2.6	TJ	6.0	B		10	16	D6			RZE

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 05.81		B	2.7	HV	0.7	E		1					KAM01
2007 11 05.81		B	2.8	TK	0.8	E		1					HAS02
2007 11 05.81		I	3.1	TK	0.8	E		1					HAS02
2007 11 05.81		S	2.7	HI	0.0	E		1	20	S6/			SAN07
2007 11 05.81	G	M	2.6	TI	0.8	E		1	15	6/			HOR03
2007 11 05.84		S	2.9	HI	5.0	B		10	35	5			SOM
2007 11 05.85		B	2.6	TI	0.0	E		1					LAB02
2007 11 05.86		B	2.5	TJ	0.0	E		1		8			CHE03
2007 11 05.87		B	2.6	TJ	5.0	B		7	20	6			CHE03
2007 11 05.87		I	2.6	TJ	0.0	E		1	10	8			GIA01
2007 11 05.92		S	2.7	TK	5.0	B		10	24	6			ZAN01
2007 11 05.93		S	3.1	AA	0.0	E		1					GOB01
2007 11 05.94		S	2.3	TK	3.0	B		3	&18	6			BUS01
2007 11 05.94		S	2.4	TK	4.4	B		7	&18	5			BUS01
2007 11 05.95		I	2.4	TK	0.0	E		1		8			BUS01
2007 11 05.98	x	B	2.8	TJ	0.0	E		1					BOR
2007 11 06.01		B	2.7	TK	0.0	E		1		5/			BOU
2007 11 06.01		I	2.5	TK	0.0	E		1	&25	6/			SCH04
2007 11 06.01		M	2.6	TK	5.0	B		7	16	D4			BOU
2007 11 06.06		I	2.6	TK	0.0	E		1		9			DIJ
2007 11 06.06		M	2.4	TK	5.0	B		7	17	9			DIJ
2007 11 06.07		B	2.6	GA	12.6	T		10	14	8			MOR09
2007 11 06.07		I	2.6	TJ	0.0	E		1	&25	6			PER01
2007 11 06.07	G	B	2.4	TJ	0.0	E		1	&25	6			PER01
2007 11 06.09		B	2.7	AE	0.0	E		1					GRE
2007 11 06.14		S	2.5	TK	5.0	B		20	21	6			DIE02
2007 11 06.16		M	2.7	TJ	5.0	B		10	21	4			MOR
2007 11 06.20		S	2.8	HV	0.0	E		1	15	6			BIV
2007 11 06.23		S	2.9	HV	0.0	E		1	15	6			BIV
2007 11 06.49		I	3.0	AA	0.0	E		1					WHE01
2007 11 06.65		M	2.8	TJ	3.0	B		8	23	2/			SHU
2007 11 06.65	G	M	2.6	TJ	0.0	E		1	14	3/			SHU
2007 11 06.72		S	2.4	TJ	0.7	E		1					PIL01
2007 11 06.73		B	2.6	TK	0.7	E		1		6/			MEY
2007 11 06.73		B	2.8	TT	0.8	E		1	10	8			LEH
2007 11 06.75		S	2.4	TK	4.4	B		7	&20	5			BUS01
2007 11 06.75	G	M	3.2	TK	0.8	E		1	15	4			URB01
2007 11 06.77		I	2.5	TK	0.0	E		1	&20	7			GIL01
2007 11 06.78		I	2.5	TK	0.0	E		1	&20	6/			RIE
2007 11 06.78		S	2.6	TK	5.0	B		20	21	6			DIE02
2007 11 06.78		S	2.6	TK	5.0	B		20	21	6			DIE02
2007 11 06.79		M	2.5	TK	5.0	B		7	16	8			DIJ
2007 11 06.79		S	2.4	TK	3.0	B		4	22	6			RIE
2007 11 06.79		S	2.8	HD	0.0	E		1	14	5			NEV
2007 11 06.80		I	2.6	TK	0.0	E		1		9			DIJ
2007 11 06.82	x	S	2.8	HV	3.2	B		7	15	4/			MIY01
2007 11 06.83		B	2.6	TK	0.0	E		1		7			KAR02
2007 11 06.85		S	2.6	TK	5.0	B		10	24	6			ZAN01
2007 11 06.89		B	2.7	HV	0.7	E		1					KAM01
2007 11 06.91		B	3.0	TK	0.8	E		1					HAS02
2007 11 06.91		I	3.2	TK	0.8	E		1					HAS02
2007 11 06.94		S	2.9	HV	0.0	E		1	15	6			BIV
2007 11 07.02	G	M	2.7	TT	0.8	E		1	20	5/			HOR02
2007 11 07.05					41	L	5	57	16.3	5/	?	205	BOR
2007 11 07.05	x	B	2.8	TJ	5.0	N	4	1	27	6			BOR
2007 11 07.05	x	B	3.0	TJ	0.0	E		1	32	6			BOR
2007 11 07.07		M	2.8	TJ	3.0	B		8	21	2/			SHU
2007 11 07.07	G	M	2.9	TJ	0.0	E		1	15	3			SHU
2007 11 07.07	s	S	3.6	YG	8.0	B		20	9	1			AMO01
2007 11 07.08		I	2.7	TJ	0.0	E		1	&20	5/			PER01
2007 11 07.08	G	B	2.7	TJ	0.0	E		1	&20	5/			PER01
2007 11 07.08	s	S	2.6	YG	5.0	B		7	13	2			AMO01
2007 11 07.16		S	3.2	HI	10.0	B		25	15	5			VAS06
2007 11 07.18		B	3.1	SC	0.0	E		1		8			HAL
2007 11 07.19		B	2.6	AE	0.0	E		1					GRE

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 07.20		I	2.5	TK	0.0	E		1	&20	6			GIL01
2007 11 07.25		S	3.3	AA	0.0	E		1					GOB01
2007 11 07.41	x	B	2.9	TJ	0.0	E		1	36	6			BOR
2007 11 07.41	x	B	2.9	TJ	5.0	N	4	1	24	6/			BOR
2007 11 07.45		B	2.9	AA	3.5	B		7	21	5			KAN
2007 11 07.48		I	3.0	AA	0.0	E		1		6			KAN
2007 11 07.49		B	3.0	AA	2.5	B		10					WHE01
2007 11 07.49		I	3.0	YG	0.0	E		1	24	7/			YOS04
2007 11 07.49		S	2.4	YG	6.6	R		10	22	6			YOS04
2007 11 07.49	G	B	3.0	AA	0.0	E		1					WHE01
2007 11 07.50		I	2.8	YG	0.0	E		1	&25	7/			NAG08
2007 11 07.50		M	2.6	YG	3.5	B		7	23	6			NAG08
2007 11 07.52		I	3.0	AA	0.0	E		1		5/			KAN
2007 11 07.53	x	I	2.8	HV	0.0	E		1	23	4			MIY01
2007 11 07.53	x	S	2.8	HV	3.2	B		7	20	4/			MIY01
2007 11 07.55		I	3.0	AA	0.0	E		1	39	6			KAN
2007 11 07.56	x	M	2.7	HV	3.5	B		7	20	6			MIT
2007 11 07.57	x	S	2.6	HV	0.0	E		1	30	6			MIT
2007 11 07.67	x	I	2.8	TT	0.0	E		1					TSU02
2007 11 07.70	x	B	2.6	HV	0.0	E		1		7			YOS02
2007 11 07.70	x	B	2.7	HV	5.0	B		10	20	5/			NAG04
2007 11 07.71		S	2.4	AA	11	L	7	54	25	5			IVA03
2007 11 07.71		S	2.5	AA	3.0	R	6	6	25	5			IVA03
2007 11 07.71	x	M	2.4	HV	3.5	B		7	34	5			YOS02
2007 11 07.77		S	2.7	AA	0.0	E		1	15	5			IVA03
2007 11 07.79		I	2.6	TK	0.0	E		1		9			DIJ
2007 11 07.80		B	2.4	TK	0.0	E		1	25	7			GON05
2007 11 07.81		I	2.6	TK	0.0	E		1	&20	6/			RIE
2007 11 07.81		S	2.6	TJ	0.7	E		1					PIL01
2007 11 07.82		M	3.0	TK	10.0	B		25	55	D6	1.7	210	GON05
2007 11 07.82		S	2.4	TI	0.0	E		1	30	s6			SCA02
2007 11 07.82		S	2.4	TK	3.0	B		4	22	6			RIE
2007 11 07.89		S	3.1	AA	0.0	E		1					GOB01
2007 11 07.92		B	2.8	TI	0.0	E		1					LAB02
2007 11 07.93		S	2.4	TK	4.4	B		7	&21	4/			BUS01
2007 11 07.94		I	2.5	TK	0.0	E		1		7/			BUS01
2007 11 07.94		S	2.4	TK	3.0	B		3	&21	5/			BUS01
2007 11 07.96		B	2.8	TK	5.0	B		7	15	6			QVA
2007 11 08.02		I	2.5	TK	0.0	E		1	&25	6/			SCH04
2007 11 08.04		M	2.5	YG	0.7	E		1	20	6			GRA04
2007 11 08.10		I	2.7	TJ	0.0	E		1	&20	5			PER01
2007 11 08.10	G	B	2.7	TJ	0.0	E		1	&20	5			PER01
2007 11 08.13	x	B	2.9	TJ	0.0	E		1	37	5/			BOR
2007 11 08.13	x	B	2.9	TJ	5.0	N	4	1	33	6			BOR
2007 11 08.14		B	2.7	AE	0.0	E		1					GRE
2007 11 08.14		M	2.7	TJ	5.0	B		10	22	D4			MOR
2007 11 08.57	x	M	2.7	HV	3.5	B		7	24	5			MIT
2007 11 08.64		I	3.0	AA	0.0	E		1	34	6			KAN
2007 11 08.65		B	2.9	AA	3.5	B		7	25	6			KAN
2007 11 08.67	x	B	2.6	HV	0.0	E		1		7			YOS02
2007 11 08.70		I	2.9	YG	0.0	E		1	24	7			YOS04
2007 11 08.70		S	2.5	YG	6.6	R		10	24	5			YOS04
2007 11 08.78		S	2.6	TK	5.0	B		20	21	6			DIE02
2007 11 08.78		S	2.6	TK	5.0	B		20	21	6			DIE02
2007 11 08.79		M	2.7	YG	3.5	B		7	23	5			NAG08
2007 11 08.81	x	I	2.9	HV	0.0	E		1	23	4			MIY01
2007 11 08.81	x	S	2.8	HV	3.2	B		7	20	4			MIY01
2007 11 08.82		S	2.9	HV	0.0	E		1	15	5			BIV
2007 11 08.85		S	3.4	AA	5.0	B		10	30	3			ZAJ
2007 11 08.86		S	2.9	AA	0.0	E		1	30	5/			NAG09
2007 11 08.88		B	2.9	TK	0.8	E		1					HAS02
2007 11 08.88		I	3.3	TK	0.8	E		1					HAS02
2007 11 08.91		I	2.7	TK	0.0	E		1	21	8/			DIJ
2007 11 08.91		S	2.4	TK	4.4	B		7	&22	4/			BUS01
2007 11 08.92		I	2.6	TK	0.0	E		1		7/			BUS01

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 08.92		S	2.4	TK	3.0	B		3	&21	5/			BUS01
2007 11 08.96		M	2.5	TK	5.0	B		7	19	8/			DIJ
2007 11 08.97		S	3.2	TK	5.0	B		10	32	6			ZAN01
2007 11 09.00		S	2.9	HV	0.0	E		1	20	5			BIV
2007 11 09.02		B	2.8	TK	0.0	E		1		5			BOU
2007 11 09.07		I	2.7	TK	0.0	E		1		6/			SCH04
2007 11 09.16		I	2.9	TJ	0.0	E		1	&22	4			PER01
2007 11 09.16	G	B	2.9	TJ	0.0	E		1	&22	4			PER01
2007 11 09.19		B	3.0	SC	0.0	E		1		7/			HAL
2007 11 09.49	G	B	3.0	AA	0.0	E		1					WHE01
2007 11 09.58	x	M	2.7	HV	3.5	B		7	35	5			YOS02
2007 11 09.59	x	B	2.7	HV	0.0	E		1		7			YOS02
2007 11 09.76		B	2.7	TK	0.7	E		1	35	6			MEY
2007 11 09.77		B	2.9	GA	8.0	B		10	26	8			MOR09
2007 11 09.77		S	2.6	TI	0.0	E		1	20	s6			SCA02
2007 11 09.81		I	2.8	TK	0.0	E		1	20	8			DIJ
2007 11 09.81		M	2.6	TK	5.0	B		7	19	8			DIJ
2007 11 09.83		I	2.7	TK	0.0	E		1	&23	6/			SCH04
2007 11 09.84		S	3.2	TK	5.0	B		10	32	6			ZAN01
2007 11 09.88		B	3.4:	TJ	6.0	B		10	&23	d6/			RZE
2007 11 09.89		S	3.0	HV	0.0	E		1	20	6			BIV
2007 11 09.95		M	3.0	TK	10.0	B		25	55	D6	2.2	190	GON05
2007 11 09.98					7.0	B		10	24	5	1.0	210	GRA04
2007 11 09.98		M	2.6	YG	0.7	E		1	25	6			GRA04
2007 11 10.00		B	2.4	TK	0.0	E		1	25	7			GON05
2007 11 10.01		B	2.6	YG	0.7	E		1		6			SKI
2007 11 10.10		B	2.8	TJ	2.2	R	11	5	&26	3/			PER01
2007 11 10.10		I	2.8	TJ	0.0	E		1	&22	4			PER01
2007 11 10.10		M	2.8	TJ	2.2	R	11	5	&26	3/			PER01
2007 11 10.10		S	2.4	TJ	2.2	R	11	5	&26	3/			PER01
2007 11 10.10	G	B	2.9	TJ	0.0	E		1	&22	4			PER01
2007 11 10.44		M	2.6	TJ	5.0	B		10	24	D3			MOR
2007 11 10.44		S	2.6	TJ	0.7	E		10	35	D7			MOR
2007 11 10.55		S	2.8	AA	0.0	E		1	30				SEA
2007 11 10.70		B	2.6	TT	3.5	B		7	30	D5			PAR03
2007 11 10.72		B	2.7	TT	10.0	B		25	40	D5			PAR03
2007 11 10.72		B	2.8	TT	0.8	E		1	20	8			LEH
2007 11 10.73		I	2.7	TT	0.0	E		1	36	D6			PAR03
2007 11 10.73		M	2.7	TK	5.0	B		7	24	5			BOU
2007 11 10.73		S	2.4	TK	3.0	B		3	&24	5/			BUS01
2007 11 10.73		S	2.5	TK	4.4	B		7	&25	4/			BUS01
2007 11 10.75		S	3.0	AA	0.0	E		1	60	6			NAG09
2007 11 10.75		S	3.3	AA	5.0	B		10	40	2			ZAJ
2007 11 10.78		S	2.6	TK	5.0	B		20	24	5			DIE02
2007 11 10.78		S	2.6	TK	5.0	B		20	24	5			DIE02
2007 11 10.80		M	2.8	TJ	5.0	B		15	22	5			XU
2007 11 10.81		S	3.2	TT	3.0	B		8	33	8			MAN02
2007 11 10.83		S	2.7	AA	3.0	R	6	6	30	5			IVA03
2007 11 10.83		S	3.0	AA	0.0	E		1	10	5			IVA03
2007 11 10.84		B	3.1	TT	0.8	E		1	20	2			KOU
2007 11 10.86		B	3.3	TJ	6.0	B		10	26	d6			RZE
2007 11 10.86		M	2.9	TJ	10.0	R	7	28	21	4/			XU
2007 11 10.87					5.0	B		7	&50	5	1.0	200	GRA04
2007 11 10.87		M	2.6	YG	0.7	E		1	25	6			GRA04
2007 11 10.89		B	2.5	S	2.0	B		4	25	3			MAR02
2007 11 10.91		B	2.7	TK	0.0	E		1	30	6			KAR02
2007 11 10.95		B	2.8	TI	0.0	E		1					LAB02
2007 11 10.95		B	3.0	TI	8.0	B		11	30	5	60 m		LAB02
2007 11 10.97		M	3.3	TT	6	L	6	25	24	2			KOU
2007 11 10.98	G	M	2.7	TT	0.8	E		1	25	5			HOR02
2007 11 10.99		M	2.7	TT	5	N		1	25	5			HOR02
2007 11 11.05	x	B	2.9	TJ	5.0	N	4	1	39	5			BOR
2007 11 11.05	x	B	3.0	TJ	0.0	E		1	42	5/			BOR
2007 11 11.08		B	2.8	AC	0.0	E		1					NOW
2007 11 11.14		I	3.2	YG	0.5	E		1					SOU01

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 11.14		S	2.9	YG	4.0	O		3	25	3			SOU01
2007 11 11.15		B	2.9	TJ	2.2	R	11	5	&27	3/			PER01
2007 11 11.15		I	2.8	TJ	0.0	E		1	&25	4			PER01
2007 11 11.15		M	2.9	TJ	2.2	R	11	5	&27	3/			PER01
2007 11 11.15		S	2.4	TJ	2.2	R	11	5	&27	3/			PER01
2007 11 11.15		S	3.2	YG	3.0	B		8	25	4			SOU01
2007 11 11.15		S	3.2	YG	8.0	B		11	30	5	20 m	190	SOU01
2007 11 11.15	G	B	3.0	TJ	0.0	E		1	&25	4			PER01
2007 11 11.21		B	2.7	AE	0.0	E		1					GRE
2007 11 11.47		I	2.7	YG	0.0	E		1	&25	7/			NAG08
2007 11 11.47		M	2.8	YG	3.5	B		7	25	5			NAG08
2007 11 11.49		I	3.0	AA	0.0	E		1	45	5			KAN
2007 11 11.50	x	B	2.8	HV	0.0	E		1		5/			MIT
2007 11 11.50	x	M	2.8	HV	3.5	B		7	25	5			MIT
2007 11 11.51		B	3.0	AA	3.5	B		7	29	5	0.5		KAN
2007 11 11.51		S	2.9	AA	3.5	B		7	29	5	0.5		KAN
2007 11 11.57		S	2.4	AA	0.0	E		1					SEA
2007 11 11.61		S	3.2	AA	0.0	E		1	10	4			IVA03
2007 11 11.65		S	3.0	AA	3.0	R	6	6	30	5			IVA03
2007 11 11.67		B	3.0	AA	3.5	B		7	26	5	0.5	200	KAN
2007 11 11.69		B	2.7	YG	0.0	E		1	33	7			YOS04
2007 11 11.69		S	2.6	YG	6.6	R		10	30	5/			YOS04
2007 11 11.72		M	2.8	YG	0.7	E		1	25	6			GRA04
2007 11 11.73		M	2.6	TK	5.0	B		7	25	4/			BOU
2007 11 11.74		I	2.9	TK	0.0	E		1	30	8			DIJ
2007 11 11.74		M	2.6	TK	5.0	B		7	26	6			DIJ
2007 11 11.74		M	2.7	TT	5	N		1	25	5			HOR02
2007 11 11.74		S	2.5	TI	0.0	E		1	30	s6			SCA02
2007 11 11.74		S	3.5	TK	5.0	B		10	32	3			ZAN01
2007 11 11.74	G	M	2.8	TT	0.8	E		1	30	4/			HOR02
2007 11 11.75		S	2.5	TK	4.4	B		7	&26	4/			BUS01
2007 11 11.75		S	3.6	AA	5.0	B		10	40	2			ZAJ
2007 11 11.78		S	2.9	TJ	0.7	E		1					PIL01
2007 11 11.79		S	2.6	TK	0.0	E		1	&22	6			GIL01
2007 11 11.79		S	2.7	TK	5.0	B		20	24	5			DIE02
2007 11 11.79		S	2.7	TK	5.0	B		20	24	5			DIE02
2007 11 11.80		I	2.6	TK	0.0	E		1	&30	6			RIE
2007 11 11.80		S	2.5	TK	3.0	B		4	24	5/			RIE
2007 11 11.81		B	2.6	TT	3.5	B		7	30	d5			PAR03
2007 11 11.81		I	2.6	TK	0.0	E		1	&30	5			SCH04
2007 11 11.83		B	2.6	TT	10.0	B		25	33	d5	0.55	202	PAR03
2007 11 11.83		I	2.6	TK	0.0	E		1		7			BUS01
2007 11 11.83		S	2.4	TK	3.0	B		3	&26	5			BUS01
2007 11 11.83	x	I	2.8	HV	0.0	E		1	24	4			MIY01
2007 11 11.83	x	S	2.8	HV	3.2	B		7	24	4			MIY01
2007 11 11.84		B	2.9	GA	8.0	B		10	26	8			MOR09
2007 11 11.85		B	3.3	TJ	6.0	B		10	&23	d6			RZE
2007 11 11.88		M	2.8	TT	0.8	E		1	20	7			LEH
2007 11 11.89		S	3.0	HV	0.0	E		1	25	5			BIV
2007 11 11.93					41	L	5	57	24	5/		211	BOR
2007 11 11.93	x	B	2.9	TJ	5.0	N	4	1	33	5			BOR
2007 11 11.93	x	B	3.0	TJ	0.0	E		1					BOR
2007 11 11.93	x	S	2.9	TJ	0.0	E		1	&45	5			BOR
2007 11 11.94		B	2.8	HV	0.7	E		1					KAM01
2007 11 12.08		B	3.0	AC	0.0	E		1					NOW
2007 11 12.13		B	2.8	AE	0.0	E		1					GRE
2007 11 12.21		B	3.0	SC	0.0	E		1		7			HAL
2007 11 12.21		S	2.5	TK	0.0	E		1	&24	6			GIL01
2007 11 12.46	x	B	2.8	HV	0.0	E		1		6			YOS02
2007 11 12.55		S	2.6	AA	0.0	E		1					SEA
2007 11 12.55	x	M	2.8	HV	3.5	B		7	28	5			MIT
2007 11 12.56	x	B	2.8	HV	0.0	E		1	35	6			MIT
2007 11 12.56	x	M	2.8	HV	3.5	B		7	35	4			YOS02
2007 11 12.63		B	2.6	YG	0.0	E		1	32	6/			YOS04
2007 11 12.63		S	2.8	YG	6.6	R		10	30	5			YOS04

Comet 17P/Holmes· [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 12.66		I	2.8	YG	0.0	E		1	&30	6			NAG08
2007 11 12.66		M	2.9	YG	3.5	B		7	30	5			NAG08
2007 11 12.73		B	3.2	TK	0.8	E		1					HAS02
2007 11 12.74		I	3.2	AA	0.0	E		1	52	5			KAN
2007 11 12.78		I	2.6	TK	0.0	E		1	&35	5			SCH04
2007 11 12.81		B	2.7	TK	0.7	E		1	35	5			MEY
2007 11 12.82		S	2.7	HI	0.0	E		1	35	4			SZA
2007 11 12.82		S	3.5	TK	5.0	B		10	48	4			ZAN01
2007 11 12.86		I	2.6	TK	0.0	E		1	&30	6			RIE
2007 11 12.86		S	2.5	TK	3.0	B		4	26	5			RIE
2007 11 12.87	G	M	3.3	TI	0.8	E		1	20	4			HOR03
2007 11 12.88		I	2.8	TK	0.0	E		1	30	8			DIJ
2007 11 12.88		M	2.5	TK	5.0	B		7	26	6			DIJ
2007 11 12.88		M	3.2	TI	5.0	B		10	30	5/			HOR03
2007 11 12.94		M	2.7	TK	5.0	B		7	26	4/			BOU
2007 11 12.97		B	2.7	YG	0.7	E		1		5/			SKI
2007 11 12.97		B	2.8	HV	0.7	E		1					KAM01
2007 11 13.04		M	2.7	YG	0.7	E		1	30	5			GRA04
2007 11 13.20		S	2.6	TK	0.0	E		1	&26	5			GIL01
2007 11 13.22		M	2.6	TJ	5.0	B		10	29	D3			MOR
2007 11 13.23		S	3.6	AA	0.0	E		1					GOB01
2007 11 13.49		I	3.1	AA	0.0	E		1	69	4			KAN
2007 11 13.49	G	B	2.9	AA	0.0	E		1					WHE01
2007 11 13.51		I	2.8	YG	0.0	E		1	&30	6			NAG08
2007 11 13.53	x	B	2.9	HV	0.0	E		1	35	6			MIT
2007 11 13.53	x	M	2.9	HV	3.5	B		7	30	5			MIT
2007 11 13.62		B	2.9	YG	0.0	E		1	30	6/			YOS04
2007 11 13.62		S	3.0	YG	6.6	R		10	30	5/			YOS04
2007 11 13.63		M	3.2	HI	5.0	B		7	31	5			NOV01
2007 11 13.64		S	3.5	AA	0.0	E		1	15	4			IVA03
2007 11 13.69		S	2.8	HI	0.0	E		1	25	4			SZA
2007 11 13.75		S	2.7	HI	0.0	E		1	30	2/			SAN07
2007 11 13.77		B	3.1	GA	8.0	B		10	24	8			MOR09
2007 11 13.77		S	2.5	TI	0.0	E		1	40	s6			SCA02
2007 11 13.79		S	2.9	TT	3.0	B		8	38	8			MAN02
2007 11 13.80		S	3.6	AA	5.0	B		10	40	2			ZAJ
2007 11 13.91		I	2.7	TK	0.0	E		1	30	8			DIJ
2007 11 13.94		M	2.4	TK	5.0	B		7	27	6/			DIJ
2007 11 13.94		M	3.0	TK	10.0	B		25	31	5	0.6	200	GON05
2007 11 13.98		I	2.6	TK	0.0	E		1		6/			BUS01
2007 11 13.98		S	2.5	TK	3.0	B		3	&30	4/			BUS01
2007 11 14.00					41	L	5	57	27	5		213	BOR
2007 11 14.00	x	B	2.9	TJ	5.0	N	4	1	36	6			BOR
2007 11 14.00		M	2.6	TK	5.0	B		7	28	5			BOU
2007 11 14.00	x	S	3.0	TJ	0.0	E		1	41	5			BOR
2007 11 14.03		M	2.6	TK	0.0	E		1	30	6			GON05
2007 11 14.03		S	3.6	TK	5.0	B		10	48	3			ZAN01
2007 11 14.07		S	3.0	HV	0.0	E		1	25	5			BIV
2007 11 14.10		B	3.3	SC	0.0	E		1	40	7			HAL
2007 11 14.17		S	2.7	TK	0.0	E		1	&26	5			GIL01
2007 11 14.22		I	2.9	TJ	0.0	E		1	&30	4			PER01
2007 11 14.22		M	3.0	TJ	2.2	R	11	5	&30	3/			PER01
2007 11 14.23		B	2.8	AE	0.0	E		1					GRE
2007 11 14.29		M	2.6	TJ	5.0	B		10	30	D3			MOR
2007 11 14.49	G	B	3.2	AA	0.0	E		1					WHE01
2007 11 14.60	x	M	2.9	HV	3.5	B		7	35	5			MIT
2007 11 14.61	x	B	3.0	HV	0.0	E		1		5/			MIT
2007 11 14.62		B	3.0	YG	0.0	E		1	34	6/			YOS04
2007 11 14.62		S	2.8	YG	6.6	R		10	31	4/			YOS04
2007 11 14.64		I	2.9	YG	0.0	E		1	&30	6			NAG08
2007 11 14.64		M	3.0	YG	3.5	B		7	31	5			NAG08
2007 11 14.76		B	3.2	GA	8.0	B		10	24	8			MOR09
2007 11 14.79		I	2.7	TK	0.0	E		1	&33	5/			RIE
2007 11 14.79		S	2.6	TK	3.0	B		4	29	4			RIE
2007 11 14.80		M	3.0	TK	5.0	B		7	30	4			GON06

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 14.80	x	B	3.0	HV	0.0	E		1	30	4			MIY01
2007 11 14.80	x	S	2.9	HV	3.2	B		7	30	4			MIY01
2007 11 14.83		B	2.8	TK	0.7	E		1	40	5			MEY
2007 11 14.89		S	3.0	HV	0.0	E		1	30	5			BIV
2007 11 14.90		S	2.8	TK	5.0	B		20	24	5			DIE02
2007 11 14.91		I	2.7	TK	0.0	E		1	&35	5			SCH04
2007 11 14.96		I	2.6	TK	0.0	E		1		6			BUS01
2007 11 14.96		I	2.6	TK	0.0	E		1	30	8			DIJ
2007 11 14.97		S	2.5	TK	3.0	B		3	>30	4/			BUS01
2007 11 15.03		S	2.6	TK	0.0	E		1	&35	5/			BOU
2007 11 15.03		S	3.5	TK	5.0	B		10	48	4			ZAN01
2007 11 15.13		I	2.9	TJ	0.0	E		1	&32	4			PER01
2007 11 15.13		M	3.0	TJ	2.2	R	11	5	&30	3			PER01
2007 11 15.22		S	2.8	TK	0.0	E		1	&30	5			GIL01
2007 11 15.23		S	3.5	AA	0.0	E		1					GOB01
2007 11 15.49	G	B	3.2	AA	0.0	E		1					WHE01
2007 11 15.50		B	3.2	AA	3.5	B		7	32	4	0.6	200	KAN
2007 11 15.50		S	3.0	AA	3.5	B		7	32	4	0.6	200	KAN
2007 11 15.51		S	3.0	YG	6.6	R		10	33	4			YOS04
2007 11 15.52		B	3.3	YG	0.0	E		1	37	6			YOS04
2007 11 15.54		I	3.1	AA	0.0	E		1	57	4			KAN
2007 11 15.57	x	M	3.0	HV	3.5	B		7	34	5			MIT
2007 11 15.58	x	B	3.1	HV	0.0	E		7	&40	5			MIT
2007 11 15.60		M	3.0	YG	3.5	B		7	32	5			NAG08
2007 11 15.72		B	2.8	TJ	0.0	E		1		7			CHE03
2007 11 15.73		S	3.6	TK	5.0	B		10	48	3			ZAN01
2007 11 15.74		S	3.5	AA	0.0	E		1	15	4			IVA03
2007 11 15.75		S	2.6	TI	0.0	E		1	30	s6			SCA02
2007 11 15.77		B	2.9	TJ	5.0	B		7	&30	5			CHE03
2007 11 15.80		M	2.5	TK	5.0	B		7	32	6/			DIJ
2007 11 15.81		I	2.7	TK	0.0	E		1	30	8			DIJ
2007 11 15.83		B	3.2	GA	8.0	B		10	27	6			MOR09
2007 11 15.84		B	3.1	TK	0.7	E		1	40	5			MEY
2007 11 15.85		S	3.5	AA	0.0	E		1					GOB01
2007 11 15.90		S	2.9	TI	0.0	E		1	30	2			LAB02
2007 11 15.90		S	3.0	HV	0.0	E		1	30	5			BIV
2007 11 15.99		I	2.7	TK	0.0	E		1		5/			BUS01
2007 11 15.99		I	3.0	TJ	0.0	E		1	&35	3/			PER01
2007 11 15.99		S	2.5	TK	3.0	B		3	>30	4/			BUS01
2007 11 15.99		S	2.9	TJ	2.2	R	11	5	&30	2/			PER01
2007 11 16.04	s	S	2.8	YG	5.0	B		10	20	0			AMO01
2007 11 16.18		S	3.0	TK	0.0	E		1	&34	5			GIL01
2007 11 16.20		M	2.7	TJ	5.0	B		10	31	D3			MOR
2007 11 16.23		S	3.5	AA	0.0	E		1					GOB01
2007 11 16.38					7.0	B		15	31	5		200	BOR
2007 11 16.38		B	3.0	TJ	2.5	B		3	29	4			BOR
2007 11 16.38		S	2.9	TJ	0.0	E		1	40	4			BOR
2007 11 16.42	G	B	3.3	AA	0.0	E		1					WHE01
2007 11 16.51		M	3.1	YG	3.5	B		7	32	5			NAG08
2007 11 16.52		I	3.2	AA	0.0	E		1	69	4			KAN
2007 11 16.54		S	2.9	YG	6.6	R		10	35	3/			YOS04
2007 11 16.57		B	3.2	AA	3.5	B		7	38	4	0.6	205	KAN
2007 11 16.58	x	M	3.1	HV	3.5	B		7	33	4			MIT
2007 11 16.73		M	3.0	TT	0.8	E		1	25	5			LEH
2007 11 16.73		S	2.7	TT	3.5	B		7	35	d4			PAR03
2007 11 16.74		M	2.7	TK	5.0	B		7	30	4			BOU
2007 11 16.75		S	2.6	TI	0.0	E		1	30	s6			SCA02
2007 11 16.75		S	2.6	TK	3.0	B		3	>30	4/			BUS01
2007 11 16.76		B	3.4	TJ	6.0	B		10	&31	d5			RZE
2007 11 16.77	x	B	3.2	HV	5.0	B		10	29	4/			NAG04
2007 11 16.79		B	3.5	TK	5.0	B		7	30				QVA
2007 11 16.80		B	3.1	TT	0.8	E		1	25	3			KOU
2007 11 16.80		S	3.6	TK	5.0	B		10	48	3			ZAN01
2007 11 16.81		M	3.3	TT	6	L	6	25	27	2/			KOU
2007 11 16.81		S	3.6	AA	0.0	E		1					GOB01

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 16.81	x	B	3.0	HV	0.0	E		1	30	4			MIY01
2007 11 16.81	x	S	3.0	HV	3.2	B		7	36	4			MIY01
2007 11 16.83		I	2.8	TK	0.0	E		1	&30	4			SCH04
2007 11 16.86		B	3.0	HV	0.7	E		1					KAM01
2007 11 16.86	G	M	2.9	TT	0.8	E		1	40	3/			HOR02
2007 11 16.87		M	2.8	TT	5	N		1	40	3/			HOR02
2007 11 16.93		S	2.9	TK	5.0	B		20	25	5			DIE02
2007 11 17.00		S	2.7	TK	0.0	E		1	35	6			GON05
2007 11 17.01		B	3.4	GA	8.0	B		10	31	4			MOR09
2007 11 17.01		S	2.9	TK	0.0	E		1	&34	5			GIL01
2007 11 17.01		S	2.9	TK	3.0	O		4	35	5			GON05
2007 11 17.02		I	3.1	TK	0.0	E		1	25	5			DIJ
2007 11 17.02		M	2.9	TK	5.0	B		7	27	3/			DIJ
2007 11 17.07					41.0	L	5	57	31	5		200	BOR
2007 11 17.07		B	3.1	TJ	5.0	N	4	1					BOR
2007 11 17.07		S	3.0	TJ	2.5	B		3	37	5			BOR
2007 11 17.07		S	3.1	TJ	0.0	E		1	45	4			BOR
2007 11 17.07		S	3.1	TJ	5.0	N	4	1	37	5			BOR
2007 11 17.17		M	2.7	TJ	5.0	B		10	32	3			MOR
2007 11 17.23		S	3.1	HV	0.0	E		1	30	5			BIV
2007 11 17.25		S	3.0	AE	3.5	N		1					GRE
2007 11 17.48	x	M	2.9	HV	3.5	B		7	35	4			YOS02
2007 11 17.55		M	3.1	YG	3.5	B		7	35	4/			NAG08
2007 11 17.55		S	3.0	YG	6.6	R		10	37	3			YOS04
2007 11 17.55	x	M	3.2	HV	3.5	B		7	34	4			MIT
2007 11 17.74		M	2.9	TK	6.0	B		15	29	3/			DIJ
2007 11 17.75		S	3.3	HD	0.0	E		1	30	2			NEV
2007 11 17.85		M	3.5:	HI	5.0	B		7	30	2/			NOV01
2007 11 17.86		S	3.7	TK	5.0	B		10	48	3			ZAN01
2007 11 17.87		S	3.6	AA	0.0	E		1					GOB01
2007 11 17.92		S	3.1	HV	0.0	E		1	30	4			BIV
2007 11 17.93		S	3.0	TK	5.0	B		20	25	5			DIE02
2007 11 17.97		B	3.4	GA	8.0	B		10	34	4			MOR09
2007 11 18.04		B	3.2	TT	0.8	E		1	25	2/			KOU
2007 11 18.05		S	3.0	TJ	2.2	R	11	5	37	3			PER01
2007 11 18.13		S	3.5	AA	5.0	B		10	40	2			ZAJ
2007 11 18.15		S	3.4	HR	22	L	6	36	38	2	0.5	220	GOI
2007 11 18.36		B	5.1	AC	5.0	B		10	45	5	0.5	160	NOW
2007 11 18.52	x	M	3.2	TJ	3.5	B		7	36	4			NAG08
2007 11 18.53	x	M	3.3	HV	3.5	B		7	34	4			MIT
2007 11 18.54		B	3.3	AA	3.5	B		7	33	4	0.5	200	KAN
2007 11 18.55		S	3.1	YG	6.6	R		10	34	3			YOS04
2007 11 18.55		S	3.2	AA	3.5	B		7	33	4	0.5	200	KAN
2007 11 18.61		S	3.4	HI	5.0	B		7	30	2			NOV01
2007 11 18.75	x	M	3.0	HV	3.5	B		7	35	4			YOS02
2007 11 18.78		S	3.1	TK	5.0	B		20	30	5			DIE02
2007 11 18.78		S	3.4	AA	0.0	E		1	15	2			IVA03
2007 11 18.81		M	2.9	TK	5.0	B		7	30	3			BOU
2007 11 18.81		S	3.1	TK	0.7	E		1	&30	5			MEY
2007 11 18.81	x	S	3.4	HV	3.2	B		7	30	4	&25 m	145	MIY01
2007 11 18.88	G	M	3.3	TI	0.8	E		1	35	4			HOR03
2007 11 18.89		M	2.9	TK	6.0	B		15	30	3/			DIJ
2007 11 18.93		S	3.7	TK	5.0	B		10	48	3			ZAN01
2007 11 19.27		S	3.1:	AE	5.0	N		1					GRE
2007 11 19.28		S	3.1:	AE	5.0	R		12	&40	2			GRE
2007 11 19.61	x	M	3.3	TJ	3.5	B		7	37	3/			NAG08
2007 11 19.67	x	M	3.4	HV	3.5	B		7	37	3/			MIT
2007 11 19.69		S	3.0	TT	3.0	B		8	35	0			MAN02
2007 11 19.71		S	3.0	YG	6.6	R		10	33	3			YOS04
2007 11 19.73	G	S	3.0:	TT	0.8	E		1	40	3			HOR02
2007 11 19.75		S	3.9	AA	5.0	B		10	45	1			ZAJ
2007 11 19.80	G	M	3.3	TI	0.8	E		1	35	4			HOR03
2007 11 19.82		M	3.1:	TK	6.0	B		15		3/			DIJ
2007 11 19.82		S	2.9	TK	5.0	B		7	&35	3			BOU
2007 11 19.83		M	3.2:	TT	5.0	B		10	30	4			LEH

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 19.83		S	3.2	HI	0.0	E		1	45	3			SZA
2007 11 19.86		M	3.5	TJ	8.0	B		18	30	d4			RZE
2007 11 19.86		S	3.4	AA	0.0	E		1	15	2			IVA03
2007 11 19.90		M	2.8	TT	6.7	R	6	16	36	d5			PAR03
2007 11 19.90		M	2.9	YG	0.7	E		1	&30	4			GRA04
2007 11 19.90		S	2.9	TK	5.0	B		7	35	3			GRA04
2007 11 20.03		S	4.1	YG	5.0	B		10	15	0			AMO01
2007 11 20.14		S	3.7	HR	5.0	B		7	32	0			GOI
2007 11 20.21		M	3.0	TJ	5.0	B		10	30	2			MOR
2007 11 20.25	x	M	3.0	HV	5.0	N		1					OME
2007 11 20.52	x	M	3.3	TJ	3.5	B		7	39	3/			NAG08
2007 11 20.53	x	S	3.3	HV	3.5	B		7	28	3			YOS02
2007 11 20.60		S	3.0	YG	6.6	R		10	39	3/			YOS04
2007 11 20.63		S	3.5	HI	5.0	B		7		2			NOV01
2007 11 20.72	x	M	3.4	HV	3.5	B		7	34	3/			MIT
2007 11 20.78		S	3.0:	TT	6.0	B		10	&35	3			PAR03
2007 11 20.80		S	4.0	AA	5.0	B		10	45	1			ZAJ
2007 11 20.82		S	2.8	TI	0.0	E		1	45	s3/			SCA02
2007 11 20.84		S	3.7	TK	5.0	B		10	48	2			ZAN01
2007 11 20.86		M	3.4	TJ	8.0	B		18	30	d4			RZE
2007 11 20.87		S	3.1	TK	3.0	O		4	37	4			GON05
2007 11 20.90		S	3.0	AA	0.0	E		1	15	2			IVA03
2007 11 21.05		M	3.3	TK	6.0	B		15	30	3			DIJ
2007 11 21.08		S	3.4	TJ	2.4	B		8					PIL01
2007 11 21.08		S	3.5	YG	4.0	O		3	30	1			SOU01
2007 11 21.10		M	3.5	TJ	3.0	B		8	34	3			SHU
2007 11 21.18		S	2.9	TJ	2.2	R	11	5	48	3			PER01
2007 11 21.47		S	3.1	YG	6.6	R		10	40	2			YOS04
2007 11 21.54	x	M	3.3	TJ	3.5	B		7	39	3			NAG08
2007 11 21.54	x	S	3.2	HV	3.5	B		7	32	3			YOS02
2007 11 21.70		M	3.4	TJ	3.0	B		8	36	2/			SHU
2007 11 21.75		S	3.0	TI	0.0	E		1	30	s3/			SCA02
2007 11 21.75		S	4.0	AA	5.0	B		10	45	1			ZAJ
2007 11 21.77	x	M	3.4	HV	3.5	B		7	38	3			MIT
2007 11 21.85		M	3.2	TJ	8.0	B		18	36	d3/			RZE
2007 11 21.85		S	3.8	AA	0.0	E		1					GOB01
2007 11 21.88		S	3.2	HV	0.0	E		1	35	3			BIV
2007 11 21.90		S	3.2	TK	5.0	B		20	30	4			DIE02
2007 11 21.92		S	3.0	TT	6.7	R	6	16	40	d4			PAR03
2007 11 21.93		S	3.2	AA	0.0	E		1	15	2			IVA03
2007 11 21.95		S	2.9	TT	5.0	B		7	38	4			PAR03
2007 11 21.96		S	3.7	TK	5.0	B		10	48	2			ZAN01
2007 11 21.97		S	3.1	TK	5.0	B		7	&30	3			BOU
2007 11 21.98		M	3.2:	TK	6.0	B		15	30	3/			DIJ
2007 11 22.06		S	4.0	YG	5.0	B		10	20	0			AMO01
2007 11 22.21		S	3.3	TK	0.0	E		1	>30	4			GIL01
2007 11 22.22		S	3.2	TK	0.0	E		1	&35	2/			SCH04
2007 11 22.47	x	M	3.4	TJ	3.5	B		7	40	2			NAG08
2007 11 22.51		S	3.0	AA	3.5	B		7	43	3	1.0	200	KAN
2007 11 22.51		S	3.1	YG	6.6	R		10	39	2/			YOS04
2007 11 22.61	x	M	3.3	HV	3.5	B		7	40	3			MIT
2007 11 22.62	x	M	3.0	HV	5.0	N		1					OME
2007 11 22.72	x	S	3.2	HV	3.5	B		7	32	3			YOS02
2007 11 22.74		S	3.2	TK	5.0	B		20	30	3			DIE02
2007 11 22.75		S	3.7	TK	5.0	B		10	48	2			ZAN01
2007 11 22.78		M	3.3	TJ	8.0	B		18	&36	3			RZE
2007 11 22.84		S	3.1	TK	3.0	O		4	37	3			GON05
2007 11 22.86		S	3.2	AA	0.0	E		1	17	2			IVA03
2007 11 22.88		S	3.3:	TK	5.0	B		10	&40	3			MEY
2007 11 22.90		S	3.1	TT	6.7	R	6	16	32	3/			PAR03
2007 11 22.91		S	3.0	TT	5.0	B		7	32	3			PAR03
2007 11 23.01		S	3.2	TK	5.0	B		7	&30	3			BOU
2007 11 23.03		S	3.1	TJ	5.0	N	4	1					BOR
2007 11 23.04		S	4.0	YG	5.0	B		10	15	0			AMO01
2007 11 23.21		S	3.0	AE	5.0	R		12	&30	0/			GRE

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 23.43	x	S	3.4	HV	3.2	B		7	35	2			MIY01
2007 11 23.51	x	M	3.4	TJ	3.5	B		7	&40	2			NAG08
2007 11 23.66	x	M	3.4	HV	3.5	B		7	38	2			MIT
2007 11 23.73		B	3.5	GA	2.0	B		7	40	2			MOR09
2007 11 23.77		S	3.0	AA	0.0	E		1	20	2			IVA03
2007 11 23.82	G	M	3.5	TI	0.8	E		1	40	3/			HOR03
2007 11 23.85		M	3.1	TK	6.0	B		15	&30	3			DIJ
2007 11 23.88		S	3.2	HV	0.0	E		1	30	3			BIV
2007 11 23.90		S	3.3	TT	3.5	B		7	30	3			PAR03
2007 11 23.95		S	2.9	TJ	2.2	R	11	5	39	2			PER01
2007 11 24.04		S	3.0	YG	3.0	R		6	35	2			GRA04
2007 11 24.10		S	4.0	HR	5.0	B		7	35	0			GOI
2007 11 24.25	x	M	3.0	HV	5.0	N		1					OME
2007 11 24.27		S	3.0	AE	5.0	R		12	&35	1			GRE
2007 11 24.54	x	M	3.5:	TJ	3.5	B		7	&40	1			NAG08
2007 11 24.61		S	3.1	YG	6.6	R		10	40	1			YOS04
2007 11 24.64		S	3.6	AA	0.0	E		1	15	2			IVA03
2007 11 24.73		S	3.4	TI	0.0	E		1	30	s3/			SCA02
2007 11 24.88		S	3.5:	TT	3.5	B		7	&30	2			PAR03
2007 11 24.98		S	3.0	TJ	2.2	R	11	5	39	2			PER01
2007 11 25.00		S	3.2	TJ	2.4	B		8	40	1			PIL01
2007 11 25.08		M	3.2	TK	6.0	B		15	&30	2/			DIJ
2007 11 25.20	x	M	3.0	HV	5.0	N		1					OME
2007 11 25.28		S	2.9	AE	5.0	R		12	&35	1			GRE
2007 11 25.49	x	M	3.5:	TJ	3.5	B		7	&40	1			NAG08
2007 11 25.63		S	3.2	YG	6.6	R		10	42	1/			YOS04
2007 11 25.71		S	3.2	TK	5.0	B		7	&35	2			BOU
2007 11 25.75		S	3.0	TI	0.0	E		1	40	s3/			SCA02
2007 11 25.77		S	4.0	TK	5.0	B		10	48	2			ZAN01
2007 11 25.82		S	3.6	TJ	2.4	B		8	50	1			PIL01
2007 11 25.89		S	3.1	TK	5.0	B		7	32	2/			DIJ
2007 11 25.95					7.0	B		15	36	4		185	BOR
2007 11 25.95		S	2.9	TJ	2.5	B		3	40	3			BOR
2007 11 25.95		S	3.1	TJ	5.0	N	4	1					BOR
2007 11 25.97		S	3.0	AE	5.0	R		12	&35	0/			GRE
2007 11 26.00		S	3.0	TJ	2.2	R	11	5	&45	2/			PER01
2007 11 26.04		B	3.6	GA	2.0	B		7	44	1			MOR09
2007 11 26.29	x	M	3.0	HV	5.0	N		1					OME
2007 11 26.41	x	M	3.6	TJ	3.5	B		7	42	2			NAG08
2007 11 26.68		S	3.0	HI	0.0	E		1	45	2/			SAN07
2007 11 26.70		M	3.1	TT	5	N		1	46	2/			HOR02
2007 11 26.70		S	3.3	TT	0.8	E		1	50	2			LEH
2007 11 26.77		M	3.6	TJ	8.0	B		18	30	2			RZE
2007 11 26.79		S	3.0:	TT	3.0	B		8	55	0			MAN02
2007 11 26.80		M	3.7	TK	5.0	B		7	40	4			GON06
2007 11 26.86		S	3.2	TK	6.0	B		15	35	3			DIJ
2007 11 26.87		B	3.6:	TT	0.8	E		1	>35	2			KOU
2007 11 26.88		S	3.0	AA	0.0	E		1	20	2			IVA03
2007 11 26.93		S	3.3:	TK	0.0	E		1	>40	2/			GIL01
2007 11 27.01		S	3.1	TJ	2.2	R	11	5	&45	2			PER01
2007 11 27.01		S	4.0	TK	5.0	B		10	48	2			ZAN01
2007 11 27.02		B	3.5	GA	2.0	B		7	40	1			MOR09
2007 11 27.03		S	3.5	YG	5.0	B		10	40	0			AMO01
2007 11 27.05		B	3.0	SC	0.0	E		1	40	5/			HAL
2007 11 27.09		S	4.0	HR	5.0	B		7	40	0			GOI
2007 11 27.67		M	3.0	YG	3.0	R		6	40	2/			GRA04
2007 11 27.70		M	3.1	TT	5	N		1	50	2/			HOR02
2007 11 27.73		B	3.4	GA	2.0	B		7	36	2			MOR09
2007 11 27.73		S	2.9	TK	3.0	B		3	&45	3/			BUS01
2007 11 27.75		S	2.7	TI	0.0	E		1	60	s5			SCA02
2007 11 27.75		S	3.7	TJ	0.7	E		1	55	1			PIL01
2007 11 27.78		I	3.2:	TK	0.0	E		1	>40	2/			SCH04
2007 11 27.79		S	4.2	AA	5.0	B		10	45	1			ZAJ
2007 11 27.80		S	3.3	HV	0.0	E		1	40	2			BIV
2007 11 27.81		S	2.9	TK	3.0	O		4	40	3			GON05

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 27.81		S	3.4:	TT	3.0	B		8	50	0			MAN02
2007 11 27.82		S	3.2	TI	0.0	E		1	40	1			LAB02
2007 11 27.83		S	3.1	TJ	2.2	R	11	5	&48	2/			PER01
2007 11 27.84		S	3.2	HV	0.7	E		1					KAM01
2007 11 27.86		S	2.9	TK	1.5	B		3	45	3			MEY
2007 11 27.86		S	3.0	TK	0.7	E		1	&50	2			MEY
2007 11 27.88		S	3.4	TT	0.8	E		1	40	2			LEH
2007 11 27.91		S	3.3	HV	0.0	E		1	40	3			BIV
2007 11 27.92		S	3.2:	TK	5.0	B		7		3			BOU
2007 11 27.93		S	3.0	TK	0.0	E		1		2			BOU
2007 11 27.98					41.0	L	5	57	30	5		178	BOR
2007 11 27.98		S	2.9	TJ	2.5	B		3	48	3			BOR
2007 11 27.98		S	3.1	TJ	0.0	E		1	&56	2/			BOR
2007 11 27.98		S	3.1	TJ	5.0	N	4	1	50	3			BOR
2007 11 28.01		S	3.2	TK	6.0	B		15	35	2			DIJ
2007 11 28.08		S	3.4	YG	4.0	O		3	30	1			SOU01
2007 11 28.63		M	3.3	TJ	5.0	B		15	30	3			XU
2007 11 28.67	x	S	3.1	HV	3.5	B		7	35	3			YOS02
2007 11 28.71		M	3.0	TT	5	N		1	50	2			HOR02
2007 11 28.71		S	3.7	HI	0.0	E		1	58	4			VAS06
2007 11 28.72		M	3.4	TJ	8.0	B		18	45	2			RZE
2007 11 28.72		S	4.2	HI	5.0	B		10	59	3			SOM
2007 11 28.74		B	3.3	TJ	0.0	E		1		2			CHE03
2007 11 28.75		S	3.3	HV	0.7	E		1					KAM01
2007 11 28.75		S	3.4	TJ	5.0	R	4	7	&52	3			CHE03
2007 11 28.75		S	4.1	AA	5.0	B		10	45	1			ZAJ
2007 11 28.76		S	3.3	HI	0.0	E		1	50	2	1.5	180	SAN07
2007 11 28.76		S	3.5	HI	0.0	E		1	20	2/			SAR02
2007 11 28.77		B	3.5	GA	2.0	B		7	46	2			MOR09
2007 11 28.77		S	3.3	AA	0.0	E		1	30	3	1.5	180	NAG09
2007 11 28.79		B	3.1	TK	0.8	E		1					HAS02
2007 11 28.79		S	2.9	HI	0.0	E		1	40	3			SZA
2007 11 28.83		S	3.3	HV	0.0	E		1	40	2			BIV
2007 11 28.83		S	3.3	TT	0.8	E		1	50	2			LEH
2007 11 28.87		S	3.1	TJ	2.2	R	11	5	&48	2/			PER01
2007 11 29.04		S	3.5	YG	5.0	B		10	40	0/			AMO01
2007 11 29.08		S	3.3	YG	4.0	O		3	50	1			SOU01
2007 11 29.08		S	3.8	HR	5.0	B		7	50	1	1.5	190	GOI
2007 11 29.25	x	M	3.1	HV	5.0	N		1					OME
2007 11 29.52	x	S	3.0	HV	0.0	E		1	&45	4			YOS02
2007 11 29.70		S	3.8	HI	0.0	E		1	47	4			VAS06
2007 11 29.71		S	3.3	HI	0.0	E		1	50	2	1.5	180	SAN07
2007 11 29.72		M	3.0	TT	5	N		1	50	2			HOR02
2007 11 29.72		S	2.7	TI	0.0	E		1	70	s5			SCA02
2007 11 29.74		S	2.9	TK	3.0	B		3		3			BUS01
2007 11 29.74		S	3.2	TK	5.0	B		10	&50	2/			COM
2007 11 29.75		M	3.3	TJ	8.0	B		18	54	d2			RZE
2007 11 29.78		S	3.0	AA	0.0	E		1	30	2			IVA03
2007 11 29.80		S	2.9	TK	1.5	R	3	2	&50	3/			SCH04
2007 11 29.80		S	3.3	TK	0.0	E		1	&60	2/			GIL01
2007 11 29.81		S	2.9	TK	0.0	E		1	&50	3			BOU
2007 11 29.84		S	3.0	TK	5.0	B		7	41	3			DIJ
2007 11 29.86		S	4.0	TK	5.0	B		10	48	2			ZAN01
2007 11 29.90		S	3.3	TJ	2.2	R	11	5	&48	2/			PER01
2007 11 29.92		S	3.4	TK	5.0	B		8	40	3			DIE02
2007 11 29.98					7.0	B		15	42	4/	53 m	174	BOR
2007 11 29.98					41.0	L	5	57	37	5	47 m	180	BOR
2007 11 29.98		S	2.9	TJ	2.5	B		3	42	4			BOR
2007 11 29.98		S	3.1	TJ	0.0	E		1	53	4			BOR
2007 11 29.98		S	3.1	TJ	5.0	N	4	1	53	4			BOR
2007 11 30.00		S	3.3	HV	0.0	E		1	30	3			BIV
2007 11 30.07		S	3.8	YG	5.0	B		10	30	0			AMO01
2007 11 30.08		S	3.4	YG	3.0	B		8	50	1			SOU01
2007 11 30.08		S	3.8	HR	5.0	B		7	60	1	2.0	190	GOI
2007 11 30.60	x	M	3.0	TT	2.0	R	5	3		4			TSU02

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 11 30.82		S	3.1	TJ	2.2	R	11	5	&48	2			PER01
2007 11 30.99					7.0	B		15	42	5	58 m	178	BOR
2007 11 30.99					41.0	L	5	57	34	5	55 m	178	BOR
2007 11 30.99		S	3.1	TJ	0.0	E		1	52	3			BOR
2007 11 30.99		S	3.1	TJ	5.0	N	4	1	47	3			BOR
2007 12 01.25	x	M	3.1	HV	5.0	N		1					OME
2007 12 01.40	x	M	4.0:	TJ	3.5	B		7	&40	0			NAG08
2007 12 01.60		S	3.3	YG	6.6	R		10	48	1			YOS04
2007 12 01.60	x	M	3.5	HV	3.5	B		7	50	2			MIT
2007 12 01.60	x	S	3.0	HV	0.0	E		1	&45	3/			YOS02
2007 12 01.70		S	3.1	TK	1.5	R	3	2	&50	2/			SCH04
2007 12 01.72		S	3.3	TK	5.0	B		10	&50	2			COM
2007 12 01.73		S	2.7	TI	0.0	E		1	70	s5			SCA02
2007 12 01.73		S	2.9	TK	3.0	B		3		3			BUS01
2007 12 01.74		S	2.9	TK	5.0	B		7	46	3			DIJ
2007 12 01.75		S	3.3	HV	0.0	E		1	40	2			BIV
2007 12 01.76		S	3.5	HI	5.0	B		7	41	2			NOV01
2007 12 01.77		S	3.2	TI	0.0	E		1	45	1			LAB02
2007 12 01.78		S	3.4	TK	5.0	B		8	40	3			DIE02
2007 12 01.79		S	2.9	TK	0.7	E		1	&40	3			MEY
2007 12 01.79		S	2.9	TK	3.0	O		4	45	2			GON05
2007 12 01.79		S	3.0	TK	1.5	B		3	60	3/			MEY
2007 12 01.83		S	3.5	TJ	0.7	E		1	60	3			PIL01
2007 12 01.84		I	2.9	TK	0.0	E		1	&50	2			BUS01
2007 12 01.88		S	3.1	TJ	2.2	R	11	5	&50	2/			PER01
2007 12 01.99		S	3.4	HV	0.7	E		1					KAM01
2007 12 02.03		S	3.3	HV	0.0	E		1	40	3			BIV
2007 12 02.04		B	3.4	GA	8.0	B		10	49	1			MOR09
2007 12 02.04		S	3.0	TK	0.0	E		1		2/			BOU
2007 12 02.06		S	3.7	HR	5.0	B		7	55	1	1	190	GOI
2007 12 02.10		S	3.1	AE	5.0	R		12	&50	0/			GRE
2007 12 02.13					7.0	B		15	40	5	60 m	180	BOR
2007 12 02.13		S	3.1	TJ	0.0	E		1	52	3			BOR
2007 12 02.13		S	3.1	TJ	5.0	N	4	1	42	3/			BOR
2007 12 02.25	x	M	3.1	HV	5.0	N		1					OME
2007 12 02.51	x	M	4.0:	TJ	3.5	B		7	&45	1			NAG08
2007 12 02.52		B	3.4	AA	3.5	B		7	49	3	0.9	175	KAN
2007 12 02.53		S	3.0	AA	3.5	B		7	49	3	0.9	175	KAN
2007 12 02.56	x	M	3.4	HV	3.5	B		7	52	2			MIT
2007 12 02.60		S	3.0	YG	6.6	R		10	55	2			YOS04
2007 12 02.62	x	B	3.7	HV	5.0	B		10	51	4			NAG04
2007 12 02.70		I	3.4	AA	0.0	E		1	89	2			KAN
2007 12 02.76		B	3.2	TK	0.0	E		1	45	3			KAR02
2007 12 02.80		S	3.4	TK	0.0	E		1	&60	2			GIL01
2007 12 02.81	x	S	3.6	HV	3.2	B		7	38	2/			MIY01
2007 12 02.82		S	2.8	HI	0.0	E		1	50	2			SZA
2007 12 02.85		S	3.0	TK	1.5	R	3	2	&55	3			SCH04
2007 12 02.85		S	3.0	TT	2.4	B		3	60	d3			PAR03
2007 12 02.86		I	3.0	TT	0.0	E		1	60	3			PAR03
2007 12 02.87		S	3.2	AA	0.0	E		1	30	2			IVA03
2007 12 02.88		I	3.0	TK	0.0	E		1	50	3			DIJ
2007 12 02.88		S	2.9	TK	5.0	B		7	47	3			DIJ
2007 12 02.88		S	3.4	TK	5.0	B		8	42	3			DIE02
2007 12 02.89		S	3.1	TJ	2.2	R	11	5	&52	2			PER01
2007 12 03.04		S	3.5	YG	3.0	B		8	60	1			SOU01
2007 12 03.10		B	3.0	SC	0.0	E		1		5/			HAL
2007 12 03.27	x	M	3.3	HV	5.0	N		1					OME
2007 12 03.44	x	I	3.5	TJ	0.0	E		1	&50	5			NAG08
2007 12 03.51	x	S	3.1	HV	0.0	E		1	50	3			MIY01
2007 12 03.51	x	S	3.3	HV	2.1	B		7	50	2/			MIY01
2007 12 03.56	x	M	3.4	HV	3.5	B		7	54	2			MIT
2007 12 03.60		S	3.3	YG	6.6	R		10	52	1/			YOS04
2007 12 03.60	x	M	3.7	TJ	1.8	R		3	50	4			NAG08
2007 12 03.68		I	3.5	AA	0.0	E		1	68	2			KAN
2007 12 03.75		B	3.4	GA	8.0	B		10	50	1			MOR09

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 12 03.77		B	3.2	TK	0.8	E		1					HAS02
2007 12 03.80		M	3.4	TJ	8.0	B		18	50	2			RZE
2007 12 03.81		S	3.1	TK	1.5	B		3	50	3			MEY
2007 12 03.83		S	3.0	TK	0.7	E		1	50	2/			MEY
2007 12 03.86		S	3.0	TK	0.0	E		1		3			BOU
2007 12 03.87		I	3.0	TK	0.0	E		1	55	3/			DIJ
2007 12 03.87		S	3.0	TK	3.0	B		3		2/			BUS01
2007 12 03.87		S	3.0	TK	5.0	B		7	49	3			DIJ
2007 12 03.87		S	3.1	TT	2.4	B		3	55	3			PAR03
2007 12 03.89		M	3.1	TT	5	N		1	60	2			HOR02
2007 12 03.92		S	4.0	TK	5.0	B		10	48	2			ZAN01
2007 12 03.93		S	3.3	TK	0.0	E		1	&60	2			GIL01
2007 12 03.95		S	3.7	TK	5.0	B		10	&60	1/			COM
2007 12 04.06		B	3.2	YG	0.7	E		1	&50	2			GRA04
2007 12 04.06		M	3.2	YG	3.0	R		6	50	D2/			GRA04
2007 12 04.10		S	3.1	TJ	2.2	R	11	5	&55	2			PER01
2007 12 04.11		S	3.1	TK	1.5	R	3	2	&60	2/			SCH04
2007 12 04.15		S	3.2	TJ	0.0	E		1	&70	2			BOR
2007 12 04.28		S	3.1	AE	5.0	R		12	&50	0/			GRE
2007 12 04.43	x	M	3.7	TJ	1.8	R		3	50	4			NAG08
2007 12 04.69		M	3.1	TT	5	N		1	60	2			HOR02
2007 12 04.71		I	3.0	AA	0.0	E		1	87	3			KAN
2007 12 04.73		S	2.7	TI	0.0	E		1	70	s5			SCA02
2007 12 04.75		S	3.0	HI	0.0	E		1	80	d4	13	200	SAN07
2007 12 04.78		S	3.1	TK	3.0	O		4	50	2/			GON05
2007 12 04.79		S	3.6	HI	0.0	E		1	52	5			VAS06
2007 12 04.80		M	3.2	TJ	8.0	B		18	50	2			RZE
2007 12 05.02		S	3.1	TK	3.0	O		4	50	2/			GON05
2007 12 05.08		S	3.2	TJ	2.2	R	11	5	&54	1/			PER01
2007 12 05.14					7.0	B		15	41	5	72	m 175	BOR
2007 12 05.14		S	3.1	TJ	5.0	N	4	1	52	3			BOR
2007 12 05.17		S	3.1	AE	5.0	R		12	&50	0/			GRE
2007 12 05.49	x	S	3.2	HV	0.0	E		1	&70	3			YOS02
2007 12 05.50	x	M	3.7	TJ	1.8	R		3	50	3			NAG08
2007 12 05.51	x	M	3.4	HV	3.5	B		7	55	2			MIT
2007 12 05.52	x	B	3.1	HV	0.0	E		1	60	2			MIY01
2007 12 05.52	x	M	3.0	TT	2.0	R	5	3		4			TSU02
2007 12 05.52	x	S	3.2	HV	2.1	B		7	50	3			MIY01
2007 12 05.60		S	2.8	YG	0.0	E		1	60	4			YOS04
2007 12 05.60		S	3.1	YG	6.6	R		10	63	2/			YOS04
2007 12 05.61		I	2.9	AA	0.0	E		1	85	3			KAN
2007 12 05.69	x	B	3.6	HV	5.0	B		10	53	4			NAG04
2007 12 05.72		M	3.4	TJ	8.0	B		18	48	d2/			RZE
2007 12 05.73		S	2.7	TI	0.0	E		1	65	s5			SCA02
2007 12 05.75		S	3.0	HI	0.0	E		1	80	3	14	200	SAN07
2007 12 05.78		S	3.3	TJ	0.0	E		1	&60	2			CHE03
2007 12 05.79		B	3.2	TK	0.8	E		1					HAS02
2007 12 05.84		S	4.2	AA	5.0	B		10	50	1			ZAJ
2007 12 05.85		S	3.2	TI	0.0	E		1	45	2			LAB02
2007 12 05.85		S	3.2	TK	1.5	R	3	2	&60	2/			SCH04
2007 12 05.85		S	3.4	TI	8.0	B		11	48	2			LAB02
2007 12 05.89		S	3.0	TK	0.7	E		1	60	3/			MEY
2007 12 05.89		S	3.1	TK	1.5	B		3	50	3			MEY
2007 12 05.92		S	3.0	TK	0.0	E		1	55	3/			DIJ
2007 12 05.92		S	3.0	TK	5.0	B		7	49	3/			DIJ
2007 12 05.94		S	3.0	TK	3.0	B		3		2/			BUS01
2007 12 05.99		S	3.0	TK	0.0	E		1	&65	3			BOU
2007 12 05.99		S	4.0	TK	5.0	B		10	48	2			ZAN01
2007 12 06.25		S	3.1	AE	5.0	R		12	&50	0/			GRE
2007 12 06.55	x	M	3.4	HV	3.5	B		7	57	2/			MIT
2007 12 06.60		S	3.3	YG	6.6	R		10	50	1/			YOS04
2007 12 06.69		M	3.1	TT	5	N		1	60	2			HOR02
2007 12 06.72		S	2.7	TI	0.0	E		1	75	s5			SCA02
2007 12 06.73		S	3.3	HI	0.0	E		1	72	5			VAS06
2007 12 06.73		S	3.5	TT	0.8	E		1	60	2			LEH

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 12 06.77		B	3.4	TI	8.0	B		10	50	1			MOR09
2007 12 06.88		S	3.8	AA	5.0	B		10	46	2			KES01
2007 12 06.99					7.0	B		15	50	3	64	m 175	BOR
2007 12 06.99		S	3.1	TJ	5.0	N	4	1	52	3			BOR
2007 12 07.01		S	3.6	HI	0.0	E		1	60	2			SAR02
2007 12 07.07		S	3.1	AE	5.0	R		12	&50	0/			GRE
2007 12 07.08		B	3 :	SC	0.0	E		1		5			HAL
2007 12 07.51	x	S	3.5:	TJ	1.8	R		3	&55	2			NAG08
2007 12 07.52	x	M	3.5	HV	3.5	B		7	&55	2			MIT
2007 12 07.54	x	S	3.3	HV	5.0	R		8	60	2			YOS02
2007 12 07.60		S	3.4	YG	6.6	R		10	54	1/			YOS04
2007 12 07.73		S	3.0	TK	3.0	B		3		2/			BUS01
2007 12 07.74		S	2.8	TI	0.0	E		1	65	s5			SCA02
2007 12 07.77		S	3.4	TK	5.0	B		8	42	3			DIE02
2007 12 07.79		S	3.0	TK	0.7	E		1	60	3			MEY
2007 12 07.79		S	3.1	TK	1.5	B		3	50	3			MEY
2007 12 07.84		S	3.0	TK	1.5	R	3	2	&60	2/			SCH04
2007 12 07.94		S	3.2	TK	0.0	E		1		2			BOU
2007 12 07.95		I	3.1	TK	0.0	E		1		1/			BUS01
2007 12 07.95		S	3.0	TK	0.0	E		1	65	3/			DIJ
2007 12 07.95		S	3.1	TK	5.0	B		7	69	3			DIJ
2007 12 07.98		B	3.2	TI	8.0	B		10	56	2			MOR09
2007 12 08.12		S	3.6:	TK	5.0	B		10	>60	1			COM
2007 12 08.49	x	S	3.3	HV	5.0	R		8	52	2			YOS02
2007 12 08.64		S	2.7	YG	0.0	E		1	67	D2			YOS04
2007 12 08.78		S	3.3	HV	0.0	E		1	50	3			BIV
2007 12 08.78		S	3.3	TK	3.0	O		4	50	2/			GON05
2007 12 08.79		M	3.1	TT	5	N		1	65	2			HOR02
2007 12 08.85		S	3.1	YG	3.0	R		6	&60	2			GRA04
2007 12 08.86		B	3.0	TI	0.0	E		1	50	1			MOR09
2007 12 08.87	G	M	3.2	TI	0.8	E		1	55	2			HOR03
2007 12 08.88		B	3.4	TK	0.0	E		1	60	2			KAR02
2007 12 08.89		S	3.1	TT	2.4	B		3	80	3			PAR03
2007 12 08.93		S	3.3	HV	0.0	E		1	60	3			BIV
2007 12 08.99		S	3.1	AE	5.0	R		12	&50	0/			GRE
2007 12 09.02					7.0	B		15	36	5	60	m 166	BOR
2007 12 09.02		S	3.1	TJ	5.0	N	4	1	50	3			BOR
2007 12 09.40	x	M	3.5	TJ	1.8	R		3	60	2			NAG08
2007 12 09.44	x	B	3.0	HV	0.0	E		1	70	2			MIY01
2007 12 09.44	x	S	3.3	HV	2.1	B		7	65	2/			MIY01
2007 12 09.47		S	2.7	YG	0.0	E		1	70	D2			YOS04
2007 12 09.52		I	3.1	AA	0.0	E		1	89	2			KAN
2007 12 09.56		S	3.2	AA	3.5	B		7	58	3	1.5	165	KAN
2007 12 09.57	x	M	3.4	HV	3.5	B		7	57	2			MIT
2007 12 09.69		S	4.0	TK	5.0	B		10	48	2			ZAN01
2007 12 09.72		S	2.9	TJ	0.7	E		1	60	2			PIL01
2007 12 09.72		S	3.4	HV	0.7	E		1					KAM01
2007 12 09.73		S	3.0	TK	3.0	B		3		2			BUS01
2007 12 09.73	x	S	3.5	HV	5.0	R		8	52	2			YOS02
2007 12 09.75		S	3.0	TK	5.0	B		7	68	3/			DIJ
2007 12 09.75		S	3.1	TK	0.0	E		1	70	3			DIJ
2007 12 09.75		S	3.1	TK	0.0	E		1	75	3			BOU
2007 12 09.78	x	B	3.3	HV	5.0	R	5	10	49	3/			NAG04
2007 12 09.80		S	3.3	HV	0.0	E		1	60	2			BIV
2007 12 09.90		S	3.2:	TT	2.4	B		3	&70	2/			PAR03
2007 12 09.94		S	3.1	TJ	2.2	R	11	5	&52	3			PER01
2007 12 09.94		S	3.3	HV	0.0	E		1	60	3			BIV
2007 12 09.99		S	3.8	TK	5.0	B		7	55	1	1	175	GOI
2007 12 10.47		S	3.4	AA	0.0	E		1	70				SEA
2007 12 10.76		S	3.1	TK	0.0	E		1	58	3			DIJ
2007 12 10.76		S	3.1	TK	0.0	E		1	75	3			BOU
2007 12 10.82		S	3.3	HV	0.0	E		1	60	3			BIV
2007 12 10.88		S	3.0	TK	1.5	R	3	2		2/			SCH04
2007 12 10.93		S	3.1	TJ	2.2	R	11	5	&55	2/			PER01
2007 12 10.94		S	3.3	HV	0.0	E		1	60	3			BIV

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 12 11.14		S	3.1	AE	5.0	R		12	&50	1			GRE
2007 12 11.56	x	M	3.4	HV	3.5	B		7	61	2			MIT
2007 12 11.70		S	3.2	YG	3.0	R		6	60	2			GRA04
2007 12 11.73		S	3.2	TK	0.0	E		1	58	3/			DIJ
2007 12 11.76		S	3.0	TK	0.0	E		1	75	3/			BOU
2007 12 11.77		S	3.0	TK	1.5	R	3	2		2/			SCH04
2007 12 11.81		S	3.0	TK	0.0	E		1	60	3			GON05
2007 12 11.81		S	3.1	TK	3.0	B		3		2			BUS01
2007 12 11.86		S	3.3	TK	5.0	B		8	55	3			DIE02
2007 12 11.87		S	3.5:	TK	5.0	B		10	>60	1/			COM
2007 12 11.89		S	3.1	TJ	2.2	R	11	5	&60	2			PER01
2007 12 11.89		S	3.4	TI	0.0	E		1	50	1			LAB02
2007 12 11.90		I	3.0	TK	0.0	E		1	>60	2/			RIE
2007 12 11.90		S	3.0	TK	3.0	B		4	>60	2			RIE
2007 12 11.90		S	3.2	TK	0.0	E		1	&70	2			GIL01
2007 12 11.94		B	3.5	TI	8.0	B		10	40	1			MOR09
2007 12 12.04		S	3.3	HV	0.0	E		1	60	2			BIV
2007 12 12.23		B	3.3	SC	0.0	E		1		5			HAL
2007 12 12.52		S	3.2	AA	0.0	E		1	60				SEA
2007 12 12.73		S	3.2	TK	0.0	E		1	60	2/			DIJ
2007 12 12.73		S	4.3	TK	5.0	B		10	48	2			ZAN01
2007 12 12.83		I	3.2	TK	0.0	E		1		2			BUS01
2007 12 12.83		S	3.2	TK	3.0	B		3		2			BUS01
2007 12 12.85		S	3.2	TK	0.0	E		1		2			BOU
2007 12 12.86		S	3.4	TJ	0.0	E		1	&65	2			CHE03
2007 12 12.89		S	3.5:	TK	5.0	B		10	>60	2			COM
2007 12 12.90		S	2.7	TI	0.0	E		1	70	s4			SCA02
2007 12 12.94		S	3.2	TK	1.5	R	3	2	&60	2/			SCH04
2007 12 12.99					7.0	B		15	45	3/	73 m	157	BOR
2007 12 12.99		S	3.2	TJ	5.0	N	4	1	&70	3			BOR
2007 12 12.99		S	3.3	TJ	0.0	E		1	&70	2/			BOR
2007 12 13.04		S	3.2	TJ	2.2	R	11	5	&58	2/			PER01
2007 12 13.05		M	3.1	YG	3.0	R		6	60	2			GRA04
2007 12 13.10		S	3.1	AE	5.0	R		12	&50	0/			GRE
2007 12 13.25		B	3.4	AE	0.0	E		1					GRE
2007 12 13.54	x	M	3.4	HV	3.5	B		7	62	2			MIT
2007 12 13.63		S	3.5	YG	6.6	R		10	52	1			YOS04
2007 12 13.67	x	B	3.3	HV	0.0	E		1	60	2			MIY01
2007 12 13.67	x	S	3.4	HV	2.1	B		7	50	2			MIY01
2007 12 13.71		S	3.0	HI	0.0	E		1	60	3			SAN07
2007 12 13.74	x	M	3.7	TJ	1.8	R		3	70	2			NAG08
2007 12 13.78		S	3.1	TK	0.0	E		1	&75	3			BOU
2007 12 13.82		S	3.3	TK	5.0	B		8	57	4			DIE02
2007 12 13.83		S	2.8	TI	0.0	E		1	70	s3			SCA02
2007 12 13.91		S	3.8	HV	0.7	E		1					KAM01
2007 12 13.93		S	3.3	TK	0.0	E		1	&60	2			DIJ
2007 12 13.93		S	4.3	TK	5.0	B		10	48	1			ZAN01
2007 12 13.98		S	3.0	YG	5.0	B		10	45	0			AMO01
2007 12 14.12		S	3.2	TJ	2.2	R	11	5	&64	1			PER01
2007 12 14.56	x	M	3.5	TJ	1.8	R		3	75	2			NAG08
2007 12 14.56	x	S	3.6	TJ	0.0	E		1	&80	3			NAG08
2007 12 14.58	x	M	3.5	HV	3.5	B		7	60	1/			MIT
2007 12 14.60	x	S	3.1	HV	0.0	E		1	&80	2/			YOS02
2007 12 14.60	x	S	3.4	HV	5.0	R		8	60	2			YOS02
2007 12 14.73		M	3.5	HI	3.0	R		8	90	3	12	155	SAN07
2007 12 14.75		S	4.0	AA	5.0	B		10	50	1			ZAJ
2007 12 14.80		S	3.0	AA	0.0	E		1	40	2			IVA03
2007 12 14.82		S	2.8	TI	0.0	E		1	70	s3			SCA02
2007 12 14.93		S	3.1	TK	1.5	R	3	2	>70	2			SCH04
2007 12 14.98		S	3.0	YG	5.0	B		10	50	0			AMO01
2007 12 15.16		S	3.3	TJ	2.2	R	11	5	&65	0/			PER01
2007 12 15.51		I	3.8	AA	0.0	E		1	73	1			KAN
2007 12 15.51	x	B	3.5	HV	0.0	E		1	73	2			MIY01
2007 12 15.51	x	S	3.6	HV	2.1	B		7	65	2			MIY01
2007 12 15.55		B	3.8	AA	3.5	B		7	54	2	1.4	160	KAN

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 12 15.56		S	3.6	AA	3.5	B		7	54	2	1.4	160	KAN
2007 12 15.59	x	S	3.6	TJ	1.8	R		3	&75	1/			NAG08
2007 12 15.60		S	3.5	YG	6.6	R		10	55	1			YOS04
2007 12 15.67		S	3.3	HI	0.7	E		1	50	2			NOV01
2007 12 15.75		S	3.6	HI	5.0	B		7	64	3			NOV01
2007 12 15.78		S	3.1	TK	1.5	R	3	2	&70	2/			SCH04
2007 12 15.78		S	4.5	TK	5.0	B		10	60	2			ZAN01
2007 12 15.83		S	3.2	TK	0.7	E		1	65	2			MEY
2007 12 15.83		S	3.3	TK	1.5	B		3	60	2			MEY
2007 12 15.84		S	3.6	TJ	0.7	E		1	60				PIL01
2007 12 15.87		S	3.3	TK	0.0	E		1	>60	1/			COM
2007 12 15.90		M	3.2	TT	5	N		1	75	2			HOR02
2007 12 15.90		S	3.2	TK	3.0	B		3		2			BUS01
2007 12 15.90		S	3.3	TK	0.0	E		1	&75	2			BOU
2007 12 15.90		S	3.5	TK	5.0	B		7	60	2			DIJ
2007 12 15.91		I	3.2	TK	0.0	E		1		2			BUS01
2007 12 15.91		S	3.3	HV	0.0	E		1	60	2			BIV
2007 12 15.91		S	3.3	TK	5.0	B		8	60	4			DIE02
2007 12 15.94		S	3.4	TK	0.0	E		1	&70	1			GIL01
2007 12 15.95		S	3.6	HV	0.7	E		1					KAM01
2007 12 15.98		B	3.2	TI	8.0	B		10	55	1			MOR09
2007 12 16.00		B	3.4	TK	0.0	E		1	70	2			KAR02
2007 12 16.13		S	3.3	TJ	2.2	R	11	5	&70	0/			PER01
2007 12 16.39	x	M	3.5	TJ	1.8	R		3	&80	1			NAG08
2007 12 16.52	x	B	3.5	HV	0.0	E		1	73	2			MIY01
2007 12 16.52	x	S	3.6	HV	2.1	B		7	65	2			MIY01
2007 12 16.59	x	M	3.5	HV	3.5	B		7	62	2			MIT
2007 12 16.75		M	3.3	TT	5	N		1	70	2			HOR02
2007 12 16.90		S	3.3	TT	0.8	E		1	60	2			LEH
2007 12 16.91		S	3.2	TK	1.5	R	3	2	&70	2			SCH04
2007 12 16.95		S	3.5	TK	5.0	B		8	60	4			DIE02
2007 12 16.98		S	4.0	TK	5.0	B		7	60	0			GOI
2007 12 17.02		S	3.4	TK	0.0	E		1	>60	1/			COM
2007 12 17.52		B	3.5	HV	0.0	E		1	73	2			MIY01
2007 12 17.52		S	3.6	HV	2.1	B		7	65	2			MIY01
2007 12 17.57	x	M	3.8	TJ	1.8	R		3	&80	1			NAG08
2007 12 17.60	x	M	3.6	HV	3.5	B		7	64	2			MIT
2007 12 17.66		S	3.8	YG	6.6	R		10	&50	0			YOS04
2007 12 17.68	x	S	3.4	HV	0.0	E		1	&80	2/			YOS02
2007 12 17.75		S	4.2	AA	5.0	B		10	55	1			ZAJ
2007 12 17.89		S	3.3	TK	3.0	R		6	70	2			GRA04
2007 12 17.91		S	3.3	TK	3.0	B		3		2			BUS01
2007 12 17.97					7.0	B		15	&55	3		157	BOR
2007 12 18.08		S	3.2	TK	1.5	R	3	2	>60	1			SCH04
2007 12 18.24		S	3.2	AE	5.0	R		12	&50	0			GRE
2007 12 18.52	x	M	4.0	TJ	1.8	R		3	&80	0/			NAG08
2007 12 18.54		I	3.8	AA	0.0	E		1	73	1			KAN
2007 12 18.58		S	3.5	AA	3.5	B		7	53	2	1.4	150	KAN
2007 12 18.68		S	3.5	HI	0.0	E		1	80	3	2	150	SAN07
2007 12 18.68		S	3.8	YG	6.6	R		10	58	1			YOS04
2007 12 18.73		S	3.0	TI	0.0	E		1	65	s2			SCA02
2007 12 18.88		M	3.3	TT	5	N		1	65	2			HOR02
2007 12 18.92		S	3.4	TT	0.8	E		1	50	2			LEH
2007 12 19.00		S	3.5	AE	5.0	R		12	&50	0			GRE
2007 12 19.22		S	3.4	TK	1.8	R		3	70	1/			GRA04
2007 12 20.58	x	M	3.8	HV	3.5	B		7	60	1			MIT
2007 12 20.68		M	3.4	TT	5	N		1	60	2			HOR02
2007 12 21.05		S	3.5	TK	5.0	R		8	&70	1			GRA04
2007 12 22.85		S	3.8:	TT	3.5	B		7	&50	2			PAR03
2007 12 25.69		S	3.4	TK	1.8	R	4	3	&75	1/			GRA04
2007 12 25.71		B	4.0	TK	0.8	E		1					HAS02
2007 12 25.96		B	4.1	AE	0.0	E		1					GRE
2007 12 26.40	x	B	3.4	HV	0.0	E		1	66	1/			MIY01
2007 12 26.40	x	S	4.1	HV	5.0	R		9	52	2			MIY01
2007 12 26.55	x	M	3.8	TJ	1.8	R		3	&85	0			NAG08

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 12 26.75		S	3.4	TT	0.8	E		1	70	1			LEH
2007 12 26.78		S	3.2	TK	3.0	R		4	70	2/			GON05
2007 12 26.81		S	3.5	TJ	2.2	R	11	5	&68	0/			PER01
2007 12 26.83	G	M	4.0	TI	0.8	E		1	35	1			HOR03
2007 12 26.97		S	4.0	YG	8.0	B		11					SOU01
2007 12 27.04		S	3.4	HV	0.0	E		1	60	2			CRE01
2007 12 27.07		B	3.8	SC	0.0	E		1		2			HAL
2007 12 27.72		B	4.1	TK	0.8	E		1					HAS02
2007 12 27.72	G	M	3.4	TI	0.8	E		1	55	1	1.2	150	HOR03
2007 12 27.88		S	3.5	TJ	2.2	R	11	5	>65	0/			PER01
2007 12 27.98		S	4.0	YG	8.0	B		11	60	0			SOU01
2007 12 28.12		S	3.4	TK	1.8	R	4	3	&80	1			GRA04
2007 12 28.71					5.0	B		10	70	3	1	75	PIL01
2007 12 28.71		S	3.8	TJ	0.7	E		1	70				PIL01
2007 12 28.73		S	3.6	TK	5.0	B		8	60	2			DIE02
2007 12 28.75		S	3.3	TK	1.5	R	3	2	&85	2			SCH04
2007 12 28.77		S	3.4	TI	3.0	B		4	65	1			LAB02
2007 12 28.78		S	3.9	HV	0.7	E		1	65				KAM01
2007 12 28.80		B	3.3	S	2.0	B		4	75	1/			MAR02
2007 12 28.81		S	3.5	HV	0.0	E		1	60	3			BIV
2007 12 28.97		S	4.1	TK	5.0	B		7	70	0			GOI
2007 12 29.71		M	4.0:	TJ	8.0	B		18	&55	1			RZE
2007 12 29.72		B	4.1	TK	0.8	E		1					HAS02
2007 12 29.73		S	3.4	TT	0.8	E		1	70	1			LEH
2007 12 29.74		S	3.6	TK	5.0	B		8	60	2			DIE02
2007 12 29.75		S	3.0	TI	0.0	E		1	85	s2			SCA02
2007 12 29.75	G	M	3.3	TI	0.8	E		1	60	1	1.2	150	HOR03
2007 12 29.76		S	3.3	TK	0.0	E		1	&85	2			BOU
2007 12 29.76		S	3.5	TT	2.4	R		3	80	2			PAR03
2007 12 29.76		S	4.8	TK	5.0	B		10	72	1			ZAN01
2007 12 29.77		S	3.2	TK	1.5	B		3	65	1			MEY
2007 12 29.77		S	3.4	TK	0.0	E		1	&70	2			DIJ
2007 12 29.78		S	3.3	TK	3.0	B		3		1			BUS01
2007 12 29.79		S	3.4	TK	1.5	R	3	2	&85	2			SCH04
2007 12 29.85		S	3.5:	TJ	5.0	R	4	7	&75	0			CHE03
2007 12 29.87		S	3.8:	TK	0.0	E		1	&60	1			COM
2007 12 29.88		S	3.6	TJ	2.2	R	11	5	>65	0			PER01
2007 12 29.90		S	3.5	HV	0.0	E		1	72	2			BIV
2007 12 29.97		S	3.8	TJ	2.5	B		3	65	2			BOR
2007 12 29.97		S	3.8	TJ	5.0	N		1		2			BOR
2007 12 30.22		S	3.6:	AE	5.0	R		12	>60	0			GRE
2007 12 30.39	x	M	4.1	HV	3.5	B		7	70	1			MIT
2007 12 30.44		S	4 :	AA	2.5	B		2					SEA
2007 12 30.46	x	S	3.8	HV	5.0	R		9	80	2			MIY01
2007 12 30.47		S	3.8	YG	6.6	R		10	&55	0			YOS04
2007 12 30.49		S	3.5	AA	3.5	B		7	64	1	1.3	145	KAN
2007 12 30.53	x	S	3.8	HV	5.0	R		8	&70	1/			YOS02
2007 12 30.77		S	3.3	TI	3.0	B		4	65	1			LAB02
2007 12 30.77		S	3.3	TK	2.8	R	2	2	70	2			DIJ
2007 12 30.77		S	4.8	TK	5.0	B		10	72	1			ZAN01
2007 12 30.78		S	3.3	TK	2.8	R	2	2		2			BOU
2007 12 30.78		S	3.4	TK	3.0	B		3		1			BUS01
2007 12 30.79		S	3.3	TK	1.5	R	3	2	&85	2			SCH04
2007 12 30.81		S	3.1	TK	3.0	R		4	75	2			GON05
2007 12 30.83		S	3.7:	TK	0.0	E		1	&70	1			COM
2007 12 30.86		S	3.5	TK	1.8	R	4	3	80	1			GRA04
2007 12 30.91		S	3.0	TI	0.0	E		1	90	s2			SCA02
2007 12 30.91		S	3.5	TK	0.0	E		1	&70	1			GIL01
2007 12 30.93		B	3.7	TK	0.0	E		1	&80	1/			KAR02
2007 12 30.93		S	3.6	TJ	2.2	R	11	5	&66	2			PER01
2007 12 30.94		S	4.0	HV	0.7	E		1					KAM01
2007 12 31.03		S	3.5	HV	0.0	E		1	72	2			BIV
2007 12 31.10		B	3.8	SC	0.0	E		1		2			HAL
2007 12 31.38		S	2.9	TJ	1.7	B		5	&60	3			MOR
2007 12 31.39	x	M	4.1	HV	3.5	B		7	70	1			MIT

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2007 12 31.41	x	B	3.6	HV	0.0	E		1	80	1			MIY01
2007 12 31.41	x	S	3.8	HV	5.0	R		9	88	2			MIY01
2007 12 31.47		S	3.8	YG	6.6	R		10	&60	1			YOS04
2007 12 31.64		S	3.5	AA	0.0	E		1	60	2			IVA03
2007 12 31.73		S	3.3	TK	2.8	R	2	2	&70	2			DIJ
2007 12 31.76		S	3.4	TK	0.0	E		1	&75	1			BOU
2007 12 31.76		S	3.5:	HI	5.0	B		7	65	2			NOV01
2007 12 31.78		S	3.4	TK	3.0	B		3		1			BUS01
2007 12 31.79		B	3.4	S	2.0	B		4	90	1/			MAR02
2007 12 31.84		S	4.1	TK	5.0	B		10	96	1			ZAN01
2008 01 01.01		S	3.5	HV	0.0	E		1	78	2			BIV
2008 01 01.04		S	3.2	TK	3.0	R		4	75	2			GON05
2008 01 01.05		S	4.0	YG	5.0	B		10	40	0			AMO01
2008 01 01.08		S	3.6	TJ	2.2	R	11	5	&60	1/			PER01
2008 01 01.19		S	3.6:	AE	5.0	R		12	&60	0			GRE
2008 01 01.38	x	S	3.8	TJ	0.0	E		1	&75	1			NAG08
2008 01 01.46		S	3.7	YG	6.6	R		10	52	2			YOS04
2008 01 01.48	x	S	3.7	HV	0.0	E		1	&70	1/			YOS02
2008 01 01.52	x	M	4.0	HV	3.5	B		7	67	1/			MIT
2008 01 01.66		B	4.0	YG	4.5	B		12	&80	1/			CHE09
2008 01 01.67		M	3.6	HI	0.7	E		1	65	2			NOV01
2008 01 01.68		S	3.4	AA	5	R		8	70	1/			KOR01
2008 01 01.73		S	3.1	TI	0.0	E		1	85	s2			SCA02
2008 01 01.83		S	3.4	TT	5	N		1	70	1			HOR02
2008 01 01.83		S	4.0	HD	0.0	E		1	85	1			NEV
2008 01 01.93		S	3.4	TK	2.8	R	2	2	&70	2/			DIJ
2008 01 01.94		S	3.4	TK	3.0	B		3		1			BUS01
2008 01 01.95		S	3.5	TK	0.0	E		1	&80	1/			BOU
2008 01 01.96		S	4.0	HV	0.7	E		1					KAM01
2008 01 01.97		S	3.4	TK	1.5	R	3	2	&80	1/			SCH04
2008 01 01.98		S	4.0	YG	5.0	B		7	60	0			SOU01
2008 01 01.98		S	4.0	YG	5.0	B		7	60	0			SOU01
2008 01 01.99		S	3.5	HV	0.0	E		1	72	2			BIV
2008 01 02.01		S	3.2	TK	0.7	E		1	55	1			MEY
2008 01 02.01		S	3.2	TK	1.5	B		3	60	1/			MEY
2008 01 02.11		B	3.8	SC	0.0	E		1		2			HAL
2008 01 02.42	x	B	3.8	HV	0.0	E		1	66	1			MIY01
2008 01 02.42	x	S	3.8	HV	5.0	R		9	80	2			MIY01
2008 01 02.51		S	4.0	YG	6.6	R		10	&55	1			YOS04
2008 01 02.65		M	3.7	TJ	3.0	B		8	70	0/			SHU
2008 01 02.65		S	3.7	HI	5.0	B		7	60	2			NOV01
2008 01 02.65	G	M	3.8	TJ	0.0	E		1	80	1			SHU
2008 01 02.72		S	3.5	TK	1.5	R	3	2	&70	1/			SCH04
2008 01 02.74		S	3.6	TK	5.0	B		8	60	2			DIE02
2008 01 02.75		S	4.5	AA	5.0	B		10	60	1			ZAJ
2008 01 02.77		S	3.2	TK	1.5	B		3	75	1/			MEY
2008 01 02.77		S	3.3	TK	0.7	E		1	75	0/			MEY
2008 01 02.80		I	3.3	TK	0.0	E		1	&70	2			RIE
2008 01 02.80		S	3.4	TK	3.0	B		4	&80	1/			RIE
2008 01 02.84		S	3.5	AA	5	R		8	70	1/			KOR01
2008 01 03.18		B	4.0	AE	0.0	E		1					GRE
2008 01 03.18		S	3.6	AE	5.0	R		12	&55	0/			GRE
2008 01 03.23	x	M	3.9	HV	5.0	N		1					OME
2008 01 03.46		S	4.0	YG	5.0	R		10	75	1			YOS04
2008 01 03.63		S	4.0	HI	5.0	B		7	70	1/			NOV01
2008 01 03.80		S	3.4	TK	3.0	R		4	80	2			GON05
2008 01 03.83		S	3.5	TK	1.8	R	4	3	85	1			GRA04
2008 01 03.84		S	3.4	TT	5	N		1	80	1			HOR02
2008 01 03.97		S	3.6	TJ	2.5	B		3	&85	2			BOR
2008 01 03.99		S	4.2	TK	5.0	B		7	60	0			GOI
2008 01 04.03		S	3.5	TJ	2.2	R	11	5	&78	0			PER01
2008 01 04.05		S	3.5	HV	0.0	E		1	78	1			BIV
2008 01 04.40	x	B	3.8	HV	0.0	E		1	66	1			MIY01
2008 01 04.40	x	S	3.8	HV	5.0	R		9	80	2			MIY01
2008 01 04.41	x	S	3.8	TJ	1.8	R		3	&80	1			NAG08

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2008 01 04.42	x	S	3.6	HV	0.0	E		1	&80	2			YOS02
2008 01 04.45		S	3.3	YG	0.0	E		1	100	D1			YOS04
2008 01 04.45		S	3.6	YG	5.0	R		10	85	2			YOS04
2008 01 04.49	x	M	4.1	HV	3.5	B		7	68	1/			MIT
2008 01 04.65		S	3.9	HI	5.0	B		7	70	1/			NOV01
2008 01 04.71		S	3.4	TT	2.4	R		3	85	2			PAR03
2008 01 04.72		S	4.0	HD	0.0	E		1	85	1			NEV
2008 01 04.75	G	B	4.5	TK	0.0	E		1		1			SER
2008 01 04.80		S	4.0:	TJ	5.0	R	4	7	&70	0			CHE03
2008 01 04.93		M	3.7	TJ	3.0	B		8	80	0/			SHU
2008 01 05.52	x	S	3.6	HV	0.0	E		1	&80	2			YOS02
2008 01 05.63	x	M	4.1	HV	3.5	B		7	67	1/			MIT
2008 01 05.65		S	3.5	AA	0.0	E		1	60	1			IVA03
2008 01 05.73		S	3.3	TT	2.4	R		3	90	2			PAR03
2008 01 05.77		M	3.9	TJ	3.0	B		8	80	0/			SHU
2008 01 05.77	G	B	4.5	TK	0.0	E		1		1			SER
2008 01 05.83		S	3.5	TK	3.0	B		3	&80	1			BUS01
2008 01 06.00		S	4.0:	YG	5.0	B		10					AMO01
2008 01 06.41	x	S	3.9	TJ	1.8	R		3	&75	1			NAG08
2008 01 06.63	x	B	4.1	HV	5.0	R		10	70	2	56 m	135	NAG04
2008 01 06.73		S	3.4	TK	0.7	E		1	80	0/			MEY
2008 01 06.73		S	3.5	TK	0.0	E		1	&60	1/			DIJ
2008 01 06.73		S	3.5	TK	1.5	B		3	55	1			MEY
2008 01 06.73		S	3.5	TT	5	N		1	80	1			HOR02
2008 01 06.75		S	3.5	HI	4.2	B		10	50	1			SZA
2008 01 06.75		S	3.6	TK	5.0	B		8	60	2			DIE02
2008 01 06.75		S	4.0	HV	0.7	E		1					KAM01
2008 01 06.76		I	3.4	TK	0.0	E		1	&75	2			RIE
2008 01 06.76		S	3.5	TK	0.0	E		1	&90	1/			BOU
2008 01 06.78		S	3.5	TK	1.5	R	3	2	&80	1/			SCH04
2008 01 06.81		S	3.3	TK	3.0	R		4	80	2			GON05
2008 01 06.82		S	3.5	TK	3.0	B		3	&80	1			BUS01
2008 01 06.88		S	3.4	TI	0.0	E		1	70	s1			SCA02
2008 01 06.89		S	4.5	TK	5.0	B		10	48	1	1		ZAN01
2008 01 06.97		S	4.2	TK	5.0	B		7	60	0			GOI
2008 01 07.23	x	M	4.0	HV	5.0	N		1					OME
2008 01 07.72		S	3.4	TK	0.7	E		1	70	0			MEY
2008 01 07.72		S	3.5	TK	1.5	B		3	55	1			MEY
2008 01 07.77		S	3.6	TK	3.0	B		3		1			BUS01
2008 01 07.77		S	4.5	TK	5.0	B		10	48	1	1	145	ZAN01
2008 01 07.79		S	3.4	TJ	0.7	E		1	20	3			PIL01
2008 01 07.80		B	3.9	TK	0.8	E		1					HAS02
2008 01 07.80		S	3.6	TK	2.8	R	2	2	&90	1/			DIJ
2008 01 07.82		S	3.8	HI	4.2	B		10	72	1			SZA
2008 01 07.86		S	3.6	TK	0.0	E		1	&85	1/			BOU
2008 01 07.87		S	3.8:	TK	0.0	E		1	&90	1/			COM
2008 01 07.97		S	4.1	TK	5.0	B		7	65	1			GOI
2008 01 07.98					5.0	B		10	45	2	80 m	145	BOR
2008 01 07.98		S	3.7	TJ	2.5	B		1	&90	1			BOR
2008 01 08.05		S	4.0	YG	8.0	B		11	60	0			SOU01
2008 01 08.05		S	4.0	YG	8.0	B		11	60	0			SOU01
2008 01 08.46		S	4.1	HV	5.0	R		9	66	1			MIY01
2008 01 08.72		S	3.6	TT	0.8	E		1	60	1			LEH
2008 01 08.76		S	4.5	AA	5.0	B		10	60	1	1.5	60	KES01
2008 01 08.78		S	3.5	TK	1.5	R	3	2	&70	1			SCH04
2008 01 08.79		S	3.5	HI	5.0	R	6	8	70	1/			TOT03
2008 01 08.79		S	4.2	HV	0.7	E		1					KAM01
2008 01 08.81		S	3.5	TK	0.7	E		1	80	0			MEY
2008 01 08.81		S	3.5	TK	1.5	B		3	55	1			MEY
2008 01 08.85		S	3.6	TT	5	N		1	80	1			HOR02
2008 01 08.97		S	4.2	TK	5.0	B		7	60	0/			GOI
2008 01 08.98		S	4.2	YG	5.0	B		7	60	0			SOU01
2008 01 08.98		S	4.2	YG	5.0	B		7	60	0			SOU01
2008 01 09.11		B	3.8	SC	0.0	E		1		1			HAL
2008 01 09.61	x	B	3.9	HV	5.0	R	5	10	82	2			NAG04

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2008 01 09.74		S	3.6	TK	1.5	B		3	55	1			MEY
2008 01 09.75		S	3.5	TK	0.7	E		1	80	0			MEY
2008 01 09.76		S	3.5	TK	1.5	R	3	2	&85	1			SCH04
2008 01 09.76		S	4.0:	TK	0.0	E		1	&80	1/			COM
2008 01 09.77		S	3.4	TI	0.0	E		1	95	s2			SCA02
2008 01 09.77		S	3.5	TK	0.0	E		1	&90	1/			DIJ
2008 01 09.81		S	3.6	TK	3.0	B		3		1			BUS01
2008 01 09.92		S	3.4	TK	3.0	R		4	90	2			GON05
2008 01 09.97		S	4.2	YG	5.0	B		7	60	0			SOU01
2008 01 09.97		S	4.2	YG	5.0	B		7	60	0			SOU01
2008 01 09.99					5.0	B		7	55	2	80	m 142	BOR
2008 01 09.99		S	3.7	TJ	2.5	B		3	&70	1/			BOR
2008 01 10.45		S	4.0	AA	0.0	E		1					SEA
2008 01 10.48	x	M	4.2	HV	3.5	B		7	64	1			MIT
2008 01 10.80		S	3.4	TK	3.0	R		4	70	1/			GON05
2008 01 10.89		S	3.9:	HV	0.0	E		1	60	1			BIV
2008 01 10.97		B	3.8	TK	0.8	E		1					HAS02
2008 01 10.97		S	4.2	YG	5.0	B		7	60	0			SOU01
2008 01 10.97		S	4.2	YG	5.0	B		7	60	0			SOU01
2008 01 11.45		S	4.2	AA	0.0	E		1					SEA
2008 01 11.74		B	3.8:	TK	0.0	E		1	&75	1/			KAR02
2008 01 11.75		S	3.5	TT	0.8	E		1	80	1			LEH
2008 01 11.82		S	3.5	TI	0.0	E		1	100	s2			SCA02
2008 01 11.86		S	3.8	TT	2.4	R		3	96	1/			PAR03
2008 01 11.89		S	3.7	TK	1.8	R	4	3	&85	0/			GRA04
2008 01 11.98					5.0	B		10	60	2	1.5	130	BOR
2008 01 11.98		S	3.7	TJ	2.5	B		3	100	1/			BOR
2008 01 12.03		S	3.8	TJ	2.2	R	11	5	>65	0/			PER01
2008 01 12.75		S	3.7	TK	0.0	E		1	&90	1			GIL01
2008 01 12.76		S	3.5	TK	0.7	E		1	80	0/			MEY
2008 01 12.76		S	3.6	TK	1.5	B		3	55	1			MEY
2008 01 12.76		S	4.5	TK	5.0	B		10	48	1	1	145	ZAN01
2008 01 12.77		S	3.7	HV	0.0	E		1	60	1			BIV
2008 01 12.78		S	3.7	TK	0.0	E		1	&95	1/			BOU
2008 01 12.80		S	3.5	TK	1.5	R	3	2	&80	1			SCH04
2008 01 12.80		S	3.6	TK	3.0	B		3		1			BUS01
2008 01 12.82		S	3.6	TI	3.0	B		4	75	1			LAB02
2008 01 12.82		S	3.8	TT	2.4	R		3	90	1/			PAR03
2008 01 13.00		S	3.4	TK	3.0	R		4	70	2			GON05
2008 01 13.40	x	S	4.2	TJ	1.6	B		6	&70	1			NAG08
2008 01 13.45		S	4.6	AA	3.5	B		6	50				SEA
2008 01 13.78		S	3.6	TK	1.5	R	3	2	&80	1			SCH04
2008 01 13.79		S	3.5	TI	0.0	E		1	95	s2			SCA02
2008 01 13.87		S	4.5	TK	5.0	B		10	48	1	1	145	ZAN01
2008 01 13.88		M	4.0	TJ	3.0	B		8	90	0			SHU
2008 01 13.90		I	4.2	TK	0.0	E		1	100	1			COM
2008 01 13.91		S	3.6	TT	0.8	E		1	70	1			LEH
2008 01 13.91		S	3.7	TK	0.0	E		1	&95	1/			BOU
2008 01 13.95		S	4.5	AA	0.0	E		1	75	1			SAR02
2008 01 13.97		S	3.9	TT	5	N		1	80	1			HOR02
2008 01 13.97		S	4.2	HV	0.7	E		1					KAM01
2008 01 14.72		M	4.1	TJ	3.0	B		8	80	0/			SHU
2008 01 14.72		S	4.5	HD	0.0	E		1	80	1			NEV
2008 01 14.73		S	3.4	TI	0.0	E		1	95	s2			SCA02
2008 01 14.76		S	4.5	TK	5.0	B		10	48	1	1	145	ZAN01
2008 01 15.16		B	4 :	SC	0.0	E		1		1			HAL
2008 01 15.46		S	4.2	HV	5.0	R		9	66	1			MIY01
2008 01 15.78		S	4.0:	TT	3.5	B		7	&70	1/			PAR03
2008 01 15.97		S	4.2:	YG	8.0	B		11					SOU01
2008 01 18.83		S	4.2	TJ	2.2	R	11	5	&45	2			PER01
2008 01 23.69		S	4.8	AA	5.0	B		10	40	2			SAJ
2008 01 24.70		S	4.5:	AA	5.0	B		10	45	2			SAJ
2008 01 24.81		S	4.0	TK	0.0	E		1	&90	0			DIJ
2008 01 24.83		S	3.9	TJ	2.2	R	11	5	&75	1			PER01
2008 01 24.98		S	4.5	TK	5.0	B		7	70	0			GOI

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2008 01 25.47	x	S	4.6	HV	5.0	R		9	48	0/			MIY01
2008 01 25.74		S	4.3	TT	5	N		1	90	0/			HOR02
2008 01 25.75		S	3.5	TT	0.8	E		1	90	1			LEH
2008 01 25.76		S	3.7	HI	0.0	E		1	80	0/			SAN07
2008 01 25.77		S	3.8	TI	0.0	E		1	80	s2			SCA02
2008 01 25.78		S	12.0	HS	50.8	L	5	123	1.5	1			TOT03
2008 01 25.80		S	4.0	TK	3.0	B		3	&70	1			BUS01
2008 01 25.87		S	4.0	TJ	2.2	R	11	5	&75	3			PER01
2008 01 25.99		B	4.3	TJ	2.5	B		3	70				BOR
2008 01 26.23	x	M	3.9	HV	5.0	N		1					OME
2008 01 26.47	x	M	5.2	HV	3.5	B		7	&60	0/			MIT
2008 01 26.74		S	4.5	HI	4.2	B		10	65	1			SZA
2008 01 26.75		S	4.0	TI	0.0	E		1	70	s2			SCA02
2008 01 26.76		S	3.9	TK	5.0	R	4	8	&80	1			GRA04
2008 01 26.79		S	4.0	HI	0.0	E		1	60	0/			SAN07
2008 01 26.79		S	4.8	AA	0.0	E		1	85	0/			UJV
2008 01 26.81		S	3.8	TJ	2.2	R	11	5	&80	2			PER01
2008 01 26.83		S	3.7	TK	3.0	R		4	65	1			GON05
2008 01 26.83		S	12.4	HS	50.8	L	5	123	0.7	1			SZA
2008 01 27.43	x	S	4.7	TJ	1.8	R		3	&55	0/			NAG08
2008 01 27.78		S	3.8	TI	3.0	B		4	65	1			LAB02
2008 01 27.87		S	3.7	TK	3.0	R		4	65	1			GON05
2008 01 28.77		S	4.0	HI	0.0	E		1	60	0/			SAN07
2008 01 28.78		S	4.9	AA	0.0	E		1	80	0			UJV
2008 01 28.81		S	4.0	TI	0.0	E		1	60	s2			SCA02
2008 01 28.92		S	4.0	TJ	2.2	R	11	5	&84	3			PER01
2008 01 29.07		B	6.1	AC	3.5	B		7	120	1			NOW
2008 01 29.74	%	S	4.0	TK	1.5	B		3	70	1			MEY
2008 01 29.83		S	3.8	TK	3.0	R		4	65	1			GON05
2008 01 29.88		S	4.1	TI	0.0	E		1	60	s2			SCA02
2008 01 30.23	x	M	4.5	HV	5.0	N		1					OME
2008 01 30.72		S	4.5	AA	5.0	B		10	40	3			SAJ
2008 01 30.74		S	4.0	TI	0.0	E		1	65	s2			SCA02
2008 01 30.76		S	4.1	TK	0.0	E		1	&10	0/			BOU
2008 01 30.80		S	5.3	TK	5.0	B		10	50	0			ZAN01
2008 01 30.96		S	4.1	TK	0.0	E		1	&90	0/			DIJ
2008 01 30.98		S	4.3	TK	1.5	R	3	2	&70	1			SCH04
2008 01 31.00		B	4.2	TJ	2.5	B		3	80				BOR
2008 01 31.08		S	4.1	AE	5.0	R		12	&50	0			GRE
2008 01 31.43	x	S	4.6:	TJ	1.8	R		3	&60	0			NAG08
2008 01 31.47	x	S	4.7	HV	5.0	R		9	58	1			MIY01
2008 01 31.95		S	4.1	TJ	2.2	R	11	5	>70	3			PER01
2008 02 01.10		B	4.0	SC	0.0	E		1		1			HAL
2008 02 01.54	x	S	5.3	HV	3.5	B		7	65	0			MIT
2008 02 01.73		S	5.0	AA	5.0	B		10	30	2			SAJ
2008 02 01.77		S	4.1	TK	3.0	B		3	&70	1			BUS01
2008 02 01.78		S	4.1	TK	3.0	B		4	&75	1			RIE
2008 02 01.79		S	4.4:	TT	2.4	B		3	&60	1/			PAR03
2008 02 01.80		S	4.3	TK	1.5	R	3	2	&70	0			SCH04
2008 02 02.76		S	4.1	TK	3.0	B		3	&75	0/			BUS01
2008 02 02.77		B	4.3	TK	0.8	E		1					HAS02
2008 02 02.79		S	3.7	TT	0.8	E		1	80	1			LEH
2008 02 02.79		S	4.1	TK	3.0	B		4	&75	1			RIE
2008 02 02.79		S	4.3	TK	1.2	R	4	3	&75	0			SCH04
2008 02 02.81		S	3.9	TK	3.0	R		4	70	1			GON05
2008 02 02.82		S	4.0	TI	0.0	E		1	60	s2			SCA02
2008 02 02.82		S	4.6	TJ	0.7	E		1	40	2			PIL01
2008 02 02.84		S	4.3	TJ	2.2	R	11	5	&70	3			PER01
2008 02 03.18		B	4.0	SC	0.0	E		1		1			HAL
2008 02 03.72		S	4.8	HD	0.0	E		1	70	0			NEV
2008 02 03.78		S	4.4	TT	2.4	B		3	90	1/			PAR03
2008 02 03.79		S	3.6	TT	0.8	E		1	90	1			LEH
2008 02 03.82		S	4.2	TI	0.0	E		1	60	s2			SCA02
2008 02 03.97		S	6.0	TK	5.0	B		10	50	0			ZAN01
2008 02 04.77		S	4.4:	TT	2.4	B		3	&70	1/			PAR03

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2008 02 04.79		S	6.0	TK	5.0	B		10	50	0			ZAN01
2008 02 04.82		S	4.4	TK	1.2	R	4	3	&75	0			SCH04
2008 02 04.87		S	4.5	TJ	2.2	R	11	5	&80	1			PER01
2008 02 04.94		S	3.9	TK	3.0	R		4	70	1			GON05
2008 02 04.98		S	4.6	TK	5.0	B		7	80	0			GOI
2008 02 05.48	x	S	4.7	HV	5.0	R		9	48	0			MIY01
2008 02 05.76		S	4.4:	TT	2.4	B		3	&70	1/			PAR03
2008 02 05.90		S	4.7	HI	0.0	E		1	70	1			TOT03
2008 02 06.81		S	4.0	TI	3.0	B		4	65	1			LAB02
2008 02 06.87		S	4.8	TK	1.5	R	3	3	&70	0			SCH04
2008 02 06.94		S	3.8	TK	3.0	R		4	70	1/			GON05
2008 02 06.95		S	4.6	TJ	2.2	R	11	5	&70	0/			PER01
2008 02 07.44		S	4.7	AA	2.5	B		2					SEA
2008 02 07.47	x	S	4.6:	TJ	1.8	R		3	&70	0			NAG08
2008 02 07.97		S	4.6	TJ	2.2	R	11	5	&85	1			PER01
2008 02 08.45	x	S	5.1	HV	5.0	R		9	48	0			MIY01
2008 02 08.77		S	3.8	TT	0.8	E		1	80	1			LEH
2008 02 08.82		S	4.3	TI	0.0	E		1	70	s2			SCA02
2008 02 08.90		S	5.0:	TT	3.5	B		7	&50	1/			PAR03
2008 02 08.97		S	4.7	TJ	2.2	R	11	5	&90	0/			PER01
2008 02 08.99		S	4.9	TK	1.5	R	3	3	&70	0			SCH04
2008 02 09.17		B	4.0	SC	0.0	E		1		1			HAL
2008 02 09.44		S	4.7	AA	2.5	B		2	80				SEA
2008 02 09.74		S	4.5	TJ	2.4	B		8	60	0	1.5		PIL01
2008 02 09.78		S	6.0	TK	5.0	B		10	50	0			ZAN01
2008 02 09.81		S	3.8	TT	0.8	E		1	90	1			LEH
2008 02 09.82		S	4.1	TK	1.8	R	4	3	&90	1			GRA04
2008 02 09.83		S	4.9	TK	1.5	R	3	3	&70	0			SCH04
2008 02 09.89		S	3.9	TK	3.0	R		4	70	1/			GON05
2008 02 10.02		S	4.6	TJ	2.2	R	11	5	&90	1			PER01
2008 02 10.61	x	B	5.9	HV	5.0	R	5	10	74	2/			NAG04
2008 02 10.77		S	4.4	TK	3.0	B		3	&85	0			BUS01
2008 02 10.83		S	3.8	TT	0.8	E		1	80	1			LEH
2008 02 10.92		S	4.9	TK	1.5	R	3	3	&75	0			SCH04
2008 02 10.98		S	4.6	TT	2.4	B		3	70	1/			PAR03
2008 02 11.01		B	4.3	TJ	2.5	B		3	60				BOR
2008 02 11.02		S	6.0	TK	5.0	B		10	50	0			ZAN01
2008 02 11.92		S	6.2	TK	5.0	B		10	50	0			ZAN01
2008 02 12.16		S	4.6	TJ	5.0	R		12	&60	0			GRE
2008 02 12.73		S	5.5	AA	5.0	B		10	15	1			SAJ
2008 02 12.77		S	4.2	TT	5.0	B		10	70	1			LEH
2008 02 13.02		S	4.1	TK	3.0	R		4	70	1/			GON05
2008 02 16.81		S	4.4	TT	5.0	B		10	60	1			LEH
2008 02 22.82		S	4.2	TK	3.0	R		4	70	1/			GON05
2008 02 22.83		S	4.3	TK	0.0	E		1	70	1			GON05
2008 02 23.25	x	M	4.2	HV	5.0	N		1	&60				OME
2008 02 23.42	x	S	5.1	HV	5.0	R		9	40	1			MIY01
2008 02 23.83		S	4.6	TI	3.0	B		4	60	1			LAB02
2008 02 24		B	6.2	AC	5.6	B		8	60	1			NOW
2008 02 24.25	x	M	4.2	HV	5.0	N		1					OME
2008 02 24.75		S	4.6	TT	2.4	B		3	90	1			PAR03
2008 02 24.79		S	4.4	TT	0.8	E		1	90	0/			LEH
2008 02 24.79		S	5.0	TJ	5.0	B		10	30	1			PIL01
2008 02 25.79		S	4.8	TT	0.0	E		1	70	0/			LEH
2008 02 25.86		S	4.8	TJ	2.2	R	11	5	&60	2/			PER01
2008 02 26.00		S	5.0	TK	5.0	B		7	40	0			GOI
2008 02 26.74		S	6.0	AA	5.0	B		10	20	2			SAJ
2008 02 27.46	x	S	5.2	HV	5.0	R		9	40	0/			MIY01
2008 02 27.46	x	S	5.4	TK	5.0	R		8	&50	1/			YOS02
2008 02 27.79		S	4.8	TT	0.0	E		1	60	0/			LEH
2008 02 28.48	x	S	5.3:	TK	5.0	R		8	&50	1			YOS02
2008 02 29.25	x	M	4.6	HV	5.0	N		1					OME
2008 02 29.46	x	S	5.4	HV	5.0	R		9	40	0			MIY01
2008 02 29.96		S	4.9	TJ	2.2	R	11	5	&36	1/			PER01
2008 03 01.86		S	4.9	TJ	2.2	R	11	5	&65	1/			PER01

Comet 17P/Holmes [cont.]

DATE (UT)	N	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
2008 03 01.88		S	4.4	TK	3.0	R		4	70	1/			GON05
2008 03 02.75		S	5.0:	HI	0.0	E		1	60	0/			SAN07
2008 03 02.76		S	4.7:	TT	3.5	B		7	&70	1/			PAR03
2008 03 02.81		S	4.6	TI	3.0	B		4	60	1			LAB02
2008 03 03.99		S	5.2	TK	5.0	B		7	60	0			GOI
2008 03 04.76		S	5.8	TJ	5.0	B		10	40	0			PIL01
2008 03 04.91		S	5.1	TJ	2.2	R	11	5	&65	1/			PER01
2008 03 05.42	x	M	5.5:	TJ	3.5	B		7	&70	0			NAG08
2008 03 05.45		S	4.7	YG	5.0	R		10	80	1			YOS04
2008 03 05.50	x	S	5.6	HV	5.0	R		9	40	0			MIY01
2008 03 05.86		S	5.0	TJ	2.2	R	11	5	&80	1/			PER01
2008 03 05.89		S	4.6	TK	3.0	R		4	70	1/			GON05
2008 03 06.95		S	5.2	TJ	2.2	R	11	5	&65	1/			PER01
2008 03 06.98		S	4.8	TK	3.0	R		4	55	1			GON05
2008 03 07.82		S	4.6	TI	3.0	B		4	70	1			LAB02
2008 03 08.49	x	S	5.8	HV	5.0	R		9	32	0			MIY01
2008 03 08.76		S	4.7	HI	5.0	B		7	40	1/			NOV01
2008 03 09.83		S	5.0:	TT	3.5	B		7	&60	1			PAR03
2008 03 10.55	x	S	5.7	TK	5.0	R		8	&50	1			YOS02
2008 03 10.93		S	4.7	TK	3.0	R		4	70	1			GON05
2008 03 10.94		S	4.5:	TK	0.0	E		1	&60	1			GON05
2008 03 22.73		S	5.5:	HI	3.0	B		8		0			NOV01
2008 03 26.80		S	5.5:	TT	3.5	B		7	&50	1			PAR03
2008 03 26.95		S	5.8	TK	5.0	B		7	60	0			GOI
2008 03 28.93		S	5.2	TK	3.0	R		4	60	0			GON05
2008 03 29.81		S	6.0:	HI	5.0	B		7	50	0			NOV01
2008 03 29.81		S	7.0	TJ	32.0	L	5	36	12	0			PIL01
2008 03 30.87		S	5.2	TK	3.0	R		4	60	0			GON05
2008 03 31.82		S	5.5	TI	3.0	B		4	50	1			LAB02
2008 04 03.90		S	5.4	TK	3.0	R		4	60	0			GON05
2008 04 04.86		S	5.5	TI	3.0	B		4	55	1			LAB02
2008 04 05.86		S	5.3	TI	3.0	B		4	60	1			LAB02
2008 04 23.92		S[	6.2	TK	5.0	R		6	!60				GON05
2008 04 25.85		S	6.0:	TT	5.0	B		7	&60	1			PAR03
2008 04 30.85		S	5.5	TI	8.0	B		11	50	1			LAB02

◇ ◇ ◇

Full-Format CCD Data of Comet 17P

All but one of the CCD photometric observations tabulated below were summarized in the last three issues of the *ICQ*. See the notes regarding this special tabulation on page 81 of this issue.

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 page 81 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".

◇ ◇ ◇

Comet 17P/Holmes

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2007 05 19.75		C	14.8	TJ	25.0	L	5	a960	0.8		1.5m	252	S 0.8 m	K26	SI4	5*	P	ST9	KAD02
2007 05 25.77		C	14.9	TJ	25.0	L	5	a720	0.8				S 0.8 m	K26	SI4	5*	P	ST9	KAD02
2007 06 02.74		C	14.8:	TJ	25.0	L	5	a720	0.4				S 0.4 m	K26	SI4	5*	P	ST9	KAD02
2007 06 22.73		C	14.8	TJ	25.0	L	5	a270	0.85		1.8m	249	S 0.85m	K26	SI4	5*	P	ST9	KAD02
2007 06 29.75		C	14.8	TJ	25.0	L	5	a480	0.8		0.9m	251	S 0.8 m	K26	SI4	5*	P	ST9	KAD02
2007 07 05.77		C	14.7	TJ	25.0	L	5	A080	0.75		1.6m	253	S 0.75m	K26	SI4	5*	P	ST9	KAD02
2007 07 15.78		C	14.9	TJ	25.0	L	5	a180	0.7		3.7m	249	S 0.7 m	K26	SI4	5*	P	ST9	KAD02
2007 07 17.01	d	k	15.0	LB	14.5	L	8	a800	0.4				C 0.80m	K40	GAI	5*		ST7	SRB
2007 07 17.01	d	k	15.8	LB	14.5	L	8	a800	0.4				C 0.40m	K40	GAI	5*		ST7	SRB
2007 07 17.01	d	k	16.4	LB	14.5	L	8	a800	0.4				C 0.20m	K40	GAI	5*		ST7	SRB
2007 07 23.75	ax	C	15.5	HV	35.0	C	14	a120	0.3	5	1.0m	250	S 0.71m	KA1a	SI5	5		STL	TSU02
2007 07 25.72	x	C	15.7	GA	16.0	L	6	a240	0.5		1.3m	248	S 0.5 m	K26	SI5	5		ST9	YOS02
2007 07 27.73		C	15.3	TJ	25.0	L	5	A080	0.65		1.6m	248	S 0.65m	K26	SI4	5*	P	ST9	KAD02
2007 08 09.75	ax	C	15.5	HV	35.0	C	14	a 90	0.4	4	2.5m	255	S 0.80m	KA1a	SI5	5		STL	TSU02
2007 08 15.99		C	16.5	UU	30.0	L	5	a300	0.3	6	0.5m	260	C18.0 s	ICX	A41	4	P	QHY	NEV
2007 08 26.70		C	15.4	TJ	25.0	L	5	A440	0.55		0.9m	251	S 0.55m	K26	SI4	5*	P	ST9	KAD02
2007 09 07.04		C	17.0	UO	30.0	L	5	a420	0.2	7	1 m	260	C12.6 s	ICX	MIm	4	P	QHY	NEV
2007 09 10.97		C	16.4	UO	30.0	L	5	a300	0.3	8	1 m	257	C14.4 s	ICX	MIm	4	P	QHY	NEV
2007 09 21.06		C	16.4	UO	30.0	L	5	a300	0.3	7	0.7m	260	C12.6 s	ICX	MIm	4	P	QHY	NEV
2007 09 25.71		C	16.2	TJ	25.0	L	5	B100	0.45		0.7m	250	S 0.45m	K26	SI4	5*	P	ST9	KAD02
2007 10 09.86		C	16.4	UO	8.0	R	7	a 60	0.30	2/			C 0.30m	SAL	A41	4		AAL	SHU
2007 10 16.84		C	16.3	UO	8.0	R	7	a420	0.58	7/			C 0.58m	SAL	A41	5		AAL	SHU
2007 10 21.60		C	16.5	TJ	25.0	L	5	B160	0.4		0.4m	235	S 0.4 m	K26	SI4	5*	P	ST9	KAD02
2007 10 24.61		C	3.6	TJ	25.0	L	5	a 0		9			S 1.7 m	K26	SI4	5	P	ST9	KAD02
2007 10 24.67		C	4.0	UO	8.0	R	7	a 60	3	9			C 3.00m	SAL	A41	4		AAL	SHU
2007 10 25.35		k	2.2	HC	62	L	5	a 1	1.32				C60 s	TK2	Mir			FLD	MCG
2007 10 25.35		k	2.4	HC	62	L	5	a 1	1.32				C30 s	TK2	Mir			FLD	MCG
2007 10 25.35		k	4.0	HC	62	L	5	a 1	1.32				C 8 s	TK2	Mir			FLD	MCG
2007 10 25.68		C	2.9	UO	8.0	R	7	a 60	8	8/			C 8.00m	SAL	A41	4		AAL	SHU
2007 10 26.18		B	4.1	ST	41	T	10	a005	2.00				C58 s	K6M	PHO	5		STX	SCH16
2007 10 26.18		H	2.6	ST	41	T	10	a005	2.05				C58 s	K6M	PHO	5		STX	SCH16
2007 10 26.18		V	3.4	ST	41	T	10	a005	2.07				C58 s	K6M	PHO	5		STX	SCH16
2007 10 26.18		k	3.0	ST	41	T	10	a005	2.10				C58 s	K6M	PHO	5		STX	SCH16
2007 10 27.48	x	C	2.6	TJ	16.0	L	6	a 1	9.0				C 9.0 m	K26	SI5	5		ST9	YOS02
2007 10 27.48	x	c	6.3	TJ	16.0	L	6	a 1	0.4				C 0.4 m	K26	SI5	5		ST9	YOS02
2007 10 27.71		C	2.6	TJ	25.0	L	5	a 2	14.4				S14.4 m	K26	SI4	5	P	ST9	KAD02
2007 10 28.50		C	2.4	TJ	25.0	L	5	a 2	16.3				S16.3 m	K26	SI4	5	P	ST9	KAD02
2007 10 29.85		V	2.4	TA	5.0	R	7	a 75	19				S 9.3 m	KAIa	MIm	4		ST2	QVA
2007 10 31.78	d	k	2.3	LB	14.5	L	8	a150	11.6				C12.15m	K40	GAI	5*		ST7	SRB
2007 10 31.78	d	k	2.8	LB	14.5	L	8	a150	11.6				C 6.50m	K40	GAI	5*		ST7	SRB
2007 10 31.78	d	k	3.7	LB	14.5	L	8	a150	11.6				C 3.25m	K40	GAI	5*		ST7	SRB
2007 10 31.78	d	k	5.0	LB	14.5	L	8	a150	11.6				C 1.60m	K40	GAI	5*		ST7	SRB
2007 10 31.78	d	k	5.3	LB	14.5	L	8	a150	11.6				C 1.20m	K40	GAI	5*		ST7	SRB
2007 10 31.78	d	k	6.2	LB	14.5	L	8	a150	11.6				C 0.80m	K40	GAI	5*		ST7	SRB
2007 10 31.78	d	k	7.5	LB	14.5	L	8	a150	11.6				C 0.40m	K40	GAI	5*		ST7	SRB
2007 10 31.78	d	k	8.8	LB	14.5	L	8	a150	11.6				C 0.20m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	2.1	LB	14.5	L	8	a150	13.3				C12.15m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	2.6	LB	14.5	L	8	a150	13.3				C 6.50m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	3.5	LB	14.5	L	8	a150	13.3				C 3.25m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	4.9	LB	14.5	L	8	a150	13.3				C 1.60m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	5.3	LB	14.5	L	8	a150	13.3				C 1.20m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	6.2	LB	14.5	L	8	a150	13.3				C 0.80m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	7.5	LB	14.5	L	8	a150	13.3				C 0.40m	K40	GAI	5*		ST7	SRB
2007 11 01.72	d	k	8.8	LB	14.5	L	8	a150	13.3				C 0.20m	K40	GAI	5*		ST7	SRB

Comet 17P/Holmes [cont.]

DATE (UT)	n	M	MAG.	RF	AP.	T	f/	EXP.	COMA	DC	TAIL	PA	APERTUR	Chp	Sfw	C	P	Cam	OBS.
2007 11 01.84		C	2.5	TT	15	R	15	a240	>15				C13.80m		GAI	4*		Nik	SRB
2007 11 01.84		C	2.5	TT	15	R	15	a240	>15				C18.40m		GAI	4*		Nik	SRB
2007 11 01.84		C	2.7	TT	15	R	15	a240	>15				C 9.20m		GAI	4*		Nik	SRB
2007 11 01.84		C	3.0	TT	15	R	15	a240	>15				C 6.90m		GAI	4*		Nik	SRB
2007 11 01.84		C	3.6	TT	15	R	15	a240	>15				C 4.60m		GAI	4*		Nik	SRB
2007 11 01.84		C	4.8	TT	15	R	15	a240	>15				C 2.30m		GAI	4*		Nik	SRB
2007 11 01.84		C	6.1	TT	15	R	15	a240	>15				C 1.15m		GAI	4*		Nik	SRB
2007 11 01.84		C	7.4	TT	15	R	15	a240	>15				C 0.55m		GAI	4*		Nik	SRB
2007 11 01.84		C	8.6	TT	15	R	15	a240	>15				C 0.30m		GAI	4*		Nik	SRB
2007 11 02.50	x	C	2.6	TJ	16.0	L	6	a 15	14.5				C14.5 m	K26	SI5	5		ST9	YOS02
2007 11 02.50	x	c	8.5	TJ	16.0	L	6	a 15	0.4				C 0.4 m	K26	SI5	5		ST9	YOS02
2007 11 03.50	x	C	2.6	TJ	16.0	L	6	a 15	16.4				C16.4 m	K26	SI5	5		ST9	YOS02
2007 11 03.50	x	c	8.8	TJ	16.0	L	6	a 15	0.4				C 0.4 m	K26	SI5	5		ST9	YOS02
2007 11 03.55		C	2.5	TJ	25.0	L	5	a 10	19.6				S19.6 m	K26	SI4	5	P	ST9	KAD02
2007 11 05.79	d	k	2.9	LB	14.5	L	8	a150	>19				C 9.55m	K40	GAI	5*		ST7	SRB
2007 11 05.79	d	k	3.4	LB	14.5	L	8	a150	>19				C 6.50m	K40	GAI	5*		ST7	SRB
2007 11 05.79	d	k	4.5	LB	14.5	L	8	a150	>19				C 3.25m	K40	GAI	5*		ST7	SRB
2007 11 05.79	d	k	6.1	LB	14.5	L	8	a150	>19				C 1.60m	K40	GAI	5*		ST7	SRB
2007 11 05.79	d	k	7.4	LB	14.5	L	8	a150	>19				C 0.80m	K40	GAI	5*		ST7	SRB
2007 11 05.79	d	k	8.7	LB	14.5	L	8	a150	>19				C 0.40m	K40	GAI	5*		ST7	SRB
2007 11 05.79	d	k	10.1	LB	14.5	L	8	a150	>19				C 0.20m	K40	GAI	5*		ST7	SRB
2007 11 07.88		v	3.0	TA	05.0	R	7	a240	19.0				S19.0 m	KAIa	MIm	3		ST2	QVA
2007 11 09.46	x	C	2.6	TJ	16.0	L	6	a 30	24.5				C24.5 m	K26	SI5	5		ST9	YOS02
2007 11 09.46	x	c	9.9	TJ	16.0	L	6	a 30	0.4				C 0.4 m	K26	SI5	5		ST9	YOS02
2007 11 14.64	x	C	2.7	TJ	5.4	A	6	a 20	29.8				C30.2 m	K16	SI5	5		MCV	NAG08
2007 11 17.66		C	2.7	TJ	25.0	L	5	a 20	&30				S28.0 m	K26	SI4	5	P	ST9	KAD02
2007 11 18.45	ax	C	2.7	HV	1.4	A	4	a 3					S46.70m	KA1a	SI5	5		STL	TSU02
2007 11 22.40	x	C	2.7	TJ	5.4	A	6	a 40	43				C46.3 m	K16	SI5	5		MCV	NAG08
2007 11 28.73		C	2.7	TT	5	A	6	a450	44				C52.25m		GAI	5*		Nik	SRB
2007 11 28.73		C	3.1	TT	5	A	6	a450	44				C34.85m		GAI	5*		Nik	SRB
2007 11 28.73		C	4.1	TT	5	A	6	a450	44				C17.40m		GAI	5*		Nik	SRB
2007 11 28.73		C	5.4	TT	5	A	6	a450	44				C 8.70m		GAI	5*		Nik	SRB
2007 11 28.73		C	6.7	TT	5	A	6	a450	44				C 4.35m		GAI	5*		Nik	SRB
2007 11 28.73		C	8.2	TT	5	A	6	a450	44				C 2.20m		GAI	5*		Nik	SRB
2007 11 29.50	x	c	11.8	TJ	16.0	L	6	a 30	0.4				C 0.4 m	K26	SI5	5		ST9	YOS02
2007 12 05.49	x	C	2.8	TJ	5.4	A	6	a 60	65				C78.5 m	K16	SI5	5		MCV	NAG08
2007 12 07.41	x	C	2.8	TJ	5.4	A	6	a 60	70				C78.5 m	K16	SI5	5		MCV	NAG08
2007 12 18.51	x	C	3.2	TJ	5.4	A	6	a 60	92				C 1.9 d	K16	SI5	5		MCV	NAG08
2007 12 30.54	x	C	3.7	TJ	5.4	A	6	a 45	84				C 1.6 d	K16	SI5	5		MCV	NAG08
2008 01 09.53	x	C	3.5	TJ	5.4	A	6	a 60	92				C 1.7 d	K16	SI5	5		MCV	NAG08
2008 02 01.43	x	C	3.9	TJ	5.4	A	6	a 60	82				C 2.0 d	K16	SI5	5		MCV	NAG08
2008 03 01.51	x	C	4.2:	TJ	2.5	A	6	a 75	80				C 2.0 d	K16	SI5	5		MCV	NAG08
2008 03 09.77		C	14.6	UO	8	R	7	a150	0.63	2/			C 0.63m	SAL	A41	4		AAL	SHU
2008 03 27.75		C	13.9	UO	8	R	7	a300	1.4		3	m281	C 1.40m	SAL	A41	4		AAL	SHU

◇ ◇ ◇

NOTE: *The tabulated CCD data summary begins on page 118 of this issue.*

◇ ◇ ◇

Tabulated Visual-Data Summary

As begun the July 2007 issue, we now publish summaries of contributed tabulated data instead of publishing each line of observation that is contributed to the *ICQ* (with rare exceptions, as with comet 17P earlier in this same issue); the following format serves the purpose of summarizing all the comets that had data reported with their observational arcs for each observer. The full 80-character observation records are posted at the *ICQ* website (`http://www.cfa.harvard.edu/icq/icqobs.html`), and are available upon request by e-mail to the *ICQ* Editor.

The tabulation below lists, for each comet, the first and last observation (with associated total visual magnitude estimate) for each observer, listed in alphabetical order of the observers within each comet's listing (the usual 3-letter, 2-digit observer code coming under the column `Obs.`, whose key is provided above). The final column (separated by a slash, /, from the observer code) provides the number of individual 80-character observation records entered into the *ICQ* archive from that observer for the particular comet for this issue; when only one observation was submitted by a specific observer for a given comet, the last column is left blank (with no slash mark after the observer code).

Comet 8P/Tuttle

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 01.98	6.6	2008 04 25.92	10.4:	AMO01/ 52
2008 02 04.98	6.7	2008 03 29.95	8.1	DES01/ 16
2008 02 01.08	6.7	2008 04 27.93	10.5	GOI / 42
2007 11 30.73	9.5			MAJ01
2008 01 13.39	6.2	2008 01 26.39	7.2	MIT / 2
2008 01 14.47	6.6	2008 01 27.41	7.4	NAG08/ 2
2008 01 17.06	5.5			NOW
2008 01 25.38	6.8	2008 02 12.40	6.9	RAE / 13
2008 02 05.12	7.0	2008 03 05.10	7.6	ROB06/ 2
2007 11 05.87	12.5	2008 01 12.73	6.0	SAN07/ 7
2007 12 13.81	8.2			SAR02
2008 02 05.47	6.8	2008 04 03.44	8.6	SEA / 7
2008 03 02.00	7.5			SOU01
2007 12 02.81	9.8	2008 01 26.74	6.7	SZA / 8
2007 10 31.81	13.5	2008 01 26.75	6.9	TOT03/ 7
2007 12 03.84	9.5	2007 12 13.73	8.6	VAS06/ 5
2008 01 02.76	6.1			ZAJ

Comet 26P/Grigg-Skjellerup

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 09.22	[12.8			AMO01
2008 04 12.25	11.3			GOI
2008 04 06.18	11.3	2008 04 12.17	11.4	GON05/ 2

Comet 29P/Schwassmann-Wachmann

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 07.08	11.5:	2008 03 05.91	12.7	GON05/ 4
2008 01 28.89	11.2			HAS02
2008 03 07.88	12.8	2008 04 04.89	13.7	LAB02/ 2
2008 02 12.81	12.9			LEH
2008 01 25.72	10.9			MAJ01
2008 03 08.91	14.6			MAR02
2008 02 07.47	12.0:			NAG08
2008 02 03.81	11.8	2008 02 10.94	11.6	PAR03/ 2
2008 01 16.03	10.8	2008 01 28.79	11.4	SAN07/ 2
2008 02 11.96	12.4			SCH04
2008 01 08.92	12.5	2008 02 10.81	13.8	SZA / 5
2008 01 07.90	13.1	2008 03 29.86	14.5	TOT03/ 8
2008 03 05.51	13.3			YOS04

Comet 46P/Wirtanen

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 01.96	9.0	2008 03 05.95	10.0:	AMO01/ 7
2008 02 27.80	8.9			BUS01
2008 03 29.94	9.8			DES01
2008 02 01.79	9.7	2008 02 12.77	8.8	DIE02/ 5
2008 02 08.97	9.1	2008 04 05.95	10.8	GOI / 15
2008 02 02.80	8.6	2008 03 28.99	10.4	GON05/ 8
2008 02 02.75	9.9	2008 02 24.78	8.5	HAS02/ 3
2008 03 06.82	9.2			KAR02
2008 02 06.80	8.8	2008 04 04.90	10.5	LAB02/ 5
2008 02 03.76	8.9	2008 02 16.74	8.8	LEH / 4
2008 01 25.73	9.4			MAJ01
2008 03 08.87	10.0			MAR02

Comet 46P/Wirtanen [cont.]

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 01 26.40	9.7			MIT
2008 03 05.47	10.2	2008 03 08.46	10.6	MIY01/ 2
2008 02 10.51	9.8			NAG04
2008 01 27.42	8.8	2008 03 05.42	9.3	NAG08/ 4
2008 02 03.71	8.8	2008 03 27.81	10.6	NEV / 2
2008 03 22.72	[9.4	2008 03 29.87	10.6	NOV01/ 3
2008 02 03.78	8.3	2008 04 25.91	11.7	PAR03/ 6
2008 02 02.81	8.0	2008 04 26.85	12.1	PIL01/ 6
2008 01 28.39	9.4			RAE
2008 02 02.79	8.7			RIE
2008 01 28.73	8.8			SAN07
2008 02 01.79	9.3	2008 03 24.83	10.5:	SCH04/ 10
2008 03 31.84	11.6			SHU
2008 01 06.73	9.8	2008 02 10.79	10.1	SZA / 5
2007 11 05.76	13.2	2008 02 10.78	9.5	TOT03/ 7
2008 02 27.51	8.8	2008 03 31.51	10.8	YOS02/ 3
2008 03 05.46	9.3			YOS04

Comet 50P/Arend

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 08.90	[16.0			MAR02

Comet 93P/Lovas

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 03.83	13.8	2008 02 10.79	13.9	LEH / 2
2008 03 08.90	[15.1			MAR02
2007 10 13.98	13.2			SAN07
2008 01 08.90	13.2	2008 02 10.82	13.8	SZA / 2
2007 10 13.87	13.1	2008 01 08.87	13.5	TOT03/ 7
2008 03 05.48	13.5			YOS04

Comet 110P/Hartley

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 10.88	14.4			LEH
2008 03 08.91	[15.2			MAR02
2008 03 05.52	[14.2			YOS04

Comet 124P/Mrkos

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 24.83	14.0			PAR03

Comet 180P/NEAT

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 08.92	[15.4			MAR02

Comet 185P/Petriew

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 08.96	[15.6			MAR02

Comet 192P/Shoemaker-Levy

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 03.76	14.2			HAS02
2008 02 03.75	13.5:			PAR03
2008 02 07.75	13.7			TOT03

Comet C/2005 L3 (McNaught)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 04 25.91	13.4			NEV
2008 03 05.80	13.9			YOS04

Comet C/2006 Q1 (McNaught)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 03.16	12.0:	2008 04 14.94	11.5	AMO01/ 12
2008 02 26.13	11.9	2008 04 27.96	11.0	GOI / 21
2008 04 03.92	10.7			GON05
2008 02 05.50	11.9	2008 02 12.45	12.5:	RAE / 4
2008 03 01.14	12.1			ROB06
2008 03 03.44	11.0	2008 03 28.42	11.5	SEA / 3
2008 03 05.56	11.4			YOS04

Comet C/2006 S5 (Hill)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 09.77	14.0			HAS02
2008 02 12.88	14.2			LEH
2008 03 08.92	14.2			MAR02
2008 01 07.85	13.9	2008 01 08.94	13.3	SZA / 2
2008 01 07.87	13.7	2008 01 08.95	13.7	TOT03/ 2
2008 03 05.55	14.4			YOS04

Comet C/2006 VZ_13 (LINEAR)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2007 07 07.67	7.6			XU

Comet C/2006 W3 (Christensen)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 09.77	13.4			HAS02
2008 02 12.84	14.3			LEH
2008 03 08.89	14.9			MAR02
2008 03 05.54	14.7			YOS04

Comet C/2007 B2 (Skiff)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 10.08	14.2	2008 04 03.94	12.8	GON05/ 2
2008 04 05.06	12.6			LAB02
2008 03 08.93	14.1			MAR02
2008 02 03.16	13.5:			PAR03
2008 03 31.86	11.9			SHU
2008 02 27.92	13.8	2008 03 11.96	13.6	TOT03/ 2
2008 03 05.70	14.4			YOS04

Comet P/2007 C1 (Christensen)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 04 03.40	11.4	2008 04 04.40	11.4	SEA / 2

Comet C/2007 E2 (Lovejoy)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2007 05 22.95	10.5	2007 05 23.95	10.5	HOR03/ 2
2007 04 21.29	8.7	2007 04 22.32	8.8	NOW / 2
2007 04 17.88	8.2			XU

Comet C/2007 F1 (LONEOS)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2007 10 14.73	6.3	2007 10 16.73	6.1	MAJ01/ 2
2007 10 14.73	6.2	2007 10 17.72	5.8	SAN07/ 3
2007 11 11.40	7.3			SAR02
2007 10 13.73	6.6	2007 10 15.73	6.4	TOT03/ 2

Comet C/2007 G1 (LINEAR)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 05.52	[13.9			YOS04

Comet P/2007 H1 (McNaught)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 01 08.76	[15.6			TOT03

Comet C/2007 T1 (McNaught)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 01.99	8.8	2008 03 09.98	11.0:	AMO01/ 10
2008 02 01.11	9.1	2008 03 23.96	11.4	GOI / 16
2008 03 01.83	10.3	2008 03 05.84	10.5	GON05/ 2
2008 03 07.81	10.7			LAB02
2008 03 09.78	10.3:	2008 03 23.80	11.5:	PAR03/ 2
2008 01 26.42	9.1	2008 02 12.40	9.9	RAE / 8
2007 10 16.73	10.8	2007 10 17.74	10.0	SAN07/ 2
2008 02 07.48	8.7	2008 03 03.48	10.5	SEA / 3
2007 10 13.75	10.6	2007 10 15.75	10.9	TOT03/ 2
2008 03 05.41	10.7			YOS04

Comet C/2007 W1 (Boattini)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 09.19	12.5:	2008 04 30.93	7.3	AMO01/ 17
2008 03 17.12	11.4	2008 04 28.97	7.5	GOI / 26
2008 02 07.13	14.3	2008 04 28.94	7.2	GON05/ 13
2008 04 13.82	8.6			HAS02
2008 03 07.97	12.6	2008 04 30.86	7.8	LAB02/ 5
2008 03 08.97	12.2			MAR02
2008 02 03.14	13.9	2008 04 25.88	9.5	PAR03/ 2
2008 04 26.84	9.1			PIL01
2008 03 28.91	10.0	2008 03 30.90	9.5	SAN07/ 2
2008 03 02.54	12.8	2008 04 26.45	7.3	SEA / 8
2008 03 31.94	11.0			SHU
2008 03 11.95	13.2	2008 03 29.89	11.0	TOT03/ 2
2008 03 31.53	10.2			YOS02
2008 03 05.70	13.8			YOS04

Comet C/2008 A1 (McNaught)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 04 17.94	11.9	2008 04 27.94	11.4	GOI / 4

Comet C/2008 C1 (Chen-Gao)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 29.92	9.6			DES01
2008 03 26.94	9.8:	2008 04 27.92	10.4	GOI / 12
2008 02 04.89	12.8	2008 04 23.90	10.0	GON05/ 14
2008 02 03.76	12.9	2008 04 13.83	10.0	HAS02/ 3
2008 03 06.83	10.5			KAR02
2008 02 06.79	13.0	2008 04 30.85	10.5	LAB02/ 7
2008 02 03.74	13.3	2008 02 16.77	12.2	LEH / 5
2008 03 02.25	11.2	2008 04 06.26	10.3	LIN04/ 3
2008 03 08.88	10.4			MAR02
2008 03 05.48	10.5	2008 03 08.47	10.3	MIY01/ 2
2008 03 22.53	11.0			MUR02
2008 02 03.86	13.5	2008 03 27.80	10.8	NEV / 2
2008 03 26.77	9.9	2008 03 29.86	9.7	NOV01/ 2
2008 02 10.96	12.6	2008 03 09.81	10.4	PAR03/ 3
2008 03 04.79	11.8	2008 03 29.82	10.6	PIL01/ 2
2008 03 30.79	9.6:			SAN07
2008 02 08.99	12.2	2008 02 11.93	12.5:	SCH04/ 2
2008 03 31.83	11.0			SHU
2008 02 10.82	11.0			SZA
2008 02 05.78	13.4	2008 03 29.84	10.8	TOT03/ 5
2008 02 27.46	11.5	2008 03 31.48	10.4	YOS02/ 3
2008 03 05.49	10.3			YOS04

◇ ◇ ◇

Tabulated CCD-Data Summary

Comet 8P/Tuttle

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 01 24.45	7.8 C			NAG08
2007 12 02.01	9.1 V	2007 12 17.85	7.2 V	QVA / 3

Comet 22P/Kopff

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 07.95	17.6 C	2008 03 27.92	18.9 C	NEV / 2

Comet 26P/Grigg-Skjellerup

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 15.83	15.4 C	2008 04 11.82	15.5 C	TSU02/ 3
2008 02 13.81	16.8 C			YOS02

Comet 29P/Schwassmann-Wachmann

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 01.46	11.2 C			NAG08
2008 02 03.90	13.6 C			NEV
2008 01 25.90	11.9 v	2008 02 13.95	11.6 v	QVA / 3
2008 01 28.93	11.7 C	2008 03 27.76	14.1 C	SHU / 10

Comet 46P/Wirtanen

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 01.41	10.1 C	2008 03 01.44	10.6 C	NAG08/ 3
2008 01 17.72	9.5 V	2008 04 20.91	13.8 V	QVA / 17
2008 02 16.73	10.6 C	2008 03 31.80	12.2 C	SHU / 11
2008 02 01.44	10.5 C	2008 04 11.50	13.8 C	TSU02/ 3

Comet 50P/Arend

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 10.76	17.2 C			NEV
2008 02 28.48	17.2 C			TSU02

Comet 65P/Gunn

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 07.92	17.2 C	2008 04 14.88	16.9 C	NEV / 3

Comet 70P/Kojima

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 08.03	16.4 C	2008 04 25.87	16.9 C	NEV / 3
2008 03 08.11	16.0 C			SHU
2008 03 10.65	16.4 C	2008 04 11.60	16.7 C	TSU02/ 2

Comet 74P/Smirnova-Chernykh

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 03.94	16.7 C			SHU

Comet 79P/duToit-Hartley

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 10.46	17.4 C	2008 04 11.51	17.7 C	TSU02/ 2

Comet 93P/Lovas

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 10.73	15.1 C			NEV
2008 01 28.87	14.9 C	2008 03 09.74	15.4 C	SHU / 6
2008 02 01.49	15.0 C			TSU02

Comet 110P/Hartley

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 27.84	16.2 C	2008 04 14.81	17.2 C	NEV / 2
2008 01 28.91	14.3 C	2008 03 26.76	16.6 C	SHU / 6
2008 02 01.51	15.6 C	2008 02 28.50	16.2 C	TSU02/ 2
2008 03 11.51	16.2 C			YOS02

Comet 124P/Mrkos

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 03.98	17.2 C	2008 04 21.85	16.7 C	NEV / 3
2008 02 24.12	15.0 C			SHU

Comet 173P/Mueller

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 28.59	18.6 C	2008 03 10.50	19.4 C	TSU02/ 2

Comet 180P/NEAT

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 04 21.87	16.5 C	2008 04 26.86	16.8 C	NEV / 2
2008 03 10.55	17.8 C			TSU02

Comet 183P/Korlević-Jurić

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 10.60	18.5 C			TSU02

Comet 187P/LINEAR

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 04 26.88	18.1 C			NEV

Comet 192P/Shoemaker-Levy

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 01.42	15.2 C	2008 02 25.41	15.9 C	TSU02/ 2

Comet 194P/LINEAR

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 28.57	16.9 C			TSU02

Comet 197P/LINEAR

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 28.00	17.4 C			NEV

Comet C/2005 L3 (McNaught)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 28.03	14.3 C	2008 04 27.95	14.1 C	NEV / 4
2008 03 15.80	14.2 C			TSU02
2008 02 13.83	14.3 C	2008 02 13.84	14.2 V	YOS02/ 3

Comet C/2006 S5 (Hill)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 03.92	15.0 C	2008 03 07.88	15.2 C	NEV / 2
2008 02 03.96	14.4 C	2008 03 26.83	15.5 C	SHU / 6
2008 01 14.55	14.1 C	2008 04 11.53	16.9 C	TSU02/ 2
2008 03 11.53	14.9 C	2008 03 11.55	14.0 H	YOS02/ 3

Comet C/2006 W3 (Christensen)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 01 28.95	14.2 C	2008 03 27.72	14.0 C	SHU / 7

Comet C/2007 B2 (Skiff)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 04.05	15.1 C	2008 04 25.89	14.5 C	NEV / 5
2008 02 24.03	13.3 C	2008 03 31.87	14.1 C	SHU / 3
2008 04 11.68	14.1 C			TSU02
2008 04 05.62	14.0 C			YOS02

Comet C/2007 G1 (LINEAR)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 28.09	14.8 C			NEV
2008 03 30.02	14.5 C			SHU
2008 03 15.85	15.6 C			TSU02

Comet C/2007 W1 (Boattini)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 03 08.05	14.3 C			NEV
2008 03 31.83	12.4 C			SHU
2008 03 15.55	12.8 C	2008 04 11.58	10.8 C	TSU02/ 2
2008 02 13.79	14.5 V	2008 04 05.55	11.5 C	YOS02/ 6

Comet C/2008 C1 (Chen-Gao)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 02 10.81	12.3 V	2008 03 29.90	11.4 V	QVA / 7
2008 02 04.73	13.4 C	2008 03 31.76	11.3 C	SHU / 11
2008 02 25.46	13.1 C	2008 04 11.46	12.6 C	TSU02/ 2
2008 03 11.47	12.5:C	2008 03 11.49	12.7:V	YOS02/ 3

Comet C/2008 H1 (LINEAR)

First Date UT	Mag.	Last Date UT	Mag.	Obs. / No.
2008 04 21.97	17.1 C	2008 04 26.92	17.2 C	NEV / 2