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Photograph of periodic comet Machholz 1986*e* by Michael Jäger of Fischamend, Austria, obtained on 1986 June 26.936 UT (6-min exposure on 2415 film) with an 8-inch (20-cm) Schmidt camera. Note the two tails leaving the comet in nearly opposite directions. North is to the right.

INSIDE THIS ISSUE

The International Comet Quarterly (*ICQ*) is a non-profit journal devoted to news and observation of comets. Issues are published 4 times per year (January, April, July, and October). The *ICQ* is published in part by the Department of Physics and Astronomy at Appalachian State University in Boone, North Carolina.

The regular (invoiced) subscription rate is US$24.00 per year (price includes the annual *Comet Handbook*; the price without the *Handbook* is US$16.00 per year). Subscribers who do not wish to be billed may subscribe at the special rate of US$18.00 per year, or US$20.00/year outside North America (rates are $10.00 and $12.00, respectively, without *Handbook*), although such subscribers are *not* entitled to back issues lost by not renewing promptly. [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.] Make checks or money orders payable in U.S. funds to *International Comet Quarterly* and send to Daniel Green; Smithsonian Astrophysical Observatory; 60 Garden St.; Cambridge, MA 02138, U.S.A. Group subscription rates are available upon request. Back issues are available ($4.00 each) from Dr. Thomas Rokoske; Dept. of Physics and Astronomy; Appalachian State Univ.; Boone, NC 28608, U.S.A., *except* for the annual edition of ephemerides (called the *Comet Handbook*) which is available *only* from the Editor at the Cambridge address for $10.00 ($8.00 to subscribers if ordered with their *ICQ* subscription; see above).

Manuscripts will be reviewed for possible publication (send 3 copies of typed, double-spaced copy to the Editor at the Cambridge address above); authors should first obtain a copy of "Information and Guidelines for Authors" from the Editor. Cometary observations also should be sent to the Editor in Cambridge; all data intended for publication in the *ICQ* should be sent on standard *ICQ* observation report forms. Those who can send manuscripts and observational data in machine-readable form are encouraged to do so (especially via floppy disks, or through mail via the computer networks *BITNET* or *SPAN* to GREEN at node CFA1), and should contact the Editor for further information.

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NOTICE CONCERNING THE 1988 COMET HANDBOOK

The *1988 Comet Handbook* will be published in late November 1987 and distributed in early December. The *Handbook* will no longer be published as one of the four regular quarterly issues of the *ICQ*, but rather as a special *ICQ* publication (the *1988 Comet Handbook* will be called *Vol. 9, No. 5*). The annual *Handbook* will cost $8.00 (for one copy) to *ICQ* subscribers; single extra copies to subscribers and all copies to non-subscribers will cost $10.00. (Lower bulk-purchase rates are available.)

Readers interested in receiving the *1988 Comet Handbook* upon publication (in December) should remit the additional $8.00 as soon as possible (if you have not already done so). This is especially important since we will publish only a limited number of copies, based on the number of orders received by early November for the *1988 Handbook* and also on the number of *1987 Handbook* requests from non-*ICQ* subscribers (which were lower than anticipated); it is therefore possible that we will run out of extra copies of the *1988 Handbook* not long after December 1987. — *The Editor*

RECENT NEWS AND RESEARCH CONCERNING COMETS

New Discoveries and Recoveries

P/Harrington was recovered as comet 1987*n* by T. Gehrels and J. V. Scotti using the 91-cm "SPACEWATCH" reflector at Kitt Peak in early May (*cf. IAUC* 4383). Their CCD images revealed a 15″ coma of magnitude 20.0. This is the fourth observed apparition of P/Harrington, originally discovered in 1953 during the course of the original Palomar Sky Survey.

Comet 1987*o* is Carolyn Shoemaker's ninth comet discovery, found while scanning films obtained with the 18-inch (46-cm) Palomar Schmidt telescope on April 25. Then estimated at magnitude 14 with a short tail to the southeast (*cf. IAUC* 4384), the comet was near opposition and moving slowly northwestwards near the Hercules/Ophiuchus border. The comet had passed perihelion on 1986 Nov. 17 at a heliocentric distance of $\sim$ 5.46 AU and is travelling in a retrograde orbit. Comet Shoemaker 1987*o* was reported near mag 15–16 throughout May and June by most astrometric observers.

The Shoemakers hope to soon join a select group of 13 observers who have ten or more comets named after them. Those observers are (asterisks indicating they are still actively observing): Pons, 26; Brooks, 21; Barnard, 16; Swift, 14; Tempel, 13; Bradfield, 12*; Honda, 12*; Mrkos, 12*; Giacobini, 12; Messier, 12; Borrelly, 11; Peltier, 10; Winnecke, 10. Note that only 5 observers are "name"-credited with more than a dozen comet discoveries; it appears to be a difficult "wall" to pass!

Comet 1987*p* is P/Borrelly, following its recovery by Alan C. Gilmore and Pamela M. Kilmartin on plates exposed June 5 and 7 at Mount John Observatory in New Zealand. The observers reported the comet as being diffuse with condensation ($m_2 \sim 19$) and very close to the predicted position (*cf. IAUC* 4404).

P/Russell 2 was recovered by Michael Candy and colleagues at the Perth Observatory in Western Australia, appearing as a nearly-stellar object of magnitude $\sim$ 20 during the first week in July. T. Seki of Geisei, Japan, had searched a fair-sized area around the predicted position with no success. The object, designated comet 1987*q*, is fainter (by almost 3 magnitudes) than expected from its discovery apparition in 1980. A photograph (40-min exposure) taken with the U. K. Schmidt Telescope at Siding Spring, Australia, also in early July, shows P/Russell 2 at $m_1 \sim 18$, strongly condensed with a 10″ coma diameter and a diffuse tail of length 0.4′ toward the west-southwest.

Other Comets under Observation

Hans-Emil Schuster, European Southern Observatory, reported that La Silla night assistants Oscar and Guido Pizarro discovered a diffuse object on an ESO red atlas plate which on June 25.3 was perhaps magnitude 15; this object is evidently P/Schwassmann-Wachmann 1, which has been in outburst recently. On May 3.45, Gehrels and Scotti obtained images of the comet which indicated $m_1 < 14.7$ with a strong nuclear condensation and coma diameter 2.0′ $\times$ 1.7′. Perhaps the lack of outbursts observed in P/Schwassmann-Wachmann 1 during the last few years may be correlated with the current minimum of solar activity.

Jim Gibson has reported positions of comet Machholz *1985 VIII* (1985*e*) obtained with the 60-inch (1.5-m) reflector at Palomar on 1985 September 7 (*cf. MPC* 11891), and he estimates the CCD images of the comet to be near $m_1 = 20.5$. The only other apparent detections of this comet after perihelion were via satellite on July 3 (*cf. ICQ* **8**, 40) and by T. Seki in Japan on July 7 (*cf. IAUC* 4083), as the comet "fizzled" away into virtually nothing.

John Briggs, working with the comet astrometry program of Edgar Everhart at the Chamberlin Observatory field station in Colorado, searched photographs taken June 22.410 and 27.412 UT for P/Denning-Fujikawa, with no success down to a limit of perhaps magnitude 17.5. Briggs used a 16-inch *f*/5.5 reflector and hypersensitized 2415 film, and his field size was $\sim$ 30′ $\times$ 30′ (he searched for $\Delta T \sim \pm$ 0.5 day). P/Denning-Fujikawa has only been seen at two apparitions (last in 1978 after it had been lost for nearly a century), with its orbital period of just under 9 years.

— *Daniel W. E. Green (1987 July 10)*

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TABULATION OF COMET OBSERVATIONS

Two new key codes have been added to the Magnitude Method (MM) Key, to describe the integrated magnitudes derived James V. Scotti (in collaboration with Tom Gehrels) at the University of Arizona: *C* = unfiltered total CCD magnitudes and *c* = unfiltered nuclear CCD magnitudes (both closely approximate the Johnson V band). Gehrels and Scotti both work to obtain the observations using the 91-cm SPACEWATCH telescope at Kitt Peak, while Scotti does the reduction of brightness with a computer in Tucson; the new observer code for their combined effort is *SCO02*. Also to accomodate Scotti's CCD magnitudes, we add the following unpublished reference code to the Magnitude Reference Key: *FA* = *V* photometry by Harold Ables (U.S. Naval Observatory, Flagstaff), Region No. 6, containing photoelectric magnitudes in the range $11.1 \leq V \leq 15.8$ and electronographic magnitudes in the range $13.7 \leq V \leq 21.6$; Ables has released early versions of the photometry to Kitt Peak and elsewhere, but he notes that there appear to be slight problems with the electronographic data (such that there may be as much as 0.1- to 0.2-mag error by 21st magnitude). Another new addition to the reference key is *CA*, referring to the M44 standard sequence as published by Henden and Kaitchuck in *Astronomical Photometry* (1982, New York: Van Nostrand Reinhold), *pp.* 301–302. Also, a new addition to the "Key to Group Sources" is *16* = Yamaneko Group of Comet Observers (c/o Akimasa Nakamura, Aichi, Japan). This group-source number is located in the listing of observers between the 5-character code and the observer's name, in most cases where data was collected by a "recorder" and sent in bulk to the *ICQ* for publication.

With the last 5 issues of the *ICQ* (not counting the January 1987 issue, which is the *1987 Comet Handbook*) so heavily devoted to observations of P/Halley, we had little time or space to devote to older observations (*i.e.*, those > two years old). But now that the bulk of the P/Halley data has been published, we can now begin concentrating on the huge amounts of older data which have been piling up here, and we again publish older, unpublished data in this issue. Significant numbers of such data which are still awaiting publication have been contributed by Albert Jones of New Zealand (mostly data from the 1950s and 1960s), and by the groups Hoshino Hiroba and Yameneko Group of Comet Observers (YGCO) in Japan (mostly from the late 1970s and early 1980s) and the Comets Section of the Association of Lunar and Planetary Observers (ALPO) in the United States (mostly from the 1960s and early 1970s).

In the descriptive data which follow, information concerning P/Halley while it was bright is being held for publication in a later issue, due to time and space constraints. Readers who do not have the complete Keys to Abbrevations used in the Descriptive and Tabulated Data in the *ICQ* may obtain copies for US$4.00 postpaid from the Editor.

NOTICE: We now ask observers who observe comets at magnitude 12 or fainter to submit observations of "negative" observations for publication in the ICQ (especially for short-period comets). It is felt that a record of searches during periods when a comet is not observable visually would be useful to indicate upper limits on an object's brightness — particularly the month immediately before and after last visual detection. As noted in previous issues of the *ICQ*, we always welcome negative observations of P/Schwassmann-Wachmann 1 throughout its orbit. We now suggest that observers report the method used for determining a limiting magnitude estimate when the comet is not seen: this will give more accuracy to the estimate. If the limiting magnitude established is a stellar one (that is, if no de-focussing is attempted), then code "I" should be used as the magnitude method. If stars are defocussed, then an imaginary coma diameter must be given to indicate the amount of de-focussing (a default size of either 1′ or 30″ is recommended if there is no prior knowledge as to the coma's approximate size); such coma diameters should be preceded by an exclamation mark (!) to indicate that it is imaginary. (Publication of such negative observations is at the discretion of the Editors.)

Attention is also called to the need for exercising extreme caution and care in identifying very faint comets. It has been noted that the grid overlays for Vehrenberg atlases are sometimes in error by a few arc minutes (especially in declination), and these atlases are of limited use when a comet is fainter than magnitude 12 (because this approaches the limiting visual stellar magnitude of the atlases and is near the limit for limiting magnitudes of extended objects). It is thus recommended that observers seeking out comets fainter than magnitude 12 gain access to photographs which have limiting magnitudes of 16 or fainter (such as the Palomar Sky Survey). Lacking such access, the most appropriate procedure is to carefully determine the offset position of the comet from a nearby *SAO Catalog* star, and to then be sure that a given comet suspect is the correct candidate through noting proper motion over a period of an hour or more (and also by observing the object on more than one night). When near the limiting magnitude of a given instrument, it is common to be fooled by a faint galaxy which is not plotted on a drawn star chart or not visible on a photographic chart, or possibly by a faint star or small group of faint stars. Experienced comet observers are aware of the saying, "If it is known that a faint comet is in a given position, it is all too easy to find something there, regardless of whether the comet is visible or not!" If an observer has any doubt about proper identification of a comet in a given observation, therefore, we ask that such doubt be indicated when reporting data to the *ICQ*. — *The Editors*

Descriptive Information (to complement the Tabulated Data):

◇ *Comet Seki* (1961*VIII*), all remarks are by JON: 1961 Nov. 9.65: in 7.8-cm R, coma elongated in p.a. 130°; in 31.7-cm *f*/5 L, 86×, DC = 3. Nov. 10.62: comet visible to unaided eye; in 20.0-cm *f*/8 L, 54×, coma dia. 7′, DC = 3. Nov. 11.64: in 4.5-cm *f*/6 R, 13×, coma dia. 20′; in 20.0-cm *f*/8 L, 54×, coma dia. 10′, comet possibly slightly elongated in p.a. 110°. Nov. 14.62: in 4.5-cm *f*/5 R, 7×, coma dia. 24′; in 31.7-cm *f*/5 L, 48×, DC = 6, broad diffuse tail in p.a. 210°. Nov. 16.62: in 31.7-cm *f*/5 L, 86×, coma dia. 25′, DC = 4. Nov. 17.63: in 20.0-cm *f*/8 L, 96×, DC = 4; condensation larger than on previous night. Dec. 5.49: in 31.7-cm *f*/5 L, 86×, coma dia. 3′, DC = 1. Dec. 8.50: in 20.0-cm *f*/5 L, 54×, coma dia. 5′, DC = 2.

◇ *Comet Ikeya* (1963*I*), all remarks are by JON: 1963 Jan. 15.63: in 31.7-cm *f*/5 L, 86×, coma dia. 2′. Jan. 16.63: in 31.7-cm *f*/5 L, 86×, coma dia. 3.2′, DC = 4. Jan. 18.61: short, broad tail suspected. Jan. 19.61: in 20.0-cm *f*/8 L, 54×, coma dia. 3.75′. Jan. 21.63: in 31.7-cm *f*/5 L, 86×, coma dia. 4.2′, nucleus displaced in p.a. 280° or possible tail in p.a. 100°. Jan. 24.63: in 31.7-cm *f*/5 L, 86×, coma dia. 4′. Jan. 26.64: in 20.0-cm *f*/8 L, 54×, coma dia. 7′. Feb. 11.49: in 31.7-cm *f*/5 L, 86×, coma dia. 5′, DC = 6. Feb. 12.41: in 7.8-cm *f*/7.5 R, 30×, coma dia. 15′; in 31.7-cm *f*/5 L, 86×, coma dia. 12′, DC = 6, straight tail 1.3° long and 3′–4′ wide in p.a. 330°. Feb. 13.43: in 7.8-cm *f*/7.5 R, 30×, coma dia. 15′; in 31.7-cm *f*/5 L, 86×, DC = 5, tail 1° long in p.a. 60°. Feb. 15.39: in 20-cm L, cond. 2′ diameter. Feb. 18.39: in 31.7-cm L, small bright cond. elongation in direction of tail.

◇ *Comet Ikeya* (1964*VIII*), all remarks are by JON: 1964 Aug. 8.77: in 31.7-cm *f*/5 L, 62×, coma dia. 4.7′. Aug. 18.30: in 31.7-cm *f*/5 L, 62×, coma dia. 4′. Aug. 22.31: in 31.7-cm *f*/5 L, 62×, coma dia. 3′, DC = 6. Sept. 10.34: in 31.7-cm *f*/5 L, 62×, coma dia. 2′, DC = 4.

◇ *Comet Ikeya-Seki* (1965*VIII*), all remarks are by JON: 1965 Sept. 22.69: in 31.7-cm *f*/5 L, 62×, coma dia. 2′, DC = 6. Sept. 24.70: in 31.7-cm *f*/5 L, 62×, coma dia. 2.5′, DC = 6. Sept. 27.70: in 31.7-cm *f*/5 L, 62×, DC = 6?, tail in p.a. 270°. Oct. 6.69: comet faintly visible to unaided eye. Oct. 8.70: in 31.7-cm *f*/5 L, 86×, tail 0.6° long in p.a. 260°. Oct. 13.70: in 7×50 B, tail 0.6° long. Nov. 20.61: "tail brightest 1° from head". Nov. 22.61: "tail to 2° with averted vision". Nov. 29.62: in 31.7-cm *f*/5 L, 62×, coma dia. 4′, DC = 4. Nov. 30.62: tail traced to length of 1.5° with unaided eye; in 31.7-cm *f*/5 L, 62×, DC = 4. Dec. 1.61: in 31.7-cm *f*/5 L, 62×, coma dia. 4.5′, DC = 3. Dec. 15.46: in 31.7-cm *f*/5 L, 62×, coma dia. 3′, DC = 1–2.

◇ *Comet Bradfield* 1979 *X*, all remarks are by JON: 1980 Jan. 10.64: straight tail. Jan. 12.64: in 11×80 B, 0.5° tail in p.a. 260°; in 31.7-cm *f*/5 L, 86×, coma dia. 3.5′, DC = 5. Jan. 20.47: in 31.7-cm L, broad, straight, faint, wispy tail. Jan. 21.65: in 31.7-cm *f*/5 L, 86×, DC = 5, tail in p.a. 200°. Jan. 23.42: in 31.7-cm *f*/5 L, 86×, coma dia. 7′, DC = 5. Feb. 3.38: in 31.7-cm *f*/5 L, 86×, coma dia. 4′, DC = 5. Feb. 5.39: in 31.7-cm *f*/5 L, 86×, coma dia. 6′, DC = 4. Feb. 6.41: in 31.7-cm L, coma extended in p.a. 90°. Feb. 8.39: possible faint tail visible with 31.7-cm L. Feb. 11.39: in 31.7-cm *f*/5 L, 86×, coma dia. 3′, DC = 3. Feb. 16.38: in 31.7-cm *f*/5 L, 86×, coma dia. 3′, DC = 2.

◇ *Comet Bradfield* 1980 *XV*: 1980 Dec. 20.66: broad, stubby tail [JON].

◇ *P/Kopff* 1983 *XIII*: 1982 June 15.45: $m_2 \simeq 10$ [LOV]. June 28.38: $m_2 \sim 10$–11 in 20-cm L, 50× [LOV]. Oct. 2.54: "strong cond." [CLA]. Nov. 2.52: "*very* faint, small (0.5′) central cond. surrounded by extremely faint, vague outer coma" [CLA]. Nov. 8.56: "moon up; *very* faint, vague" [CLA]. Nov. 26.54: "not visible" in 41-cm *f*/4.2 L, 86× [CLA].

◇ *Comet IRAS-Araki-Alcock* 1983 *VII*: 1983 May 12.35: in 31.7-cm *f*/5 L, 86×, $m_2 = 9.2$ (MM: I, ref. VN) [JON]. May 12.37: to naked eye, coma dia. 70′; in 11×80 B, possible short, broad tail in p.a. 240° [JON]. May 12.41: broad fan in p.a. 40°, spike in p.a. 70° [LOV]. May 13.36: in 31.7-cm *f*/5 L, 86×, $m_2 = 12.1$ (MM: I, ref. VN) [JON]. May 14.32: in 11×80 B, coma dia. 10′, DC = 5; in 31.7-cm *f*/5 L, 86×, tail in p.a. 270° and $m_2 = 11.2$ (MM: I, ref. VN) [JON]. May 15.40: in 31.7-cm *f*/5 L, 86×, $m_2 = 11.6$ (MM: I, ref. VN) [JON]. May 16.41: in 3-cm R, "faint outer coma also visible, plus tail-like formation" [LOV]. May 17.39: "slight flare in brightness"; in 3-cm R, "tail-like formation (parabolic tendency in coma) more readily visible" [LOV]. May 19.40: in 31.7-cm *f*/5 L, 86×, coma dia. 5′, DC = 4–5 [JON]. May 20.36: in 31.7-cm *f*/5 L, 86×, coma dia. 3.5′, DC = 3 [JON]. May 22.32: in 31.7-cm *f*/5 L, 86×, coma dia. 1.5′, DC = 2 [JON]. May 23.32: in 31.7-cm *f*/5 L, 86×, coma dia. 1.5′ [JON]. May 27.35: in 31.7-cm *f*/5 L, 86×, coma dia. 2.25′, DC = 2 [JON]. June 7.30: in 31.7-cm *f*/5 L, 86×, coma dia. 2′, DC = 2 [JON].

◇ *Comet Černis* 1983 *XII*: 1983 Aug. 4.08: $m_2 = 12$ [KEI]. Aug. 6.09: $m_2 = 12.5$ [KEI]. Aug. 13.08: "broad tail in p.a. 25°; fan to west; jet in p.a. 200°" [KEI]. Aug. 15.75: "small diffuse coma" [JON]. Aug. 16.32: "stellar condensation ($m_2 = 12$)" [MOR]. Aug. 17.69: "small nucleus?" [JON]. Sept. 02.23–16.34: "coma elongated, bright condensation" [MOR]. Oct. 7.24: "elongated fan-shaped coma toward p.a. 270°, nearly stellar condensation" [MOR]. Oct. 7.99: "numerous tails and structure in 29.8-cm L" [KEI]. Oct. 8.19: elongated fan-shaped coma toward p.a. 260°; condensation was a "bumpy" disk 10″ – –15″ in diameter offset toward the east by 0.2′ [MOR]. Oct. 15.26–31.13: "condensation was diffuse disk" [MOR].

◇ *P/IRAS* 1983 *XIV*: 1983 Sept. 5.97, $m_2 = 12.5$ [KEI].

◇ *P/d'Arrest* 1982 *VII*, all remarks by LOV: 1982 Oct. 14.4: slightly elongated. Oct. 17.45: circular, possible nucleus in brighter central core at 140×.

◇ *P/Giacobini-Zinner* 1985 *XIII*, all remarks by WAT01: 1985 Aug. 13.70: possible second tail in p.a. 310°. Aug. 14.69: possible second tail in p.a. 355°. Aug. 15.71: possible second tail in p.a. 280°.

◇ *Comet Hartley-Good* 1985 *XVII*: 1985 Oct. 13.41: in 31.7-cm *f*/5 L, 86×, coma dia. 2.5′, DC = 1–2 [JON]. Oct. 16.44: in 31.7-cm *f*/5 L, 86×, coma dia. 2.5′, DC = 3 [JON]. Oct. 19.45: in 31.7-cm *f*/5 L, 86×, coma dia. ~ 4′, DC = 2 [JON].

◇ *Comet Wilson* 1986*l*: 1986 Aug. 30.03: "circular, thick coma with diffuse outer region and starlike nuclear region" [ZAN]. Aug. 31.88: "outer coma more diffuse than on Aug. 30" [ZAN]. Sept. 6.85: "starlike nuclear region" [ZAN]. Sept. 21.78: "elliptical coma with major axis in p.a. 78°–258°; nuclear region offset in p.a. 258°; faint narrow, straight tail" [ZAN]. Sept. 29.84: "elliptical coma with major axis in p.a. 70°–250°; narrow, straight tail" [ZAN]. Oct. 2.87: elliptical coma with major axis in p.a. 68°–248° [ZAN]. Oct. 4.98: elliptical coma with major axis in p.a. 60°–240° [ZAN]. Oct. 17.80: "elliptical coma with offset central cond.; possible starlike nuclear region; observation made during total lunar eclipse" [ZAN]. Oct. 24.77: elliptical coma with major axis in p.a. 60°–240° [ZAN]. Oct. 27.76: "elliptical coma (major axis in p.a. 60°–240°) with diffuse edges; at 190×, starlike nuclear region" [ZAN]. Nov. 4.77: central cond. strongly offset [ZAN]. Nov. 29.74: "nearly circular coma with indefinite edges; at 112×, faint, narrow, straight tail 0.18° long in p.a. 45° and probable starlike nuclear region" [ZAN]. Nov. 30.75: "circular coma; at 112×, very faint, narrow, straight 0.18° tail in p.a. 45° [ZAN]. Dec. 7.63: "small central cond. and starlike nuclear region" [ZAN]. 1987 Feb. 28.86: also tail 0.12° long in p.a. 27° [CLA]. Mar. 1.86: also tail 0.13° long in p.a. 27° [CLA]. Mar. 7.87: "starlike spot in center", second tail 0.20° long in p.a. 24° [CLA]. Mar. 12.86: also tail 0.20° long in p.a. 12° [CLA]. Mar. 26.82: "coma parabolic", second tail 0.67° long in p.a. 5° [CLA]. Mar. 27.86: starlike condensation, "coma parabolic", second tail 0.67° long in p.a. 2° [CLA]. Mar. 28.84: starlike cond., "coma parabolic", second tail 0.20° long in p.a. 358° [CLA]. Apr. 1.82: in 12.5-cm R, "coma not as parabolic", nucleus slightly fainter; second tail 0.33° long in p.a. 357° [CLA]. Apr. 4.86: in 12.5-cm R, "nucleus not visible, central cond. larger"; second tail 0.42° long in p.a. 351° [CLA]. Apr. 20.59: in 25-cm C, 200×, coma dia. 3′, starlike central cond. [BEM]. Apr. 21.59: in 25-cm C, 200×, coma dia. 5′, starlike central cond. [BEM]. Apr. 26.41: fan-shaped tail spanning p.a. 200°–310° [BEM]. Apr. 27.47: tail spanning p.a. 230°–310° [BEM]. Apr. 27.82: in 7.6-cm S, "coma still parabolic", second tail 0.42° long [CLA]. Apr. 28.86: in 7.6-cm S, second tail 0.42° long [CLA]. Apr. 29.46: tail ~ 10′ wide [BEM]. May 2.50: also 2.0° and 1.0° tails in p.a. 160° and 90° [CLA]. May 2.53: in 20-cm L, also tail 2° long in p.a. 153°, possible spike in p.a. 95° [PEA]. May 5.54: in 20-cm L, also tails in p.a. 130° (0.7° long) and 90° [PEA]. May 26.49: "diffuse outer coma, larger than on previous nights" [PEA]. May 27.03: tail was bright, "(possible outburst)" [DEA]. May 27.93: tail was now faint (compare with May 27.03) [DEA]. June 2.52: also 0.50° and 0.33° tails in p.a. 111° and 162° [CLA].

◇ *Comet Sorrells* 1986*n*: 1986 Nov. 30.87: "at 100×, 0.067° tail in p.a. 135° [LIN02]. 1987 Jan. 23.80: "at 94×, possible tail at p.a. 290° [ZAN]. Feb. 1.77: in 30.5-cm *f*/5 L, 150×, 0.13° tail in p.a. 45° [ZAN]. May 30.44: "sharp peak in coma surface brightness, but no stellar condensation" [MOR]. June 21.41–July 7.45: "bright stellar condensation and elongated coma towards the S or SE" [MOR].

◇ *P/Wiseman-Skiff* 1987*b*: 1987 Jan. 22.30: "elongated coma" [LEV].

◇ *Comet Nishikawa-Takamizawa-Tago* 1987*c*: 1987 Jan. 22.10: "wide, fan-shaped tail" [LEV]. Feb. 2.14: "comet only 3° from crescent moon"; tail visible with Swan-band filter, but almost invisible without filter [HAL]. Apr. 4.87: also a brighter tail 1.75° long in p.a. 240° [CLA]. May 5.81: "very faint large outer coma" [PEA]. May 7.83: "very faint outer halo" [PEA]. May 24.64: coma oval-shaped, 12′ × 8′, "very faint, diffuse" [CLA]. May 28.09: "very low surface brightness" [DEA]. June 1.80: in 32-cm *f*/3.75 L, 37×, coma dia. 10′, DC = 0–1, "very similar to comet 1983*e*" [PEA].

◇ *Comet Terasako* 1987*d*: 1987 Jan. 27.10: "sunward feature 10′ long" in p.a. 250° – –270° [LEV]. Jan. 30.09: "sunward feature 10′ long toward p.a. 260°, sharper" [LEV]. Feb. 2.10: second tail, 0.25° long in p.a. 125° [HAL].

◇ *P/Halley* 1982*i*: 1987 Jan. 25.52: "comet noticeably more prominent than earlier in the month; a minor outburst in the interim?" [HAL]. Apr. 23.20: "small, well condensed coma"; similar appearance to that of P/Schwassmann-Wachmann 1 during outburst [HAL].

◇ *P/Neujmin 2*: searches performed to limiting stellar magnitude of ~ 14 on 1986 Dec. 8.1 (25.4-cm *f*/4.5 L, 36×–114×) and to mag ~ 15 on 1987 Feb. 1.0 (40.6-cm *f*/4.5 L, 57×–114×), with no success [ZAN].

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Key to observers with observations published in this issue [those with asterisks (*) preceding the 5-character code are new additions to the Observer Key (cf. ICQ 9, 66)]:

BEM	14	C. S. Bembrick, Australia	KEI	01	Graham Keitch, England
BOU	11	Reinder J. Bouma, The Netherlands	LEV		David Levy, AZ, U.S.A.
CLA	07	Maurice L. Clark, Australia	LIN02		Juergen Linder, West Germany
DEA		V. F. de Assis Neto, Brazil	LOV		Terry Lovejoy, Australia
DOH	07	P. B. Doherty, England	MOR		Charles S. Morris, U.S.A.
GAR01		Gordon Garradd, N.S.W., Australia	NAK01	16	Akimasa Nakamura, Japan
GRE		Daniel W. E. Green, U.S.A.	*OHT	16	Tadao Ohtsuka, Japan
HAL		Alan Hale, U.S.A.	PEA	14	Andrew R. Pearce, Australia
HAS02		Werner Hasubick, West Germany	PRI		Robert T. Price, Australia
HUR	01	Guy M. Hurst, England	SC001		James V. Scotti, AZ, U.S.A.
ICH	16	Kazuhiko Ichikawa, Japan	*SC002		T. Gehrels and J. V. Scotti, Kitt Peak Obs., U.S.A.
*ISH02	16	Akiyoshi Ishikawa, Japan	SEA	14	David A. J. Seargent, Australia
JAC01		Eric A. Jacobson, MN, U.S.A.	SHA02	07	Jonathan D. Shanklin, England
JON	09	Albert F. Jones, New Zealand	TAN01	16	Kunihiko Taniguchi, Japan
KAN	06	Kiyotaka Kanai, Japan	WAT01	16	Nobuo Watanabe, Japan
KEE	05	Richard A. Keen, CO, U.S.A.	ZAN		Mauro Zanotta, Italy

Comet Pajdušáková 1954 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1953 12 27.45	* S	10.6	AA	20.0	L	8	54	2.5	4	0.20	85	JON

Comet Alcock 1959 IV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1959 09 24.34	S	12.0	VN	31.7	L	5	48	2.5	1/			JON

Comet Seki 1961 VIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1961 11 04.65	S	6.8	SC	7.5	R	12	23	6	2			JON
1961 11 09.65				7.8	R	8	30	6			130	JON
1961 11 09.65	S	5.3	SC	4.5	R	5	7	9				JON
1961 11 10.62				4.5	R	6	13	15	4			JON
1961 11 10.62	S	4.5	SC	4.9	B		3					JON
1961 11 11.64				4.5	R	5	7	28		?	110	JON
1961 11 11.64	S	4.3	SC	4.9	B		3					JON
1961 11 12.60	S	4.3	SC	4.9	B		3	24				JON
1961 11 14.62	S	4.5	SC	4.9	B		3					JON
1961 11 16.45	S	4.4	SC	4.9	B		3	26				JON
1961 11 16.62	S	5.0	SC	4.9	B		3					JON
1961 11 17.42	S	5.0	SC	4.9	B		3					JON
1961 11 17.63	S	4.8	SC	4.5	R	5	7	23				JON

Comet Seki 1961 VIII (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1961 11 20.48	S	6.1	SC	4.5	R	5	7	11	2			JON
1961 11 23.41	S	6.8	SC	4.5	R	5	7	5				JON
1961 11 25.43	S	7.5	SC	4.5	R	6	13	6				JON
1961 12 04.48	S	8.4	SC	7.8	R	8	30	3	1			JON
1961 12 05.49	S	8.6	S	7.8	R	8	30		1			JON
1961 12 07.47	S	8.8	S	7.8	R	8	30	3	1			JON
1961 12 08.50	S	9.1	VN	7.7	R	12	23					JON
1961 12 08.50	S	9.2	S	7.7	R	12	23					JON
1961 12 09.48	S	9.2	S	7.7	R	12	23					JON
1961 12 09.48	S	9.3	VN	7.7	R	12	23		1			JON

Comet Ikeya 1963 I

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1963 01 15.63	S	8.8	VN	7.8	R	8	30					JON
1963 01 16.63	S	8.8	VN	7.8	R	8	30					JON
1963 01 18.61				20.0	L	8	54	3.75	5	?	90	JON
1963 01 18.61	S	8.2	VN	4.5	R	6	13					JON
1963 01 19.61	S	8.0	VN	4.5	R	6	13					JON
1963 01 21.63	S	7.8	VN	7.8	R	8	30					JON
1963 01 23.63				31.7	L	5	86	5.5	5		110	JON
1963 01 23.63	S	7.2	VN	4.5	R	5	7					JON
1963 01 24.63	S	7.2	VN	4.5	R	5	7					JON
1963 01 24.63	S	7.3	SC	4.5	R	5	7					JON
1963 01 26.64	S	7.2	VN	4.5	R	6	13					JON
1963 01 26.64	S	7.3	SC	4.5	R	6	13					JON
1963 02 11.49	S	4.7	SC	2.3	B		2					JON
1963 02 12.41				31.7	L	5	86	12	6	1.3	330	JON
1963 02 12.41	S	3.5	SC	2.3	B		2					JON
1963 02 13.43	S	3.3	SC	2.3	B		2					JON
1963 02 15.39				20.0	L	8	54	14		4	102	JON
1963 02 15.39	S	4.0	SC	3.0	B		2					JON
1963 02 18.39				31.7	L	5	86		5	2.5	90	JON
1963 02 18.39	S	3.3	SC	2.3	B		2					JON
1963 02 23.41				20.0	L	8	54	12	4	2.6	102	JON
1963 02 23.41	S	3.5	SC	3.0	B		2					JON
1963 02 25.39				7.8	R	8	30	12	5	2.3	97	JON
1963 02 25.39	S	3.0	SC	2.3	B		2					JON
1963 03 06.36				7.8	R	8	30		6	0.3	100	JON
1963 03 06.36	S	4.5	VN	4.5	R	5	7					JON

Comet Alcock 1963 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1963 06 16.36				31.7	L	5	86	2	5	0.13	100	JON
1963 06 16.36	S	7.0	SC	7.8	R	8	30					JON
1963 07 12.36	S	9.0	VN	7.8	R	8	30					JON
1963 07 20.36				31.7	L	5	86		5	0.08	85	JON
1963 07 20.36	S	9.4	VN	7.8	R	8	30					JON
1963 07 22.32				31.7	L	5	86		5	0.06	92	JON
1963 07 22.32	S	9.2	VN	7.8	R	8	30					JON
1963 08 13.33	S	10.7	VN	31.7	L	5	86		3	?		JON
1963 08 20.32	S	11.6	VN	31.7	L	5	86		4			JON
1963 08 22.31	S	11.9	VN	31.7	L	5	86		3			JON

Comet Pereyra 1963 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1963 10 10.69	S	9.1	A	31.7	L	5	86		2			JON
1963 10 11.69	S	8.4	HD	7.8	R	8	30		5			JON
1963 10 12.68	S	8.3	A	20.0	L	8	35	2	4			JON
1963 10 14.68	S	8.5	A	7.8	R	8	30			?	230	JON
1963 10 15.69				31.7	L	5	86	1	3	0.3	270	JON
1963 10 15.69	S	8.4	A	7.8	R	8	30					JON
1963 11 23.64	S	12.5	VN	31.7	L	5	86		1			JON

Comet Ikeya 1964 VIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1964 08 07.76	S	4.0	SC	4.9	B		3					JON
1964 08 08.77	S	3.1	SC	4.9	B		3					JON
1964 08 15.30	S	2.8	SC	2.3	B		2					JON
1964 08 16.31				7.8	R	8	30			1.3	140	JON
1964 08 16.31	S	3.8	SC	2.3	B		2		5			JON
1964 08 18.30	S	3.5	SC	2.3	B		2					JON
1964 08 22.31	S	4.5	SC	2.3	B		2					JON
1964 08 24.31	S	4.3	SC	2.3	B		2					JON
1964 08 29.36	S	6.6	SC	2.3	B		2					JON
1964 08 30.38	S	7.0	SC	7.8	R	8	30		5			JON
1964 09 02.37				31.7	L	5	86	4	6	?0.4	115	JON
1964 09 02.37	S	6.5	SC	7.8	R	8	30					JON
1964 09 10.34	S	7.4	SC	7.8	R	8	30					JON
1964 09 12.33	S	8.5	S	31.7	L	5	62		4			JON
1964 10 04.34	S	10.4	VN	31.7	L	5	86		2			JON
1964 10 06.34	S	10.1:	VN	31.7	L	5	86		2			JON
1964 10 07.34	S	10.4	VN	31.7	L	5	86		2			JON

Comet Ikeya-Seki 1965 VIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1965 09 22.69	S	7.3	SC	4.5	R	6	13					JON
1965 09 24.70	S	7.1	SC	4.5	R	6	13					JON
1965 09 26.70				31.7	L	5	62	2.5	6	0.16	270	JON
1965 09 26.70	S	6.6	SC	4.5	R	6	13					JON
1965 09 27.70	S	6.3	SC	4.5	R	6	13					JON
1965 09 29.70				31.7	L	5	86		6	0.25	265	JON
1965 09 29.70	S	6.1	SC	4.5	R	6	13					JON
1965 10 02.70				31.7	L	5	86		6	0.25	260	JON
1965 10 02.70	S	5.3	SC	4.5	R	6	13					JON
1965 10 06.69				31.7	L	5	62	3.5	7	0.5	262	JON
1965 10 06.69	S	4.8	SC	4.9	B		3					JON
1965 10 06.69	S	5.0	SC	4.5	R	6	13					JON
1965 10 07.70				31.7	L	5	86			0.5	260	JON
1965 10 07.70	S	5.0	SC	4.5	R	5	7					JON
1965 10 08.70	S	4.7	SC	4.5	R	5	7					JON
1965 10 09.70				31.7	L	5	86		7	0.5	260	JON
1965 10 09.70	S	4.1	SC	4.5	R	5	7					JON
1965 10 10.70	S	3.5	SC	5.0	B		7					JON
1965 10 13.70		2.4	SC	0.0	E		1					JON
1965 10 17.71		1.0	SC	0.0	E		1					JON
1965 10 29.67	S	4.1	SC	5.0	B		7			15	270	JON
1965 10 31.67	S	4.1	SC	5.0	B		7			17		JON
1965 11 02.66	S	4.6	SC	2.3	B		2			21	278	JON

Comet Ikeya-Seki 1965 VIII (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1965 11 18.61	S	6.5	SC	5.0	B		7			5	285	JON
1965 11 20.61	S	6.5	SC	5.0	B		7			3.5	288	JON
1965 11 22.61	S	6.5	SC	5.0	B		7			1.0	290	JON
1965 11 26.59	S	7.7	SC	5.0	B		7			1.3	300	JON
1965 11 29.62	S	7.5	SC	5.0	B		7			6.0	304	JON
1965 11 30.62	S	7.5	SC	5.0	B		7			4.0	294	JON
1965 12 01.61	S	7.7	SC	5.0	B		7			3.5	300	JON
1965 12 05.63				31.7	L	5	62	3	2			JON
1965 12 05.63	S	8.0	SC	5.0	B		7			0.8	295	JON
1965 12 05.63	S	8.0	SC	7.8	R	8	30					JON
1965 12 11.46	S	9.4	S	31.7	L	5	48	2.5	2			JON
1965 12 15.46	S	9.1	HD	7.8	R	8	30					JON
1965 12 17.60				31.7	L	5	86	3	1	0.5	325	JON
1965 12 17.60	S	9.5	S	7.8	R	8	30	3	1			JON

Comet West 1976 VI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 12 23.43	S	9.5	VN	7.8	R	8	30					JON
1975 12 30.42	S	8.7	VN	7.8	R	8	30		6			JON
1976 04 18.39	* B	6.1	S	5.0	B		12		3	&0.67	300	GRE
1976 05 07.68				7.8	R	8	30		4	0.25	270	JON
1976 05 07.68	S	8.0	SC	8.0	B		11					JON
1976 05 09.70				7.8	R	8	30		6	0.8	270	JON
1976 05 09.70	S	7.9	SC	4.5	R	6	13					JON
1976 05 10.72	S	7.0	SC	4.5	R	6	13		4	0.5	270	JON
1976 05 17.64	S	7.7	S	4.5	R	6	13		4			JON
1976 06 20.46	S	8.7	S	7.8	R	8	30		3			JON
1976 06 22.47	S	8.8	S	7.8	R	8	30					JON
1976 06 26.48	S	9.5	S	31.7	L	5	86		2			JON
1976 07 02.22	* B	9.0	S	20.3	L	6		& 7				GRE
1976 07 03.48	S	10.5	V	31.7	L	5	86	2				JON
1976 07 19.48	S	10.4	V	31.7	L	5	86	2	2			JON
1976 07 22.37	S	10.5	V	31.7	L	5	86		2			JON
1976 07 26.16	* B	10.6	AC	20.3	L	6		& 7.9	0			GRE
1976 07 29.14	* B	10.7	AC	20.3	L	6		& 7.0	0/			GRE

Comet Bradfield 1979 VII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1979 07 03.28	* S	9.2	S	31.7	L	5	86		3			JON

Comet Bradfield 1979 X

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1979 12 26.65	S	5.5	SC	4.5	R	6	13					JON
1980 01 05.65				8.0	B		11		5	0.25	260	JON
1980 01 05.65	S	5.8	SC	4.9	B		3					JON
1980 01 10.64				8.0	B		11			0.5	250	JON
1980 01 10.64	S	5.3	SC	4.9	B		3					JON
1980 01 12.64	S	5.4	SC	2.3	B		2					JON
1980 01 18.42	S	6.1	SC	3.0	B		3					JON
1980 01 18.66				31.7	L	5	86		5	0.5	255	JON
1980 01 18.66	S	5.8	SC	3.0	B		3					JON
1980 01 20.47				31.7	L	5	86	12	6	0.5	250	JON

Comet Bradfield 1979 X (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 01 20.47	S	4.9	SC	2.3	B		2					JON
1980 01 21.65	S	5.2	SC	2.3	B		2					JON
1980 01 23.42	S	4.9	SC	2.3	B		2					JON
1980 01 25.65				31.7	L	5	86	8	5		100	JON
1980 01 25.65	S	5.3	SC	2.3	B		2					JON
1980 01 26.49	S	5.1	SC	4.5	R	6	13					JON
1980 01 28.43	S	4.9	SC	2.3	B		2					JON
1980 01 30.41	S	5.7	SC	4.5	R	6	13					JON
1980 02 03.38	S	5.6	SC	4.9	B		3					JON
1980 02 05.39	S	6.2	SC	4.9	B		3					JON
1980 02 06.41				31.7	L	5	86	6	4	?	90	JON
1980 02 06.41	S	6.4	SC	4.9	B		3					JON
1980 02 08.39				31.7	L	5	86	4	3	?	90	JON
1980 02 08.39	S	7.9	SC	4.5	R	6	13					JON
1980 02 11.39	S	8.2	SC	4.5	R	6	13					JON
1980 02 16.38	S	8.9	SC	7.8	R	8	30					JON

Comet Bradfield 1980 XV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 12 20.66	S	4.3	SC	8.0	B		11		6		225	JON

Comet Bowell 1982 I

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 02.16	C	21	FA	91.4	L	4		0.42	0			SC002

Comet IRAS-Araki-Alcock 1983 VII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 05 03.96	S	6.2	AA	5.0	B		10	12	3			HUR
1983 05 06.93	S	5.6	AA	8.0	B		15	25				HUR
1983 05 07.00	S	5.6	AA	5.0	B		10	50	2			HUR
1983 05 09.04	I	4.5	AA	0.0	E		1	60				HUR
1983 05 09.10	S	2.5	V	5.0	B		10	45	4/			DOH
1983 05 09.87	I	3.0	A	0.0	E		1					HUR
1983 05 09.89	S	2.8	A	8.0	B		15	90				HUR
1983 05 09.90	S	2.0	V	5.0	B		10	45				DOH
1983 05 09.97	S	2.0	V	5.0	B		10	85	5			DOH
1983 05 10.89	I	2.1	A	0.0	E		1	90				HUR
1983 05 11.00	I	1.7	V	0.0	E		1	110	4/			DOH
1983 05 11.4	S	3.4	A	0.0	E		1	120	1			LOV
1983 05 12.30	S	2.5	SC	4.3	R	3	4	55				JON
1983 05 12.37	G	1.5	Y	0.8	E		1	115	4			BOU
1983 05 12.41	S	2.0	A	0.0	E		1	>90	2		40	LOV
1983 05 13.29	S	4.7	SC	4.3	R	3	4					JON
1983 05 13.36				31.7	L	5	86		3/		250	JON
1983 05 13.40	G	2.2	Y	0.8	E		1	85	2			BOU
1983 05 14.34	S	5.1	SC	4.9	B		3					JON
1983 05 14.43	G	3.0	Y	0.8	E		1	35				BOU
1983 05 15.37	S	5.1	SC	4.9	B		3					JON
1983 05 15.40	G	3.9	Y	0.8	E		1		2			BOU
1983 05 16.41	S	6.1	A	0.0	E		1					LOV
1983 05 16.41	S	6.4	A	3.0	R		8	4.5	5			LOV
1983 05 16.42	G	4.3	Y	0.8	E		1					BOU

Comet IRAS-Araki-Alcock 1983 VII (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 05 17.39	S	5.5	A	0.0	E		1					LOV
1983 05 17.39	S	5.8	A	3.0	R		8	6	6			LOV
1983 05 19.36	S	6.8	A	3.0	R		8	7	5			LOV
1983 05 19.39	S	7.2	SC	4.5	R	6	13					JON
1983 05 20.36	S	7.1	SC	4.5	R	6	13	3				JON
1983 05 22.32	S	7.6	SC	4.5	R	6	13	2.5				JON
1983 05 23.32	S	8.3	S	7.8	R	8	30	2.25				JON
1983 05 23.35	S	7.8	A	3.0	R		8	5	4			LOV
1983 05 27.35	S	8.6	VN	7.8	R	8	30	3				JON
1983 05 29.37	S	8.0	A	3.0	R		8		5			LOV
1983 05 30.37	S	8.3	A	3.0	R		8	4				LOV
1983 05 31.36	S	8.3	A	3.0	R		8	4	5			LOV
1983 06 01.34	S	10.9	VN	31.7	L	5	86		2			JON
1983 06 02.31	S	8.2	VN	7.8	R	8	30	4				JON
1983 06 02.32	S	9.4	VN	31.7	L	5	86		3/			JON
1983 06 03.3	S	9.2	VN	7.8	R	8	30	3.5				JON
1983 06 03.37	S	10.5	VN	31.7	L	5	86	3	2			JON
1983 06 06.28	S	9.6	VN	7.8	R	8	30	3				JON
1983 06 06.29	S	10.5	VN	31.7	L	5	86	2	5			JON
1983 06 07.30	S	9.3	VN	7.8	R	8	30					JON
1983 06 11.40	S	10.3	A	20	L	7	50	4	2			LOV
1983 06 13.28	S	11.0	VN	31.7	L	5	86	& 2	3			JON
1983 06 14.28	S	11.4	VN	31.7	L	5	86	1.3	2			JON
1983 06 15.30	S	10.2	VN	7.8	R	8	30					JON
1983 06 15.30	S	10.9	VN	31.7	L	5	86	2.5	2			JON
1983 06 16.32	S	11.2	VN	31.7	L	5	86		2			JON
1983 06 17.33	S	11.2	VN	31.7	L	5	86		1			JON

Comet Černis 1983 XII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 08 04.08	S	10.1	AA	29.8	L	5	62	1.2				KEI
1983 08 06.09	S	10.3	V	29.8	L	5	62	1.5	5/			KEI
1983 08 13.08	S	10.4	V	29.8	L	5	62	1	6	0.05	25	KEI
1983 08 13.75	S	11.0	V	31.7	L	5	86	? 0.5	5			JON
1983 08 14.75	S	10.6	V	31.7	L	5	86	1.5	6			JON
1983 08 15.08	S	10.4	V	29.8	L	5	62	1.0				KEI
1983 08 15.75	S	10.6	V	31.7	L	5	86		6			JON
1983 08 16.32	M	10.0	AC	25.0	L	7	68	1.9	7			MOR
1983 08 16.70	S	10.6	V	31.7	L	5	86	1.5	5			JON
1983 08 17.69	S	10.5	V	31.7	L	5	86	1	5/			JON
1983 08 18.73	S	10.4	V	31.7	L	5	86	1.25	5/			JON
1983 09 02.23	S	9.8:	AC	25.0	L	7	68	1.2	6/			MOR
1983 09 04.24	M	9.9	AC	25.0	L	7	68	1.3	6			MOR
1983 09 05.28	M	9.9	AC	25.0	L	7	68	2.1	6	0.12	190	MOR
1983 09 06.02	S	9.8	AA	29.8	L	5	62	1.5	6			KEI
1983 09 07.04	S	9.6	AA	8.0	B		20	2.8				KEI
1983 09 07.04	S	9.8	AA	29.8	L	5	53	2.1				KEI
1983 09 07.04	S	9.9	AA	29.8	L	5	62	1.2	6/	0.03	275	KEI
1983 09 08.32				25.0	L	7	68			0.05	270	MOR
1983 09 08.32	M	9.9	AC	25.0	L	7	68	2.0	7/	0.08	220	MOR
1983 09 09.32				25.0	L	7	103			0.08	220	MOR
1983 09 09.32	M	9.8	AC	25.0	L	7	68	2.6	7			MOR
1983 09 11.69	S	10.5	V	7.8	R	8	30					JON
1983 09 15.37				25.0	L	7	68			0.05	225	MOR

Comet Černis 1983 XII (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 09 15.37	M	9.8	AC	25.0	L	7	68	2.2	8	0.10	270	MOR
1983 09 16.34	M	9.8	AC	25.0	L	7	68	1.1	7/	0.03	290	MOR
1983 09 17.73	S	10.4	V	31.7	L	5	86	0.8	4			JON
1983 09 19.18	S	9.4	AA	8.0	B		20	1.9				KEI
1983 09 19.18	S	9.5	AA	29.8	L	5	62	2.5		?	135	KEI
1983 09 29.42	S	10.8	VN	31.7	L	5	86	1.25	5			JON
1983 10 01.71	S	10.5	VN	31.7	L	5	86		4			JON
1983 10 05.01	S	8.8	AA	8.0	B		20	3.5	4/			KEI
1983 10 07.24	M	9.4	AC	25.0	L	7	68	1.9	6			MOR
1983 10 07.99	S	8.7	AA	8.0	B		20	3.5				KEI
1983 10 08.19	M	9.4	S	25.0	L	7	68	2.3	6			MOR
1983 10 08.20	S	9.4	S	8.0	B		20	5.	3			MOR
1983 10 12.69	S	10.9	VN	31.7	L	5	86		4			JON
1983 10 13.97	S	8.7	AA	8.0	B		20	4.9				KEI
1983 10 15.26	M	9.4	S	25.0	L	7	68	2.1	6	0.10	285	MOR
1983 10 26.45	S	11.1	VN	31.7	L	5	86		4			JON
1983 10 31.13!	M	10.7	AC	25.0	L	7	68	2.9	4			MOR
1983 11 01.10!	S	10.9	AC	25.0	L	7	68	& 3.	3			MOR
1983 11 02.10!	S	11.0	AC	25.0	L	7	68	2.7	2			MOR
1983 11 05.42	S	10.8	VN	31.7	L	5	86	1	4/			JON
1983 12 04.42	S	11.6	VN	31.7	L	5	86		4			JON
1983 12 05.41	S	11.7:	VN	31.7	L	5	86		3			JON
1983 12 23.42	S	11.8	VN	31.7	L	5	86	0.8	3/			JON
1983 12 24.42	S	11.8	VN	31.7	L	5	86		3			JON
1983 12 28.41	S	11.9	VN	31.7	L	5	86		2			JON
1983 12 30.42	S	12.2	VN	31.7	L	5	86		2			JON
1984 01 03.42	S	12.4	VN	31.7	L	5	86		3			JON
1984 01 24.40	S	12.5:	VN	31.7	L	5	86					JON

Comet Shoemaker 1984 XV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 08 31.33	c	19.0	FA	91.4	L	4						SCO02

Comet Shoemaker 1985 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 11 12.41	S	12.0	A	26	L	5	73	0.6	3/			KAN
1984 11 13.44	S	12.2	A	13	L	6	64	1	4			ISH02
1984 11 13.45	S	11.7	A	26	L	5	73	0.6	5			KAN
1984 11 25.46	S	11.0	A	16	L	6	112	1				OHT
1984 11 25.47	S	10.7	A	10	L	10	56	2.7				ICH
1984 11 25.49	S	11.5	A	26	L	5	73	0.8	6			KAN
1984 11 26.40	S	12.5	VN	31.7	L	5	86		5			JON
1984 11 26.42	S	10.4	A	10	L	10	56					ICH
1984 11 27.40	S	12.6	VN	31.7	L	5	86	& 1	3			JON
1984 11 27.45	S	10.5	A	10	L	10	56	1.8				ICH
1984 11 27.51	S	11.7	A	13	L	6	64	1.3	4			ISH02
1984 11 28.42	S	12.4	VN	31.7	L	5	86		3			JON
1984 11 30.43	S	10.1	A	10	L	10	56	1.5				ICH
1984 12 02.51	S	10.7	A	10	L	10	56	2.3				ICH
1984 12 03.47	S	10.8	A	10	L	10	56	2.0				ICH
1984 12 12.44	S	11.1	A	20	L	5	80	1.8	6			NAK01
1984 12 12.45	M	10.2	A	10	L	10	56	3.7				ICH
1984 12 14.48	M	10.8	A	10	L	10	56	1.3				ICH

Comet Shoemaker 1985 II (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 12 15.43	S	10.8	A	20	L	5	80	2	4			NAK01
1984 12 22.43	S	12.0	VN	31.7	L	5	86	0.8	6	0.03	0	JON
1984 12 23.42	S	11.5	VN	31.7	L	5	86	0.8		0.03	35	JON
1984 12 23.44	S	10.7	A	20	L	5	80	3	5/	0.07	50	NAK01
1984 12 24.41	S	11.7	VN	31.7	L	5	86	0.5	4	0.03	60	JON
1984 12 25.45	P	11.0	A	16	L	3				0.03		OHT
1984 12 26.43	S	11.8	VN	31.7	L	5	86	0.8	3	>0.02	25	JON
1985 01 13.44	S	11.6	VN	31.7	L	5	86	1	6	?	20	JON
1985 01 13.47	S	10.7	A	20	L	6	89	2	5			NAK01
1985 01 13.52	S	12.0	A	26	L	5	53	1.3	6			KAN
1985 01 14.52	S	12.0	A	26	L	5	53	1.4	5/			KAN
1985 01 16.42	S	11.6	VN	31.7	L	5	86					JON
1985 01 16.46	S	12.0	A	13	L	6	64	1.5	4			ISH02
1985 01 16.49	S	12.0	A	26	L	5	73	1.3	6			KAN
1985 01 17.41	S	11.6	VN	31.7	L	5	86	1	3	?		JON
1985 01 17.45	P	11.8	A	16	L	3						OHT
1985 01 20.43	S	10.8	A	20	L	6	89	2	4	?	45	NAK01
1985 01 23.45	S	11.2	A	20	L	6	89	2	5			NAK01
1985 01 25.51	P	12.4	A	16	L	3		0.4				OHT
1985 01 26.50	S	11.7	A	26	L	5	73	1.1	4/			KAN
1985 01 26.51	S	11.2	A	20	L	6	89	2.2	5			NAK01
1985 01 27.40	S	12.6	VN	31.7	L	5	86		1			JON
1985 01 28.45	S	12.7	VN	31.7	L	5	86					JON
1985 02 16.55	S	13.1	A	20	L	6	89	1				NAK01
1985 02 20.51	P	13.5	A	16	L	3						OHT
1985 02 22.50	P	14 :	A	16	L	3						OHT

Comet Machholz 1985 VIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 06 06.75	S	8.8	S	20	L	6	89	2.5	4			NAK01

Comet Shoemaker 1985 XII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 12 31.85	P	14.0	A	16	L	3						OHT
1985 01 04.85	P	14.0	A	16	L	3						OHT
1985 01 21.84	P	13.6	A	16	L	3		0.4				OHT
1985 01 26.83	P	13.7	A	16	L	3		0.3				OHT
1985 01 30.83	S	13.0	A	20	L	6	123	0.9				NAK01
1985 01 30.85	S	12.4	A	26	L	5	105	0.3	6/			KAN
1985 01 31.85	S	12.4	A	26	L	5	105	0.3	6/			KAN
1985 02 01.85	S	12.6	A	26	L	5	146	0.3				KAN
1985 02 14.77	S	12.5	A	20	L	6	123	0.8	4/			NAK01
1985 02 21.83	S	12.2	A	26	L	5	105	0.5	6			KAN
1985 02 22.81	S	12.2	A	26	L	5	105	0.5	6			KAN
1985 02 23.82	P	13.0	A	16	L	3		0.4				OHT
1985 03 17.79	S	12.3	A	20	L	6	123	1.0	5			NAK01
1985 03 28.68	S	12.0	A	20	L	6	89	1.0	6			NAK01
1985 03 29.72	S	12.0	VN	31.7	L	5	86	0.8	1			JON
1985 03 30.45	S	12.0	VN	31.7	L	5	86	0.8	1			JON
1985 03 31.76	S	12.2	A	20	L	6	89	1.0	5			NAK01
1985 04 11.39	S	11.8	VN	31.7	L	5	86	1	4			JON
1985 04 14.40	S	11.9	VN	31.7	L	5	86	1	4			JON
1985 04 16.64	S	11.6	A	20	L	6	89	1.3	5			NAK01

Comet Shoemaker 1985 XII (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 04 18.64	S	11.4	A	20	L	6	89	1.2	4			NAK01
1985 04 20.67	S	11.3	A	20	L	6	89	1.4	5			NAK01
1985 04 22.42	S	11.6	VN	31.7	L	5	86	1	5			JON
1985 04 23.39	S	11.5	VN	31.7	L	5	86	1.25	3			JON
1985 04 24.41	S	11.5	VN	31.7	L	5	86	1	5			JON
1985 04 26.42	S	11.2	VN	31.7	L	5	86	1	5/			JON
1985 04 27.66	S	10.5	A	20	L	6	89	2.3	5			NAK01
1985 04 30.39	S	11.4	VN	31.7	L	5	86					JON
1985 05 01.74	S	11.4	VN	31.7	L	5	86	1	2			JON
1985 05 11.55	S	10.9	A	20	L	6	89	2.5	5/			NAK01
1985 05 15.43	S	11.4	VN	31.7	L	5	86	1.3	4			JON
1985 05 16.37	S	11.3	VN	31.7	L	5	86	1	4/			JON
1985 05 25.37	S	11.4	VN	31.7	L	5	86	1	3			JON
1985 05 26.37	S	11.4	VN	31.7	L	5	86	1	2			JON
1985 06 08.32	S	12.0	VN	31.7	L	5	86	1	6			JON
1985 06 10.43	S	12.0	VN	31.7	L	5	86	1	1/			JON
1985 06 12.30	S	11.9	VN	31.7	L	5	86	0.8	3			JON
1985 06 16.34	S	11.9	VN	31.7	L	5	86	0.7	5			JON
1985 10 13.68	S	11.7	VN	31.7	L	5	86	< 1	6			JON
1985 10 16.68	S	11.9	VN	31.7	L	5	86					JON
1985 10 17.67	S	11.8	VN	31.7	L	5	86	1.5	1/			JON
1985 12 10.62	S	12.9	VN	31.7	L	5	86		1			JON
1986 12 30.22	c	16.7	FA	91.4	L	4						SCO02

Comet Hartley-Good 1985 XVII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 09 20.56	S	9.3	AC	20	L	6	44	5	2			NAK01
1985 09 30.34	S	10.0	VN	31.7	L	5	86	1	2/			JON
1985 10 01.35	S	10.1	VN	31.7	L	5	86	2.5	2/			JON
1985 10 02.39	S	8.9	VN	7.8	R	8	30	3				JON
1985 10 02.39	S	9.7	VN	31.7	L	5	86	2.5	3			JON
1985 10 07.49	S	9.8	AA	13	L	6	44	2.3	3			ISH02
1985 10 07.50	S	9.6	A	15	L	6	36	3.8	1/			KAN
1985 10 08.47	S	9.8	AA	13	L	6	27	3	3			ISH02
1985 10 08.53	S	9.7	AC	16	L	6	42		2/			OHT
1985 10 13.41	S	8.9	VN	7.8	R	8	30					JON
1985 10 14.43	S	8.8	A	15	L	6	36	4.7	2			KAN
1985 10 14.45	S	9.1	AC	16	L	6	42		2			OHT
1985 10 14.46	S	9.4	AA	13	L	6	24	5	3			ISH02
1985 10 16.44	S	8.9	VN	7.8	R	8	30	3				JON
1985 10 19.45	S	8.7	AA	7.8	R	8	30					JON
1985 10 22.48	S	9.3	AC	13	L	6	44	3	3			ISH02
1985 10 25.47	S	9.5	AA	13	L	6	44	3	3			ISH02
1985 10 27.39	S	8.6	A	26	L	5	53	3.3	5			KAN
1985 10 27.41	S	8.9	AA	13	L	6	44	4	4			ISH02
1985 10 28.48	S	9.1	AA	13	L	6	44	3	3			ISH02
1985 11 02.38	S	7.8	AA	13	L	6	24	8	4			ISH02
1985 11 03.39	S	7.8	AA	13	L	6	24	8	4			ISH02
1985 11 03.41	S	7.2	A	15	L	6	28	7.3	4			KAN
1985 11 03.42	S	7.6	A	16	L	6	42	4	3			OHT
1985 11 04.37	S	8.3	AA	31.7	L	5	86	2.5	2			JON
1985 11 04.42	S	7.9	AA	13	L	6	24	6.5	3			ISH02
1985 11 08.41	S	8.0	AC	20	L	6	44	6	3	?	90	NAK01
1985 11 10.41	S	7.5	AA	13	L	6	24	6	4			ISH02

Comet Hartley-Good 1985 XVII (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 11.39	S	7.5	AA	13	L	6	24	6	4			ISH02
1985 11 11.40	S	7.5	A	15	L	6	28	6.6	5/			KAN
1985 11 12.39	S	7.8	A	15	L	6	28	6.1	5/			KAN
1985 11 12.39	S	7.8	AA	13	L	6	24	4.5	4			ISH02
1985 11 13.41	S	7.8	AA	13	L	6	24	5	4			ISH02
1985 11 14.42	S	7.8	AA	13	L	6	24	5	4			ISH02
1985 11 15.43	S	7.9	AC	20	L	6	44	4.5		?	90	NAK01
1985 11 17.39	S	7.6	AA	13	L	6	24	6	5			ISH02
1985 11 23.38	S	7.8	A	15	L	6	28	2.6	6/			KAN
1985 11 23.39	S	7.6	AA	13	L	6	24	4	4			ISH02
1985 12 01.38	S	7.0	AA	13	L	6	24	3	5			ISH02
1985 12 14.85	S	7.5	A	15	L	6	28	& 2.5	5			KAN
1985 12 16.85	S	7.5	A	15	L	6	28	2.0	7			KAN
1985 12 17.85	S	7.8	A	15	L	6	28	& 2.5	7			KAN
1985 12 18.85	S	8.2	A	15	L	6	28	2.5	8			KAN
1985 12 19.85	S	8.0	A	15	L	6	28	2.5	7	?	335	KAN
1985 12 20.83	S	7.8	AC	20	L	6	44	4	5	?	350	NAK01
1985 12 20.85	S	7.9	A	15	L	6	28	2.5	7/	?	0	KAN
1985 12 23.83	S	7.8	AC	20	L	6	44	6	5	?	0	NAK01
1985 12 24.85	S	8.1	A	15	L	6	28	3.5	6/	?	0	KAN
1985 12 27.85	S	8.5	A	15	L	6	28	2.3	6/			KAN
1986 01 02.84	S	8.8	A	15	L	6	28	3.8	6			KAN
1986 01 02.85	S	8.0	AA	13	L	6	24	4	3	0.08		ISH02
1986 01 05.84	S	8.4	A	15	L	6	28	4.6	6			KAN
1986 01 06.83	S	8.1	AC	20	L	6	44	6	3/			NAK01
1986 01 06.85	S	8.1	AA	13	L	6	24	4	4	?	10	ISH02
1986 01 07.84	S	8.5	A	15	L	6	28	4.5	5			KAN
1986 01 08.83	S	8.5	A	15	L	6	28	4.2	5/			KAN
1986 01 09.82	S	9.2	A	16	L	6	42					OHT
1986 01 10.82	S	8.2	AC	20	L	6	35	6.5	3	?	315	NAK01
1986 01 11.83	S	8.7	A	15	L	6	28	4.1	4/			KAN
1986 01 14.82	S	8.3	AC	20	L	6	35	6.5	3	?	315	NAK01
1986 01 14.84	S	8.9	AA	13	L	6	24	4	3			ISH02
1986 01 17.79	S	9.9	AC	16	L	6	29					OHT
1986 01 17.82	S	8.4	AC	20	L	6	35	7.5	3	?	315	NAK01
1986 01 19.84	S	10.0	A	15	L	6	28	3.4	3			KAN
1986 01 19.85	S	9.6	A	15	L	6	51	3.6	3			WAT01
1986 01 20.85	S	10.0	A	15	L	6	28	3.4	3			KAN
1986 02 05.81	S	11.5	AC	13	L	6	44	2	2			ISH02
1986 02 06.81	S	10.5	AC	20	L	6	106	3				NAK01
1986 02 08.81	S	11.3	A	26	L	5	73	2.6	1			KAN
1986 02 11.79	S	10.7	AC	20	L	6	65	5	0/			NAK01
1986 02 12.78	S	11.0	AC	20	L	6	65	4	0			NAK01
1986 02 15.78	S	11.1	AC	20	L	6	65	4	0			NAK01
1986 02 15.78	S	12.0	A	26	L	5	105	1.8	0			KAN
1986 02 19.42	P	12.4	AC	16	L	3						OHT

Comet Thiele 1985 XIX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 22.73	S	9.1	AC	16	L	6	42		2/			OHT
1985 10 22.74	S	9.7	AC	20	L	6	44	6	2			NAK01
1985 10 23.72	S	10.9	A	26	L	5	53	3.0	2/			KAN
1985 10 23.80	S	9.8	AC	20	L	6	44	6	1/			NAK01
1985 10 24.73	S	9.1	AC	16	L	6	42		3			OHT

Comet Thiele 1985 XIX (Cont).

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 02.40	S	10.0	A	26	L	5	53	2.6	3/			KAN
1985 11 03.51	S	9.8	AA	13	L	6	44	3	3			ISH02
1985 11 07.64	S	9.0	AC	20	L	6	44	7	2			NAK01
1985 11 08.59	S	9.2	AA	13	L	6	24	6	3			ISH02
1985 11 08.60	S	8.9	AC	20	L	6	44	8	3			NAK01
1985 11 09.54	S	8.7	AC	20	L	6	44	8	2/			NAK01
1985 11 10.60	S	8.3	A	15	L	6	28	10.3	2			KAN
1985 11 11.52	S	9.0	AA	13	L	6	24	7.2	3			ISH02
1985 11 12.49	S	8.9	AA	13	L	6	24	9	3			ISH02
1985 11 12.54	S	9.5	AC	16	L	6	31	6.0	3			OHT
1985 11 12.59	S	8.6	AC	20	L	6	44	8	2			NAK01
1985 11 13.43	S	8.8	AA	13	L	6	24	9	3			ISH02
1985 11 14.46	S	8.7	AA	13	L	6	24	8	3			ISH02
1985 11 15.54	S	8.7	AA	13	L	6	24	8	3			ISH02
1985 11 15.59	S	8.7	AC	20	L	6	44	8	3			NAK01
1985 11 17.50	S	8.7	AA	13	L	6	24	8	3			ISH02
1985 11 24.41	S	9.0	AA	13	L	6	44	5	2			ISH02
1985 12 02.48	S	9.2	AA	13	L	6	24	4	3			ISH02
1985 12 09.43	S	9.2	AC	20	L	6	44	4.5	2			NAK01
1985 12 15.46	S	9.7	AC	20	L	6	89	2.5	0/			NAK01
1986 01 05.41	S	9.9	AC	20	L	6	65	2.5	1			NAK01
1986 01 12.40	S	10.2	AC	20	L	6	106	1.5				NAK01

Comet Shoemaker 1986b

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 02.42	C	19.0	FA	91.4	L	4				0.02	80	SCO02
1986 12 27.50	c	20	FA	91.4	L	4				0.02	85	SCO02

Comet Levy 1987a

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 11.54	S	10.9	AC	20	L	6	55	1.5	3/			HAL
1987 01 11.55	S	11.3	AC	40.6	L	5	156	2	2			LEV
1987 01 12.55	S	11.1	AC	40.6	L	5	156	2	3			LEV
1987 01 26.55				40.6	L	5	156	2.5	1	0.03	340	LEV
1987 01 27.50	S	11.5	AC	40.6	L	5	156	& 2.5				LEV
1987 01 29.50	S	12.0	AC	40.6	L	5	156	2				LEV
1987 01 30.54	S	11.1	AC	20	L	6	55					HAL
1987 02 05.53	S	13.0:	AC	91.4	L	8	274	3	1			LEV
1987 02 07.52	S	12.0	AC	20	L	6	163					HAL
1987 03 03.53	S	12.9	AC	40.6	L	5	156	2	1			LEV
1987 03 27.39	c	18.1	FA	91.4	L	4						SCO02
1987 03 28.32	C	17.6	FA	91.4	L	4						SCO02
1987 05 02.18	C	19.4	FA	91.4	L	4						SCO02
1987 05 24.19	C	20.5	FA	91.4	L	4						SCO02

Comet Terasako 1987d

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 28.56	S	7.9	AA	7.6	R	8	25	3.5	4			CLA
1987 01 30.09				20	L	6	55			0.42	180	HAL
1987 01 30.09	S	6.8	AC	20.3	L	7	44	4	7	0.17	65	LEV
1987 01 30.09	S	7.3	AC	5.0	B		10					HAL
1987 02 02.10				20	L	6	55			0.42	180	HAL

Comet Terasako 1987d (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 02 02.12	! S	7.6	AC	5.0	B		10					HAL
1987 02 16.12	S	8.8	AC	20	L	6	55					HAL
1987 02 21.58	S	9.6	AA	31	L	4	37	2.5	1			CLA
1987 02 23.78	S	8.4	AA	25.4	L	4	36	8	3			ZAN
1987 02 28.14	S	9.9	AC	20	L	6	55		1			HAL

Comet Shoemaker 1987o

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 05 23.31	C	16	FA	91.4	L	4						SCO02
1987 05 24.31	C	16	FA	91.4	L	4				0.08	145	SCO02
1987 06 22.38	C	16.1	FA	91.4	L	4				>0.09	140	SCO02

Comet Wilson 19861

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 08 15.45	M	11.8	AC	20	L	6	163					HAL
1986 08 31.33	M	11.5	AC	20	L	6	163					HAL
1986 09 12.27	M	11.2	AC	20	L	6	163					HAL
1986 09 25.21	M	11.0	AC	20	L	6	163					HAL
1986 10 07.20	M	11.1	AC	20	L	6	163					HAL
1986 10 27.70	M	11.4	AC	20	L	6	163					HAL
1986 11 04.16	M	11.3	AC	20	L	6	163					HAL
1986 11 20.10	M	11.1	AC	20	L	6	110					HAL
1986 11 28.12	M	11.1	AC	20	L	6	110					HAL
1986 12 02.12	M	11.0	AC	20	L	6	110					HAL
1986 12 20.08	M	10.6	AC	20	L	6	110					HAL
1986 12 27.07	S	10.2	AC	20	L	6	55					HAL
1987 02 26.86	S	7.8	AA	12.5	R	5	31	2	6	0.1	8	CLA
1987 02 28.86	S	7.5	AA	12.5	R	5	31	2	6	0.05	242	CLA
1987 03 01.86	S	7.4	AA	12.5	R	5	31	2	6	0.07	245	CLA
1987 03 02.86	S	7.4	AA	12.5	R	5	31	2.5	6	0.15	28	CLA
1987 03 04.53	! S	7.9:	AC	20	L	6	55					HAL
1987 03 07.52	! S	7.9	AC	20	L	6	55		5			HAL
1987 03 07.87	S	7.2	AA	12.5	R	5	31	3.5	6	0.05	289	CLA
1987 03 12.52	! S	7.8	AC	20	L	6	55					HAL
1987 03 12.86	S	6.7	AA	12.5	R	5	31	4	6	0.07	270	CLA
1987 03 26.82	S	6.4	AA	12.5	R	5	31	4.5	7	0.25	255	CLA
1987 03 27.51	! S	6.9	AC	20	L	6	55					HAL
1987 03 27.86	S	6.3	AA	12.5	R	5	31	4.5	7	0.25	260	CLA
1987 03 28.84	S	6.2	AA	12.5	R	5	31	5	7	0.33	254	CLA
1987 04 01.79	B	6.7	AA	8.0	B		11		3			BEM
1987 04 01.82	S	5.8	AA	12.5	R	5	31	6	7	0.52	244	CLA
1987 04 01.84		5.6	AA	0.0	E		1					CLA
1987 04 04.86	S	5.9	AA	12.5	R	5	31	8	7	1.0	247	CLA
1987 04 04.87		5.6	AA	0.0	E		1					CLA
1987 04 06.70	S	5.8	AA	5.0	B		7					GAR01
1987 04 07.71	S	5.8	AA	5.0	B		7					GAR01
1987 04 08.68	S	5.7	AA	5.0	B		7					GAR01
1987 04 09.86	S	5.9	AA	12.7	R	5	20	4.5	5/	0.3		PEA
1987 04 10.80	B	6.0	AA	8.0	B		11	9	3			BEM
1987 04 10.80	S	5.6	AA	5.0	B		7					GAR01
1987 04 11.62	B	6.0	AA	8.0	B		11		3			BEM
1987 04 11.79	S	5.4	AA	5.0	B		7					GAR01
1987 04 12.80	S	5.5	AA	5.0	B		7					GAR01

Comet Wilson 19861 (Cont).

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 04 17.59	B	6.0	AA	8.0	B		11	5	3			BEM
1987 04 18.60	B	5.8	AA	8.0	B		11	7	4			BEM
1987 04 19.63	B	5.9	AA	8.0	B		11	> 7	4			BEM
1987 04 20.59	B	5.8	AA	8.0	B		11		4			BEM
1987 04 21.59	B	5.7	AA	8.0	B		11		3			BEM
1987 04 23.72	S	5.4	AA	5.0	B		7					GAR01
1987 04 25.39	B	5.8	AA	8.0	B		11		3	0.5	310	BEM
1987 04 25.70	S	5.6	AA	5.0	B		7					GAR01
1987 04 26.41	B	5.7	AA	8.0	B		11		3	1	255	BEM
1987 04 27.47	B	5.6	AA	8.0	B		11	8	6	1	270	BEM
1987 04 27.81		5.1	AA	0.0	E		1					CLA
1987 04 27.82	S	5.2	AA	7.6	S	8	30	12	7	1.0		CLA
1987 04 27.86	S	5.3	AA	20	L	5	32	6	6/			PEA
1987 04 28.85		5.1	AA	0.0	E		1					CLA
1987 04 28.86	S	5.2	AA	7.6	S	8	30	12	7	1.0		CLA
1987 04 29.46	B	5.7	AA	8.0	B		11	10	5	1	225	BEM
1987 05 02.50	S	5.1	AA	20	L	5	31	5	4	2.0	190	CLA
1987 05 02.53	B	5.1	AA	3.0	B		8		5			PEA
1987 05 02.53	S	5.0	AA	0.0	E		1					PEA
1987 05 02.53	S	5.3	AA	20	L	5	32	25	6	2	195	PEA
1987 05 03.38	B	5.7	AA	8.0	B		11	7	6	2	255	BEM
1987 05 03.48	S	5.2	AA	0.0	E		1					GAR01
1987 05 05.52	S	5.3	AA	3.0	B		8	13	6			PEA
1987 05 05.54	S	5.7	AA	20	L	5	50	8	7	0.7	188	PEA
1987 05 06.49	S	5.8	AA	3.0	B		8	15	6			PEA
1987 05 07.47	S	5.7	AA	3.0	B		8	16	6			PEA
1987 05 14.87		5.5:	AA	8.0	B		20	8.2				HAS02
1987 05 15.89	S	6.1	AA	8.0	B		20	9.4	5	0.33	150	HAS02
1987 05 16.13	S	6.1:	WH	20	L	6	55	5	4	0.42	35	HAL
1987 05 16.37	S	6.2	AA	2.5	B		2					SEA
1987 05 16.88	S	5.9	AA	0.0	E		1					HAS02
1987 05 16.88	S	5.9	AA	3.0	B		8	5.1				HAS02
1987 05 16.88	S	5.9	AA	8.0	B		20	5.1	4			HAS02
1987 05 16.99	B	6.3	S	7.0	B		10	6.0		0.26	125	DEA
1987 05 17.13	S	6.2	AC	5.0	B		10					HAL
1987 05 17.53	S	6.5	AA	3.0	B		8	7	7			PEA
1987 05 18.48	S	6.5	AA	3.0	B		8	6	5			PEA
1987 05 18.89	B	6.2	AA	8.0	B		20	6.4	4			HAS02
1987 05 18.89	S	6.1	AA	3.0	B		8	6.4				HAS02
1987 05 19.42	S	6.2	AA	5.0	B		7		4			GAR01
1987 05 19.46	B	6.6	AA	3.0	B		8					PEA
1987 05 19.46	S	6.6	AA	3.0	B		8	6	6			PEA
1987 05 19.47	S	6.4	AA	5.0	B		10					SEA
1987 05 20.42	S	6.3	AA	5.0	B		7		4			GAR01
1987 05 20.45	B	6.7	AA	3.0	B		8					PEA
1987 05 20.45	S	6.7	AA	3.0	B		8	5.5	6			PEA
1987 05 20.90				8.0	B		20	6.6	4	0.18	140	HAS02
1987 05 20.90	S	6.3	AA	3.0	B		8					HAS02
1987 05 21.40	S	6.3	AA	5.0	B		7					GAR01
1987 05 22.45				8.0	B		15	4	5	0.8	120	SEA
1987 05 22.45	S	6.3	AA	5.0	B		10					SEA
1987 05 23.42	S	6.3	AA	5.0	B		7		4			GAR01
1987 05 23.42	S	6.3	AA	5.0	B		10					SEA
1987 05 24.17	S	6.4	AA	8.0	B		20	11.	2			MOR
1987 05 24.17	S	6.4:	AC	20	L	6	55					HAL

Comet Wilson 19861 (Cont).

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 05 24.41	S	6.4	AA	5.0	B		10	6	4			SEA
1987 05 24.43	S	6.5	AA	5.0	B		7		5			GAR01
1987 05 25.46	S	6.6	AA	5.0	B		7		5			GAR01
1987 05 26.36	S	6.6	AA	5.0	B		7		5			GAR01
1987 05 26.44	S	6.5	AA	5.0	B		10					SEA
1987 05 26.49	S	6.8	AA	3.0	B		8	10	5			PEA
1987 05 27.03	B	6.9	S	7.0	B		10	7.6		0.8	140	DEA
1987 05 27.93	B	6.9	S	7.0	B		10	7.6		0.5	140	DEA
1987 05 28.42	S	6.5	AA	5.0	B		10	& 4	4			SEA
1987 05 28.47	S	7.0	AA	3.0	B		8	7	6			PEA
1987 05 28.51	S	7.1	AA	31	L	4	31	5	4	0.87	132	CLA
1987 05 29.15 !	M	6.6	CA	5.0	B		10					HAL
1987 05 31.42				8.0	B		15	3	5	0.3	130	SEA
1987 05 31.42	S	6.8	AA	5.0	B		10					SEA
1987 06 01.48				32	L	4	37	5	6	0.5		PEA
1987 06 01.48	S	7.2	AA	3.0	B		8	6	6			PEA
1987 06 02.52	S	7.0	W	12.5	R	5	31	5.5	5	1.15	140	CLA
1987 06 03.16 !	S	6.8	CA	20	L	6	55					HAI
1987 06 17.15 !	S	7.9:	CA	20	L	6	55					HAL
1987 06 19.88	S	8.6	S	7.0	B		10	2.4				DEA
1987 06 25.36	S	8.5	AA	8.0	B		15					SEA
1987 06 27.34	S	8.4	AA	8.0	B		15					SEA

Comet Sorrells 1986n

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 11 04.36	S	11.2	WA	20	L	6	163					HAL
1986 11 21.15	M	10.4	PC	20	L	6	110		7/			HAL
1986 11 28.22	M	9.8	PC	20	L	6	110					HAL
1986 11 30.87	B	9.8	AA	20.3	T	10	50	2.2	6			LIN02
1986 12 02.19	M	9.6	PC	20	L	6	61					HAL
1986 12 26.18	M	9.5	AC	20	L	6	61			?0.05	75	HAL
1986 12 30.19	M	9.2	AC	20	L	6	61			0.05	40	HAL
1986 12 30.22	S	9.4	AC	5.0	B		10					HAL
1987 01 02.15	S	9.2	AC	5.0	B		10					HAL
1987 01 02.18	M	9.1	AC	20	L	6	61			0.08	40	HAL
1987 01 05.22	M	9.0	AC	20	L	6	55	5				HAL
1987 01 19.12	M	8.9	AC	20	L	6	55			0.13	60	HAL
1987 01 22.18 !	M	9.1	AC	20	L	6	55			0.13	60	HAL
1987 01 23.78	S	8.9	AA	8.0	B		20	7	3/			ZAN
1987 01 23.79	S	9.1	AA	30.5	L	5	47	5	5/			ZAN
1987 01 30.17 !	M	9.3	AC	20	L	6	55					HAL
1987 02 01.76	S	9.3	AA	30.5	L	5	47	5	4			ZAN
1987 02 01.77	S	9.2	AA	8.0	B		20	6	2/			ZAN
1987 02 02.16 !	M	9.4	AC	20	L	6	55					HAL
1987 02 16.09 !	S	9.4:	AC	20	L	6	55					HAL
1987 02 23.76	S	9.3	AC	25.4	L	4	71	4	4			ZAN
1987 02 28.11 !	S	9.5:	AC	20	L	6	55					HAL
1987 04 11.48	S	10.0	AC	20	L	6	55					HAL
1987 04 23.48	S	9.8	AC	20	L	6	110					HAL
1987 04 30.44	M	10.1	NP	25.6	L	4	67	3.0	4			MOR
1987 05 04.87	S	10.5	VN	20	L	5	50	2	5			PEA
1987 05 05.46	S	9.7	AC	20	L	6	55					HAL
1987 05 05.85	S	10.5	VN	20	L	5	50	2	5			PEA
1987 05 06.85	S	9.8	AA	20	L	5	31	2.5	6	0.13	70	CLA

Comet Sorrells 1986n (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 05 06.86	S	10.4	VN	20	L	5	50	2.2	5	?	71	PEA
1987 05 07.87	S	10.6	VN	20	L	5	50	2	4	?	70	PEA
1987 05 23.48	S	9.6	AC	20	L	6	55					HAL
1987 05 24.76	S	10.4	V	25.4	L	4	46	3	5			SEA
1987 05 27.44	M	9.9	AC	41	L	4	83					HAL
1987 05 28.77	S	10.1	V	15.2	L	5	29		5			SEA
1987 06 01.42	S	9.9	AC	20	L	6	55					HAL
1987 06 01.43	M	9.8	AC	41	L	4	83					HAL
1987 06 01.86	S	10.5	VN	32	L	4	50	4	5			PEA
1987 06 10.44	M	9.9	AC	41	L	4	83					HAL
1987 06 21.02	S	9.5	AC	15.5	L	5	32	5	5			ZAN
1987 06 21.41	M	9.7	NP	25.6	L	4	67	4.0	4			MOR
1987 06 22.66	S	10.2	V	15.2	L	5	29	6	4			SEA
1987 06 23.39	M	9.7	AC	41	L	4	83					HAL
1987 06 24.64	S	10.3	AC	15.2	L	5	29	4	4			SEA
1987 06 25.35	M	9.7	NP	25.6	L	4	67	3.5	4			MOR
1987 06 26.65	S	10.4	AC	15.2	L	5	29		4			SEA
1987 06 27.33	M	9.8	NP	25.6	L	4	67	2.7	4	0.04	90	MOR
1987 06 28.64	S	10.4	AC	15.2	L	5	29	6	3			SEA
1987 06 29.23	S	10.2	L	40.6	C	18	229	& 1.5	4/			GRE
1987 07 01.37	M	9.8	NP	25.6	L	4	67	3.1	3			MOR
1987 07 03.36	S	10.2	AC	40.6	L	5	102		4	>0.4		SCO01
1987 07 03.36	S	10.4	AC	40.6	L	5	102	5	4	0.33	5	LEV
1987 07 07.45	M	10.1	NP	25.6	L	4	67	2.7	4			MOR

Comet Nishikawa-Takamizawa-Tago 1987c

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 22.10	S	8.9	AC	40.6	L	5	63			0.6	25	LEV
1987 01 22.11	M	8.1	AC	20	L	6	55	4	4			HAL
1987 01 24.17	! M	8.3	AC	20	L	6	55					HAL
1987 01 26.54	S	8.6	AA	20	L	6	60	5	3			CLA
1987 01 30.12				20	L	6	55			0.42	70	HAL
1987 01 30.14	S	8.0	AC	5.0	B		10					HAL
1987 02 02.14	M	8.1	AC	20	L	6	55			0.42	50	HAL
1987 02 16.11	! M	7.2:	AC	20	L	6	55					HAL
1987 03 27.79	S	6.7	AA	8.0	B		15	& 1.5	7			SEA
1987 03 29.78	S	6.6	AA	8.0	B		15		7			SEA
1987 04 02.79	S	6.7	AA	8.0	B		15		7			SEA
1987 04 04.87	S	6.9	AA	12.5	R	8	31	5	5	0.67	268	CLA
1987 04 09.49	S	7.7:	S	20	L	6	55					HAL
1987 04 09.88	S	7.2	AA	12.7	R	5	20	3	3	0.25	195	PEA
1987 04 10.49	S	7.5:	S	20	L	6	55					HAL
1987 04 10.79	S	7.0	AA	8.0	B		15	& 2.5	7	&1	245	SEA
1987 04 25.48	S	7.5	AC	20	L	6	55					HAL
1987 04 26.71	S	7.0	AA	8.0	B		15	6	5			SEA
1987 04 27.72	S	7.2	AA	8.0	B		15		5			SEA
1987 04 27.85	S	6.9	AA	7.6	S	8	30	6.5	4	1.0	240	CLA
1987 04 27.86	S	7.2	AA	20	L	5	32	4	3			PEA
1987 04 28.86	S	7.0	AA	7.6	S	8	30	7	4	1.0	240	CLA
1987 05 01.47	S	7.4	AC	5.0	B		10					HAL
1987 05 01.81	S	7.2	AA	20	L	5	31	7	3	0.5		CLA
1987 05 02.87	S	7.2	AA	20	L	5	32	6.5	3			PEA
1987 05 03.71	S	7.0	AA	8.0	B		15	7	4			SEA
1987 05 04.85	S	6.9	AA	3.0	B		8	16	3			PEA

Comet Nishikawa-Takamizawa-Tago 1987c (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 05 04.85	S	7.1	AA	20	L	5	32	10	4/	0.5	237	PEA
1987 05 05.47	S	7.4	AC	5.0	B		10					HAL
1987 05 05.81	S	7.2	AA	20	L	5	50	8	5	0.5	250	PEA
1987 05 06.82	S	7.1	AA	20	L	5	31	12	2	0.5	260	CLA
1987 05 06.82	S	7.2	AA	3.0	B		8	10	4			PEA
1987 05 06.84	S	7.2	AA	20	L	5	32	9	5	0.8	258	PEA
1987 05 07.83	S	7.2	AA	3.0	B		8	11	5			PEA
1987 05 07.83	S	7.2	AA	20	L	5	32	8	5	0.33	265	PEA
1987 05 21.08				8.0	B		20	11	1			HAS02
1987 05 21.08	S	7.4	AA	3.0	B		8					HAS02
1987 05 21.45	S	7.1	AC	5.0	B		10	15	1			HAL
1987 05 22.50	S	7.2	AA	5.0	B		10	8	1			SEA
1987 05 23.46	S	7.1	AA	5.0	B		10		1			SEA
1987 05 23.47	S	7.3	AC	5.0	B		10					HAL
1987 05 24.51	S	7.1	AA	5.0	B		10		1			SEA
1987 05 24.64	S	7.0	W	31	L	4	31	&10	0			CLA
1987 05 25.07	S	7.2	S	7.0	B		10	18				DEA
1987 05 25.47	S	6.8	AA	5.0	B		10	10	1			SEA
1987 05 26.55	S	6.8	AA	5.0	B		10		1			SEA
1987 05 27.51	S	7.0	AA	5.0	B		10		1			SEA
1987 05 28.09	S	7.2	S	7.0	B		10	18				DEA
1987 05 28.47	S	7.2	AA	5.0	B		10	8	1			SEA
1987 05 29.42	S	7.8	AC	10.8	L	4	20		0/			HAL
1987 05 29.46	S	7.4	AA	5.0	B		10		0			SEA
1987 06 01.80	S	7.6	AA	3.0	B		8	13	2			PEA
1987 06 01.80	S	7.6	AA	4.0	R		9					PEA
1987 06 02.38	S	7.8	AA	5.0	B		10		0			SEA
1987 06 03.28	S	7.8:	AA	5.0	B		10		0			SEA
1987 06 15.24	S	8.8	AC	41	L	4	83		0			HAL

Comet Torres 1987j

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 06 22.16	S	13.0:	AC	154.9	L	14	654		4	0.05		LEV
1987 06 22.17	C	15.3	FA	91.4	L	4						SCO02
1987 06 23.17	C	15.3	FA	91.4	L	4				&0.08	122	SCO02
1987 06 27.25!	S	12.8:	NP	25.6	L	4	156	1.2	2			MOR

Periodic Comet Encke (1984 VI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 02 24.40	S	10.5	A	15	L	6	50	2.3	1/			KAN
1984 02 24.40	S	10.8	A	15	L	6	50	2.5	2/			NAK01
1984 02 27.40	S	10.0	A	15	L	6	50	2.5	2			NAK01
1984 02 28.41	S	10 :	A	15	L	6	50	4	2			TAN01
1984 02 28.41	S	10.2	A	15	L	6	50	2				NAK01
1984 02 29.40	S	9.5	S	13	L	6	64	3	2			ISH02
1984 03 05.41	S	9.3	S	13	L	6	44	3	3			ISH02
1984 03 08.40	S	8.7	A	15	L	6	50	2.5	4/			NAK01
1984 03 08.41	S	8.5	A	15	L	6	50	& 3.5	3			TAN01
1984 03 08.41	S	8.6	A	15	L	6	50	2.5	4			KAN
1984 03 08.41	S	8.6	S	13	L	6	44	3	5			ISH02
1984 03 11.41	S	7.7	S	13	L	6	44	3	5			ISH02
1984 03 11.41	S	8.4	S	15	L	6	50	1.3	5			KAN
1984 03 12.41	S	7.6	S	13	L	6	44	2.5	6			ISH02

Periodic Comet Encke (1984 VI) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 03 12.41	S	8.2	S	15	L	6	28	& 2.5	4/			KAN
1984 03 18.41	B	7.9	S	10	L	10	33	& 4				ICH
1984 03 18.41	S	7.3	S	13	L	6	24	3	6			ISH02
1984 03 21.41	S	7.4	A	15	L	6	28	1.5	5			KAN
1984 03 21.42	S	7.4	A	15	L	6	50	2	6			NAK01
1984 03 22.41	S	7.5	A	15	L	6	50	1				NAK01
1984 03 22.42	S	7.2	A	15	L	6	50	1	7			KAN
1984 03 22.42	S	7.5	S	13	L	6	44	1.5	5			ISH02
1986 08 31.30	C	19.5	FA	91.4	L	4						SCO02
1986 09 25.33	C	19.2	FA	91.4	L	4						SCO02

Periodic Comet Grigg-Skjellerup (1986m)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 03.28	C	19.7	FA	91.4	L	4						SCO02
1987 03 02.12	c	19.1	FA	91.4	L	4						SCO02
1987 03 03.10	c	18.6	FA	91.4	L	4						SCO02
1987 03 27.12	C	18.7	FA	91.4	L	4						SCO02
1987 06 14.19	S	11.7	AC	41	L	4	83		2/			HAL
1987 06 15.23	S	11.5	AA	25.6	L	4	111	1.7	1			MOR
1987 06 17.20	S	11.6	AC	41	L	4	83					HAL
1987 06 17.20	S	11.8	AC	20	L	6	55					HAL
1987 06 18.22	S	12.3	AA	25.6	L	4	111	1.7	1			MOR
1987 06 23.19	! S	11.9	AC	41	L	4	83					HAL
1987 06 23.20	S	11.8	NP	25.6	L	4	111	1.9	1			MOR
1987 06 26.39	S	11.8	AC	25.4	L	4	190		2			SEA
1987 06 27.22	S	11.6	NP	25.6	L	4	111	& 4.9	1/			MOR

Periodic Comet Tempel 1 (1983 XI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 03 07.11	S	12.5	V	20	R	14	120	1	4			SHA02
1983 03 15.19	S	13.2	V	20	R	14	120	1	3/			SHA02
1983 03 20.96	S	11.9	V	32	R	18	95	1	2			SHA02
1983 04 04.89	S	11.3	A	26	L	6	80	1	2			HUR
1983 04 04.99	S	11.5	V	20	R	14	40	1.5	4			SHA02
1983 04 07.14	S	11.6	V	20	R	14	40	1.0	5			SHA02
1983 04 08.89	S	11.4	A	26	L	6	80	1				HUR
1983 04 08.94	S	11.7	V	32	R	18	95	0.6	5			SHA02
1983 04 08.95	S	11.7	V	20	R	14	120	0.7	6			SHA02
1983 04 09.64	S	11.2	AC	20	L	7	48	1	3			LOV
1983 04 12.96	S	11.7	V	32	R	18	95	0.7	6	0.01	190	SHA02
1983 04 13.00	S	11.4	V	20	R	14	95	0.7	6			SHA02
1983 04 14.91	S	12.5	V	20	R	14	95	1.0	6/			SHA02
1983 04 15.61	S	11.0	AC	20	L	7	48	1	3			LOV
1983 04 15.89	S	12.5	V	20	R	14	95	0.8	5/			SHA02
1983 04 15.91	S	12.3	V	33	L	4	45	2.0	5			SHA02
1983 04 17.56	O	11.5	A	15	R	16	50	1.5	2			PRI
1983 04 18.53	O	11.5	A	15	R	16	50	1.5	2			PRI
1983 05 05.56	S	10.7	AC	20	L	7	48		3			LOV
1983 05 06.54	O	10.2	A	15	R	16	50	2.5	2			PRI
1983 05 06.58	S	10.7	AC	20	L	7	48	1.5	2/			LOV
1983 05 08.52	O	10.0	A	20	C	10	50	2.5	2			PRI
1983 05 09.03	S	12.1	V	32	R	18	95	1.5	3/			SHA02
1983 05 09.93	S	11.8	V	20	R	14	40	2.5	4			SHA02

Periodic Comet Tempel 1 (1983 XI) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 05 12.91	S	11.5	V	20	R	14	40	3.1	4			SHA02
1983 05 14.92	S	11.5	V	33	L	4	45	2.4	5			SHA02
1983 05 14.98	S	10.3	V	8.0	B		20	4.8	3			SHA02
1983 05 14.99	S	11.9	V	20	R	14	40	1.9	6			SHA02
1983 05 15.92	S	10.8	A	26	L	6	80	4	5			HUR
1983 05 16.03	S	12.0	V	20	R	14	40	2.4	5			SHA02
1983 05 17.04	S	12.1	V	20	R	14	40	1.9	5			SHA02
1983 05 30.38	S	10.9	AC	20	L	7	50	1	4			LOV
1983 06 02.47	O	10.0	A	8.0	B		15	5	0			PRI
1983 06 02.93	S	11.4	V	20	R	14	40	3.7	1			SHA02
1983 06 14.96	S	11.1	V	20	R	14	40	5.2	2			SHA02
1983 06 14.97	S	9.7	V	8.0	B		20	2.7	3			SHA02
1983 06 15.44	S	10.7	AC	20	L	7	50		5			LOV
1983 06 28.40	S	10.8	AC	20	L	7	50					LOV
1983 06 30.94	S	10.8	V	20	R	14	40	0.8	4			SHA02

Periodic Comet Tempel 2 (1987g)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 29.46	C	20.4	FA	91.4	L	4						SCO02
1987 01 25.41	C	20.0	FA	91.4	L	4						SCO02
1987 03 27.35	C	19.8	FA	91.4	L	4						SCO02
1987 05 23.26	C	19.8	FA	91.4	L	4						SCO02

Periodic Comet Kojima (1985o)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 18.44	C	18.7	FA	91.4	L	4						SCO02
1986 02 11.30	C	18.1	FA	91.4	L	4						SCO02

Periodic Comet du Toit-Hartley (1986q)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 27.35	C	19.3	FA	91.4	L	4			8/			SCO02
1987 01 03.32	c	18.9	FA	91.4	L	4						SCO02
1987 03 27.22	c	18.7	FA	91.4	L	4						SCO02
1987 03 28.13	c	18.7	FA	91.4	L	4						SCO02

Periodic Comet Kohoutek (1986k)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 07 30.35	C	19.5	FA	91.4	L	4			0			SCO02

Periodic Comet Machholz (1986e)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 06 05.33	c	16.6	FA	91.4	L	4						SCO02
1986 06 11.38	C	13.1	FA	91.4	L	4						SCO02
1986 06 11.38	c	16.6	FA	91.4	L	4		& 3	8			SCO02
1986 07 30.26	C	17.6	FA	91.4	L	4			8			SCO02
1986 07 30.26	c	19.0	FA	91.4	L	4						SCO02
1986 09 05.15	C	19.8	FA	91.4	L	4		& 1	8			SCO02

Periodic Comet d'Arrest (1982 VII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 09 09.40	S	11.5:	A	20	L	7	50	> 2	1/			LOV
1982 10 14.4	S	9.4	A	20	L	7	50	3		?		LOV
1982 10 17.45	S	9.1	A	20	L	7	50		1/			LOV
1982 10 18.40	S	9.2	A	20	L	7	50	6	2			LOV
1982 10 22.4	S	9.3	A	20	L	7	50	5	2			LOV
1982 11 03.43	S	9.0	A	20	L	7	50		2			LOV
1982 11 08.45	S	9.4	A	20	L	7	50		1/			LOV
1982 11 17.44	S	10.0	A	20	L	7	50		2			LOV

Periodic Comet Holmes (1986f)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 29.31	C	18.2	FA	91.4	L	4						SCO02

Periodic Comet Borrelly (1987p)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 06 01.87	[13		VN	32	L	4	114					PEA

Periodic Comet Kopff (1983 XIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 04 09.73	S	10.6	AC	20	L	7	48		4			LOV
1983 05 05.58	S	9.6	AC	20	L	7	48		6			LOV
1983 05 06.58	S	9.3	AC	20	L	7	48		6			LOV
1983 05 30.40	S	9.1	AC	20	L	7	50	3	5			LOV
1983 06 15.45	S	8.2	AC	3.0	R		8	4	5			LOV
1983 06 28.38	S	8.2	AC	3.0	R		8	7	5			LOV
1983 09 26.54	S	11.4:	VN	41	L	4	86		1			CLA
1983 10 01.56	S	11.7	VN	41	L	4	86	3	1			CLA

Periodic Comet Giacobini-Zinner (1985 XIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 05 26.74	P	13.1	AC	16	L	3		0.3				OHT
1985 06 06.57	P	13.5	AC	16	L	3		0.6				OHT
1985 06 15.70	S	11.6	A	15	L	6	102	1.5	3			WAT01
1985 06 16.74	S	11.7	A	15	L	6	73	1.5	3			WAT01
1985 06 28.73	S	11.2	AC	20	L	6	89	1.0	4/			NAK01
1985 07 14.53	S	10.4	AC	20	L	6	89	2.5	4			NAK01
1985 07 14.68	S	9.8	A	15	L	6	27	2.7	4	?	230	KAN
1985 07 15.63	S	9.5	AA	13	L	6	44	3	3			ISH02
1985 07 15.70	S	9.8	A	15	L	6	50	2.7	4	?	225	KAN
1985 07 20.67	S	10.1	AC	20	L	6	89	3	4			NAK01
1985 07 22.74	S	9.9	A	15	L	6	50	2.1	4/	?	235	KAN
1985 07 23.75	M	9.4	S	15	L	6	51	2.5	7			WAT01
1985 07 25.72	S	9.6	A	15	L	6	36	1.8	4	?	235	KAN
1985 07 25.75	M	9.2	S	15	L	6	51	2.4	4			WAT01
1985 07 26.70	B	9.3	AC	20	L	6	44	5.5	5		250	NAK01
1985 07 26.72	M	8.9	S	15	L	6	51	3.0	5			WAT01
1985 07 26.75	S	9.1	AA	13	L	6	24	3.5	3			ISH02
1985 07 27.73	S	9.2	A	15	L	6	36	2.5	4	0.05	235	KAN
1985 07 27.75	M	9.2	S	15	L	6	51	3.0	4			WAT01
1985 07 28.69	B	9.3	AC	20	L	6	44	5	4	?	225	NAK01
1985 08 07.72	S	9.1	A	15	L	6	36	2.5	5	?	250	KAN

Periodic Comet Giacobini-Zinner (1985 XIII) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 08 08.69	B	9.2	AC	20	L	6	44	4	5/			NAK01
1985 08 09.60	S	8.4	S	6.0	B		10					OHT
1985 08 09.71	S	9.1	A	15	L	6	36	2.5	5	0.08	250	KAN
1985 08 11.76	S	8.9	AA	13	L	6	24	4	4			ISH02
1985 08 11.76	S	9.0	A	15	L	6	36	3.3	6	0.12	260	KAN
1985 08 12.71	S	9.0	A	15	L	6	36	2.5	5	0.11	255	KAN
1985 08 12.75	S	9.0	AA	13	L	6	24	3.3	4			ISH02
1985 08 13.68	B	8.7	AC	20	L	6	44	5.5	5	0.12	270	NAK01
1985 08 13.70	M	8.5	A	15	L	6	51	3.9	6	0.17	235	WAT01
1985 08 13.75	S	8.8	AA	13	L	6	24	4	4	0.15		ISH02
1985 08 14.61	S	8.3	S	6.0	B		10					OHT
1985 08 14.69	M	8.5	A	15	L	6	51	3.8	6	0.23	280	WAT01
1985 08 14.75	S	8.7	AA	13	L	6	24	4.5	5	0.16		ISH02
1985 08 15.65	S	8.2	S	6.0	B		10					OHT
1985 08 15.66	B	8.5	AC	20	L	6	44	5	5	0.17	275	NAK01
1985 08 15.71	M	8.4	A	15	L	6	51	4.3	6	0.15	250	WAT01
1985 08 15.75	S	8.7	AA	13	L	6	24	4.3	4	0.25		ISH02
1985 08 16.66	B	8.5	AC	20	L	6	44	5	5	0.15	270	NAK01
1985 08 16.67	M	8.2	A	15	L	6	51	4.0	6	0.18	270	WAT01
1985 08 17.71	S	8.6	AA	13	L	6	24	5	5	0.2		ISH02
1985 08 20.74	M	8.6	A	15	L	6	51	2.4	6	0.30	270	WAT01
1985 08 21.74	M	8.4	A	15	L	6	51	4.5	6	0.22	280	WAT01
1985 08 23.60	M	8.3	A	15	L	6	51	3.0	6	0.50	270	WAT01
1985 08 23.68	S	8.7	S	15	L	6	36	2.4	4/	?	270	KAN
1985 08 23.70	B	8.4	AC	20	L	6	44	5.5	5/	0.15	270	NAK01
1985 08 23.75	S	8.5	AA	13	L	6	24	4.5	5	0.16		ISH02
1985 08 24.68	B	8.6	AC	20	L	6	44	5	6	0.13	275	NAK01
1985 08 24.71	M	8.4	A	15	L	6	51	4.9	6	0.45	270	WAT01
1985 08 24.71	M	9.0	A	26	L	5	53	2.0	5	0.07	270	KAN
1985 08 25.74	S	8.9	A	26	L	5	53	2.3	5	0.05	275	KAN
1985 09 01.77	S	9.0	A	15	L	6	50	2.6	5/	0.04	275	KAN
1985 09 07.75	S	8.8	AA	13	L	6	44	3	3			ISH02
1985 09 12.75	S	8.8	AC	20	L	6	44	4.5	4/	0.08	260	NAK01
1985 09 12.79	S	8.9	AA	13	L	6	24	5	3	0.12		ISH02
1985 09 13.78	S	8.7	AC	20	L	6	44	4	5	?	270	NAK01
1985 09 13.79	S	8.9	AA	13	L	6	24	5	3	0.1		ISH02
1985 09 20.79	S	8.9	AC	20	L	6	44	5	4	0.10	275	NAK01
1985 10 02.78	S	10.8	A	26	L	5	73	1.0	5			KAN
1985 10 07.78	S	10.8	A	15	L	6	50	1.5	5			KAN
1985 10 08.77	S	9.5	AC	20	L	6	44	3.5	3			NAK01
1985 10 15.78	S	9.9	AC	20	L	6	89	2.2	4			NAK01
1985 10 15.79	S	9.8	AC	16	L	6	42					OHT
1985 10 15.81	S	10.9	AC	13	L	6	64	2	3			ISH02
1985 10 15.82	S	11.3	A	26	L	5	73	1.3	5	?	270	KAN
1985 10 19.77	S	10.8	A	26	L	5	73	1.2	5	?	270	KAN
1985 10 20.78	S	10.4	AC	20	L	6	89	2.1	5			NAK01
1985 10 22.79	S	10.2	AC	20	L	6	89	2.5	3			NAK01
1985 10 22.79	S	10.4	AC	16	L	6	42					OHT
1985 10 22.81	S	11.2	AC	13	L	6	44	2	3			ISH02
1985 10 22.82	S	11.1	A	26	L	5	73	0.9	5	?	270	KAN
1985 10 23.78	S	10.5	AC	20	L	6	89	2.5	3			NAK01
1985 10 23.79	S	11.2	A	26	L	5	73	1.0	4	?	270	KAN
1985 10 23.81	S	11.4	AC	13	L	6	44	2	2			ISH02
1985 10 24.78	S	9.8	S	16	L	6	42					OHT
1985 10 24.79	S	11.1	A	26	L	5	73	1.7	6	0.05	270	KAN

Periodic Comet Giacobini-Zinner (1985 XIII) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 24.83	S	11.3	AC	13	L	6	64	2	2			ISH02
1985 11 01.78	S	12.2	A	26	L	5	105	0.6	5/			KAN
1985 11 03.80	S	12.2	A	26	L	5	188	0.5	5			KAN
1985 11 08.70	S	11.4	AC	20	L	6	89	2.0	2			NAK01
1985 11 11.79	S	11.5	AC	13	L	6	64	1.5	3			ISH02
1985 11 12.79	S	11.6	A	26	L	5	105	1.5	5			KAN
1985 11 13.75	S	11.5	AC	20	L	6	89	2.5	1			NAK01
1985 11 13.77	S	11.6	AC	13	L	6	64	1.5	3			ISH02
1985 11 17.75	S	11.8	AC	13	L	6	64	1.5	2			ISH02
1985 11 18.75	S	12.0	A	26	L	5	105	1.1	5/			KAN
1985 11 19.74	S	11.8	AC	20	L	6	89	1.9	1/			NAK01
1985 11 20.75	S	12.0	AC	13	L	6	64	1	3			ISH02

Periodic Comet Schwassmann-Wachmann 2 (1986h)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 03 01.17	S	12.7	PC	20	L	6	163					HAL
1987 03 05.15	S	12.6	PC	20	L	6	163		1/			HAL
1987 03 20.14	S	12.7	PC	20	L	6	163					HAL
1987 03 27.14	S	12.7	PC	20	L	6	163					HAL

Periodic Comet Reinmuth 2 (1987l)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 07 08.40	S	13.7	AC	40.6	L	5	102	1	4			LEV
1987 07 09.45	S	13.8	AC	40.6	L	5	102	1	5			LEV

Periodic Comet Wirtanen (1985q)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 02 05.41	P	12.1	AC	16	L	3						OHT
1986 03 01.42	S	10.8	AC	20	L	6	106	1.2	1/			NAK01
1986 03 02.42	S	10.7	AC	20	L	6	106	1.5	2			NAK01
1986 03 02.43	S	11.8	A	26	L	5	105	0.8	2/			KAN
1986 03 03.41	S	11.5	A	26	L	5	73	1.0	2/			KAN
1986 03 06.42	S	10.3	AC	20	L	6	106	2.2	4			NAK01
1986 03 08.42	S	10.0	AC	20	L	6	106	2.2	3			NAK01
1986 03 12.42	P	10.7	AC	10	R	3		1.5				OHT
1986 03 31.43	S	10.9	AC	20	C	10	50					OHT
1986 05 04.48	P	11.8	AC	10	R	3						OHT
1986 05 08.42	P	12.2	AC	10	R	3						OHT
1986 06 08.46	P	13 :	AC	16	L	3						OHT

Periodic Comet Arend-Rigaux (1984 XXI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 11 24.81	S	12.9	A	26	L	5	146	0.6	5			KAN
1984 11 27.78	S	12.7	A	20	L	5	80	1				NAK01
1984 11 29.79	S	13.0	A	26	L	5	105	0.6	5			KAN
1984 12 03.79	S	12.4	A	20	L	5	80	1.5	5/			NAK01
1984 12 18.71	S	11.8	A	20	L	5	80	1.4	5			NAK01
1984 12 19.75	S	11.5	A	26	L	5	73	1.6	4/			KAN
1984 12 23.76	S	11.9	A	26	L	5	73	0.8	6/			KAN
1985 01 01.74	S	11.8	A	26	L	5	53	1.2	6			KAN
1985 01 01.80	S	11.7	A	13	L	6	64	& 0.8	6			ISH02

Periodic Comet Arend-Rigaux (1984 XXI) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 01 14.58	S	12.6	A	26	L	5	73	0.7	7/			KAN
1985 01 15.67	S	12.6	A	20	L	6	89	1.3	5			NAK01
1985 01 16.78	S	12.7	A	26	L	5	73	1.1	6			KAN
1985 01 20.70	S	12.5	A	20	L	6	123	1.1	5			NAK01
1985 01 23.76	S	12.6	A	20	L	6	123	1.3	5			NAK01
1985 01 25.73	S	12.4	A	20	L	6	89	1.6	5			NAK01
1985 01 26.62	S	12.6	A	26	L	5	53	1.1	7/			KAN
1985 01 30.72	S	12.9	A	20	L	6	123	1.2	6			NAK01
1985 02 13.70	S	13.2	A	20	L	6	123	1.1				NAK01

Periodic Comet Harrington (1987n)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 05 01.45	C	20.0	FA	91.4	L	4						SCO02
1987 05 03.47	C	20.0	FA	91.4	L	4		0.25				SCO02
1987 05 23.41	C	18.9	FA	91.4	L	4				<0.01	256	SCO02

Periodic Comet Tsuchinshan 1 (1985 I)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 11 27.74	P	13.6	A	16	L	3		0.6				OHT
1984 12 18.72	P	13.0	A	16	L	3		1.8				OHT
1984 12 18.79	S	13.0	A	26	L	5	73	1.5	3			KAN
1984 12 19.71	S	12.6	A	26	L	5	73	1.8	2			KAN
1984 12 23.79	P	13.0	A	16	L	3		1.8				OHT
1984 12 25.75	S	12.5	A	26	L	5	73	1.9	2			KAN
1984 12 29.81	P	12.8	A	16	L	3		1.4				OHT
1985 01 01.83	S	12.2	A	26	L	5	73	2.4	3			KAN
1985 01 14.64	P	12.7	A	16	L	3		0.4				OHT
1985 01 14.66	S	12.4	A	26	L	5	73	1.9	2			KAN
1985 01 16.69	P	12.6	A	16	L	3		0.7				OHT
1985 01 17.79	S	12.0	A	26	L	5	53	3.1	2/			KAN
1985 01 20.72	S	12.1	A	20	L	6	123	1.4	4			NAK01
1985 01 25.56	P	12.3	A	16	L	3		0.3				OHT
1985 01 25.75	S	12.3	A	20	L	6	89	1.8	4			NAK01
1985 01 26.76	S	11.8	A	26	L	5	53	3.8	1			KAN
1985 01 26.82	S	12.3	A	13	L	6	64	3	3			ISH02
1985 01 27.80	S	12.3	A	13	L	6	64	2.5	3			ISH02
1985 01 30.73	S	12.2	A	20	L	6	89	2.0	2/			NAK01
1985 02 13.71	S	12.0	A	20	L	6	89	2.0	4			NAK01
1985 02 14.73	S	12.4	A	20	L	6	123	1.5	2			NAK01
1985 02 14.75	S	12.4	A	26	L	5	73	2.0	1/			KAN
1985 02 21.71	S	12.7	A	20	L	6	89	2				NAK01
1985 02 23.64	S	12.5	A	26	L	5	73	2.1	1/			KAN
1985 03 12.58	S	12.9	A	20	L	6	89	1.5				NAK01
1985 03 28.65	S	13.5	A	20	L	6	89	1.0				NAK01

Periodic Comet Gunn (1982 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 02.39	C	18.6	FA	91.4	L	4				0.04	272	SCO02
1987 01 04.26	C	18.0	FA	91.4	L	4						SCO02

Periodic Comet Wild 2 (1984 XIV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 09 02.27	C	19.5	FA	91.4	L	4						SCO02

Periodic Comet Wild 3 (1987e)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 29.46	C	19.5	FA	91.4	L	4		0.23				SCO02
1987 02 28.47	C	19.5	FA	91.4	L	4						SCO02

Periodic Comet Bus (1987f)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 29.39	C	19.5	FA	91.4	L	4		0.28				SCO02

Periodic Comet Howell (1987h)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 06 01.88	[	13	VN	32	L	4	114					PEA
1987 07 01.44	S	12.6	NP	25.6	L	4	111	1.8	1/			MOR
1987 07 05.41	S	11.6	AC	40.6	L	5	102	4	2			LEV
1987 07 06.32	S	12.4	EC	40.6	C	18	229	& 0.6	1/			GRE
1987 07 06.40	S	11.9	AC	40.6	L	5	102	3.5	2			LEV
1987 07 07.43	S	12.8	NP	25.6	L	4	111	2.0	1			MOR

Periodic Comet Takamizawa (1984 VII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 08 04.63	B	9.6	NP	16	L	6	25	4.5	5/			NAK01
1984 08 05.68	S	9.4	A	18	L	5	40	4	4			NAK01
1984 08 14.53	S	10.0	A	13	L	6	44	3	2			ISH02
1984 08 15.53	S	10.0	A	13	L	6	44	3	3			ISH02
1984 08 17.53	S	10.1	A	10	L	10	56	3.3	2			ICH
1984 08 18.53	S	10.4	A	15	L	6	72	1.5	4			KAN
1984 08 19.52	S	10.2	A	13	L	6	64	& 2.5	3			ISH02
1984 08 27.65	S	11.0	A	10	L	10	25					ICH
1984 08 28.53	S	11.0	A	13	L	6	85	2	2			ISH02
1984 08 28.54	S	11.4	A	10	L	10	56	1.7				ICH
1984 08 31.52	S	10.8	A	20	C	10	110		1			OHT
1984 09 02.52	S	11.0	A	10	L	10	56	2.2				ICH
1984 09 02.53	S	11.2	A	13	L	6	64	2	2			ISH02

Periodic Comet Urata-Niijima (1986o)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 01.27	C	15.9	FA	91.4	L	4						SCO02
1986 12 29.25	C	16	FA	91.4	L	4						SCO02
1987 03 02.17	C	18.5	FA	91.4	L	4		0.23				SCO02
1987 03 27.16	C	19.5	FA	91.4	L	4						SCO02

Periodic Comet Lovas 2 (1986p)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 04.27	C	15	FA	91.4	L	4						SCO02
1987 01 03.22	C	17	FA	91.4	L	4		1				SCO02
1987 01 25.18	C	18.5	FA	91.4	L	4						SCO02

Periodic Comet Lovas 2 (1986p) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 30.10	C	19.5	FA	91.4	L	4						SC002
1987 03 03.13	C	20	FA	91.4	L	4						SC002

Periodic Comet Wiseman-Skiff (1987b)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 22.30	S	14.5:	AC	40.6	L	5	156	1	1	?		LEV
1987 01 23.30	S	14.0:	AC	40.6	L	5	156	1	1			LEV
1987 01 25.33	S	14.0:	AC	40.6	L	5	156	0.8	1			LEV
1987 02 01.33	C	15	FA	91.4	L	4				>0.02	330	SC002
1987 03 27.26	C	17.6	FA	91.4	L	4						SC002
1987 05 01.16	C	18.6	FA	91.4	L	4						SC002
1987 05 02.16	C	18.9	FA	91.4	L	4						SC002
1987 05 23.17	C	19.0	FA	91.4	L	4						SC002
1987 05 25.16	C	19.4	FA	91.4	L	4						SC002

Periodic Comet Brooks 2 (1987m)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 07 03.44	S	14.5:		40.6	L	5	156					SC001
1987 07 04.41	S	14.1	AC	40.6	L	5	102	3	0			LEV
1987 07 06.28	I[	14.5	EC	40.6	C	18	229					GRE
1987 07 06.28	S[	13.5	EC	40.6	C	18	229	! 0.5				GRE

Periodic Comet Wolf-Harrington (1984 XVII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 11 02.82	S	12.7	A	20	L	5	80	1				NAK01
1984 11 03.80	S	12.6	A	20	L	5	80	1.2	4/			NAK01
1984 11 04.81	S	12.8	A	26	L	5	105	0.6				KAN
1984 11 05.84	S	13.0	A	26	L	5	146	0.7				KAN
1984 11 20.79	S	12.8	A	20	L	5	80	1.2				NAK01
1984 11 27.79	S	13.3	A	26	L	5	188	0.5	3			KAN

Periodic Comet Whipple (1985h)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 09 26.33	C	18.9	FA	91.4	L	4						SC002
1986 12 04.34	C	18.0	FA	91.4	L	4				0.03	274	SC002

Periodic Comet Ashbrook-Jackson (1985a)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 08 16.58	S	13.1	A	20	L	6	123	1.1	1/			NAK01
1987 01 04.15	C	17.4	FA	91.4	L	4						SC002
1987 03 02.25	C	19.1	FA	91.4	L	4						SC002

Periodic Comet Shoemaker 1 (1984 XVI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 10 13.40	S	12.0	A	26	L	5	73	2.2	1/			KAN
1984 10 14.44	S	12.0	A	26	L	5	73	2.0	1/			KAN
1984 10 21.47	S	11.9	A	26	L	5	73	2.8	1			KAN
1984 10 30.47	S	12.2	A	26	L	5	105	1.8	1			KAN

Periodic Comet Shoemaker 1 (1984 XVI) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 12 14.51	P	14.5	A	16	L	3		0.7				OHT
1984 12 25.39	P	15 :	A	16	L	3		& 0.9				OHT

Periodic Comet Ciffréo (1985 XVI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 12.23	C	15.2	FA	91.4	L	4						SCO02
1986 03 15.12	C	18.7	FA	91.4	L	4						SCO02

Periodic Comet Schaumasse (1984 XXII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 10 21.79	S	13.1	A	26	L	5	105	1.3	1			KAN
1984 10 25.82	S	12.6	A	26	L	5	73	1.0				KAN
1984 10 29.80	S	12.4	A	20	L	5	80	1.5				NAK01
1984 10 30.80	S	12.2	A	26	L	5	73	2.2	1/			KAN
1984 10 30.81	S	12.4	A	20	L	5	80	1.8				NAK01
1984 11 01.81	S	12.0	A	26	L	5	73	2.5	1/			KAN
1984 11 02.80	S	12.1	A	20	L	5	80	1.5	2			NAK01
1984 11 02.82	S	12.0	A	26	L	5	73	2.7	2			KAN
1984 11 03.82	S	11.9	A	20	L	5	80	2	2			NAK01
1984 11 12.84	S	11.6	A	26	L	5	73	1.5	3			KAN
1984 11 13.84	S	11.3	A	26	L	5	73	2.0	3			KAN
1984 11 20.82	S	10.8	A	20	L	5	80	2.5	3/			NAK01
1984 11 22.81	S	10.9	A	20	L	5	80	2.5	4			NAK01
1984 11 24.82	S	10.5	A	20	L	5	80	3	4			NAK01
1984 11 25.81	S	10.7	A	26	L	5	53	3.6	4			KAN
1984 11 27.81	S	10.1	A	20	L	5	40	4.5	4			NAK01
1984 11 28.80	S	10.0	A	15	L	6	28	3.6	2/			KAN
1984 11 28.82	S	9.7	A	13	L	6	44	3	3			ISH02
1984 11 30.84	S	10.1	A	26	L	5	53	3.5	3/			KAN
1984 12 02.82	S	9.8	A	13	L	6	44	3	3			ISH02
1984 12 03.81	S	9.9	A	13	L	6	44	3	3			ISH02
1984 12 03.81	S	10.1	A	26	L	5	73	2.9	3			KAN
1984 12 03.81	S	10.2	A	20	L	5	40	4	4			NAK01
1984 12 18.82	S	10.1	A	20	L	5	80	3	2/			NAK01
1984 12 19.83	S	9.9	A	26	L	5	53	3.6	4			KAN
1984 12 23.83	S	9.8	A	13	L	6	44	5	3			ISH02
1984 12 26.81	S	10.4	A	26	L	5	56	3.4	3			KAN
1985 01 01.82	S	10.3	A	13	L	6	44	4	2			ISH02
1985 01 01.82	S	10.6	A	18	L	6	78	2.5	3			NAK01
1985 01 04.83	S	10.4	A	13	L	6	44	4	2			ISH02
1985 01 04.84	S	11.3	A	26	L	5	73	3.0	3/			KAN
1985 01 16.82	S	10.9	A	20	L	5	89	3	1			NAK01
1985 01 16.84	S	11.2	A	26	L	5	73	2.1	2/			KAN
1985 01 17.84	S	11.3	A	26	L	5	53	2.7	2/			KAN
1985 01 20.82	S	11.1	A	20	L	5	89	2.5	1/			NAK01
1985 01 24.82	S	11.4	A	13	L	6	44	2.5	1			ISH02
1985 01 25.83	S	11.5	A	20	L	5	89	2.2	1			NAK01
1985 01 25.83	S	12.0	A	26	L	5	73	2.0	1/			KAN
1985 01 29.83	S	12.3	A	20	L	6	89	2				NAK01
1985 01 30.80	S	12.3	A	20	L	6	89	2.0				NAK01
1985 01 30.81	S	12.2	A	26	L	5	105	2.2	0			KAN

Periodic Comet Comas Solá (1986j)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 07 30.41	C	20	FA	91.4	L	4				<0.01	260	SCO02
1986 11 30.14	C	17.6	FA	91.4	L	4				0.45	50	SCO02

Periodic Comet Gehrels 3 (1985 IV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 16.51	c	19	FA	91.4	L	4						SCO02
1987 05 01.38	C	19.4	FA	91.4	L	4				0.06	209	SCO02

Periodic Comet Halley (1982i)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 12.98	S	11.7	WA	26	L	6	218	0.6	3			HUR
1985 10 13.01	S	11.5	WA	26	L	6	145	0.8	3/			HUR
1985 10 13.02	S	11.2	WA	26	L	6	55	0.8	3			HUR
1985 10 19.99	S	10.5	WA	26	L	6	55	2.7	4			HUR
1985 10 20.00	S	10.6	WA	26	L	6	145	2.7	4			HUR
1985 10 20.01	S	9.7	WA	8.0	B		15	& 3.0	4			HUR
1985 10 20.97	S	10.6	WA	26	L	6	55	1.4	3			HUR
1985 11 02.96	S	8.7	WC	26	L	6	55	2.8	5			HUR
1985 11 05.86	S	8.2	WC	26	L	6	55	3.1				HUR
1985 11 05.89	S	7.6	WC	8.0	B		15	6.0	3			HUR
1985 11 05.90	S	7.4	WC	5.0	B		10	6.0	3/	?0.33	300	HUR
1985 11 06.97	S	7.6	WC	8.0	B		15	18	4/			HUR
1985 11 06.98	S	7.3	WC	5.0	B		10	13.5	4			HUR
1985 11 07.94	S	7.5:	WC	8.0	B		15	13.5	4			HUR
1985 11 09.05	S	7.3	WC	8.0	B		15	18	5	0.5	310	HUR
1985 11 09.06	S	7.1	WC	5.0	B		10	13.5	5	0.5	355	HUR
1985 11 09.86	S	7.5	AA	5.0	B		10	21.6	5/			HUR
1985 11 09.95	S	7.1	WC	5.0	B		10	&21	5	0.3	270	HUR
1985 11 10.82	S	7.5	NO	8.0	B		15	16	2/			HUR
1985 11 10.89	S	6.7	NO	5.0	B		10	10	4	0.6	302	HUR
1985 11 12.10	S	6.7	NO	5.0	B		10	16.8	4/			HUR
1985 11 12.84	S	6.0	NO	5.0	B		10					HUR
1985 11 12.93		5.5:	AA	0.0	E		1					HUR
1985 11 12.93	S	6.0	AA	5.0	B		10	21	5			HUR
1985 11 13.83	S	5.9	AA	5.0	B		10	&17.1	5			HUR
1985 11 13.92	S	5.9	AA	5.0	B		10	&17	5			HUR
1985 11 15.86	S	5.9	AA	5.0	B		10	18	5/			HUR
1985 11 25.91	S	5.4	AA	8.0	B		15	9.9				HUR
1985 11 27.82	S	5.2	AA	5.0	B		10	12.0	6			HUR
1985 11 27.96	S	5.1	AA	5.0	B		10	&15				HUR
1985 11 28.81	S	4.9	AA	5.0	B		10	15.0	7			HUR
1985 12 05.88	S	4.8	AA	5.0	B		10	21.0	8			HUR
1985 12 05.89	S	5.5	AA	0.0	E		1					HUR
1985 12 05.90				8.0	B		15	21		0.70	77	HUR
1985 12 07.08	B	5.9	AA	3.5	B		7	20	2	?1	80	JAC01
1985 12 07.75	S	4.8	AA	5.0	B		10	19.2	7/			HUR
1985 12 08.09	B	5.9	AA	3.5	B		7	&24	2	?1	76	JAC01
1985 12 09.88				8.0	B		15	12.0	8	0.70	53	HUR
1985 12 09.90	S	4.6	AA	5.0	B		10	14.4	8	0.67	53	HUR
1985 12 11.91	S	4.7:	AA	5.0	B		10	&11	7			HUR
1985 12 12.46	S	4.5	AA	5.0	B		10					GAR01
1985 12 13.46	S	4.5	AA	5.0	B		10					GAR01
1985 12 14.46	S	4.5	AA	5.0	B		10					GAR01

Periodic Comet Halley (1982i) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 18.79	S	4.6	AA	5.0	B		10	18	6	0.67	67	HUR
1985 12 23.76	S	4.4	AA	5.0	B		10					HUR
1985 12 27.80	S			8.0	B		15	5.8	6	?0.40	67	HUR
1985 12 27.80	S	4.6	AA	5.0	B		10	6.8	6			HUR
1985 12 29.72	S	4.6	AA	5.0	B		10	6.7	7			HUR
1985 12 29.73	S			8.0	B		15	6.7	7/	0.50	70	HUR
1985 12 29.83	S	4.6	AA	5.0	B		10	6.7	7			HUR
1986 01 03.02				0.7	E		1	48	6			JAC01
1986 01 03.02	B	5.0	WW	3.5	B		7	14	6			JAC01
1986 01 03.74	S	4.7	AA	5.0	B		10	8.4	8	0.55	50	HUR
1986 01 03.75		5.0	AA	0.0	E		1					HUR
1986 01 05.81	S	4.9	AA	5.0	B		10	11	7	0.83	73	HUR
1986 01 05.81	S	4.9	AA	8.0	B		15	11	8	0.83	73	HUR
1986 01 06.05	B	5.6	WW	3.5	B		7	10	3			JAC01
1986 01 06.78	S	4.7	AA	5.0	B		10	11	8	&0.30	50	HUR
1986 01 06.78	S	4.9	AA	8.0	B		15	11	8	&1	40	HUR
1986 01 10.75	S	4.9	AA	5.0	B		10	&13	6	&1	45	HUR
1986 01 11.76	S	4.5	WW	8.0	B		15	5.3	8	0.87	66	HUR
1986 01 11.76	S	4.6	WW	5.0	B		10	6.5	8/	0.73	61	HUR
1986 01 12.02	B	5.8	AA	3.5	B		7	7	1			JAC01
1986 01 12.76	S	4.4	WW	5.0	B		10	9	8/	0.53	54	HUR
1986 01 12.77	S	4.3	WW	8.0	B		15	6.6	9	1	54	HUR
1986 01 14.77	S	4.5	WW	5.0	B		10	6.8	8	1.2	55	HUR
1986 01 15.80	S	4.5	WW	5.0	B		10	6	8	1.0	67	HUR
1986 01 15.80	S	4.5	WW	8.0	B		15	5.4	8/			HUR
1986 01 19.77	S	4.2	WW	5.0	B		10	6.3	9	1.0	62	HUR
1986 01 19.77	S	4.2	WW	8.0	B		15	5.4	9	1.0	62	HUR
1986 01 21.74	S	4.1	WW	8.0	B		15	& 5	8	&0.5	62	HUR
1986 01 24.74	S	3.9:	WW	8.0	B		15	& 6	8	&0.5	61	HUR
1986 01 24.76	S	3.6:	WW	5.0	B		10	& 6	8	&0.5	61	HUR
1986 01 25.74	S	3.5	WW	8.0	B		15	& 6	8	&0.5		HUR
1986 01 25.76	S	3.5:	WW	5.0	B		10	& 6	7/	&0.5	67	HUR
1986 02 22.77	S	2.5	WW	5.0	B		7			3		GAR01
1986 02 26.76	S	3.0	WW	5.0	B		7			1.2		GAR01
1986 02 27.77	S	2.8	WW	5.0	B		7			1.0		GAR01
1986 02 28.77	S	2.7	WW	5.0	B		7			2.0		GAR01
1986 03 01.76	S	2.9	WW	5.0	B		7			3.2		GAR01
1986 03 02.75	S	2.8	WW	5.0	B		7			4		GAR01
1986 03 03.74	S	2.8	WW	5.0	B		7			2		GAR01
1986 03 04.76	S	3.0	WW	5.0	B		7			2		GAR01
1986 03 05.74	S	2.8	WW	5.0	B		7			3		GAR01
1986 03 06.74	S	2.8	WW	0.0	E		1					GAR01
1986 03 07.38				0.7	E		1	52	6	8.1	290	JAC01
1986 03 07.38	B	2.3	WW	6	R	13	32	9	6	2.9	290	JAC01
1986 03 07.75	S	2.6	WW	5.0	B		7			7		GAR01
1986 03 08.39				0.7	E		1	46	6	7.6	290	JAC01
1986 03 08.39	B	2.3	WW	6	R	13	32	9	6	2.5	290	JAC01
1986 03 09.42				0.7	E		1	41	4	4.2	290	JAC01
1986 03 09.42	B	2.6	WW	6	R	13	32	8	4	0.9	290	JAC01
1986 03 09.74	S	2.7	WW	0.0	E		1					GAR01
1986 03 10.75	S	2.6	WW	5.0	B		7			5		GAR01
1986 03 11.78	S	2.7	WW	0.0	E		1					GAR01
1986 03 12.74	S	2.8	WW	0.0	E		1			5		GAR01
1986 03 14.75	S	2.5	WW	0.0	E		1			5		GAR01
1986 03 15.76	S	2.5	WW	0.0	E		1					GAR01

Periodic Comet Halley (1982i) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 16.73	S	2.7	WW	0.0	E		1					GAR01
1986 03 19.67	S	2.9	WW	0.0	E		1					GAR01
1986 03 20.69	S	2.9	WW	0.0	E		1			8		GAR01
1986 03 21.74	S	3.1	WW	0.0	E		1			6		GAR01
1986 03 22.78	S	2.9	WW	0.0	E		1			5		GAR01
1986 03 23.78	S	2.9	WW	0.0	E		1			6		GAR01
1986 03 24.78	S	3.0	WW	0.0	E		1			5		GAR01
1986 03 25.77	S	3.0	WW	0.0	E		1					GAR01
1986 04 02.56	S	2.9	WW	0.0	E		1					GAR01
1986 04 03.54	S	2.6	WW	0.0	E		1			5		GAR01
1986 04 04.51	S	2.7	WW	0.0	E		1			6		GAR01
1986 04 05.66	S	2.5	WW	0.0	E		1			2		GAR01
1986 04 06.75	S	2.3	WW	0.0	E		1					GAR01
1986 04 07.71	S	2.2	WW	0.0	E		1					GAR01
1986 04 15.43	S	2.7	WW	0.0	E		1					GAR01
1986 04 18.70	S	2.7	WW	0.0	E		1			20		GAR01
1986 04 19.71	S	2.7	WW	0.0	E		1			22		GAR01
1986 04 20.73	S	2.9	WW	0.0	E		1			17		GAR01
1986 04 24.86	S	5.0:	AA	8.0	B		15	12	3			HUR
1986 04 25.87	S	4.8	AA	5.0	B		10	10	4			HUR
1986 04 27.87	S	4.9	AA	5.0	B		10	14	4			HUR
1986 04 29.46	S	4.3	WW	0.0	E		1			15		GAR01
1986 04 29.89	S	5.0	AA	5.0	B		10	17	5			HUR
1986 04 30.40		4.5	WW	0.0	E		1			18		GAR01
1986 05 01.89	S	5.0	AA	5.0	B		10	13	4			HUR
1986 05 02.49	S	4.9	WW	0.0	E		1					GAR01
1986 05 03.22	B	5.6	AA	3.5	B		7	8	3			JAC01
1986 05 03.88	S	5.2	AA	5.0	B		10	15	4/			HUR
1986 05 04.19	B	5.1	AA	3.5	B		7	9	3			JAC01
1986 05 05.19	B	4.9	AA	6	R	13	32	11	4			JAC01
1986 05 05.88	S	5.2	AA	5.0	B		10	17	5	0.50	105	HUR
1986 05 06.21	B	5.0	AA	6	R	13	32	12	4			JAC01
1986 05 08.41	S	5.9	AA	5.0	B		7			6		GAR01
1986 05 08.91				8.0	B		15	14	5	0.40	118	HUR
1986 05 08.91	S	5.3	AA	5.0	B		10	16	4			HUR
1986 05 09.41	S	5.9	AA	5.0	B		7			11		GAR01
1986 05 11.48	S	6.0	AA	5.0	B		7			5.5		GAR01
1986 05 12.26	B	5.1	AA	3.5	B		7	& 5	0			JAC01
1986 05 12.43	S	5.9	AA	5.0	B		7			4		GAR01
1986 05 13.18	B	4.2	AA	3.5	B		7	12	6	3.9	85	JAC01
1986 05 13.46	S	5.9	AA	5.0	B		7			3		GAR01
1986 05 13.90				8.0	B		15	24	4	1	36	HUR
1986 05 13.91	S	5.2	AA	5.0	B		10	19	4			HUR
1986 05 14.19	B	4.3	AA	3.5	B		7	11	6	3.2	87	JAC01
1986 05 14.50	S	5.9	AA	5.0	B		7			9		GAR01
1986 05 15.56	S	6.0	AA	5.0	B		7			6		GAR01
1986 05 15.91	S	5.4:	AA	8.0	B		15	18	2			HUR
1986 05 16.23	B	5.3	AA	3.5	B		7	13	0			JAC01
1986 05 16.50	S	6.5	AA	5.0	B		7					GAR01
1986 05 16.91	S	5.8	AA	5.0	B		10	14	2			HUR
1986 05 26.17	B	6.2	AA	3.5	B		7	16	0			JAC01
1986 05 27.15	B	6.2	AA	3.5	B		7	12	0			JAC01
1986 05 27.90	S	7.3	AA	8.0	B		15	9	2			HUR
1986 05 28.17	B	6.3	AA	3.5	B		7	10	0			JAC01
1986 05 29.23	B	6.3	AA	3.5	B		7	10	0			JAC01

Periodic Comet Halley (1982i) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 05 30.22	B	6.3	AA	3.5	B		7	10	0			JAC01
1986 05 31.25	B	6.1	AA	3.5	B		7	14	1			JAC01
1986 05 31.45	S	7.1	AA	5.0	B		7			4		GAR01
1986 06 01.23	B	6.2	AA	5.0	B		7	16	1			JAC01
1986 06 02.19	B	6.5	AA	5.0	B		7	15	0			JAC01
1986 06 03.19	B	6.6	AA	5.0	B		7	9	0			JAC01
1986 06 03.49	S	7.8	AA	5.0	B		7			4		GAR01
1986 06 05.21	B	7.2	AA	5.0	B		7	6	0			JAC01
1986 06 08.39	S	7.8	AA	5.0	B		7					GAR01
1986 06 09.41	S	7.7	AA	5.0	B		7			1.5		GAR01
1986 06 13.21	B	7.5	AA	5.0	B		10	12	0			JAC01
1986 06 19.19	B	7.4	AA	5.0	B		10	17	1			JAC01
1986 06 20.20	B	7.7	AA	5.0	B		10	12	0			JAC01
1986 06 23.21	B	7.8	AA	5.0	B		10	6	0			JAC01
1986 06 24.21	B	7.9	AA	5.0	B		10	7	0			JAC01
1986 06 25.21	B	7.6	AA	5.0	B		10	9	2			JAC01
1986 10 31.51	S	12.0:	AC	20	L	6	163					HAL
1986 11 01.51	S	12.0:	AC	20	L	6	163					HAL
1986 11 05.51 !	S	12.0	AC	20	L	6	163					HAL
1986 11 27.48	S	12.0	AC	20	L	6	163					HAL
1986 12 02.51	S	11.9	AC	20	L	6	61		1			HAL
1986 12 12.54	S	11.9	AC	20	L	6	55					HAL
1986 12 26.54	S	12.0	AC	20	L	6	55					HAL
1986 12 30.54	S	12.3	AC	20	L	6	55					HAL
1987 01 03.52	S	12.1	AC	20	L	6	55		0/			HAL
1987 01 09.51	S	12.2	AC	20	L	6	55					HAL
1987 01 25.52	S	12.1	AC	20	L	6	55		2			HAL
1987 01 30.50	S	12.4	AC	20	L	6	163					HAL
1987 02 06.51	S	12.5	AC	20	L	6	55					HAL
1987 02 23.41	S	12.4	AC	20	L	6	110		1			HAL
1987 03 03.36	S	12.1	AC	20	L	6	55					HAL
1987 03 03.38	S	12.3	AC	20	L	6	110					HAL
1987 03 07.41	S	12.4	AC	20	L	6	110		1			HAL
1987 03 20.21	S	12.7	AC	20	L	6	110		0/			HAL
1987 03 22.23	S	13.4	AC	40.6	L	5	102	1.5	1			LEV
1987 03 27.30	S	13.0	AC	20	L	6	110		0/			HAL
1987 04 02.29	S	12.9	AC	20	L	6	110					HAL
1987 04 20.21	S	13.3	NP	25.6	L	4	111	1.2	2			MOR
1987 04 23.20	S	12.7:	AC	20	L	6	163					HAL
1987 04 24.17	S	13.1	AC	20.3	L	7	71	1.5	1			LEV
1987 04 24.23	S	12.6	AC	20	L	6	163		6			HAL
1987 04 24.24	M	12.8	AC	61	C	15	300		6			HAL
1987 04 27.12	S	13.9	L	40.6	C	18	229	& 0.8	1			GRE
1987 05 27.18 !	S	13.2	AC	32	L	4	150	1.5	0			KEE
1987 05 28.18 !	S	13.1	AC	32	L	4	150	1.5	0			KEE
1987 05 29.21	S	13.3	NP	25.6	L	4	156	1.0	3			MOR
1987 05 30.18	S	13.8	AC	60	L	4		1.5	0			LEV
1987 06 15.21		13.8:		31.8	L	4	100	& 1.	0			MOR
1987 06 17.19	S	13.9	AC	91.4	L	8	274	2				LEV

Periodic Comet Boethin (1985n)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 09.42	S	9.1	AC	20	L	6	89	3.5	1			NAK01
1986 01 02.40	S	9.0	A	26	L	5	53	2.8	5/			KAN

Periodic Comet Boethin (1985n) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 02.40	S	9.0	S	13	L	6	24	3.5	4			ISH02
1986 01 03.40	S	9.2	S	13	L	6	44	2.5	4			ISH02
1986 01 04.40	S	8.5	AC	20	L	6	65	3	3			NAK01
1986 01 05.39	S	8.7	A	26	L	5	53	2.9	5			KAN
1986 01 05.39	S	8.9	S	13	L	6	24	3	4			ISH02
1986 01 05.44	S	8.3	AC	20	L	6	65	4	2			NAK01
1986 01 06.39	S	8.8	AA	13	L	6	24	3	3			ISH02
1986 01 09.41	S	8.5	A	15	L	6	28	4.7	3			KAN
1986 01 09.43	S	8.6	AC	20	L	6	65	5	2			NAK01
1986 01 10.43	S	8.5	AC	20	L	6	65	5	2			NAK01
1986 01 11.42	S	8.4	AC	20	L	6	65	4	2			NAK01
1986 01 11.43	S	9.0	A	15	L	6	28	3.5	3/			KAN
1986 01 12.43	S	8.4	AC	20	L	6	65	4.5	3			NAK01
1986 01 14.42	S	8.8	AA	13	L	6	44	2.5	3			ISH02
1986 01 17.41	S	8.9	AA	13	L	6	64	2	4			ISH02
1986 01 18.41	S	9.1	AA	13	L	6	64	2	3			ISH02
1986 01 19.42	S	8.3	S	20	L	6	65	4.5	1/			NAK01
1986 01 27.40	S	8.7	AA	13	L	6	24	3.5	4			ISH02
1986 02 02.40	S	8.6	AC	20	L	6	65	4.5	2			NAK01
1986 02 02.44	S	9.0	A	26	L	6	53	2.9	3			KAN
1986 02 05.41	S	8.5	AC	20	L	6	65	4.5	2/			NAK01
1986 02 05.45	S	8.8	AA	13	L	6	24	3	3			ISH02
1986 02 08.42	S	8.9	AA	13	L	6	24	3.5	3			ISH02
1986 02 10.42	S	9.0	AA	13	L	6	44	3	3			ISH02
1986 02 12.40	S	9.7	A	26	L	6	53	3.1	3			KAN
1986 02 12.42	S	9.2	AA	13	L	6	44	2	3			ISH02
1986 02 12.42	S	9.2	AC	20	L	6	65	5	2			NAK01
1986 02 16.43	S	9.6	AA	13	L	6	44	2	3			ISH02
1986 03 01.43	S	9.3	AC	20	L	6	65	4	1			NAK01
1986 03 02.43	S	9.7	AC	20	L	6	65	3	2			NAK01
1986 03 02.46	S	10.5	AC	13	L	6	44	2	2			ISH02
1986 03 02.47	S	11.2	A	26	L	6	73	1.7	1/			KAN
1986 03 05.44	S	10.7	AC	13	L	6	64	2	2			ISH02
1986 03 06.44	S	11.0	AC	20	L	6	65	2	3			NAK01
1986 03 08.43	S	10.3	AC	20	L	6	65	3.5	4			NAK01
1986 03 12.45	S	11.0	AC	13	L	6	64	2	2			ISH02

Periodic Comet Schwassmann-Wachmann 1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 06 19.60		[13.0	A	31.7	L	8	105					PEA
1984 01 15.81		[13.0	A	31.7	L	8	148					PEA
1985 02 23.82		[12.5	A	20.3	L	6	116					PEA
1985 02 24.82		[12.5	A	20.3	L	6	116					PEA
1985 02 25.84		[12.5	A	20.3	L	6	116					PEA
1985 02 26.83		[12.5	A	20.3	L	6	116					PEA
1985 02 27.82		[12.5	A	20.3	L	6	116					PEA
1985 03 04.84		[12.5	A	20.3	L	6	116					PEA
1985 03 19.82		[12.5	A	20.3	L	6	116					PEA
1985 03 20.84		[12.5	A	20.3	L	6	116					PEA
1985 03 26.82		[12.5	A	20.3	L	6	116					PEA
1985 03 27.82		[12.5	A	20.3	L	6	116					PEA
1985 04 02.81		[12.8	A	20.3	L	6	116					PEA
1985 04 19.80		[12.8	A	20.3	L	6	116					PEA
1985 04 25.80		[12.8	A	20.3	L	6	116					PEA

Periodic Comet Schwassmann-Wachmann 1 (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 05 12.65		[12.5	A	20.3	L	6	116					PEA
1985 05 13.66		[12.5	A	20.3	L	6	116					PEA
1985 05 29.70		[12.5	A	20.3	L	6	116					PEA
1985 05 30.70		[12.8	A	20.3	L	6	116					PEA
1985 06 17.62		[12.5	A	20.3	L	6	116					PEA
1985 07 23.55		[13.2	A	31.7	L	5	149					PEA
1985 07 26.56		[13.2	A	31.7	L	5	149					PEA
1986 08 12.29	S	[12.0	AC	20	L	6	163					HAL
1986 08 26.15	S	[11.5	AC	20	L	6	163					HAL
1986 09 01.15	S	[11.5	AC	20	L	6	163					HAL
1986 09 25.17	S	[12.0	AC	20	L	6	163					HAL
1986 10 05.12	S	[12.0	AC	20	L	6	163					HAL
1986 10 27.08	S	[11.5	AC	20	L	6	163					HAL
1986 11 20.07	S	[11.5	AC	20	L	6	163					HAL
1987 03 28.49	S	[11.5	AC	20	L	6	163					HAL
1987 04 06.48	S	[12.0	AC	20	L	6	163					HAL
1987 04 27.46	S	[12.0	AC	20	L	6	163					HAL
1987 05 01.44	S	[12.5	AC	20	L	6	163					HAL
1987 05 04.44	S	[12.5	AC	20	L	6	163					HAL
1987 05 04.77		[12.8	VN	20	L	5	142					PEA
1987 05 06.77	S	12.1	VN	20	L	5	95	1.4	1			PEA
1987 05 06.81	S	12.0	A	20	L	5	50	2	1			CLA
1987 05 07.84	S	12.0	VN	20	L	5	50	2	0/			PEA
1987 05 09.46	M	[12.2	AC	20	L	6	163					HAL
1987 05 09.80	S	12.0	A	20	L	5	50	3	0			CLA
1987 05 09.81	S	11.9	VN	20	L	5	50	2.2	1			PEA
1987 05 10.45	M	[12.3	AC	20	L	6	163					HAL
1987 05 30.35	S	[13.5	AC	41	L	4	244					HAL
1987 06 19.32	S	[13.5	AC	41	L	4	244					HAL
1987 06 22.42	S	14.0:	AC	154.9	L	14	654		2			LEV
1987 06 29.26	S	[12.5	EB	40.6	C	18	229	! 0.5				GRE

Periodic Comet Crommelin (1984 IV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 01 28.40	S	10.5	A	15	L	6	72	3.5	1			NAK01
1984 01 28.40	S	10.8	A	18	L	6	55	2.5	2			TAN01
1984 01 29.40	S	10.5	A	15	L	6	50		1			KAN
1984 02 02.39	S	10.1	A	15	L	6	50	3.6	0			KAN
1984 02 04.39	S	9.6	A	15	L	6	50	2.5	1			KAN
1984 02 04.39	S	10.5	A	15	L	6	50	3.5	2			TAN01
1984 02 04.41	S	9.9	A	15	L	6	50	4	1/			NAK01
1984 02 07.41	B	9.6	S	20	C	10	50					OHT
1984 02 07.41	S	9.3	S	13	L	6	44	& 3.5	4			ISH02
1984 02 08.40	S	9.0	S	15	L	6	50	3.2	1/			KAN
1984 02 09.39	S	9.3	A	15	L	6	50	3.0	4/			KAN
1984 02 09.40	S	9.2	A	15	L	6	50	4.5	3			NAK01
1984 02 09.40	S	9.5	A	15	L	6	50	6	2			TAN01
1984 02 09.41	S	9.3	S	13	L	6	44	3	3			ISH02
1984 02 10.39	S	9.2	A	15	L	6	50	2.6	4			KAN
1984 02 11.40	S	9.1	A	15	L	6	52	4	3			NAK01
1984 02 11.40	S	9.6	A	15	L	6	50	2.1	2			KAN
1984 02 11.41	B	8.7	S	10	L	10	33	6.9				ICH
1984 02 13.40	S	8.7	S	15	L	6	50	3.5	3			NAK01
1984 02 13.41	S	9.0	S	15	L	6	50	& 3.5	3			TAN01

Periodic Comet Crommelin (1984 IV) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 02 18.40	S	8.2	A	15	L	6	50	4	5			NAK01
1984 02 18.40	S	9.1	A	15	L	6	50	2.9	4/			KAN
1984 02 18.41	S	8.5	A	15	L	6	50	3.5	3			TAN01
1984 02 18.41	S	8.8	S	13	L	6	24	4	5			ISH02
1984 02 18.43	B	8.2	S	10	L	10	33	4.8				ICH
1984 02 19.39	S	8.2	A	15	L	6	50	2.5	4			TAN01
1984 02 19.40	S	8.2	A	15	L	6	50	3	4			NAK01
1984 02 19.41	S	8.9	S	13	L	6	24	4	5			ISH02
1984 02 19.42	S	9.0	A	15	L	6	50	3.6	2			KAN
1984 02 20.41	S	8.2	A	15	L	6	50	2.5	4			NAK01
1984 02 20.41	S	8.7	A	15	L	6	50	3.4	4			KAN
1984 02 20.41	S	8.9	S	13	L	6	44	4.1	5			ISH02
1984 02 24.41	S	8.2	S	15	L	6	50	3.5	5			NAK01
1984 02 24.41	S	8.4	S	13	L	6	24	4.5	5			ISH02
1984 02 24.43	S	8.3	A	15	L	6	28	3.0	5			KAN
1984 02 24.44	S	8.0	S	10	L	10	33	& 5				ICH
1984 02 27.41	S	8.1	S	15	L	6	50	4	6			NAK01
1984 02 28.41	S	7.8	S	10	L	10	33	& 4.5				ICH
1984 02 28.41	S	8.3	A	15	L	6	28	3.2	4			KAN
1984 02 28.42	S	8.3	A	15	L	6	28	4	5			NAK01
1984 02 28.42	S	8.6	S	13	L	6	44	& 4	4			ISH02
1984 02 28.43	S	8.5	A	15	L	6	50	4.5	3			TAN01
1984 02 29.42	S	8.5	S	13	L	6	44	4	5			ISH02
1984 02 29.44	B	7.7	S	10	L	10	33	6				ICH
1984 03 01.41	S	8.3	S	13	L	6	24	4.5	5			ISH02
1984 03 02.42	S	8.5	S	13	L	6	44	3	4			ISH02
1984 03 05.43	S	8.1	S	13	L	6	24	4.5	5			ISH02
1984 03 05.43	S	8.3	A	15	L	6	28	3.9	5			KAN
1984 03 05.46	S	8.2	S	10	L	10	33	5				ICH
1984 03 06.41	S	8.3	A	15	L	6	28	3.8	4/			KAN
1984 03 06.43	S	8.4	S	13	L	6	44	3.5	4			ISH02
1984 03 08.42	S	8.6	S	15	L	6	50	3.5	2/			NAK01
1984 03 08.42	S	8.8	S	15	L	6	50	& 3.5	2			TAN01
1984 03 08.43	S	8.4	S	13	L	6	44	3.5	4			ISH02
1984 03 11.42	M	8.6	S	10	L	10	33	6.2				ICH
1984 03 11.43	S	8.6	S	13	L	6	44	2.8	3			ISH02
1984 03 11.44	S	8.7	A	15	L	6	50	2.4	2/			KAN
1984 03 12.42	S	8.6	S	13	L	6	44	& 2.5	4			ISH02
1984 03 18.43	M	8.8	A	10	L	10	33	& 3.5				ICH
1984 03 18.43	S	9.0	S	13	L	6	44	3	3			ISH02
1984 03 20.42	M	9.3	S	10	L	10	56					ICH
1984 03 20.43	S	8.9	S	13	L	6	44	3	3			ISH02
1984 03 20.44	S	9.5	A	15	L	6	28	3.9	3			KAN
1984 03 21.43	S	9.6	A	15	L	6	50	3				NAK01
1984 03 21.44	S	9.7	A	15	L	6	50	3	1			KAN
1984 03 22.44	S	8.8	S	13	L	6	44	3	3			ISH02
1984 03 26.43	S	11.0	A	15	L	6	100	1.2	1			KAN
1984 03 26.44	S	9.4	S	13	L	6	44	& 2.5	2			ISH02

Periodic Comet Stephan-Oterma (1980 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 11 03.65	S	9.5	BD	7.8	R	8	30		4			JON
1980 11 09.64	S	9.9	VN	7.8	R	8	30		5			JON
1980 11 13.64	S	9.8	VN	7.8	R	8	30					JON

Periodic Comet Stephan-Oterma (1980 X) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 11 17.65	S	9.6	VN	7.8	R	8	30		5			JON
1980 11 19.65	S	10.4	VN	31.7	L	5	86					JON
1980 12 02.64	S	9.9	VN	7.8	R	8	30		5			JON
1980 12 03.64	S	10.1	VN	7.8	R	8	30					JON
1980 12 09.62	S	9.7	VN	7.8	R	8	30					JON
1980 12 10.62	S	9.6	V	7.8	R	8	30					JON

Periodic Comet Klemola (1987i)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 05 30.45	S	13.9	AC	41	L	4	244					HAL
1987 06 01.83	S	13.3	VN	32	L	4	114	0.8	2			PEA
1987 06 05.44	S	13.7	AC	41	L	4	244					HAL
1987 06 23.43	S	13.1	AC	41	L	4	244					HAL
1987 06 25.43	S	13.3	NP	25.6	L	4	156	& 1.0	2			MOR
1987 06 27.40	S	13.1	NP	25.6	L	4	156	0.9	2			MOR
1987 06 29.30	S	13.1	EC	40.6	C	18	229	& 0.5	1/			GRE
1987 07 01.40	S	13.1	NP	25.6	L	4	156	0.8	2/			MOR
1987 07 03.42	S	12.6:	AC	40.6	L	5	102		2			SCO01
1987 07 07.41	S	13.0	NP	25.6	L	4	156	0.8	3			MOR

Periodic Comet IRAS (1983 XIV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 09 01.88	S	12.0	A	29.8	L	5	62	1.0	6			KEI
1983 09 05.97	S	11.8	A	29.8	L	5	62	1.2				KEI
1983 09 06.98	S	11.7	A	29.8	L	5	62	0.8				KEI
1983 09 19.17	S	11.3	A	29.8	L	5	62	0.8	4	?	225	KEI
1983 10 01.96	S	11.2	A	29.8	L	5	62	2.5	3/			KEI
1983 10 04.91	S	11.1	A	29.8	L	5	62	2.2	3/			KEI
1983 10 07.94	S	11.0	A	29.8	L	5	53	2.4	4			KEI
1983 10 10.90	S	11.0	A	29.8	L	5	62	2.5	3			KEI
1983 10 14.00	S	11.1	A	29.8	L	5	62	2.6		?	135	KEI
1983 10 30.00	S	12.9	A	29.8	L	5	89	0.6				KEI

Periodic Comet Hartley-IRAS (1984 III)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 02 02.86	S	10.8	A	15	L	6	129	1.1	1/			KAN
1984 02 03.86	S	10.5	A	15	L	6	100	1.3	1			KAN
1984 02 07.85	S	9.5	A	15	L	6	50	3.0	4			KAN
1984 02 08.84	S	10.0	A	13	L	6	64	3	4			ISH02
1984 02 08.85	S	9.4	A	15	L	6	50	3.8	1/			KAN
1984 02 09.85	S	9.6	A	15	L	6	50	2.8	3			KAN
1984 02 09.85	S	9.9	A	13	L	6	64	3	4			ISH02
1984 02 13.84	S	10.5	A	15	L	6	72	1.5				KAN
1984 02 14.83	S	9.8	A	15	L	6	50	2.6	2			KAN
1984 02 14.85	S	9.8	A	13	L	6	44	2.2	3			ISH02
1984 02 20.84	S	9.4	A	15	L	6	50	2.7	2			KAN
1984 02 20.84	S	9.8	A	13	L	6	64	3	3			ISH02
1984 02 24.81	S	8.4	A	15	L	6	50	4.5	5			NAK01
1984 02 26.82	S	8.5	A	15	L	6	50	5	5			NAK01
1984 02 26.82	S	8.7	A	15	L	6	28	5.4	4			KAN
1984 02 26.83	S	8.6	A	15	L	6	50	5.5	4			TAN01
1984 02 27.80	S	8.4	A	15	L	6	28	4	4			NAK01

Periodic Comet Hartley-IRAS (1984 III) [Cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 02 27.82	S	8.5	A	15	L	6	50	5	4			TAN01
1984 02 28.80	S	8.9	A	15	L	6	28	4.5	4			NAK01
1984 02 28.81	S	8.6	A	15	L	6	28	5	4			TAN01
1984 02 28.83	S	8.8	A	15	L	6	28	5.4	3			KAN
1984 02 28.84	S	8.5	A	13	L	6	24	4	4			ISH02
1984 02 29.83	S	8.4	A	13	L	6	24	4	4			ISH02
1984 03 01.80	S	9.2	A	15	L	6	28	4	4			NAK01
1984 03 01.81	S	8.9	A	15	L	6	28	6	4			TAN01
1984 03 01.83	S	8.6	A	13	L	6	24	4	4			ISH02
1984 03 01.83	S	9.0	A	15	L	6	28	4.5	4			KAN
1984 03 02.83	S	8.8	A	13	L	6	24	3.5	3			ISH02
1984 03 02.83	S	8.9	A	15	L	6	28	6.2	3			KAN
1984 03 03.82	S	9.3	A	15	L	6	50	3.5	3			NAK01
1984 03 05.81	S	9.2	A	15	L	6	50	4.5	3			NAK01
1984 03 05.83	S	9.2	A	15	L	6	28	3.7	3			KAN
1984 03 06.80	S	8.7	S	10	L	10	33	2.2				ICH
1984 03 06.82	S	9.9	A	13	L	6	24	3	3			ISH02
1984 03 07.82	S	8.9	A	15	L	6	28	5.5	3			KAN
1984 03 10.82	S	9.0	A	15	L	6	28	4.7	2/			KAN
1984 03 10.84	S	9.6	A	10	L	10	56	2.7				ICH
1984 03 11.82	S	9.3	A	15	L	6	28	4.7	2			KAN
1984 03 11.82	S	9.7	A	13	L	6	44	3.2	2			ISH02
1984 03 11.83	S	9.7	A	18	L	6	55	3	1/			NAK01
1984 03 12.83	S	9.6	A	13	L	6	44	3	3			ISH02
1984 03 21.82	S	10.2	A	15	L	6	28	3	2			KAN
1984 03 22.81	S	9.6	A	15	L	6	28	4.3	1			KAN
1984 03 30.80	S	9.8	A	15	L	6	50	3.4	1/			KAN
1984 04 05.80	S	10.0	A	15	L	6	50	2.2				KAN
1984 04 08.75	S	10.5	A	15	L	6	28	3.5	0			KAN

Periodic Comet Shoemaker 3 (1985 XVIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 02 11.33	C	15	FA	91.4	L	4						SCO02

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BOOK REVIEWS

Ices in the Solar System

J. Klinger, D. Benest, A. Dollfus, and R. Schmoluchowski, Eds., 972 pp. clothbound, US$99.00 (1985, D. Reidel Publ. Co., P.O. Box 989, 3300 AZ Dordrecht, The Netherlands). [ISBN 90-277-2062-2]

Most astronomical conferences focus on a specific object or class of objects, such as one of the planets, a type of variable star, or comets. The NATO Advanced Workshop on Ices in the Solar System, held in Nice, France, during January 16–19, 1984, took the unusual approach of focusing on a constituent which bridges several classes of objects in the solar system. For a discussion of the conference, see the article by Fred Whipple in the April 1984 issue of the *ICQ*.

Ices in the Solar System, the Proceedings of the Workshop, contains chapters on the Physics and Remote Sensing of Ices; Cosmochemistry and Interplanetary Particles; The Icy Nuclei of Comets; Ices on Mars; and Rings, Icy Satellites and Pluto. This review concentrates on the papers dealing with comets, which account for about a quarter of the more than 50 papers in the book. A sampling of some of these papers is given below.

The chapter on comets begins with Fred Whipple presenting a review of the status of his famous (and basically correct) icy conglomerate model for cometary nuclei. His paper provides a good summary of the model, but doesn't add any significant new information.

Extensive use of visual light curves is made by Delsemme in attempting to determine the characteristic distance, r_o, separating the sublimation steady state (small dependence on distance) from radiation steady state (steep dependence on distance). Most of the comets he discusses are pre-1940 (based on data compiled by Bobrovnikoff). The most recent comet cited is comet Kohoutek *1973 XII*. P/Encke is the characteristic periodic comet chosen with observations by Beyer. It is unfortunate and disturbing that Delsemme did not choose to use more recent comets as well as the extensive data base published in the *ICQ*. All of the r_o values derived by Delsemme are in the range 1.7–4.4 AU. From this result and other arguments he concludes that sublimation for both "new" and periodic comets is controlled by water ice only.

An interesting paper by A'Hearn and Feldman clearly proves that an outburst in comet IRAS-Araki-Alcock *1983 VII* was correlated with an increase in the velocity of the solar wind. (The connection of this event, observed in the visual, with solar wind was first suggested by the reviewer and D. W. E. Green who found a correlation between the outburst and the disturbed geomagnetic indices.) The authors point out that S_2 was found in spectra taken during the outburst. They argue that S_2 is a parent molecule. If so, the cometary ice must have accreted directly from interstellar grains with ice mantles prior to any warming.

Rickmann, Froeschlé and Klinger use the the light curve of comet P/Halley to argue that sublimation fed only by absorbed sunlight cannot explain the observed gas production at large distances from the Sun. They suggest that the amorphous-cubic phase transition would produce an internal source of heat that could account for the distant activity.

Delsemme summarizes what we don't know about cometary ices (as of 1984) — which is a lot. The two things that we do know is that the cometary nucleus is composed volatile ices and that its major constituent is water ice. There is little known about the minor constituents. In addition, a list of parent molecules has been difficult to establish.

Considering the high cost of the book, *Ices* has a significant number of typos including missing page references in the Author Index. (Three different Morris' are listed including the reviewer with no page numbers given!) In addition, the book was not typeset as each paper has a slightly different type style.

Because of all the new information about comets derived from the intensive study of comet Halley, some of the material presented on comets is outdated. The real value of this book is that it brings together ice experts who deal not only with comets, but with other objects in the solar system. A considerable amount of information on ice physics and chemistry is presented which is not typically found in a conference devoted solely to comets. However, its exorbitantly high price makes it difficult to recommend *Ices*. — Charles S. Morris

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Long-Term Evolution of Short-Period Comets

A. Carusi, L. Kresak, E. Perozzi, and G. B. Valsecchi. Looseleaf notebook, ~ 272 printed pages, $85.00 (1985, Adam Hilger, Ltd., P.O. Box 230, Accord, MA 02018, U.S.A.). [ISBN 0-85274-489-7]

This interesting publication is different from the usual type of book reviewed in the *ICQ*, in that there is not very much text. Tables and schematic diagrams take up the bulk of this work, which displays the results of integrating the orbital elements of 132 short-period comets (known at the beginning of 1985) over the years 1585–2406 A.D (a span of 821.4 years). A perusal of *Long-Term Evolution of Short-Period Comets* will give insight into the evolution of cometary orbits through close and not-so-close encounters with the Jovian planets. A description of this catalogue/atlas, including sample diagrams, can be found in papers by the authors in *Dynamics of Comets: Their Origin and Evolution* (see book review in this issue of the *ICQ*).

An 8-page introduction describes the procedures and conditions used for integrating the orbital elements, and the authors appropriately caution users that the starting orbital elements (mostly taken from Brian Marsden's 1982 *Catalogue of Cometary Orbits*) vary greatly in degree of accuracy from one comet to the next and that nongravitational forces were not taken into account. One of the authors' points states: "Since the errors in revolution period may affect appreciably the geometry of the past and future planetary encounters, every strong perturbation makes the motion beyond it much less determinate. In critical cases this error can even change an accelerating encounter into a decelerating one or *vice versa*, making the computed motion entirely different from the reality beyond this point."

The results for each comet begin on a new page, permitting the user of *Long-Term Evolution of Short-Period Comets* to rearrange the order of the looseleaf notebook in any desirable manner; the authors and publisher also state their intention that future pages for newly-discovered comets will be published and can be simply added to the notebook (one fills out a form supplied by the publisher in order to receive future supplements to this "atlas"). The entire publication (text and figures) appears to be computer-generated and is very neatly produced. The section for an individual comet begins with a brief overall sketch of "the main characteristics of the orbital evolution of the comet in question" (to quote the Introduction); I often find this summary to be lacking in useful and significant remarks. There then follows a table listing the starting orbital elements and the computed elements for 7 epochs during the integration period (*i.e.*, for every 50,000 days). This is followed by a time-line which plots the comet's closest major approaches to planets over the integrated period. There are then 4 strip charts plotting *versus* time the following values: the Tisserand invariant with respect to Jupiter, the orbital inclination, and the aphelion and perihelion distances. All of this information is included for each comet.

Special sections are added for comets which make "very deep and/or slow, complex encounters with a planet" or "when a libration about some planetary resonance persists for at least one full cycle". Diagrams are then given which show the comet's motion with respect to one or more planets and the sun. A necessary and useful index is included at the end of the volume.

I would recommend this publication as a very interesting and potentially useful exhibit of orbital evolution of short-period comets. I must seriously question the high cost charged by the publisher, however, as this should really be sold for about a third of the asking price. — Daniel W. E. Green