# THE INTERNATIONAL COMET QUARTERLY

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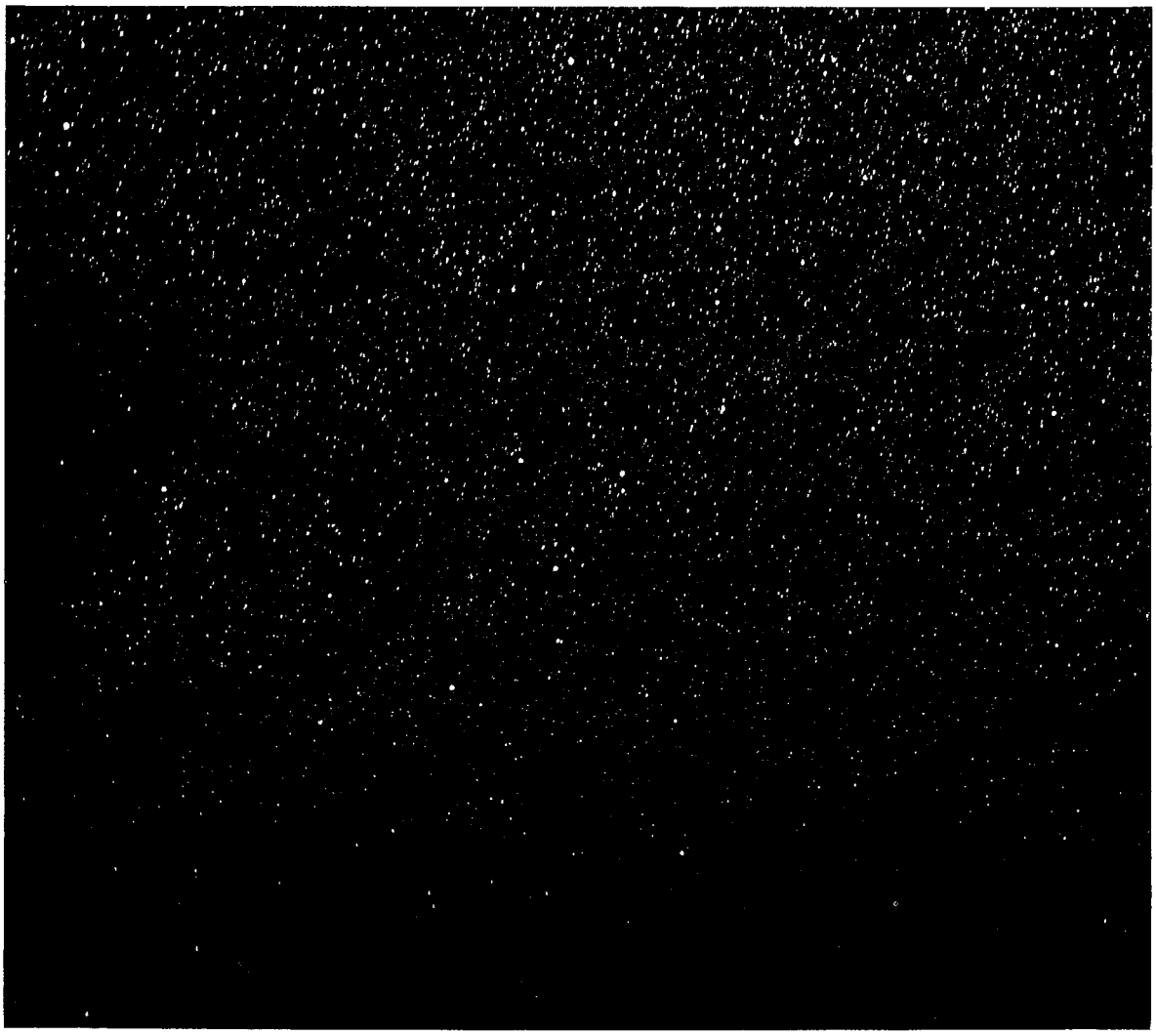

Above is a photograph of comet Pereyra 1963 V by Alan McClure from Mount Piños, California. Ten-minute exposure on a panchromatic plate beginning at $12^h06^m$ UT on 1963 September 21, with a 10-inch-focal-length Zeiss camera operating at $f/3.8$.

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# ROMAN NUMERAL DESIGNATIONS OF COMETS IN 1988

The following tabulation is from *Minor Planet Circular* 15439. The designation 1987 XXXVI was given to P/Parker-Hartley (1989i), and the designation 1987 XXXVII is now given to P/Helin-Roman-Alu 1 (1989w).

| Comet | T | Name | Year/letter | Ref. |
|---|---|---|---|---|
| 1988 I | Jan. 10.1 | Ichimura | 1987d1 | MPC 12710 |
| 1988 II | Jan. 18.8 | Jensen-Shoemaker | 1987g1 | MPC 14904 |
| 1988 III | Feb. 14.2 | Shoemaker-Holt | 1988g | MPC 13452 |
| 1988 IV | Mar. 3.1 | Furuyama | 1987f1 | MPC 13459 |
| 1988 V | Mar. 31.1 | Liller | 1988a | MPC 13459 |
| 1988 VI | May 10.0 | P/Reinmuth 1 | 1987r | IAUC 4424 |
| 1988 VII | May 21.4 | P/Shoemaker-Holt 1 | 1987z | MPC 14592 |
| 1988 VIII | May 23.8 | P/Ge-Wang | 1988o | IAUC 4681 |
| 1988 IX | June 6.1 | P/Finlay | 1988f | IAUC 4586 |
| 1988 X | June 27.8 | (SMM 3) | 1988l | IAUC 4648 |
| 1988 XI | Aug. 7.4 | P/Shoemaker-Holt 2 | 1989j | MPC 14747 |
| 1988 XII | Aug. 21.8 | (SMM 4) | 1988m | IAUC 4660 |
| 1988 XIII | Sept.10.2 | P/Helin-Roman-Crockett | 1989b | MPC 14460 |
| 1988 XIV | Sept.16.7 | P/Tempel 2 | 1987g | IAUC 4312 |
| 1988 XV | Sept.17.6 | Machholz | 1988j | MPC 13591 |
| 1988 XVI | Oct. 6.3 | P/West-Hartley | 1989k | MPC 14747 |
| 1988 XVII | Oct. 12.1 | (SMM 5) | 1988n | IAUC 4668 |
| 1988 XVIII | Oct. 12.2 | P/Longmore | 1987c1 | IAUC 4493 |
| 1988 XIX | Oct. 24.9 | (SMM 7) | 1988q | IAUC 4692 |
| 1988 XX | Oct. 31.8 | Yanaka | 1989a | MPC 14747 |
| 1988 XXI | Nov. 2.1 | Shoemaker | 1989f | MPC 14460 |
| 1988 XXII | Nov. 18.4 | (SMM 6) | 1988p | IAUC 4684 |
| 1988 XXIII | Dec. 5.2 | P/Bradfield 2 | 1989c | MPC 14322 |
| 1988 XXIV | Dec. 11.7 | Yanaka | 1988r | MPC 14322 |

# TABULATION OF COMET OBSERVATIONS

We thank SAO summer student aide Elinor Gates for entering many of the tabulated observations published in this issue and the October 1989 issue. She also entered into our computer most of Max Beyer's visual magnitude data from his series of articles in the *Astronomische Nachrichten* covering the 1930s to around 1970; Beyer's data will be included in the next edition of the *ICQ* archive on magnetic tape. Beyer is now the most prolific observer in the *ICQ* archive, in terms of numbers of visual $m_1$ estimates, with well over 2000 brightness estimates of scores of comets.

**Descriptive Information (to complement the Tabulated Data):**

◇ *Periodic Comet Harrington (1987 XXVIII)* ⟹ 1987 Nov. 24.04: "not a definite sighting; averted vision only" [JAC01].

◇ *P/Pons-Winnecke (1989g)* [all notes by HAL] ⟹ 1989 Aug. 3.18: very faint candidate suspected, but not confirmed; the nearby galaxy IC 903 (5′ from comet's position) was observed: faint but definite. Aug. 10.15: sky conditions good, but observation attempt hampered by moonlight. Aug. 23.16: the nearby galaxy MCG −2-37-06 was observed. Aug. 31.13: very faint candidate suspected, but not confirmed. Sept. 3.15: altitude fairly low. Sept. 22.12: low altitude; sky conditions not very good. Sept. 30.11: low altitude; rich star field.

◇ *Periodic Comet Gehrels 2 (1989n)* ⟹ 1989 Oct. 23.20: comet's position close to a 6th mag star [HAL].

◇ *Periodic Comet Brorsen-Metcalf (1989o)* ⟹ 1989 Aug. 3.43: possible 0°.5 tail in p.a. 295°, suspected in 10×50 B, but not definitely detected in 41-cm L [HAL]. Aug. 10.04: in 20.3-cm *f*/10 T, bright inner coma 2′.5; no starlike central cond. [KAM01]. Aug. 10.04: in 20.3-cm *f*/10 T, the inner 2′ of coma was pronounced; no starlike central cond. [KAM01]. Aug. 12.40: on photograph (Konica 3200 film) with 14-cm *f*/3.64 S, 0°.2 tail in p.a. 275° [PRY]. Aug. 17.1: observations made during lunar eclipse that was total. Aug. 28.48: on photograph (Konica 3200 film) with 14-cm *f*/3.64 S, 1°.73 tail in p.a. 300° [PRY]. Aug. 31.13: in 7.5-cm *f*/9.3 L (30×), coma dia. 1′.5, DC = 8, central cond. [KAM01]. Sept. 3.48: on photograph (Konica 3200 film) with 14-cm *f*/3.64 S, 1°.44 tail in p.a. 310° [PRY]. Sept. 5.14: on photograph with 4.8-cm *f*/2.8 R, tail of length 2°.4 in p.a. 304°, where a kink occurred and the tail then extended another 3°.5 in p.a. 314° [BOU]. Sept. 8.14: in 20.3-cm *f*/10 T (81×), coma dia. 1′.3, DC = 8-9, 0°.3 tail in p.a. 315°, with "one streamer in the middle of the tail" [KAM01]. Sept. 13.13: on photograph with 4.8-cm *f*/2.8 R, 10-min exposure with 135-mm lens on Kodak TP2415 hypered film, shows 7°.7 tail in p.a. 304°.5 [BOU]. Sept. 18.50: interference from low altitude, moonlight and twilight; little more than the central cond. and the inner coma could be seen [HAL]. Sept. 25.50: interference from low altitude and twilight; little more than the central cond. could be seen [HAL].

◇ *Comet Okazaki-Levy-Rudenko 1989r* ⟹ 1989 Sept. 8.81: $m_2 \sim 13.5$ [JAH]. Sept. 17.80: $m_2 \sim 13.0$ [JAH]. Sept. 20.80: also 0°.01 tail in p.a. 125°; $m_2 \sim 12.5$ [JAH]. Sept. 26.11: tail suspected in p.a. 62° [MOR]. Sept. 30.12: tail suspected in p.a. 58° [MOR]. Oct. 3.77: narrow tail [MOE]. Oct. 8.06: fan-shaped, very diffuse tail (a 60° arc centered on p.a. 40°) [CHE]. Oct. 10.76: at 136×, central cond. of dia. ∼ 3″, coma dia. 2′.8, DC = 4 [JAH]. Oct. 18.81: in 15-cm L, bright central cond., 2′ in dia. and moderately diffuse, striking compared to the rest of the coma; the outer coma limits were diffuse and irregular [PER01]. Oct. 20.73: at 56×, coma dia. 4′.4, DC = 3, tails of length ∼ 0°.12 and 0°.10 in p.a. ∼ 43° and 322°, respectively [JAH]. Oct. 23.00: in 37-cm L (64× and 127×), 12′ coma, DC = 7, "bright central mass" of dia. ∼ 1′; 20′ fan-shaped tail (a 30° arc centered on p.a. 10°), with a short, brighter extension in p.a. 0° and a single ion 1° spike in p.a. 10°; there appeared to be a brighter patch about halfway along the spike's length [CHE]. Oct. 23.07: brightness estimate affected by low altitude and comet's proximity to 7th mag star; the telescopic tail was straight and narrow, except for a slight bend ∼ 5′ from the coma; this tail showed a distinct enhancement when viewed with a $C_2$ filter [HAL]. Oct. 30.23: in 15-cm L, "distinctly starlike central cond. of mag 9", offset 0′.4 toward p.a. 15° [PER01]. Nov. 4.23: "tail bent eastward near the coma (perhaps 0°.3 from the coma), the eastern edge being very straight and sharp" [PER01]. Nov. 4.54 and 5.54: "there was a short dust fan north of the tail that subtended ∼ 60° of p.a." [MOR]. Nov. 10.53: comet was distinctly blue in 26-cm *f*/4.5 L [MOR]. Nov. 25.54: "in 26-cm L (67×), head was flattened on sunward side; there was a non-stellar condensation in the center of the coma; comet was distinctly blue" [MOR]. Nov. 25.5: tail very faint compared to coma in 10×50 B [ROB03]. Nov. 26.50: tail fairly faint and subtle [HAL]. Dec. 1.51: a vague, broad tail, ∼ 15′ long in p.a. 340°, strongly suspected with both 10×50 B and 41-cm L [HAL].

◇ *Comet Helin-Roman-Alu 1989v* ⟹ 1989 Oct. 18.76: in 20.4-cm *f*/6 L (72×), $m_1 \sim 10$, coma dia. 3′.2, DC = 1; cirrus clouds interfered, comet at limit of visibility [JAH]. Oct. 19.13: sky conditions only fair [HAL]. Oct. 29.87: round coma could be as large as 8′ or 9′ [PER01]. Nov. 9.84: small central cond. was faint and diffuse [PER01]. Nov. 16.79: a Lumicon Swan-band filter expands the coma to 1′.5 at 260× and to 3′ at 123× [KOR]. Nov. 17.79: with Swan-band filter, coma dia. 6′ at 123× [KOR]. Nov. 18.14: apparently had undergone an outburst [MOR]. Nov. 19.78: with Swan-band filter, coma dia. 4′ at 123× [KOR]. Nov. 30.07: coma very diffuse, elongated somewhat in p.a. 45°; tear-shaped, very diffuse tail [CHE].

◇ *Periodic Comet Helin-Roman-Alu 2 (1989y)* ⟹ 1989 Nov. 6.33: sky conditions extremely good; an extremely faint candidate was suspected, but could not be confirmed [HAL].

◇ *Comet Skorichenko-George 1989e*$_1$ ⟹ 1989 Dec. 20.14: comet had a knot of material (∼ 0′.5) surrounded by a diffuse coma [MOR].

◇ *P/Gunn* [all notes by HAL] ⟹ 1989 July 27.23: low altitude; observation hurried as clouds began to move in. Aug. 3.20: altitude fairly low; brief search halted by clouds [HAL]. Aug. 23.19: low altitude. Aug. 26.16: altitude fairly low; observation attempt possibly hampered by thin cirrus.

◇ *Comet Aarseth-Brewington (1989a$_1$)* ⟹ 1989 Nov. 19.70: in 48.5-cm L, also 0°.2 tail in p.a. 0° [MOE]. Nov. 29.97: "thin ion tail" [CHE]. Dec. 2.08 and 3.08: comet only 2°-3° above the horizon [MOR]. Dec. 5.50: in 25.4-cm L (~ 100×), there was a strong starlike nuclear cond. and 0°.3 tail in p.a. 360° [ROB03]. Dec. 18.53: comet visible to naked eye as a faint star [HAL]. Dec. 20.53: comet easily visible to naked eye; even the beginning of a tail is visible [HAL]. Dec. 20.56: comet had a stellar head and was white; glimpsed with the naked eye [MOR]. Dec. 21.56: some cirrus clouds present; comet displayed two tails, with the gas tail south of the broader dust tail (both were straight); in 26-cm *f*/4.5 L, the coma had a non-stellar round cond. surrounded by an area of increased brightness extended toward the gas tail; rays could be seen in the gas tail, but no disconnection events were obvious [MOR]. Dec. 22.54:.low altitude; sky transparency relatively poor (comet observed through a fairly thick haze layer); the comet is probably somewhat brighter than the given estimate, and the tail direction is only approximate [HAL]. Dec. 22.56: in 26-cm L, stellar cond. glimpsed when comet was in bright twilight; glimpsed with naked eye [MOR]. Dec. 23.57: comet only 1° above the horizon in a dark sky; in 26-cm L, non-stellar cond. appeared yellow [MOR]. Dec. 24.55: low altitude and twilight; despite the bright sky, the comet is relatively easy in 10×50 B [HAL].

◇ *P/Schwassmann-Wachmann 1* [all notes by HAL] ⟹ 1989 Aug. 3.47: comet vague, diffuse and large; observed during early stages of twilight. Aug. 9.38: comet's position close to 7th mag star. Aug. 23.23: observation hurried due to impending moonrise; a very faint candidate was suspected but could not be confirmed; the nearby galaxy UGC 12785 was observed. Sept. 1.41: comet's position very close to 7th mag star. Sept. 3.29: observation attempt possibly hampered by thin cirrus. Sept. 8.26: sky transparency not very good. Sept. 23.25: comet small and condensed, indicative of the early stages of a fresh outburst. Oct. 8.39: sky conditions fairly poor. Oct. 23.17: comet seems somewhat more condensed than when observed earlier in the month, suggesting there has been more activity in the interim.

◇ ◇ ◇

Key to observers with observations published in this issue, with 2-digit numbers between Observer Code and Observer's Name indicating source [16 = Yamaneko Group of Comet Observers (c/o Akimasa Nakamura, Aichi, Japan); 18 = Coordinated amateur Polish group, c/o Marek Muciek, Torun, Poland; 19 = SOPROCH, Soviet amateur network for observing P/Halley (c/o K. I. Churyumov); etc.]. Those with asterisks (*) preceding the 5-character code are new additions to the Observer Key:

| CODE | S | OBSERVER, LOCATION |
|---|---|---|
| *ADA01 | 18 | Andrzej Adamski, Poland |
| *ALE | 19 | A. Aleinikov, Moscow, U.S.S.R. |
| AMO | | Mauro Amoretti, Italy |
| *BAN | 18 | Jaroslaw Bandurowski, Poland |
| BAR | | Sandro Baroni, Italy |
| *BEL03 | 19 | D. Belyaev, Tuapse, U.S.S.R. |
| *BEZ | 19 | A. Bezrodniy, Moscow, U.S.S.R. |
| *BOD | 18 | Robert Bodzon, Poland |
| BOU | | Reinder J. Bouma, The Netherlands |
| *BUD | 19 | P. Budilka, Zaporozhye, U.S.S.R. |
| *BUK | 19 | A. Bukotkin, Tuapse, U.S.S.R. |
| CAB | 13 | Mari Paz Miralles Caballero, Spain |
| CAV | | Marco Cavagna, Italy |
| CHE | | G. R. Chester, VA, U.S.A. |
| CHE03 | 18 | K. T. Cernis, Lithuania, U.S.S.R. |
| CHU | 19 | Klim Churyumov, Kiev, U.S.S.R. |
| *CHU01 | 19 | S. Chuprakov, U.S.S.R. |
| *CNO | 18 | Ryszard Cnota, Poland |
| COL02 | | Mike J. Collins, England |
| *DAN | 19 | M. Danilov, Tuapse, U.S.S.R. |
| *DAT | 06 | Makoto Date, Japan |
| DEA | | V. F. de Assis Neto, Brazil |
| DES01 | | Jose Guilherme de Souza Aguiar, Brazil |
| DIE02 | | Alfons Diepvens, Belgium |
| *DRA | 19 | I. Drapun, Visoko-Litovsk, U.S.S.R. |
| *DRA01 | 19 | A. Drapun, Visoko-Litovsk, U.S.S.R. |
| *DUS | 18 | Grzegorz Duszanowicz, Sweden |
| *DYA | 19 | A. Dyachuk, Tuapse, U.S.S.R. |
| *DZH | 19 | K. Dzhultaev, Tuapse, U.S.S.R. |
| *FED01 | 19 | M. Fedkiv, Novotroitskoe, U.S.S.R. |
| *FIL03 | 19 | S. Filimonchev, Tuapse, U.S.S.R. |
| *GAM | 18 | Mariusz Gamracki, Poland |
| *GER | 19 | A. Gerasimov, Dniepropetrovsk, U.S.S.R. |
| *GOL | 19 | V. Golubev, Vitebsk, U.S.S.R. |
| *GOL01 | 19 | M. Goldfarb, Leningrad, U.S.S.R. |
| *GOS | 19 | A. Gostev, Tuapse, U.S.S.R. |
| GRE | | Daniel W. E. Green, U.S.A. |
| *GUR | 19 | S. Guryanov, Krasnoyarsk, U.S.S.R. |
| HAL | | Alan Hale, U.S.A. |
| HAS02 | | Werner Hasubick, West Germany |
| *HAS04 | 06 | Takashi Hasegawa, Japan |
| *HAY01 | | Hironori Hayashi, Japan |
| ICH | 06 | Kazuhiko Ichikawa, Japan |
| *INO | | Yoshihiro Ino, Japan |
| ISH02 | 16 | Akiyoshi Ishikawa, Japan |
| *IVA | 19 | V. Ivanov, Tuapse, U.S.S.R. |
| *IWA01 | | Yoshitaka Iwaki, Japan |
| *IWA02 | 18 | Mariusz Iwanski, Poland |
| JAC01 | | Eric A. Jacobson, MN, U.S.A. |
| JAH | | Jost Jahn, West Germany |
| *KAB | 19 | V. Kabalin, Naberezhnie-Chelni, U.S.S.R |
| KAM01 | | Andreas Kammerer, West Germany |
| *KAM02 | 19 | Y. Kamnev, Tuapse, U.S.S.R. |
| KAN | 16 | Kiyotaka Kanai, Japan |
| *KAS | 19 | I. Kasirin, Tuapse, U.S.S.R. |
| *KAZ | 19 | D. Kazanski, Leningrad, U.S.S.R. |
| *KIS | 06 | Ayumu Kishi, Japan |
| *KIS01 | 19 | N. Kiselev, Tariha, U.S.S.R. |
| *KNY | 19 | N. Knyazyuk, Dalnegorsk, U.S.S.R. |
| *KOL | 19 | V. Kolchanov, Tuapse, U.S.S.R. |
| *KOL01 | 19 | S. Kolomeyets, Zaporozhye, U.S.S.R. |
| *KOL02 | 18 | Andrzej Kolasinski, Poland |
| *KON | 19 | S. Konstantinov, Novosibirsk, U.S.S.R. |
| *KON01 | 18 | Maciej Konacki, Poland |
| KOR | | Stefan Korth, West Germany |
| *KOR01 | 19 | V. Korneev, Zelenograd, U.S.S.R. |
| *KOS03 | 18 | Kazimierz Kosz, Poland |
| KRA01 | | Rainer Kracht, West Germany |
| *KRE | 18 | Witold Kremienowski, Poland |
| *KRY | 19 | A. Krylov, Tuapse, U.S.S.R. |
| *KUR | 19 | S. Kurtsov, Tuapse, U.S.S.R. |
| *LEW01 | 18 | Wojciech Lewandowski, Poland |
| LOZ | 13 | Luis Lozano, Spain |
| *LUE | | Hartwig Luethen, West Germany |
| *LYU | 19 | A. Lyubavin, Dimitrov, U.S.S.R. |
| *MAK01 | 19 | S. Maksimov, Tuapse, U.S.S.R. |
| *MAM | 19 | V. Mamedov, Krasnovodsk, U.S.S.R. |
| MAR02 | | Jose Carvajal Martinez, Spain |
| *MAR04 | 19 | A. Martis, Rogachevo, U.S.S.R. |
| *MAY01 | 19 | P. Maylisov, Tuapse, U.S.S.R. |
| *MAY02 | 19 | A. Maydik, Novotroitskoe, U.S.S.R. |
| *MIO | 18 | Stanislaw Miotk, Poland |
| *MIS | 19 | A. Misuhin, Tuapse, U.S.S.R. |
| MOE | | Michael Moeller, West Germany |
| MOR | | Charles S. Morris, U.S.A. |
| *MOR04 | 19 | V. Mormil, Chernigovka, U.S.S.R. |
| *MUR | 19 | Yu. Muravyeva, Leningrad, U.S.S.R. |
| NAK01 | 06 | Akimasa Nakamura, Japan |
| *NAV | 19 | M. Navalihin, Tuapse, U.S.S.R. |
| *NES | 19 | Yu. V. Nesterov, U.S.S.R. |
| *NII | 16 | Tuneo Niijima, Japan |
| NOW | | Gary T. Nowak, VT, U.S.A. |
| OHT | 16 | Tadao Ohtsuka, Japan |
| OKA02 | 06 | Masanori Okada, Japan |
| *OLE | 18 | Arkadiusz Olech, Poland |
| *OSK | 19 | E. Oskin, Tuapse, U.S.S.R. |
| *PAL01 | 19 | Yu. Palko, Chop, U.S.S.R. |
| *PAR03 | 18 | Mieczyslaw Paradowski, Poland |
| *PAS | 19 | D. Pashko, Zaporozhye, U.S.S.R. |
| *PAS01 | 19 | A. Paschenko, Tuapse, U.S.S.R. |
| PER01 | | Alfredo Jose Serra Pereira, Portugal |
| *PET | 19 | P. Petrov, Tuapse, U.S.S.R. |
| *PIS | 19 | V. Pishnenko, Nikolaev, U.S.S.R. |
| *PLE02 | 19 | D. Pleshkunov, Tuapse, U.S.S.R. |
| *PON | 19 | E. Ponomaryov, Chelyabinsk, U.S.S.R. |
| *POR01 | 19 | A. Poroshin, Gorky, U.S.S.R. |
| PRY | | Jim Pryal, WA, U.S.A. |
| ROB03 | | Paul C. Robinson, WV, U.S.A. |
| *ROG03 | 19 | V. Rogozin, Tuapse, U.S.S.R. |
| *RUD | 19 | G. Rudakov, Kiev, U.S.S.R. |
| *RUD01 | 19 | S. Rudenko, Leningrad, U.S.S.R. |
| *RUM01 | 18 | Krzysztof Ruminski, Poland |
| *SAV01 | 19 | A. Savelyev, Novosibirsk, U.S.S.R. |
| *SEL | 19 | G. Selevich, Vilnius, U.S.S.R. |
| SHE01 | 12 | Yaron Sheffer, Israel |
| *SHI02 | 19 | A. Shitikov, Zaporozhye, U.S.S.R. |
| *SHI03 | 19 | A. Shirokov, Ryazan, U.S.S.R. |
| *SHI04 | 19 | S. Shilov, Krasnoperekopsk, U.S.S.R. |
| *SIE | 18 | H. Sielewicz, Lithuania |
| *SIK | 19 | L. Sikoruk, Novosibirsk, U.S.S.R. |
| *SIW | 18 | Ryszard Siwiec, Poland |
| *SLA | 19 | Ya. Sladkov, Tuapse, U.S.S.R. |
| *SOC | 18 | Krzysztof Socha, Poland |
| *SZA01 | 18 | Robert Szaj, Poland |
| TAN01 | 16 | Kunihiko Taniguchi, Japan |
| *TAN03 | 06 | Masatoshi Tanikawa, Japan |
| *TAT | 19 | A. Tatarnikov, Tuapse, U.S.S.R. |
| *TRO | 19 | D. Trost, Moscow, U.S.S.R. |
| *TSV | 19 | T. Tsvetkov, Vilnius, U.S.S.R. |
| *TSY | 19 | D. Tsygankov, Zaporozhye, U.S.S.R. |
| *VIT | 19 | Yu. Vitovtov, Tuapse, U.S.S.R. |
| *WAT02 | 06 | Akira Watanabe, Japan |
| *WAT03 | 06 | Hiroko Watanabe, Japan |
| *WEI02 | | F. Weissferdt, West Germany |
| *WES04 | 18 | Tomasz Weselak, Poland |
| *YUR | 19 | Yu. Yurchenko, Zaporozhye, U.S.S.R. |
| *ZAG | 19 | V. Zagaynov, Alma-Ata, U.S.S.R. |
| *ZHI | 19 | A. Zhigalev, Tuapse, U.S.S.R. |
| *ZIN | 19 | V. Zinovyev, Volgograd, U.S.S.R. |

**OBSERVATIONS OF COMETS**

The headings for the tabulated data are as follows: "DATE (UT)" = Date and time to hundredths of a day in Universal Time; "MM" = the method employed for estimating the total visual magnitude (B = Bobrovnikoff, M = Morris, S = Sidgwick/In-out, etc.; also, P stands for photographic magnitude, and photoelectrically-determined values fall under L, U, and V for the standard *U*, *B*, and *V*, respectively). "MAG." = total visual magnitude estimate; a colon indicates that the observation is only approximate, due to bad weather conditions, *etc.* (A left bracket, [, indicates limiting magnitude, comet not seen.) "RF" = reference for magnitude estimates (see the April 1988 issue, page 34). "AP." = aperture in centimeters of the instrument used for the observations, usually given to tenths. "T" = type of instrument used for the observation (R = refractor, L = Newtonian reflector, B = binoculars, C = Cassegrain reflector, A = camera, T = Schmidt-Cassegrain reflector, S = Schmidt-Newtonian reflector, E = naked eye, *etc.*). "F/" and "PWR" are the focal ratio and power or magnification, respectively, of the instrument used for the observation.

"COMA" = estimated coma diameter of the comet in minutes of arc. An ampersand (&) indicates an approximate estimate. An exclamation mark (!) precedes a coma diameter when the comet was not seen (*i.e.*, was too faint) and where a limiting magnitude estimate is provided based on an "assumed" coma diameter (a default size of 1′ or 30″ is recommended; cf. *ICQ* **9**, 100). "DC" = degree of condensation on a scale where 9 = stellar and 0 = diffuse; a slash (/) indicates a value midway between the given number and the next-higher integer. "TAIL" = estimated tail length in degrees; again, an ampersand indicates a rough estimate. "PA" = estimated measured position angle of the tail in degrees (north = 0°, east = 90°). "OBS" = the observer who made the observation (given as a 3-letter, 2-digit code). An asterisk between the DATE and MM columns indicates that the observation is an updated version of one already published in a previous issue of the *ICQ*, *The Comet Quarterly*, or *The Comet*. (An exclamation mark in this same location indicates that the observer has corrected his estimate in some manner for atmospheric extinction.) A complete list of the Keys to abbrevations used in the *ICQ* is available from the Editor for $4.00 postpaid.

◇ ◇ ◇

Comet Černis 1983 XII

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 08 05.69 | S | 10.3 | AC | 13 | L | 6 | 44 | 2.7 | 3 | | | KAN |
| 1983 08 05.69 | S | 10.5 | AC | 13 | L | 6 | 44 | 2.5 | 4 | | | ISH02 |
| 1983 08 05.69 | S | 10.5 | AC | 30 | L | 6 | 60 | 3 | 4/ | | | NAK01 |
| 1983 08 05.70 | S | 10.5 | AC | 30 | L | 6 | 60 | 4 | | | | ICH |
| 1983 08 05.70 | S | 10.8 | AC | 30 | L | 6 | 60 | 3 | 4 | | | TAN01 |
| 1983 08 07.72 | M | 10.1 | AC | 10 | L | 10 | 30 | 3.7 | | | | ICH |
| 1983 08 11.70 | S | 10.5 | AC | 15 | L | 6 | 50 | 3 | 6 | | | NAK01 |
| 1983 08 11.72 | S | 10.5 | AC | 15 | L | 6 | 50 | 4 | 5 | | | TAN01 |
| 1983 08 11.72 | S | 11.0 | AC | 30 | L | 6 | 45 | 3 | 4 | | | OHT |
| 1983 08 12.73 | S | 10.4 | AC | 15 | L | 6 | 50 | 3.5 | 6 | | | NAK01 |
| 1983 08 13.69 | S | 10.3 | AC | 15 | L | 6 | 50 | 4 | 6/ | | | NAK01 |
| 1983 08 14.69 | S | 10.3 | AC | 15 | L | 6 | 50 | 4 | 6 | | | NAK01 |
| 1983 08 18.70 | S | 9.5 | AC | 20 | T | 10 | 50 | 6 | 1 | | | OHT |
| 1983 08 19.70 | S | 10.4 | AC | 15 | L | 6 | 50 | 3 | 5/ | | | NAK01 |
| 1983 08 19.71 | S | 10.2 | AC | 15 | L | 6 | 50 | 4.5 | 6 | | | TAN01 |
| 1983 08 19.76 | S | 10.3 | AC | 20 | L | 6 | 48 | 2.8 | 4 | 0.1 | | ISH02 |
| 1983 09 06.67 | S | 10.4 | AC | 15 | L | 6 | 50 | 4 | 4/ | | | NAK01 |
| 1983 09 06.68 | S | 10.4 | AC | 15 | L | 6 | 50 | 3.5 | 5 | | | TAN01 |
| 1983 09 13.74 | S | 10.2 | AC | 20 | L | 6 | 48 | 3 | 3 | 0.1 | | ISH02 |
| 1983 09 16.66 | S | 10.2 | AC | 15 | L | 6 | 50 | 4.5 | 4 | | | NAK01 |
| 1983 09 16.68 | S | 10.3 | AC | 15 | L | 6 | 50 | 3 | 5 | | | TAN01 |
| 1983 10 04.61 | E | 9.5 | S | 10 | L | 10 | 30 | 2.7 | | | | ICH |
| 1983 10 11.58 | S | 10.1 | AC | 15 | L | 6 | 50 | 3 | 3/ | | | NAK01 |
| 1983 10 11.61 | S | 10.0 | AC | 20 | L | 6 | 85 | 3 | 4 | | | ISH02 |
| 1983 10 11.61 | S | 10.7 | AC | 10 | L | 10 | 60 | 2.5 | | 0.1 | 30 | ICH |
| 1983 10 14.67 | S | 10.3 | AC | 15 | L | 6 | 50 | 3.5 | 4 | | | NAK01 |
| 1983 10 27.53 | S | 10.9 | AC | 32 | L | 5 | 106 | | 4 | | | TAN01 |
| 1983 10 27.58 | S | 10.6 | AC | 32 | L | 5 | 76 | 3 | 4 | | | NAK01 |
| 1983 10 29.51 | S | 10.4 | AC | 32 | L | 5 | 76 | 2.5 | 4/ | | | NAK01 |
| 1983 10 29.52 | S | 11.1 | AC | 32 | L | 5 | 76 | 3 | 4 | | | TAN01 |
| 1983 12 01.41 | S | 11.6 | AC | 15 | L | 6 | 100 | 1.5 | | | | NAK01 |
| 1983 12 03.45 | S | 11.4 | AC | 32 | L | 5 | 106 | 1.8 | 2 | | | NAK01 |

Comet Levy 1986 XVII

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 01 10.83 | S | 11.3 | AC | 20 | L | 6 | 65 | 2.5 | 2 | | | NAK01 |
| 1987 01 10.84 | S | 10.8 | AC | 20 | L | 5 | 69 | 2 | 2 | | | ISH02 |
| 1987 01 24.82 | S | 12.1 | AC | 20 | L | 6 | 106 | 1.2 | | | | NAK01 |
| 1987 01 25.85 | S | 11.5 | AC | 20 | L | 5 | 69 | 2 | 2 | | | ISH02 |
| 1987 01 27.82 | S | 12.0 | AC | 20 | L | 5 | 69 | 2 | 2 | | | ISH02 |
| 1987 01 28.82 | S | 12.4 | AC | 20 | L | 6 | 106 | 1.3 | 2/ | | | NAK01 |
| 1987 01 29.84 | S | 12.3 | AC | 20 | L | 5 | 69 | 2 | 2 | | | ISH02 |
| 1987 01 30.83 | S | 12.4 | AC | 20 | L | 5 | 69 | 2 | 1 | | | ISH02 |
| 1987 01 31.84 | S | 12.4 | AC | 20 | L | 5 | 69 | 2 | 1 | | | ISH02 |
| 1987 02 04.84 | S | 12.8 | AC | 20 | L | 5 | 100 | 1.5 | 2 | | | ISH02 |
| 1987 02 05.83 | S | 12.8 | AC | 20 | L | 5 | 100 | 1.8 | 1 | | | ISH02 |

Comet Bradfield 1987 XXIX

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 08 26.46 | S | 8.8 | S | 13 | L | 6 | 62 | 2 | 3 | | | ISH02 |
| 1987 09 19.44 | S | 7.6 | AA | 20 | L | 6 | 35 | 7.5 | 7 | | | NAK01 |
| 1987 10 03.41 | S | 7.0 | AA | 13 | L | 6 | 24 | 3 | 5 | | | ISH02 |
| 1987 10 13.41 | S | 7.0 | AA | 13 | L | 6 | 62 | 3 | 5 | | | ISH02 |
| 1987 10 18.42 | M | 6.5 | S | 20 | L | 6 | 46 | | | 0.9 | | NAK01 |
| 1987 10 19.43 | S | 6.4 | AA | 13 | L | 6 | 24 | 4 | 5 | 0.33 | | ISH02 |
| 1987 10 21.41 | M | 6.5 | S | 20 | L | 6 | 46 | 5 | | 0.7 | 90 | NAK01 |
| 1987 10 27.39 | S | 6.2 | AA | 13 | L | 6 | 24 | 4 | 5 | 0.17 | | ISH02 |
| 1987 10 28.42 | M | 6.3 | S | 20 | L | 6 | 46 | 5 | 7 | | | NAK01 |
| 1987 10 29.38 | S | 6.2 | AA | 13 | L | 6 | 24 | 3 | 5 | 0.17 | | ISH02 |
| 1987 11 05.38 | S | 6.0 | AA | 13 | L | 6 | 24 | 5 | 5 | 0.33 | | ISH02 |
| 1987 11 08.39 | S | 5.8 | AA | 13 | L | 6 | 24 | 6 | 5 | 0.67 | | ISH02 |
| 1987 11 08.40 | M | 6.1 | AA | 20 | L | 6 | 46 | 4.5 | 6 | 1.3 | 80 | NAK01 |
| 1987 11 10.37 | S | 5.8 | AA | 13 | L | 6 | 24 | 5 | 5 | 0.33 | | ISH02 |
| 1987 11 11.40 | S | 5.9 | AA | 13 | L | 6 | 24 | 4 | 5 | 0.17 | | ISH02 |
| 1987 11 11.42 | M | 5.9 | AA | 20 | L | 6 | 46 | 5 | 7 | 0.9 | 70 | NAK01 |
| 1987 11 16.38 | S | 5.9 | AA | 13 | L | 6 | 24 | 5 | 5 | 0.25 | | ISH02 |
| 1987 11 17.38 | S | 5.8 | AA | 13 | L | 6 | 24 | 6 | 5 | 0.33 | | ISH02 |
| 1987 11 19.38 | S | 5.6 | AA | 13 | L | 6 | 24 | 5 | 5 | 0.17 | | ISH02 |
| 1987 11 20.38 | S | 5.6 | AA | 13 | L | 6 | 24 | 6 | 5 | 0.5 | | ISH02 |
| 1987 11 20.42 | M | 5.9 | AA | 20 | L | 6 | 46 | 5.5 | 7 | 0.9 | 70 | NAK01 |
| 1987 11 21.38 | S | 5.7 | AA | 13 | L | 6 | 24 | 4 | 4 | 0.25 | | ISH02 |
| 1987 11 22.38 | S | 5.4 | AA | 13 | L | 6 | 24 | 6 | 5 | 0.67 | | ISH02 |
| 1987 11 22.39 | M | 6.1 | AA | 20 | L | 6 | 46 | 5.5 | 7 | 1.3 | 60 | NAK01 |
| 1987 11 23.37 | S | 5.6 | AA | 13 | L | 6 | 24 | 5 | 5 | 0.33 | | ISH02 |
| 1987 11 24.39 | S | 5.7 | AA | 13 | L | 6 | 24 | 5 | 5 | 1.0 | | ISH02 |
| 1987 11 25.38 | S | 5.7 | AA | 13 | L | 6 | 24 | 6 | 4 | 0.33 | | ISH02 |
| 1987 11 29.38 | S | 5.8 | AA | 13 | L | 6 | 24 | 6 | 4 | 0.5 | | ISH02 |
| 1987 12 01.43 | S | 5.8 | AA | 13 | L | 6 | 24 | 4 | 4 | 0.17 | | ISH02 |
| 1987 12 02.38 | S | 5.7 | AA | 13 | L | 6 | 24 | 4.5 | 4 | 0.5 | | ISH02 |
| 1987 12 03.40 | S | 5.9 | AA | 13 | L | 6 | 24 | 4 | 4 | 0.17 | | ISH02 |
| 1987 12 04.40 | S | 5.9 | AA | 13 | L | 6 | 24 | 4 | 4 | 0.25 | | ISH02 |
| 1987 12 07.38 | S | 5.7 | AA | 13 | L | 6 | 24 | 6 | 4 | 1.0 | | ISH02 |
| 1987 12 08.38 | S | 5.6 | AA | 13 | L | 6 | 24 | 6 | 5 | 0.5 | | ISH02 |
| 1987 12 13.39 | M | 6.0 | AA | 20 | L | 6 | 46 | 7 | 7 | 0.9 | 65 | NAK01 |
| 1987 12 14.39 | S | 6.0 | AA | 13 | L | 6 | 24 | 6.5 | 4 | 0.67 | | ISH02 |
| 1987 12 15.39 | S | 6.0 | AA | 13 | L | 6 | 24 | 5 | 4 | 0.33 | | ISH02 |
| 1987 12 16.39 | S | 5.7 | AA | 13 | L | 6 | 24 | 7 | 4 | 0.67 | | ISH02 |
| 1987 12 17.39 | S | 5.8 | AA | 13 | L | 6 | 24 | 7.5 | 4 | 0.83 | | ISH02 |
| 1987 12 19.42 | M | 5.9 | AA | 20 | L | 6 | 46 | 7 | 6 | 0.7 | 60 | NAK01 |
| 1987 12 20.38 | S | 6.0 | AA | 13 | L | 6 | 24 | 8 | 4 | 0.33 | | ISH02 |
| 1987 12 21.39 | S | 5.9 | AA | 13 | L | 6 | 24 | 9 | 4 | 0.67 | | ISH02 |
| 1987 12 22.39 | S | 6.1 | AA | 13 | L | 6 | 24 | 7 | 5 | 0.5 | | ISH02 |
| 1987 12 23.43 | S | 6.1 | AA | 13 | L | 6 | 24 | 7 | 4 | 0.5 | | ISH02 |

Comet Bradfield 1987 XXIX [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 12 23.45 | M | 5.9 | AA | 20 | L | 6 | 46 | 7 | 5/ | 1.0 | 70 | NAK01 |
| 1987 12 24.38 | S | 6.2 | AA | 13 | L | 6 | 24 | 6 | 3 | 0.33 | | ISH02 |
| 1987 12 26.42 | S | 6.4 | AA | 13 | L | 6 | 24 | 6 | 3 | 0.25 | | ISH02 |
| 1987 12 27.40 | S | 6.4 | AA | 13 | L | 6 | 24 | 5 | 3 | | | ISH02 |
| 1987 12 28.46 | S | 6.6 | AA | 13 | L | 6 | 24 | 5 | 3 | | | ISH02 |
| 1987 12 29.41 | S | 6.7 | AA | 13 | L | 6 | 24 | 4 | 3 | | | ISH02 |
| 1987 12 30.39 | S | 6.4 | AA | 13 | L | 6 | 24 | 7 | 4 | 0.25 | | ISH02 |
| 1987 12 31.38 | S | 6.5 | AA | 13 | L | 6 | 24 | 5 | 4 | | | ISH02 |
| 1988 01 01.40 | S | 6.7 | AA | 13 | L | 6 | 24 | 5 | 3 | | | ISH02 |
| 1988 01 06.47 | S | 7.0 | AA | 13 | L | 6 | 24 | 8 | 3 | 0.2 | | ISH02 |
| 1988 01 08.51 | S | 7.2 | AA | 13 | L | 6 | 24 | 7.5 | 3 | 0.17 | | ISH02 |
| 1988 01 09.42 | M | 6.8 | AA | 20 | L | 6 | 46 | 6.5 | 5 | 0.3 | 70 | NAK01 |
| 1988 01 10.40 | M | 6.9 | AA | 20 | L | 6 | 46 | 6 | 5 | ? | 70 | NAK01 |
| 1988 01 10.43 | S | 7.3 | AA | 13 | L | 6 | 24 | 7 | 4 | 0.17 | | ISH02 |
| 1988 01 11.46 | S | 7.3 | AA | 13 | L | 6 | 24 | 7 | 4 | 0.17 | | ISH02 |
| 1988 01 13.43 | S | 7.4 | AA | 13 | L | 6 | 24 | 7 | 3 | 0.08 | | ISH02 |
| 1988 01 13.44 | M | 7.0 | AA | 20 | L | 6 | 46 | 6 | 5 | ? | 65 | NAK01 |
| 1988 01 14.45 | S | 7.6 | AA | 13 | L | 6 | 24 | 6 | 3 | | | ISH02 |
| 1988 01 17.43 | M | 7.3 | S | 20 | L | 6 | 46 | 6.5 | 6 | 0.5 | 70 | NAK01 |
| 1988 01 17.43 | S | 7.7 | AA | 13 | L | 6 | 24 | 8 | 3 | | | ISH02 |
| 1988 01 18.42 | S | 7.7 | AA | 13 | L | 6 | 24 | 8 | 3 | 0.17 | | ISH02 |
| 1988 01 20.41 | S | 7.8 | AA | 13 | L | 6 | 24 | 7 | 3 | | | ISH02 |
| 1988 01 23.51 | M | 7.8 | AC | 20 | L | 6 | 46 | 6.5 | 5/ | ? | 80 | NAK01 |
| 1988 01 24.44 | M | 7.7 | AC | 20 | L | 6 | 46 | 5 | 5 | | 80 | NAK01 |
| 1988 01 24.46 | S | 7.9 | AA | 13 | L | 6 | 24 | 6 | 3 | | | ISH02 |
| 1988 01 25.42 | S | 8.0 | AA | 13 | L | 6 | 24 | 5 | 2 | | | ISH02 |
| 1988 01 27.41 | S | 8.2 | AA | 13 | L | 6 | 44 | 4 | 2 | | | ISH02 |
| 1988 01 28.42 | S | 8.1 | AA | 13 | L | 6 | 24 | 4 | 3 | | | ISH02 |
| 1988 01 29.44 | S | 8.2 | AA | 13 | L | 6 | 24 | 4 | 3 | | | ISH02 |
| 1988 02 01.44 | S | 8.6 | AA | 13 | L | 6 | 62 | 3 | 2 | | | ISH02 |
| 1988 02 02.49 | S | 8.5 | AA | 13 | L | 6 | 62 | 3 | 2 | | | ISH02 |
| 1988 02 03.44 | S | 8.6 | AC | 13 | L | 6 | 62 | 3 | 2 | | | ISH02 |
| 1988 02 04.39 | S | 8.5 | AC | 13 | L | 6 | 62 | 4 | 3 | | | ISH02 |
| 1988 02 05.44 | S | 8.4 | AC | 13 | L | 6 | 44 | 4 | 3 | | | ISH02 |
| 1988 02 06.47 | S | 8.0 | AC | 20 | L | 6 | 46 | 6 | 4/ | | | NAK01 |
| 1988 02 07.41 | S | 8.6 | AC | 13 | L | 6 | 24 | 5 | 3 | | | ISH02 |
| 1988 02 07.43 | S | 7.8 | AC | 20 | L | 6 | 46 | 6 | 4/ | | | NAK01 |
| 1988 02 08.42 | S | 8.7 | AC | 13 | L | 6 | 24 | 5 | 3 | | | ISH02 |
| 1988 02 09.42 | S | 8.8 | AC | 13 | L | 6 | 24 | 4 | 3 | | | ISH02 |
| 1988 02 10.42 | S | 8.3 | AC | 20 | L | 6 | 46 | 3.5 | 4 | | | NAK01 |
| 1988 02 10.42 | S | 9.0 | AC | 13 | L | 6 | 24 | 4 | 2 | | | ISH02 |
| 1988 02 12.41 | S | 9.2 | AC | 13 | L | 6 | 62 | 3 | 2 | | | ISH02 |
| 1988 02 13.47 | S | 8.4 | AC | 20 | L | 6 | 46 | 4 | 4 | | | NAK01 |
| 1988 02 15.47 | S | 9.6 | AC | 13 | L | 6 | 44 | 3 | 2 | | | ISH02 |
| 1988 02 16.47 | S | 9.8 | AC | 13 | L | 6 | 44 | 3 | 1 | | | ISH02 |
| 1988 02 17.45 | S | 9.6 | AC | 13 | L | 6 | 44 | 3.5 | 2 | | | ISH02 |
| 1988 02 19.42 | S | 9.3 | AC | 13 | L | 6 | 44 | 3.5 | 3 | | | ISH02 |
| 1988 02 20.46 | S | 9.5 | AC | 13 | L | 6 | 44 | 3 | 2 | | | ISH02 |
| 1988 02 21.44 | S | 9.4 | AC | 20 | L | 6 | 46 | 4.5 | 4 | | | NAK01 |
| 1988 02 21.45 | S | 9.6 | AC | 13 | L | 6 | 44 | 3 | 2 | | | ISH02 |
| 1988 02 24.41 | S | 9.7 | AC | 13 | L | 6 | 62 | 2 | 2 | | | ISH02 |
| 1988 03 06.46 | S | 9.7 | AC | 13 | L | 6 | 44 | 4 | 2 | | | ISH02 |
| 1988 03 08.48 | S | 9.8 | AC | 13 | L | 6 | 44 | 2.5 | 2 | | | ISH02 |
| 1988 03 10.42 | S | 9.9 | AC | 13 | L | 6 | 44 | 2.5 | 2 | | | ISH02 |
| 1988 03 12.43 | S | 10.2 | AC | 13 | L | 6 | 44 | 2.5 | 1 | | | ISH02 |
| 1988 03 12.43 | S | 10.9 | AC | 20 | L | 6 | 58 | 4 | 3 | | | NAK01 |
| 1988 03 18.51 | S | 10.4 | AC | 13 | L | 6 | 44 | 2 | 2 | | | ISH02 |

Comet Aarseth-Brewington 1989a1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 11 17.98 | S | 8.6 | S | 20.3 | L | 6 | 49 | & 1.5 | 2 | | | GRE |
| 1989 11 18.11 | M | 8.3 | AA | 25.6 | L | 4 | 45 | 2.1 | 4/ | 0.33 | 45 | MOR |
| 1989 11 18.70 | S | 8.1 | AC | 15.2 | L | 5 | 44 | 4 | 4 | | | MOE |
| 1989 11 19.10 | M | 8.4 | AA | 25.6 | L | 4 | 45 | 2.1 | 4/ | | | MOR |
| 1989 11 19.10 ! | M | 8.9 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 11 19.70 | S | 8.0: | AC | 48.5 | L | 4 | 115 | & 4 | 4 | 0.3 | 150 | MOE |
| 1989 11 19.70 | S | 8.3: | AC | 15.2 | L | 5 | 44 | 4 | 3 | | | MOE |
| 1989 11 20.10 | M | 8.7 | AA | 25.6 | L | 4 | 45 | 1.7 | 4/ | | | MOR |
| 1989 11 23.07 ! | S | 8.5 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1989 11 27.09 | M | 7.7 | AA | 25.6 | L | 4 | 45 | 3.0 | 6 | 1.0 | 5 | MOR |
| 1989 11 27.10 | M | 7.5 | AA | 8.0 | B | | 20 | 5.0 | 5 | 1.0 | 5 | MOR |
| 1989 11 29.23 | B | 6.7 | AA | 15.0 | R | 15 | 56 | 4 | 6 | | 20 | DIE02 |
| 1989 11 29.97 | B | 7.4 | S | 37 | L | | 52 | 7 | 7 | 0.5 | 0 | CHE |
| 1989 11 30.26 | S | 7.1 | AA | 15 | L | 4 | 26 | & 3 | 3/ | | | PER01 |
| 1989 11 30.26 | S | 7.3 | AA | 3.4 | B | | 9 | | 5 | | | PER01 |
| 1989 11 30.73 | B | 6.2 | AA | 15.0 | R | 15 | 56 | 6 | 6 | | | DIE02 |
| 1989 12 02.08 ! | M | 7.2: | S | 8.0 | B | | 20 | 4.0 | 6 | | | MOR |
| 1989 12 02.53 | M | 7.0 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 12 03.08 ! | M | 7.2: | S | 8.0 | B | | 20 | 4.0 | 6 | | | MOR |
| 1989 12 03.23 | B | 5.3 | AA | 15.0 | R | 15 | 56 | 6 | 8 | 10 | 335 | DIE02 |
| 1989 12 05.50 | B | 5.8 | AA | 5.0 | B | | 10 | &10 | 8 | | | ROB03 |
| 1989 12 06.53 | | | | 41 | L | 4 | 83 | | | 0.2 | 357 | HAL |
| 1989 12 06.53 | M | 5.9 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 12 10.52 | M | 5.8 | SC | 5.0 | B | | 10 | | | 0.42 | 343 | HAL |
| 1989 12 13.50 | O | 4.5 | SC | 5.0 | B | | 7 | &12.5 | | ? | 0 | SHE01 |
| 1989 12 14.53 | M | 5.3 | SC | 5.0 | B | | 10 | | | 1.1 | 335 | HAL |
| 1989 12 18.53 | M | 4.2 | SC | 5.0 | B | | 10 | | | 1.0 | 321 | HAL |
| 1989 12 20.53 | M | 3.7 | SC | 5.0 | B | | 10 | | | 3 | 309 | HAL |
| 1989 12 20.56 | B | 3.4 | AA | 8.0 | B | | 20 | | 9 | 4.0 | 310 | MOR |
| 1989 12 21.56 | | | | 8.0 | B | | 20 | | | 1.0 | 302 | MOR |
| 1989 12 21.56 | B | 3.2 | AA | 8.0 | B | | 20 | | 9 | 2.33 | 315 | MOR |
| 1989 12 22.45 | B | 3.3 | AA | 5.0 | B | | 12 | | | | | GRE |
| 1989 12 22.45 ! | B | 3.3 | AA | 5.0 | B | | 12 | | 8 | &3 | | GRE |
| 1989 12 22.46 | B | 3.3 | AA | 3.5 | B | | 7 | | | | | GRE |
| 1989 12 22.54 | M | 4.0: | SC | 5.0 | B | | 10 | | | 1 | 315 | HAL |
| 1989 12 22.56 | | | | 8.0 | B | | 20 | | | 0.67 | 283 | MOR |
| 1989 12 22.56 | B | 3.2 | AA | 8.0 | B | | 20 | | 9 | 3.5 | 304 | MOR |
| 1989 12 23.57 | B | 3.4 | AA | 8.0 | B | | 20 | | 9 | 2.25 | 300 | MOR |
| 1989 12 24.55 | M | 3.2: | SC | 5.0 | B | | 10 | | | &1 | | HAL |

Comet Okazaki-Levy-Rudenko 1989r

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 08 27.93 | S | 10.4 | AC | 25.4 | J | 6 | 59 | 2.3 | 2/ | | | BOU |
| 1989 08 28.84 | S | 10.2 | AC | 25.4 | J | 6 | 59 | 3 | 3 | | | BOU |
| 1989 08 29.16 | S | 10.3 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 08 29.84 | S | 10.1 | AC | 25.4 | J | 6 | 59 | 3 | 2/ | | | BOU |
| 1989 08 30.85 | S | 9.9 | AC | 25.4 | J | 6 | 59 | 3.0 | 3 | | | BOU |
| 1989 09 02.84 | S | 10.0 | AC | 25.4 | J | 6 | 59 | 3.0 | 2/ | | | BOU |
| 1989 09 03.18 | S | 10.1 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 09 03.83 | S | 9.7 | AA | 20.4 | L | 6 | 72 | 4.3 | 3 | 0.08 | 128 | JAH |
| 1989 09 03.86 | S | 9.8 | AC | 52.0 | L | 4 | 75 | 2.5 | 3/ | 0.1 | 80 | BOU |
| 1989 09 03.87 | S | 9.8 | AC | 25.4 | J | 6 | 59 | 3 | 3 | | | BOU |
| 1989 09 04.91 | M | 9.9 | AC | 25.4 | J | 6 | 59 | | 3 | | | BOU |
| 1989 09 05.86 | M | 9.6 | AC | 25.4 | J | 6 | 59 | 3.0 | 3 | | | BOU |
| 1989 09 05.88 | S | 9.5: | AC | 5.0 | B | | 10 | | 1 | | | BOU |
| 1989 09 06.83 | S | 9.6 | AC | 25.4 | J | 6 | 59 | 3.0 | 4 | | | BOU |
| 1989 09 07.87 | S | 9.6 | AC | 25.4 | J | 6 | 59 | 3 | 3 | | | BOU |
| 1989 09 08.81 | S | 9.4 | AA | 20.4 | L | 6 | 72 | 3.2 | 2 | | | JAH |

Comet Okazaki-Levy-Rudenko 1989r [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 09 09.86 | S | 9.2 | AA | 20.4 | L | 6 | 72 | & 5.0 | 3 | | | JAH |
| 1989 09 09.91 | S | 9.4 | AC | 15.6 | L | 5 | 36 | 3.5 | 2/ | | | BOU |
| 1989 09 17.80 | S | 8.5 | AA | 20.4 | L | 6 | 72 | 4.0 | 3 | | 7 | JAH |
| 1989 09 18.79 | S | 9.4 | AA | 10.0 | B | | 14 | 2.2 | 4 | | | HAS02 |
| 1989 09 18.80 | B | 8.6 | AA | 20.4 | L | 6 | 72 | | | | | JAH |
| 1989 09 18.80 | S | 8.4 | AA | 20.4 | L | 6 | 72 | 3.8 | 3 | | | JAH |
| 1989 09 19.13 | S | 8.9 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1989 09 19.17 | M | 8.5 | AA | 8.0 | B | | 20 | 4.1 | 5 | 1.25 | 65 | MOR |
| 1989 09 20.80 | B | 8.4 | AA | 20.4 | L | 6 | 72 | | | &0.20 | 167 | JAH |
| 1989 09 20.80 | S | 8.1 | AA | 20.4 | L | 6 | 72 | 3.8 | 3 | &0.12 | 208 | JAH |
| 1989 09 20.81 | M | 8.5 | AC | 15.6 | L | 5 | 36 | 3.5 | 4/ | | | BOU |
| 1989 09 20.83 | S | 8.6 | S | 10.3 | R | 7 | 40 | 7 | 4 | | | COL02 |
| 1989 09 21.10 | M | 8.3 | AA | 8.0 | B | | 20 | 4.5 | 5 | 1.25 | 65 | MOR |
| 1989 09 21.79 | B | 8.5 | AA | 20.4 | L | 6 | 72 | | | | | JAH |
| 1989 09 21.79 | S | 8.3 | AA | 20.4 | L | 6 | 72 | 4.8 | 2 | | | JAH |
| 1989 09 21.83 | S | 8.5 | S | 10.3 | R | 7 | 40 | 8 | 4 | | | COL02 |
| 1989 09 22.80 | S | 8.3 | AA | 20.4 | L | 6 | 72 | 2.9 | 1 | | | JAH |
| 1989 09 22.82 | S | 8.5 | S | 8.0 | B | | 20 | 4.6 | 4 | | | HAS02 |
| 1989 09 23.10 | M | 8.3 | AA | 8.0 | B | | 20 | 4.5 | 5 | 1.25 | 65 | MOR |
| 1989 09 24.12 | M | 8.2 | AA | 8.0 | B | | 20 | 4.1 | 5 | 1.0 | 60 | MOR |
| 1989 09 25.10 | M | 8.2 | AA | 8.0 | B | | 20 | 4.1 | 4 | | | MOR |
| 1989 09 25.14 | M | 8.6 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1989 09 26.11 | M | 8.1 | AA | 8.0 | B | | 20 | 4.1 | 6 | | | MOR |
| 1989 09 26.80 | S | 8.1 | AC | 8.0 | B | | 20 | 4.5 | 5 | | | BOU |
| 1989 09 26.81 | M | 8.2 | AC | 25.4 | J | 6 | 48 | 3.8 | 6 | | | BOU |
| 1989 09 27.80 | M | 8.0 | AC | 25.4 | J | 6 | 48 | 3 | 6 | | | BOU |
| 1989 09 28.12 | M | 8.1 | AA | 8.0 | B | | 20 | 4.1 | 6 | | | MOR |
| 1989 09 30.12 | M | 8.2 | AA | 8.0 | B | | 20 | 3.7 | 6 | | | MOR |
| 1989 09 30.14 | ! S | 8.1 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1989 09 30.83 | S | 7.7 | S | 10.3 | R | 7 | 40 | 5 | 5 | | | COL02 |
| 1989 10 02.82 | S | 8.1 | S | 10.3 | R | 7 | 40 | 4 | 5 | | | COL02 |
| 1989 10 03.13 | ! S | 8.0 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1989 10 03.76 | B | 7.9 | AA | 20.4 | L | 6 | 72 | | | 0.06 | 93 | JAH |
| 1989 10 03.76 | B | 8.4 | S | 20.4 | L | 6 | 72 | | | | | JAH |
| 1989 10 03.76 | S | 7.7 | AA | 20.4 | L | 6 | 72 | 2.3 | 4 | 0.09 | 140 | JAH |
| 1989 10 03.76 | S | 8.1 | S | 20.4 | L | 6 | 72 | | | 0.05 | 171 | JAH |
| 1989 10 03.77 | S | 7.2 | AC | 15.2 | L | 5 | 44 | 5.5 | 5 | 0.25 | 110 | MOE |
| 1989 10 03.77 | S | 7.6 | S | 9.0 | M | 6 | 55 | & 3.5 | 3 | | | LUE |
| 1989 10 03.78 | B | 8.5 | S | 5.0 | R | 10 | 13 | | | | | JAH |
| 1989 10 03.78 | S | 8.0 | S | 5.0 | R | 10 | 13 | 2.8 | 3 | | | JAH |
| 1989 10 03.78 | S | 8.2 | S | 10.8 | L | 4 | 24 | 1 | | | | KRA01 |
| 1989 10 03.79 | M | 7.7 | AC | 8.0 | B | | 20 | 3.7 | 6 | | | BOU |
| 1989 10 03.79 | S | 8.0 | S | 10.0 | B | | 14 | 4.3 | 5 | | | HAS02 |
| 1989 10 03.80 | M | 7.6 | AC | 25.4 | J | 6 | 48 | 3 | 7 | | | BOU |
| 1989 10 03.80 | M | 7.8 | AC | 4.0 | R | 6 | 10 | | 5 | | | BOU |
| 1989 10 03.80 | S | 7.8 | AC | 5.0 | B | | | 5 | 1 | | | KOR |
| 1989 10 03.82 | S | 8.1 | S | 10.0 | B | | 14 | 7 | 2 | | | WEI02 |
| 1989 10 03.88 | B | 7.2 | AC | 5.0 | B | | 7 | & 4 | 6 | | | MOE |
| 1989 10 04.77 | S | 7.9 | S | 10.0 | B | | 14 | 4.3 | 5 | | | HAS02 |
| 1989 10 04.79 | B | 8.2 | S | 5.0 | R | 10 | 13 | | | | | JAH |
| 1989 10 04.79 | S | 7.6 | AC | 5.0 | B | | 10 | 4 | 5 | | | BOU |
| 1989 10 04.79 | S | 7.9 | S | 5.0 | R | 10 | 13 | 5.6 | 5 | | | JAH |
| 1989 10 04.81 | S | 7.9 | AC | 8.0 | B | | 15 | 5 | 5 | 0.5 | 35 | KOR |
| 1989 10 04.82 | S | 8.3 | S | 10.3 | R | 7 | 40 | 4 | 4 | | | COL02 |
| 1989 10 05.76 | S | 7.1 | AC | 15.2 | L | 5 | 44 | 5.5 | 5 | 0.3 | 110 | MOE |
| 1989 10 05.78 | S | 7.8 | S | 9.0 | M | 6 | 55 | 2 | 2 | | | LUE |
| 1989 10 05.78 | S | 8.0 | SC | 10.8 | L | 4 | 24 | 1 | | | | KRA01 |
| 1989 10 05.78 | S | 8.2 | S | 5.0 | R | 10 | 13 | 3.7 | 2 | | | JAH |
| 1989 10 05.79 | M | 7.4 | AC | 25.4 | J | 6 | 48 | | 7 | | | BOU |

Comet Okazaki-Levy-Rudenko 1989r [cont.]

| DATE (UT) | | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 10 07.13 | | M | 7.9 | AA | 8.0 | B | | 20 | 2.5 | 7 | | | MOR |
| 1989 10 07.79 | | B | 7.1 | AC | 5.0 | B | | 7 | 4 | 6 | | | MOE |
| 1989 10 08.06 | | B | 7.5 | S | 37 | L | | 52 | 10 | 7 | 0.17 | 40 | CHE |
| 1989 10 08.12 | | M | 7.9 | AA | 8.0 | B | | 20 | 3.3 | 7 | | | MOR |
| 1989 10 08.12 | | M | 8.0 | AA | 25.6 | L | 4 | 45 | | | | | MOR |
| 1989 10 09.75 | | S | 7.0 | AC | 15.2 | L | 5 | 44 | 4.5 | 6 | | | MOE |
| 1989 10 09.76 | | S | 7.5 | AA | 8.0 | B | | 20 | 5 | 7 | | | BAR |
| 1989 10 10.74 | | B | 7.7 | S | 20.4 | L | 6 | 72 | | | 0.08 | 133 | JAH |
| 1989 10 10.74 | | S | 7.9 | S | 20.4 | L | 6 | 72 | 3.7 | 5 | 0.16 | 66 | JAH |
| 1989 10 10.76 | | S | 7.2 | AC | 48.5 | L | 4 | 116 | 4.5 | 5 | 0.6 | 40 | MOE |
| 1989 10 10.77 | | S | 7.0 | S | 9.0 | M | 6 | 20 | 3 | 3 | | | LUE |
| 1989 10 11.99 | | S | 7.8 | AA | 20.3 | L | 6 | 49 | & 3 | 6 | | | GRE |
| 1989 10 14.77 | | S | 6.9 | A | 9.0 | M | 6 | 20 | | | | | LUE |
| 1989 10 14.77 | | S | 7.1 | S | 9.0 | M | 6 | 20 | 2 | 4 | | | LUE |
| 1989 10 17.07 | | M | 7.0 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 10 17.75 | | S | 7.3 | AA | 8.0 | B | | 15 | 6 | 5 | &0.33 | 40 | KOR |
| 1989 10 18.73 | | | 7 : | A | 20.4 | L | 6 | 72 | & 0.8 | 7 | | | JAH |
| 1989 10 18.74 | | S | 7.2 | AA | 10.8 | L | 4 | 24 | | | | | KRA01 |
| 1989 10 18.75 | | S | 6.8: | AC | 15.2 | L | 5 | 44 | 4 | 5 | | | MOE |
| 1989 10 18.76 | | M | 6.9 | AC | 10.8 | L | 5 | 20 | 4.5 | 7/ | | | BOU |
| 1989 10 18.81 | | B | 7.0 | AA | 3.4 | B | | 9 | | | | | PER01 |
| 1989 10 18.81 | | M | 6.7 | AA | 3.4 | B | | 9 | | | | | PER01 |
| 1989 10 18.81 | | S | 6.5 | AA | 3.4 | B | | 9 | &12 | 7 | | | PER01 |
| 1989 10 18.81 | | S | 6.6 | AA | 15 | L | 4 | 26 | 5 | 4/ | | | PER01 |
| 1989 10 19.11 | | M | 6.9 | AA | 8.0 | B | | 20 | | 8/ | 1.75 | 37 | MOR |
| 1989 10 19.80 | | M | 6.6 | AA | 15 | L | 4 | 26 | | | | | PER01 |
| 1989 10 19.80 | | S | 6.2 | AA | 3.4 | B | | 9 | 8 | 7 | | | PER01 |
| 1989 10 19.80 | | S | 6.4 | AA | 15 | L | 4 | 26 | 4 | 4 | | | PER01 |
| 1989 10 20.72 | | B | 6.7 | A | 5.0 | R | 10 | 13 | 8.8 | 5 | | | JAH |
| 1989 10 20.72 | | S | 6.7 | A | 5.0 | R | 10 | 13 | | | | | JAH |
| 1989 10 20.74 | | S | 6.8 | AA | 10.8 | L | 4 | 24 | | | | | KRA01 |
| 1989 10 20.76 | | M | 6.8 | AC | 5.0 | B | | 10 | | 7 | | | BOU |
| 1989 10 21.75 | | S | 6.9 | S | 10.0 | B | | 14 | 10 | 6 | | | WEI02 |
| 1989 10 21.99 | | S | 7.4 | AA | 20.3 | L | 6 | 32 | & 4 | 7 | | | GRE |
| 1989 10 22.73 | | S | 6.4: | AC | 15.2 | L | 5 | 44 | 5.5 | 6 | 0.7 | 20 | MOE |
| 1989 10 22.74 | | B | 6.8 | A | 5.0 | R | 10 | 13 | 5.9 | 7 | | | JAH |
| 1989 10 22.74 | | S | 6.8 | S | 10.0 | B | | 14 | 8 | 5 | | | WEI02 |
| 1989 10 22.74 | | S | 6.9 | A | 5.0 | R | 10 | 13 | | | | | JAH |
| 1989 10 23.00 | | B | 6.9 | S | 5.0 | B | | 7 | | | | | CHE |
| 1989 10 23.07 | | | | | 41 | L | 4 | 83 | | | >0.33 | 012 | HAL |
| 1989 10 23.07 | | M | 7.3 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 10 23.74 | | S | 6.7 | S | 10.0 | B | | 14 | 6 | 4 | | | WEI02 |
| 1989 10 23.79 | ! | M | 6.3 | AA | 15 | L | 4 | 26 | | | | | PER01 |
| 1989 10 23.79 | ! | S | 6.3 | AA | 15 | L | 4 | 26 | 2 | 5 | | | PER01 |
| 1989 10 23.79 | ! | S | 6.5 | AA | 3.4 | B | | 9 | | | | | PER01 |
| 1989 10 23.98 | | B | 7.2 | AA | 8.0 | R | 3 | 20 | | | | | GRE |
| 1989 10 23.98 | | S | 6.8 | AA | 8.0 | R | 3 | 20 | & 5 | 6/ | | | GRE |
| 1989 10 24.78 | | S | 6.0: | AC | 15.2 | L | 5 | 44 | 6 | 6 | 0.8 | 15 | MOE |
| 1989 10 24.97 | | B | 7.2 | AA | 8.0 | R | 3 | 20 | & 5 | 7/ | | | GRE |
| 1989 10 25.20 | | S | 6.7 | A | 5.0 | R | 10 | 13 | & 3.0 | 1 | | | JAH |
| 1989 10 25.75 | | S | 6.7 | S | 10.0 | B | | 14 | 6 | 4 | | | WEI02 |
| 1989 10 27.10 | | M | 6.9 | AA | 8.0 | B | | 20 | | | | | MOR |
| 1989 10 28.11 | | M | 6.9 | AA | 8.0 | B | | 20 | | | | | MOR |
| 1989 10 29.09 | | M | 6.9 | AA | 8.0 | B | | 20 | | 8 | | | MOR |
| 1989 10 29.40 | | B | 7.1 | AA | 8.0 | R | 3 | 20 | | | | | GRE |
| 1989 10 29.41 | | S | 6.9 | AA | 8.0 | R | 3 | 20 | & 4.5 | 7/ | | | GRE |
| 1989 10 30.23 | ! | S | 6.4 | AA | 3.4 | B | | 9 | 10 | 7/ | | | PER01 |
| 1989 10 30.73 | | S | 5.8: | AC | 15.2 | L | 5 | 44 | 5 | 5 | 0.7 | 20 | MOE |
| 1989 10 30.78 | ! | S | 6.8 | AA | 15 | L | 4 | 26 | & 5 | 5/ | | | PER01 |

Comet Okazaki-Levy-Rudenko 1989r [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 10 30.79 | ! S | 6.9 | AA | 3.4 | B | | 9 | &12 | 6 | | | PER01 |
| 1989 10 31.73 | S | 5.7 | AC | 5.0 | B | | 7 | 4 | 6 | 0.8 | 10 | MOE |
| 1989 11 03.50 | M | 6.9 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 11 04.22 | S | 6.6 | AA | 3.4 | B | | 9 | 8 | 7/ | 1.0 | 355 | PER01 |
| 1989 11 04.23 | M | 6.6 | AA | 3.4 | B | | 9 | 4 | 6/ | 1.7 | 355 | PER01 |
| 1989 11 04.40 | B | 6.5 | AA | 3.5 | B | | 7 | & 7 | 8 | | | GRE |
| 1989 11 04.54 | M | 6.6 | AA | 8.0 | B | | 20 | | 8/ | 0.67 | 345 | MOR |
| 1989 11 05.54 | M | 6.2 | AA | 8.0 | B | | 20 | | 8/ | 0.75 | 340 | MOR |
| 1989 11 06.54 | M | 6.2 | AA | 8.0 | B | | 20 | | 9 | 2.0 | 343 | MOR |
| 1989 11 08.18 | S | 5.1 | AA | 8.0 | B | | 20 | 4 | 7 | | | BAR |
| 1989 11 08.26 | S | 6.4: | AA | 3.4 | B | | 9 | | | | | PER01 |
| 1989 11 08.50 | M | 6.2 | SC | 5.0 | B | | 10 | | | 0.33 | 337 | HAL |
| 1989 11 10.22 | S | 6.3 | AA | 3.4 | B | | 9 | 5 | 5 | | | PER01 |
| 1989 11 10.23 | M | 6.3 | AA | 3.4 | B | | 9 | | | | | PER01 |
| 1989 11 10.24 | B | 6.6 | AA | 3.4 | B | | 9 | | 8 | 2.0 | 350 | PER01 |
| 1989 11 10.39 | B | 5.8 | AA | 3.5 | B | | 7 | | | | | GRE |
| 1989 11 10.39 | B | 6.0 | Y | 3.5 | B | | 7 | & 9 | 8 | | | GRE |
| 1989 11 10.40 | B | 6.1 | AA | 5.0 | B | | 7 | | 8 | | | GRE |
| 1989 11 10.40 | B | 6.1 | AA | 8.0 | R | 3 | 20 | & 6 | 8 | | | GRE |
| 1989 11 10.53 | M | 6.2 | AA | 8.0 | B | | 20 | | 9 | 2.5 | 322 | MOR |
| 1989 11 11.39 | B | 6.0 | AA | 3.5 | B | | 7 | | 8/ | | | GRE |
| 1989 11 11.39 | B | 6.3 | AA | 8.0 | R | 3 | 20 | & 4 | 8 | | | GRE |
| 1989 11 11.53 | B | 6.2 | AA | 8.0 | B | | 20 | | 9 | | | MOR |
| 1989 11 15.19 | S | 4.9 | AA | 8.0 | B | | 20 | 3 | 5 | | | BAR |
| 1989 11 16.48 | O | 5.7 | HR | 5.0 | B | | 7 | & 5 | | | | SHE01 |
| 1989 11 17.50 | M | 6.0 | SC | 5.0 | B | | 10 | | | 0.75 | 312 | HAL |
| 1989 11 17.55 | B | 6.4 | AA | 8.0 | B | | 20 | | 9 | | | MOR |
| 1989 11 18.53 | B | 6.4 | AA | 8.0 | B | | 20 | | 8 | | | MOR |
| 1989 11 19.15 | S | 5.9 | AC | 15.2 | L | 5 | 44 | 5.5 | 7 | 0.9 | 330 | MOE |
| 1989 11 19.40 | B | 6.4 | AA | 5.0 | B | | 7 | | 8 | | | GRE |
| 1989 11 19.40 | B | 6.4 | AA | 8.0 | R | 3 | 20 | | | | | GRE |
| 1989 11 19.40 | S | 6.2 | AA | 8.0 | R | 3 | 20 | & 6 | 7 | | | GRE |
| 1989 11 19.41 | B | 6.4 | AA | 3.5 | B | | 7 | | 8 | | | GRE |
| 1989 11 19.53 | M | 6.1 | AA | 8.0 | B | | 20 | | 8 | | | MOR |
| 1989 11 20.53 | M | 5.7 | AA | 8.0 | B | | 20 | | 8 | | | MOR |
| 1989 11 22.51 | M | 6.0 | SC | 5.0 | B | | 10 | | | 1.0 | 310 | HAL |
| 1989 11 23.48 | O | 6.1 | SC | 5.0 | B | | 7 | & 4 | | | | SHE01 |
| 1989 11 23.50 | B | 5.6 | AA | 5.0 | B | | 10 | & 6 | 8 | 0.75 | 280 | ROB03 |
| 1989 11 24.40 | B | 6.0 | AA | 8.0 | R | 3 | 20 | | | | | GRE |
| 1989 11 24.40 | S | 5.6 | AA | 8.0 | R | 3 | 20 | & 5 | 6 | | | GRE |
| 1989 11 24.41 | B | 6.0 | AA | 10.2 | R | 4 | 16 | | 7/ | | | GRE |
| 1989 11 24.41 | M | 5.6: | AA | 10.2 | R | 4 | 16 | | | | | GRE |
| 1989 11 25.50 | B | 4.9 | AA | 0.0 | E | | 1 | | 9 | | | ROB03 |
| 1989 11 25.50 | B | 5.1 | AA | 5.0 | B | | 10 | & 6 | 8 | 1.7 | 290 | ROB03 |
| 1989 11 25.54 | I | 5.0 | AA | 0.7 | E | | 1 | | 9 | | | MOR |
| 1989 11 25.54 | M | 5.2 | AA | 8.0 | B | | 20 | | 7 | 2.0 | 294 | MOR |
| 1989 11 26.21 | S | 5.5 | AA | 8.0 | B | | 20 | 4 | 4 | | | BAR |
| 1989 11 26.22 | B | 5.3 | AC | 35 | T | 6 | 113 | 2.5 | 6 | | | AMO |
| 1989 11 26.28 | B | 5.6 | S | 7.0 | B | | 10 | | | | | DEA |
| 1989 11 26.50 | B | 5.3 | AA | 5.0 | B | | 10 | & 5 | 8 | 1.5 | 280 | ROB03 |
| 1989 11 26.50 | M | 5.8 | SC | 5.0 | B | | 10 | | | 0.83 | 288 | HAL |
| 1989 11 27.27 | B | 5.6 | S | 7.0 | B | | 10 | | | | | DEA |
| 1989 11 27.42 | B | 6.3 | AA | 8.0 | R | 3 | 20 | | | | | GRE |
| 1989 11 27.42 | S | 5.8 | AA | 8.0 | R | 3 | 20 | & 6 | 5/ | | | GRE |
| 1989 11 27.53 | M | 5.4 | AA | 8.0 | B | | 20 | | 6/ | 1.67 | 294 | MOR |
| 1989 11 30.26 | S | 5.7 | AA | 3.4 | B | | 9 | 14 | 3 | | | PER01 |
| 1989 12 01.51 | M | 5.8 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 12 05.53 | M | 5.8: | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 12 08.28 | B | 7.8 | S | 7.0 | B | | 10 | 7 | | | | DEA |
| 1989 12 09.28 | B | 7.0 | S | 7.0 | B | | 10 | 8 | | | | DEA |

Comet Helin-Roman 1989s

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 09 08.23 | ! S | 13.2 | AC | 41 | L | 4 | 183 | | 3 | | | HAL |
| 1989 09 28.12 | I[ | 13.5 | | 41 | L | 4 | 183 | | | | | HAL |

Comet Helin-Roman-Alu 1989v

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC. | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 10 03.22 | S | 12.7 | AC | 41 | L | 4 | 183 | | | | | HAL |
| 1989 10 03.92 | S | 13.1 | AC | 25.4 | J | 6 | 117 | 1.3 | 1/ | | | BOU |
| 1989 10 04.90 | S | 12.8 | GA | 25.4 | J | 6 | 90 | 1.8 | 0/ | | | BOU |
| 1989 10 07.28 | S | 11.9 | NP | 25.6 | L | 4 | 67 | 3.0 | 1 | | | MOR |
| 1989 10 08.33 | S | 11.5 | NP | 25.6 | L | 4 | 67 | 3.8 | 1 | | | MOR |
| 1989 10 09.32 | S | 12.6 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 10 17.78 | S | 12.3 | AC | 36.0 | T | 11 | 325 | 0.8 | 3 | | | KOR |
| 1989 10 19.13 | S | 12.6 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 10 23.15 | S | 11.8 | AC | 41 | L | 4 | 83 | | 1/ | | | HAL |
| 1989 10 26.90 | S | 10.2 | AC | 15.6 | L | 5 | 29 | & 5 | 0/ | | | BOU |
| 1989 10 28.13 | S | 9.8 | NP | 25.6 | L | 4 | 45 | 5.0 | 1 | | | MOR |
| 1989 10 29.11 | S | 10.7 | NP | 50.8 | L | 4 | 78 | 4.3 | 2 | | | MOR |
| 1989 10 29.14 | S | 9.8 | NP | 8.0 | B | | 20 | 8.0 | 0 | | | MOR |
| 1989 10 29.87 | S | 10.4 | AC | 15 | L | 4 | 26 | 4 | 1 | | | PER01 |
| 1989 10 30.24 | S | 11.0 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 11 02.93 | B | 10.9 | AC | 35 | T | 6 | 113 | | 8 | | | AMO |
| 1989 11 03.83 | S | 10.2 | AC | 15 | L | 4 | 26 | 4 | 1/ | | | PER01 |
| 1989 11 04.19 | S | 10.2 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 11 04.22 | S | 9.8 | NP | 25.6 | L | 4 | 45 | 6.1 | 2 | | | MOR |
| 1989 11 04.77 | B | 10.7 | AC | 35 | T | 6 | 113 | | 8 | | | AMO |
| 1989 11 05.25 | S | 9.9 | NP | 25.6 | L | 4 | 45 | 5.9 | 1/ | | | MOR |
| 1989 11 09.84 | S | 10.1 | AC | 15 | L | 4 | 26 | 2 | 5 | | | PER01 |
| 1989 11 16.79 | S | 10.4 | AC | 36.0 | T | 11 | 260 | 1.1 | 1 | | | KOR |
| 1989 11 17.79 | S | 10.3 | AC | 36.0 | T | 11 | 123 | 4 | 1 | | | KOR |
| 1989 11 18.14 | M | 8.8 | NP | 25.6 | L | 4 | 45 | 4.7 | 2 | | | MOR |
| 1989 11 18.73 | S | 9.6 | AC | 15.2 | L | 5 | 44 | 5.5 | 1 | | | MOE |
| 1989 11 19.12 | M | 9.1 | NP | 25.6 | L | 4 | 45 | 4.9 | 2 | | | MOR |
| 1989 11 19.13 | S | 9.5 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 11 19.70 | S | 9.7 | AC | 15.2 | L | 5 | 44 | 5 | 1 | | | MOE |
| 1989 11 19.78 | S | 10.8 | AC | 36.0 | T | 11 | 123 | 2.5 | 1 | | | KOR |
| 1989 11 20.12 | M | 9.5 | NP | 25.6 | L | 4 | 45 | 5.3 | 3 | | | MOR |
| 1989 11 22.79 | S | 9.7: | AC | 15.2 | L | 5 | 44 | 4 | 1 | | | MOE |
| 1989 11 25.14 | S | 10.7 | NP | 25.6 | L | 4 | 67 | 4.6 | 1 | | | MOR |
| 1989 11 25.20 | S | 9.9 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 11 27.12 | S | 10.7 | NP | 25.6 | L | 4 | 67 | | 1 | | | MOR |
| 1989 11 27.79 | S | 9.8 | AC | 15.2 | L | 5 | 44 | 4.5 | 1 | | | MOE |
| 1989 11 28.72 | S | 10.0 | AC | 15.2 | L | 5 | 44 | 4 | 1 | | | MOE |
| 1989 11 30.07 | B | 10.6: | S | 37 | L | | 127 | 4 | 1 | &0.17 | 45 | CHE |
| 1989 12 01.17 | S | 10.0 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 12 02.82 | S | 10.0 | AC | 15 | L | 4 | 26 | 3 | 1/ | | | PER01 |
| 1989 12 18.09 | S | 11.0 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 12 20.16 | S | 10.0 | AC | 25.6 | L | 4 | 67 | 3.8 | 1 | | | MOR |
| 1989 12 24.09 | S | 10.9 | AC | 41 | L | 4 | 83 | | 1 | | | HAL |

Comet Skorichenko-George 1989e1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 12 19.08 | M | 10.5 | AC | 41 | L | 4 | 83 | | 5 | | | HAL |
| 1989 12 20.14 | M | 10.2 | AC | 25.6 | L | 4 | 67 | 2.3 | 5 | | | MOR |
| 1989 12 24.11 | M | 10.3 | AC | 41 | L | 4 | 83 | | | | | HAL |

Periodic Comet Tuttle-Giacobini-Kresák (1989b1)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 11 26.49 | I | [13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 12 10.52 | I | [13.0 | | 41 | L | 4 | 183 | | | | | HAL |

Periodic Comet Pons-Winnecke (1989g)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 08 03.18 | I | [13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 10.15 | I | [12.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 23.16 | I | [13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 31.13 | I | [13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 03.15 | I | [13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 19.11 | I | [13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 22.12 | I | [12.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 30.11 | I | [12.5 | | 41 | L | 4 | 183 | | | | | HAL |

Periodic Comet du Toit-Neujmin-Delporte (1989l)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 08 23.20 | I | [13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 30.13 | I | [13.5 | | 41 | L | 4 | 244 | | | | | HAL |

Periodic Comet Schwassmann-Wachmann 2 (1987 XIX)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 03 09.21 | S | 13.0 | A | 25 | L | 4 | 179 | 1.1 | 1 | | | JAC01 |
| 1988 03 13.36 | S | 13.3 | L | 25 | L | 4 | 179 | | | | | JAC01 |
| 1988 04 07.13 | S | [13.0: | A | 25 | L | 4 | 179 | | | | | JAC01 |

Periodic Comet Harrington (1987 XXVIII)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 10 27.14 | S | 13.0 | L | 25 | L | 4 | 179 | 1 | 4 | | | JAC01 |
| 1987 10 28.13 | S | 13.1 | L | 25 | L | 4 | 179 | 1.6 | 4/ | | | JAC01 |
| 1987 11 10.07 | S | 13.1 | L | 25 | L | 4 | 179 | 1.2 | 3 | | | JAC01 |
| 1987 11 24.04 | S | 13.5: | L | 25 | L | 4 | 179 | | | | | JAC01 |

Periodic Comet Churyumov-Gerasimenko (1982 VIII)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 08 28.80 | S | 13.3 | AC | 50 | L | 5 | 208 | 0.5 | 5 | | | NAK01 |
| 1982 08 28.80 | S | 13.5 | AC | 50 | L | 5 | 104 | 0.5 | | | | ICH |
| 1982 09 26.65 | B | 13.0 | NP | 30 | L | 6 | 100 | | | | | OHT |
| 1982 09 26.76 | S | 12.5 | AC | 15 | L | 6 | 129 | 0.3 | | | | KAN |
| 1982 10 12.68 | B | 12.5 | NP | 30 | L | 6 | 100 | 0.8 | | | | OHT |
| 1982 10 12.73 | S | 12.0 | AC | 15 | L | 6 | 50 | 0.8 | | | | KAN |
| 1982 10 16.69 | B | 12.3 | NP | 30 | L | 6 | 100 | 0.7 | | | | OHT |
| 1982 10 16.70 | S | 11.4 | AC | 15 | L | 6 | 50 | 1.0 | | | | ICH |
| 1982 10 16.70 | S | 11.7 | AC | 15 | L | 6 | 50 | 0.9 | | | | KAN |
| 1982 10 16.71 | S | 11.6 | AC | 15 | L | 6 | 50 | 1.5 | 4 | | | NAK01 |
| 1982 10 16.76 | S | 11.8 | AC | 20 | L | 6 | 85 | 0.7 | 6 | | | ISH02 |
| 1982 10 18.59 | B | 12.2 | NP | 30 | L | 6 | 100 | | | | | OHT |
| 1982 10 20.65 | B | 12.0 | NP | 30 | L | 6 | 100 | 0.9 | 7 | | | OHT |
| 1982 10 20.72 | S | 11.3 | AC | 15 | L | 6 | 50 | 1.6 | 5 | | | NAK01 |
| 1982 10 20.76 | S | 11.6 | AC | 20 | L | 6 | 85 | 1.0 | 4 | | | ISH02 |
| 1982 10 21.70 | S | 11.3 | AC | 20 | L | 5 | 55 | 1.2 | | | | TAN01 |
| 1982 10 21.77 | S | 11.2 | AC | 15 | L | 6 | 50 | 1.1 | 6 | | | NAK01 |
| 1982 10 21.78 | S | 11.4 | AC | 15 | L | 6 | 50 | 1.3 | 4 | | | KAN |
| 1982 10 21.78 | S | 11.5 | AC | 20 | L | 6 | 85 | 0.8 | 4 | | | ISH02 |
| 1982 10 22.61 | B | 11.5 | NP | 30 | L | 6 | 100 | 0.9 | 6 | | | OHT |

Periodic Comet Churyumov-Gerasimenko (1982 VIII) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 10 22.70 | S | 11.3 | AC | 15 | L | 6 | 50 | 1.4 | 5 | | | NAK01 |
| 1982 10 22.79 | S | 11.5 | AC | 20 | L | 6 | 85 | 1.2 | 5 | | | ISH02 |
| 1982 10 24.73 | S | 11.3 | AC | 15 | L | 6 | 50 | 1.4 | 5 | | | NAK01 |
| 1982 10 24.79 | S | 11.4 | AC | 20 | L | 6 | 85 | 1.2 | 6 | | | ISH02 |
| 1982 10 25.68 | S | 11.5 | AC | 15 | L | 6 | 50 | 1.7 | 5 | | | KAN |
| 1982 10 25.80 | S | 11.4 | AC | 20 | L | 6 | 85 | 1.3 | 5 | | | ISH02 |
| 1982 10 26.71 | B | 11.5 | NP | 30 | L | 6 | 100 | 0.9 | 6 | | | OHT |
| 1982 10 26.76 | S | 11.4 | AC | 15 | L | 6 | 50 | 1.6 | 5 | | | NAK01 |
| 1982 10 26.79 | S | 11.2 | AC | 15 | L | 6 | 50 | 2.0 | | | | ICH |
| 1982 10 26.79 | S | 11.5 | AC | 20 | L | 6 | 85 | 1.2 | 6 | | | ISH02 |
| 1982 11 11.84 | S | 10.5 | AC | 15 | L | 6 | 28 | 2.0 | | | | KAN |
| 1982 11 12.60 | B | 10.7 | NP | 30 | L | 6 | 100 | 1.6 | 4 | | | OHT |
| 1982 11 12.77 | S | 10.8 | AC | 20 | L | 6 | 85 | 1.6 | 6 | 0.07 | | ISH02 |
| 1982 11 12.77 | S | 10.9 | AC | 15 | L | 6 | 50 | 1.8 | | | | TAN01 |
| 1982 11 12.78 | S | 10.7 | AC | 15 | L | 6 | 50 | 1.9 | 5 | | | NAK01 |
| 1982 11 12.79 | S | 10.3 | AC | 15 | L | 6 | 28 | 2.3 | 5 | | | KAN |
| 1982 11 14.67 | S | 10.9 | AC | 15 | L | 6 | 50 | | | | | TAN01 |
| 1982 11 14.68 | S | 10.5 | AC | 15 | L | 6 | 50 | 1.0 | | | | ICH |
| 1982 11 14.69 | S | 10.6 | AC | 15 | L | 6 | 50 | 1.6 | 6 | | | NAK01 |
| 1982 11 24.66 | B | 10.4 | AC | 30 | L | 6 | 100 | 1.3 | 4 | | | OHT |
| 1982 11 24.76 | S | 10.1 | AC | 15 | L | 6 | 50 | 3.0 | 5 | | | TAN01 |
| 1982 11 24.78 | S | 10.4 | AC | 15 | L | 6 | 50 | 3.0 | 5 | | | NAK01 |
| 1982 11 24.79 | S | 9.8 | AC | 15 | L | 6 | 28 | 2.7 | | 0.15 | 270 | KAN |
| 1982 11 24.80 | S | 10.4 | AC | 20 | L | 6 | 85 | 2.5 | 6 | | | ISH02 |
| 1982 11 24.81 | S | 10.1 | AC | 15 | L | 6 | 50 | 4.0 | | | | ICH |
| 1982 11 25.75 | S | 9.8 | AC | 15 | L | 6 | 50 | 3.7 | | 0.07 | 260 | KAN |
| 1982 11 25.77 | S | 10.3 | AC | 15 | L | 6 | 50 | 2.5 | 6 | ? | 270 | NAK01 |
| 1982 11 25.79 | S | 10.3 | AC | 15 | L | 6 | 50 | 3.0 | 4 | | | TAN01 |
| 1982 11 25.81 | S | 10.0 | AC | 15 | L | 6 | 50 | 4.0 | | 0.08 | | ICH |
| 1982 11 25.81 | S | 10.3 | AC | 20 | L | 6 | 85 | 2.8 | 6 | 0.08 | | ISH02 |
| 1982 11 26.77 | S | 10.3 | AC | 15 | L | 6 | 50 | 2.5 | 6 | | | NAK01 |
| 1982 11 26.79 | S | 10.7 | AC | 15 | L | 6 | 50 | 3.0 | 4 | | | TAN01 |
| 1982 11 27.77 | S | 10.3 | AC | 20 | L | 6 | 85 | 3.0 | 6 | 0.08 | | ISH02 |
| 1982 11 27.78 | S | 9.7 | AC | 15 | L | 6 | 28 | 2.8 | | 0.08 | 266 | KAN |
| 1982 12 06.51 | B | 10.6 | NP | 30 | L | 6 | 100 | 1.5 | 8 | | | OHT |
| 1982 12 06.53 | S | 9.8 | AC | 15 | L | 6 | 28 | 3.0 | 7 | | | KAN |
| 1982 12 06.55 | S | 10.4 | AC | 20 | L | 6 | 85 | 3.0 | 5 | 0.1 | | ISH02 |
| 1982 12 07.55 | B | 10.3 | AC | 30 | L | 6 | 100 | 1.9 | 7 | | | OHT |
| 1982 12 07.57 | S | 10.4 | AC | 20 | L | 6 | 85 | 2.5 | 5 | 0.08 | | ISH02 |
| 1982 12 07.59 | S | 10.1 | AC | 15 | L | 6 | 50 | 2.5 | 5 | | | NAK01 |
| 1982 12 07.60 | S | 10.3 | AC | 15 | L | 6 | 50 | 2.5 | 4 | | | TAN01 |
| 1982 12 07.62 | S | 10.5 | AC | 15 | L | 6 | 50 | 2.5 | | 0.07 | 290 | ICH |
| 1982 12 08.59 | S | 10.4 | AC | 20 | L | 6 | 85 | 3.0 | 5 | 0.08 | | ISH02 |
| 1982 12 09.52 | B | 10.3 | AC | 30 | L | 6 | 100 | 1.7 | 6 | | | OHT |
| 1982 12 09.61 | S | 10.5 | AC | 20 | L | 6 | 85 | 2.5 | 4 | | | ISH02 |
| 1982 12 10.58 | S | 10.3 | AC | 15 | L | 6 | 50 | 2.0 | 4 | | | NAK01 |
| 1982 12 10.59 | S | 10.6 | AC | 15 | L | 6 | 50 | 3.0 | | | | ICH |
| 1982 12 11.59 | S | 10.4 | AC | 15 | L | 6 | 50 | 2.5 | 6 | | | NAK01 |
| 1982 12 12.60 | S | 10.4 | AC | 20 | L | 6 | 85 | 2.5 | 5 | 0.08 | | ISH02 |
| 1982 12 13.60 | S | 10.3 | AC | 15 | L | 6 | 50 | 3.0 | 5 | | | NAK01 |
| 1982 12 13.76 | S | 10.4 | AC | 20 | L | 6 | 85 | 2.0 | 5 | | | ISH02 |
| 1982 12 15.52 | B | 10.7 | AC | 30 | L | 6 | 100 | 1.5 | 4 | | | OHT |
| 1982 12 15.63 | S | 9.6 | AC | 15 | L | 6 | 28 | 3.3 | | | | KAN |
| 1982 12 15.72 | S | 10.0 | AC | 15 | L | 6 | 50 | 2.3 | 4 | | | TAN01 |
| 1982 12 15.74 | S | 10.0 | AC | 15 | L | 6 | 50 | 3.0 | 5 | | | NAK01 |
| 1982 12 16.62 | S | 10.3 | AC | 20 | L | 6 | 85 | 3.0 | 6 | | | ISH02 |
| 1982 12 17.75 | S | 9.8 | AC | 20 | L | 6 | 38 | 4.0 | 6 | 0.08 | | ISH02 |
| 1982 12 19.51 | B | 10.4 | AC | 30 | L | 6 | 100 | 1.2 | 3 | | | OHT |
| 1982 12 19.62 | S | 10.2 | AC | 20 | L | 6 | 85 | 2.8 | 5 | | | ISH02 |

Periodic Comet Churyumov-Gerasimenko (1982 VIII) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 12 19.73 | S | 10.0 | AC | 15 | L | 6 | 50 | 2.5 | 5 | | | NAK01 |
| 1982 12 19.74 | S | 10.1 | AC | 15 | L | 6 | 50 | 2.5 | 3 | | | TAN01 |
| 1982 12 19.75 | S | 10.3 | AC | 15 | L | 6 | 50 | 2.5 | | | | ICH |
| 1982 12 20.64 | S | 10.3 | AC | 15 | L | 6 | 50 | 3.0 | 4 | | | TAN01 |
| 1982 12 20.67 | S | 10.1 | AC | 15 | L | 6 | 50 | 2.7 | | | | ICH |
| 1982 12 23.63 | S | 10.2 | AC | 20 | L | 6 | 85 | 2.5 | 5 | | | ISH02 |
| 1982 12 23.67 | S | 10.2 | AC | 15 | L | 6 | 50 | 3.2 | | | | ICH |
| 1982 12 23.68 | S | 9.4 | AC | 15 | L | 6 | 28 | 3.8 | | | | KAN |
| 1982 12 23.73 | S | 10.2 | AC | 15 | L | 6 | 50 | 2.5 | 6 | | | NAK01 |
| 1982 12 24.76 | S | 10.1 | AC | 20 | L | 6 | 85 | 2.5 | 5 | | | ISH02 |
| 1982 12 27.80 | S | 10.0 | AC | 10 | L | 10 | 30 | 1.3 | | | | ICH |
| 1982 12 30.47 | S | 10.5 | AC | 10 | L | 10 | 56 | 3.0 | 4 | | | NAK01 |
| 1982 12 30.48 | S | 10.3 | AC | 20 | L | 6 | 85 | 2.5 | 5 | 0.08 | | ISH02 |
| 1982 12 30.50 | S | 10.3 | AC | 20 | L | 6 | 89 | 3.0 | | 0.1 | 270 | ICH |
| 1982 12 31.56 | S | 10.1 | AC | 10 | L | 10 | 45 | 1.2 | | | | ICH |
| 1983 01 01.82 | S | 9.7 | AC | 10 | L | 10 | 33 | 0.8 | | | | ICH |
| 1983 01 02.55 | S | 10.4 | AC | 20 | L | 6 | 85 | 2.0 | | | | ISH02 |
| 1983 01 03.47 | S | 9.7 | AC | 15 | L | 6 | 28 | 4.2 | | | | KAN |
| 1983 01 03.48 | S | 9.9 | AC | 15 | L | 6 | 28 | 0.3 | 5 | | | NII |
| 1983 01 03.50 | S | 10.2 | AC | 15 | L | 6 | 50 | 3.3 | 5 | | | ISH02 |
| 1983 01 04.49 | B | 10.6 | AC | 30 | L | 6 | 100 | 1.7 | 4 | | | OHT |
| 1983 01 04.54 | S | 10.3 | AC | 20 | L | 6 | 85 | 3.0 | 4 | | | ISH02 |
| 1983 01 09.58 | S | 10.4 | AC | 20 | L | 6 | 85 | 2.5 | 4 | 0.08 | | ISH02 |
| 1983 01 10.49 | B | 11.4 | AC | 30 | L | 6 | 100 | 1.2 | 3 | | | OHT |
| 1983 01 10.60 | S | 10.5 | AC | 20 | L | 6 | 85 | 2.5 | 4 | 0.1 | | ISH02 |
| 1983 01 10.70 | S | 10.7 | AC | 15 | L | 6 | 50 | 1.8 | 5 | | | NAK01 |
| 1983 01 10.72 | S | 10.4 | AC | 15 | L | 6 | 129 | 2.2 | | 0.05 | 290 | ICH |
| 1983 01 11.50 | B | 11.9 | AC | 30 | L | 6 | 100 | 1.0 | 3 | | | OHT |
| 1983 01 11.60 | S | 10.5 | AC | 20 | L | 6 | 85 | 2.5 | 3 | 0.07 | | ISH02 |
| 1983 01 11.64 | S | 10.8 | AC | 15 | L | 6 | 50 | 2.0 | 5 | | | NAK01 |
| 1983 01 11.66 | S | 10.7 | AC | 15 | L | 6 | 129 | 1.7 | | | | ICH |
| 1983 01 14.48 | S | 9.7 | AC | 15 | L | 6 | 28 | 4.2 | | | | KAN |
| 1983 01 14.66 | S | 11.2 | AC | 15 | L | 6 | 50 | 1.6 | 4 | | | NAK01 |
| 1983 01 14.73 | S | 11.4 | AC | 15 | L | 6 | 180 | 1.2 | | | | ICH |
| 1983 01 15.46 | S | 9.8 | AC | 15 | L | 6 | 28 | 3.8 | | | | KAN |
| 1983 01 15.57 | S | 10.7 | AC | 20 | L | 6 | 85 | 2.5 | 3 | | | ISH02 |
| 1983 01 16.45 | S | 11.9 | AC | 30 | L | 6 | 100 | 1.0 | 2 | | | OHT |
| 1983 01 16.49 | S | 11.1 | AC | 15 | L | 6 | 50 | 2.2 | 5 | | | NAK01 |
| 1983 01 16.54 | S | 10.8 | AC | 20 | L | 6 | 85 | 2.0 | 2 | | | ISH02 |
| 1983 01 20.58 | S | 10.9 | AC | 20 | L | 6 | 85 | 2.0 | 3 | | | ISH02 |
| 1983 01 21.49 | S | 10.5 | AC | 15 | L | 6 | 28 | 2.4 | | | | KAN |
| 1983 01 21.61 | S | 11.1 | AC | 20 | L | 6 | 85 | 2.0 | 2 | | | ISH02 |
| 1983 01 22.63 | S | 11.3 | AC | 15 | L | 6 | 50 | 2.0 | 4 | | | NAK01 |
| 1983 01 22.65 | S | 11.6 | AC | 15 | L | 6 | 50 | 2.0 | | | | ICH |
| 1983 01 23.66 | S | 10.8 | AC | 20 | L | 6 | 48 | 3.0 | | | | ISH02 |
| 1983 01 23.68 | S | 11.3 | AC | 15 | L | 6 | 50 | 1.8 | 5 | | | NAK01 |
| 1983 01 23.68 | S | 11.5 | AC | 15 | L | 6 | 50 | 1.7 | | | | ICH |
| 1983 01 31.42 | S | 12.5 | AC | 15 | L | 6 | 72 | 0.8 | | | | KAN |
| 1983 02 03.44 | S | 13.0 | AC | 30 | L | 6 | 100 | 0.6 | 1 | | | OHT |
| 1983 02 03.48 | S | 12.4 | AC | 15 | L | 6 | 100 | 0.9 | | | | NAK01 |
| 1983 02 03.57 | S | 12.5 | AC | 20 | L | 6 | 127 | 1.2 | 2 | | | ISH02 |
| 1983 02 05.62 | S | 12.5 | AC | 15 | L | 6 | 100 | 1.1 | | | | NAK01 |
| 1983 02 05.63 | S | 12.7 | AC | 15 | L | 6 | 100 | 0.8 | | | | ICH |
| 1983 02 08.42 | S | 12.0 | AC | 30 | L | 6 | 100 | 0.8 | 2 | | | OHT |
| 1983 02 08.61 | S | 12.0 | AC | 20 | L | 6 | 85 | 1.4 | 3 | | | ISH02 |
| 1983 02 09.48 | S | 12.7 | AC | 15 | L | 6 | 100 | 1.1 | | | | ICH |
| 1983 02 09.48 | S | 12.7 | AC | 15 | L | 6 | 100 | 1.1 | | | | NAK01 |
| 1983 02 10.58 | S | 12.3 | AC | 20 | L | 6 | 85 | 1.2 | 2 | | | ISH02 |
| 1983 02 11.56 | S | 12.5 | AC | 20 | L | 6 | 85 | 1.0 | 2 | | | ISH02 |

Periodic Comet Churyumov-Gerasimenko (1982 VIII) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 02 12.45 | S | 12.6 | AC | 30 | L | 6 | 100 | | | | | OHT |
| 1983 02 12.60 | S | 12.6 | AC | 20 | L | 6 | 85 | 1.5 | 1 | | | ISH02 |
| 1983 02 13.43 | S | 12.6 | AC | 15 | L | 6 | 100 | 1.2 | 4 | | | ICH |
| 1983 02 13.43 | S | 12.6 | AC | 15 | L | 6 | 100 | 1.2 | 4 | | | NAK01 |
| 1983 02 13.57 | S | 12.6 | AC | 20 | L | 6 | 85 | 1.0 | 2 | | | ISH02 |
| 1983 02 15.58 | S | 12.8 | AC | 20 | L | 6 | 85 | 1.0 | 1 | | | ISH02 |
| 1983 02 19.60 | S | 12.9 | AC | 15 | L | 6 | 100 | 0.9 | | | | ICH |
| 1983 02 19.60 | S | 12.9 | AC | 15 | L | 6 | 100 | 0.9 | | | | NAK01 |
| 1983 02 19.60 | S | 13.0 | AC | 20 | L | 6 | 85 | 0.8 | 1 | | | ISH02 |
| 1983 03 14.48 | S | 13.9 | AC | 30 | L | 6 | 196 | 0.7 | 4 | | | NII |
| 1983 03 14.48 | S | 13.9 | AC | 30 | L | 6 | 196 | 0.8 | | | | KAN |
| 1983 03 14.52 | S | 13.9 | AC | 30 | L | 6 | 140 | 0.8 | 3 | | | ISH02 |

Periodic Comet Gunn

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 05 03.95 | S | 12.6 | AC | 25.4 | J | 6 | 145 | 0.6 | 4 | | | BOU |
| 1989 05 04.94 | S | 12.7 | AC | 25.4 | J | 6 | 145 | 0.6 | 3 | | | BOU |
| 1989 05 09.97 | S | 12.9 | AC | 25.4 | J | 6 | 145 | 0.6 | 3 | | | BOU |
| 1989 05 23.94 | S | 12.5 | AC | 25.4 | J | 6 | 145 | 0.7 | 3 | | | BOU |
| 1989 05 24.97 | S | 12.7 | AC | 25.4 | J | 6 | 145 | 0.6 | 3/ | | | BOU |
| 1989 05 28.96 | S | 12.4 | AC | 25.4 | J | 6 | 90 | 1.0 | 3/ | | | BOU |
| 1989 05 30.95 | S | 12.5 | AC | 25.4 | J | 6 | 117 | 0.9 | 3 | | | BOU |
| 1989 06 02.96 | S | 12.4 | AC | 25.4 | J | 6 | 117 | 1.0 | 3 | | | BOU |
| 1989 06 05.97 | S | 12.3 | AC | 25.4 | J | 6 | 90 | 1.1 | 3 | | | BOU |
| 1989 07 27.23 | I | [12.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 03.20 | I | [13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 23.19 | I | [12.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 26.16 | I | [13.0 | | 41 | L | 4 | 183 | | | | | HAL |

Periodic Comet Gehrels 2 (1989n)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 09 01.43 | I | [13.5 | | 41 | L | 4 | 244 | | | | | HAL |
| 1989 09 09.38 | I | [14.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 28.44 | I | [13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 10 09.36 | I | [13.5 | | 41 | L | 4 | 244 | | | | | HAL |
| 1989 10 23.20 | I | [13.5 | | 41 | L | 4 | 244 | | | | | HAL |
| 1989 11 03.29 | S | 13.3 | AC | 41 | L | 4 | 183 | | | | | HAL |
| 1989 11 04.32 | S | 13.3 | AC | 41 | L | 4 | 183 | | | | | HAL |
| 1989 11 19.16 | S | 13.6 | NP | 25.6 | L | 4 | 156 | 0.8 | 2 | | | MOR |
| 1989 11 20.16 | S | 13.6 | NP | 25.6 | L | 4 | 156 | 0.8 | 2 | | | MOR |
| 1989 11 22.29 | S | 13.3 | AC | 41 | L | 4 | 183 | | | | | HAL |
| 1989 12 02.27 | I | [13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 12 20.26 | I | [13.5 | | 41 | L | 4 | 183 | | | | | HAL |

Periodic Comet Comas Solá (1987 XVIII)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 12 26.46 | S | [12.5 | L | 25 | L | 4 | 179 | | | | | JAC01 |
| 1988 02 11.36 | S | [12.5 | L | 25 | L | 4 | 179 | | | | | JAC01 |

Periodic Comet Halley (1986 III)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 08 22.92 | B | 15.2 | PK | 100 | L | 13 | 185 | 0.15 | 1 | | | CHU |
| 1985 08 27.95 | S | 15.3 | SP | 102 | L | 13 | 185 | 0.5 | 1 | | | CHE03 |
| 1985 09 10.99 | B | 14.4 | SP | 102 | L | 13 | 185 | 0.6 | 1 | | | CHE03 |
| 1985 09 11.10 | S | 12.8 | WA | 40.6 | L | 4 | 183 | 0.65 | 1/ | | | CAV |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 09 11.97 | B | 14.6 | SP | 102 | L | 13 | 475 | 0.7 | 1 | | | CHE03 |
| 1985 09 12.04 | B | 12.2 | SP | 16 | L | 10 | 30 | 1.0 | 5 | | | MOR04 |
| 1985 09 12.97 | B | 14.3 | SP | 102 | L | 13 | 185 | | 1 | | | CHE03 |
| 1985 09 13.94 | B | 14.2 | PK | 100 | L | 13 | 185 | 0.5 | 1 | | | CHU |
| 1985 09 13.95 | B | 12.9 | PK | 20 | R | 15 | 120 | | 1 | | | CHU |
| 1985 09 13.99 | B | 14.3 | SP | 102 | L | 13 | 475 | 0.6 | 1 | | | CHE03 |
| 1985 09 14.94 | B | 14.3 | PK | 100 | L | 13 | 185 | | | | | CHU |
| 1985 09 14.95 | B | 13.3 | PK | 20 | R | 15 | 120 | 1.0 | 3 | | | CHU |
| 1985 09 14.97 | B | 14.0 | SP | 102 | L | 13 | 475 | 0.7 | 3 | | | CHE03 |
| 1985 09 15.97 | B | 14.1 | SP | 102 | L | 13 | 185 | | 3 | | | CHE03 |
| 1985 09 16.94 | B | 14.1 | PK | 100 | L | 13 | 185 | | | | | CHU |
| 1985 09 16.95 | B | 12.9 | PK | 20 | R | 15 | 120 | | 3 | | | CHU |
| 1985 09 16.97 | B | 14.0 | SP | 102 | L | 13 | 185 | | 3 | | | CHE03 |
| 1985 09 17.95 | B | 14.0 | PK | 100 | L | 13 | 185 | 0.2 | 6 | | | CHU |
| 1985 09 18.03 | S | 12.6 | WA | 25.4 | L | 4 | 141 | 0.55 | | | | CAV |
| 1985 09 18.04 | S | 12.6 | WA | 40.6 | L | 4 | 183 | 0.8 | 4 | | | CAV |
| 1985 09 19.89 | B | 13.8 | PK | 100 | L | 13 | 185 | 0.1 | 5 | | | CHU |
| 1985 09 19.92 | B | 12.5 | PK | 20 | R | 15 | 120 | | | | | CHU |
| 1985 09 20.89 | B | 13.8 | PK | 100 | L | 13 | 185 | 0.3 | 3 | | | CHU |
| 1985 09 20.97 | B | 12.7 | PK | 20 | R | 15 | 120 | | | | | CHU |
| 1985 09 22.87 | B | 13.6 | PK | 100 | L | 13 | 185 | | | | | CHU |
| 1985 09 22.91 | B | 13.0 | PK | 20 | R | 15 | 120 | | | | | CHU |
| 1985 09 24.05 | B | 11.5: | SP | 16 | L | 10 | 30 | 2.0 | | | | MOR04 |
| 1985 09 24.06 | S | 12.0 | WA | 25.4 | L | 4 | 141 | 0.5 | | 0.03 | 197 | CAV |
| 1985 09 25.05 | B | 11.5: | SP | 16 | L | 10 | 30 | 2.0 | | | | MOR04 |
| 1985 10 10.99 | S | 11.3 | WA | 25.4 | L | 4 | 99 | 1.1 | 5/ | | | CAV |
| 1985 10 12.00 | B | 10.2: | SP | 15 | L | | | | | | | KOR01 |
| 1985 10 12.96 | B | 12.3 | PK | 100 | L | 13 | 185 | 0.5 | 4 | | | CHU |
| 1985 10 12.98 | B | 11.2 | PK | 20 | R | 15 | 120 | 1.0 | 3 | | | CHU |
| 1985 10 13.86 | B | 12.2 | PK | 100 | L | 13 | 185 | | | | | CHU |
| 1985 10 13.90 | B | 11.2 | PK | 20 | R | 15 | 120 | 3.0 | 3 | | | CHU |
| 1985 10 14.89 | B | 11.2 | PK | 20 | R | 15 | 120 | 2.0 | 3 | | | CHU |
| 1985 10 14.92 | B | 12.3 | PK | 100 | L | 13 | 185 | | | | | CHU |
| 1985 10 14.94 | B | 11.0 | A | 20 | R | 15 | 120 | | | | | CHU |
| 1985 10 15.88 | B | 12.2 | PK | 100 | L | 13 | 185 | | | | | CHU |
| 1985 10 15.90 | B | 11.0 | A | 20 | R | 15 | 120 | 1.0 | 5 | | | CHU |
| 1985 10 17.95 | M | 10.4 | WA | 25.4 | L | 4 | 79 | 3.5 | 6/ | | | CAV |
| 1985 10 17.95 | S | 10.2 | WA | 8.0 | B | | 20 | 2 | | | | CAV |
| 1985 10 18.04 | B | 10.8 | SP | 8 | R | | | | | | | NES |
| 1985 10 19.97 | B | 10.2: | SP | 16 | L | 10 | 30 | 2.0 | 5 | | | MOR04 |
| 1985 10 22.73 | S | 10.9 | AC | 6.5 | R | 8 | 27 | | | | | DAT |
| 1985 10 22.92 | B | 10.1 | A | 12 | R | 5 | 35 | 3.7 | 4 | | | CHE03 |
| 1985 10 22.95 | B | 10.0 | A | 20 | L | 5 | 35 | 2.5 | 5 | | | TSV |
| 1985 10 25.76 | M | 11.6 | AA | 10 | L | 10 | 56 | 3.2 | 5 | | | ICH |
| 1985 10 26.15 | S | 8.5 | WC | 8.0 | B | | 20 | 5.6 | 5 | | | CAV |
| 1985 10 28.74 | M | 10.4 | AA | 10 | L | 10 | 56 | 2.0 | 6 | | | ICH |
| 1985 10 28.78 | B | 9.3: | A | 12 | R | 5 | 35 | & 3 | | | | CHE03 |
| 1985 10 30.05 | B | 8.3 | A | 25 | R | 17 | 300 | &10 | | | | CHU |
| 1985 11 02.62 | M | 10.2 | AC | 10 | L | 10 | 56 | 2.5 | 6 | 0.01 | | ICH |
| 1985 11 03.68 | M | 10.0 | AC | 10 | L | 10 | 56 | 2 | 6 | | | ICH |
| 1985 11 03.83 | B | 8.7 | SP | 5.0 | B | | 7 | 4 | | | | MOR04 |
| 1985 11 03.90 | B | 8.5 | A | 25 | R | 17 | 300 | &10 | 4 | | | CHU |
| 1985 11 04.64 | M | 9.7 | AC | 10 | L | 10 | 56 | 2.5 | 5 | | | ICH |
| 1985 11 04.83 | B | 8.5 | SP | 5.0 | B | | 7 | | | | | POR01 |
| 1985 11 04.83 | B | 8.5 | SP | 5.0 | B | | 7 | 4.0 | 5 | | | MOR04 |
| 1985 11 04.84 | B | 9.0 | A | 8 | R | | 8 | 2.0 | 3 | | | SHI03 |
| 1985 11 04.89 | B | 9.7 | A | 25 | R | 17 | 300 | | | | | CHU |
| 1985 11 04.95 | B | 9.0 | SP | 7 | L | 8 | 33 | 2.5 | | | | BEZ |
| 1985 11 04.96 | B | 8.4 | SP | 8 | R | | 29 | 2.5 | | | | NES |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 11 05.67 | B | 8.5 | SP | 10 | R | | 15 | 5.0 | 5 | | | CHU |
| 1985 11 05.87 | B | 9.0 | SP | 10 | L | 10 | 50 | 10.0 | | | | ZIN |
| 1985 11 06.00 | B | 8.2 | SP | 8 | R | | 29 | 3.5 | | | | NES |
| 1985 11 06.74 | B | 7.6 | HD | 5.0 | B | | 7 | 7.5 | | | | KON |
| 1985 11 06.75 | B | 8.1 | SP | 8 | R | 10 | 28 | 3.0 | 4 | | | ZAG |
| 1985 11 07.59 | B | 8.8 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 07.84 | B | 8.4 | A | 10 | R | | 15 | 5.0 | 4 | | | CHU |
| 1985 11 07.90 | B | 8.0: | BD | 7 | R | | 22 | 2.0 | 4 | | | KAB |
| 1985 11 07.90 | S | 7.1 | WD | 5.0 | B | | 10 | | | | | CAV |
| 1985 11 07.90 | S | 7.2 | WD | 8.0 | B | | 20 | 8.3 | 6 | | | CAV |
| 1985 11 08.30 | B | 8.1 | SP | 4 | R | 6 | 18 | 21 | | | | DRA |
| 1985 11 08.60 | S | 8.7 | AA | 6.5 | R | 8 | 27 | | 3 | | | DAT |
| 1985 11 08.61 | M | 9.0 | AA | 10 | L | 10 | 56 | 4.2 | 5 | 0.17 | 225 | ICH |
| 1985 11 08.63 | B | 8.5 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 08.67 | S | 8.0 | AA | 12 | L | 6 | 36 | 1.0 | 3 | | | KIS |
| 1985 11 08.68 | B | 7.8 | SP | 5.0 | B | | 7 | 15 | 4 | | | ZAG |
| 1985 11 08.76 | E | 7.9 | SP | 8 | R | | | 15 | 4 | | | MAY02 |
| 1985 11 08.80 | B | 8.1 | SP | 4 | R | 6 | 18 | 21 | 0 | | | DRA |
| 1985 11 08.87 | B | 7.5 | SP | 5.0 | B | | 7 | 12 | 5 | | | MOR04 |
| 1985 11 08.87 | B | 7.7 | A | 12 | R | 4 | 35 | 8 | 5 | | | CHE03 |
| 1985 11 09.02 | B | 8.3 | A | 20 | L | 5 | 35 | 8 | 5 | | | TSV |
| 1985 11 09.15 | B | 7.0 | SP | 7 | L | 8 | 33 | 6 | 1/ | | | PAS |
| 1985 11 09.79 | E | 8.0: | SP | 5 | R | 10 | 35 | 5.0 | 6 | | | VIT |
| 1985 11 09.79 | E | 8.1 | SP | 7 | L | 8 | 88 | 5.0 | 6 | | | SHI04 |
| 1985 11 09.79 | M | 7.9 | A | 4.0 | B | | 12 | 15 | 4 | | | MAY02 |
| 1985 11 09.81 | B | 7.4 | SP | 5.0 | B | | 7 | 13.0 | 5 | | | MOR04 |
| 1985 11 09.83 | S | 7.8 | SP | 11 | L | 7 | 32 | 4.6 | 4 | | | ALE |
| 1985 11 09.85 | S | 6.1 | SP | 7 | L | 8 | 33 | 1.0 | 3 | | | SHI02 |
| 1985 11 09.86 | B | 7.3 | SP | 8 | R | | 29 | 4.0 | | | | NES |
| 1985 11 09.88 | B | 8.2 | HD | 15 | L | 5 | 25 | | | 0.2 | | KOR01 |
| 1985 11 10.01 | B | 8.4 | SP | 7 | L | 8 | 33 | 4.0 | | | | BEZ |
| 1985 11 10.07 | B | 7.2 | HD | 8 | R | | 29 | 4.0 | | | | NES |
| 1985 11 10.08 | B | 6.8 | HD | 7 | L | 8 | 33 | 5.0 | 2 | | | PAS |
| 1985 11 10.55 | B | 8.5 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 10.56 | S | 8.3 | AA | 15.3 | L | 9 | 52 | 4 | 3 | | | IWA01 |
| 1985 11 10.67 | B | 8.0 | HD | 25 | L | 6 | 75 | | | | | SAV01 |
| 1985 11 10.93 | B | 7.3 | A | 5.0 | B | | 7 | 20.0 | 3 | | | CHU |
| 1985 11 11.00 | B | 8.4 | A | 20 | L | 5 | 35 | 6.0 | 4 | | | TSV |
| 1985 11 11.55 | S | 8.7 | AA | 15.3 | L | 9 | 52 | 4 | 3 | | | IWA01 |
| 1985 11 11.56 | B | 8.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 11.57 | B | 8.8 | S | 15 | L | 6 | 34 | 15 | 5 | | | TAN03 |
| 1985 11 11.59 | S | 8.2 | AA | 12 | L | 6 | 36 | 1.0 | 3 | | | KIS |
| 1985 11 11.62 | M | 8.9 | AC | 10 | L | 10 | 40 | & 3.5 | 7 | | | ICH |
| 1985 11 11.77 | B | 7.2 | A | 5.0 | B | | 7 | 10.0 | 4 | | | CHU |
| 1985 11 11.77 | E | 7.9 | HD | 7 | L | 8 | 88 | 5.0 | 5 | | | SHI04 |
| 1985 11 11.78 | B | 7.5 | A | 11 | R | | | | | | | CHU |
| 1985 11 11.78 | B | 8.0 | A | 20 | R | | | | | | | CHU |
| 1985 11 11.78 | G | 6.1 | A | 0.0 | E | | 1 | | | | | CHU |
| 1985 11 11.91 | B | 8.4 | SP | 7 | L | 8 | 33 | 3.0 | | | | BEZ |
| 1985 11 12.5 | B | 8.8 | S | 15 | L | 6 | 34 | 12 | 5 | | | TAN03 |
| 1985 11 12.55 | B | 8.0 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 12.62 | M | 7.8 | AA | 10 | L | 10 | 40 | 4 | | | | ICH |
| 1985 11 12.62 | M | 8.8 | AA | 13 | L | 6 | 32 | 4.7 | 9 | | | INO |
| 1985 11 12.66 | S | 7.9 | AA | 12 | L | 6 | 36 | 1.2 | 5 | | | KIS |
| 1985 11 12.74 | B | 7.4 | A | 8 | R | | 8 | 6 | 5 | | | SHI03 |
| 1985 11 12.75 | B | 7.8 | SP | 10 | R | | | | | | | POR01 |
| 1985 11 12.81 | B | 7.6 | A | 11 | R | | | | | | | CHU |
| 1985 11 12.86 | B | 7.9 | A | 20 | R | | | | | | | CHU |
| 1985 11 12.99 | S | 8.5 | AA | 15.3 | L | 9 | 33 | 4 | 3 | | | IWA01 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 11 13.52 | B | 7.8 | HD | 21 | L | | 80 | 3.5 | 6 | | | KNY |
| 1985 11 13.55 | B | 8.0 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 13.58 | S | 7.6 | AA | 15.3 | L | 9 | 52 | 5 | 3 | | | IWA01 |
| 1985 11 13.63 | M | 7.5 | AA | 10 | L | 10 | 56 | 5.7 | | | | ICH |
| 1985 11 13.79 | B | 7.4 | A | 11 | R | | | | | | | CHU |
| 1985 11 13.88 | B | 7.8 | A | 20 | R | | | | | | | CHU |
| 1985 11 14.47 | B | 8.0 | S | 15 | L | 6 | 34 | 10 | 7 | | | TAN03 |
| 1985 11 14.52 | B | 7.5 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 11 14.59 | S | 7.8 | AA | 15.3 | L | 9 | 52 | 3.5 | 3 | | | IWA01 |
| 1985 11 14.65 | M | 7.9 | AA | 12 | L | 6 | 36 | 1.4 | 6 | | | KIS |
| 1985 11 14.81 | S | 7.0 | A | 8 | R | | 8 | 5 | 3 | | | SHI03 |
| 1985 11 14.91 | B | 8.0 | A | 20 | R | | | | | | | CHU |
| 1985 11 14.92 | B | 7.4 | HD | 8 | R | | 29 | 4.5 | | | | NES |
| 1985 11 14.96 | B | 7.6 | A | 11 | R | | | | | | | CHU |
| 1985 11 15.47 | B | 8.9 | S | 30 | L | 7 | 52 | 10 | 7 | | | TAN03 |
| 1985 11 15.48 | M | 7.5 | AA | 3.5 | B | | 7 | 5 | 6 | | | WAT03 |
| 1985 11 15.52 | B | 7.5 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 11 15.58 | B | 8.5 | AA | 13 | L | 6 | 32 | 4.4 | 8 | | | INO |
| 1985 11 15.62 | B | 7.6 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 15.73 | E | 7.4 | HD | 7 | L | 8 | 88 | 5.4 | 5 | | | SHI04 |
| 1985 11 15.73 | S | 8.0 | AA | 15.3 | L | 9 | 33 | 2.5 | 3 | | | IWA01 |
| 1985 11 15.75 | E | 7.4: | SP | 5 | R | 10 | 35 | 5.3 | 5 | | | VIT |
| 1985 11 15.81 | B | 7.6 | A | 20 | R | | | | | | | CHU |
| 1985 11 15.85 | B | 7.0 | A | 11 | R | | | | | | | CHU |
| 1985 11 15.92 | B | 7.1 | HD | 8 | R | 10 | 28 | 14 | 7 | | | RUD |
| 1985 11 16.04 | B | 7.5 | HD | 15 | L | 5 | 25 | | | &0.3 | | KOR01 |
| 1985 11 16.46 | M | 7.5 | AA | 3.5 | B | | 7 | 5 | 1 | | | WAT02 |
| 1985 11 16.49 | B | 7.4 | HD | 21 | L | | 80 | 3.7 | 5/ | | | KNY |
| 1985 11 16.70 | B | 6.8 | SP | 5.0 | B | | 7 | 10 | 5 | | | ZAG |
| 1985 11 16.78 | B | 7.4 | HD | 4 | R | 6 | 18 | 17 | | | | DRA01 |
| 1985 11 16.78 | B | 7.4 | HD | 4 | R | 6 | 18 | 17 | 0 | | | DRA |
| 1985 11 16.80 | B | 6.4 | A | 6 | R | | 30 | 5 | | | | GOL |
| 1985 11 16.83 | B | 6.8 | SP | 8 | R | 10 | 28 | 13 | 6 | | | GOS |
| 1985 11 16.93 | B | 6.8 | A | 11 | R | | | | | | | CHU |
| 1985 11 16.94 | S | 5.8 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1985 11 16.94 | S | 5.8 | AA | 5.0 | B | | 10 | | | | | CAV |
| 1985 11 17.00 | B | 7.5 | A | 20 | R | | | | | | | CHU |
| 1985 11 17.51 | B | 7.4 | HD | 21 | L | | 80 | 4.2 | 5/ | | | KNY |
| 1985 11 17.53 | S | 7.0 | AA | 6 | R | 15 | 91 | | | | | ICH |
| 1985 11 17.54 | B | 7.5 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 11 17.54 | S | 7.0 | AA | 15.3 | L | 9 | 33 | 5 | 5 | | | IWA01 |
| 1985 11 17.55 | B | 7.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 17.59 | B | 7.6 | HD | 5.0 | B | | 7 | | | | | KON |
| 1985 11 17.68 | M | 6.5 | AA | 3.5 | B | | 7 | 5 | 6 | | | WAT02 |
| 1985 11 17.78 | B | 6.7 | A | | | | | | | | | CHU |
| 1985 11 17.80 | B | 7.4 | A | 20 | R | | | | | | | CHU |
| 1985 11 17.83 | S | 7.6 | BD | 5.0 | B | | 7 | 9 | 3/ | | | KAB |
| 1985 11 17.87 | B | 7.5 | A | 11 | R | | | | | | | CHU |
| 1985 11 18.61 | B | 8.3 | S | 15 | L | 6 | 34 | 10 | 7 | | | TAN03 |
| 1985 11 18.62 | M | 6.8 | AA | 10 | L | 10 | 40 | 19.4 | 6 | 0.33 | 100 | ICH |
| 1985 11 18.66 | M | 7.5 | AA | 12 | L | 6 | 36 | 2.4 | 6 | | | KIS |
| 1985 11 18.68 | B | 7.0 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 18.79 | B | 6.9 | SP | 5.0 | B | | 7 | 14 | 5 | | | MOR04 |
| 1985 11 18.83 | B | 6.5 | A | 11 | R | | | | | | | CHU |
| 1985 11 18.85 | B | 8.0 | HD | 3.0 | B | | 8 | 17 | | | | ZIN |
| 1985 11 18.92 | B | 6.7 | HD | 20 | R | 15 | 150 | 21 | 7 | | | GOS |
| 1985 11 19.46 | B | 7.2 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 19.55 | S | 6.6 | AA | 15.3 | L | 9 | 33 | 5 | 4 | | | IWA01 |
| 1985 11 19.76 | B | 6.8 | SP | 5.0 | B | | 7 | 7 | 5 | | | MOR04 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 11 19.87 | B | 6.7 | A | 12 | R | 5 | 35 | 16 | 6 | | | CHE03 |
| 1985 11 20.02 | B | 6.5 | SP | 5.0 | B | | 7 | 14 | 5 | | | MOR04 |
| 1985 11 20.30 | M | 6.9 | SP | 4.0 | B | | 12 | 18 | 5 | | | MAY02 |
| 1985 11 20.45 | M | 6.2 | AA | 3.5 | B | | 7 | 5 | 6 | | | WAT03 |
| 1985 11 20.45 | M | 6.5 | AA | 3.5 | B | | 7 | 5 | 6 | | | WAT02 |
| 1985 11 20.48 | B | 7.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 20.52 | B | 7.3 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 11 20.62 | M | 6.5 | AA | 10 | L | 10 | 40 | 19.5 | 6 | 0.32 | 100 | ICH |
| 1985 11 20.67 | M | 7.5 | AA | 12 | L | 6 | 36 | 2.5 | 6 | | | KIS |
| 1985 11 20.70 | B | 6.4 | HD | 5.0 | B | | 7 | | | | | MAR04 |
| 1985 11 20.72 | B | 6.0 | A | 11 | R | | | | | | | CHU |
| 1985 11 20.79 | B | 6.0 | SP | 5.0 | B | | 7 | 10 | 5 | | | MOR04 |
| 1985 11 20.96 | B | 6.8 | HD | 8 | R | | 29 | 5 | | 0.2 | | NES |
| 1985 11 21.19 | E | 6.8 | SP | 8 | R | | | 18 | 5 | | | MAY02 |
| 1985 11 21.54 | B | 7.0 | HD | 21 | L | | 80 | 5.2 | 5/ | | | KNY |
| 1985 11 21.56 | B | 6.9 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 11 21.60 | M | 6.6 | AA | 10 | L | 10 | 40 | 11.6 | 6 | 0.25 | 95 | ICH |
| 1985 11 21.61 | B | 7.0 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 21.64 | B | 5.9 | SP | 5.0 | B | | 7 | 15 | 5 | | | MOR04 |
| 1985 11 21.67 | B | 6.1 | A | 5.0 | B | | 7 | 8 | | | | GOL |
| 1985 11 21.92 | B | 5.5 | A | 3.0 | B | | 3 | | | | | CHU |
| 1985 11 22.00 | B | 6.7 | HD | 8 | R | | 29 | 4 | | | | NES |
| 1985 11 22.65 | B | 5.8 | A | 8.0 | B | | 20 | | | | | CHU |
| 1985 11 22.83 | B | 5.9 | SP | 5.0 | B | | 7 | 15 | 5 | | | MOR04 |
| 1985 11 22.91 | B | 5.7 | A | 8.0 | B | | 20 | | | | | CHU |
| 1985 11 22.92 | B | 6.7 | HD | 7 | L | 8 | 33 | 5 | | | | BEZ |
| 1985 11 23.60 | B | 8.6 | S | 15 | L | 6 | 34 | 10 | 5 | | | TAN03 |
| 1985 11 23.63 | M | 7.0 | AA | 12 | L | 6 | 36 | 3.5 | 6 | | | KIS |
| 1985 11 24.55 | B | 7.2 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 24.70 | B | 6.0 | A | 15 | L | | | | | | | KOR01 |
| 1985 11 24.83 | B | 5.8 | HD | 7 | L | 8 | 33 | 2 | 3 | | | SHI02 |
| 1985 11 25.57 | M | 6.3 | AA | 10 | L | 10 | 40 | 10.7 | 6 | 0.33 | 90 | ICH |
| 1985 11 26.67 | S | 7.1 | AA | 12 | L | 6 | 36 | | | | | KIS |
| 1985 11 27.39 | M | 6.5 | AA | 3.5 | B | | 7 | 5 | 6 | | | WAT02 |
| 1985 11 29.42 | M | 6.0 | AA | 3.5 | B | | 7 | 10 | 6 | | | WAT02 |
| 1985 11 29.43 | M | 6.0 | AA | 3.5 | B | | 7 | 10 | 6 | | | WAT03 |
| 1985 11 29.60 | B | 6.5 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 29.67 | B | 5.5 | HD | 0.0 | E | | 1 | | | | | POR01 |
| 1985 11 29.74 | B | 6.4 | SP | 5 | R | 8 | 20 | 14 | 4 | | | RUD |
| 1985 11 29.78 | B | 6.3 | HD | 5.0 | B | | 7 | 6 | | | | KON |
| 1985 11 30.55 | B | 5.8 | HD | 5.0 | B | | 7 | 10 | | | | KON |
| 1985 11 30.60 | B | 6.5 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 11 30.60 | M | 6.6 | AA | 10 | L | 10 | 56 | 5 | 7 | | 90 | ICH |
| 1985 11 30.60 | S | 7.0 | AA | 15.3 | L | 9 | 33 | 5 | 4 | | | IWA01 |
| 1985 11 30.67 | E | 6.6 | SP | 7 | R | 14 | 30 | 10 | 4 | | | KAZ |
| 1985 11 30.71 | B | 6.0 | SP | 3.0 | B | | 8 | 20 | 3 | | | ZAG |
| 1985 11 30.77 | B | 5.8 | HD | 3.0 | B | | 8 | | | | | TSY |
| 1985 11 30.87 | B | 6.5 | A | 8 | R | | 8 | 8 | 3 | | | SHI03 |
| 1985 12 01.00 | B | 6.4 | HD | 20 | L | 5 | 35 | 8 | 5 | | | TSV |
| 1985 12 01.40 | B | 6.0 | AA | 5.0 | B | | 7 | 30 | | | | HAY01 |
| 1985 12 01.40 | B | 6.4 | AA | 12 | L | 6 | 40 | 15 | 5 | | | HAY01 |
| 1985 12 01.46 | B | 6.3 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 12 01.52 | M | 5.9 | AA | 10 | L | 10 | 40 | 15.3 | 4 | | 90 | ICH |
| 1985 12 01.53 | B | 6.0 | HD | 5.0 | B | | 7 | 7.7 | | | | KON |
| 1985 12 01.55 | M | 6.7 | AA | 12 | L | 6 | 36 | 4.8 | 5 | | | KIS |
| 1985 12 01.60 | S | 6.0 | AA | 15.3 | L | 9 | 33 | 6 | 4 | | | IWA01 |
| 1985 12 01.65 | M | 6.0 | SP | 3.0 | B | | 8 | 15 | | | | ZAG |
| 1985 12 01.67 | B | 6.2 | SP | 3.0 | B | | 8 | 16 | | | | ZAG |
| 1985 12 01.71 | B | 5.8 | HD | 8.0 | B | | 40 | | | | | PAL01 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 12 01.72 | E | 6.6 | SP | 7 | R | 14 | 30 | 10 | 4 | | | KAZ |
| 1985 12 01.74 | S | 4.8 | AA | 0.0 | E | | 1 | 19 | | | | CAV |
| 1985 12 01.77 | B | 7.0 | HD | 7 | L | 8 | 35 | 4.5 | 4 | | | RUD01 |
| 1985 12 02.46 | B | 6.3 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 12 02.53 | M | 6.0 | AA | 3.5 | B | | 7 | 15 | 5 | | | WAT02 |
| 1985 12 02.56 | B | 6.3 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 02.62 | M | 5.8 | AA | 10 | L | 10 | 40 | 22 | 5 | | 90 | ICH |
| 1985 12 02.67 | B | 5.7 | SP | 3.0 | B | 7 | 7 | 16 | | | | ZAG |
| 1985 12 02.69 | B | 5.4 | SP | 5.0 | B | | 7 | 15 | 5 | | | MOR04 |
| 1985 12 02.69 | B | 6.4 | HD | 5 | R | | 20 | 4.5 | | | | NES |
| 1985 12 02.76 | E | 6.6 | SP | 7 | R | 14 | 30 | 7.6 | 5 | | | KAZ |
| 1985 12 02.79 | B | 6.2 | A | 8 | R | | 8 | 15 | 3 | | | SHI03 |
| 1985 12 02.80 | B | 5.7 | SP | 3.0 | B | | 8 | 16 | | | | ZAG |
| 1985 12 02.92 | B | 6.1 | A | 8.0 | B | | 8 | 18 | 3 | | | SHI03 |
| 1985 12 03.52 | S | 6.2 | AA | 15.3 | L | 9 | 33 | 11 | 5 | | | IWA01 |
| 1985 12 03.56 | B | 6.3 | AA | 5.0 | B | | 7 | | | | | HAS04 |
| 1985 12 03.57 | B | 6.3 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 03.58 | B | 6.1 | HD | 5.0 | B | | 7 | 12 | | | | KON |
| 1985 12 03.69 | B | 6.1 | SP | 3.0 | B | | 8 | 16 | | | | ZAG |
| 1985 12 03.71 | B | 6.3 | HD | 5 | R | | 20 | 4.5 | | | | NES |
| 1985 12 03.73 | M | 6.3 | SP | 4.0 | B | | 12 | 25 | 5 | | | MAY02 |
| 1985 12 03.74 | B | 6.2 | HD | 7 | L | 8 | 33 | | | | | BEZ |
| 1985 12 03.75 | B | 5.8 | HD | 3.0 | B | | 8 | | | | | TSY |
| 1985 12 03.76 | S | 6.1 | A | 8 | R | | 8 | 10 | 3 | | | SHI03 |
| 1985 12 03.84 | B | 5.3 | SP | 5.0 | B | | 7 | 18 | 5 | | | MOR04 |
| 1985 12 03.87 | S | 6.1 | A | 3.0 | B | | 8 | 18 | 4 | | | SHI03 |
| 1985 12 04.43 | B | 5.9 | HD | 21 | L | | 80 | 9 | 5 | | | KNY |
| 1985 12 04.60 | B | 6.1 | SP | 5.0 | B | | 7 | 15 | | | | ZAG |
| 1985 12 04.62 | B | 5.7 | SP | 3.0 | B | | 8 | 17 | | | | ZAG |
| 1985 12 04.62 | B | 5.8 | SP | 5 | R | 8 | 20 | 14 | | | | ZAG |
| 1985 12 04.64 | B | 6.2 | HD | 5.0 | B | | 7 | 19 | | | | KON |
| 1985 12 04.65 | M | 5.8 | AA | 3.5 | B | | 7 | 20 | 6 | | | WAT02 |
| 1985 12 05.40 | S | 6.0 | AA | 15.3 | L | 9 | 33 | 10 | 5 | | | IWA01 |
| 1985 12 05.41 | B | 5.9 | HD | 12 | L | | 40 | 9 | | | | KNY |
| 1985 12 05.46 | B | 5.6 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1985 12 05.46 | B | 6.5 | AA | 12 | L | 6 | 40 | 15 | 4/ | | | HAY01 |
| 1985 12 05.54 | B | 6.2 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 05.58 | B | 5.8 | HD | 5.0 | B | | 7 | 13 | | | | KON |
| 1985 12 05.58 | G | 5.0 | HD | 0.0 | E | | 1 | | | | | POR01 |
| 1985 12 05.59 | M | 5.5 | AA | 3.5 | B | | 7 | 25 | 5 | | | WAT02 |
| 1985 12 05.71 | B | 5.7 | SP | 3.0 | B | | 8 | 17 | | | | ZAG |
| 1985 12 05.71 | B | 6.2 | HD | 14 | R | 14 | 200 | 6.5 | | 0.1 | 110 | SHI04 |
| 1985 12 05.77 | B | 5.7 | HD | 7 | L | 8 | 33 | 6 | 5 | | | SHI02 |
| 1985 12 06.58 | B | 6.0 | HD | 5.0 | B | | 7 | 12 | | | | KON |
| 1985 12 06.67 | B | 5.3 | SP | 5.0 | B | | 7 | 20 | 5 | | | MOR04 |
| 1985 12 06.68 | B | 6.3 | HD | 4 | R | 6 | 18 | 20 | | | | DRA01 |
| 1985 12 06.69 | B | 5.7 | A | 11 | R | | | | | | | CHU |
| 1985 12 06.70 | B | 6.3 | HD | 4 | R | 6 | 18 | 20 | 4 | | | DRA |
| 1985 12 06.71 | B | 6.2 | HD | 10 | L | 10 | 169 | 6.5 | 3 | 0.1 | 110 | SHI04 |
| 1985 12 06.73 | B | 5.2 | A | 5.0 | B | 4 | 7 | | 6 | | | CHE03 |
| 1985 12 06.73 | B | 6.5 | A | 20.0 | R | | | | | | | CHU |
| 1985 12 07.44 | B | 5.9 | HD | 21 | L | | 80 | 9.4 | 5 | | | KNY |
| 1985 12 07.49 | B | 6.3 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 07.60 | B | 5.5 | AA | 5.0 | B | | 7 | 30 | | | | HAY01 |
| 1985 12 07.69 | B | 6.3 | HD | 7 | L | 8 | 33 | 5.7 | 2 | | | YUR |
| 1985 12 07.71 | M | 6.3 | SP | 4.0 | B | | 12 | 27 | 6 | | | MAY02 |
| 1985 12 07.79 | B | 5.5 | HD | 7 | L | 8 | 33 | 10 | 3 | | | SHI02 |
| 1985 12 07.79 | B | 5.6 | HD | 3.0 | B | | 8 | | | | | TSY |
| 1985 12 07.81 | E | 6.0 | HD | 5.0 | B | | 7 | | | | | PIS |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 12 07.91 | B | 6.6 | HD | 7 | L | 8 | 33 | 3 | 6 | 0.1 | | RUD01 |
| 1985 12 08.44 | B | 5.9 | HD | 21 | L | | 80 | 10 | 5 | | | KNY |
| 1985 12 08.52 | B | 6.0 | HD | 5 | R | | 7 | | | | | KON |
| 1985 12 08.55 | B | 6.2 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 08.61 | M | 6.2 | AA | 10 | L | 10 | 56 | 3.5 | 5 | | | ICH |
| 1985 12 08.65 | B | 5.5 | SP | 8.0 | B | | 8 | 15 | | | | GOL |
| 1985 12 08.67 | B | 5.2 | A | 5 | R | 4 | 7 | 20 | 6 | | | CHE03 |
| 1985 12 08.71 | M | 6.2 | SP | 4 | R | | 12 | 28 | 6 | | | MAY02 |
| 1985 12 08.73 | B | 6.3 | A | 15 | L | | | | | | | KOR01 |
| 1985 12 08.82 | B | 6.3 | HD | 4 | R | 6 | 18 | 20 | | | | DRA01 |
| 1985 12 08.82 | B | 6.3 | HD | 4 | R | 6 | 18 | 20 | 4 | | | DRA |
| 1985 12 09.48 | B | 5.9 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1985 12 09.48 | B | 6.2 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 09.48 | B | 6.5 | S | 15 | L | 6 | 23 | 12 | 5 | | | TAN03 |
| 1985 12 09.48 | B | 7.1 | S | 15 | L | 6 | 34 | 12 | 6 | | | TAN03 |
| 1985 12 09.53 | B | 5.6 | AA | 5.0 | B | | 7 | 20 | | | | HAY01 |
| 1985 12 09.53 | B | 6.3 | AA | 12 | L | 6 | 40 | 10 | 5/ | | | HAY01 |
| 1985 12 09.58 | B | 6.0 | A | 5.0 | B | 7 | 7 | 4 | 6 | 4.5 | 62 | GUR |
| 1985 12 09.63 | B | 5.0 | A | 8.0 | B | | 8 | 17 | | | | GOL |
| 1985 12 09.64 | B | 5.5 | A | 11 | R | 7 | | | | | | CHU |
| 1985 12 09.64 | B | 5.9 | A | 15 | L | | | | | | | KOR01 |
| 1985 12 09.65 | B | 6.0 | HD | 7 | L | 8 | 33 | | | | | MAR04 |
| 1985 12 09.66 | B | 5.7 | HD | 10 | R | | 30 | | | | | LYU |
| 1985 12 09.69 | B | 6.1 | HD | 8 | R | | 29 | 4 | | 0.3 | | NES |
| 1985 12 09.72 | S | 5.7 | A | 8 | R | 10 | 29 | | 5 | | | GOL01 |
| 1985 12 09.73 | B | 5.4 | HD | 8.0 | B | | 8 | 12 | | | | CHU01 |
| 1985 12 09.73 | B | 5.4 | SP | 8.0 | B | | 8 | 12 | | | | NAV |
| 1985 12 09.73 | B | 5.6 | SP | 8 | R | 10 | 29 | 10 | | | | DYA |
| 1985 12 09.73 | B | 5.6 | SP | 8 | R | 10 | 29 | 12 | | | | DAN |
| 1985 12 09.73 | B | 5.7 | SP | 6 | R | 10 | 28 | | | | | KAM02 |
| 1985 12 09.73 | B | 5.7 | SP | 6 | R | 10 | 28 | | | | | PLE02 |
| 1985 12 09.73 | G | 5.6 | SP | 0.0 | E | | 1 | 14 | 5 | | | DZH |
| 1985 12 09.73 | G | 5.6 | SP | 0.0 | E | | 1 | 14 | 5 | | | KOL |
| 1985 12 09.73 | G | 5.6 | SP | 0.0 | E | | 1 | 14 | 5 | | | SLA |
| 1985 12 09.73 | S | 5.8 | HD | 6 | R | 10 | 28 | 9 | 2 | | | MUR |
| 1985 12 09.75 | S | 5.8 | A | 8.0 | B | | 8 | 15 | 5 | | | SHI03 |
| 1985 12 09.79 | B | 5.7 | A | 3.0 | B | | 8 | 18 | 4 | | | SHI03 |
| 1985 12 10.38 | M | 5.5 | AA | 3.5 | B | | 7 | 25 | 6 | | | WAT03 |
| 1985 12 10.38 | M | 5.5 | AA | 3.5 | B | | 7 | 30 | 6 | | | WAT02 |
| 1985 12 10.45 | B | 6.0 | AA | 5.0 | B | | 7 | | 3 | | | HAS04 |
| 1985 12 10.50 | B | 5.7 | AA | 3.5 | B | | 7 | | | | | OKA02 |
| 1985 12 10.57 | M | 5.4 | AA | 10 | L | 10 | 25 | 5.0 | 5 | 0.67 | 85 | ICH |
| 1985 12 10.65 | S | 5.7 | A | 8 | R | 10 | 29 | | | | | GOL01 |
| 1985 12 10.68 | B | 6.2 | HD | 7 | R | 8 | 33 | | | | | MAR04 |
| 1985 12 10.70 | B | 5.1 | A | 8.0 | B | | 8 | 17 | | | | GOL |
| 1985 12 10.73 | B | 5.7 | HD | 8.0 | B | | 8 | 12 | | | | ROG03 |
| 1985 12 10.73 | B | 5.7 | SP | 6 | R | 10 | 28 | | | | | KAM02 |
| 1985 12 10.73 | B | 5.7 | SP | 6 | R | 10 | 28 | | | | | PLE02 |
| 1985 12 10.73 | B | 5.7 | SP | 8.0 | B | | 8 | 12 | | | | ZHI |
| 1985 12 11.43 | S | 5.7 | AA | 10 | L | 10 | 40 | 7.5 | 6 | | | ICH |
| 1985 12 11.44 | B | 5.9 | SP | 21 | L | | 80 | 11 | 4 | | | KNY |
| 1985 12 11.46 | B | 6.0 | AA | 5.0 | B | | 7 | | 3 | | | HAS04 |
| 1985 12 11.48 | B | 6.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 11.50 | B | 7.0 | S | 15 | L | 6 | 34 | 12 | 5 | | | TAN03 |
| 1985 12 11.51 | B | 6.0 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1985 12 11.51 | B | 7.1 | S | 15 | L | 6 | 23 | 12 | 5 | | | TAN03 |
| 1985 12 11.56 | M | 5.3 | AA | 10 | L | 10 | 40 | 10 | 5/ | 0.67 | 75 | ICH |
| 1985 12 11.70 | B | 5.7 | A | 20 | R | 15 | | | | | | CHU |
| 1985 12 11.73 | B | 6.0 | HD | 8.0 | B | | 40 | | | | | PAL01 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 12 11.75 | S | 5.6 | A | 8 | R | 10 | 29 | | | | | GOL |
| 1985 12 11.80 | B | 5.1 | A | 11 | R | 7 | | 20 | 6 | 0.3 | 70 | CHU |
| 1985 12 12.39 | B | 5.5 | AA | 5.0 | B | | 7 | 25 | | | | HAY01 |
| 1985 12 12.50 | B | 5.5 | AA | 3.5 | B | | 7 | 10 | | | | OKA02 |
| 1985 12 12.53 | S | 5.7 | AA | 15.3 | L | 9 | 33 | 8 | 5 | | | IWA01 |
| 1985 12 12.57 | B | 6.0 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 12.60 | B | 5.3 | A | 11 | R | 7 | | 25 | 6 | 1 | 70 | CHU |
| 1985 12 12.71 | B | 5.8 | HD | 8.0 | B | | 40 | | | | | PAL01 |
| 1985 12 12.73 | S | 5.6 | A | 8 | R | 10 | 29 | | | | | GOL01 |
| 1985 12 12.74 | S | 4.1 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1985 12 12.78 | B | 5.4 | SP | 8.0 | B | | 8 | | | | | CHU01 |
| 1985 12 12.78 | B | 5.4 | SP | 8.0 | B | | 8 | | | | | NAV |
| 1985 12 12.78 | B | 5.4 | SP | 8.0 | B | | 8 | | 3 | | | DZH |
| 1985 12 12.78 | B | 5.4 | SP | 8.0 | B | | 8 | | 3 | | | KOL |
| 1985 12 12.78 | B | 5.4 | SP | 8.0 | B | | 8 | | 3 | | | SLA |
| 1985 12 12.78 | B | 5.6 | HD | 8 | R | 10 | 29 | | | | | GOL01 |
| 1985 12 12.79 | B | 5.2 | HD | 8.0 | B | | 8 | 7 | | | | GOL |
| 1985 12 13.38 | M | 5.4 | AA | 3.5 | B | | 7 | 25 | 6 | | | WAT03 |
| 1985 12 13.40 | M | 5.4 | AA | 3.5 | B | | 7 | 25 | 6 | | | WAT02 |
| 1985 12 13.45 | B | 5.7 | AA | 5.0 | B | | 7 | 25 | | | | HAY01 |
| 1985 12 13.52 | B | 5.6 | HD | 5.0 | B | | 7 | 5 | 6 | 3 | 61 | GUR |
| 1985 12 13.52 | B | 5.6 | HD | 5.0 | B | | 7 | 7 | | | | KON |
| 1985 12 13.53 | M | 5.5 | AA | 20 | R | 12 | 25 | 5.9 | 7 | 0.33 | 90 | ICH |
| 1985 12 13.54 | B | 6.0 | AA | 5.0 | B | | 7 | | 3 | | | HAS04 |
| 1985 12 13.57 | B | 5.9 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 13.66 | M | 6.1 | HD | 4.0 | B | | 12 | 28 | 6 | | | MAY02 |
| 1985 12 13.67 | B | 5.2 | A | 8.0 | B | | 8 | 12 | | | | GOL |
| 1985 12 13.68 | B | 5.0 | SP | 5.0 | B | | 7 | 20 | 5 | | | MOR04 |
| 1985 12 13.68 | B | 5.0 | SP | 5.0 | B | | 7 | 20 | 5 | | | MOR04 |
| 1985 12 13.68 | B | 5.9 | HD | 7 | L | 8 | 33 | 6 | 3 | | | YUR |
| 1985 12 13.69 | B | 6.2 | HD | 10 | R | 10 | 169 | 7.5 | 2 | &0.1 | 130 | SHI04 |
| 1985 12 13.70 | B | 5.4 | HD | 5.0 | B | | 7 | 38 | 3 | 1.2 | | BUD |
| 1985 12 13.73 | B | 5.2 | A | 11 | R | 7 | | | | | | CHU |
| 1985 12 13.76 | B | 5.4 | HD | 8.0 | B | | 8 | 15 | 4 | 0.2 | | MUR |
| 1985 12 13.76 | B | 5.4 | SP | 8.0 | B | | | 18 | 3 | | | DZH |
| 1985 12 13.76 | B | 5.4 | SP | 8.0 | B | | 8 | 12 | | | | DYA |
| 1985 12 13.76 | B | 5.4 | SP | 8.0 | B | | 8 | 13 | | | | DAN |
| 1985 12 13.76 | B | 5.5 | SP | 6 | R | 10 | 28 | | | | | KAM02 |
| 1985 12 13.76 | B | 5.5 | SP | 6 | R | 10 | 28 | | | | | PLE02 |
| 1985 12 13.76 | B | 5.5 | SP | 8.0 | B | | | 18 | 3 | | | KOL |
| 1985 12 13.76 | B | 5.5 | SP | 8.0 | B | | | 18 | 3 | | | SLA |
| 1985 12 13.76 | B | 5.6 | A | 8 | R | 10 | 29 | | | | | GOL01 |
| 1985 12 13.80 | B | 5.8 | HD | 5 | R | | 20 | 3 | | | | NES |
| 1985 12 14.44 | B | 6.9 | S | 15 | L | 6 | 23 | 13 | 7 | 0.33 | 85 | TAN03 |
| 1985 12 14.53 | M | 5.4 | AA | 10 | L | 10 | 56 | 5.8 | | | 90 | ICH |
| 1985 12 14.73 | S | 5.4 | A | 8 | R | 10 | 29 | | | | | GOL01 |
| 1985 12 14.77 | B | 5.2 | A | 8 | R | | 8 | 15 | | | | GOL |
| 1985 12 14.77 | S | 5.4 | HD | 6 | R | 10 | 28 | 4 | 3 | 0.1 | | MUR |
| 1985 12 14.78 | B | 5.3 | SP | 8.0 | B | | | | 4 | | | DZH |
| 1985 12 14.78 | B | 5.3 | SP | 8.0 | B | | | 15 | 4 | | | KOL |
| 1985 12 14.78 | B | 5.3 | SP | 8.0 | B | | | 15 | 4 | | | SLA |
| 1985 12 14.78 | B | 5.5 | SP | 8 | R | 10 | 29 | 13 | | | | DAN |
| 1985 12 14.85 | B | 4.8: | HD | 11.0 | B | | | | | | | CHU |
| 1985 12 15.38 | S | 5.9 | AA | 15.3 | L | 9 | 33 | 10 | 4 | | | IWA01 |
| 1985 12 15.44 | B | 5.9 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 15.50 | M | 4.8 | AA | 10 | L | 10 | 25 | 9 | 5 | 0.33 | 90 | ICH |
| 1985 12 15.52 | M | 4.4 | AA | 13 | L | 6 | 32 | 12.1 | 4 | | | INO |
| 1985 12 15.62 | B | 5.6 | HD | 5.0 | B | | 7 | | | | | KON |
| 1985 12 15.66 | B | 5.3 | A | 11 | R | | | | | | | CHU |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 12 15.73 | S | 4.1 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1985 12 16.35 | M | 5.2 | AA | 3.5 | B | | 7 | 20 | 6 | | | WAT03 |
| 1985 12 16.35 | M | 5.2 | AA | 3.5 | B | | 7 | 25 | 6 | | | WAT02 |
| 1985 12 16.39 | B | 5.8 | SP | 21 | L | | 80 | 11 | 4 | | | KNY |
| 1985 12 16.48 | B | 5.8 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 16.49 | B | 5.6 | AA | 5.0 | B | | 7 | 30 | | | | HAY01 |
| 1985 12 16.54 | B | 5.8 | AA | 5.0 | B | | 7 | | 5 | | | HAS04 |
| 1985 12 16.54 | M | 5.3 | AA | 10 | L | 10 | 25 | 6.8 | | | 80 | ICH |
| 1985 12 16.55 | B | 5.8 | HD | 5.0 | B | | 7 | | | | | KON |
| 1985 12 16.64 | B | 5.9 | HD | 5 | R | | 20 | 5 | | | | NES |
| 1985 12 16.79 | B | 4.8 | A | 11 | R | 7 | | 15 | 5 | 0.7 | 66 | CHU |
| 1985 12 16.79 | B | 5.3 | A | 20 | R | 15 | | | | | | CHU |
| 1985 12 17.48 | B | 5.5 | HD | 5.0 | B | | 7 | 5 | 6 | 3 | 62 | GUR |
| 1985 12 17.48 | M | 5.7 | AA | 12 | L | 6 | 36 | 4.7 | 6 | | | KIS |
| 1985 12 17.49 | B | 6.2 | HD | 5.0 | B | | 7 | | | | | SIK |
| 1985 12 17.56 | B | 5.4 | A | 20 | R | | | | | | | CHU |
| 1985 12 17.56 | M | 4.6 | AA | 5.0 | B | | 20 | 20 | 4 | 1.0 | 80 | ICH |
| 1985 12 17.60 | B | 6.8 | SP | 5.0 | B | | 7 | 7 | 4 | | | MOR04 |
| 1985 12 17.60 | S | 5.0 | SP | 5 | R | 8 | 20 | 18 | | | | ZAG |
| 1985 12 17.62 | B | 4.8 | A | 11 | R | | | 25 | 6 | 1.5 | 66 | CHU |
| 1985 12 17.64 | B | 5.2 | SP | 3.0 | B | | 8 | 17 | | | | ZAG |
| 1985 12 17.71 | B | 5.7 | HD | 5.0 | B | | 7 | 4 | | | | NES |
| 1985 12 17.91 | M | 5.9 | W | 20.0 | L | 6 | 40 | 17 | 5 | | | LOZ |
| 1985 12 18.00 | B | 5.3 | A | 20 | L | 5 | 35 | 12 | 5 | | | TSV |
| 1985 12 18.38 | M | 5.0 | AA | 3.5 | B | | 7 | 20 | 6 | | | WAT03 |
| 1985 12 18.39 | M | 5.0 | AA | 3.5 | B | | 7 | 20 | 6 | | | WAT02 |
| 1985 12 18.42 | B | 5.5 | AA | 5.0 | B | | 7 | 25 | | | | HAY01 |
| 1985 12 18.44 | M | 5.7 | AA | 12 | L | 6 | 36 | 5.5 | 6 | | | KIS |
| 1985 12 18.48 | B | 5.8 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 18.50 | B | 5.7 | HD | 5.0 | B | | 7 | | 5 | 2 | 60 | GUR |
| 1985 12 18.57 | B | 5.7 | HD | 5.0 | B | | 7 | | | | | KON |
| 1985 12 18.65 | B | 5.7 | HD | 5.0 | B | | 7 | 4 | | | | NES |
| 1985 12 18.65 | B | 5.7 | HD | 7 | L | 8 | 33 | 12 | 2 | | | SHI02 |
| 1985 12 18.70 | B | 5.0 | A | 11 | R | 7 | | 15 | 6 | | | CHU |
| 1985 12 18.79 | B | 5.3 | HD | 3.0 | B | | 8 | | | | | TSY |
| 1985 12 18.86 | B | 5.0 | A | 5 | R | 4 | 7 | | 6 | | | CHE03 |
| 1985 12 19.48 | B | 5.5 | HD | 5.0 | B | | 7 | | 5 | 2 | 60 | GUR |
| 1985 12 19.48 | B | 6.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 19.54 | B | 6.3 | HD | 5.0 | B | | 7 | | | | | KON |
| 1985 12 19.55 | B | 4.9 | A | 11 | R | 7 | | | | | | CHU |
| 1985 12 19.60 | B | 5.9 | HD | 5.0 | B | | 7 | | | | | PON |
| 1985 12 19.67 | B | 5.6 | HD | 7 | L | 8 | 33 | 7 | 3 | | | YUR |
| 1985 12 19.69 | B | 5.3 | A | 20 | R | 15 | | | | | | CHU |
| 1985 12 19.70 | B | 5.0 | SP | 5.0 | B | | 7 | 12 | 5 | | | MOR04 |
| 1985 12 19.71 | E | 5.9 | HD | 8 | R | | | 25 | 6 | | | MAY02 |
| 1985 12 20.42 | M | 4.9 | AA | 3.5 | B | | 7 | 18 | 6 | | | WAT02 |
| 1985 12 20.43 | M | 4.9 | AA | 3.5 | B | | 7 | 18 | 6 | | | WAT03 |
| 1985 12 20.47 | M | 5.5 | AA | 12 | L | 6 | 36 | 4.7 | 6 | | | KIS |
| 1985 12 20.69 | B | 6.5: | HD | 3.0 | B | | 8 | 8 | | | | ZIN |
| 1985 12 21.44 | B | 5.8 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 21.50 | M | 5.7 | AA | 12 | L | 6 | 36 | 3.5 | 5 | | | KIS |
| 1985 12 21.65 | B | 4.6 | HD | 5.0 | B | | 7 | 50 | 6 | 2.2 | 40 | BUD |
| 1985 12 21.69 | B | 5.4 | HD | 5.0 | B | | 7 | 3 | | | | NES |
| 1985 12 23.36 | M | 5.0 | AA | 3.5 | B | | 7 | 15 | 6 | | | WAT02 |
| 1985 12 23.37 | M | 5.0 | AA | 3.5 | B | | 7 | 15 | 6 | | | WAT03 |
| 1985 12 23.42 | B | 6.5 | S | 15 | L | 6 | 23 | 10 | 6 | | | TAN03 |
| 1985 12 23.53 | B | 6.0 | HD | 5.0 | B | | 7 | | | | | KON |
| 1985 12 23.67 | B | 4.9 | SP | 5.0 | B | | 7 | 12 | 5 | | | MOR04 |
| 1985 12 23.67 | M | 5.7 | HD | 4.0 | B | | 12 | 23 | 6 | | | MAY02 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 12 24.38 | B | 5.5 | AA | 5.0 | B | | 7 | 25 | | | | HAY01 |
| 1985 12 24.38 | M | 4.9 | AA | 3.5 | B | | 7 | 10 | 6 | | | WAT02 |
| 1985 12 24.38 | M | 4.9 | AA | 3.5 | B | | 7 | 10 | 6 | | | WAT03 |
| 1985 12 24.42 | M | 5.3 | AA | 12 | L | 6 | 36 | 6.4 | 6 | | | KIS |
| 1985 12 24.46 | M | 5.3 | AA | 5.0 | B | | 7 | 10 | 5 | 0.83 | 95 | ICH |
| 1985 12 24.48 | B | 5.8 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 24.70 | B | 4.8 | SP | 5.0 | B | | 7 | 12 | 5 | | | MOR04 |
| 1985 12 24.70 | M | 5.7 | HD | 4.0 | B | | 12 | 20 | 6 | | | MAY02 |
| 1985 12 25.55 | B | 5.8 | HD | 5.0 | B | | 7 | | | | | PON |
| 1985 12 25.70 | B | 4.8 | SP | 5.0 | B | | 7 | 10 | 5 | | | MOR04 |
| 1985 12 25.70 | M | 5.7 | HD | 4.0 | B | | 12 | 20 | 6 | | | MAY02 |
| 1985 12 25.73 | B | 5.3 | HD | 5 | R | | 20 | 3 | | | | NES |
| 1985 12 25.81 | M | 5.6 | W | 5.0 | B | | 16 | 20 | 5 | | | LOZ |
| 1985 12 26.41 | M | 5.0 | AA | 3.5 | B | | 7 | 10 | 6 | | | WAT02 |
| 1985 12 26.41 | M | 5.0 | AA | 3.5 | B | | 7 | 10 | 6 | | | WAT03 |
| 1985 12 27.40 | B | 5.0 | AA | 3.5 | B | | 7 | | | | | OKA02 |
| 1985 12 27.42 | M | 5.0 | AA | 12 | L | 6 | 36 | 6.2 | 6 | | | KIS |
| 1985 12 27.42 | M | 5.2 | AA | 3.5 | B | | 7 | 8 | 5 | | | WAT03 |
| 1985 12 27.43 | M | 5.2 | AA | 3.5 | B | | 7 | 10 | 5 | | | WAT02 |
| 1985 12 27.48 | B | 6.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 27.58 | B | 5.8 | HD | 5.0 | B | | 7 | | | | | PON |
| 1985 12 27.71 | S | 4.3 | AA | 5.0 | B | | 10 | 8 | 8 | | | CAV |
| 1985 12 28.40 | B | 5.5 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 28.57 | B | 5.4 | HD | 5.0 | B | | 7 | 5 | 4 | 2 | 60 | GUR |
| 1985 12 29.42 | B | 5.2 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1985 12 29.45 | M | 5.0 | AA | 13 | L | 6 | 47 | 6 | | | | ICH |
| 1985 12 29.50 | B | 5.8 | HD | 5.0 | B | | 7 | | | | | KON |
| 1985 12 29.56 | B | 5.7 | HD | 5.0 | B | | 7 | | | | | PON |
| 1985 12 29.67 | B | 4.8 | SP | 5.0 | B | | 7 | 12 | 5 | | | MOR04 |
| 1985 12 29.70 | B | 5.3 | HD | 7 | L | 8 | 33 | 13 | 2 | | | SHI02 |
| 1985 12 29.73 | B | 5.2 | HD | 3.0 | B | | 8 | | | | | TSY |
| 1985 12 30.60 | B | 5.6 | HD | 5.0 | B | | 7 | | | | | PON |
| 1985 12 30.68 | B | 4.9 | A | 5 | R | 4 | 7 | 8 | 6 | 2.5 | 66 | CHE03 |
| 1985 12 30.68 | B | 5.1 | A | 20 | L | 4 | 30 | 5.5 | 6 | 1 | 66 | SEL |
| 1985 12 30.72 | B | 5.3 | HD | 8.0 | B | | 40 | | | | | PAL01 |
| 1985 12 30.79 | M | 5.5 | W | 5.0 | B | | 10 | 20 | 5 | | | LOZ |
| 1985 12 31.38 | S | 4.7 | AA | 15.3 | L | 9 | 52 | 4 | 5 | | | IWA01 |
| 1985 12 31.40 | B | 5.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1985 12 31.63 | B | 4.9 | HD | 5.0 | B | | 7 | 4 | | 0.5 | | NES |
| 1985 12 31.64 | M | 5.6 | HD | 4.0 | B | | 12 | 15 | 6 | | | MAY02 |
| 1985 12 31.67 | B | 4.7 | SP | 5.0 | B | | 7 | 12 | 5 | | | MOR04 |
| 1985 12 31.67 | B | 4.7 | SP | 16 | L | | 30 | | | 1 | 52 | MOR04 |
| 1985 12 31.67 | B | 5.1 | A | 8.0 | B | | 8 | 10 | | | | GOL |
| 1985 12 31.79 | M | 5.4 | W | 5.0 | B | | 10 | 20 | 6 | | | LOZ |
| 1986 01 01.40 | B | 5.5 | HD | 12 | L | | 40 | 8 | 4 | 0.3 | | KNY |
| 1986 01 01.58 | B | 5.2 | HD | 5.0 | B | | 7 | 4 | | 0.3 | | NES |
| 1986 01 01.64 | B | 5.6 | HD | 5.0 | B | | 7 | | 3 | | | MAM |
| 1986 01 02.38 | M | 4.4 | AA | 10 | L | 10 | 56 | 6.2 | 5 | 1.5 | 75 | ICH |
| 1986 01 02.38 | M | 5.1 | AA | 3.5 | B | | 7 | 15 | 6 | | | WAT02 |
| 1986 01 02.40 | B | 5.1 | WW | 3.5 | B | | 7 | | | 1 | | OKA02 |
| 1986 01 02.40 | M | 4.5 | AA | 10 | L | 10 | 25 | 12.5 | 6 | | | ICH |
| 1986 01 02.42 | S | 4.7 | AA | 15.3 | L | 9 | 52 | 4 | 5 | 0.13 | 50 | IWA01 |
| 1986 01 02.43 | B | 5.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1986 01 02.44 | B | 4.9 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 01 02.75 | B | 5.3 | A | 11.0 | B | | 20 | &15 | 6 | &1 | | SHI03 |
| 1986 01 03.37 | B | 4.9 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 01 03.40 | B | 5.3 | AA | 5.0 | B | | 7 | | 6 | | | HAS04 |
| 1986 01 03.58 | B | 4.3 | HD | 0.0 | E | | 1 | | | | | POR01 |
| 1986 01 03.78 | B | 5.2 | A | 11.0 | B | | 20 | | 6 | &1 | | SHI03 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 01 03.81 | M | 5.4 | WW | 5.0 | B | | 10 | 20 | 6 | | | LOZ |
| 1986 01 04.39 | S | 4.8 | AA | 15.3 | L | 9 | 33 | 4 | 4 | | 50 | IWA01 |
| 1986 01 04.43 | M | 5.3 | AA | 20 | C | 10 | 50 | 5.7 | 6 | | | ICH |
| 1986 01 04.43 | S | 4.9 | AA | 7.0 | B | | 10 | 11 | 5 | 0.67 | 60 | ICH |
| 1986 01 04.44 | B | 4.9 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1986 01 04.50 | B | 5.5 | HD | 5.0 | B | | 7 | 5 | 7 | 0.4 | 45 | KON |
| 1986 01 04.54 | B | 5.0 | HD | 5.0 | B | | 7 | 5 | 7 | | | SIK |
| 1986 01 04.59 | B | 4.7 | SP | 3.0 | B | | 8 | 18 | | | | ZAG |
| 1986 01 04.73 | S | 4.0 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 01 05.38 | B | 4.8 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 01 05.39 | B | 5.1 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 01 05.40 | M | 4.2 | AA | 12 | L | 6 | 36 | 7.6 | 6 | | | KIS |
| 1986 01 05.41 | M | 4.2 | AA | 10 | L | 10 | 40 | 6.2 | 7 | | | ICH |
| 1986 01 05.42 | B | 4.7 | AA | 5.0 | B | | 7 | | 7 | | | HAS04 |
| 1986 01 05.43 | B | 4.9 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1986 01 05.52 | B | 4.9 | HD | 5.0 | B | | | 5 | 7 | 0.4 | 40 | KON |
| 1986 01 05.54 | B | 5.0 | HD | 5.0 | B | | 7 | 5 | | | | SIK |
| 1986 01 05.54 | B | 5.0 | SP | 3.0 | B | | 8 | 16 | | | | ZAG |
| 1986 01 05.55 | B | 5.1 | HD | 5.0 | B | | 7 | 3 | 5 | | | PET |
| 1986 01 05.58 | S | 5.1 | SP | 3.0 | B | | 8 | 15 | | | | ZAG |
| 1986 01 05.60 | G | 4.2 | HD | 0.0 | E | | 1 | | | | | POR01 |
| 1986 01 05.68 | B | 4.9 | A | 20 | L | 4 | 30 | 6 | 6 | 0.8 | 66 | SEL |
| 1986 01 05.71 | B | 4.8 | HD | 8.0 | B | | 40 | | | | | PAL01 |
| 1986 01 05.72 | B | 4.4 | A | 5 | R | 4 | 7 | 8 | 6 | >2 | 60 | CHE03 |
| 1986 01 05.81 | M | 5.2 | WW | 5.0 | B | | 10 | 22 | 6 | | | LOZ |
| 1986 01 06.41 | M | 4.1 | AA | 12 | L | 6 | 36 | 7.6 | 7 | | | KIS |
| 1986 01 06.42 | B | 5.2 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1986 01 06.42 | B | 5.3 | AA | 5.0 | B | | 7 | | 5 | | | HAS04 |
| 1986 01 06.46 | B | 4.9 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1986 01 06.52 | B | 5.6 | HD | 5.0 | B | | 7 | 5 | 6 | >0.1 | 61 | GUR |
| 1986 01 06.54 | B | 4.6 | SP | 3.0 | B | | 8 | 19 | | | | ZAG |
| 1986 01 06.58 | S | 5.0 | SP | 5 | R | 8 | 20 | | | | | ZAG |
| 1986 01 06.60 | M | 4.5 | SP | 3.0 | B | | 8 | 13 | | | | ZAG |
| 1986 01 06.62 | B | 4.8 | SP | 5.0 | B | | 7 | 10 | 4 | 2 | 63 | MOR04 |
| 1986 01 06.65 | B | 5.3 | HD | 7 | L | 8 | 33 | 9 | 4 | | | YUR |
| 1986 01 06.65 | M | 5.6 | HD | 4.0 | B | | 12 | 13 | 6 | 0.7 | | MAY02 |
| 1986 01 06.68 | E | 5.7 | HD | 5.0 | B | | 7 | | | | | PIS |
| 1986 01 07.40 | B | 5.2 | HD | 12 | L | | 40 | 4 | 4 | 0.3 | | KNY |
| 1986 01 07.43 | M | 4.1 | AA | 12 | L | 6 | 36 | 3.8 | 7 | | | KIS |
| 1986 01 07.53 | B | 4.6 | SP | 3.0 | B | | 8 | 20 | | | | ZAG |
| 1986 01 07.55 | B | 4.6 | A | 10.0 | B | | 20 | | | >2 | 66 | CHU |
| 1986 01 07.59 | M | 4.5 | SP | 3.0 | B | | 8 | 12 | | | | ZAG |
| 1986 01 07.60 | G | 4.1 | HD | 0.0 | E | | 1 | | | | | POR01 |
| 1986 01 07.62 | B | 4.1 | A | 4.0 | B | | 12 | | | 0.2 | | KOR01 |
| 1986 01 07.63 | B | 5.0 | HD | 8 | R | | 29 | 3 | | 0.8 | | NES |
| 1986 01 08.38 | B | 4.6 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 01 08.38 | B | 4.9 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1986 01 08.39 | B | 4.7 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 01 08.40 | B | 4.7 | AA | 5.0 | B | | 7 | | 7 | | | HAS04 |
| 1986 01 08.46 | M | 4.2 | AA | 10 | L | 10 | 40 | 10 | | | | ICH |
| 1986 01 08.60 | B | 4.4 | SP | 3.0 | B | | 8 | 20 | | | | ZAG |
| 1986 01 08.68 | B | 5.0 | A | 10.0 | B | | | | | >2 | 66 | CHU |
| 1986 01 08.78 | M | 4.9 | WW | 5.0 | B | | 10 | 25 | 6 | 1 | 320 | LOZ |
| 1986 01 09.38 | M | 5.0 | AA | 3.5 | B | | 7 | 15 | 5 | | | WAT02 |
| 1986 01 09.39 | B | 4.5 | WW | 3.5 | B | | 7 | | | 1 | | OKA02 |
| 1986 01 09.39 | B | 4.7 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 01 09.40 | B | 4.7 | WW | 5.0 | B | | 7 | | 5 | | | HAS04 |
| 1986 01 09.43 | B | 4.9 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1986 01 09.43 | B | 5.1 | AA | 7.0 | B | | 10 | | | | | DAT |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 01 09.58 | B | 4.8 | HD | 3.0 | B | | 8 | 13 | | | | ZAG |
| 1986 01 09.59 | B | 4.8 | SP | 3.0 | B | | 8 | 11 | | | | ZAG |
| 1986 01 09.60 | B | 4.7 | A | 11 | R | | | | | | | CHU |
| 1986 01 09.61 | B | 5.1 | HD | 5.0 | B | | 7 | | 3 | | | MAM |
| 1986 01 09.74 | S | 4.0 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 01 10.38 | B | 4.6 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 01 10.38 | M | 4.8 | WW | 3.5 | B | | 7 | 20 | 6 | 0.50 | 60 | WAT03 |
| 1986 01 10.38 | M | 4.8 | WW | 3.5 | B | | 7 | 20 | 6 | 0.83 | 60 | WAT02 |
| 1986 01 10.40 | B | 5.3 | WW | 5.0 | B | | 7 | | 5 | | | HAS04 |
| 1986 01 10.41 | B | 5.1 | AA | 7.0 | B | | 10 | | | | | DAT |
| 1986 01 10.54 | B | 4.5 | A | 11 | R | | | | | | | CHU |
| 1986 01 10.60 | B | 5.0 | A | 20 | R | | | | | | | CHU |
| 1986 01 10.64 | E | 5.8 | HD | 7 | R | 14 | 30 | 6 | 5 | | 74 | KAZ |
| 1986 01 10.68 | B | 5.8 | HD | 7 | L | 8 | 33 | 4 | 6 | 0.2 | 80 | RUD01 |
| 1986 01 11.37 | M | 4.7 | WW | 3.5 | B | | 7 | 15 | 6 | 1 | 60 | WAT02 |
| 1986 01 11.37 | M | 4.7 | WW | 3.5 | B | | 7 | 20 | 6 | | | WAT03 |
| 1986 01 11.40 | B | 5.3 | WW | 5.0 | B | | 7 | | 5 | | | HAS04 |
| 1986 01 11.40 | M | 4.1 | WW | 10 | L | 10 | 40 | 4.3 | 7 | 1.2 | 90 | ICH |
| 1986 01 11.41 | B | 4.7 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1986 01 11.41 | B | 4.7 | WW | 3.5 | B | | 7 | | | 1 | | OKA02 |
| 1986 01 11.44 | B | 4.5 | AA | 6.5 | R | 8 | 28 | 10 | 6 | 1.5 | | HAY01 |
| 1986 01 11.60 | B | 5.0 | A | 20 | R | | | | | | | CHU |
| 1986 01 11.69 | B | 4.5 | A | 11 | R | | | | | | | CHU |
| 1986 01 12.36 | M | 4.6 | WW | 3.5 | B | | 7 | 10 | 6 | | | WAT03 |
| 1986 01 12.37 | M | 4.6 | WW | 3.5 | B | | 7 | 10 | 6 | | | WAT02 |
| 1986 01 12.40 | B | 4.5 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 01 12.40 | M | 4.2 | WW | 10 | L | 10 | 40 | 4 | 7 | 1.5 | 90 | ICH |
| 1986 01 12.61 | B | 5.5 | A | 20 | R | | | | | | | CHU |
| 1986 01 12.64 | B | 4.7 | A | 11 | R | | | | | | | CHU |
| 1986 01 12.78 | M | 4.7 | WW | 5.0 | B | | 10 | 28 | 6 | 1.5 | 300 | LOZ |
| 1986 01 13.40 | M | 4.0 | WW | 5.0 | B | | 7 | 12 | 6 | 1.4 | | ICH |
| 1986 01 13.41 | B | 4.9 | S | 5.0 | B | | 7 | | | | | TAN03 |
| 1986 01 13.43 | B | 4.5 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 01 13.55 | B | 5.1 | A | 11 | R | | | | | | | CHU |
| 1986 01 13.59 | B | 5.5 | A | 20 | R | | | | | | | CHU |
| 1986 01 13.74 | S | 3.8 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 01 13.76 | M | 4.7 | WW | 5.0 | B | | 10 | 30 | 6 | | | LOZ |
| 1986 01 14.38 | B | 4.7 | WW | 5.0 | B | | 7 | | 8 | | | HAS04 |
| 1986 01 14.57 | B | 4.7 | A | 11 | R | | | | | | | CHU |
| 1986 01 14.57 | B | 4.9 | HD | 5.0 | B | | 7 | | 7 | | | KON |
| 1986 01 14.59 | B | 5.0 | A | 20 | R | | | | | | | CHU |
| 1986 01 14.64 | B | 5.0 | HD | 7 | L | 8 | 33 | 14 | 6 | | | YUR |
| 1986 01 15.38 | B | 4.7 | WW | 5.0 | B | | 7 | | 6 | | | HAS04 |
| 1986 01 15.39 | M | 3.8 | WW | 10 | L | 10 | 83 | 3.8 | | 0.83 | | ICH |
| 1986 01 15.49 | B | 4.7 | HD | 5.0 | B | | 7 | 3 | 6 | 0.1 | 55 | GUR |
| 1986 01 15.58 | B | 4.7 | A | 11 | R | | | | | | | CHU |
| 1986 01 15.62 | S | 5.4 | A | 20 | R | | | | | | | CHU |
| 1986 01 16.40 | M | 3.9 | WW | 10 | L | 10 | 25 | 3.8 | 5 | | | ICH |
| 1986 01 16.75 | S | 3.5 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 01 17.37 | M | 4.5 | WW | 3.5 | B | | 7 | | | | | WAT02 |
| 1986 01 17.76 | M | 4.4 | WW | 5.0 | B | | 10 | 35 | | | | LOZ |
| 1986 01 18.49 | B | 4.6 | HD | 5.0 | B | | 7 | 3 | 4 | 0.1 | | GUR |
| 1986 01 18.55 | B | 4.7 | A | 10 | R | | | | | | | CHU |
| 1986 01 18.57 | B | 4.1 | HD | 5.0 | B | | 7 | | 7 | | | KON |
| 1986 01 18.64 | E | 5.2 | HD | 8 | R | | | 10 | 6 | 0.3 | | MAY02 |
| 1986 01 18.65 | B | 4.2 | HD | 8 | R | | 29 | 4 | | | | NES |
| 1986 01 18.65 | B | 4.9 | HD | 7 | L | 8 | 33 | | | | | YUR |
| 1986 01 18.66 | B | 3.8 | SP | 5.0 | B | | 7 | 8 | 5 | 2.5 | 69 | MOR04 |
| 1986 01 18.76 | M | 4.4 | WW | 5.0 | B | | 10 | 40 | 7 | 1.5 | 286 | LOZ |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 01 19.39 | M | 3.8 | WW | 7.0 | B | | 10 | | | | | ICH |
| 1986 01 19.55 | B | 4.7 | A | 10 | R | | | | | | | CHU |
| 1986 01 19.60 | G | 3.8 | HD | 0.0 | E | | 1 | | | | | POR01 |
| 1986 01 19.77 | M | 4.3 | WW | 5.0 | B | | 10 | 40 | 7 | 1.5 | 290 | LOZ |
| 1986 01 20.50 | B | 4.5 | HD | 5.0 | B | | 7 | 2 | 4 | 0.1 | | GUR |
| 1986 01 20.66 | B | 4.7 | A | 10 | R | | | | | | | CHU |
| 1986 01 20.74 | S | 3.3 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 01 21.64 | B | 5.3 | HD | 3 | R | 3 | 10 | & 8 | 4 | | | GER |
| 1986 01 21.64 | S | 3.5 | SP | 5.0 | B | | 7 | 8 | 4 | 1 | 60 | MOR04 |
| 1986 01 21.65 | B | 4.6 | HD | 7 | L | 8 | 33 | 21 | 7 | | | YUR |
| 1986 01 21.66 | B | 3.5 | SP | 5.0 | B | | 7 | 8 | 5 | 1 | 60 | MOR04 |
| 1986 01 21.66 | B | 4.6 | SP | 7 | L | 8 | 33 | | 7 | | | YUR |
| 1986 01 21.67 | B | 3.5 | HD | 5.0 | B | | 7 | 7 | 5 | 1 | 60 | MOR04 |
| 1986 01 21.67 | B | 4.4 | HD | 5.0 | B | | 7 | | | | | PIS |
| 1986 01 21.67 | B | 4.7 | HD | 3.0 | B | | 8 | | | | | TSY |
| 1986 01 21.77 | M | 4.1 | WW | 5.0 | B | | 10 | 40 | 7 | 1.9 | 280 | LOZ |
| 1986 01 22.36 | M | 4.0 | WW | 5.0 | B | | 7 | 5 | 5 | 0.67 | 90 | ICH |
| 1986 01 22.40 | B | 3.5 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 01 22.49 | B | 4.7 | SP | 5.0 | B | | 7 | 2 | 4 | | | GUR |
| 1986 01 22.65 | B | 3.5 | SP | 5.0 | B | | 7 | 8 | 5 | | | MOR04 |
| 1986 01 23.49 | B | 4.6 | HD | 5.0 | B | | 7 | 2 | 6 | | | GUR |
| 1986 01 24.68 | B | 4.6 | HD | 3.0 | B | | 8 | | | | | TSY |
| 1986 01 24.77 | M | 3.9 | WW | 5.0 | B | | 16 | 40 | 8 | 2 | 290 | LOZ |
| 1986 01 25.74 | S | 3.3 | AA | 5.0 | B | | 10 | | | | | CAV |
| 1986 01 26.36 | M | 4.3 | WW | 10 | L | 10 | 25 | 2.5 | 4 | 0.50 | 90 | ICH |
| 1986 01 28.37 | M | 5.5 | WW | 10 | L | 10 | 83 | 1.08 | | | | ICH |
| 1986 02 19.85 | M | 3.8 | WW | 10 | L | 10 | 25 | 3.5 | | >0.5 | | ICH |
| 1986 02 20.37 | B | 3.0 | A | 4.0 | B | | 7 | | | 1 | | KIS01 |
| 1986 02 20.85 | M | 4.0 | WW | 10 | L | 10 | 25 | 5.0 | | >0.5 | | ICH |
| 1986 02 24.85 | B | 3.5 | WW | 5.0 | B | | 7 | 7 | 6/ | 0.75 | | HAY01 |
| 1986 02 25.83 | M | 3.4 | WW | 10 | L | 10 | 25 | 3.3 | | 1.3 | 270 | ICH |
| 1986 02 25.85 | B | 4.0 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 02 26.03 | B | 4.1 | HD | 5.0 | B | | 7 | 1 | | | | KON |
| 1986 02 28.84 | B | 3.5 | WW | 5.0 | B | | 7 | 5 | 7 | 1.5 | | HAY01 |
| 1986 02 28.85 | B | 3.7 | WW | 3.5 | B | | 7 | | | 1 | | OKA02 |
| 1986 03 01.05 | B | 3.9 | HD | 5.0 | B | | 7 | 2 | | | | KON |
| 1986 03 02.04 | B | 4.0 | HD | 5.0 | B | | 7 | 2 | | 0.2 | | KON |
| 1986 03 02.37 | B | 3.5 | HD | 4.0 | B | | 7 | | | 5 | | KIS01 |
| 1986 03 02.84 | B | 3.4 | WW | 5.0 | B | | 7 | 5 | 7 | 2 | | HAY01 |
| 1986 03 02.85 | M | 3.3 | WW | 10 | L | 10 | 40 | 10.2 | 6 | 1.5 | 180 | ICH |
| 1986 03 04.84 | B | 4.0 | WW | 3.5 | B | | 7 | | | 1 | | OKA02 |
| 1986 03 05.83 | B | 3.3 | WW | 5.0 | B | | 7 | 5 | 6/ | 2 | | HAY01 |
| 1986 03 05.85 | B | 3.8 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 03 06.03 | B | 2.5 | A | 5 | R | 4 | 7 | 8 | 7 | 3 | 259 | CHE03 |
| 1986 03 06.83 | B | 3.9 | WW | 3.5 | B | | 7 | | | 1.5 | | OKA02 |
| 1986 03 06.84 | B | 3.8 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 03 07.02 | B | 2.7 | A | 5 | R | 4 | 7 | 8 | 7 | 4.5 | 260 | CHE03 |
| 1986 03 07.03 | B | 3.9 | HD | 5.0 | B | | 7 | 2 | | 0.8 | | KON |
| 1986 03 07.35 | B | 3.5 | A | 4.0 | B | | 7 | | | 5 | | KIS01 |
| 1986 03 07.84 | B | 3.4 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 03 07.84 | B | 4.0 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 03 08.03 | B | 2.9 | A | 11.0 | B | | 20 | 10 | 7 | 4 | 260 | CHE03 |
| 1986 03 08.03 | B | 3.8 | HD | 5.0 | B | | 7 | | | 1.8 | | KON |
| 1986 03 08.12 | E | 4.5 | HD | 8 | R | | | 7 | 6 | 0.2 | | MAY02 |
| 1986 03 08.12 | E | 4.5 | HD | 8 | R | | 7 | 7 | 6 | 0.2 | | FED01 |
| 1986 03 08.82 | B | 4.0 | WW | 3.5 | B | | 7 | | | 2.2 | | OKA02 |
| 1986 03 08.83 | B | 3.8 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 03 08.83 | S | 3.4 | WW | 15.3 | L | 9 | 33 | 20 | 6 | 2 | | IWA01 |
| 1986 03 08.84 | M | 3.0 | WW | 0.0 | E | | 1 | | | 1.0 | 190 | ICH |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 03 11.80 | B | 3.0 | WW | 5.0 | B | | 7 | | | 10 | | HAY01 |
| 1986 03 12.10 | B | 2.8 | SP | 5.0 | B | | 7 | 20 | 5 | 2.5 | 270 | MOR04 |
| 1986 03 12.10 | B | 4.2 | A | 8.0 | B | | 8 | 60 | | 5.5 | | KOR01 |
| 1986 03 12.83 | B | 3.9 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 03 12.83 | M | 3.6 | WW | 10 | L | 10 | 40 | 7.2 | 6 | 2 | 250 | ICH |
| 1986 03 16.80 | B | 3.0 | WW | 5.0 | B | | 7 | | | 10 | | HAY01 |
| 1986 03 17.10 | B | 2.9 | SP | 5.0 | B | | 7 | 20 | 5 | 3.5 | 260 | MOR04 |
| 1986 03 17.80 | M | 3.3 | WW | 12 | L | 6 | 36 | 5.7 | 7 | | | KIS |
| 1986 03 17.81 | M | 3.5 | WW | 10 | L | 10 | 25 | 8.2 | 6 | 2.2 | 252 | ICH |
| 1986 03 18.00 | B | 2.9 | A | 5 | R | 4 | 7 | 10 | 7 | 6 | 260 | CHE03 |
| 1986 03 18.99 | B | 4.5 | HD | 5.0 | B | | 7 | 6 | 8 | 0.7 | | KON |
| 1986 03 19.00 | B | 2.8 | A | 5 | R | 4 | 7 | 11 | 7 | 6 | 262 | CHE03 |
| 1986 03 20.00 | B | 3.6 | A | 8.0 | B | | | | | | | CHU |
| 1986 03 20.00 | G | 3.0 | A | 0.0 | E | | 1 | | | | | CHU |
| 1986 03 20.33 | B | 3.8 | | 3.5 | B | | 7 | | | 6 | | KIS01 |
| 1986 03 20.79 | M | 3.2 | WW | 12 | L | 6 | 60 | 7.6 | 6 | | | KIS |
| 1986 03 20.81 | M | 3.4 | WW | 10 | L | 10 | 25 | 6.2 | 6 | 2.0 | 260 | ICH |
| 1986 03 20.99 | B | 3.6 | A | 8.0 | B | | 20 | | | | | CHU |
| 1986 03 20.99 | G | 2.8 | A | 0.0 | E | | 1 | | | | | CHU |
| 1986 03 21.83 | M | 4.0 | WW | 10 | L | 10 | 25 | 25 | 7 | 2.0 | 265 | ICH |
| 1986 03 21.99 | B | 3.2 | A | 8.0 | B | | | | | | | CHU |
| 1986 03 21.99 | G | 2.2 | A | 0.0 | E | | 1 | | | 8 | 270 | CHU |
| 1986 03 22.01 | B | 3.0 | A | 5 | R | 4 | 7 | 9 | | 7 | 267 | CHE03 |
| 1986 03 22.01 | B | 3.8 | HD | 5.0 | B | | 7 | 9 | 9 | | | KON |
| 1986 03 22.20 | M | 2.5 | WW | 5.0 | B | | 10 | 150 | 7 | 11 | 87 | LOZ |
| 1986 03 22.97 | B | 2.7 | A | 8.0 | B | | | | | | | CHU |
| 1986 03 22.98 | G | 2.0 | A | 0.0 | E | | 1 | | | | | CHU |
| 1986 03 23.35 | B | 3.8 | A | 4.0 | B | | 7 | | | 5.5 | | KIS01 |
| 1986 03 24.80 | B | 3.0 | WW | 5.0 | B | | 7 | 8 | 5 | 4 | | HAY01 |
| 1986 03 24.82 | B | 3.3 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 03 25.01 | S | 2.8 | AA | 0.0 | E | | 1 | | | 3 | 274 | CAV |
| 1986 03 25.79 | B | 4.6 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 03 25.80 | M | 3.4 | WW | 10 | L | 10 | 25 | 7.2 | 6 | 1.5 | 270 | ICH |
| 1986 03 26.19 | M | 2.5 | WW | 5.0 | B | | 10 | 150 | 7 | | | LOZ |
| 1986 03 28.18 | M | 2.5 | WW | 5.0 | B | | 10 | 150 | 7 | | | LOZ |
| 1986 03 28.97 | S | 2.9 | AA | 0.0 | E | | 1 | | | &3 | 276 | CAV |
| 1986 03 31.00 | S | 2.7 | AA | 0.0 | E | | 1 | | | 2.5 | 280 | CAV |
| 1986 03 31.79 | B | 3.4 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 03 31.83 | S | 4.9 | WW | 15.3 | L | 9 | 33 | | 6 | | | IWA01 |
| 1986 04 02.02 | S | 2.7 | AA | 0.0 | E | | 1 | | | 3.2 | 285 | CAV |
| 1986 04 02.80 | S | 2.4 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 02.81 | B | 2.9 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 04 05.65 | M | 3.9 | WW | 10 | L | 10 | 40 | 7.6 | 6 | 0.5 | 270 | ICH |
| 1986 04 05.76 | B | 3.3 | WW | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 04 05.80 | B | 3.2 | WW | 3.5 | B | | 7 | | | 0.5 | | OKA02 |
| 1986 04 05.98 | S | 2.4 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 06.75 | B | 3.2 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 04 08.88 | S | 2.6 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 09.9 | S | 2.8 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 10.87 | S | 2.7 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 11.67 | B | 3.5 | WW | 3.5 | B | | 7 | 20 | | | | OKA02 |
| 1986 04 11.88 | S | 2.8 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 12.64 | S | 4.2 | WW | 15 | R | 15 | 56 | 4.5 | 4 | 0.5 | 270 | ICH |
| 1986 04 12.66 | B | 3.4 | WW | 5.0 | B | | 7 | 40 | | 4 | | HAY01 |
| 1986 04 12.67 | B | 3.5 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 04 12.88 | S | 2.9 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 13.83 | S | 3.0 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 14.79 | S | 2.8 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 15.79 | S | 2.8 | AA | 0.0 | E | | 1 | | | | | CAV |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 04 16.62 | B | 3.7 | WW | 3.5 | B | | 7 | 17 | | | | OKA02 |
| 1986 04 16.78 | B | 4.2 | HD | 5.0 | B | | 7 | 15 | 9 | | | KON |
| 1986 04 16.79 | S | 2.9 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 04 16.94 | M | 3.7 | WW | 5.0 | B | | 10 | 60 | 6 | 1 | | LOZ |
| 1986 04 17.81 | B | 4.4 | HD | 5.0 | B | | 7 | 13 | 9 | | | KON |
| 1986 04 18.92 | M | 4.2 | WW | 5.0 | B | | 10 | 60 | 6 | 1 | | LOZ |
| 1986 04 19.93 | M | 4.0 | WW | 5.0 | B | | 10 | 60 | 6 | 1.5 | 287 | LOZ |
| 1986 04 20.87 | M | 4.0 | WW | 5.0 | B | | 10 | 60 | 6 | 1.5 | 300 | LOZ |
| 1986 04 22.54 | S | 4.5 | AA | 10 | L | 10 | 40 | 8 | 4 | 0.67 | 250 | ICH |
| 1986 04 24.52 | S | 6.5 | WW | 15.3 | L | 9 | 52 | 10 | 5 | | | IWA01 |
| 1986 04 25.75 | B | 4.9 | SP | 8.0 | B | | | 21 | | | | BUK |
| 1986 04 25.75 | B | 5.0 | SP | 0.0 | E | | 1 | | | | | BEL03 |
| 1986 04 25.75 | B | 5.0 | SP | 11.0 | B | | | 20 | | | | KAS |
| 1986 04 25.75 | B | 5.2 | SP | 11 | L | | | 26 | | | | KRY |
| 1986 04 25.75 | B | 5.4 | SP | 8.0 | B | | 8 | 28 | | | | MAY01 |
| 1986 04 25.75 | G | 4.9 | SP | 0.0 | E | | 1 | | | | | PAS01 |
| 1986 04 25.75 | G | 5.0 | SP | 0.0 | E | | 1 | | | | | MIS |
| 1986 04 25.75 | S | 4.8 | A | 8.0 | B | | 8 | 20 | | | | GOL |
| 1986 04 25.77 | E | 5.0 | HD | 8 | R | | | 20 | 5 | | | MAY02 |
| 1986 04 25.83 | B | 4.8 | A | 11.0 | B | | 20 | 20 | 5 | | | CHE03 |
| 1986 04 25.84 | M | 4.2 | WW | 5.0 | B | | 10 | 60 | 6 | 2 | 290 | LOZ |
| 1986 04 26.74 | B | 4.9 | A | 8.0 | B | | 8 | 20 | | | | GOL |
| 1986 04 26.74 | B | 4.9 | SP | 8.0 | B | | 8 | 20 | | | | TAT |
| 1986 04 26.74 | B | 5.0 | SP | 6 | R | | | 20 | | | | KUR |
| 1986 04 26.74 | B | 5.0 | SP | 8.0 | B | | 8 | 20 | | | | MAY01 |
| 1986 04 26.74 | B | 5.1 | SP | 0.0 | E | | 1 | 20 | | | | MAK01 |
| 1986 04 26.74 | B | 5.1 | SP | 8.0 | B | | 8 | 20 | | | | FIL03 |
| 1986 04 26.74 | B | 5.2 | SP | 8.0 | B | | 8 | 20 | | | | OSK |
| 1986 04 26.74 | B | 5.3 | SP | 11.0 | B | | 20 | 24 | | | | KRY |
| 1986 04 26.74 | G | 5.1 | SP | 0.0 | E | | 1 | | | | | PAS01 |
| 1986 04 26.74 | G | 5.1 | SP | 0.0 | E | | 1 | 20 | | | | BUK |
| 1986 04 26.81 | B | 5.2 | HD | 11 | L | | 30 | | 3 | 0.7 | 260 | YUR |
| 1986 04 26.85 | B | 4.6 | A | 11.0 | B | | 20 | 20 | 5 | | | CHE03 |
| 1986 04 27.76 | B | 5.0 | SP | 11.0 | B | | 20 | 15 | | | | MAK01 |
| 1986 04 27.76 | B | 5.1 | A | 8.0 | B | | 8 | 20 | | | | GOL |
| 1986 04 27.76 | B | 5.1 | HD | 8.0 | B | | 8 | 19 | | | | MAY01 |
| 1986 04 27.76 | B | 5.1 | SP | 8.0 | B | | 8 | | | | | IVA |
| 1986 04 27.76 | B | 5.2 | SP | 0.0 | E | | 1 | | | | | BEL03 |
| 1986 04 27.76 | B | 5.2 | SP | 8.0 | B | | | 18 | | | | MIS |
| 1986 04 27.76 | B | 5.2 | SP | 8.0 | B | | 8 | 17 | | | | KAS |
| 1986 04 27.76 | B | 5.3 | SP | 11.0 | B | | 20 | 25 | | | | KRY |
| 1986 04 27.76 | G | 5.0 | SP | 8.0 | B | | | | | | | PAS01 |
| 1986 04 27.76 | G | 5.0 | SP | 8.0 | B | | | 19 | | | | FIL03 |
| 1986 04 27.76 | G | 5.1 | SP | 8.0 | B | | | 18 | | | | TAT |
| 1986 04 27.78 | B | 5.5 | HD | 5.0 | B | | 7 | | 4 | | | MAM |
| 1986 04 27.98 | B | 4.9 | A | 4.0 | B | | 7 | | | 5.4 | | KIS01 |
| 1986 04 28.45 | B | 5.1 | WW | 5.0 | B | | 7 | 15 | 3 | | | HAY01 |
| 1986 04 28.48 | B | 5.0 | WW | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 04 28.54 | B | 5.2 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 04 28.76 | B | 5.3 | HD | 11 | L | | 30 | 8 | 2 | 0.7 | 263 | YUR |
| 1986 04 28.78 | B | 4.8 | A | 8.0 | B | | 8 | 25 | | | | GOL |
| 1986 04 28.78 | B | 4.9 | HD | 8.0 | B | | 8 | 25 | | | | MAY01 |
| 1986 04 28.78 | B | 4.9 | SP | 0.0 | E | | 1 | 21 | | | | KUR |
| 1986 04 28.78 | B | 5.0 | SP | 0.0 | E | | 1 | 20 | | | | MAK01 |
| 1986 04 28.78 | B | 5.0 | SP | 8.0 | B | | 8 | 22 | | | | OSK |
| 1986 04 28.78 | B | 5.1 | SP | 0.0 | E | | 1 | 20 | | | | FIL03 |
| 1986 04 28.78 | B | 5.1 | SP | 0.0 | E | | 1 | 21 | | | | TAT |
| 1986 04 28.78 | B | 5.2 | SP | 8 | R | | | | | | | BEL03 |
| 1986 04 28.78 | B | 5.2 | SP | 8 | R | | | 18 | | | | MIS |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 04 28.78 | B | 5.2 | SP | 8.0 | B | | 8 | 18 | | | | KAS |
| 1986 04 28.78 | B | 5.4 | SP | 11.0 | B | | 20 | 24 | | | | KRY |
| 1986 04 28.78 | G | 5.1 | HD | 0.0 | E | | 1 | 20 | | | | BUK |
| 1986 04 28.78 | G | 5.2 | SP | 0.0 | E | | 1 | | | | | IVA |
| 1986 04 28.79 | B | 4.3 | SP | 5.0 | B | | 7 | 20 | 5 | 1.5 | 98 | MOR04 |
| 1986 04 28.81 | B | 5.3 | HD | 5.0 | B | | 7 | 10 | 4 | | | KOL01 |
| 1986 04 28.85 | B | 5.4 | HD | 7 | L | 8 | 33 | 10 | 4 | | | PAS |
| 1986 04 28.87 | M | 4.6 | WW | 5.0 | B | | 10 | 55 | 5 | 1.5 | 290 | LOZ |
| 1986 04 28.98 | B | 4.8 | A | 4.0 | B | | 7 | | | 5 | | KIS01 |
| 1986 04 29.49 | B | 5.3 | AA | 5.0 | B | | 7 | 15 | 3 | 1 | | HAY01 |
| 1986 04 29.49 | B | 5.3 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 04 29.50 | B | 4.9 | WW | 3.5 | B | | 7 | | | 0.7 | | OKA02 |
| 1986 04 29.75 | B | 5.4 | HD | 5.0 | B | | 7 | | 4 | | | MAM |
| 1986 04 29.75 | B | 5.7 | HD | 4.0 | B | | 12 | 10 | | 0.4 | | RUD01 |
| 1986 04 29.77 | B | 5.0 | SP | 8.0 | B | | 8 | 20 | | | | MAK01 |
| 1986 04 29.77 | B | 5.2 | A | 8.0 | B | | 8 | 20 | | | | GOL |
| 1986 04 29.77 | B | 5.2 | SP | 0.0 | E | | 1 | | | | | PAS01 |
| 1986 04 29.77 | B | 5.2 | SP | 8.0 | B | | 8 | | | | | NAV |
| 1986 04 29.77 | B | 5.2 | SP | 8.0 | B | | 8 | | | | | TAT |
| 1986 04 29.77 | B | 5.3 | SP | 8.0 | B | | 8 | 18 | | | | MAY01 |
| 1986 04 29.77 | B | 5.3 | SP | 8.0 | B | | 8 | 23 | | | | OSK |
| 1986 04 29.77 | B | 5.4 | SP | 11.0 | B | | 20 | | | | | BEL03 |
| 1986 04 29.77 | B | 5.4 | SP | 11.0 | B | | 20 | | | | | KAS |
| 1986 04 29.77 | B | 5.4 | SP | 11.0 | B | | 20 | 17 | | | | MIS |
| 1986 04 29.77 | B | 5.5 | SP | 11.0 | B | | 20 | 22 | | | | KRY |
| 1986 04 29.77 | G | 5.2 | SP | 0.0 | E | | 1 | 20 | | | | BUK |
| 1986 04 29.77 | G | 5.3 | SP | 0.0 | E | | 1 | | | | | FIL03 |
| 1986 04 29.77 | G | 5.4 | SP | 0.0 | E | | 1 | 23 | | | | KUR |
| 1986 04 29.78 | B | 5.6 | HD | 0.0 | E | | 1 | 12 | | | | RUD01 |
| 1986 04 29.79 | B | 4.4 | SP | 5.0 | B | | 7 | 20 | 5 | 3 | 100 | MOR04 |
| 1986 04 29.81 | B | 5.1 | SP | 5.0 | B | | 7 | 6 | 1 | 0.1 | 190 | KOL01 |
| 1986 04 29.81 | B | 5.2 | SP | 7 | L | 8 | 33 | 6 | 1 | 0.1 | 190 | PAS |
| 1986 04 29.81 | B | 5.3 | SP | 11 | L | | 30 | 7 | 3 | 0.6 | 268 | YUR |
| 1986 04 29.86 | B | 5.0 | A | 11.0 | B | | 20 | | | 1 | 115 | CHE03 |
| 1986 04 29.91 | M | 4.7 | WW | 5.0 | B | | 10 | 55 | 5 | 1 | 290 | LOZ |
| 1986 04 30.46 | S | 5.2 | WW | 12 | L | 6 | 36 | 3.8 | 3 | | | KIS |
| 1986 04 30.67 | S | 3.8 | AA | 0.0 | E | | 1 | | | 13 | 98 | CAV |
| 1986 04 30.78 | B | 4.8: | A | 8.0 | B | | | | | | | CHU |
| 1986 04 30.78 | B | 5.3 | A | 8.0 | B | | 8 | 20 | | | | GOL |
| 1986 04 30.78 | B | 5.5 | SP | 8.0 | B | | | | | | | BEL03 |
| 1986 04 30.78 | B | 5.5 | SP | 8.0 | B | | | 17 | | | | MIS |
| 1986 04 30.78 | B | 5.5 | SP | 8.0 | B | | 8 | | 5 | | | IVA |
| 1986 04 30.78 | B | 5.8 | SP | 4.0 | B | | 12 | 6 | | | | RUD01 |
| 1986 04 30.78 | G | 5.6 | SP | 0.0 | E | | 1 | 20 | | | | BUK |
| 1986 04 30.79 | B | 4.7 | SP | 5.0 | B | | 7 | 15 | 5 | 1.5 | 110 | MOR04 |
| 1986 04 30.79 | B | 5.9 | HD | 5.0 | B | | 7 | 10 | | | | KON |
| 1986 04 30.86 | B | 5.2 | A | 11.0 | B | | 20 | 20 | 5 | 1 | 113 | CHE03 |
| 1986 04 30.90 | M | 4.9 | WW | 5.0 | B | | 10 | 50 | 5 | 1 | 290 | LOZ |
| 1986 05 01.76 | B | 5.9 | HD | 4.0 | B | | 12 | | 5 | 0.6 | 117 | RUD01 |
| 1986 05 01.76 | B | 7.0 | HD | 10 | R | | | | | | | POR01 |
| 1986 05 01.78 | B | 5.2 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 01.83 | B | 5.7 | HD | 11 | L | | 30 | 5 | 4 | 0.5 | 272 | YUR |
| 1986 05 01.85 | B | 6.1 | HD | 3.0 | B | 8 | 18 | 18 | 0 | | | DRA |
| 1986 05 01.87 | M | 5.0 | W | 5.0 | B | | 10 | 45 | 5 | 0.84 | 280 | LOZ |
| 1986 05 02.57 | B | 5.8 | HD | 5.0 | B | | 7 | 4 | 0 | | | KON |
| 1986 05 02.69 | B | 5.2 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 02.75 | E | 6.2 | HD | 8 | R | | | 10 | 5 | | | MAY02 |
| 1986 05 02.81 | B | 4.8 | SP | 5.0 | B | | 7 | 20 | 5 | 5 | 105 | MOR04 |
| 1986 05 02.81 | B | 5.8 | HD | 11 | L | | 30 | 4 | 4 | 0.5 | 272 | YUR |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 05 02.85 | B | 5.3 | A | 11.0 | B | | 20 | 20 | 5 | 0.8 | 113 | CHE03 |
| 1986 05 02.85 | B | 6.0 | HD | 3 | R | 8 | 18 | | | | | DRA |
| 1986 05 02.98 | B | 5.4 | A | 4.0 | B | | 7 | | | 5.3 | | KIS01 |
| 1986 05 03.46 | M | 5.6 | AA | 20 | C | 10 | 50 | 7.2 | 6 | 1.5 | 85 | ICH |
| 1986 05 03.70 | B | 5.6 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 03.73 | B | 6.4 | HD | 5.0 | B | | 7 | 5 | 0 | | | KON |
| 1986 05 03.82 | B | 6.5 | HD | 8.0 | B | | 40 | 18 | 4 | | | PAL01 |
| 1986 05 03.83 | B | 6.5 | HD | 3 | R | 8 | 18 | 18 | 0 | | | DRA |
| 1986 05 03.91 | M | 5.2 | W | 5.0 | B | | 10 | 45 | 5 | 0.67 | 280 | LOZ |
| 1986 05 04.00 | B | 5.6 | A | 4.0 | B | | 7 | | | 5 | | KIS01 |
| 1986 05 04.45 | M | 5.7 | AA | 20 | C | 10 | 50 | 8.2 | 6 | 0.83 | 85 | ICH |
| 1986 05 04.50 | B | 5.5 | AA | 5.0 | B | | 7 | | | | | HAY01 |
| 1986 05 04.67 | S | 4.2 | AA | 0.0 | E | | 1 | | | | | CAV |
| 1986 05 04.70 | B | 5.6 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 04.72 | B | 5.8 | HD | 5.0 | B | | 7 | | | | | KON |
| 1986 05 04.76 | B | 8.0 | HD | 10 | R | | | | | | | POR01 |
| 1986 05 04.83 | B | 6.5: | HD | 3 | R | 6 | 8 | 18 | 0 | | | DRA |
| 1986 05 05.29 | B | 6.8 | HD | 5.0 | B | | 30 | 1 | 0 | 2 | | TRO |
| 1986 05 05.82 | B | 6.7 | HD | 8.0 | B | | 40 | | 5 | | | PAL01 |
| 1986 05 05.85 | B | 5.5 | A | 5.0 | B | | 7 | 15 | 4 | 0.5 | 113 | CHE03 |
| 1986 05 05.85 | B | 6.6: | HD | 3 | R | 6 | 8 | 19 | 0 | | | DRA |
| 1986 05 05.98 | B | 5.8 | A | 4.0 | B | | 7 | | | 4.5 | | KIS01 |
| 1986 05 06.76 | B | 5.9 | HD | 11 | L | | 30 | 4 | 4 | 0.4 | 273 | YUR |
| 1986 05 06.80 | B | 4.9 | SP | 5.0 | B | | 7 | 12 | 5 | 1 | 105 | MOR04 |
| 1986 05 06.83 | B | 6.8 | HD | 3.0 | B | 6 | 8 | 18 | 0 | | | DRA |
| 1986 05 06.93 | M | 5.4 | W | 5.0 | B | | 10 | 45 | 5 | 0.92 | 270 | LOZ |
| 1986 05 07.45 | M | 5.7 | AA | 10 | L | 10 | 56 | 5.4 | 6 | 0.5 | 90 | ICH |
| 1986 05 07.52 | B | 5.9 | AA | 5.0 | B | | 7 | 15 | 3 | &0.25 | | HAY01 |
| 1986 05 07.53 | B | 5.8 | AA | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 05 07.54 | S | 7.1 | AA | 12 | L | 6 | 60 | | 3 | | | KIS |
| 1986 05 07.55 | B | 5.9 | WW | 7.0 | B | | 10 | | | | | DAT |
| 1986 05 07.77 | M | 6.4 | HD | 4.0 | B | | 12 | 15 | 5 | | | MAY02 |
| 1986 05 07.80 | B | 4.8 | SP | 5.0 | B | | 7 | 15 | 5 | 3 | 106 | MOR04 |
| 1986 05 07.90 | B | 6.6 | A | 11.0 | B | | 20 | 15 | 4 | | | CHE03 |
| 1986 05 07.91 | M | 5.5 | W | 5.0 | B | | 10 | 40 | 4 | 0.67 | 270 | LOZ |
| 1986 05 08.00 | B | 5.9 | A | 4.0 | B | | 7 | | | | | KIS01 |
| 1986 05 08.67 | B | 6.0 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 08.71 | B | 5.8 | A | 11 | R | | | | | | | CHU |
| 1986 05 08.71 | B | 6.7 | HD | 5.0 | B | | 7 | 7 | 0 | | | KON |
| 1986 05 08.77 | B | 6.5 | A | 20 | R | | | | | | | CHU |
| 1986 05 08.90 | M | 5.7 | W | 5.0 | B | | 10 | 35 | 4 | 0.67 | 265 | LOZ |
| 1986 05 09.00 | B | 6.0 | A | 4.0 | B | | 7 | | | | | KIS01 |
| 1986 05 09.51 | B | 6.1 | AA | 5.0 | B | | 7 | | 5 | | | HAY01 |
| 1986 05 09.68 | B | 6.6 | HD | 5.0 | B | | 7 | | | | | KON |
| 1986 05 09.70 | B | 5.8 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 09.74 | B | 6.1 | A | 11 | R | | | | | | | CHU |
| 1986 05 09.81 | B | 6.5 | A | 20 | R | | | | | | | CHU |
| 1986 05 09.93 | M | 6.0 | W | 5.0 | B | | 10 | 30 | 4 | | | LOZ |
| 1986 05 10.49 | B | 6.5 | AA | 3.5 | B | | 7 | | | | | OKA02 |
| 1986 05 10.66 | B | 7.1 | HD | 5.0 | B | | 7 | 7 | | | | KON |
| 1986 05 10.68 | B | 6.7 | HD | 5.0 | B | 7 | 20 | 5 | 0 | | | KON |
| 1986 05 10.71 | B | 6.2 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 10.77 | B | 6.3 | A | 11 | R | | | | | | | CHU |
| 1986 05 10.90 | M | 6.1 | W | 5.0 | B | | 10 | 25 | 3 | 0.42 | 270 | LOZ |
| 1986 05 11.70 | B | 6.1 | A | 8.0 | B | | | | | | | CHU |
| 1986 05 11.72 | B | 6.1 | A | 11 | R | | | | | | | CHU |
| 1986 05 11.81 | B | 5.5 | SP | 5.0 | B | | 7 | 15 | 5 | 1 | 112 | MOR04 |
| 1986 05 11.88 | M | 6.3 | W | 5.0 | B | | 10 | 22 | 3 | 0.09 | 270 | LOZ |
| 1986 05 12.80 | B | 5.5 | SP | 5.0 | B | | 7 | 20 | 5 | 1 | 112 | MOR04 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 05 12.80 | B | 6.1 | HD | 7 | L | 8 | 33 | 3 | 3 | | | YUR |
| 1986 05 13.72 | B | 7.0 | HD | 5 | R | 7 | 20 | | | | | KON |
| 1986 05 13.78 | B | 6.0 | SP | 5.0 | B | | 7 | 7 | 5 | | | MOR04 |
| 1986 05 13.91 | M | 6.5 | W | 5.0 | B | | 10 | 25 | 3 | 0.17 | 265 | LOZ |
| 1986 05 14.79 | B | 6.2 | SP | 6 | R | 10 | 21 | 6 | 5 | | | MOR04 |
| 1986 05 14.80 | B | 6.6 | SP | 11.0 | B | | 20 | 15 | 4 | | | CHE03 |
| 1986 05 14.92 | M | 6.6 | W | 5.0 | B | | 10 | 25 | 3 | 0.17 | 260 | LOZ |
| 1986 05 15.53 | B | 7.4 | AA | 12 | L | 6 | 40 | | 4 | | | HAY01 |
| 1986 05 16.79 | B | 6.5 | SP | 6 | R | 10 | 21 | 5 | 5 | | | MOR04 |
| 1986 05 16.80 | B | 7.0 | A | 11.0 | B | | 20 | 15 | 4 | | | CHE03 |
| 1986 05 16.91 | M | 6.8 | W | 5.0 | B | | 10 | 15 | 2 | 0.17 | 265 | LOZ |
| 1986 05 19.79 | B | 7.0 | HD | 5.0 | B | | 7 | 14 | 4 | | | TSY |
| 1986 05 23.80 | B | 7.3 | HD | 5.0 | B | | 7 | 11 | 3 | 0.1 | 175 | TSY |
| 1986 05 24.81 | B | 7.3 | HD | 7 | L | 8 | 33 | 7 | 3 | | | PAS |
| 1986 05 24.83 | B | 6.9 | SP | 7 | L | 8 | 33 | 7 | 3 | | | KOL01 |
| 1986 05 25.53 | S | 7.0 | AA | 10 | L | 10 | 56 | 3.6 | 5 | | | ICH |
| 1986 05 25.67 | B | 8.5 | HD | 5 | R | 7 | 20 | 4 | 0 | | | KON |
| 1986 05 26.48 | S | 7.0 | AA | 10 | L | 10 | 56 | 3.6 | 5 | | | ICH |
| 1986 05 26.78 | B | 6.9 | SP | 8 | R | 10 | 28 | 8 | 5 | | | MOR04 |
| 1986 05 26.81 | B | 6.8 | SP | 5.0 | B | | 7 | 13 | 5 | 1.5 | | MOR04 |
| 1986 05 26.84 | B | 7.0 | HD | 5.0 | B | | 7 | 6 | 5 | | | MOR04 |
| 1986 05 27.76 | B | 7.8 | SP | 7 | L | 8 | 33 | | 3 | 0.1 | 183 | SHI02 |
| 1986 05 27.81 | B | 7.3 | SP | 8 | R | 10 | 28 | 10 | 5 | 0.5 | | MOR04 |
| 1986 05 28.80 | B | 7.8: | SP | 8 | R | 10 | 28 | 9 | 5 | | | MOR04 |
| 1986 05 29.80 | B | 7.9: | SP | 8 | R | 10 | 28 | 6 | 5 | | | MOR04 |
| 1986 05 30.80 | B | 8.2: | | 8 | R | 10 | 28 | 5 | 5 | | | MOR04 |
| 1986 05 31.80 | B | 8.4: | SP | 8 | R | 10 | 28 | 4 | 5 | | | MOR04 |
| 1986 06 01.81 | B | 8.9: | SP | 16 | L | | 50 | 5 | 4 | | | MOR04 |
| 1986 06 03.80 | B | 8.9: | SP | 16 | L | | 50 | & 4 | 4 | | | MOR04 |
| 1986 06 08.48 | M | 7.9 | AA | 10 | L | 10 | 56 | 2.5 | 4 | | | ICH |
| 1986 06 08.88 | S | 7.8 | AA | 8.0 | B | | 20 | 4.5 | 3 | 0.2 | 75 | CAV |
| 1986 06 09.48 | M | 8.0 | AA | 10 | L | 10 | 40 | 3.0 | 3 | | | ICH |
| 1986 06 26.47 | M | 8.0 | AA | 10 | L | 10 | 40 | 2.7 | 3 | | | ICH |

Periodic Comet Brorsen-Metcalf (1989o)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 07 11.99 | S | 10.3 | AA | 25.4 | J | 6 | 73 | & 4 | 1/ | | | BOU |
| 1989 07 13.44 | S | 9.1 | AC | 5.0 | B | | 10 | | 2 | | | HAL |
| 1989 07 14.91 | B | 8.4 | AA | 11.0 | B | 4 | 20 | & 8 | 2 | | | CHE03 |
| 1989 07 15.93 | B | 8.2 | AA | 11.0 | B | 4 | 20 | &10 | 3 | | | CHE03 |
| 1989 07 16.27 | M | 8.8 | AA | 10.0 | B | | 20 | 3.0 | 2 | | | NOW |
| 1989 07 17.95 | B | 8.3 | AA | 11.0 | B | 4 | 20 | &10 | 3 | | | CHE03 |
| 1989 07 26.95 | B | 8.0 | AA | 11.0 | B | 4 | 20 | &12 | 3 | | | CHE03 |
| 1989 07 27.41 | M | 7.7 | AC | 5.0 | B | | 10 | | | | | HAL |
| 1989 07 27.95 | B | 7.8 | AA | 11.0 | B | 4 | 20 | &15 | 3 | 0.1 | 275 | CHE03 |
| 1989 07 27.95 | S | 7.2 | AC | 15.6 | L | 5 | 24 | & 8 | 2 | | | BOU |
| 1989 07 29.36 | S | 7.8 | AA | 8.0 | B | 3 | 11 | 7.0 | 3 | | | PRY |
| 1989 07 29.96 | B | 7.4 | AA | 11.0 | B | 4 | 20 | &12 | 3 | | | CHE03 |
| 1989 07 30.24 | S | 6.7 | AC | 40.0 | L | 4 | 56 | 7.2 | 1 | | | NOW |
| 1989 07 30.35 | S | 7.5 | SC | 8.0 | B | 3 | 11 | 6.8 | 3 | | | PRY |
| 1989 07 31.11 | B | 7.5 | AA | 5.0 | B | | 7 | 8 | 5/ | | | COL02 |
| 1989 07 31.96 | M | 6.5 | AA | 15.6 | L | 5 | 24 | 9 | 4 | | | BOU |
| 1989 07 31.97 | S | 6.4 | AA | 5.0 | B | | 10 | 11 | 2 | | | BOU |
| 1989 08 02.01 | B | 7.3 | AA | 5.0 | B | | 7 | 7 | 6 | | | COL02 |
| 1989 08 03.43 | M | 7.1 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 08 03.98 | S | 6.2 | AA | 5.0 | B | | 10 | &10 | 2/ | | | BOU |
| 1989 08 04.04 | B | 7.1 | AA | 5.0 | B | | 7 | 12 | 6 | | | COL02 |
| 1989 08 04.40 | S | 6.6 | SC | 8.0 | B | 3 | 11 | 7.5 | 4 | | | PRY |

Periodic Comet Brorsen-Metcalf (1989o) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 08 05.05 | B | 7.1 | AA | 5.0 | B | | 7 | 8 | 5 | | | COL02 |
| 1989 08 05.20 | S | 6.6 | AA | 5.0 | B | | 20 | 3 | 7 | | | DES01 |
| 1989 08 05.38 | S | 6.5 | SC | 8.0 | B | 3 | 11 | 7.5 | 4 | | | PRY |
| 1989 08 06.05 | S | 6.7 | AA | 5.0 | B | | 7 | 11 | 5 | | | COL02 |
| 1989 08 07.98 | B | 7.0: | AA | 6.0 | B | 4 | 20 | & 2 | 4 | | | SIE |
| 1989 08 08.21 | S | 6.2 | AA | 5.0 | B | | 20 | 5.25 | 6 | | | DES01 |
| 1989 08 09.06 | B | 6.6 | S | 5.0 | B | | 7 | 8 | 4/ | | | COL02 |
| 1989 08 09.21 | S | 6.1 | AA | 5.0 | B | | 20 | 5.5 | 6 | | | DES01 |
| 1989 08 09.44 | | | | 41 | L | 4 | 83 | | | 0.25 | 250 | HAL |
| 1989 08 09.44 | M | 6.6 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1989 08 10.04 | S | 6.6 | AA | 6.3 | B | | 9 | 7.5 | 4 | | | KAM01 |
| 1989 08 11.94 | B | 6.5 | AA | 6.0 | B | 4 | 20 | & 2 | 4 | | | SIE |
| 1989 08 12.02 | B | 7.2 | S | 8.0 | L | 7 | 56 | | 3/ | | | MIO |
| 1989 08 12.03 | B | 6.5 | S | 5.0 | B | | 7 | 10 | 5 | | | COL02 |
| 1989 08 12.08 | B | 6.7 | AA | 25.0 | L | 6 | | 17 | 5 | | | CAB |
| 1989 08 12.10 | M | 6.3 | SC | 30.0 | L | 5 | 75 | 6 | 5 | 0.13 | 75 | MAR02 |
| 1989 08 12.12 | B | 6.6 | AA | 3.0 | B | | 8 | 20 | 5 | | | CAB |
| 1989 08 12.43 | S | 6.0 | SC | 8.0 | B | 3 | 11 | 7.6 | 6 | 0.03 | | PRY |
| 1989 08 13.01 | B | 6.2 | S | 31.0 | L | 6 | 50 | | 4 | | | KOL02 |
| 1989 08 13.01 | B | 7.2 | S | 15 | C | 15 | 56 | | 4 | | | SOC |
| 1989 08 13.41 | S | 6.1 | SC | 8.0 | B | 3 | 11 | 7.5 | 6 | 0.02 | | PRY |
| 1989 08 14.02 | B | 6.3: | S | 31.0 | L | 6 | 50 | | | | | KOL02 |
| 1989 08 14.02 | B | 7.2 | S | 15 | C | 15 | 56 | | 4 | | | SOC |
| 1989 08 14.04 | B | 7.1 | S | 8.0 | L | 7 | 56 | | 4 | | | MIO |
| 1989 08 14.07 | S | 5.7 | AA | 5.0 | B | | 10 | &12 | 3/ | | | BOU |
| 1989 08 15.04 | B | 7.0 | S | 8.0 | L | 7 | 36 | | 4 | | | MIO |
| 1989 08 15.08 | B | 6.4 | S | 5.0 | R | 10 | 33 | 9.5 | 6 | &0.30 | 290 | JAH |
| 1989 08 15.08 | S | 6.1 | S | 5.0 | R | 10 | 33 | | | | | JAH |
| 1989 08 15.10 | S | 6.4 | AA | 6.3 | B | | 9 | 5.5 | 6 | &0.25 | 315 | KAM01 |
| 1989 08 17.02 | B | 6.8 | S | 15 | C | 15 | 56 | | 4 | | | SOC |
| 1989 08 17.08 | B | 6.2 | AA | 5.0 | B | | 10 | | | | | BOU |
| 1989 08 17.08 | B | 7.1 | S | 20 | R | 5 | 41 | | 4 | | | RUM01 |
| 1989 08 17.09 | B | 5.4 | S | 5.0 | B | | 7 | 12 | 6 | | | COL02 |
| 1989 08 17.09 | M | 5.5 | AA | 5.0 | B | | 10 | &10 | 5 | 0.75 | | BOU |
| 1989 08 17.09 | M | 6.8 | S | 15 | C | 15 | 56 | | 4 | | | SZA01 |
| 1989 08 17.17 | B | 6.4 | AA | 11.4 | L | 8 | | 20 | 5 | | | CAB |
| 1989 08 18.06 | B | 6.3 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 08 19.04 | B | 7.0: | S | 15 | C | 15 | 56 | | 4 | | | SOC |
| 1989 08 19.06 | B | 6.2 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 08 19.09 | B | 6.0 | S | 5.0 | R | 10 | 33 | | | | | JAH |
| 1989 08 19.09 | M | 6.9 | S | 15 | C | 15 | 56 | | 5 | | | SZA01 |
| 1989 08 19.09 | S | 5.8 | S | 5.0 | R | 10 | 33 | &11 | 4 | | | JAH |
| 1989 08 20.04 | M | 6.5 | S | 15 | C | 15 | 56 | | 5 | | | SZA01 |
| 1989 08 20.05 | B | 6.4 | AA | 6.0 | B | 4 | 20 | & 5 | 5 | 0.2 | | CHE03 |
| 1989 08 20.07 | B | 6.1: | S | 6.4 | R | 12 | 40 | | 6 | | | SIW |
| 1989 08 20.99 | B | 6.2 | AA | 6.0 | B | 4 | 20 | & 5 | 4 | 0.2 | | CHE03 |
| 1989 08 21.08 | B | 6.5: | S | 6.4 | R | 6 | 20 | | 5 | | | CNO |
| 1989 08 21.08 | B | 6.7: | S | 8.0 | L | 7 | 23 | | 3/ | | | MIO |
| 1989 08 21.99 | B | 6.6: | SC | 8.0 | B | 4 | 15 | | 3 | | | DUS |
| 1989 08 22.06 | M | 6.4 | S | 15 | C | 15 | 56 | | 5 | | | SZA01 |
| 1989 08 22.07 | M | 6.6 | S | 15.0 | C | 15 | 60 | | 4 | | | KRE |
| 1989 08 22.07 | S | 6.8 | S | 6.4 | R | 12 | 40 | 0.8 | 5 | | | BOD |
| 1989 08 23.08 | B | 6.4 | S | 20 | R | 5 | 41 | | 5 | | | RUM01 |
| 1989 08 23.09 | B | 5.9 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 08 23.47 | M | 5.5 | SC | 5.0 | B | | 10 | | | 1.1 | 302 | HAL |
| 1989 08 23.97 | B | 6.8 | SC | 8.0 | B | 4 | 15 | | 3 | | | DUS |
| 1989 08 24.10 | B | 6.5 | S | 15 | C | 15 | 56 | | 5 | | | SOC |
| 1989 08 24.10 | M | 6.5 | S | 15.0 | C | 15 | 60 | | 4 | | | KRE |
| 1989 08 24.89 | B | 6.1 | SC | 8.0 | B | 4 | 15 | | 5/ | | | DUS |

Periodic Comet Brorsen-Metcalf (1989o) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 08 25.08 | B | 5.8 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 08 25.09 | M | 6.5: | S | 15 | C | 15 | 56 | | 6 | | | SZA01 |
| 1989 08 25.10 | S | 6.2 | S | 6.6 | R | 6 | 40 | | | | | GAM |
| 1989 08 25.92 | B | 5.7 | AA | 12.0 | R | 5 | 27 | & 4 | 5 | 0.1 | | SIE |
| 1989 08 26.05 | B | 5.7 | S | 6.4 | R | 12 | 40 | | 6 | | | SIW |
| 1989 08 26.08 | B | 5.8 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 08 26.10 | B | 6.1 | S | 6.4 | R | 6 | 20 | | 5 | | | CNO |
| 1989 08 26.10 | B | 6.3 | S | 5.0 | B | | 7 | | | | | KON01 |
| 1989 08 26.13 | M | 5.2 | AA | 5.0 | B | | 10 | | 5/ | | | BOU |
| 1989 08 26.94 | B | 6.7 | SC | 8.0 | B | 4 | 15 | | 6 | | | DUS |
| 1989 08 27.03 | B | 5.9 | AA | 11.0 | B | 4 | 20 | & 2 | 5 | 0.6 | | CHE03 |
| 1989 08 27.03 | B | 5.9 | AA | 26.0 | L | 4 | 35 | & 3 | 5 | 0.1 | 303 | SIE |
| 1989 08 27.08 | B | 6.2 | S | 6.4 | R | 6 | 20 | | 6 | | | CNO |
| 1989 08 27.08 | M | 6.3 | S | 3.0 | B | 4 | 8 | | 6 | | | KOS03 |
| 1989 08 27.08 | S | 6.2 | S | 6.4 | R | 12 | 40 | 0.9 | 6 | | | BOD |
| 1989 08 27.09 | M | 6.3 | S | 5.0 | R | 11 | 22 | | 6 | | | KOS03 |
| 1989 08 27.33 | B | 5.8 | AC | 20.0 | L | 6 | 37 | 4.5 | 5 | 1.0 | 20 | NOW |
| 1989 08 27.41 | S | 5.6 | SC | 8.0 | B | 3 | 11 | 6.0 | 7 | 1 | 300 | PRY |
| 1989 08 28.03 | B | 6.5 | SC | 8.0 | B | 4 | 15 | | 5 | 0.6 | 319 | DUS |
| 1989 08 28.05 | B | 5.9 | AA | 6.0 | B | 4 | 20 | & 2 | 5 | 0.6 | | CHE03 |
| 1989 08 28.06 | S | 6.0 | S | 6.4 | R | 12 | 40 | 1.0 | 6 | | | BOD |
| 1989 08 28.13 | B | 5.4 | AA | 5.0 | B | | 10 | | | | | BOU |
| 1989 08 28.13 | M | 5.1 | AA | 5.0 | B | | 10 | & 7 | 7 | 2.5 | 308 | BOU |
| 1989 08 29.06 | B | 6.1 | SC | 8.0 | B | 4 | 15 | | 5 | 0.2 | 294 | DUS |
| 1989 08 29.09 | B | 5.7 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 08 29.13 | M | 5.2 | AA | 5.0 | B | | 10 | | 7 | 4.2 | 305 | BOU |
| 1989 08 30.03 | B | 5.6 | S | 6.4 | R | 12 | 40 | | 6 | | | SIW |
| 1989 08 30.08 | B | 5.6 | S | 7.5 | R | 3 | 15 | | | 0.25 | 310 | IWA02 |
| 1989 08 30.09 | B | 5.8 | S | 6.3 | R | 13 | 34 | | 8 | | | RUM01 |
| 1989 08 30.13 | B | 5.4 | AA | 5.0 | B | | 10 | | | | | BOU |
| 1989 08 30.13 | M | 5.2 | AA | 5.0 | B | | 10 | | 7 | 4 | 305 | BOU |
| 1989 08 31.03 | B | 5.9 | SC | 8.0 | B | 4 | 15 | | 7 | | | DUS |
| 1989 08 31.08 | B | 5.8 | S | 5.0 | B | | 7 | | | | | KON01 |
| 1989 08 31.08 | B | 5.9 | S | 6.3 | R | 6 | 20 | 3.45 | 6/ | | | SZA01 |
| 1989 08 31.08 | B | 6.2: | S | 5.0 | B | | 10 | 1.6 | 7 | &0.3 | 314 | WES04 |
| 1989 08 31.08 | B | 6.3 | S | 15 | C | 15 | 56 | | 5 | | | SOC |
| 1989 08 31.09 | B | 5.6 | S | 6.6 | R | 6 | 56 | 4 | | 0.4 | 315 | IWA02 |
| 1989 08 31.11 | M | 6.1: | S | 15.0 | C | 15 | 60 | | | | | KRE |
| 1989 08 31.13 | B | 5.9 | AA | 6.3 | B | | 9 | | 8 | | | KAM01 |
| 1989 08 31.13 | I | 5.3: | AA | 0.7 | E | | 1 | | | | | BOU |
| 1989 08 31.13 | M | 5.2 | AA | 5.0 | B | | 10 | | 7 | 4 | 305 | BOU |
| 1989 09 01.06 | B | 5.9 | SC | 8.0 | B | 4 | 15 | | 7 | 0.12 | 302 | DUS |
| 1989 09 01.06 | B | 6.2 | S | 5.0 | B | | 10 | 2.5 | 7 | 0.6 | 320 | WES04 |
| 1989 09 01.09 | B | 5.6 | S | 6.6 | R | 6 | 56 | 4.5 | | 0.5 | 318 | IWA02 |
| 1989 09 01.09 | B | 6.2 | S | 8.0 | L | 7 | 23 | | 4 | | | MIO |
| 1989 09 01.10 | B | 5.7 | S | 6.3 | R | 13 | 34 | | 8 | | | RUM01 |
| 1989 09 01.11 | B | 5.6 | S | 10.3 | R | 7 | 40 | 10 | 5 | 0.1 | 230 | COL02 |
| 1989 09 01.44 | B | 5.4 | SC | 5.0 | B | | 10 | | | 0.75 | 302 | HAL |
| 1989 09 02.06 | B | 6.1 | S | 5.0 | B | | 10 | 2.3 | 7 | 0.5 | 310 | WES04 |
| 1989 09 02.08 | B | 6.2 | S | 5.0 | B | | 10 | | | | | OLE |
| 1989 09 02.09 | B | 6.0 | S | 5.0 | B | | 7 | | | | | KON01 |
| 1989 09 02.11 | B | 5.5 | S | 5.0 | B | | 7 | | | | | LEW |
| 1989 09 02.11 | B | 6.3 | S | 6.0 | B | | 20 | | 5 | | | BAN |
| 1989 09 02.15 | S | 5.4 | AA | 5.0 | B | | 10 | | 7/ | | | BOU |
| 1989 09 03.08 | M | 6.7 | S | 6.4 | R | 6 | 16 | | 2 | | | ADA01 |
| 1989 09 03.09 | B | 5.8 | S | 6.3 | R | 13 | 21 | | 5 | | | KOL02 |
| 1989 09 03.09 | B | 5.8 | SC | 8.0 | B | 4 | 15 | | 5 | | 319 | DUS |
| 1989 09 03.09 | B | 6.3 | S | 8.0 | L | 7 | 36 | | 4 | | | MIO |
| 1989 09 03.13 | M | 5.2 | AA | 5.0 | B | | 10 | | 7/ | | | BOU |

Periodic Comet Brorsen-Metcalf (1989o) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 09 03.47 | S | 5.6 | SC | 8.0 | B | 3 | 11 | 6.0 | 7 | 1 | 310 | PRY |
| 1989 09 04.05 | B | 6.1 | SC | 8.0 | B | 4 | 15 | | 6/ | | 313 | DUS |
| 1989 09 04.13 | M | 5.3 | AA | 5.0 | B | | 10 | | 7 | | | BOU |
| 1989 09 04.36 | B | 5.4 | AC | 6.3 | B | 4 | 9 | | | | | NOW |
| 1989 09 04.37 | B | 5.4 | AC | 40.0 | L | 4 | 56 | 5.0 | 5 | 1.5 | 10 | NOW |
| 1989 09 04.47 | B | 5.6 | SC | 5.0 | B | | 10 | | | 1.5 | 335 | HAL |
| 1989 09 05.06 | B | 5.9 | SC | 8.0 | B | 4 | 15 | | 8 | | 302 | DUS |
| 1989 09 05.08 | B | 6.3 | S | 5.0 | B | | 10 | 2.7 | 7 | 1.9 | 311 | WES04 |
| 1989 09 05.10 | B | 5.4 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 09 05.10 | B | 5.8: | S | 15.0 | C | 15 | 56 | | 5/ | &0.1 | 302 | KOL02 |
| 1989 09 05.14 | M | 5.5 | AA | 5.0 | B | | 10 | | 8 | 5 | 305 | BOU |
| 1989 09 06.08 | B | 6.3 | S | 5.0 | B | | 10 | & 2.2 | 7 | 1.0 | 310 | WES04 |
| 1989 09 06.10 | B | 5.9 | S | 6.4 | R | 6 | 20 | | 6 | | | CNO |
| 1989 09 06.13 | B | 5.7 | SC | 6.0 | R | 5 | 9 | 5.8 | 9 | 0.30 | 293 | JAH |
| 1989 09 06.13 | S | 5.5 | SC | 6.0 | R | 5 | 9 | | | | | JAH |
| 1989 09 06.14 | B | 5.8 | AA | 6.3 | B | | 9 | | 8 | ? | 320 | KAM01 |
| 1989 09 06.14 | M | 5.4 | AA | 5.0 | B | | 10 | | 7/ | 5 | 303 | BOU |
| 1989 09 07.10 | B | 6.1 | SC | 8.0 | B | 4 | 15 | | 8 | | | DUS |
| 1989 09 07.11 | B | 5.3 | S | 6.6 | R | 6 | 56 | 5.5 | | 0.7 | 330 | IWA02 |
| 1989 09 07.15 | ! M | 5.5 | AA | 5.0 | B | | 10 | | 7 | | | BOU |
| 1989 09 08.11 | B | 5.3 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 09 08.11 | B | 5.9: | S | 10.0 | R | 10 | 25 | | 6 | | 310 | KOL02 |
| 1989 09 08.14 | B | 5.7 | AA | 6.3 | B | | 9 | | 8/ | | | KAM01 |
| 1989 09 08.48 | B | 5.9 | SC | 5.0 | B | | 10 | | | 1.8 | 335 | HAL |
| 1989 09 09.06 | B | 6.0 | AA | 5.0 | B | 4 | 7 | & 2.5 | 6 | 1.2 | 304 | CHE03 |
| 1989 09 09.06 | B | 6.0 | AA | 6.0 | B | 4 | 20 | & 2 | 7 | 1.6 | 304 | SIE |
| 1989 09 09.08 | S | 6.6 | S | 6.4 | R | 12 | 40 | 0.7 | 6 | | | BOD |
| 1989 09 10.11 | B | 6.1: | S | 6.3 | R | 6 | 20 | & 2.3 | 6 | | | SZA01 |
| 1989 09 10.12 | B | 5.4 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 09 11.10 | B | 6.0: | S | 5.0 | B | 4 | 7 | & 1 | 5 | | | PAR03 |
| 1989 09 11.12 | B | 5.6 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 09 11.12 | B | 6.0 | S | 15.0 | L | 9 | 33 | & 1 | 5 | | | PAR03 |
| 1989 09 11.49 | B | 5.9 | SC | 5.0 | B | | 10 | | | 1 | 313 | HAL |
| 1989 09 12.07 | B | 6.1 | AA | 6.0 | B | 4 | 20 | & 2 | 6 | &0.5 | | CHE03 |
| 1989 09 12.07 | B | 6.3 | AA | 12.0 | R | 5 | 27 | & 2 | 6/ | 0.8 | | SIE |
| 1989 09 12.11 | B | 6.2: | S | 6.4 | R | 6 | 20 | | 6 | | | CNO |
| 1989 09 12.12 | B | 5.7 | S | 7.5 | R | 3 | 15 | | | | | IWA02 |
| 1989 09 13.10 | B | 6.0 | S | 5.0 | B | 4 | 7 | & 1 | 5 | | | PAR03 |
| 1989 09 13.10 | B | 6.3 | S | 6.4 | R | 6 | 20 | | 5 | | | CNO |
| 1989 09 13.10 | S | 6.4 | S | 6.4 | R | 12 | 40 | 0.6 | 6 | | | BOD |
| 1989 09 13.12 | B | 6.0 | S | 15.0 | L | 9 | 33 | & 1 | 5 | 0.17 | 308 | PAR03 |
| 1989 09 14.10 | B | 6.0: | S | 5.0 | B | 4 | 7 | & 1 | 5 | | | PAR03 |
| 1989 09 14.11 | B | 6.0 | S | 6.8 | R | 6 | 20 | & 1 | 5 | | | PAR03 |
| 1989 09 14.11 | B | 6.4 | S | 6.4 | R | 6 | 20 | | 5 | | | CNO |
| 1989 09 14.11 | S | 6.6 | S | 6.4 | R | 12 | 40 | 0.6 | 6 | | | BOD |
| 1989 09 14.12 | B | 6.0: | S | 15.0 | L | 9 | 33 | & 1 | 5 | | | PAR03 |
| 1989 09 18.50 | B | 7.0: | SC | 41 | L | 4 | 52 | | | | | HAL |
| 1989 09 25.50 | M | 6.8: | SC | 41 | L | 4 | 52 | | | | | HAL |

Periodic Comet Schwassmann-Wachmann 1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 10 08.83 | S[ | 14.0 | AC | 51.0 | L | 4 | 265 | ! 1.0 | | | | BOU |
| 1989 08 03.47 | S | 13.1: | AC | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 09.38 | I[ | 13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 08 23.23 | I[ | 12.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 01.41 | I[ | 12.0 | | 41 | L | 4 | 244 | | | | | HAL |
| 1989 09 03.29 | I[ | 13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 08.26 | S[ | 13.4 | AC | 41 | L | 4 | 183 | ! 1.0 | | | | HAL |

Periodic Comet Schwassmann-Wachmann 1 [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 09 10.45 | | I[13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 23.25 | | M 12.8 | AC | 41 | L | 4 | 83 | | 8 | | | HAL |
| 1989 09 25.19 | | M 12.5 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 09 26.84 | | S 12.6 | AC | 25.4 | J | 6 | 117 | 1.2 | 3 | | | BOU |
| 1989 09 27.85 | | S 12.7 | AC | 25.4 | J | 6 | 117 | 1.0 | 3 | | | BOU |
| 1989 09 30.24 | | S 12.5 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 10 03.27 | | S 12.2 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 10 03.84 | | S 12.7 | AC | 25.4 | J | 6 | 59 | | 1 | | | BOU |
| 1989 10 03.84 | | S 12.8 | AC | 25.4 | J | 6 | 90 | 1.4 | 1/ | | | BOU |
| 1989 10 04.84 | | S 12.9 | AC | 25.4 | J | 6 | 117 | 1.4 | 0/ | | | BOU |
| 1989 10 04.85 | | S 12.8 | GA | 25.4 | J | 6 | 117 | | | | | BOU |
| 1989 10 07.31 | | S 12.1 | NP | 25.6 | L | 4 | 111 | 1.8 | 1/ | | | MOR |
| 1989 10 08.32 | | S 12.3 | NP | 25.6 | L | 4 | 111 | 1.4 | 2 | | | MOR |
| 1989 10 08.39 | | S 12.6 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 10 23.17 | | M 12.9 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 10 28.27 | | S 13.3 | NP | 25.6 | L | 4 | 156 | 0.8 | 1/ | | | MOR |
| 1989 10 29.14 | | S 13.6 | NP | 50.8 | L | 4 | 195 | 0.7 | 1 | | | MOR |
| 1989 10 30.13 | | S 12.8 | NP | 25.6 | L | 4 | 156 | 1.3 | 1 | | | MOR |
| 1989 10 30.34 | | S 12.9 | AC | 41 | L | 4 | 183 | | | | | HAL |
| 1989 11 04.23 | | S 13.0 | AC | 41 | L | 4 | 83 | | 0/ | | | HAL |
| 1989 11 04.24 | | S[13.3 | NP | 25.6 | L | 4 | 156 | | | | | MOR |
| 1989 11 05.25 | | S[13.3 | NP | 25.6 | L | 4 | 156 | | | | | MOR |
| 1989 11 19.14 | | S[13.3 | NP | 25.6 | L | 4 | 156 | | | | | MOR |
| 1989 11 19.19 | | I[13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 11 20.13 | | S[13.3 | NP | 25.6 | L | 4 | 156 | | | | | MOR |
| 1989 11 27.14 | | S[13.3 | NP | 25.6 | L | 4 | 156 | | | | | MOR |
| 1989 12 02.21 | | I[13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 12 20.23 | | I[13.0 | | 41 | L | 4 | 183 | | | | | HAL |

Periodic Comet Lovas 1 (1989p)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 09 01.40 | | I[13.5 | | 41 | L | 4 | 244 | | | | | HAL |
| 1989 09 09.41 | | I[14.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 09 28.43 | | I[13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 10 09.38 | | I[13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 10 24.28 | | I[13.5 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 11 04.40 | | S 12.9 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 11 08.49 | | S 13.0 | AC | 41 | L | 4 | 183 | | | | | HAL |
| 1989 11 19.26 | | S 13.3 | NP | 25.6 | L | 4 | 156 | 1.5 | 1 | | | MOR |
| 1989 11 22.33 | | S 12.9 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 11 26.14 | | B 11.2 | AC | 35 | T | 6 | 113 | | 8 | | | AMO |
| 1989 11 30.35 | | S 12.7 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 12 05.50 | | S 12.8 | AC | 41 | L | 4 | 83 | | | | | HAL |
| 1989 12 20.29 | | S 12.8 | AC | 41 | L | 4 | 183 | | | | | HAL |

Periodic Comet Helin-Roman-Alu 1 (1987 XXXVII)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 10 09.34 | | I[13.0 | | 41 | L | 4 | 183 | | | | | HAL |

Periodic Comet Helin-Roman-Alu 2 (1989y)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 11 02.31 | | I[13.0 | | 41 | L | 4 | 183 | | | | | HAL |
| 1989 11 06.33 | | I[14.0 | | 41 | L | 4 | 183 | | | | | HAL |

# RECENT NEWS AND RESEARCH CONCERNING COMETS

Much has happened since I wrote the last edition of this column (January 1989 issue). Before NASA's *Solar Maximum Mission (SMM)* re-entered the earth's atmosphere a few weeks ago, it produced images of 3 more apparent new sungrazing comets (comets SMM 8, SMM 9, and SMM 10, with provisional designations 1989$m$, 1989$q$, and 1989$x$, respectively). Eleven comets have been recovered, including the much-anticipated return of P/Brorsen-Metcalf. Eleven new comets have also been discovered using ground-based telescopes since early March of last year. A record number of provisional letter designations were issued by the Central Bureau for Astronomical Telegrams, as P/Van Biesbroeck was recovered by Jim Gibson at Palomar in December as comet 1989$h_1$.

## New Recoveries

Several observatories had searched unsuccessfully for P/Brorsen-Metcalf by June, when I began to coordinate various observers having access to Schmidt telescopes. An accidental error in pointing the Uppsala Southern Schmidt telescope by Rob H. McNaught in June caused him to miss finding the comet then, which arrived at perihelion $\sim$ 16 days earlier than had been expected. The moon (and in some locations, clouds) then interfered until late June, when I asked Eleanor Helin's group at Palomar to try photographing a couple of suggested regions with the 18-inch Schmidt telescope. When no news came from her group, I asked Henry E. Holt to try a couple of fields; Holt was conducting the Shoemakers' observing run immediately after Helin's run. Helin and Holt both found the comet on films that they had taken on July 4 and 6, respectively, and the recovery as announced as P/Brorsen-Metcalf 1989$o$ (cf. *IAUC* 4804).

The comet was near $m_1 = 10$, visually, at recovery — so visual observers missed a rare opportunity to recover a short-period comet. P/Brorsen-Metcalf quickly brightened to $m_1 = 7$ by late July and to nearly fifth magnitude in August. While it did sport a tail several degrees in length, the tail was rather narrow and of rather low surface brightness (due to an apparent lack of much dust in the comet). Before the comet was lost in the solar glare in September, it faded somewhat to near sixth magnitude.

Of the remaining ten comet recoveries mentioned above, eight were found by Gibson at Palomar with the 60-inch (1.5-m) Cassegrain reflector (+ CCD) at Palomar: P/du Toit-Neujmin-Delporte 1989$l$ (*IAUC* 4787), P/Gehrels 2 1989$n$ (*IAUC* 4800), P/Wild 2 1989$t$ (with Karen J. Meech; *IAUC* 4860), P/Kearns-Kwee 1989$u$ (*IAUC* 4866), P/Tuttle-Giacobini-Kresák 1989$b_1$ (*IAUC* 4909), P/Schwassmann-Wachmann 3 1989$d_1$ (with Jane Luu *et al.*; *IAUC* 4923), P/Russell 4 1989$g_1$ (*IAUC* 4932), and P/Van Biesbroeck. P/Russell 4 is making its first observed predicted return to perihelion. P/Schwassmann-Wachmann 3, P/Wild 2, P/Gehrels 2, and P/Brorsen-Metcalf are all making their third observed returns to perihelion.

The other two recoveries since last February are those of P/Lovas 1 (1989$p$) by amateur astronomer T. Seki in Japan in July (when the comet was at $m_1 = 17$-17.5 on 60-cm reflector photographs; cf. *IAUC* 4813) and P/Sanguin (1989$z$) by B. Weller, R. Coker, and Meech from Cerro Tololo Interamerican Observatory in Chile in May (not reported until November; *IAUC* 4903). Both of these comets are making their first observed predicted returns to perihelion, having been seen previously only at their discovery apparitions.

## New Discoveries

Amateur astronomers have been making an impact since last February with the visual discoveries of no fewer than four new comets. Two of these (Okazaki-Levy-Rudenko 1989$r$ and Aarseth-Brewington 1989$a_1$) have already reached naked-eye brightness, and a third (Austin 1989$c_1$) holds some promise in the next few months for putting on the best display since comet West 1976 VI.

David Levy (Tucson, Arizona) and Michael Rudenko (Amherst, Massachusetts) reported their visual discoveries of a new 10th-magnitude comet moving southwestward near the Bootes/Corona Borealis border in late August. It is Levy's fifth comet and Rudenko's third; Rudenko had been hunting for 174 hours since his second discovery (1987$u$). After the IAU telegram was sent out announcing comet Levy-Rudenko 1989$r$, word came from Japan's National Observatory in Tokyo that an independent discovery had been made (a day earlier yet) by Kiyomi Okazaki (Kahoku-machi, Yamagata-ken, Japan), and the comet was renamed Okazaki-Levy-Rudenko. The comet rapidly brightened to mag 8 by late September and to mag 5 by late November as it raced southward into southern-hemisphere skies in December. It, too, produced a faint, thin gaseous tail as long as a few degrees.

Knut B. Aarseth of Volda, Norway, and Howard J. Brewington of Newberry, South Carolina, independently discovered comet 1989$a_1$ visually as an eighth-magnitude object near the Hercules/Corona Borealis border on November 16. Comet Aarseth-Brewington became the brightest observed comet (not counting the SMM sungrazers) since P/Halley, reaching third magnitude in late December (around the time of perihelion).

Rodney R. D. Austin of New Zealand found his third comet on December 6 as an eleventh-magnitude diffuse object in the southern constellation Tucana (*IAUC* 4919). This comet will remain far south until perihelion ($T \simeq$ 1990 April 9; $q = 0.35$ AU), during which it should gradually brighten. After perihelion, it will be most favorably placed for northern-hemisphere observers in the morning sky, and in May could be brighter than second magnitude in a dark sky.

Douglas B. George (near Ottawa, Canada) found a comet in Vulpecula on December 18 that was designated comet 1989$e_1$ (cf. *IAUC* 4925). George, who was using the same telescope (40-cm reflector) that Rolf Meier has used to discover several comets, had hunted only 65 hours before finding this comet (his first). Word came a few days later from Klim I. Churyumov of Kiev Observatory in the Soviet Union that Boris Nikolaevich Skorichenko had independently discovered this comet on December 17 with a 15-cm reflector. Comet Skorichenko-George was near mag 10 in late December, but will not become as bright as the other three above-mentioned comets that were found visually; its perihelion distance is $q \sim 1.7$ AU.

Carolyn Shoemaker found her seventeenth comet on Palomar Schmidt films exposed on March 9. The object is known as P/Shoemaker-Holt 2 (1988 XI = 1989$j$; thus, comet 1988 VII = 1987$z$ becomes P/Shoemaker-Holt 1).

Malcolm Hartley found his eleventh comet on 48-inch Schmidt plates at Siding Spring Observatory in Australia; his comet was first found by Richard West on a plate taken with the European Southern Observatory 1-m Schmidt telescope on March 14, but nothing more was known until Hartley found the same comet on May 28 plates, and Brian Marsden connected the two with a an orbit of period 7.6 years (*IAUC* 4784, 4795). The comet is called P/West-Hartley 1988 XVI = 1989$k$. Another find at Siding Spring in late December is known as comet McKenzie-Russell 1989$f_1$, a 13th-mag object already past perihelion and fading.

Eleanor F. Helin and her group found four new comets since last February: Helin-Roman 1989$s$, Helin-Roman-Alu 1989$v$, P/Helin-Roman-Alu 1 (1989$w$), and P/Helin-Roman-Alu 2 (1989$y$). P/Helin-Roman-Alu 1 passed perihelion some two years before discovery, and has the permanent designation 1987 XXXVII. Of these, comet 1989$v$ became as bright as $m_1 = 9$ to 10 in the latter part of 1989. Both of Helin's new short-period comets have orbital periods around 9 to 10 years.

### Other News

A recent *Astronomical Journal* paper by Brian G. Marsden addresses the so-called Kreutz sungrazing comet problem, now in light of the apparent members of this group that were found prior to 1989 with the *SOLWIND* and *SMM* coronographs. Marsden finds that the location of Jupiter (with respect to the in-coming comets) is a key factor in determining whether or not a given comet will survive perihelion, as gravitational perturbations from Jupiter can easily force a comet closer to the sun at perihelion. Marsden found that comets 1843 I and 1880 I were likely one single object that split apart at its perihelion passage in the second half of the fifteenth century; no comet from historical records can definitely be singled out as the progenitor, however. Following his own work two decades ago on the sungrazers, two major subgroups are still found, and Marsden found the evolutionary period for all components to be shorter than previously thought; he suggests the possibility that all observed parts may have been one comet in 372 B.C., when a bright comet was noted by Aristotle and Ephorus. Planetary perturbations near successive perihelia for each piece of the original comet cause differences in orbital period of hundreds of years from one observed sungrazer to the next.

The U.S. Congress has approved the *Comet Rendezvous Asteroid Flyby (CRAF)* mission for a new start in FY 1990.

— *Daniel W. E. Green (1990 January 2)*

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# ELECTRONIC SENDING OF COMET OBSERVATIONS

Various observers have asked about the format we use internally for processing of tabulated observations of comets. For historical reasons, we use one line per observation, each line consisting of 80 characters.

The first 12 columns are for the comet's identification. The first three characters are blank (except for short-period comets, which have a 3-digit code, obtainable from the Editor). Columns 4-7 represent the year that the comet arrives at perihelion. Columns 8-9 are the Arabic numeral representations of the comet's official Roman numeral designation (with a zero in column 8 for I-IX; columns 8 and 9 are left blank until Roman numeral designations are issued). Column 10 is the last digit of the year of the provisional letter designation, and column 11 is the lower-case letter (column 12 is used if there are more than 26 provisional letter designations in a given year). Thus, an observations of comet Aarseth-Brewington 1989$a_1$ has characters 1-12 given as " 1989 9a1".

Columns 13-16 are for the year, 18-19 for the month, and 21-25 for the date (to 0.01 day, with a decimal in column 23), given in Universal Time in fractions of a day.

Column 27 contains the 1-letter code for the magnitude method (MM), column 28 contains a bracket ([) if necessary, and columns 29-32 contain the magnitude estimate (column 31 is a decimal point). Column 33 is for a colon (:), or for an extra digit in the case of photoelectric data.

Columns 34-35 contain the 1- or 2-letter reference code (flush left). Columns 36-40 contain the instrument aperture, given in centimeters (as AAA.A, with a decimal point in column 39). Column 41 is for the 1-letter code representing the instrument type. Columns 42-43 are for the f/-ratio (flush right), and 44-47 are for the magnification (flush right).

Columns 49-54 are for the coma diameter (in arc minutes), with column 52 being the decimal point and column 49 used for symbols (<, >, &, !). Columns 6-7 are for the degree of condensation (DC), flush left, with column 7 used *only* for a slash (/).

Columns 59-63 are for the tail length (in degrees), with column 61 being the decimal point and column 59 again used for symbols. Columns 65-67 are for the tail's position angle (in degrees), flush right.

Column 75 is for notes (e.g., ! denotes that atmospheric extinction was corrected for). Columns 76-78 contain the letter portion, and 79-80 the number portion, of the observer code.

*We strongly encourage all observers to send, if at all possible, observations in electronic form (e-mail or floppy disks) rather than on paper forms. The volume of incoming data has become very high. — The Editor*

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The indices to *ICQ* Volumes 10 and 11 will be mailed with the April 1990 issue.

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**On page 40 is a photograph of comet Seki-Lines 1962 III taken on 1962 April 10 (3h42m-3h52m UT) by Alan McClure from Frasier Mountain, California (elevation 7300 feet). He used a 5.5-inch *f*/5 Zeiss triplet aerial lens and a panchromatic plate with no filter (380-630 nm). The anti-tail is quite prominent in this view.**