# INTERNATIONAL COMET QUARTERLY

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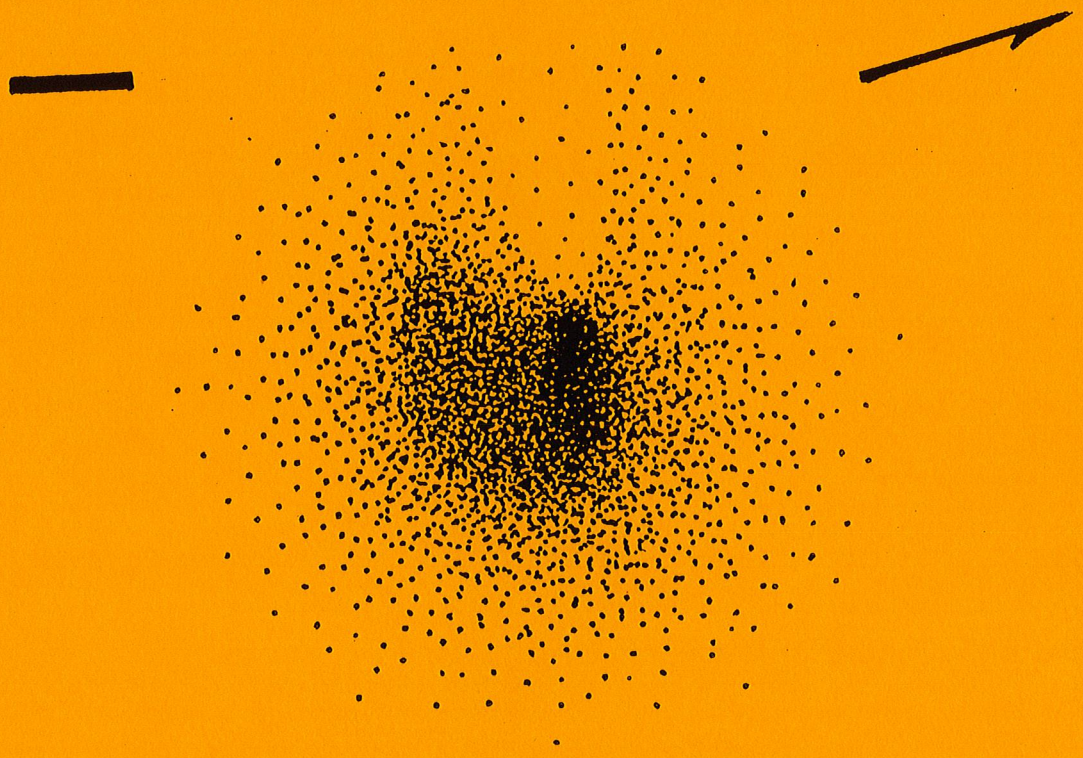

Drawing of the inner coma of P/Swift-Tuttle (1992t) by John E. Bortle on Oct. 27.99 UT (50-cm Newtonian reflector, 241×). Arrow points north; bar is ~ 1′ long.

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

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

The regular (invoiced) subscription rate is US$24.00 per year (price includes the annual *Comet Handbook*; the price without the *Handbook* is US$16.00 per year). Subscribers who do not wish to be billed may subscribe at the special rate of US$20.00 per year (rate is $12.00 without *Handbook*). [The last set of digits (after the hyphen) on the top line of the mailing address label gives the Whole Number that signifies the last *ICQ* issue which will be sent under the current subscription status.] Make checks or money orders payable in U.S. funds (and drawn on a U.S. bank) to *International Comet Quarterly* and send to Daniel Green; Smithsonian Astrophysical Observatory; 60 Garden St.; Cambridge, MA 02138, U.S.A. [Group subscription rates available upon request.] Back issues are $4.00 each — *except* for "current" *Comet Handbooks*, which are available for $10.00 ($8.00 to subscribers if ordered with their *ICQ* subscription; see above). Up-to-date information concerning comet discoveries, orbital elements, and ephemerides can be obtained by subscribing to the *IAU Circulars* and/or the *Minor Planet Circulars* (via postal mail and also available via computer access); for further information, contact the *ICQ* Editor at the above address.

Manuscripts will be reviewed for possible publication (if possible, send via computer networks; or, send typed, double-spaced copy to the Editor at the Cambridge address above); authors should first obtain a copy of "Information and Guidelines for Authors" from the Editor. Cometary observations also should be sent to the Editor in Cambridge; all data intended for publication in the *ICQ* that is not sent via computer electronic mail should be sent on standard *ICQ* observation report forms, which can be obtained upon request from the Editor. Those who can send manuscripts and observational data in machine-readable form are encouraged to do so [especially through e-mail via the computer networks *SPAN* (CFAPS2::GREEN), *BITNET* (GREEN@CFA), or Internet (GREEN@CFA.HARVARD.EDU), or via floppy disks that can be read on an IBM PC], and should contact the Editor for further information.

Among the Observation Coordinators (OCs) listed below, those with postal addresses have e-mail contacts with the *ICQ* Editor (or regularly send data to the Editor on IBM PC-compatible floppy disks); observers in the general area of such OCs who lack access to e-mail networks may send data to the OC for relay to the *ICQ* in electronic form.



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## — CATALOGUE OF COMETARY ORBITS 1993 —

The eighth edition of this *Catalogue* is now available, its 102 pages containing orbital elements (in the J2000.0 system) for 1392 cometary apparitions through April 1993. A new feature has comet names in the same table as their orbital elements. The cost of the printed *Catalogue* is US$20.00 postpaid. The main part of the *Catalogue* can be supplied via e-mail for $50.00 or on an MS-DOS diskette (5.25-inch or 3.5-inch) for $100.00, the latter including a facility for extracting individual orbits and computing ephemerides. Checks accompanying orders should be made out to "Central Bureau for Astronomical Telegrams" and sent to the *ICQ* Editor (address above).

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## — CORRIGENDA —

• In the January 1993 issue (*ICQ* No. 85), p. 4, the title at the top *should read* "Roman Numeral Designations of Comets in 1991"

• Also in the January 1993 issue, p. 31, 'Periodic Comet Hartley 2 (1991 XV)', the observation for 1991 Sept. 10.80 UT was by observer TSU02, *not* TSU. [In fact, observer TSU had *no* observations in that entire issue.]

• Also in the January 1993 issue, p. 42, 'Periodic Comet Swift-Tuttle (1992t)', the observation attributed to COM on 1992 Oct. 29.77 was actually made by SCH04 and the tail's p.a. *should read* 40°

# THOSE PROBLEM OBSERVATIONS!

**Attention all contributors!**

This note is aimed at all observers who send in observations, and particularly those who send them by paper. The July 1992 issue of the *ICQ* outlined how observations should be submitted in computer format, and most 'computer contributors' do a very good job. There are a couple of places where 'computer contributors' tend to err as far as the proper columns are concerned: the reference for comparison stars, the *f*/-ratio, and the DC — where the tendency is sometimes to 'right justify', 'left-justify', and 'right justify', respectively (the opposite is the correct way to enter the data). Also, left brackets and colons for $m_1$ estimates, and '&' signs for coma-diameter and tail-length estimates tend to get placed in the wrong columns. But 'computer contributors' might take note of some of the comments below.

In these pages I have frequently complained about messy, illegible report forms, but only about half of the worst offenders have changed their ways. Perhaps the worst offenders don't read the *ICQ* — they just contribute observations — I don't know. That's why I put the heading to this short article in big letters, hopefully to attract the attention of the worst offenders.

I've requested all contributors (especially individuals, and particularly those who contribute via Observation Coordinators) to monitor the *ICQ* closely for publication of their observations — to check to see if their observations are published, and if so, to be sure that errors didn't creep in. If the observations were *not* published, it's most likely because something was wrong in the manner in which the data were reported (though losses in the mail are also possible very occasionally). Below I list the biggest problems that are present in observations that arrive for publication in the *ICQ*, and these problems cause many observations to be precluded from archiving (perhaps as many as 5 or 10 percent of all observations received!).

• We frequently cannot read the handwriting on the report forms. *Solution: type or* **print very neatly**. We have numerous report forms filed away in our 'HOLD file' where we cannot even decipher the observer's name!

• Dates and times are sometimes not converted to decimals of a day, but are given in hours and minutes. Such observations will be greatly delayed, sometimes never published. Also, please do not give times to greater accuracy than 0.01 day; the data's accuracy usually do not warrant such accuracy (unless they are photoelectric), and probably most watches and clocks aren't, either.

• Year, month, and date are often given without spaces on report forms. *Please* put spaces between the year, month, and date! It takes a typist much longer to read data that are not properly spaced, and the opportunities for error introduction are increased. And please be sure that you have not forgotten the year or the month (a common mistake). Also, for months and dates less than 10, a leading zero is necessary.

• Place the extinction note characters in the 'Remarks' column at the far right; confusion can occur if you place them next to the MM, the $m_1$ estimate, or the reference. The special note characters go before the observer code on the internal archive's data records.

• Be sure that you are using the proper codes for MM, reference, and telescope type.

• Total visual magnitude estimates. We have been ignoring contributed observations by observers who report magnitudes only to the nearest whole or half magnitude. Most of these observers do not place a colon by their estimates, and they are obviously not trying hard enough to get decent estimates. By definition, any $m_1$ estimate only good to $\pm$ 0.5 mag is considered a rough estimate and should have a colon (:) *immediately following the estimate.* Also, it is rather absurd to regularly make visual $m_1$ estimates of 5th-magnitude comets with a 20- or 30-cm telescope! One should *always* make an estimate with the smallest instrument needed to *easily* see the comet. Only use binoculars if the comet is brighter than mag 7 or 8, for example. And don't use 20×80 binoculars, for example, if you cannot defocus them enough for a large comet, because your estimate will be in error.

• 'Computer contributors' should never put a zero in front of *any* non-date value (meaning $m_1$ estimates, aperture, *f*/-ratio, magnification, coma diameter, and tail information).

• *Always* give instrument aperture in **centimeters** — not millimeters, not meters, and not inches. Always give binoculars to 0.1 cm (most are usually sized in whole centimeters, anyway). Only give telescope apertures to 0.1 cm if they are known to 0.1 cm.

• Coma diameter. So many contributors get this wrong, especially the significant figures. It must be given in arc minutes. Please do not give it to 0′.1 unless you are confident that the estimate is good to $\pm$ 0′.3 or better. (We allot space for 0′.01 *only* for non-visual observers.) Do *not* put a colon (:) for an approximate coma diameter estimate; use an ampersand (&), and put it *before* (not after) the estimate itself. (This last sentence also applies to tail length.)

• The degree of condensation should be given as a whole number. If you estimate that it is somewhere between, say, 5 and 6, put '5/' (do *not* put '5.5'). There is no provision for saying 'approximately 5', so do not use such symbols as '&', ':', or '?' for DC (this also applies to the tail's p.a.).

• The tail length should *always* be given in degrees, to 0°.01 if necessary and appropriate. If the length is 2° $\pm$ 0°.5, do not give the length as 2°.00! (Too many observers make this mistake.) It is up to the *observer* to decide what figures are significant — please do not force the *ICQ* editors to decide!

• If there is a fan tail, provide a p.a. for the tabulated data that corresponds to the length given. Then, in the 'Descriptive Information', provide the full p.a. span of the fan tail in degrees (and indicate how long the tail is over the span). Also, if there are two or more tails, give the longest tail with the tabulated magnitude data, and give the additional tail information in 'Descriptive Information' format *only* (not in tabulated form; we do not want to use an extra line of tabulated format for each additional tail datum).

*(Continued on next page...)*

• Again, do not put leading zeroes in front of the tail's position angle, which are only given to whole integers (*not* to fractions of a degree). And there is no provision for denoting an approximate p.a. (so don't state they are approximate unless the data are intended for the 'Descriptive Information' section).

• Do **not** put a '.0' after a number unless it means something!

• The observer. Yes, even this causes us quite a bit of headache. 'Computer contributors' should provide, at the end of a data listing, a list of observers' full names with the corresponding *ICQ* codes as used in the given file (mistakes do happen, and we like to verify things). Frequently names are misspelled, and this causes us problems, because we don't know if we should assign a new designation or not. A key problem here arises in two places: (1) in countries whose native languages use non-Roman alphabets, and a transliteration is necessary (such contributors should consult the *ICQ* key to observers to see if errors have occurred); and (2) in Spanish or hispanic countries where people tend to carry both the names of their father and their mother. We ask contributors from such countries in particular to be most careful in providing full names and underlining the family name.

• Please do not provide such information as 'faintest naked-eye star' or 'tail intensity'.

• Be very careful to give the proper name and designation of the comet observed! Sloppy contributors mix up names and designations, and it can be nearly impossible trying for *ICQ* Staff members to figure out which comet was observed!

In closing, I ask that all contributors take these comments seriously, because the quality of the archive depends on all of the data that go into it. One area that is a continual problem for us is where inexperienced observers contribute data that are off from reality by a huge amount: magnitude estimates that are 2-3 magnitudes too faint, or coma diameters that are two times too big or ten times too small. We ask Observation Coordinators to take an active role in instructing their observers to use proper procedures, taking note of observations that are very discordant with the majority of other data (particularly in the case of well-observed 'binocular comets'), and discussing the situation with the observer.

— D. W. E. Green

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# TABULATION OF COMET OBSERVATIONS

In late March, the brightest supernova visible from the northern hemisphere since 1972 was discovered, designated SN 1993J and located in the galaxy M81 = NGC 3031. SN 1993J reached visual mag 10.7 at maximum brightness, and was followed by professional and amateur observers worldwide. It quickly became clear that the largest collection of photometry for stars in the field surrounding M81 was that on the *Supernova Search Chart (SSC)* by Thompson and Bryan (see review in *ICQ* **13**, 141). However, the *SSC* magnitudes for M81 is a patchwork of data from several different sources, and observers were quickly reporting that sequences did not look right — that stars were fainter or brighter than their published magnitudes. This began some in-depth scrutiny of the stellar magnitudes in the M81 field, and much of the "fall-out" from this story has impact on visual observers of comets.

What was soon learned was that Thompson and Bryan had taken magnitudes from an AAVSO chart for M81 without asking the AAVSO. It turns out that the AAVSO-derived magnitudes were visual "guesstimates" from an AAVSO observer who was not even using comparison stars (he was going on "experience)! Furthermore, as photometrists looked closer at the M81 field, it soon became apparent that two and possibly more of the comparison stars are quite noticeably variable in brightness. New $V$ photometry of stars in the M81 field has been performed by several observers, most notably Brian Skiff at Lowell Observatory, who produced magnitudes for several bright stars not measured previously. The AAVSO is working on a third revision of the chart in less than two months, and the final version should be quite useful visual observations of stars and comets. Janet Mattei, AAVSO Director, has kindly allowed us to publish this revised chart in the *ICQ* for comet observers to use when comets are reasonably nearby. The new chart appears on page 102 of this issue, and we assign *ICQ* reference code 'AS' to this chart. There is a good sequence for the range $10.3 < V < 15.5$.

What has also been learned as a result of intensive observation of the stars surrounding SN 1993J is that the Hubble Guide Star Catalogue has severe problems, such that the average GSC star in the M81 field is off by $\pm$ 0.5 mag or more. Reports have surfaced elsewhere of large problems with not only the GSC throughout the sky, but also with the *SSC*. So, even though we assigned the *ICQ* code 'HS' for the GSC $V$ magnitudes in the January 1993 issue (page 4), we must now recommend that GSC magnitudes *not* be used except where there are no other reasonable possibilities. (Note that this does not have any bearing on the *Ap.J. Suppl.* catalogue — *ICQ* code 'GA' — which was produced directly from photometry at various telescopes and was intended as a basis for the larger GSC. Reference 'GA' is a good source.)

New reference code: 'YF' = fourth edition, *Yale Bright Star Catalogue.*

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

◇ *Comet Ichimura 1987d*$_1$ = *1988 I* $\Longrightarrow$ 1987 Dec. 14.92: "comet diffuse, circular; coma more diffuse, no central cond." [DES01].

◇ *Comet Liller 1988a = 1988 V* $\Longrightarrow$ 1988 Feb. 12.95: diffuse coma; small bright cond. [DES01]. Feb. 13.93: comet very diffuse, no central cond. [DES01].

◇ *Comet Tsuchiya-Kiuchi 1990i = 1990 XVII [all remarks by DES01]* $\Longrightarrow$ 1990 Oct. 28.27: coma appeared elongated, possible tail. Nov. 13.29: comet had distinctly blue color, and remained so through Nov. 25. Nov. 21.24: fan-shaped tail is visible. Nov. 23.24: broad tail very faint.

◇ *Comet Levy 1990 XX* ⟹ 1990 Aug. 27.84: w/ 15.0-cm telescope (225×), central cond. of dia. 15″ [CHE03].

◇ *Comet Shoemaker-Levy 1991d = 1991 XXIV* ⟹ 1992 Sept. 2.95: search based on the elements of *MPC* 20602 [GAR02].

◇ *Comet Shoemaker-Levy 1991a*$_1$ ⟹ 1992 June 27.01: comet showed great and weak outer coma, there was also a very strong cond. towards the center [MEY]. July 11.91: in 19.9-cm *f*/4.5 L (129×), 'diffuse coma' boundaries, but center moderately gradually condensed to the starlike nucleus (DC = 4); some interference of twilight [ZHU]. July 20.91: in 12.9-cm *f*/4.3 L (92×), "extended, gradually condensed coma with unsharp planet-like center 2′ in dia., whose brightness, in turn, gradually increased to the stellar nucleus" [ZHU].

◇ *Comet Zanotta-Brewington 1991g*$_1$ ⟹ 1992 Jan. 11.73: moon only 30° away, bright background sky [MEY]. Jan. 24.74: slightly cirrus, conspicuous faint outer coma [MEY]. Jan. 25.00: "comet observed very low and close the horizon; comet probable enlogated; coma very diffuse, the central cond. very faint [DES01].

◇ *Comet Mueller 1991h*$_1$ ⟹ 1992 Feb. 27.77: short and broad tail suspected [MEY]. Mar. 1.76: great and faint outer coma suspected [MEY].

◇ *Comet Tanaka-Machholz 1992d* ⟹ 1992 Sept. 26.13: search based on the elements of *MPC* 20309 [GAR02].

◇ *Comet Spacewatch 1992h* ⟹ 1993 Apr. 12.30: "for all observation attempts the comet was presumed to be a small, condensed object; during this attempt an extremely faint, vague, diffuse object was suspected at the visual threshold; however, its existence could not be confirmed (and is presumed doubtful)" [HAL].

◇ *Comet Shoemaker 1992y* ⟹ 1992 Dec. 20.87-1993 Mar. 18.81: searches based on the elements on *MPC* 21236 [GAR02].

◇ *Comet Ohshita 1992a*$_1$ ⟹ 1992 Dec. 22.53: poor sky conditions; quite a bit of interference from cirrus; the given brightness estimate is not much more than a guess [HAL]. 1993 Jan. 20.43: fairly low altitude [HAL]. Feb. 1.21: used 20-cm *f*/2 Baker-Schmidt camera + *V* filter + ST-6 CCD; circular coma with central cond. of dia. ~ 0′.5 [MIK]. Feb. 2.16: weak, diffuse object [MIK].

◇ *Comet Mueller 1993a* ⟹ 1993 Jan. 16.31: "the comet is small, faint and condensed; it has maintained this same general appearance throughout subsequent observations" [HAL]. Jan. 31.19: used 19-cm *f*/4 flat field camera + *V* filter + Wright CCD; starlike central cond. of dia. 22″; fan-shaped tail ~ 5′ long [MIK]. Feb. 1.17: completely stellar appearance; delicate fan tail ~ 4′ long [MIK]. Feb. 8.78 and 20.80: stellar appearance; fanlike tail [MIK]. Feb. 12.25: "the coma has developed a slightly asymmetric appearance, with the central brightest region being displaced off-center toward the leading edge of the coma; this appearance has persisted throughout subsequent observations" [HAL]. Feb. 13.88: 4′ fanlike tail [MIK]. Mar. 10.81: straight 5′ tail [MIK]. Mar. 16.83 and Apr. 8.86: fanlike tail [MIK].

◇ *Comet Mueller 1993d* ⟹ 1993 Mar. 26.94: several frames taken between Mar. 26.80-26.94 show no suitable object; limiting *V* mag of frames = 17.8 [MIK].

◇ *Periodic Comet Brewington (1992p)* ⟹ 1992 Sept. 21.03: interference from nearby Moon [ZHU]. Sept. 26.11: search based on elements from *MPC* 20775 [GAR02].

◇ *P/Ciffréo (1992s)* ⟹ 1992 Sept. 2.99 and 25.93: search based on elements on *MPC* 16378 [GAR02]. Nov. 29.18: the nearby galaxy NGC 7727 was bright and easy [HAL]. Dec. 20.86, 26.78, and 1993 Jan. 17.78: searches based on elements on *MPC* 20908 [GAR02]. 1993 Jan. 16.12: based upon its appearance in 1985, the comet was presumed to be a vague, low-surface-brightness object [HAL].

◇ *Periodic Comet Schaumasse (1992x)* ⟹ 1992 Dec. 16.781: w/ 40-cm L (+ image intensifier RTC XX 1390 w/ S20R photocathode, spectral range 300-950 nm) and T-Max 400 film, 5-sec exp. yields $m_1$ [13 (assumed diffuse) [MER]. Dec. 22.29: some interference from cirrus [HAL]. Dec. 26.76: comet appeared fainter w/ Lumicon Swan Band Filter; comet was near the threshold of visibility [MEY]. Dec. 27.07: at 157×, no apparent separate central cond. or nucleus [BOR]. Dec. 29.898: observed as on Dec. 16.781, comet appears as condensed object w/ some diffuseness, $m_1$ = 12.5, coma dia. 30″ [MER]. Dec. 29.96: possible tail < 1′ in p.a. 90° [GAR02]. Dec. 30.99: w/ 30.0-cm *f*/5 L (130×), $m_1$ ~ 11: (MM: S), coma dia. 2′, DC = 0 [SCH04].

1993 Jan. 13.21: interference from cirrus [HAL]. Jan. 14.81: comet near 8th-mag star, appeared very large w/ averted vision; Lumicon Swan Band Filter showed the comet larger and brighter [MEY]. Jan. 14.83: a pair of 5-sec exp. on T-Max 400 film w/ 40-cm L (+ image intensifier RTC XX 1390) shows $m_1$ = 11.5, coma dia. 30″, cond. of dia. 10″ [MER]. Jan. 17.76: large coma w/ vague boundaries [MEY]. Jan. 18.0: w/ 20-cm T (80×), coma dia. 2′.5 [GAR02]. Jan. 18.95: w/ Celestron 8 (167× and 250×), 0°.07 tail in p.a. 92° and 0°.02 streamer in p.a. 115°; coma asymmetrical toward p.a. 192° [GAR02]. Jan. 19.13: "coma boundaries extremely diffuse and ill-defined; coma consists of a dense central region surrounded by a very weak but extensive outer halo; Lumicon Comet (Swan-band) filter slightly enhances comet's image" [BOR]. Jan. 21.05: "overall appear appearance of coma rather like the galaxy M33 — a small, dense central region imbedded in an extensive but very faint outer disk of light; extreme outer extent (dia.) of coma varies by glimpses; no nucleus of separate central cond. at 110×" [BOR]. Jan. 21.93 *[see drawing on page 62]*: w/ Celestron 8 (167× and 250×), 0°.02 tail toward p.a. 132° and very diffuse coma w/ 3 concentric envelopes of dia. 0′.8, 1′.8, and 4′.0 [GAR02]. Jan. 22.92: w/ 20.3-cm *f*/10 T (80×), coma dia. 4′; at 167× and 250×, faint fan-shaped tail, w/ length 0°.14 toward p.a. 116°, 0°.10 in p.a. 123°, and 0°.09 in p.a. 142°; coma uniform — no concentric envelopes seen [GAR02]. Jan. 26.00: central cond. appears more diffuse than on Jan. 23.98; coma appears brighter toward the E [DID]. Jan. 26.09: in 20×80 B, comet appears as a very faint, diffuse, circular glow so large as to be at the extreme extrafocal capabilities of the binoculars; in 32-cm L (110×), "a minute, stellar nucleus is noted, of mag ~ 13.5, at the coma's center; the Lumicon comet filter, used at 68×, enhances the comet little if at all" [BOR].

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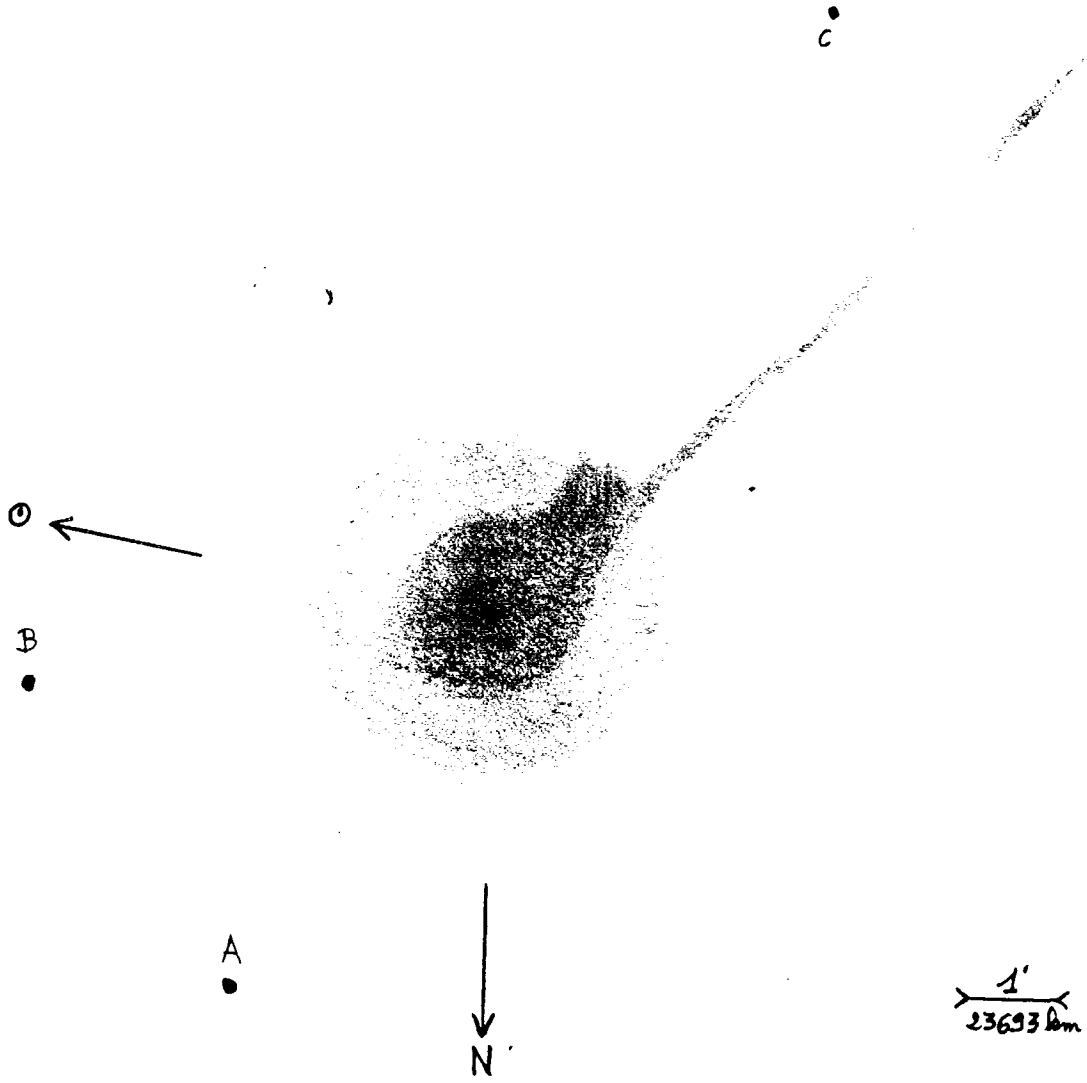


**Drawing by S. Garro of P/Schaumasse on 1993 Jan. 21.93 [see text].**

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[cont. from page 61]

Feb. 9.01: in 20×80 B, coma's size (9′.5) well beyond the extrafocal limit of the instrument, DC = 2; in 32-cm L, dense central region comprises 60% of coma's dia., remaining outer halo exceedingly faint; at 55×, use of the Lumicon comet filter noticeably enhances comet's image; at 110×, a tiny knot of material not larger than 0′.1 noted at coma's center [BOR]. Feb. 10.05: comet too close to 7th-mag star for obs. w/ 10×50 B [BOR]. Feb. 11.80: comet involved w/ 8th-mag star [MEY]. Feb. 13.8-13.9: w/ 20.3-cm *f*/10 T (167× and 250×), 0°.3-long fan-shaped tail spans p.a. ~ 60°-120° [GAR02]. Feb. 15: w/ 20.3-cm *f*/10 T (167× and 250×), small, stellar nucleus of mag ~ 11.5 seen at center of very diffuse, uniform coma [GAR02]. Feb. 15.00: noticeable central cond.; coma seems brighter toward the SW [DID]. Feb. 15.03: bright portion of coma is 3′.5 in dia., while outer halo somewhat exceeds 5′ (no defineable boundaries); at 110×, a minute speck of light is glimpsed at the coma's center [BOR]. Feb. 18.04: w/ 32-cm L, central region of coma obviously condensed but is surrounded by an extensive outer halo which is significantly more than twice its size; much more difficult than usual to define where coma ends; at 110×, no separate central cond. or nucleus [BOR]. Feb. 18.17: observation made under conditions of relatively severe light pollution [HAL]. Feb. 18.31: low altitude [HAL]. Feb. 18.84: w/ 20.3-cm *f*/10 T (167× and 250×), tail length 0°.17 toward p.a. 108° and 0°.05 toward p.a. 136°; 0°.02 streamer in p.a. 273° (curved toward p.a. 237°); head elongated toward p.a. 125°; at 80×, coma dia. 4′ [GAR02]. Feb. 19.08: Swan-band filter shows no significant brightening [SHA04]. Feb. 20.03: inner coma 2′.8 in dia.; very tenuous outer halo at least 5′.5 in dia., but totally w/o boundaries [BOR]. Feb. 20.07: slight fan shape [SHA04]. Feb. 21.82: no central cond. [LOO01]. Feb. 25.03: w/ 32-cm L, inner coma 2′.6 in size, bright, dense, and condenses steadily to the center; this is surrounded by an extremely faint, ill-defined outer halo up to 4′.5 in dia.; at 110×, a minute, possibly stellar nucleus of mag 13.5 [BOR]. Feb. 26.05: w/ 32-cm L, inner coma ~ 2′ in dia.; outer halo at least 3′.4, but sky brightened by moonlight and reflected light off snow-covered ground; comet involved w/ a number of faint stars, but there is a suggestion of extensions toward the W; w/ 20×80 B, coma dia. 8′.5, DC = 2 [BOR]. *(Continued on next page...)*

[cont. from page 62] Feb. 27.03: at 55×, coma may be up to 6′ in dia., but very ill-defined; at 68×, the outer halo can be traced to a dia. of 4′, but the brighter inner coma is much smaller; Lumicon comet (Swan-band) filter strongly enhances comet's image; at 110×, a minute nucleus or nuclear cond. is glimpsed, mag probably not brighter than 13.5 [BOR].

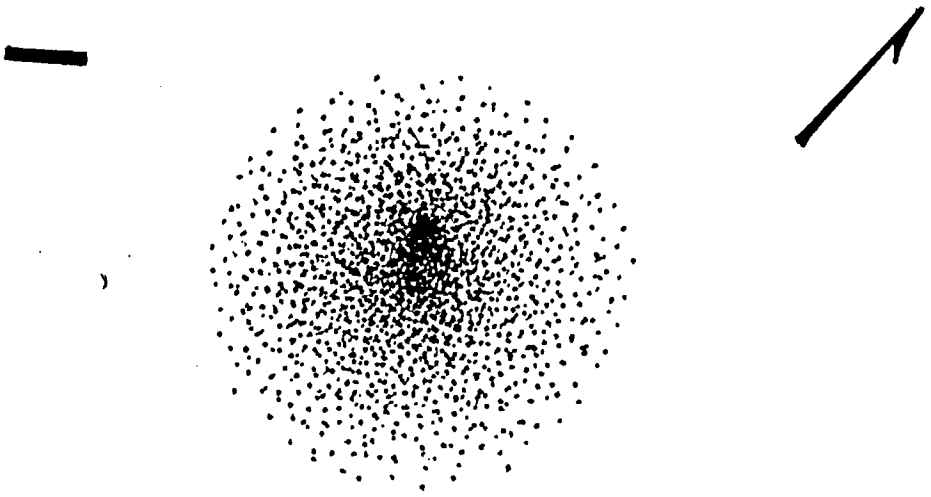
Mar. 10.04: coma is composed of a distinctly brighter region somewhat more than 1′ in dia., surrounded by a very faint, tenuous outer halo w/ a dia. of ~ 3′.5; at 110×, there is a minute nucleus or nuclear cond. of mag 13.5 [BOR]. Mar. 16.05: in 32-cm L, possible central brightness plateau in coma; except for centermost region, coma now seems to condense steadily from the edges inward (unlike previously); Lumicon Swan-band comet filter strongly enhances comet's image; at 110×, a not-quite-stellar nucleus of mag ~ 13.5 [BOR]. Mar. 16.81: "there were 7 stars inside the coma which were clipped out to the level of nearby coma before the final reduction; the contribution of these stars to total $V$ magnitude is 0.2 mag; this procedure is now regularly used whenever necessary, enabling precise photometry to be done even when the comet travels through densely populated regions" [MIK]. Mar. 17.95: "low surface brightness object, but easier to see than on Mar. 17.00; it resembled P/Swift-Tuttle just after its recovery in 1992" [GRA04]. Mar. 19.06: at 110×, one suspects a minute knot of bright material or a stellar nucleus of mag ~ 13.5 [BOR]. Mar. 26.16: coma fully 5′ in dia. at 55× — much smaller at 68×; coma totally w/o defineable boundaries, and definitely now a single mass rather than two separate features (inner coma/outer halo); Lumicon Swan-band comet filter strongly enhances comet's image; at 110×, glimpses of a minute knot or nucleus at the threshold of detection [BOR]. Mar. 27.05: in binoculars, coma's size is at limit of extrafocal range; in 32-cm L (55×), coma is slightly larger than view at 68×; at 68×, there is a brightness plateau at the center of the coma; outer regions of coma very ill-defined and faint; Lumicon Swan-band comet filter strongly enhances comet [BOR]. Apr. 17.19: comet only a few arcmin from SAO 061433 ($m_v$ = 8.3), affecting observation [KRO02]. Apr. 17.91: w/ 20-cm C (80×), hint of tail suspected at p.a. ~ 80° [GAR02].

◇ *P/Schwassmann-Wachmann 1* ⟹ 1992 Oct. 1.41: most observation attempts throughout this opposition were affected to some extent by rich star fields [HAL]. Dec. 15.19: damp atmosphere, poor transparency [HAL]. Dec. 16.764: w/ 40-cm L (+ image intensifier RTC XX 1390 w/ S20R photocathode — spectral range 300-950 nm — and T-Max 400 film), 5-sec exp. shows $m_1$ [15 [MER]. Dec. 29.94: photo taken as on Dec. 16.764, $m_1$ [16 [MER].

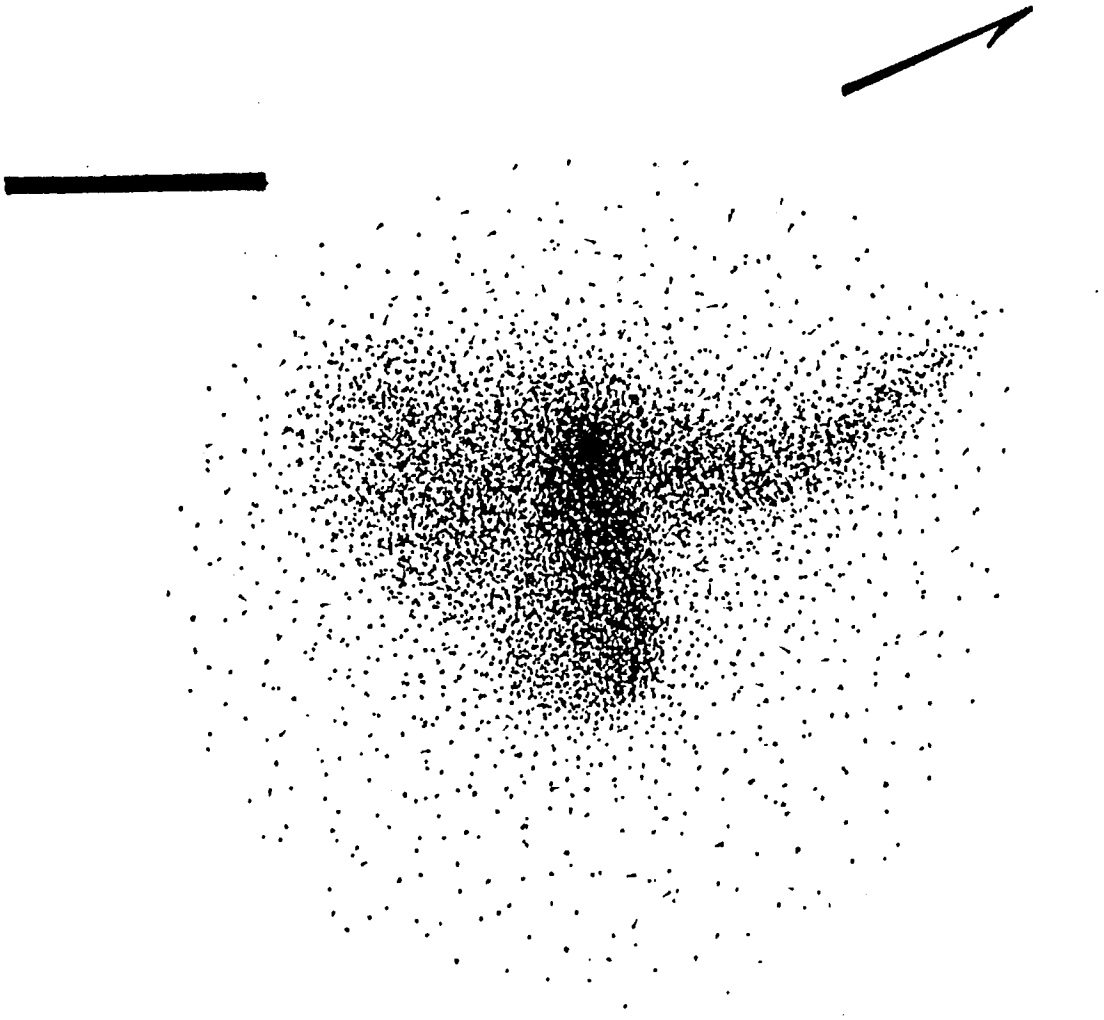
1993 Jan. 25.94: used 19-cm $f$/4 flat field camera + $V$ filter + 574×384 CCD [MIK]. Jan. 29.53: w/ 25-cm $f$/3.4 Wright Schmidt, comet appears at $m_{pg}$ = 14, diffuse with strong central cond.; coma extends toward N; image suggests that the comet is two or three days past outburst [T. Kojima, Chiyoda, Gunma-ken, Japan]. Feb. 8.76: 0′.8 starlike central cond. w/ some weak coma toward NW [MIK]. Feb. 10.14: the comet is small and relatively diffuse; based upon the comet's appearance, the outburst seems to be 1-2 weeks old [HAL]. Feb. 10.40: w/ 16-cm $f$/6.3 L (+ CCD), comet is diffuse at mag 14.1 (evidently using HS as ref.) [T. Kobayashi, Oizumi, Gunma-ken, Japan]. Feb. 10.508: obs. made as on Jan. 29.53 (above) w/ TP6415 film, shows comet at mag 13.7 (evidently using HS as ref.), strongly condensed, faint coma extending to NE [Kojima]. Feb. 11.587: obs. made as on Jan. 29.53 (above), shows comet at mag 12.8, almost stellar [Kojima]. Feb. 12.43: obs. as on Feb. 10.40; comet appears stellar at mag 11.2 [Kobayashi]. Feb. 12.529: obs. as on Feb. 10.508 (above), shows almost stellar comet at $m_1$ = 12.5 [Kojima]. Feb. 13.471: obs. as on Feb. 10.508 (above), shows comet at $m_1$ = 12.2 w/ very strong condensation, slightly diffuse, and surrounding very faint coma of dia. 1′.5 [Kojima]. Feb. 13.75: 0′.4 starlike central cond. and delicate asymmetric coma elongated toward p.a. 90° [MIK]. Feb. 16.74: comet appears as stellar cond. of dia. 0′.5 without coma; fanlike tail ~ 1′.5 long [MIK]. Feb. 19: a 60-min exp. w/ Celestron 8 at $f$/6 on TP2415 film confirmed the visual detection [GAR02]. Feb. 20: inner coma had dia. 35″; at 167× and 250×, a very faint fan-shaped outer coma of dia. 1′ was glimpsed w/ averted vision, along w/ a 0°.03 tail toward p.a. 78° [GAR02]. Feb. 26.27: for this attempt the comet was presumed to be a diffuse, low surface brightness object typical of late stages of an outburst [HAL].

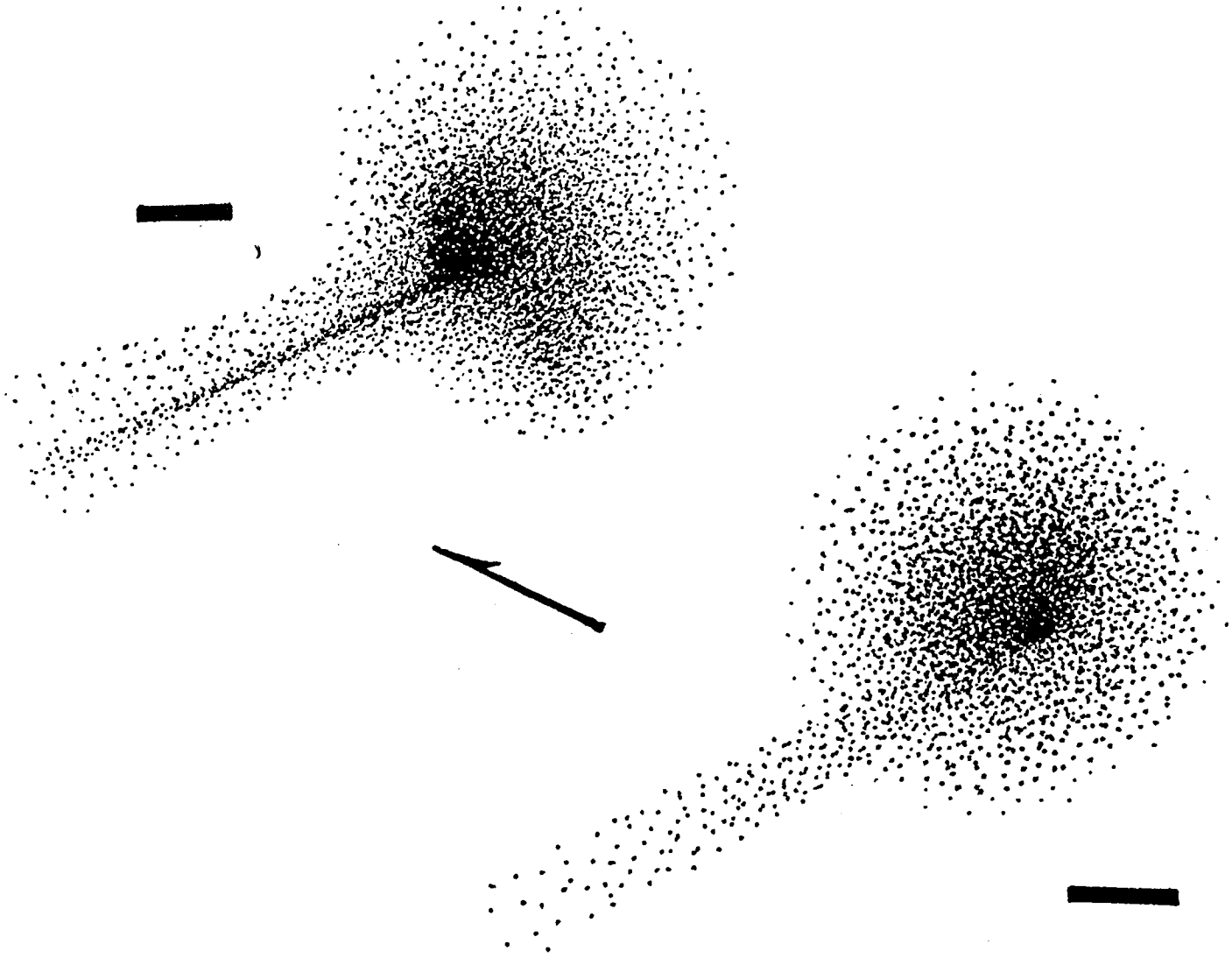
Mar. 10.78: starlike central cond. of dia. 0′.4 with delicate coma of size ~ 2′.5 elongated toward the N [MIK]. Mar. 12.84: faint coma of dia. 2′.4 (nearly circular, brighter part of dia. 1′.1); bright jet in p.a. 339° ± 3° extending to a distance of 14″ ± 2″ from the central cond; the unfiltered CCD magnitude of 13.9 was measured in an aperture of size 0′.5 [PRA01; observers incl. Jana Ticha, M. Tichy, Z. Moravec, and Petr Pravec at the Kleť Observatory]. Mar. 13.80: "jet in p.a. 339° ± 3° extending to a distance of 16″ ± 2″ from the central cond.; coma appearance similar to that of Mar. 12.84, but close stars did not allow good measurement" [PRA01]. Apr. 9.510: photographic obs. made as on Jan. 29.53 (above) evidently does not show the comet (mag [15) [Kojima]. Apr. 14.48: very strong central cond. suggests that a new outburst occured a few days before [NAK01]. Apr. 14.488: photographic obs. made as on Jan. 29.53 (above) shows comet as diffuse w/ strong cond. ($m_1$ = 13.0) [Kojima]. Apr. 22.83 and 23.84: "dense, almost starlike central cond. w/o any surrounding coma, suggesting that the comet is undergoing another fresh outburst" [MIK].

◇ *Periodic Comet Shoemaker-Levy 9 (1993e)* ⟹ 1993 Mar. 28.39: "distinctly elongated in E-W direction; there seem to be two 'knots' in the linear bar, one on the E side, one on the W; the E 'knot' appears to be 0.2 to 0.3 magnitude brighter than the W one, although a very faint star near the E 'knot' may have contributed to this" [HAL]. Mar. 31.29: "distinctly elongated in E-W direction; again there appear to be 'knots' in both the E and W ends of the bar; the E 'knot' still appears to be slightly brighter than the W bar, but this difference is not as pronounced as it was on Mar. 28" [HAL]. Apr. 1.03: object dimensions ~ 1′ × 0′.5, trailed in p.a. ~ 85°-265° [MIK]. Apr. 1.7: the comet was visible visually; CCD images show a 'train' 1′.2 long in p.a. 76°-256°, w/ faint tails 2′.9 in p.a. 77° and 3′.4 in p.a. 258° [NAK01]. Apr. 12.28: "long, linear bar in E-W direction; the comet bears a superficial resemblance to the galaxy M82, with zones of increased brightness on the E and W portions of the bar; these zones do not appear quite as concentrated as they did in March; the E region is perhaps the brighter, although the difference in brightness between the two zones is small" [HAL]. Apr. 14.59: CCD images show a 'train' 1′.0 long in p.a. 79°-259°, w/ faint tails 3′.4 in p.a. 71° and 3′.3 in p.a. 256° [NAK01]. Apr. 17.85: bar-like appearance ~ 1′ long in p.a. 85°-265° [MIK]. Apr. 19.30: the comet appears fainter and more vague than during previous observations; it remains distinctly elongated in E-W direction, although the decreased brightness does not allow much structure in the bar to be discerned; there again appear to be two weak brightness zones on either side of the bar, which this time appear to be of about equal brightness [HAL].



Drawings by J. E. Bortle of P/Swift-Tuttle using a 31.7-cm Newtonian reflector at 167×. The drawing above was made on 1992 Oct. 17.99 UT, and that below on Nov. 10.96. All of Bortle's drawings in this issue (for which the tabulated and descriptive data were published in the January issue) have an arrow pointing north and a ~ 1′ bar representing the scale for each drawing.





**Drawings by J. E. Bortle (Brooks Observatory, Stormville, NY) of P/Swift-Tuttle. The drawing at top was made Nov. 16.97 UT using a 50-cm Newtonian reflector at 78×, 96×, 157×, and 241×. The drawing immediately above was made on Nov. 20.03 using his 31.7-cm reflector at 55×, 68×, and 110× (see also caption on previous page).**

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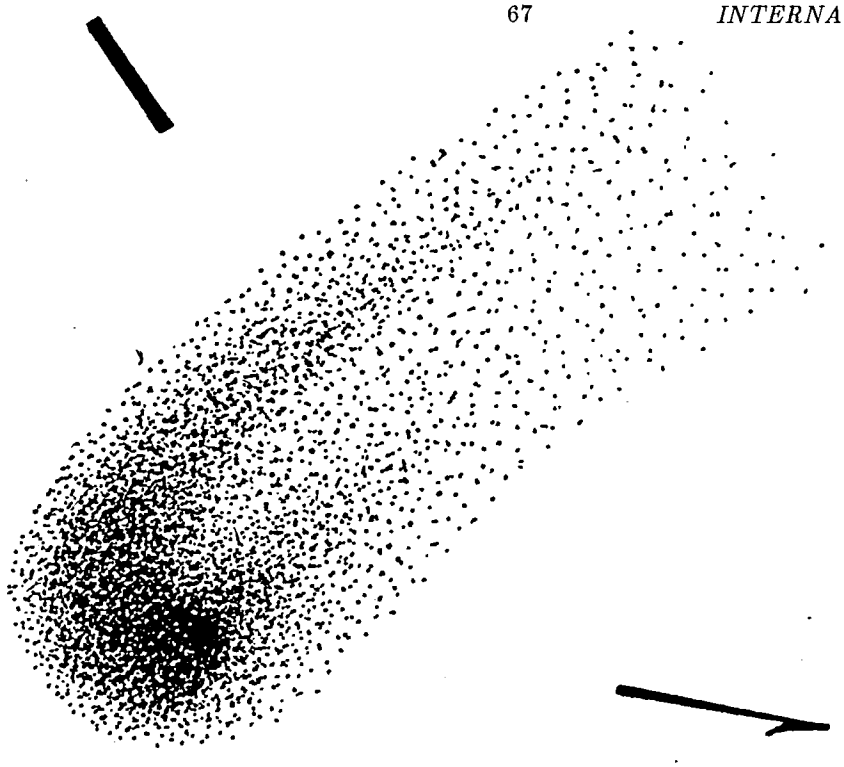
◇ *Periodic Comet Swift-Tuttle (1992t)* ⟹ 1992 Oct. 8.16: w/ 25.4-cm $f/4.5$ L (56×), $m_1 = 8.8$, 4′ coma, DC = 3 [Cèdric Braga, Bron, France]. Oct. 14.68: "comet large and diffuse; faint knot of cond. was seen at the coma's center at lower magnif., but at higher ones comet appeared more homogeneous; interference from rising Moon" [ZHU]. Oct. 17.77: in 20-cm R (40×), fan tail spanning 80° (length 0°.33) centered at p.a. 260° [SHA02]. Oct. 17.86: starlike central cond. [DIA]. Oct. 18.76: comet involved w/ 8th-mag star; w/ Lumicon Swan Band Filter, the comet showed a wide and faint outer coma [MEY]. Oct. 23.86: w/ 20-cm R (40×), 0°.17 fan tail spans p.a. 170°-260° [SHA02]. Oct. 24.59: in 48-cm L, central cond. of dia. 80″ [CHE03]. Oct. 24.79: in 20.3-cm $f/10$ T (62.5×), coma dia. 7′; at 167× and 250×, pronounced comma-shaped jet at p.a. 297° (curved to p.a. 278° beyond 20″ from the nucleus); w/ 11×80 B, coma dia. 7′, tails 1°.2 and 0°.4 in p.a. 21° and 3° [GAR02]. Oct. 25.09: "comet vague and diffuse; extended coma was seen well condensed to the bright nucleus of dia. 2′; in 20-cm $f/15$ R (214×), at the center of nucleus there was a twinkling 'star' of mag 12 ± 0.5; the observation made through thin cirrus" [ZHU]. Oct. 25.80: in 10-cm $f/10$ M (50×), coma dia. ~ 23′.5, DC = 5 [PAR03]. Oct. 26.10: "in 41-cm L, a weak cond. was visible, imbedded within a bright inner coma that was itself surrounded by an asymmetric outer coma, which extended in the anti-sunward direction" [HAL]. Oct. 26.77: central cond. 6′ [BUS01]. Oct. 29.74: in 6.7-cm $f/4.5$ R (14×), central cond. 7′ of mag 5.9 [BUS01]. Oct. 29.76 and 31.74: in 10.8-cm $f/4.2$ L (22×), central cond. 7′ of mag 6.1 [BUS01]. Oct. 29.81 and Nov. 4.74: also tail ~ 0°.17 long in p.a. 0° [SCI]. Oct. 30.85: strong central cond. [MAR02]. Oct. 31.15: observation affected by low altitude and thin cirrus [HAL]. Oct. 31.76: in 6.7-cm $f/4.5$ R (14×), central cond. ~ 7′ of mag 6.0 [BUS01]. Oct. 31.78: tail very faint; still a wide and faint outer coma visible [MEY]. Oct. 31.8: w/ 11×80 B, coma dia. 6′, DC = 4, tails 1°.1 and 0°.5 long in p.a. 39° and 7°, and 0°.2 streamer in p.a. 281°; in 20.3-cm $f/10$ T (167× and 250×), short jet glimpsed toward p.a. 97°, inner coma asymmetric toward W [GAR02].

[text cont. from page 65] Nov. 3.13: nucleus is offset from center of coma [PRY]. Nov. 3.75: w/ 14.5-cm *f*/8 L (48×), DC = 4, 0°.3 tail in p.a. 30° [LAA]. Nov. 4.79: also tail ~ 0°.27 long in p.a. 75° [FIL04]. Nov. 6.08: "observation affected by moonlight (gibbous moon) and occasional cirrus; a short, broad tail in the anti-sunward direction was visible in 41-cm L; there also seemed to be brief hints of an anti-tail" [HAL]. Nov. 7.73: also tail ~ 0°.20 long in p.a. 4° [SCI]. Nov. 8.72: also tail ~ 0°.13 long in p.a. 95° [FIL04]. Nov. 8.72: also tail ~ 0°.17 long in p.a. 355° [SCI]. Nov. 8.73: bright moon hindered exact estimation; only inner parts of the coma visible [MEY]. Nov. 9.69: also tail ~ 0°.07 long in p.a. 0° [SCI]. Nov. 9.81: also tail ~ 0°.10 long in p.a. 330° [FIL04]. Nov. 10.65: "bright, distinct, stellar central cond. of mag 8 ± 0.5 was presented at the ESE edge of bluish coma" [ZHU]. Nov. 11.64: "short fan (?) tail spans p.a. 240°-340°, or extended part of outer coma" [ZHU]. Nov. 11.68: also tail 0°.22 long in p.a. 0° [SCI]. Nov. 12.69: also tail 0°.25 long in p.a. 0° [SCI]. Nov. 12.75: also tail ~ 0°.15 long in p.a. 350° [FIL04]. Nov. 13.08: comet weakly visible to naked eye [HAL]. Nov. 13.74: w/ 11.0-cm *f*/7 L (32×), 0°.6 tail in p.a. 45° [SCH04]. Nov. 14.72: 0°.8 tail was type-I; also 0°.6 type-II tail in p.a. 61° [TAN02]. Nov. 14.75: w/ 8×40B, 30′ tail [BAK]. Nov. 14.75: w/ 10.8-cm *f*/4 L (22×), 0°.2 tail in p.a. 25° [BUS01]. Nov. 16.80: 1°.5 straight, thin tail in p.a. 305°; 0°.3 wide, curved tail in p.a. 310°; tails not visible w/ deep-sky filter [MAR02]. Nov. 17.75: in 10×50 B, $m_1$ ~ 5.8: (MM: S), coma dia. 6′.5, DC = 3-4 [MCK = R. McKim, England, via B.A.A.]. Nov. 18.75: "in 20.3-cm *f*/10 T (167× and 250×), two beautiful fountains to the S (p.a. 141°, 181°); there were two haloes in the inner coma, the inner one asymmetrical toward the S (dia. 45″), the second one symmetrical w/ dia. 126″; $m_2$ ~ 11.5; jet quite visible in the anti-solar direction (p.a. 275°, curved to 230°) seemed to feed the inner halo — near this jet, there was an ejection area too large to be called a 'jet'; two very short (12″, 11″) jets were also seen toward p.a. 12° and 88°; w/ 11×80 B, coma dia. 7′.5, 1°.4 and 0°.4 tails in p.a. 42° and 7° — main tail curved to the N (from p.a. 45° near the center of the coma to p.a. 35° at 1° from the nucleus)" [GAR02]. [cont. from page 64] Nov. 19.75: w/ 10×50 B, tail ~ 30′ long in p.a. 315° [COM]. Nov. 20.77: in 10×50 B, $m_1$ ~ 5.5: (MM: S), coma dia. 6′.5, DC = 5, 1° tail in p.a. 28° [MCK]. Nov. 20.8: in 20.3-cm *f*/10 T (167× and 250×), 25″ jet in p.a. 131°, halo w/ dia. 45″ in inner coma; 11-min exp. w/ 200-mm *f*/4 telephoto lens on Ilford HP5+ shows a 1°.3 ion tail in p.a. 46°; coma dia. 8′ [GAR02]. Nov. 21.8: in 20.3-cm *f*/10 T (167× and 250×), broad tail is in two pieces, at p.a. 43° and 64°; also 50″ and 58″ streamers in p.a. 121° and 182°; two fountains at p.a. 164° and 203°; two haloes in inner coma (dia. 34″ and 95″); 11″, 18″, and 23″ jets in p.a. 357°, 242°, and 292° (curved to 272°) [GAR02]. Nov. 23.12 and 24.12: distinct 'knot' in tail behind head [SPR]. Nov. 23.74 and 24.72: w/ 10×50 B, tail ~ 30′ long in p.a. 20° [COM]. Nov. 23.74: w/ 11.0-cm *f*/7 L (32×), tail ~ 0°.4 long in p.a. 15° [SCH04]. Nov. 24.69: also tails of length ~ 0°.92, 0°.57, and 0°.27 in p.a. 23°, 10°, and 0° [SCI]. Nov. 24.72: "big starlike cond.; two cond. in dust tail (?) w/ 28.0-cm T at 87×" [COM]. Nov. 26.71: also tails of length 0°.53, 0°.53, and 0°.17 in p.a. 30°, 15°, and 340° [SCI]. Nov. 26.74: w/ 5.0-cm B, tail ~ 0°.3 long in p.a. 20° [SCH04]. Nov. 27.71: very strong, bright, and nearly-starlike central cond. [MEY]. Nov. 27.77: in 20.3-cm *f*/10 T (62.5×), coma dia. 4′-5′, pronounced stellar nucleus of $m_2$ ~ 9; 15-min exp. w/ 127-mm *f*/6 T (Celestron 5) on Ilford HP5+ shows two tails, 0°.7 ion and 0°.3 dust in p.a. 49° and 24°, coma dia. 7′; exp. w/ 200-mm *f*/4 telephoto lens at same time shows ion tail 2°.2 long, coma dia. 8′ [GAR02]. Nov. 28.68: "bad weather conditions" [ZHU]. Nov. 28.8: in 20.3-cm *f*/10 T (62.5×), coma dia. 4′, DC = 4, ion tail more pronounced than last week, $m_2$ = 8.6 (ref = S); at 167× and 250×, following details seen w/ difficulty (moonlight): ion tail in two pieces at p.a. 52° and 60°, 0°.02, 0°.05, and 0°.02 streamers in p.a. 35° (curved to 28°), 77°, and 94° (curved to 86°), dust tail delimited by a 0°.08 streamer at p.a. 331° (curved to 360°); two fountains visible, one at p.a. 178° (curved to 149°), and the other in two pieces at p.a. 213° and 227° (both curved to p.a. 249°); also 18″, 24″, 19″, 22″, and 14″ jets in p.a. 86° (curved to 125°), 141° (curved to 168°), 191°, 246° (curved to 220°), and 308° (curved to 279°); small nodosity seen on edge of a 0′.6 inner halo at p.a. 198°-218°; w/ Celestron 5 (40×), ion tails 1°.4 and 0°.7 long in p.a. 50°-54° and 57°-60°, and dust tail 0°.6 long in p.a. 11° (curved to 357°); 15-min exp. w/ 200-mm telephoto lens on Ilford HP5+ film shows coma dia. 8′.5, 2°.3 ion tail in p.a. 47° [GAR02]. Nov. 29.10: crescent moon in sky; the comet was just visible to the naked eye [HAL]. Nov. 30.64: "in 20-cm *f*/15 R (100×), comet was elongated towards NW, the bluish coma surrounding the excessively bright stellar nucleus" [ZHU]. Nov. 30.68: also tails of length 0°.97, 0°.67, and 0°.17 in p.a. 45°, 0°, and 345° [SCI]. Nov. 30.70 and Dec. 5.71: w/ 6.7-cm *f*/4 R (14×), tail ~ 30′ long in p.a. 30° [BUS01].

Dec. 1.63: "photographic plate (20-min exp.) taken w/ 0.2-m *f*/15 R of Sternberg Astronomical Institute shows ion tail 0°.2 long in p.a. 50°" [ZHU]. Dec. 1.67: also tails of length 1°.13 and 0°.53 in p.a. 45° and 2° [SCI]. Dec. 2.68: also tail 0°.43 long in p.a. 30° [SCI]. Dec. 4.66: also tail 0°.50 long in p.a. 35° [SCI]. Dec. 7.64: "in 20-cm *f*/15 R (214×) was seen a not-quite-stellar nucleus 25″ ± 5″ in dia.; interference from light pollution and moonlight" [ZHU]. Dec. 8.64: "in 30-cm *f*/15 R at various magnifications (up to 450×), a fine, distinct, completely stellar central cond. was seen again; $m_1$-scatter (Dec. 7.64) in all probability caused by improper comparison-star magnitudes; the observation was hampered by light pollution and moonlight" [ZHU]. Dec. 10.81: "streamers visible in tail; shadow of false nucleus visible" [DIA]. Dec. 15.67: also tail 0°.17 long in p.a. 20° [SCI]. Dec. 16.74: w/ 40-cm L (+ image intensifier RTC XX 1390 w/ S20R photocathode — spectral range 300-950 nm), eight 1- to 5-sec exp. on T-Max 400 film shows the comet w/ a conspicuous spiral-like jet structure leaving the nucleus at p.a. 214°, corkscrewing clockwise and following E until 50″ from the nucleus; tail is fan-shaped; no evidence of gas tail; the 'pseudo-latus rectum' is very asymmetrical — 40″ toward p.a. 335° and 90″ toward p.a. 155°, due to the spiral jet [MER]. Dec. 17.06: comet just barely visible to naked eye [HAL]. Dec. 18.64, 19.62, and 19.63: "comet very low; interference from light pollution" [ZHU]. Dec. 18.67: also tail ~ 0°.47 long in p.a. 25° [SCI]. Dec. 20: in 20.3-cm *f*/10 T (62.5×), coma dia. 4′, DC = 4, 0°.6 dust tail in p.a. ~ 60°-70°; at 167×, short jet in p.a. ~ 340° [GAR02]. Dec. 20.07: "observation affected by low altitude and some cirrus; the measured brightness is probably an underestimate" [HAL]. Dec. 21: in 20.3-cm *f*/10 T (62.5×), 30′ dust tail in p.a. ~ 60°-70° and 0°.3 ion tail in p.a. ~ 85°-90°; also 0°.2 streamer toward p.a. ~ 115° [GAR02]. Dec. 24.07: observation affected by low altitude and twilight; some cirrus clouds were also in the comet's vicinity [HAL]. Dec. 26: w/ 11×80 B, $m_1$ = 5.5: [GAR02].

*(Continued on next page...)*



**Drawing of P/Swift-Tuttle by J. E. Bortle using his 31.7-cm reflector at 110× on Dec. 13.95.**

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[text cont. from page 66]

1993 Feb. 19.81: "using Lumicon Swan band filter, comet enhanced somewhat"; low altitude and twilight [SEA]. Feb. 22.75: "coma possibly elongated" [SEA]. Feb. 23.75: "comet diffuse and just visible above the background brightness of the sky, little or no cond. of the coma" [CAM03]. Feb. 26.76: "coma suspected of being elongated to SW" [CAM03]. Mar. 3.76: "DC could not be measured, as comet was involved with a group of stars" [CAM03]. Mar. 21.75: "comet is a 5′ diffuse patch of light, no cond." [CAM03]. Mar. 23.74: "comet is a 3′ diffuse patch as seen through 20.3-cm L (56×); it was possible to see faint stars through the central coma" [CAM03].

We received the drawings of P/Swift-Tuttle from John Bortle — produced in this issue — just as the January issue (which contained his tabulated and descriptive data for this comet) was going to press. He writes in his cover letter: "P/Swift-Tuttle has been the ONLY comet for which jet structure was clearly evident since comet Bennett in 1970, in my opinion. Even so, apertures of 10 inches and greater still seem to have been required to view these features, judging from the material that reached *Sky and Telescope*."

◇ *Periodic Comet Väisälä (1992u)* ⟹ 1993 Feb. 21.39: "windy conditions, which prohibited confirmation of the comet until the following night; the comet is small and condensed, with a high-surface-brightness coma" [HAL]. Mar. 17.35: "comet appears to be slightly brighter than during previous observations; there seems to be a weak cond. slightly off-center toward the W side of the coma" [HAL]. Mar. 18.80: fanlike tail ~ 2′.5 long in p.a. 135°-170° [MIK]. Mar. 25.29: "observation made under conditions of considerable eye fatigue; the comet seems less condensed than before" [HAL]. Apr. 8.84: 2′.5 fanlike tail [MIK]. Apr. 12.18: "the comet is more vague and diffuse than during previous observations" [HAL]. Apr. 17.83: 2′.5 fanlike tail in p.a. ~ 130° [MIK].

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## TABULATED DATA

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 — see October 1980 issue of *ICQ*, pages 69-73 — etc.; also, P stands for photographic magnitude, and photoelectrically-determined values fall under U, L, 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 that the comet was not seen, with an estimated limiting magnitude given (if the comet IS seen, and it is simply estimated to be fainter than a certain magnitude, a "greater-than" sign (>) must be used, not a bracket). "RF" = reference for magnitude estimates (see pages 98-100 of the October 1992 issue, and page 60 of this issue, for the 1- and 2-letter codes). "AP." = aperture in centimeters of the instrument used for the observations, usually given to tenths. "T" = type of instrument used for the observation (R = refractor, L = Newtonian reflector, B = binoculars, C = Cassegrain reflector, A = camera, T = Schmidt-Cassegrain reflector, S = Schmidt-Newtonian reflector, E = naked eye, *etc.*). "F/" and "PWR" are the focal ratio and power or magnification, respectively, of the instrument used for the observation — given to nearest whole integer (round even).

"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); a plus mark (+) precedes a coma diameter when a diaphragm was used electronically, thereby specifying the diaphragm size (i.e., the coma is almost always larger than such a specified diaphragm size). "DC" = degree of condensation on a scale where 9 = stellar and 0 = diffuse; a slash (/) indicates a value midway between the given number and the next-higher integer. "TAIL" = estimated tail length in degrees, to 0.01 degree if appropriate; again, an ampersand indicates a rough estimate. "PA" = estimated measured position angle of the tail to nearest whole integer in degrees (north = 0°, east = 90°). "OBS" = the observer who made the observation (given as a 3-letter, 2-digit code).

An asterisk between the published 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; prior to September 1992, this was the standard symbol for noting extinction correction, but following publication of the extinction paper (July 1992 *ICQ*), this symbol is only to be used to denote corrections made using procedures different from that outlined by Green (1992, *ICQ* **14**, 55-59), and then only for situations where the observed comet is at altitude > 10°. Here again are the new special symbols: '&' = comet observed at altitude 20° or less with no atmospheric extinction correction applied; '$' = comet observed at altitude 10° or lower, observations corrected by the observer using procedure of Green (*ibid.*); for a correction applied by the observer using Tables Ia, Ib, or Ic of Green (*ibid.*), the letters 'a', 'w', or 's', respectively, should be used.

A complete list of the Keys to abbrevations used in the *ICQ* is available from the Editor for $4.00 postpaid. *Please note that data in archival form, and thus the data to be sent in machine-readable form, use a format that is different from that of the Tabulated data in the printed pages of the ICQ;* see pages 59-61 of the July 1992 issue for further information.

◇ ◇ ◇

**Key to observers with observations published in this issue,** *with 2-digit numbers between Observer Code and Observer's Name indicating source [11 = Dutch Comet Section; 16 = Japanese observers (c/o Akimasa Nakamura, Aichi, Japan); 34 = Bulgarian observers (c/o V. Radeva); etc.]. Those with asterisks (*) preceding the 5-character code are new additions to the Observer Key:*

| CODE | S | OBSERVER, LOCATION |
|---|---|---|
| ADA02 | 18 | Jacek Adamik, Poland |
| AKI | 16 | Isao Akita, Japan |
| ASA | 16 | Masaaki Asakura, Japan |
| *BAK | 11 | E. Bakker, The Netherlands |
| BEN04 | 18 | Leszek Benedyktowicz, Poland |
| BET01 | 18 | Marcin Betlej, Poland |
| BOR | | John E. Bortle, NY, U.S.A. |
| BRE02 | 24 | Per-Jonny Bremseth, Norway |
| BUS01 | 11 | E. P. Bus, The Netherlands |
| CAM03 | | Paul Camilleri, Australia |
| *CEL | 18 | Tomasz Celeban, Poland |
| CHE03 | 33 | Kazimieras T. Cernis, Lithuania |
| *CIC | 18 | Adam Cichy, Poland |
| CIU | 18 | Grzegorz Ciura, Poland |
| CNO | 18 | Ryszard Cnota, Poland |
| COM | 11 | Georg Comello, The Netherlands |
| DAH | 24 | Haakon Dahle, Norway |
| DAL01 | 18 | Grzegorz Dalek, Poland |
| DES01 | | Jose Guilherme de Souza Aguiar, Brazil |
| DIA | 13 | Francisco Garcia Diaz, Spain |
| DID | | Richard Robert Didick, MA, U.S.A. |
| *DOR | 11 | J. J. van Dorp, CA, U.S.A. |
| FEI | 11 | Henk Feijth, The Netherlands |
| FIE | | Marsilio Fierimonte, Italy |
| FIL04 | 18 | Marcin Filipek, Poland |
| GAR02 | | Stephane Garro, France |
| GAS01 | 33 | Darius Gasiunas, Lithuania |
| GRA04 | 24 | Bjoern Haakon Granslo, Norway |
| GRO03 | 18 | Radoslaw Grochowski, Poland |
| HAL | | Alan Hale, U.S.A. |
| HAS02 | | Werner Hasubick, Germany |
| HAS07 | 16 | Akie Hashimoto, Japan |
| *HIS | 16 | Tsutomu Hishikura, Japan |
| *HUD02 | 23 | T. Hudecek, Czech Republic |
| *IOR | 34 | Tatiana Iordanova, Bulgaria |
| ISH02 | 16 | Akiyoshi Ishikawa, Japan |
| IWA02 | 18 | Mariusz Iwanski, Poland |
| *JOH03 | 11 | R. Johanns, The Netherlands |
| JON | 09 | Albert F. Jones, New Zealand |
| KAK01 | 16 | Wataru Kakei, Japan |
| *KAN03 | 16 | Toshikazu Kanno, Japan |
| *KAN04 | 16 | Shigemi Kanbara, Japan |
| *KAT01 | 16 | Taichi Kato, Japan |
| KIE | 18 | Grzegorz Kieltyka, Poland |
| KOM | 18 | Artur Komorowski, Poland |
| KOR01 | | Valeriy L. Korneyev, Zelenograd, Russia |
| KOS | 07 | Attila Kosa-Kiss, Romania |
| KOS01 | 18 | Janusz Kosinski, Poland |
| KOS03 | 18 | Kazimierz Kosz, Poland |
| KRO02 | | Gary W. Kronk, IL, U.S.A. |
| KYS | 23 | J. Kysely, Czech Republic |
| LAA | 11 | T. A. van der Laan, The Netherlands |
| LEH | | Martin Lehky, Czech Republic |
| *LIS01 | 18 | Aneta J. Lis, Poland |
| LOO01 | | Frans R. van Loo, Belgium |
| LUE | | Hartwig Luethen, Germany |
| LUK01 | 18 | Jerzy Lukaszewicz, Poland |
| LUK03 | 18 | Sabina Lukaniuk, Poland |
| MAR02 | 13 | Jose Carvajal Martinez, Spain |
| *MAR11 | 18 | Bernard Markowski, Poland |
| MAT06 | 18 | Leslaw Materniak, Poland |
| MCN | | Robert Houston McNaught, Australia |
| MER | | Jean-Claude Merlin, France |
| MEY | | Maik Meyer, Germany |

| CODE | S | OBSERVER, LOCATION |
|---|---|---|
| MIK | | Herman Mikuz, Slovenia |
| MIT | 16 | Shigeo Mitsuma, Japan |
| MIY | 16 | Shuuichi Miyata, Japan |
| MOE | | Michael Moeller, Germany |
| MOM | 16 | Masahiko Momose, Japan |
| MOS01 | 18 | Waclaw Moskal, Poland |
| NAG04 | 16 | Kazuro Nagashima, Japan |
| NAK01 | 16 | Akimasa Nakamura, Japan |
| NAK06 | 16 | Yuuzi (Yuji) Nakamura, Japan |
| NES | 33 | Yurij V. Nesterov, Russia |
| OBU | 16 | Yasushi Obuchi, Japan |
| OHK | | Masami Ohkuma, Japan |
| OLE | 18 | Arkadiusz Olech, Poland |
| ONO | 16 | Osamu Onodera, Japan |
| OSS | 18 | Piotr Ossowski, Poland |
| PAR03 | 18 | Mieczyslaw L. Paradowski, Poland |
| PER04 | 18 | Lukasz Perec, Poland |
| PIO | 18 | Tomasz Piotrowski, Poland |
| PLE01 | 18 | Janusz Pleszka, Poland |
| POR02 | 34 | Diliana Porojanova, Bulgaria |
| *POW01 | 18 | Jacek Powichrowski, Poland |
| *PRA01 | 23 | Petr Pravec, Czech Republic |
| PRY | | Jim Pryal, WA, U.S.A. |
| *PUJ01 | 13 | Francisco Pujol, Spain |
| RAD01 | 34 | Veselka Radeva, Bulgaria |
| RAF | 18 | Jerzy Rafalski, Poland |
| ROB03 | | Paul C. Robinson, WV, U.S.A. |
| ROD01 | 13 | Diego Rodriguez, Spain |
| RZE01 | 18 | Marcin Rzepka, Poland |
| *SAD | 18 | Piotr Sadowski, Poland |
| SCH | | Rudiger Schmidt, Germany |
| SCH04 | 11 | A. H. Scholten, The Netherlands |
| SCI | 18 | Tomasz Sciezor, Poland |
| SEA | 14 | David A. J. Seargent, Australia |
| SHA02 | 07 | Jonathan D. Shanklin, England |
| SHA04 | | Gregory T. Shanos, U.S.A. |
| SHI | 16 | Hiroyuki Shioi, Japan |
| SIE | 33 | Henryk Sielewicz, Lithuania |
| SIM | | Karl Simmons, FL, U.S.A. |
| SIM01 | | Wanda Simmons, FL, U.S.A. |
| SIW | 18 | Ryszard Siwiec, Poland |
| SKI | 24 | Oddleiv Skilbrei, Norway |
| SOC | 18 | Krzysztof Socha, Poland |
| SPE01 | 18 | Jerzy Speil, Poland |
| SPR | | C. E. Spratt, BC, Canada |
| SWI | 18 | Mariusz Swietnicki, Poland |
| SWI01 | 18 | Stanislaw Swierczynski, Poland |
| SZU | 18 | Mieczyslaw Szulc, Poland |
| TAK05 | 16 | Kesao Takamizawa, Japan |
| TAN02 | 07 | Tony Tanti, Malta |
| TAY | 07 | M. D. Taylor, England |
| TOM01 | | Maura Tombelli, Italy |
| TSU02 | 16 | Mitsunori Tsumura, Japan |
| URB | 18 | Piotr Urbanski, Poland |
| VEL02 | 34 | Valentin Velkov, Bulgaria |
| WES04 | 18 | Tomasz Weselak, Poland |
| WOL01 | | Graham W. Wolf, New Zealand |
| YAS | 16 | Masanori Yasuki, Japan |
| YOS03 | 16 | Hitoshi Yoshida, Japan |
| YUS | 16 | Toru Yusa, Japan |
| ZAN01 | 11 | W. T. Zanstra, The Netherlands |
| ZBR | 18 | Mariusz Zbrzezniak, Poland |
| ZHU | | Sergey V. Zhuiko, Moscow, Russia |
| ZNO | 23 | Vladimir Znojil, Czech Republic |

Comet Černis-Petrauskas 1980 IV

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 07 31.74 | B | 8.8: | S | 8.0 | B | 4 | 10 | | 4 | | | CHE03 |
| 1980 08 01.75 | B | 9.2 | S | 11.0 | B | 4 | 20 | 2.5 | 4 | | | CHE03 |
| 1980 08 02.73 | B | 9.3 | S | 11.0 | B | 4 | 20 | 2.5 | 4 | | | CHE03 |
| 1980 08 03.73 | B | 9.4 | S | 11.0 | B | 4 | 20 | 2.8 | 3 | | | CHE03 |
| 1980 08 04.74 | B | 9.3 | S | 11.0 | B | 4 | 20 | 3.0 | 3 | 0.1 | 240 | CHE03 |
| 1980 08 05.73 | B | 9.6: | BD | 11.0 | B | 4 | 20 | | 1 | | | CHE03 |
| 1980 08 06.71 | B | 9.5 | BD | 11.0 | B | 4 | 20 | | 3 | | | CHE03 |
| 1980 08 08.71 | B | 9.4 | BD | 11.0 | B | 4 | 20 | & 3 | 3 | | | CHE03 |
| 1980 08 09.71 | B | 9.5 | BD | 11.0 | B | 4 | 20 | | 1 | | | CHE03 |
| 1980 08 10.75 | B | 9.7 | NP | 11.0 | B | 4 | 20 | & 3 | 1 | | | CHE03 |
| 1980 08 12.75 | B | 9.4 | NP | 11.0 | B | 4 | 20 | 3.5 | 3 | 0.1 | 240 | CHE03 |
| 1980 08 13.73 | B | 9.6 | NP | 11.0 | B | 4 | 20 | 3.5 | 1 | | | CHE03 |
| 1980 08 19.72 | B | 10.0: | NP | 11.0 | B | 4 | 20 | | 1 | | | CHE03 |
| 1980 08 20.72 | B | 9.8 | NP | 11.0 | B | 4 | 20 | | 1 | | | CHE03 |
| 1980 08 21.72 | B | 10.2: | NP | 11.0 | B | 4 | 20 | | 1 | | | CHE03 |

Comet Hartley-Good 1985 XVII

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 11 03.95 | O | 7.9 | AC | 20.3 | T | 10 | 80 | 4 | 5 | | | GRA04 |
| 1985 11 14.78 | O | 7.2 | AC | 7.6 | R | 16 | 48 | 4.5 | 4 | | | GRA04 |
| 1985 11 20.79 | O | 7.2: | SC | 7.6 | R | 16 | 48 | 3 | 3 | | | GRA04 |

Comet Thiele 1985 XIX

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 11 07.91 | O | 9.1 | AC | 20.3 | T | 10 | 80 | 3 | 3 | | | GRA04 |
| 1985 11 10.99 | O | 9.3 | AC | 20.3 | T | 10 | 80 | 3 | 3 | | | GRA04 |

Comet Ichimura 1988 I

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 12 14.92 | S | 7.9 | AA | 6.0 | R | 11 | 116 | 5 | 1 | | | DES01 |

Comet Liller 1988 V

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 02 12.95 | S | 8.6 | AA | 6.0 | R | 11 | 116 | 3 | 4 | | | DES01 |
| 1988 02 13.93 | S | 8.6 | AA | 6.0 | R | 11 | 116 | 3 | 4 | | | DES01 |
| 1988 04 13.81 | S | 6.1 | S | 8.0 | B | | 20 | 3 | 7 | | | YOS03 |
| 1988 04 15.46 | S | 6.5 | AA | 6.0 | B | | 10 | 5 | 3 | 1.0 | | KAN03 |
| 1988 04 15.80 | S | 6.2 | S | 8.0 | B | | 20 | 3 | 7 | | | YOS03 |
| 1988 04 24.79 | S | 6.0 | AA | 8.0 | B | | 20 | & 3 | 6 | | 0 | YOS03 |
| 1988 04 26.76 | S | 6.5 | S | 6.0 | B | | 10 | 5 | 4 | 2.0 | | KAN03 |
| 1988 04 27.78 | B | 5.8 | AA | 8.0 | B | | 20 | 4 | 6 | | | YOS03 |
| 1988 04 29.74 | B | 5.8 | AA | 8.0 | B | | 20 | 5 | 6 | 0.3 | 355 | YOS03 |
| 1988 05 02.78 | B | 6.0 | AA | 8.0 | B | | 20 | 4 | 6 | | 330 | YOS03 |
| 1988 05 03.61 | B | 6.3 | AA | 6.0 | B | | 15 | 13 | 6 | 2 | 48 | ASA |
| 1988 05 04.72 | S | 6.2 | AA | 8.0 | B | | 20 | 5 | 6 | | | YOS03 |
| 1988 05 05.57 | S | 6.5 | S | 8.0 | B | | 11 | | 6 | | | MOM |
| 1988 05 08.53 | S | 6.4 | S | 6.0 | B | | 10 | 10 | 5 | 2.5 | | KAN03 |
| 1988 05 08.54 | S | 6.8 | S | 8.0 | B | | 11 | 6 | 6 | | | MOM |
| 1988 05 08.63 | S | 6.2 | AA | 8.0 | B | | 20 | 4 | 6 | 0.1 | 0 | YOS03 |
| 1988 05 09.49 | S | 6.9 | S | 8.0 | B | | 11 | 5 | 5 | | | MOM |
| 1988 05 09.50 | S | 6.2 | S | 6.0 | B | | 10 | 10 | 6 | 2.0 | | KAN03 |
| 1988 05 12.61 | S | 6.3 | AA | 8.0 | B | | 20 | 5 | 5 | | | YOS03 |
| 1988 05 13.51 | S | 6.8 | S | 8.0 | B | | 11 | 8 | 6 | | | MOM |
| 1988 05 13.60 | M | 6.0 | AA | 7.0 | B | | 10 | | 6/ | 2 | | KAK01 |
| 1988 05 13.66 | B | 6.5 | AA | 6.0 | B | | 15 | 10 | 5 | 2 | 45 | ASA |

Comet Liller 1988 V [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 05 15.55 | S | 6.7 | S | 8.0 | B | | 11 | | 6 | 0.67 | | MOM |
| 1988 05 16.52 | B | 7.6 | AA | 6.0 | B | | 15 | 7 | 4 | | | ASA |
| 1988 05 16.53 | S | 7.0 | S | 8.0 | B | | 11 | | 4 | | | MOM |
| 1988 05 18.56 | S | 7.0 | S | 8.0 | B | | 11 | | 4 | | | MOM |
| 1988 05 18.63 | S | 7.0 | S | 8.0 | B | | 20 | | | | | YOS03 |
| 1988 05 20.48 | S | 7.0 | S | 6.0 | B | | 10 | 10 | 5 | 0.33 | | KAN03 |
| 1988 05 21.55 | S | 7.0 | S | 6.0 | B | | 10 | 10 | 5 | 0.42 | | KAN03 |
| 1988 05 23.52 | S | 7.0 | S | 8.0 | B | | 11 | | 5 | | | MOM |
| 1988 05 23.71 | S | 7.2 | S | 8.0 | B | | 20 | 4 | 5 | | | YOS03 |
| 1988 05 25.53 | S | 7.1 | S | 6.0 | B | | 10 | 4 | 6 | 1.0 | | KAN03 |
| 1988 05 29.47 | S | 7.4 | S | 6.0 | B | | 10 | 4 | 6 | | | KAN03 |
| 1988 05 30.47 | S | 7.4 | S | 6.0 | B | | 10 | 5 | 6 | | | KAN03 |
| 1988 06 04.48 | S | 8.1 | AA | 6.0 | B | | 10 | 7 | 5 | | | KAN03 |
| 1988 06 04.49 | M | 7.3 | AA | 7.0 | B | | 10 | 8 | 5 | <1 | | KAK01 |
| 1988 06 04.54 | S | 7.8 | S | 8.0 | B | | 11 | | 4 | | | MOM |
| 1988 06 05.50 | S | 7.6 | S | 8.0 | B | | 11 | | | | | MOM |
| 1988 06 05.50 | S | 7.6 | S | 15 | L | 6 | 28 | 5 | 4 | | | YOS03 |
| 1988 06 05.50 | S | 7.8 | AA | 6.0 | B | | 10 | 7 | 6 | 1 | | KAN03 |
| 1988 06 06.48 | S | 7.8 | AA | 6.0 | B | | 10 | 6 | 5 | | | KAN03 |
| 1988 06 07.48 | S | 8.0 | AA | 6.0 | B | | 10 | 7 | 5 | | | KAN03 |
| 1988 06 12.10 | S | 8.9 | AA | 6.0 | R | 11 | 116 | 2 | 5/ | | | DES01 |
| 1988 06 13.53 | S | 8.8 | S | 8.0 | B | | 11 | | 3 | | | MOM |
| 1988 06 15.48 | S | 8.5 | AA | 6.0 | B | | 10 | 8 | 4 | 0.25 | | KAN03 |
| 1988 06 20.48 | S | 8.6 | AA | 6.0 | B | | 10 | 8 | 6 | 0.27 | | KAN03 |

Comet Machholz 1988 XV

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 08 15.75 | S | 7.6 | AA | 6.0 | B | | 10 | 5 | 6 | 0.28 | | KAN03 |
| 1988 08 16.76 | S | 7.3 | AA | 31 | L | 6 | 56 | 6 | 6 | 0.32 | | KAN03 |
| 1988 08 20.79 | S | 7.5 | AA | 12.5 | B | | 25 | 6 | 5 | | | AKI |
| 1988 08 20.80 | B | 8.0 | S | 15.0 | B | | 25 | 4.5 | 5 | 0.30 | | NAK06 |

Comet Okazaki-Levy-Rudenko 1989 XIX

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 10 05.44 | S | 8.1 | S | 7.0 | B | | 14 | 4 | 4 | | | KAN04 |
| 1989 10 08.40 | S | 7.3 | AA | 15 | L | 6 | 28 | 3 | 4 | | | YOS03 |
| 1989 10 09.42 | S | 7.8 | AA | 13 | L | 8 | 56 | 4 | 6 | 0.17 | | KAN03 |
| 1989 10 09.44 | S | 7.9 | S | 12.5 | B | | 25 | 5 | 4 | 0.13 | | KAN04 |
| 1989 10 17.38 | S | 6.7 | AA | 15 | L | 6 | 28 | 4 | 3 | | | YOS03 |
| 1989 10 17.39 | S | 6.7 | AA | 8.0 | B | | 11 | 7 | 5 | | | MOM |
| 1989 10 18.39 | S | 7.2 | AA | 8.0 | B | | 11 | 5 | 4 | | | MOM |
| 1989 10 20.44 | S | 6.6 | S | 12.5 | B | | 25 | 6 | 5 | 0.25 | | KAN04 |
| 1989 10 21.39 | S | 6.7 | S | 12.5 | B | | 25 | 5 | 4 | 0.17 | | KAN04 |
| 1989 10 21.40 | S | 6.4 | AA | 13 | L | 8 | 56 | 4 | 7 | 1.3 | | KAN03 |
| 1989 10 24.39 | S | 7.0 | AC | 12.5 | B | | 25 | 4 | 4 | | | KAN04 |
| 1989 10 25.39 | S | 6.6 | AA | 13 | L | 8 | 56 | 4 | 7 | 1 | | KAN03 |
| 1989 11 01.83 | B | 6.0 | AA | 6.0 | B | | 15 | 7 | 5 | | | ASA |
| 1989 11 02.82 | B | 5.4 | AA | 12.0 | B | | 20 | 10 | 6 | 0.5 | 290 | ASA |
| 1989 11 11.82 | B | 5.2 | AA | 6.0 | B | | 15 | 12 | 6 | 0.5 | 290 | ASA |
| 1989 11 17.84 | B | 5.5 | AA | 7.0 | B | | 10 | | 6 | | | KAK01 |
| 1989 11 18.83 | B | 5.3 | AA | 6.0 | B | | 15 | 10 | 6 | 0.75 | 270 | ASA |
| 1989 11 18.85 | S | 5.8 | AA | 7.0 | B | | 14 | 6 | 6 | | | KAN04 |
| 1989 11 19.83 | B | 5.3 | AA | 7.0 | B | | 10 | 10 | 6 | | | ASA |
| 1989 11 19.83 | B | 6.5 | S | 12.0 | B | | 20 | 5 | 7 | | | HIS |
| 1989 11 20.81 | B | 6.3 | S | 12.0 | B | | 20 | 5 | 7 | | | HIS |
| 1989 11 20.83 | B | 5.2 | AA | 5.0 | B | | 12 | 12 | 6 | | | ASA |
| 1989 11 20.85 | S | 6.2 | AA | 7.0 | B | | 10 | 5 | 6 | | | MIY |

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

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 11 21.83 | B | 5.2 | AA | 5.0 | B | | 10 | 12 | 6 | | | ASA |
| 1989 11 21.83 | B | 5.9 | S | 12.0 | B | | 20 | 5 | 7 | | | HIS |
| 1989 11 22.83 | B | 5.9 | S | 12.0 | B | | 20 | 5 | 7 | | | HIS |
| 1989 11 22.84 | B | 5.0 | AA | 7.0 | B | | 10 | 12 | 7 | | | ASA |
| 1989 11 23.83 | B | 5.5 | AA | 6.0 | B | | 12 | 10 | 6 | | | ASA |
| 1989 11 23.85 | B | 5.9 | S | 12.0 | B | | 20 | 4 | | | | HIS |
| 1989 11 24.85 | B | 5.3 | AA | 6.0 | B | | 15 | 10 | 6 | | | ASA |
| 1989 11 25.82 | B | 5.7 | S | 12.0 | B | | 20 | 5 | | | | HIS |
| 1989 11 25.85 | S | 6.0 | S | 7.0 | B | | 10 | 5 | 6 | | | MIY |
| 1989 11 29.85 | B | 6.1 | AA | 12.0 | B | | 20 | 5 | 6/ | | | HIS |
| 1989 11 29.86 | S | 6.2 | AA | 7.0 | B | | 10 | 5 | 6 | | | MIY |
| 1989 12 02.85 | B | 6.5 | S | 12.0 | B | | 20 | 4 | | | | HIS |

Comet Aarseth-Brewington 1989 XXII

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 12 15.86 | E | 5.0 | AA | 7.0 | B | | 10 | 5 | 7 | | | MIY |
| 1989 12 17.87 | E | 4.3 | AA | 7.0 | B | | 10 | 3 | 7 | | | MIY |
| 1989 12 18.87 | E | 4.0 | AA | 7.0 | B | | 10 | 3 | 7 | | | MIY |
| 1989 12 19.87 | E | 3.8 | AA | 7.0 | B | | 10 | 4 | 7 | 0.5 | | MIY |
| 1989 12 20.86 | S | 3.5 | S | 7.0 | B | | 14 | 6 | 6 | 2 | | KAN04 |

Comet Austin 1990 V

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1990 03 21.39 | B | 6.0 | AA | 6.3 | B | | 9 | & 1 | 8 | | | MCN |

Comet Tsuchiya-Kiuchi 1990 XVII

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1990 10 27.24 | S | 7.4 | AA | 5.0 | B | | 20 | 8 | 4 | | | DES01 |
| 1990 10 28.27 | S | 7.4 | AA | 5.0 | B | | 20 | 8 | 5 | | | DES01 |
| 1990 11 13.29 | S | 7.1 | AA | 5.0 | B | | 20 | 10 | 5 | | | DES01 |
| 1990 11 14.30 | S | 7.0 | AA | 5.0 | B | | 20 | 10 | 5 | | | DES01 |
| 1990 11 21.24 | S | 7.2 | AA | 5.0 | B | | 20 | 12 | 5 | 0.15 | 160 | DES01 |
| 1990 11 23.24 | S | 7.4 | AA | 5.0 | B | | 20 | 10 | 4 | 0.15 | 170 | DES01 |
| 1990 11 25.25 | S | 7.5 | AA | 5.0 | B | | 20 | 8 | 4 | 0.10 | 170 | DES01 |
| 1990 11 28.22 | S | 7.7 | AA | 5.0 | B | | 20 | 6 | 4 | | | DES01 |
| 1990 11 30.24 | S | 7.8 | AA | 5.0 | B | | 20 | 6 | 4 | | | DES01 |

Comet Levy 1990 XX

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1990 08 03.89 | B | 6.0: | AA | 5.0 | B | 4 | 7 | &15 | 3 | | | CHE03 |
| 1990 08 04.02 | B | 5.8 | AA | 5.0 | B | 4 | 7 | &15 | 5 | | | CHE03 |
| 1990 08 04.89 | B | 5.9 | AA | 4.0 | B | 4 | 12 | &20 | 4 | | | CHE03 |
| 1990 08 10.84 | B | 4.9 | AA | 5.0 | B | 4 | 7 | &16 | 3 | | | CHE03 |
| 1990 08 11.84 | I | 4.7 | AA | 0.0 | E | | 1 | | 3 | | | CHE03 |
| 1990 08 12.85 | I | 4.5 | AA | 0.0 | E | | 1 | | 3 | | | CHE03 |
| 1990 08 14.85 | B | 4.4: | AA | 5.0 | B | 4 | 7 | | 4 | | | CHE03 |
| 1990 08 16.87 | B | 4.3: | AA | 5.0 | B | 4 | 7 | &20 | 4 | | | CHE03 |
| 1990 08 18.89 | B | 4.1 | AA | 5.0 | B | 4 | 7 | &20 | 5 | | | CHE03 |
| 1990 08 20.87 | B | 3.9: | AA | 5.0 | B | 4 | 7 | | 5 | | | CHE03 |
| 1990 08 23.83 | B | 3.9 | AA | 5.0 | B | 4 | 7 | 15.5 | 5 | 1.0 | 110 | CHE03 |
| 1990 08 24.88 | B | 3.5 | AA | 5.0 | B | 4 | 7 | | 6 | 1.2 | 110 | CHE03 |
| 1990 08 26.84 | B | 3.6 | AA | 5.0 | B | 4 | 7 | | 5 | 1.2 | 100 | CHE03 |
| 1990 08 27.84 | I | 3.8 | AA | 0.0 | E | | 1 | | 5 | 1.0 | | CHE03 |
| 1990 08 28.82 | B | 3.7 | AA | 5.0 | B | 4 | 7 | | 5 | 1.0 | | CHE03 |

Comet Shoemaker-Levy 1991 XXIV = 1991d

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 11 04.81 | S | 11.8 | AC | 20 | L | 6 | 106 | 1.4 | 4/ | | | NAK01 |
| 1991 11 10.81 | S | 11.7 | AC | 20 | L | 6 | 106 | 1.2 | 4 | | | NAK01 |
| 1991 11 15.80 | S | 11.3 | AC | 20 | L | 6 | 106 | 1.8 | 5 | | | NAK01 |
| 1991 12 04.81 | S | 10.5 | AC | 20 | L | 6 | 58 | 3 | 6 | | | NAK01 |
| 1991 12 18.81 | S | 10.3 | AA | 12.0 | B | | 20 | 3.5 | 2 | | | MIT |
| 1991 12 18.83 | S | 10.4 | AC | 20 | L | 6 | 46 | 3.5 | 5 | | | NAK01 |
| 1991 12 30.84 | S | 10.5 | AC | 12.0 | B | | 20 | 4 | 3 | | | MIT |
| 1992 01 10.82 | S | 10.5 | AC | 20 | L | 6 | 58 | 2.5 | 5 | | | NAK01 |
| 1992 01 14.82 | S | 10.4 | AC | 20 | L | 6 | 46 | 3.5 | 5 | | | NAK01 |
| 1992 01 17.84 | S | 10.4 | AC | 20 | L | 6 | 46 | 2.8 | 5 | | | NAK01 |
| 1992 02 01.82 | S | 10.5 | AC | 20 | L | 6 | 58 | 2.0 | 5 | | | NAK01 |
| 1992 02 05.82 | S | 10.2 | AC | 20 | L | 6 | 46 | 3.0 | 5 | | | NAK01 |
| 1992 02 08.81 | S | 10.1 | AC | 20 | L | 6 | 46 | 2.8 | 5 | | | NAK01 |
| 1992 03 06.81 | S | 10.9 | AC | 20 | L | 6 | 58 | 1.9 | 3 | | | NAK01 |
| 1992 03 10.81 | S | 10.9 | AC | 20 | L | 6 | 58 | 2.6 | 3 | | | NAK01 |
| 1992 04 02.78 | S | 11.2 | AC | 20 | L | 6 | 58 | 2.5 | 2 | | | NAK01 |
| 1992 04 05.80 | S | 11.5 | AC | 20 | L | 6 | 74 | 1.8 | 4 | | | NAK01 |
| 1992 04 11.78 | S | 11.6 | AC | 20 | L | 6 | 74 | 2.0 | 4/ | | | NAK01 |
| 1992 04 13.78 | S | 11.7 | AC | 20 | L | 6 | 58 | 2.2 | 5 | | | NAK01 |
| 1992 04 28.76 | S | 11.9 | AC | 20 | L | 6 | 106 | 1.4 | 3 | | | NAK01 |
| 1992 04 30.03 | S | 12.8 | GA | 30 | L | 5 | 154 | 1.4 | 5 | | | KOR01 |
| 1992 05 02.76 | S | 11.9 | AC | 20 | L | 6 | 106 | 1.8 | 2/ | | | NAK01 |
| 1992 05 03.02 | S | 12.8 | GA | 30 | L | 5 | 154 | 1.3 | 5 | | | KOR01 |
| 1992 05 04.03 | S | 12.7 | GA | 30 | L | 5 | 154 | 1.3 | 5/ | | | KOR01 |
| 1992 05 06.02 | S | 12.8 | GA | 30 | L | 5 | 154 | 1.3 | 6 | | | KOR01 |
| 1992 05 10.74 | S | 12.3 | AC | 20 | L | 6 | 106 | 1.0 | 3/ | | | NAK01 |
| 1992 05 11.75 | S | 12.3 | AC | 20 | L | 6 | 106 | 1.1 | 4 | | | NAK01 |
| 1992 05 11.94 | S | 12.8 | GA | 30 | L | 5 | 154 | 1.2 | 6 | | | KOR01 |
| 1992 05 12.96 | S | 12.9 | GA | 30 | L | 5 | 154 | 1.2 | 5/ | | | KOR01 |
| 1992 05 14.95 | S | 12.9 | GA | 30 | L | 5 | 154 | 1.3 | 6 | | | KOR01 |
| 1992 05 15.95 | S | 12.8 | GA | 30 | L | 5 | 154 | 1.3 | 6 | | | KOR01 |
| 1992 05 19.88 | S | 12.8 | GA | 30 | L | 5 | 154 | 1.2 | 5 | | | KOR01 |
| 1992 05 24.72 | S | 12.6 | AC | 60.0 | Y | 8 | 240 | 0.7 | 5 | | | NAK01 |
| 1992 05 24.88 | S | 12.9 | GA | 30 | L | 5 | 154 | 1.1 | 5 | | | KOR01 |
| 1992 05 28.68 | S | 12.4 | AC | 60.0 | Y | 8 | 200 | 1.1 | 4/ | | | NAK01 |
| 1992 05 31.73 | S | 12.5 | AC | 20 | L | 6 | 106 | 1.0 | 5 | | | NAK01 |
| 1992 05 31.89 | S | 12.9 | GA | 30 | L | 5 | 154 | 1.1 | 5 | | | KOR01 |
| 1992 06 03.71 | S | 12.5 | AC | 20 | L | 6 | 106 | 1.4 | 4 | | | NAK01 |
| 1992 06 03.89 | S | 12.8 | GA | 30 | L | 5 | 154 | 1.2 | 4/ | | | KOR01 |
| 1992 06 05.71 | S | 12.9 | AC | 20 | L | 6 | 150 | 0.7 | | | | NAK01 |
| 1992 06 06.93 | S | 12.9 | GA | 30 | L | 5 | 154 | 1.4 | 4 | | | KOR01 |
| 1992 06 10.92 | S | 13.0 | GA | 30 | L | 5 | 154 | 1.3 | 4 | | | KOR01 |
| 1992 06 24.71 | S | 12.8 | GA | 20 | L | 6 | 150 | 1.1 | 4 | | | NAK01 |
| 1992 07 19.52 | S | 12.8 | AC | 60.0 | Y | 8 | 200 | 0.8 | 4/ | | | NAK01 |
| 1992 07 23.59 | S | 12.8 | AC | 60.0 | Y | 8 | 192 | 0.9 | 4/ | | | NAK01 |
| 1992 07 26.69 | S | 12.7 | AC | 20 | L | 6 | 150 | 0.9 | 4/ | | | NAK01 |
| 1992 08 05.69 | S | 12.6 | AC | 60.0 | Y | 8 | 200 | 0.8 | 4 | | | NAK01 |
| 1992 08 23.49 | S | 12.9 | GA | 60.0 | Y | 8 | 200 | 1.0 | 4 | | | NAK01 |
| 1992 08 27.65 | S | 13.0 | GA | 60.0 | Y | 8 | 200 | 0.8 | 4 | | | NAK01 |
| 1992 09 02.95 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 09 25.57 | S | 13.4 | AC | 60.0 | Y | 8 | 200 | 0.6 | | | | NAK01 |
| 1992 09 27.45 | S | 13.3 | AC | 60.0 | Y | 8 | 200 | 0.7 | 5 | | | NAK01 |
| 1992 10 19.49 | S | 14.0 | AC | 60.0 | Y | 8 | 253 | 0.5 | 3/ | | | NAK01 |

Comet Helin-Lawrence 19911

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 03.01 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 11 29.82 | C[ | 15 : | L | 18 | M | 6 | | ! 0.5 | | | | PRA01 |

Comet Shoemaker-Levy 1991a1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 04 07.07 | S | 11.9 | GA | 30 | L | 5 | 154 | 1.7 | 2 | 0.04 | 320 | KOR01 |
| 1992 04 08.07 | S | 11.9 | GA | 30 | L | 5 | 154 | 1.7 | 2 | 0.04 | 320 | KOR01 |
| 1992 04 09.07 | S | 11.9 | GA | 30 | L | 5 | 154 | 1.7 | 2 | 0.03 | 320 | KOR01 |
| 1992 04 11.07 | S | 11.8 | GA | 30 | L | 5 | 154 | 1.8 | 2 | 0.03 | 320 | KOR01 |
| 1992 04 24.04 | S | 11.4 | GA | 51 | C | 15 | 187 | 2 | 3 | | | KOR01 |
| 1992 04 25.04 | S | 11.4 | GA | 51 | C | 15 | 187 | 1.8 | 3 | | | KOR01 |
| 1992 04 29.04 | S | 11.2 | GA | 30 | L | 5 | 154 | 2.4 | 3 | | | KOR01 |
| 1992 04 30.04 | S | 11.1 | GA | 30 | L | 5 | 154 | 2.5 | 3 | | | KOR01 |
| 1992 05 03.03 | S | 10.9 | GA | 30 | L | 5 | 154 | 2.6 | 3 | | | KOR01 |
| 1992 05 04.03 | S | 10.9 | GA | 30 | L | 5 | 154 | 2.6 | 3/ | | | KOR01 |
| 1992 05 06.02 | S | 10.8 | GA | 30 | L | 5 | 55 | 2.6 | 3 | | | KOR01 |
| 1992 05 10.78 | S | 11.6 | AC | 20 | L | 6 | 106 | 1.4 | 4 | | | NAK01 |
| 1992 05 11.78 | S | 11.7 | AC | 20 | L | 6 | 106 | 1.2 | 3 | | | NAK01 |
| 1992 05 11.95 | S | 10.8 | GA | 30 | L | 5 | 55 | 3 | 3 | | | KOR01 |
| 1992 05 12.95 | S | 10.7 | GA | 30 | L | 5 | 55 | 3 | 3/ | | | KOR01 |
| 1992 05 14.96 | S | 10.6 | GA | 30 | L | 5 | 55 | 3.2 | 3/ | | | KOR01 |
| 1992 05 15.96 | S | 10.5 | GA | 30 | L | 5 | 55 | 3.3 | 3/ | | | KOR01 |
| 1992 05 17.96 | S | 10.4 | GA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 05 18.96 | S | 10.4 | GA | 30 | L | 5 | 55 | 3.5 | 3 | 0.05 | 305 | KOR01 |
| 1992 05 19.96 | S | 10.3 | GA | 30 | L | 5 | 55 | 3 | 3 | | | KOR01 |
| 1992 05 22.96 | S | 10.2 | GA | 30 | L | 5 | 55 | 3 | 3 | | | KOR01 |
| 1992 05 23.96 | S | 10.2 | GA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 05 24.96 | S | 10.1 | GA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 05 25.95 | S | 10.1 | GA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 05 26.96 | S | 10.0 | GA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 05 27.95 | S | 10.0 | GA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 05 28.73 | S | 11.0 | AC | 20 | L | 6 | 106 | 1.3 | 2 | | | NAK01 |
| 1992 05 31.75 | S | 10.9 | AC | 20 | L | 6 | 106 | 1.7 | 2 | | | NAK01 |
| 1992 05 31.94 | S | 9.8 | AA | 13 | L | 4 | 52 | 3 | 3 | | | KOR01 |
| 1992 06 01.94 | S | 9.8 | AA | 13 | L | 4 | 52 | 3 | 3 | | | KOR01 |
| 1992 06 02.94 | S | 9.7 | AA | 13 | L | 4 | 52 | 3 | 3 | | | KOR01 |
| 1992 06 03.74 | S | 10.3 | AC | 20 | L | 6 | 74 | 3 | 2 | | | NAK01 |
| 1992 06 03.94 | S | 9.7 | AA | 30 | L | 5 | 55 | 3.3 | 3 | | | KOR01 |
| 1992 06 04.94 | S | 9.6 | AA | 30 | L | 5 | 55 | 3.4 | 3 | | | KOR01 |
| 1992 06 05.74 | S | 9.9 | AC | 20 | L | 6 | 74 | 4 | 2 | | | NAK01 |
| 1992 06 06.96 | S | 9.5 | AA | 30 | L | 5 | 55 | 3.5 | 3/ | | | KOR01 |
| 1992 06 19.54 | S | 8.9 | S | 20 | L | 6 | 74 | 2 | 3 | | | NAK01 |
| 1992 06 20.67 | S | 8.7 | AC | 20 | L | 6 | 74 | 2.5 | 3/ | | | NAK01 |
| 1992 06 24.73 | S | 8.4 | AC | 20 | L | 6 | 46 | 4 | 4 | | | NAK01 |
| 1992 06 26.02 | O | 9.0 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 06 27.00 | O | 9.2 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 06 27.01 | S | 8.1 | AA | 10.0 | B | | 25 | 2.4 | 6 | | | MEY |
| 1992 06 27.97 | S | 8.2 | AA | 10.0 | B | | 25 | 2.3 | 7 | | | MEY |
| 1992 06 28.06 | O | 9.3 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 06 28.97 | S | 8.0 | AA | 10.0 | B | | 25 | 2.8 | 6 | | | MEY |
| 1992 06 29.03 | O | 9.3 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 06 30.03 | O | 8.8: | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 06 30.97 | S | 7.9 | AA | 10.0 | B | | 25 | 3.5 | 7 | | | MEY |
| 1992 07 01.02 | O | 8.3 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 07 04.97 | S | 7.9 | AA | 7.0 | B | | 20 | 5 | 5 | | | TAN02 |
| 1992 07 08.52 | S | 7.4 | AC | 20 | L | 6 | 46 | 4 | 5 | | | NAK01 |
| 1992 07 08.90 | O | 7.8: | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 07 11.89 | S | 7.8 | AA | 12 | R | 5 | 23 | 5 | 3 | | | ZHU |
| 1992 07 11.90 | B | 7.9 | AA | 19.9 | L | 4 | 52 | 4 | 3/ | | | ZHU |
| 1992 07 11.90 | M | 7.7 | AA | 19.9 | L | 4 | 52 | 4 | 3/ | | | ZHU |
| 1992 07 12.52 | B | 7.9 | AA | 10.5 | R | 7 | 35 | 3 | 3/ | | | OBU |
| 1992 07 15.50 | B | 7.5 | AA | 10.5 | R | 7 | 35 | 3 | 3/ | | | OBU |
| 1992 07 16.50 | B | 7.6 | AA | 10.5 | R | 7 | 35 | 3 | 4/ | | | OBU |
| 1992 07 17.83 | S | 7.4 | AA | 7.0 | B | | 20 | 3 | 6 | | 40 | TAN02 |

Comet Shoemaker-Levy 1991a1 [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 07 19.48 | S | 7.0 | AA | 20 | L | 6 | 46 | 3.5 | 5/ | 0.2 | 75 | NAK01 |
| 1992 07 19.82 | S | 7.1 | AA | 7.0 | B | | 20 | 5 | 5 | | | TAN02 |
| 1992 07 19.91 | O | 8.1 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 07 20.81 | S | 7.3 | AA | 7.0 | B | | 20 | | 4/ | | | TAN02 |
| 1992 07 20.87 | O | 8.2 | S | 10.0 | B | | 25 | | | 0.2 | | HUD02 |
| 1992 07 20.90 | S | 7.5 | AA | 12.9 | L | 4 | 38 | 6 | 3 | | | ZHU |
| 1992 07 20.90 | S | 7.7 | AA | 12.9 | L | 4 | 92 | 4 | 3/ | | | ZHU |
| 1992 07 21.87 | O | 7.9 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 07 22.50 | S | 7.3 | AA | 20 | L | 6 | 46 | 3.5 | 6 | 0.3 | 70 | NAK01 |
| 1992 07 22.50 | S | 7.8 | AA | 20 | L | 6 | 48 | 3.5 | 6 | | | YAS |
| 1992 07 23.87 | O | 8.8: | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 07 24.49 | S | 7.6 | AA | 20 | L | 6 | 48 | 3.5 | 6 | | | YAS |
| 1992 07 24.87 | O | 8.4 | S | 10.0 | B | | 25 | | | | | HUD02 |
| 1992 07 27.48 | S | 7.6 | AC | 20 | L | 6 | 46 | 3.5 | 5/ | | 75 | NAK01 |
| 1992 07 31.48 | S | 7.7 | AC | 20 | L | 6 | 46 | 3.0 | | 0.25 | 80 | NAK01 |

Comet Zanotta-Brewington 1991g1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 01 03.72 | S | 8.7 | AA | 10.0 | B | | 25 | 2.6 | 5 | | | MEY |
| 1992 01 03.75 | S | 8.5 | AC | 13.0 | L | 6 | 36 | 3.4 | 5 | | | MEY |
| 1992 01 03.76 | S | 8.8 | AA | 20.3 | T | 10 | 50 | 2.5 | 4 | | | TAN02 |
| 1992 01 06.74 | S | 8.5 | AA | 7.0 | B | | 20 | 4 | 5 | | | TAN02 |
| 1992 01 09.73 | M | 8.5 | AA | 20.3 | T | 10 | 80 | 2.8 | 4/ | | 0 | TAN02 |
| 1992 01 10.73 | S | 8.4 | AA | 20.3 | T | 10 | 80 | 2.1 | 4 | | | TAN02 |
| 1992 01 11.73 | S | 8.1 | AA | 13.0 | L | 6 | 36 | 3.7 | 6 | | | MEY |
| 1992 01 11.73 | S | 8.2 | AA | 20.3 | T | 10 | 80 | 2.0 | 4 | | | TAN02 |
| 1992 01 12.73 | M | 8.3 | AA | 20.3 | T | 10 | 80 | 2.0 | 4 | | | TAN02 |
| 1992 01 15.72 | M | 7.9 | AA | 20.3 | T | 10 | 80 | 2.6 | 4/ | | 337 | TAN02 |
| 1992 01 20.73 | S | 7.9 | AA | 7.0 | B | | 20 | 3.6 | 4/ | | | TAN02 |
| 1992 01 24.74 | S | 7.4 | AA | 13.0 | L | 6 | 36 | 4.0 | 7 | | | MEY |
| 1992 01 25.00 | S | 7.0 | AA | 5.0 | B | | 7 | 10 | 5 | | | DES01 |

Comet Mueller 1991h1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 02 24.79 | S | 8.4 | AC | 13.0 | L | 6 | 36 | 3.6 | 5 | | | MEY |
| 1992 02 27.77 | S | 8.1 | AC | 10.0 | B | | 25 | 3.5 | 5 | ? | | MEY |
| 1992 02 27.79 | S | 8.3 | AC | 13.0 | L | 6 | 36 | 3.5 | 5 | | | MEY |
| 1992 02 28.77 | S | 8.3 | AC | 10.0 | B | | 25 | 3.5 | 4 | | | MEY |
| 1992 02 29.77 | S | 8.2 | AC | 13.0 | L | 6 | 36 | 3.6 | 6 | | | MEY |
| 1992 03 01.76 | M | 8.3 | AC | 13.0 | L | 6 | 36 | | | | | MEY |
| 1992 03 01.76 | S | 8.2 | AC | 13.0 | L | 6 | 36 | 4.1 | 6 | | | MEY |

Comet Tanaka-Machholz 1992d

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 04 08.08 | S | 8.8 | AA | 30 | L | 5 | 55 | 3.5 | 4 | 0.1 | | KOR01 |
| 1992 04 11.07 | S | 8.5 | AA | 30 | L | 5 | 55 | 3.7 | 4 | 0.13 | | KOR01 |
| 1992 04 13.06 | S | 8.4 | AA | 30 | L | 5 | 55 | 3.8 | 5 | 0.15 | | KOR01 |
| 1992 04 24.03 | S | 8.4 | AA | 51 | C | 15 | 187 | 2 | 7 | | | KOR01 |
| 1992 04 24.04 | S | 8.3 | AA | 11 | L | 7 | 32 | 4.4 | 4 | 0.1 | | KOR01 |
| 1992 04 25.04 | S | 8.3 | AA | 51 | C | 15 | 187 | 2 | 6 | | | KOR01 |
| 1992 04 25.05 | S | 8.3 | AA | 11 | L | 7 | 32 | 4.5 | 4 | 0.1 | | KOR01 |
| 1992 04 25.12 | M | 8.7 | AA | 20.3 | T | 10 | 80 | 3.9 | 4 | | | TAN02 |
| 1992 04 29.04 | S | 8.4 | AA | 30 | L | 5 | 55 | 4.5 | 4 | 0.1 | | KOR01 |
| 1992 04 29.06 | S | 8.4 | AA | 5.0 | B | | 7 | 5 | 3 | | | KOR01 |
| 1992 04 29.10 | M | 8.8 | AA | 20.3 | T | 10 | 80 | 2.8 | 4 | | | TAN02 |
| 1992 04 30.92 | S | 8.5 | AA | 30 | L | 5 | 55 | 4.5 | 4 | 0.1 | 35 | KOR01 |

Comet Tanaka-Machholz 1992d [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 04 30.93 | S | 8.6 | AA | 12 | R | 5 | 20 | 5 | 4 | | | KOR01 |
| 1992 05 03.92 | S | 8.7 | AA | 30 | L | 5 | 55 | 5.5 | 4 | | | KOR01 |
| 1992 05 04.92 | S | 8.7 | AA | 30 | L | 5 | 55 | 5.6 | 4 | | | KOR01 |
| 1992 05 06.92 | S | 8.8 | AA | 30 | L | 5 | 55 | 5.3 | 4 | | | KOR01 |
| 1992 05 07.92 | S | 8.8 | AA | 30 | L | 5 | 55 | 5.2 | 3 | | | KOR01 |
| 1992 05 09.90 | S | 8.2 | AA | 13 | L | 4 | 28 | 9.5 | 5 | 0.2 | 44 | KOR01 |
| 1992 05 10.11 | S | 7.0 | AA | 7.0 | B | | 20 | 6.0 | 3/ | | | TAN02 |
| 1992 05 11.10 | S | 6.7 | AA | 7.0 | B | | 20 | 10.5 | 3/ | | | TAN02 |
| 1992 05 11.89 | S | 8.0 | AA | 13 | L | 4 | 28 | 11 | 5 | 0.25 | 46 | KOR01 |
| 1992 05 12.90 | S | 8.3 | AA | 30 | L | 5 | 55 | 8.4 | 5 | 0.17 | 45 | KOR01 |
| 1992 05 14.90 | S | 8.1 | AA | 13 | L | 4 | 28 | 10 | 4 | 0.2 | 43 | KOR01 |
| 1992 05 15.90 | S | 8.1 | AA | 13 | L | 4 | 28 | 9 | 4/ | 0.2 | 42 | KOR01 |
| 1992 05 16.89 | S | 8.2 | AA | 13 | L | 4 | 28 | 8 | 4 | 0.15 | 38 | KOR01 |
| 1992 05 16.90 | B | 8.3 | AA | 5.0 | B | | 7 | 7 | 4 | 0.1 | | KOR01 |
| 1992 05 17.91 | S | 8.3 | AA | 13 | L | 4 | 28 | 8.5 | 5 | 0.1 | 35 | KOR01 |
| 1992 05 18.90 | S | 8.4 | AA | 13 | L | 4 | 28 | 7 | 4 | 0.1 | 35 | KOR01 |
| 1992 05 19.90 | S | 8.5 | AA | 13 | L | 4 | 28 | 6.5 | 4 | 0.1 | 35 | KOR01 |
| 1992 05 22.89 | S | 8.7 | AA | 13 | L | 4 | 52 | 5 | 3 | | | KOR01 |
| 1992 05 23.89 | S | 8.8 | AA | 30 | L | 5 | 55 | 4.5 | 4 | 0.1 | | KOR01 |
| 1992 05 24.90 | S | 8.9 | AA | 30 | L | 5 | 55 | 4.3 | 3 | 0.05 | | KOR01 |
| 1992 05 25.90 | S | 9.0 | AA | 30 | L | 5 | 55 | 4.5 | 3 | 0.06 | | KOR01 |
| 1992 05 26.89 | S | 9.0 | AA | 30 | L | 5 | 55 | 4 | 3 | 0.07 | | KOR01 |
| 1992 05 27.90 | S | 9.0 | AA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 05 31.06 | S | 9.3 | AA | 33.3 | L | 4 | 57 | 4.4 | 4 | | | TAN02 |
| 1992 05 31.90 | S | 9.1 | AA | 30 | L | 5 | 55 | 6 | 2 | | | KOR01 |
| 1992 06 01.89 | S | 9.1 | AA | 30 | L | 5 | 55 | 5.5 | 2/ | | | KOR01 |
| 1992 06 02.89 | S | 9.2 | AA | 30 | L | 5 | 55 | 5 | 3 | | | KOR01 |
| 1992 06 03.88 | S | 9.2 | AA | 30 | L | 5 | 55 | 4.4 | 3 | | | KOR01 |
| 1992 06 04.89 | S | 9.4 | AA | 30 | L | 5 | 55 | 4.1 | 2 | | | KOR01 |
| 1992 06 06.93 | S | 9.5 | AA | 30 | L | 5 | 55 | 3.5 | 3 | | | KOR01 |
| 1992 06 10.99 | S | 9.7 | AA | 30 | L | 5 | 55 | 3 | 3 | | | KOR01 |
| 1992 06 26.96 | S | 10.1 | AC | 13.0 | L | 6 | 36 | 2.7 | 3 | | | MEY |
| 1992 09 26.13 | S[ | 13.0 | AC | 20.3 | T | 10 | 80 | ! 0.5 | | | | GAR02 |

Comet Spacewatch 1992h

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 02 25.74 | S | 14.9 | GA | 60.0 | Y | 8 | 200 | 0.45 | | | | NAK01 |
| 1993 02 26.44 | I[ | 14.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 28.42 | S[ | 13.5 | AA | 41 | L | 4 | 183 | ! 1 | | | | HAL |
| 1993 04 01.75 | S | 14.9 | GA | 60.0 | Y | 8 | 240 | 0.6 | | | | NAK01 |
| 1993 04 01.77 | C | 15.6 | EB | 60.0 | Y | 6 | | 0.4 | | | 180 | NAK01 |
| 1993 04 12.30 | S[ | 13.6 | AA | 41 | L | 4 | 183 | ! 1 | | | | HAL |
| 1993 04 19.33 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |

Comet Helin-Lawrence 1992q

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 03.05 | S[ | 13.0 | AC | 20.3 | T | 10 | 80 | ! 0.5 | | | | GAR02 |
| 1992 09 26.02 | S[ | 13.0 | AC | 20.3 | T | 10 | 80 | ! 0.5 | | | | GAR02 |

Comet Shoemaker 1992y

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 10 30.18 | S[ | 13.5 | A | 28.0 | T | 10 | 108 | | | | | COM |
| 1992 11 29.35 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 16.83 | S | 13.5: | A | 28.0 | T | 10 | 108 | & 1 | 1 | | | COM |
| 1992 12 17.34 | I[ | 13.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 20.87 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |

Comet Shoemaker 1992y [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 12 26.87 | | S[13.4 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 28.91 | | S 13.7: | A | 28.0 | T | 10 | 108 | < 1 | 1 | | | COM |
| 1992 12 28.94 | | S 13.9 | A | 25.4 | J | 6 | 48 | 0.7 | 0/ | | | FEI |
| 1992 12 29.93 | | S 13.8: | A | 28.0 | T | 10 | 108 | & 0.5 | 1 | | | COM |
| 1992 12 30.97 | | S 13.7: | A | 28.0 | T | 10 | 108 | & 0.5 | 0/ | | | COM |
| 1993 01 05.90 | | S 14.2 | AC | 20.0 | T | 10 | 77 | 1.3 | | | | TOM01 |
| 1993 01 17.87 | | S[13.5 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 20.18 | | I[13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 17.14 | | I[13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 18.81 | | S[13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |

Comet Ohshita 1992a1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 12 22.53 | | S 12.0: | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 23.50 | | S 12.2 | AA | 41 | L | 4 | 183 | | 2/ | | | HAL |
| 1992 12 29.15 | | S 12.2 | A | 28.0 | T | 10 | 108 | & 1.5 | 1 | | | COM |
| 1992 12 30.18 | | S 12.8 | A | 28.0 | T | 10 | 108 | & 2 | 0 | | | COM |
| 1992 12 31.09 | | S 11.9 | GA | 31 | L | 4 | 124 | 2.4 | 1/ | | | KOR01 |
| 1992 12 31.10 | | S 12.9 | A | 28.0 | T | 10 | 108 | & 1.5 | 0 | | | COM |
| 1993 01 02.19 | | S 13.2 | A | 28.0 | T | 10 | 108 | & 1 | 0 | | | COM |
| 1993 01 03.19 | | S 12.7 | A | 28.0 | T | 10 | 108 | 2 | 0 | | | COM |
| 1993 01 20.43 | | I[13.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 02 01.21 | ! | V 14.2 | HR | 20.0 | T | 2 | | & 4 | 2/ | | | MIK |
| 1993 02 02.16 | ! | V 15.0 | HR | 20.0 | T | 2 | | & 1.5 | 2 | | | MIK |
| 1993 02 08.74 | ! | V 15.5 | HR | 20.0 | T | 2 | | & 1 | 3 | | | MIK |
| 1993 02 10.78 | ! | V[17.0 | HR | 20.0 | T | 2 | | | | | | MIK |

Comet Mueller 1993a

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 01 14.95 | | S 13.4: | A | 28.0 | T | 10 | 108 | & 1 | 1/ | | | COM |
| 1993 01 16.31 | | S 13.4 | AA | 41 | L | 4 | 183 | & 1 | 4 | | | HAL |
| 1993 01 17.99 | | S[13.2 | AC | 20.3 | T | 10 | 80 | ! 0.5 | | | | GAR02 |
| 1993 01 18.82 | | S[13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 18.89 | | S 13.2 | A | 28.0 | T | 10 | 108 | & 0.5 | 1/ | | | COM |
| 1993 01 22.85 | | S[13.5 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 22.88 | | S 13.1 | A | 28.0 | T | 10 | 108 | & 0.5 | 1/ | | | COM |
| 1993 01 23.32 | | S 13.4 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 01 25.91 | | S 13.1 | A | 28.0 | T | 10 | 107 | > 0.5 | 2 | | | COM |
| 1993 01 25.91 | ! | V 14.0 | HR | 19.0 | T | 4 | | 0.9 | 9 | ?0.05 | 150 | MIK |
| 1993 01 27.94 | | S 13.1 | A | 28.0 | T | 10 | 108 | & 0.5 | 2 | | | COM |
| 1993 01 30.02 | | S 13.4 | A | 28.0 | T | 10 | 164 | & 0.5 | 2 | | | COM |
| 1993 01 31.19 | ! | V 13.9 | HR | 19.0 | T | 4 | | & 1 | 8 | 0.08 | 160 | MIK |
| 1993 02 01.17 | ! | V 13.3 | HR | 20.0 | T | 2 | | & 1 | 9 | 0.07 | 150 | MIK |
| 1993 02 08.78 | ! | V 13.8 | HR | 20.0 | T | 2 | | 0.7 | 9 | 0.03 | 150 | MIK |
| 1993 02 12.25 | | S 13.4 | WA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 02 13.88 | ! | V 13.7 | YF | 20.0 | T | 2 | | 1.0 | 7 | 0.07 | 150 | MIK |
| 1993 02 15.79 | | S[13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 02 17.86 | | S 13.3 | A | 28.0 | T | 10 | 165 | & 0.5 | 2 | | | COM |
| 1993 02 18.36 | | S 13.2 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 02 20.80 | ! | V 13.7 | YF | 20.0 | T | 2 | | 0.7 | 9 | 0.08 | 145 | MIK |
| 1993 02 22.81 | | S 13.5 | A | 28.0 | T | 10 | 165 | & 0.3 | 2 | | | COM |
| 1993 02 23.83 | | S 13.5 | A | 28.0 | T | 10 | 168 | & 0.3 | 2 | | | COM |
| 1993 03 09.81 | | S 13.5 | A | 28.0 | T | 10 | 168 | & 2 | 1 | | | COM |
| 1993 03 10.81 | ! | V 13.6 | YF | 20.0 | T | 2 | | 0.5 | 8 | 0.08 | 135 | MIK |
| 1993 03 16.83 | ! | V 13.7 | YF | 20.0 | T | 2 | | 0.5 | 8/ | 0.05 | 130 | MIK |
| 1993 03 17.33 | | S 13.3 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 18.96 | | S 13.0 | AC | 20.3 | T | 10 | 167 | 0.5 | 3 | | | GAR02 |

Comet Mueller 1993a [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 03 19.93 | S | 13.5 | A | 28.0 | T | 10 | 168 | & 2 | 1 | | | COM |
| 1993 03 24.29 | S | 13.3 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 26.93 | ! V | 13.5 | YF | 20.0 | T | 2 | | 0.5 | 8/ | | | MIK |
| 1993 04 08.86 | ! V | 13.8 | YF | 20.0 | T | 2 | | 0.5 | 8 | 0.04 | 100 | MIK |
| 1993 04 11.22 | S | 13.3 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 04 17.88 | S | 13.2 | AC | 20.3 | T | 10 | 167 | 0.5 | 3 | | | GAR02 |
| 1993 04 19.18 | S | 13.4 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 04 20.89 | S | 13.7 | A | 25.0 | J | 6 | 143 | & 2 | 1 | | | COM |
| 1993 04 23.94 | M | 12.4 | HS | 20 | R | 15 | 120 | 1.5 | 3 | | | ZNO |
| 1993 04 23.94 | M | 12.6 | HS | 20 | R | 15 | 120 | 1.2 | 2 | | | LEH |

Comet Mueller 1993d

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 03 26.94 | ! V | [17.5 | YF | 20.0 | T | 2 | | | | | | MIK |

Periodic Comet Encke

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1990 10 02.32 | S | 8.3 | AA | 6.0 | R | 11 | 116 | 3 | 4 | | | DES01 |
| 1990 10 03.31 | S | 8.2 | AA | 6.0 | R | 11 | 116 | 3 | 4 | | | DES01 |
| 1990 10 05.31 | S | 8.2 | AA | 6.0 | R | 11 | 116 | 3 | 4 | | | DES01 |
| 1990 10 05.32 | S | 8.0 | AA | 5.0 | B | | 20 | | | | | DES01 |

Periodic Comet Wolf (1992m)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 02.62 | C | 17.5: | EC | 60.0 | Y | 6 | | 0.15 | | | | NAK01 |

Periodic Comet Giacobini-Zinner (1985 XIII)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 08 07.98 | B | 9.4 | AC | 20.3 | T | 10 | 80 | 2.5 | 4 | 0.08 | 255 | GRA04 |
| 1985 08 09.91 | B | 9.3 | AC | 20.3 | T | 10 | 80 | | 2/ | | | BRE02 |
| 1985 08 09.92 | B | 9.6 | AC | 20.3 | T | 10 | 80 | | 3 | | | GRA04 |
| 1985 08 12.01 | B | 9.6 | AC | 20.3 | T | 10 | 80 | 2.1 | 3 | | | GRA04 |
| 1985 08 23.03 | B | 8.8: | AC | 20.3 | T | 10 | 80 | & 2.5 | 4 | 0.06 | 270 | GRA04 |
| 1985 08 30.01 | B | 9.6: | AC | 20.3 | T | 10 | 80 | 1.5 | 4 | | | GRA04 |
| 1985 09 09.11 | B | 10.7: | AC | 20.3 | T | 10 | 80 | 1.5 | 3 | | | GRA04 |
| 1985 09 12.09 | B | 10.2 | AC | 20.3 | T | 10 | 80 | 2 | 2 | 0.07 | 280 | GRA04 |
| 1985 09 22.15 | B | 10.0: | V | 20.3 | T | 10 | 80 | 3 | 3 | 0.33 | 275 | GRA04 |

Periodic Comet Metcalf-Brewington (1991 I)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 01 08.40 | S | 7.9 | S | 15.0 | B | | 25 | 3.5 | 5 | | | TAK05 |
| 1991 01 08.41 | B | 8.8 | AA | 8.0 | B | | 20 | 2.5 | 4 | | | YUS |
| 1991 01 09.48 | S | 8.5 | S | 12.5 | B | | 25 | 3 | 4 | | | KAN04 |
| 1991 01 10.43 | S | 9.1 | AA | 12.0 | B | | 20 | 4 | 4 | | | MIT |
| 1991 01 10.46 | B | 9.2 | AA | 8.0 | B | | 20 | 3.0 | 4 | | | YUS |
| 1991 01 12.42 | B | 8.9 | AA | 15 | L | 6 | 19 | 4 | 5 | | | YUS |
| 1991 01 13.43 | S | 8.6 | AC | 13 | L | 6 | 44 | 4 | 3 | | | ISH02 |
| 1991 01 13.46 | E | 8.8 | S | 15 | L | 5 | 38 | 2 | 4 | | | ONO |
| 1991 01 14.39 | S | 8.7 | AA | 13 | L | 6 | 24 | 3 | 3 | | | ISH02 |
| 1991 01 15.40 | S | 8.8 | AA | 13 | L | 6 | 44 | 3 | 4 | | | ISH02 |
| 1991 01 15.41 | M | 9.0 | AA | 12.0 | B | | 20 | 5 | 4 | | | MIT |
| 1991 01 15.52 | B | 9.3 | S | 15.0 | B | | 25 | 2 | 1/ | | | NAG04 |
| 1991 01 18.42 | B | 9.3 | AC | 12.0 | B | | 20 | 4 | 2/ | | | HAS07 |
| 1991 01 18.54 | S | 8.9 | S | 20 | L | 5 | 31 | 3.5 | 2 | | | TSU02 |

Periodic Comet Metcalf-Brewington (1991 I) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 01 19.40 | S | 8.9 | AA | 8.0 | B | | 15 | 4 | 3 | | | ISH02 |
| 1991 01 19.46 | S | 9.1 | S | 15.0 | B | | 25 | 3.7 | 2 | | | NAG04 |
| 1991 01 22.46 | S | 9.2 | AA | 13 | L | 6 | 44 | 2 | 3 | | | ISH02 |
| 1991 01 27.41 | S | 9.8 | AA | 13 | L | 6 | 62 | 2 | 3 | | | ISH02 |
| 1991 01 28.44 | S | 10.0 | AC | 13 | L | 6 | 62 | 1.5 | 2 | | | ISH02 |
| 1991 01 31.40 | S | 9.6 | AA | 13 | L | 6 | 44 | 3 | 2 | | | ISH02 |
| 1991 02 02.42 | S | 9.8 | AA | 13 | L | 6 | 44 | 3 | 2 | | | ISH02 |
| 1991 02 02.45 | M | 8.9 | S | 31 | L | 4 | 40 | 4 | 2 | | | TSU02 |
| 1991 02 05.45 | S | 9.7 | AA | 13 | L | 6 | 44 | 3 | 2 | | | ISH02 |
| 1991 02 06.44 | S | 9.6 | AA | 13 | L | 6 | 62 | 3 | 2 | | | ISH02 |

Periodic Comet Faye (1992n)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 01.99 | S[ | 13.8 | PA | 19.9 | L | 4 | 129 | ! 0.5 | | | | ZHU |
| 1992 09 03.11 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 09 25.79 | C | 16.1: | EC | 60.0 | Y | 6 | | 0.15 | | | | NAK01 |
| 1992 10 03.03 | S[ | 13.0 | PA | 19.9 | L | 4 | 129 | ! 0.5 | | | | ZHU |
| 1992 10 25.76 | C | 16.6: | EC | 60.0 | Y | 6 | | 0.25 | | | 300 | NAK01 |
| 1992 11 24.81 | C | 17.2 | EA | 60.0 | Y | 6 | | 0.2 | | | | NAK01 |
| 1992 11 27.96 | S[ | 12.5 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 11 30.77 | C | 17.3 | EA | 60.0 | Y | 6 | | 0.25 | | | | NAK01 |
| 1992 12 25.65 | C | 17.7 | EA | 60.0 | Y | 6 | | 0.2 | | | | NAK01 |

Periodic Comet Giclas (1992l)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 03.07 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 09 25.75 | C | 15.9: | EC | 60.0 | Y | 6 | | 0.2 | | | 260 | NAK01 |
| 1992 09 26.16 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 10 02.40 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 10 03.01 | S[ | 13.0 | PA | 19.9 | L | 4 | 129 | ! 0.5 | | | | ZHU |
| 1992 11 02.69 | C | 15.7: | EC | 60.0 | Y | 6 | | 0.25 | | | | NAK01 |
| 1992 11 24.75 | C | 15.2 | EA | 60.0 | Y | 6 | | 0.4 | | | | NAK01 |
| 1992 11 27.93 | S[ | 13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 11 30.67 | C | 15.5 | EA | 60.0 | Y | 6 | | 0.35 | | | | NAK01 |
| 1992 11 30.69 | S | 14.9 | AC | 60.0 | Y | 8 | 253 | 0.5 | | | | NAK01 |
| 1992 12 02.68 | S | 14.8 | AC | 60.0 | Y | 8 | 253 | 0.5 | | | | NAK01 |
| 1992 12 17.59 | C | 15.5 | EA | 60.0 | Y | 6 | | 0.3 | | | 350 | NAK01 |
| 1992 12 17.59 | S | 14.8 | AC | 60.0 | Y | 8 | 253 | 0.5 | | | | NAK01 |
| 1992 12 25.60 | S | 13.7 | AC | 60.0 | Y | 8 | 253 | 0.6 | 4/ | | | NAK01 |
| 1992 12 25.61 | C | 14.1 | EA | 60.0 | Y | 6 | | 0.5 | | | 55 | NAK01 |
| 1993 01 21.57 | C | 16.2 | EA | 60.0 | Y | 6 | | 0.35 | | | | NAK01 |
| 1993 02 14.48 | C | 17.0 | EA | 60.0 | Y | 6 | | 0.2 | | | | NAK01 |

Periodic Comet Ciffréo (1992s)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 02.99 | S[ | 13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 09 25.93 | S[ | 13.0 | AC | 20.3 | T | 10 | 80 | ! 1.0 | | | | GAR02 |
| 1992 11 15.17 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 11 29.18 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 14.44 | C | 15.6 | AC | 60.0 | Y | 6 | | 0.3 | | | | NAK01 |
| 1992 12 20.86 | S[ | 13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 26.78 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 16.12 | I[ | 13.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 01 17.78 | S[ | 13.5 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |

Periodic Comet Schaumasse (1992x)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 27.94 | S | [13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 16.82 | S | 12.5: | A | 28.0 | T | 10 | 108 | & 1 | 1 | | | COM |
| 1992 12 17.26 | S | 12.7 | PA | 41 | L | 4 | 183 | | 2/ | | | HAL |
| 1992 12 18.77 | S | [13.8 | PA | 20 | R | 15 | 214 | ! 0.5 | | | | ZHU |
| 1992 12 20.89 | S | [13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 22.29 | S | 12.5: | WA | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 23.84 | S | 11.9 | GA | 31 | L | 4 | 124 | 1.2 | 1 | | | KOR01 |
| 1992 12 24.83 | S | 11.0: | GA | 13.0 | L | 6 | 36 | 3.0 | 0 | | | MEY |
| 1992 12 24.88 | S | 12.2 | AC | 20 | T | 10 | 55 | | 6 | | | LOO01 |
| 1992 12 25.81 | S | 11.1: | GA | 13.0 | L | 6 | 36 | 3.2 | 0 | | | MEY |
| 1992 12 26.76 | S | 11.0: | PA | 13.0 | L | 6 | 36 | 3.2 | 0 | | | MEY |
| 1992 12 26.83 | S | 13.1 | AC | 20.3 | T | 10 | 80 | 0.6 | 2 | | | GAR02 |
| 1992 12 27.07 | S | 12.0 | AC | 50.0 | L | 5 | 125 | 1.1 | 1 | | | BOR |
| 1992 12 27.84 | S | 11.9 | AC | 20 | T | 10 | 55 | | 3 | | | LOO01 |
| 1992 12 27.96 | S | 13.2 | AC | 20.3 | T | 10 | 80 | 0.4 | 1 | | | GAR02 |
| 1992 12 28.02 | S | 12.1 | AC | 50.0 | L | 5 | 125 | 1.4 | 2 | | | BOR |
| 1992 12 28.77 | S | 11.0: | PA | 13.0 | L | 6 | 36 | & 4.5 | 1 | | | MEY |
| 1992 12 28.91 | S | 12.3: | A | 28.0 | T | 10 | 108 | > 1 | 1 | | | COM |
| 1992 12 29.88 | S | 11.3 | GA | 31 | L | 4 | 124 | 2.7 | 2 | | | KOR01 |
| 1992 12 29.93 | S | 12.4 | A | 28.0 | T | 10 | 108 | 2 | 1 | | | COM |
| 1992 12 29.96 | S | 13.2 | AC | 20.3 | T | 10 | 80 | 0.6 | 2 | | | GAR02 |
| 1992 12 29.98 | S | 12.4 | A | 25.4 | J | 6 | 48 | 1.2 | 0/ | | | FEI |
| 1992 12 30.87 | S | 11.3 | GA | 31 | L | 4 | 124 | 2.9 | 2 | | | KOR01 |
| 1992 12 30.96 | S | 12.4 | A | 28.0 | T | 10 | 108 | 1.5 | 1 | | | COM |
| 1992 12 31.89 | S | 11.1 | GA | 31 | L | 4 | 124 | 3.1 | 2 | | | KOR01 |
| 1992 12 31.92 | S | 11.0: | AC | 15.2 | L | 5 | 76 | 2.5 | 1 | | | MOE |
| 1993 01 01.89 | S | 10.8: | AC | 15.2 | L | 5 | 76 | 3.0 | 1 | | | MOE |
| 1993 01 10.76 | M | 12.2 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 01 12.12 | S | 10.7 | A | 20.0 | T | 10 | 64 | 4 | 2 | | | SPR |
| 1993 01 12.72 | M | 12.2 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 01 12.73 | S | 10.7: | AC | 15.2 | L | 5 | 42 | & 4 | 0 | | | MOE |
| 1993 01 12.75 | S | 10.0 | A | 11.0 | L | 7 | 32 | & 5 | 0 | | | SCH04 |
| 1993 01 12.78 | M | 12.3 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 01 12.85 | S | 11.2 | A | 20.0 | T | 10 | 88 | > 3 | 1 | | | COM |
| 1993 01 13.13 | S | 10.9 | A | 20.0 | T | 10 | 64 | 4 | 1 | | | SPR |
| 1993 01 13.21 | M | 10.6 | PA | 41 | L | 4 | 83 | | | | | HAL |
| 1993 01 14.75 | S | 9.8 | A | 30.0 | L | 5 | 62 | & 5 | 0 | | | SCH04 |
| 1993 01 14.81 | S | 10.0 | PA | 13.0 | L | 6 | 36 | 3.9 | 2 | | | MEY |
| 1993 01 14.83 | M | 11.8 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 01 14.85 | S | 10.5: | AC | 15.2 | L | 5 | 42 | 4 | 1 | | | MOE |
| 1993 01 14.90 | S | 10.7 | A | 28.0 | T | 10 | 108 | & 4 | 1 | | | COM |
| 1993 01 14.96 | S | 10.4 | AC | 15.2 | L | 5 | 42 | 4.5 | 1 | | | MOE |
| 1993 01 16.13 | S | 10.5 | A | 20.0 | T | 10 | 64 | 3 | 2 | | | SPR |
| 1993 01 16.72 | M | 11.8 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 01 16.89 | S | 9.7 | A | 11.0 | L | 7 | 32 | & 5 | 1 | | | SCH04 |
| 1993 01 16.95 | S | 10.4 | AC | 15.2 | L | 5 | 42 | 4 | 1 | | | MOE |
| 1993 01 17.03 | S | 10.0 | PA | 13.0 | L | 6 | 36 | 3.2 | 1 | | | MEY |
| 1993 01 17.03 | S | 10.6: | A | 20.0 | T | 10 | 77 | > 2 | 1 | | | COM |
| 1993 01 17.13 | S | 10.6 | A | 20.0 | T | 10 | 64 | 4 | 2 | | | SPR |
| 1993 01 17.76 | S | 9.7 | PA | 13.0 | L | 6 | 36 | 6.7 | 2 | | | MEY |
| 1993 01 17.78 | M | 12.0 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 01 17.84 | S | 11.6 | PA | 20.3 | T | 10 | 51 | 1.9 | 1 | | | HAS02 |
| 1993 01 17.95 | S | 10.3 | AC | 15.2 | L | 5 | 42 | 4 | 2 | | | MOE |
| 1993 01 17.96 | S | 11.3 | CS | 12.7 | T | 10 | 51 | 1.5 | 2 | | | GAR02 |
| 1993 01 17.99 | S | 10.6 | A | 28.0 | T | 10 | 108 | > 2 | 1 | | | COM |
| 1993 01 18.13 | S | 10.8 | A | 20.0 | T | 10 | 64 | 3 | 2 | | | SPR |
| 1993 01 18.77 | S | 10.1 | AC | 15.2 | L | 5 | 42 | 4.5 | 2 | | | MOE |
| 1993 01 18.81 | S | 9.2 | A | 30.0 | L | 5 | 62 | 8 | 1 | | | SCH04 |
| 1993 01 18.89 | S | 10.2 | A | 28.0 | T | 10 | 108 | & 4 | 1 | | | COM |
| 1993 01 18.95 | S | 11.1 | CS | 12.7 | T | 6 | 24 | 1.5 | 2 | | | GAR02 |

Periodic Comet Schaumasse (1992x) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 01 19.12 | S | 10.5 | A | 20.0 | T | 10 | 64 | 4 | 2 | | | SPR |
| 1993 01 19.13 | S | 9.7 | AC | 31.7 | L | 6 | 68 | 3.1 | 2 | | | BOR |
| 1993 01 20.14 | S | 9.8 | AC | 31.7 | L | 6 | 68 | 3.2 | 1/ | | | BOR |
| 1993 01 20.21 | M | 10.5 | PA | 41 | L | 4 | 83 | | 4 | | | HAL |
| 1993 01 21.05 | S | 9.5 | AC | 31.7 | L | 6 | 68 | 3.5 | 1/ | | | BOR |
| 1993 01 21.93 | S | 10.6 | CS | 8.0 | B | | 11 | 3.5 | 2 | | | GAR02 |
| 1993 01 22.39 | M | 9.5 | VN | 33.6 | B | 5 | 175 | 3.5 | 3 | | | WOL01 |
| 1993 01 22.41 | M | 9.5 | VN | 67.5 | L | 5 | 100 | 3.5 | 3 | | | WOL01 |
| 1993 01 22.79 | S | 10.9 | GA | 31 | L | 4 | 124 | 4.2 | 3 | | | KOR01 |
| 1993 01 22.88 | S | 9.9 | A | 28.0 | T | 10 | 108 | & 5 | 1/ | | | COM |
| 1993 01 23.12 | S | 10.3 | A | 20.0 | T | 10 | 64 | 4 | 2 | | | SPR |
| 1993 01 23.42 | M | 9.5 | VN | 33.6 | B | 5 | 175 | 3.5 | 3 | | | WOL01 |
| 1993 01 23.42 | M | 9.5 | VN | 67.5 | L | 5 | 100 | 3.5 | 3 | | | WOL01 |
| 1993 01 23.72 | M | 11.3 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 01 23.98 | S | 10.7 | GA | 20 | L | 8 | 56 | 3 | 0 | | | DID |
| 1993 01 24.05 | S | 10.0: | AA | 20.0 | T | 10 | 50 | & 1.4 | 1 | | | SHA04 |
| 1993 01 24.42 | M | 9.3 | VN | 21.0 | L | 9 | 76 | 3.0 | 3 | | | WOL01 |
| 1993 01 24.93 | S | 9.7 | A | 20.0 | T | 10 | 77 | & 5 | 2 | | | COM |
| 1993 01 25.88 | S | 9.9 | AC | 15.2 | L | 5 | 42 | 5 | 2 | | | MOE |
| 1993 01 25.90 | S | 9.5 | A | 8.0 | B | | 15 | > 5 | 2 | | | COM |
| 1993 01 25.90 | S | 9.6 | A | 20.0 | T | 10 | 77 | > 5 | 2 | | | COM |
| 1993 01 25.91 | S | 9.5 | AA | 25 | L | 4 | 53 | 6 | 3 | | | LOO01 |
| 1993 01 26.00 | S | 10.7 | GA | 20 | L | 8 | 56 | & 3 | 1 | | | DID |
| 1993 01 26.04 | B | 9.9 | S | 33.3 | L | 4 | 56 | 4.8 | 3 | | | KRO02 |
| 1993 01 26.09 | S | 8.9 | AC | 8.0 | B | | 20 | 6 | 1 | | | BOR |
| 1993 01 26.09 | S | 9.3 | AC | 31.7 | L | 6 | 68 | 3.2 | 2/ | | | BOR |
| 1993 01 26.42 | M | 9.3 | VN | 21.0 | L | 9 | 76 | 3.0 | 3 | | | WOL01 |
| 1993 01 26.97 | S | 10.5 | GA | 20 | L | 8 | 56 | & 3 | 1 | | | DID |
| 1993 01 27.01 | S | 9.4 | AC | 31.7 | L | 6 | 68 | 3.2 | 2/ | | | BOR |
| 1993 01 27.04 | B | 9.8 | S | 33.3 | L | 4 | 56 | 4.9 | 2 | | | KRO02 |
| 1993 01 27.75 | S | 9.7 | AC | 15.2 | L | 5 | 42 | 5.5 | 2 | | | MOE |
| 1993 01 27.76 | S | 9.8 | AA | 31 | L | 4 | 62 | 4.7 | 2/ | | | KOR01 |
| 1993 01 27.80 | M | 11.1 | S | 10.0 | B | | 25 | & 2.0 | 4 | | | ZNO |
| 1993 01 27.93 | S | 9.3 | A | 28.0 | T | 10 | 108 | > 5 | 2 | | | COM |
| 1993 01 28.03 | B | 9.9 | S | 33.3 | L | 4 | 56 | 4.5 | 3 | | | KRO02 |
| 1993 01 28.14 | S | 9.4 | AC | 31.7 | L | 6 | 68 | 3.2 | 2 | | | BOR |
| 1993 01 28.42 | M | 9.0 | VN | 21.0 | L | 9 | 106 | 3.1 | 4 | | | WOL01 |
| 1993 01 28.42 | M | 9.3 | VN | 21.0 | L | 9 | 76 | 3.0 | 4 | | | WOL01 |
| 1993 01 28.99 | S | 9.6 | AC | 15.2 | L | 5 | 42 | 5.5 | 2 | | | MOE |
| 1993 01 29.90 | S | 9.7 | AC | 15.2 | L | 5 | 42 | 5 | 2 | | | MOE |
| 1993 01 30.01 | S | 9.2 | A | 28.0 | T | 10 | 108 | & 6 | 2 | &0.2 | | COM |
| 1993 01 30.12 | S | 10.2 | A | 20.0 | T | 10 | 64 | 5 | 2 | | | SPR |
| 1993 01 30.77 | S | 9.8: | AC | 15.2 | L | 5 | 42 | & 5 | 2 | | | MOE |
| 1993 02 08.73 | I | 10.3 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 02 08.78 | S | 9.0 | AC | 13.0 | L | 6 | 36 | 7.6 | 2 | | | MEY |
| 1993 02 08.97 | S | 10.0 | GA | 20 | L | 8 | 56 | & 3 | 3 | | | DID |
| 1993 02 09.01 | S | 8.6 | NO | 5.0 | B | | 10 | 10 | 1 | | | BOR |
| 1993 02 09.01 | S | 8.8 | AC | 31.7 | L | 6 | 68 | 4.2 | 4 | | | BOR |
| 1993 02 09.78 | M | 10.1 | S | 10.0 | B | | 25 | & 2.5 | | | | ZNO |
| 1993 02 09.80 | S | 8.7 | AC | 13.0 | L | 6 | 36 | 5.3 | 4 | | | MEY |
| 1993 02 09.97 | S | 10.0 | GA | 20 | L | 8 | 56 | & 3 | 3 | | | DID |
| 1993 02 10.05 | S | 8.9 | AC | 31.7 | L | 6 | 68 | 4.1 | 3 | | | BOR |
| 1993 02 10.15 | M | 8.5 | PA | 41 | L | 4 | 83 | | | | | HAL |
| 1993 02 10.97 | S | 10.0 | GA | 20 | L | 8 | 56 | 4 | 1 | | | DID |
| 1993 02 11.14 | S | 9.2 | A | 20.0 | T | 10 | 64 | 5 | 1 | | | SPR |
| 1993 02 11.76 | M | 9.7 | S | 10.0 | B | | 25 | & 3.5 | | | | ZNO |
| 1993 02 11.80 | S | 8.7: | AC | 13.0 | L | 6 | 36 | 4.6 | 4 | | | MEY |
| 1993 02 12.13 | S | 9.0 | A | 14.0 | S | 3 | 28 | 6 | 2 | | | SPR |
| 1993 02 12.74 | I | 10.1 | NP | 11 | L | 8 | 32 | | | | | KYS |

Periodic Comet Schaumasse (1992x) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 02 12.80 | S | 8.7 | AC | 13.0 | L | 6 | 36 | 5.4 | 3 | | | MEY |
| 1993 02 12.83 | S | 8.4 | AA | 10.0 | B | | 14 | 6 | 4 | | | LOO01 |
| 1993 02 12.84 | M | 8.3 | S | 10.0 | B | 4 | 25 | 10 | 2 | | | LEH |
| 1993 02 13.04 | S | 9.4 | AA | 20.0 | T | 10 | 50 | 2.2 | 1/ | | | SHA04 |
| 1993 02 13.13 | S | 9.1 | A | 20.0 | T | 5 | 40 | 6 | 3 | | | SPR |
| 1993 02 13.77 | S | 9.0 | S | 20.3 | T | 10 | 51 | 4.3 | 2 | | | HAS02 |
| 1993 02 13.79 | S | 8.7 | AC | 13.0 | L | 6 | 36 | 5.4 | 3 | | | MEY |
| 1993 02 13.85 | S | 7.7 | S | 8.0 | B | | 11 | 5 | 2 | | | GAR02 |
| 1993 02 14.14 | S | 9.3 | A | 20.0 | T | 5 | 40 | 5 | 2 | | | SPR |
| 1993 02 14.82 | S | 7.6 | S | 5 | R | | 8 | 5 | 2 | | | GAR02 |
| 1993 02 15.00 | S | 9.7 | GA | 20 | L | 8 | 56 | 4 | 2 | | | DID |
| 1993 02 15.03 | S | 8.6 | AC | 5.0 | B | | 10 | 8 | 1/ | | | BOR |
| 1993 02 15.03 | S | 8.8 | AC | 31.7 | L | 6 | 68 | & 5 | 3 | | | BOR |
| 1993 02 15.04 | S | 8.7: | AC | 5.0 | B | | 10 | 6 | 2 | | | MOE |
| 1993 02 16.00 | S | 9.5 | GA | 20 | L | 8 | 56 | 3 | 2 | | | DID |
| 1993 02 16.79 | M | 9.3 | S | 10.0 | B | | 25 | & 4.0 | 5 | | | ZNO |
| 1993 02 17.04 | B | 9.5 | S | 33.3 | L | 4 | 56 | 4.4 | 2 | | | KRO02 |
| 1993 02 17.05 | S | 8.9 | S | 33.3 | L | 4 | 56 | 4.5 | 2 | | | KRO02 |
| 1993 02 17.14 | S | 8.9 | A | 20.0 | T | 5 | 40 | 4.5 | 2 | | | SPR |
| 1993 02 17.76 | S | 8.6 | AC | 15.2 | L | 5 | 42 | 7 | 1 | | | MOE |
| 1993 02 17.85 | S | 8.5 | A | 8.0 | B | | 15 | & 6 | 2/ | &0.2 | | COM |
| 1993 02 17.97 | B | 8.5 | AC | 5.0 | B | | 10 | 7 | 1 | | | MOE |
| 1993 02 18.04 | S | 8.4 | AC | 5.0 | B | | 10 | 9 | | | | BOR |
| 1993 02 18.04 | S | 8.7 | AC | 31.7 | L | 6 | 68 | 4.7 | 4 | | | BOR |
| 1993 02 18.17 | S | 9.0: | NP | 20 | L | 6 | 35 | | | | | HAL |
| 1993 02 18.31 | S | 8.7: | WA | 41 | L | 4 | 83 | | | | | HAL |
| 1993 02 18.81 | S | 9 : | AA | 8.0 | B | | 20 | 6 | 2/ | | | SHA02 |
| 1993 02 19.05 | B | 9.4 | S | 33.3 | L | 4 | 56 | 4.2 | 3 | | | KRO02 |
| 1993 02 19.06 | S | 8.9 | S | 33.3 | L | 4 | 56 | 4.2 | 3 | | | KRO02 |
| 1993 02 19.08 | S | 8.8 | AA | 20.0 | T | 10 | 50 | 4.4 | 1/ | | | SHA04 |
| 1993 02 19.14 | S | 9.1 | A | 20.0 | T | 10 | 64 | 5 | 2 | | | SPR |
| 1993 02 19.71 | S | 7.9 | AA | 31 | L | 4 | 62 | 4.2 | 6 | | | KOR01 |
| 1993 02 19.76 | S | 8.7: | AC | 15.2 | L | 5 | 42 | 6 | 1 | | | MOE |
| 1993 02 19.80 | M | 9.1 | S | 10.0 | B | | 25 | & 4.0 | 4 | | | ZNO |
| 1993 02 19.86 | S | 7.4 | S | 8.0 | B | | 11 | 3.5 | 2 | | | GAR02 |
| 1993 02 19.87 | S | 8.4 | S | 20 | T | 10 | 67 | 5 | 1 | | | LUE |
| 1993 02 19.92 | S | 8.6 | AC | 15.2 | L | 5 | 44 | 6.5 | 1 | | | MOE |
| 1993 02 19.98 | S | 8.6 | AA | 8.0 | B | | 20 | 6 | 3 | | | SHA02 |
| 1993 02 19.98 | S | 9.5 | GA | 20 | L | 8 | 56 | 3 | 1 | | | DID |
| 1993 02 20.03 | S | 8.6 | AC | 31.7 | L | 6 | 68 | 5.5 | 4 | | | BOR |
| 1993 02 20.07 | S | 8.8 | AA | 20.0 | T | 10 | 50 | 3.4 | 2 | | | SHA04 |
| 1993 02 20.95 | S | 8.4 | A | 20.0 | T | 10 | 77 | & 5 | 2/ | | | COM |
| 1993 02 21.11 | S | 9.5 | GA | 20 | L | 8 | 56 | 2 | 1 | | | DID |
| 1993 02 21.20 | S | 8.9 | WA | 41 | L | 4 | 83 | | 3 | | | HAL |
| 1993 02 21.82 | S | 8.5 | AC | 15.2 | L | 5 | 44 | 7 | 2 | | | MOE |
| 1993 02 21.82 | S | 8.8 | AA | 10.0 | B | | 14 | 2.5 | 4 | | | LOO01 |
| 1993 02 21.92 | S | 8.4 | A | 20.0 | T | 10 | 77 | & 5 | 3 | | | COM |
| 1993 02 21.95 | S | 7.7 | S | 5.0 | B | | 7 | 8 | 4 | | | DAH |
| 1993 02 22.79 | S | 8.5 | AA | 11.0 | L | 7 | 32 | 10 | 3 | | | SCH |
| 1993 02 22.80 | S | 8.3 | A | 20.0 | T | 10 | 77 | 5 | 2/ | | | COM |
| 1993 02 22.80 | S | 8.9 | AA | 25 | L | 4 | 53 | 2.5 | 3 | | | LOO01 |
| 1993 02 22.81 | S | 8.8 | S | 10.0 | B | | 25 | 4.5 | 2 | | | HAS02 |
| 1993 02 22.83 | I | 9.9 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 02 22.83 | S | 8.5 | A | 8.0 | B | | 15 | 9 | 1 | | | FEI |
| 1993 02 22.87 | S | 8.4 | AC | 15.2 | L | 5 | 42 | 7 | 2 | | | MOE |
| 1993 02 23.81 | S | 8.5 | AC | 15.2 | L | 5 | 42 | 6.0 | 2 | | | MOE |
| 1993 02 23.82 | S | 7.6 | S | 6.7 | R | 4 | 14 | &10 | 1/ | | | BUS01 |
| 1993 02 23.82 | S | 8.2 | A | 8.0 | B | | 15 | & 6 | 3 | | | COM |
| 1993 02 23.82 | S | 8.3 | A | 20.0 | T | 10 | 78 | & 6 | 3 | | | COM |

Periodic Comet Schaumasse (1992x) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 02 23.94 | S | 9.5 | GA | 20 | L | 8 | 56 | 3 | 1 | | | DID |
| 1993 02 24.14 | S | 9.3 | A | 20.0 | T | 10 | 64 | 4 | 2 | | | SPR |
| 1993 02 25.02 | S | 9.5 | GA | 20 | L | 8 | 56 | 3 | 2 | 0.16 | 45 | DID |
| 1993 02 25.03 | S | 8.2 | NO | 5.0 | B | | 10 | 11 | 1 | | | BOR |
| 1993 02 25.03 | S | 8.6 | AC | 31.7 | L | 6 | 68 | 4.5 | 3/ | | | BOR |
| 1993 02 25.15 | S | 9.0 | A | 20.0 | T | 10 | 64 | 5 | 3 | | | SPR |
| 1993 02 25.77 | S | 8.5 | AC | 15.2 | L | 5 | 42 | 6 | 2 | | | MOE |
| 1993 02 26.02 | S | 9.5 | GA | 20 | L | 8 | 56 | 4 | 2 | | | DID |
| 1993 02 26.05 | S | 8.6 | AC | 31.7 | L | 6 | 68 | 3.4 | 4 | ? | | BOR |
| 1993 02 26.25 | S | 8.9 | WA | 41 | L | 4 | 83 | | | | | HAL |
| 1993 02 26.75 | I | 10.5 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 02 26.78 | I | 10.8 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 02 26.80 | M | 9.3 | S | 10.0 | B | | 25 | & 4.5 | 2 | | | ZNO |
| 1993 02 26.95 | S | 8.5 | S | 13.0 | L | 6 | 36 | 5.0 | 1 | | | MEY |
| 1993 02 27.03 | S | 8.7 | AC | 31.7 | L | 6 | 68 | 4 | 3 | | | BOR |
| 1993 02 27.03 | S | 8.7 | NO | 31.7 | L | 6 | 68 | | | | | BOR |
| 1993 02 27.04 | S | 8.2 | A | 20.0 | T | 10 | 78 | & 6 | 2 | | | COM |
| 1993 02 27.09 | S | 9.4 | GA | 20 | L | 8 | 56 | 4 | 2 | | | DID |
| 1993 02 27.13 | B | 9.0 | S | 33.3 | L | 4 | 56 | 3.8 | 2 | | | KRO02 |
| 1993 02 27.82 | S | 8.8 | AA | 25 | L | 4 | 53 | 5.0 | 2 | | | LOO01 |
| 1993 02 28.81 | S | 9.3 | AA | 25 | L | 4 | 53 | 2.5 | 2 | | | LOO01 |
| 1993 03 01.05 | B | 9.3 | S | 33.3 | L | 4 | 56 | 3.6 | 2 | | | KRO02 |
| 1993 03 01.78 | S | 8.9: | AC | 15.2 | L | 5 | 42 | & 5 | 2 | | | MOE |
| 1993 03 03.66 | S | 7.9 | AA | 31 | L | 4 | 62 | 4.4 | 6 | | | KOR01 |
| 1993 03 05.69 | S | 8.0 | AA | 13 | L | 4 | 52 | 4.1 | 7 | | | KOR01 |
| 1993 03 05.80 | M | 8.7: | S | 10.0 | B | | 25 | & 4 | 4 | | | ZNO |
| 1993 03 07.71 | S | 8.0 | AA | 13 | L | 4 | 52 | 3.9 | 5 | | | KOR01 |
| 1993 03 07.79 | S | 9.3: | AC | 15.2 | L | 5 | 42 | & 5 | 1 | | | MOE |
| 1993 03 08.71 | S | 8.0 | AA | 13 | L | 4 | 52 | 3.8 | 6 | | | KOR01 |
| 1993 03 08.78 | M | 9.3 | S | 10.0 | B | | 25 | 4.5 | 7 | | | ZNO |
| 1993 03 08.98 | S[ | 8.9 | AA | 20 | R | 14 | 112 | | | | | SHA02 |
| 1993 03 09.77 | I | 10.6 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 03 09.78 | S | 8.9 | AC | 15.2 | L | 5 | 42 | 6.5 | 1 | | | MOE |
| 1993 03 09.80 | S | 8.4 | A | 28.0 | T | 10 | 108 | & 5 | 2 | | | COM |
| 1993 03 09.83 | S | 9.2 | CS | 20 | R | 14 | 40 | 2.2 | 2 | | | SHA02 |
| 1993 03 10.04 | S | 8.8 | AC | 31.7 | L | 6 | 68 | 3.5 | 4 | | | BOR |
| 1993 03 11.05 | S | 9.0: | AA | 20 | T | 10 | 50 | & 2.3 | 1 | | | SHA04 |
| 1993 03 11.73 | S | 8.3 | AA | 13 | L | 4 | 52 | 2.3 | 3/ | | | KOR01 |
| 1993 03 12.04 | S | 8.8 | AC | 31.7 | L | 6 | 68 | 3.5 | 3 | | | BOR |
| 1993 03 12.80 | I | 10.2 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 03 12.83 | S | 8.6 | A | 28.0 | T | 10 | 108 | | 1 | | | COM |
| 1993 03 12.88 | S | 8.7 | AA | 30.0 | L | 5 | 62 | & 8 | 1/ | | | SCH04 |
| 1993 03 12.89 | S | 8.9 | AA | 25.5 | L | 4 | 53 | 4.5 | 1 | | | LOO01 |
| 1993 03 13.26 | S | 9.0 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1993 03 13.73 | S | 8.7 | AA | 13 | L | 4 | 52 | 2.7 | 4 | | | KOR01 |
| 1993 03 13.77 | I | 10.1 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 03 13.84 | S | 8.5 | A | 28.0 | T | 10 | 108 | & 4 | 1 | | | COM |
| 1993 03 14.78 | I | 10.2 | NP | 11 | L | 8 | 32 | | | | | KYS |
| 1993 03 15.07 | B | 9.3 | S | 33.3 | L | 4 | 56 | 4.5 | 2 | | | KRO02 |
| 1993 03 15.79 | S | 9.3 | AC | 15.2 | L | 5 | 42 | 5 | 1 | | | MOE |
| 1993 03 15.83 | S | 8.4 | AA | 25.5 | L | 4 | 53 | 6.5 | 1 | | | LOO01 |
| 1993 03 15.88 | S | 8.5 | A | 28.0 | T | 10 | 108 | & 5 | 1/ | | | COM |
| 1993 03 15.99 | S | 9.4 | AA | 20 | R | 14 | 40 | 1.7 | 1 | | | SHA02 |
| 1993 03 16.02 | S | 9.5 | GA | 20 | L | 8 | 62 | 2 | 0/ | | | DID |
| 1993 03 16.05 | S | 8.7 | AC | 8.0 | B | | 20 | 6.5 | 3 | | | BOR |
| 1993 03 16.05 | S | 8.7 | AC | 31.7 | L | 6 | 68 | 5 | 3 | | | BOR |
| 1993 03 16.81 | ! V | 9.3 | AA | 20.0 | T | 2 | | & 8 | 5/ | | | MIK |
| 1993 03 17.00 | S | 10.2 | AC | 20.3 | T | 10 | 80 | 1.8 | 4 | | | GRA04 |
| 1993 03 17.26 | S | 9.1 | AA | 5.0 | B | | 10 | | | | | HAL |

Periodic Comet Schaumasse (1992x) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 03 17.84 | S | 9.4 | V | 20 | R | 14 | 40 | 2.0 | 1 | | | SHA02 |
| 1993 03 17.87 | S | 8.9 | AA | 25.5 | L | 4 | 53 | 2 | 1 | | | LOO01 |
| 1993 03 17.89 | S | 8.5 | A | 28.0 | T | 10 | 108 | & 4 | 1/ | | | COM |
| 1993 03 17.95 | S | 9.4 | AC | 20.3 | T | 10 | 80 | 3.2 | 3 | | | GRA04 |
| 1993 03 18.78 | S | 8.9 | AA | 13 | L | 4 | 52 | 2.2 | 4 | | | KOR01 |
| 1993 03 18.79 | S | 8.8 | S | 10.0 | B | | 25 | 3.5 | 3 | | | HAS02 |
| 1993 03 18.88 | S | 8.8 | S | 12.7 | T | 10 | 40 | 3 | 2 | | | GAR02 |
| 1993 03 18.89 | S | 8.9 | AC | 15.2 | L | 5 | 42 | 6 | 2 | | | MOE |
| 1993 03 19.06 | S | 8.9 | AC | 31.7 | L | 6 | 68 | 4.3 | 3 | | | BOR |
| 1993 03 19.09 | S | 9.6 | GA | 20 | L | 6 | 62 | 2 | 1 | | | DID |
| 1993 03 19.81 | M | 8.8 | S | 10.0 | B | | 25 | 5.0 | 5 | | | ZNO |
| 1993 03 19.86 | S | 8.9 | S | 10.0 | B | | 25 | 3.1 | 3 | | | HAS02 |
| 1993 03 19.88 | S | 8.4 | A | 6.7 | R | 10 | 20 | & 5 | | | | COM |
| 1993 03 19.91 | S | 9.3 | V | 20 | R | 14 | 40 | 2.0 | 1 | | | SHA02 |
| 1993 03 19.96 | S | 8.6 | A | 20.0 | T | 10 | 78 | & 5 | 1/ | | | COM |
| 1993 03 19.97 | S | 8.9 | AA | 30.0 | L | 5 | 62 | & 6 | 1/ | | | SCH04 |
| 1993 03 20.09 | S | 9.5: | AC | 20.3 | T | 10 | 80 | 3.1 | 2/ | | | GRA04 |
| 1993 03 20.09 | S | 9.6 | GA | 20 | L | 6 | 62 | 3 | 0/ | | | DID |
| 1993 03 21.03 | S | 8.7 | A | 20.0 | T | 10 | 78 | & 4 | 1/ | | | COM |
| 1993 03 21.86 | S | 9.0 | AA | 31 | L | 4 | 62 | 2.3 | 5 | | | KOR01 |
| 1993 03 21.93 | S | 9.2 | S | 20.3 | T | 10 | 80 | 2.9 | 2/ | | | GRA04 |
| 1993 03 21.98 | S | 9.1 | AC | 20.3 | T | 10 | 80 | | | | | GRA04 |
| 1993 03 22.99 | S | 9.4 | AA | 20 | R | 14 | 40 | 5.1 | 1 | | | SHA02 |
| 1993 03 23.10 | S | 10.0 | GA | 20 | L | 6 | 62 | 2 | 0/ | | | DID |
| 1993 03 23.85 | S | 8.4 | A | 8.0 | B | | 15 | & 6 | | | | COM |
| 1993 03 23.90 | S | 9.2 | AC | 15.2 | L | 5 | 42 | 5.5 | 2 | | | MOE |
| 1993 03 23.95 | S | 8.5 | A | 20.0 | T | 10 | 78 | & 5 | 1/ | | | COM |
| 1993 03 23.98 | S | 9.5 | AA | 20 | R | 14 | 40 | 4.3 | 1 | | | SHA02 |
| 1993 03 24.26 | S | 9.2 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1993 03 24.82 | S | 9.2 | AC | 15.2 | L | 5 | 42 | 6 | 1 | | | MOE |
| 1993 03 24.85 | S | 8.3 | AA | 25.5 | L | 4 | 53 | | | | | LOO01 |
| 1993 03 24.85 | S | 8.5 | A | 20.0 | T | 10 | 78 | & 6 | 1 | | | COM |
| 1993 03 25.80 | S | 9.1 | AC | 15.2 | L | 5 | 42 | 6 | 2 | | | MOE |
| 1993 03 25.87 | S | 9.0 | S | 20.3 | T | 10 | 80 | 4.3 | 2 | | | GRA04 |
| 1993 03 25.93 | S | 8.5 | A | 20.0 | T | 10 | 78 | & 6 | 1 | | | COM |
| 1993 03 26.16 | a S | 8.9 | AC | 31.7 | L | 6 | 68 | 3.5 | 3 | | | BOR |
| 1993 03 26.82 | I | 9.7 | S | 11 | L | 8 | 32 | 5 | 3 | | | KYS |
| 1993 03 26.83 | S | 9.2 | AC | 15.2 | L | 5 | 42 | 6 | 1 | | | MOE |
| 1993 03 26.93 | S | 8.7 | AA | 25.5 | L | 4 | 53 | 6.5 | 2 | | | LOO01 |
| 1993 03 26.95 | S | 9.8 | AA | 30 | R | 18 | 95 | 3.2 | 1 | | | SHA02 |
| 1993 03 27.02 | S | 9.9 | GA | 20 | L | 6 | 62 | 2 | 0/ | | | DID |
| 1993 03 27.05 | S | 8.7 | NO | 8.0 | B | | 20 | 7.5 | 2 | | | BOR |
| 1993 03 27.05 | a S | 8.9 | AC | 31.7 | L | 6 | 68 | 5 | 3 | | | BOR |
| 1993 03 27.81 | S | 9.3 | AC | 15.2 | L | 5 | 42 | 6 | 1 | | | MOE |
| 1993 03 27.82 | I | 10.2 | S | 11 | L | 8 | 32 | 4 | | | | KYS |
| 1993 03 27.89 | S | 8.5 | AA | 25.5 | L | 4 | 53 | 7.5 | 2 | | | LOO01 |
| 1993 03 27.96 | S | 8.6 | A | 20.0 | T | 10 | 78 | & 6 | 1/ | | | COM |
| 1993 03 28.09 | B | 9.4 | S | 33.3 | L | 4 | 56 | & 5 | 2 | | | KRO02 |
| 1993 03 28.80 | S | 9.4 | AC | 15.2 | L | 5 | 42 | 5 | 1 | | | MOE |
| 1993 03 28.99 | S | 8.6 | A | 20.0 | T | 10 | 78 | & 5 | 1/ | | | COM |
| 1993 03 30.04 | S | 8.6 | A | 20.0 | T | 10 | 78 | & 5 | 1 | | | COM |
| 1993 03 30.09 | B | 9.6 | S | 33.3 | L | 4 | 56 | 3.5 | 2 | | | KRO02 |
| 1993 03 30.81 | S | 9.5: | AC | 15.2 | L | 5 | 42 | & 5 | 1 | | | MOE |
| 1993 04 02.82 | M | 9.4 | S | 10.0 | B | | 25 | & 3 | 3 | | | ZNO |
| 1993 04 09.84 | S | 9.8 | AC | 15.2 | L | 5 | 42 | 6 | 1 | | | MOE |
| 1993 04 10.14 | S | 9.5 | S | 33.3 | L | 4 | 56 | 4.3 | 3 | | | KRO02 |
| 1993 04 10.16 | S | 9.8 | AA | 41 | L | 4 | 83 | | 2/ | | | HAL |
| 1993 04 10.83 | S | 9.9 | AC | 15.2 | L | 5 | 42 | 6 | 1 | | | MOE |
| 1993 04 10.94 | S | 10.0 | AC | 20.3 | L | 6 | 49 | 5.9 | 3 | | | GRA04 |

Periodic Comet Schaumasse (1992x) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 04 11.88 | S | 9.9 | AC | 15.2 | L | 5 | 42 | 6 | 1 | | | MOE |
| 1993 04 11.92 | S | 9.7 | AC | 15.2 | L | 8 | 49 | 5.9 | 2/ | | | GRA04 |
| 1993 04 12.10 | S | 9.5 | S | 33.3 | L | 4 | 56 | 3.5 | 3 | | | KRO02 |
| 1993 04 12.83 | S | 10.0 | AC | 15.2 | L | 5 | 42 | 5 | 1 | | | MOE |
| 1993 04 12.96 | S | 9.7 | VB | 20 | R | 14 | 40 | 2.7 | 1 | | | SHA02 |
| 1993 04 13.93 | S | 9.2 | A | 20.0 | T | 10 | 78 | & 5 | 1/ | | | COM |
| 1993 04 14.86 | M | 9.9 | S | 10.0 | B | | 25 | 2.5 | 4 | | | ZNO |
| 1993 04 15.84 | S | 10.3: | AC | 15.2 | L | 5 | 42 | & 5 | 1 | | | MOE |
| 1993 04 16.85 | M | 10.2 | S | 10.0 | B | | 25 | 3.0 | 2 | | | ZNO |
| 1993 04 16.99 | S | 9.2 | A | 20.0 | T | 10 | 78 | & 5 | 1/ | | | COM |
| 1993 04 17.19 | S | 10.3: | S | 33.3 | L | 4 | 122 | 3.8 | 2 | | | KRO02 |
| 1993 04 17.91 | S | 10.4 | CS | 12.7 | T | 10 | 40 | 3 | 1 | | | GAR02 |
| 1993 04 17.99 | S | 9.3 | A | 20.0 | T | 10 | 78 | & 6 | 1/ | | | COM |
| 1993 04 18.19 | S | 10.0 | AA | 41 | L | 4 | 83 | | | | | HAL |
| 1993 04 18.85 | S | 10.3 | AC | 15.2 | L | 5 | 42 | 5 | 1 | | | MOE |
| 1993 04 18.99 | S | 9.2 | A | 20.0 | T | 10 | 78 | & 5 | 1/ | | | COM |
| 1993 04 19.13 | S | 9.8 | S | 33.3 | L | 4 | 56 | 4.4 | 2 | | | KRO02 |
| 1993 04 19.85 | S | 10.5 | AC | 15.2 | L | 5 | 42 | 4 | 0 | | | MOE |
| 1993 04 19.99 | S | 9.3 | A | 20.0 | T | 10 | 78 | & 4 | 1/ | | | COM |
| 1993 04 20.85 | S | 10.5 | AC | 15.2 | L | 5 | 42 | 5 | 0 | | | MOE |
| 1993 04 20.86 | M | 10.8 | S | 10.0 | B | | 25 | 2.0 | 3 | | | ZNO |
| 1993 04 21.00 | S | 9.3 | A | 20.0 | T | 10 | 78 | & 6 | 1/ | | | COM |
| 1993 04 22.85 | S | 10.7: | AC | 15.2 | L | 5 | 42 | & 3 | 0 | | | MOE |
| 1993 04 23.16 | S | 10 : | S | 33.3 | L | 4 | 56 | 4.4 | 3 | | | KRO02 |
| 1993 04 23.85 | S | 10.6 | AC | 15.2 | L | 5 | 42 | 4 | 0 | | | MOE |
| 1993 04 23.89 | S | 9.4 | A | 20.0 | T | 10 | 78 | & 5 | 1/ | | | COM |
| 1993 04 23.91 | M | 11.2 | S | 10.0 | B | | 25 | 2.0 | 2 | | | ZNO |
| 1993 04 27.03 | S | 9.8 | A | 20.0 | T | 10 | 78 | > 3 | 1 | | | COM |

Periodic Comet Brewington (1992p)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 01.17 | S | 11.9 | GA | 30 | L | 5 | 90 | 1.7 | 1 | | | KOR01 |
| 1992 09 01.77 | S | 10.4 | AC | 20 | L | 6 | 58 | 2.8 | 2 | | | NAK01 |
| 1992 09 03.13 | S | 10.9 | CS | 20.3 | T | 10 | 62 | 2.5 | 1 | 0.1 | 320 | GAR02 |
| 1992 09 05.77 | S | 10.5 | AC | 20 | L | 6 | 58 | 3.5 | 1 | | | NAK01 |
| 1992 09 16.12 | S | 12.6 | GA | 30 | L | 5 | 154 | 1.6 | 1 | | | KOR01 |
| 1992 09 21.03 | S[ | 11.0: | PA | 19.9 | L | 4 | 52 | ! 1 | | | | ZHU |
| 1992 09 26.11 | S[ | 13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 09 27.78 | S | 12.0 | AC | 20 | L | 6 | 58 | 3.0 | 1/ | | | NAK01 |
| 1992 09 29.76 | S | 12.3 | AC | 20 | L | 6 | 58 | 2.8 | 1 | | | NAK01 |
| 1992 10 01.46 | S | 12.8 | CA | 41 | L | 4 | 183 | | 2 | | | HAL |
| 1992 10 01.77 | S | 12.3 | AC | 20 | L | 6 | 74 | 2.2 | 1 | | | NAK01 |
| 1992 10 03.04 | S[ | 13.0 | PA | 19.9 | L | 4 | 129 | ! 0.5 | | | | ZHU |
| 1992 10 06.81 | S | 13.4 | AC | 60.0 | Y | 8 | 200 | 1.2 | 1 | | | NAK01 |

Periodic Comet Halley (1986 III)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 09 22.14 | B | 12.9 | AC | 20.3 | T | 10 | 80 | 1.0 | 2 | | | GRA04 |
| 1985 10 12.14 | B | 11.5 | AC | 20.3 | T | 10 | 80 | 1.2 | 3 | | | GRA04 |
| 1985 10 20.10 | B | 10.7 | AC | 12.0 | R | | 20 | | | | | GRA04 |
| 1985 10 20.10 | B | 10.8 | AC | 20.3 | T | 10 | 80 | 2.5 | 4 | | | GRA04 |
| 1985 11 03.01 | M | 8.6 | WH | 20.3 | T | 10 | 80 | 2.5 | 6 | | | GRA04 |
| 1985 11 03.95 | M | 8.5 | WH | 20.3 | T | 10 | 80 | 2.5 | 6 | | | GRA04 |
| 1985 11 08.02 | M | 8.0 | WH | 20.3 | T | 10 | 80 | 3 | 7 | | | GRA04 |
| 1985 11 08.02 | O | 8.0 | WH | 3.0 | R | | 6 | | | | | GRA04 |
| 1985 11 11.01 | M | 7.2 | WH | 6.0 | R | 4 | 10 | 6 | 5 | | | GRA04 |
| 1985 11 13.04 | M | 7.2 | WH | 6.0 | R | 4 | 10 | 4 | | | | GRA04 |

Periodic Comet Halley (1986 III) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 11 13.04 | N | 13.8: | AC | 20.3 | T | 10 | 222 | | | | | GRA04 |
| 1985 11 14.21 | M | 7.1 | WH | 3.0 | R | | 6 | | | | | GRA04 |
| 1985 11 21.07 | M | 6.4 | WH | 3.0 | R | | 6 | | | | | GRA04 |
| 1985 11 23.13 | M | 5.5 | WH | 6.0 | R | 4 | 10 | 15 | 6 | | | GRA04 |
| 1985 12 07.88 | M | 5.5 | WH | 6.0 | R | 4 | 10 | 20 | 6 | | | GRA04 |
| 1985 12 13.80 | M | 5.0 | WH | 6.0 | R | 4 | 15 | &20 | 6 | | | GRA04 |
| 1985 12 13.80 | N | 13.8: | AC | 20.3 | T | 10 | 287 | | | | | GRA04 |
| 1985 12 29.72 | M | 5.0 | WH | 6.0 | R | 4 | 10 | &15 | 6 | | | GRA04 |
| 1985 12 31.76 | M | 4.8 | WH | 6.0 | R | 4 | 10 | 15 | 6 | | 80 | GRA04 |
| 1986 01 01.71 | M | 4.9 | WH | 6.0 | R | 4 | 10 | 15 | 6 | 0.8 | 68 | GRA04 |
| 1986 01 03.70 | M | 4.9 | WH | 6.0 | R | 4 | 10 | 15 | 6 | 0.8 | 62 | GRA04 |
| 1986 01 09.74 | M | 4.8 | WH | 6.0 | R | 4 | 10 | 12 | 6 | 1.6 | 63 | GRA04 |
| 1986 01 11.72 | M | 4.7 | WH | 6.0 | R | 4 | 10 | 9 | 6 | 0.8 | 52 | GRA04 |
| 1986 01 14.69 | M | 4.5 | WH | 5.0 | B | | 7 | 9 | 5 | 0.8 | 63 | GRA04 |
| 1986 01 20.71 | B | 3.6 | WH | 5.0 | B | | 7 | 5 | 6 | 0.8 | 63 | GRA04 |
| 1986 01 26.70 | B | 3.5: | WH | 5.0 | B | | 7 | 4 | 7 | | | GRA04 |
| 1986 04 07.24 | M | 2.7: | WH | 3.5 | B | | 7 | &30 | 5 | 2 | 270 | GRA04 |
| 1986 04 08.17 | M | 2.3 | WH | 0.7 | E | | 1 | 28 | 5 | 3.1 | 320 | GRA04 |
| 1986 04 08.18 | M | 2.4: | WH | 3.5 | B | | 7 | 24 | 7 | 3.5 | 310 | GRA04 |
| 1986 04 11.06 | M | 2.7 | WH | 0.7 | E | | 1 | 36 | 6 | 3.7 | 347 | GRA04 |
| 1986 04 12.08 | N | 12.5: | AC | 20.3 | T | 10 | 222 | | | | | GRA04 |
| 1986 04 12.09 | M | 2.7 | WH | 0.7 | E | | 1 | 37 | 6 | | | GRA04 |
| 1986 04 14.01 | M | 2.8 | WH | 0.7 | E | | 1 | 33 | 5 | | | GRA04 |
| 1986 04 14.99 | M | 2.7 | WH | 0.7 | E | | 1 | 32 | 6 | | | GRA04 |
| 1986 04 16.02 | M | 3.1: | WH | 3.5 | B | | 7 | &25 | 6/ | | | GRA04 |
| 1986 04 16.99 | M | 2.8 | WH | 0.7 | E | | 1 | 30 | 6 | | | GRA04 |
| 1986 04 19.15 | M | 3.2: | WH | 0.7 | E | | 1 | | 5 | | | GRA04 |
| 1986 05 01.94 | O | 4.7: | WH | 3.5 | B | | 7 | 13 | 5 | | | GRA04 |
| 1986 05 02.93 | O | 4.9 | WH | 3.5 | B | | 7 | 11 | 4/ | | | GRA04 |

Periodic Comet Swift-Tuttle (1992t)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 29.78 | S | 9.1 | AC | 20 | L | 6 | 46 | 7 | 0/ | | | NAK01 |
| 1992 09 29.89 | S | 9.5 | VB | 20 | R | 14 | 40 | 3.6 | 1 | | | SHA02 |
| 1992 10 01.49 | ! M | 9.7 | CA | 41 | L | 4 | 52 | | 3 | | | HAL |
| 1992 10 01.80 | S | 8.9 | AC | 20 | L | 6 | 46 | 5.5 | 1 | | | NAK01 |
| 1992 10 05.11 | S | 8.9 | AA | 13 | L | 4 | 52 | 5 | 3 | | | KOR01 |
| 1992 10 05.78 | S | 8.5 | AC | 20 | L | 6 | 46 | 5.5 | 1 | | | NAK01 |
| 1992 10 06.45 | S | 9.1 | S | 20 | T | 10 | 63 | 2.6 | 3 | | | PRY |
| 1992 10 07.13 | S | 8.5 | AA | 13 | L | 4 | 52 | 6.3 | 3/ | | | KOR01 |
| 1992 10 07.14 | S | 9.1 | AA | 20.3 | T | 10 | 80 | 4.0 | 2 | | | TAN02 |
| 1992 10 07.49 | S | 9.2 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1992 10 07.85 | S | 8.6 | S | 20.0 | C | 10 | 81 | 5.0 | | | | SIW |
| 1992 10 08.09 | B | 8.4 | S | 10.0 | R | 4 | 18 | 5.5 | 3 | | | GAS01 |
| 1992 10 08.09 | S | 8.3 | AA | 13 | L | 4 | 52 | 7.2 | 3/ | | | KOR01 |
| 1992 10 09.82 | S | 8.3 | AC | 20 | L | 6 | 46 | 5 | 2 | | | NAK01 |
| 1992 10 10.80 | S | 8.4 | S | 20.0 | C | 10 | 81 | 5.0 | | | | SIW |
| 1992 10 12.77 | S | 8.0 | A | 11.0 | L | 5 | 24 | 3.5 | 4 | | | FEI |
| 1992 10 12.80 | B | 9.1 | AA | 16 | L | 10 | | 1 | 1 | | | KOS |
| 1992 10 12.84 | S | 9.5: | A | 26.6 | R | 15 | 166 | 3 | 0 | | | BAK |
| 1992 10 13.91 | S | 8.2 | VB | 20 | R | 14 | 40 | 3.6 | 1 | | | SHA02 |
| 1992 10 13.14 | B | 9.1 | AA | 16 | L | 10 | | 1 | 1 | | | KOS |
| 1992 10 13.42 | B | 8.2 | S | 10.5 | R | 7 | 29 | & 7 | 4 | | | OBU |
| 1992 10 13.77 | S | 7.9 | A | 11.0 | L | 5 | 24 | 5 | 4 | | | FEI |
| 1992 10 13.78 | S | 8.0 | VB | 20 | R | 14 | 40 | 3.6 | 2 | | | SHA02 |
| 1992 10 13.80 | S | 7.6 | VB | 8.0 | B | | 20 | 5.4 | 2 | | | SHA02 |
| 1992 10 13.99 | S | 8.0 | AA | 6.6 | B | 6 | 20 | 5.5 | 3 | | | PLE01 |
| 1992 10 14.00 | S | 8.0: | AA | 20.0 | T | 10 | 50 | 0.8 | 1/ | | | SHA04 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 10 14.41 | B | 8.4 | S | 10.5 | R | 7 | 29 | > 5 | 4 | | | OBU |
| 1992 10 14.68 | S | 8.4 | AA | 19.9 | L | 4 | 46 | 9 | 3 | | | ZHU |
| 1992 10 15.00 | S | 8.0: | AA | 20.0 | T | 10 | 50 | 1.1 | 1 | | | SHA04 |
| 1992 10 15.78 | S | 8.8 | SC | 20 | L | 5 | 41 | 1.6 | 3 | | | TAY |
| 1992 10 16.40 | B | 8.2 | S | 10.5 | R | 7 | 29 | > 8 | 5 | | | OBU |
| 1992 10 16.77 | S | 7.3 | SC | 8.0 | B | | 15 | 8 | 4 | | | FEI |
| 1992 10 16.87 | S | 7.7 | AA | 20 | R | 14 | 40 | 3.6 | 2 | | | SHA02 |
| 1992 10 16.89 | S | 7.7 | AA | 8.0 | B | | 20 | 4.1 | 1 | | | SHA02 |
| 1992 10 17.10 | S | 7.8 | NP | 5.0 | B | | 10 | | | | | HAL |
| 1992 10 17.40 | B | 7.9 | S | 10.5 | R | 7 | 29 | >10 | 5 | | | OBU |
| 1992 10 17.43 | S | 7.7 | AC | 6.0 | R | 8 | 20 | 4 | 4 | | | NAK01 |
| 1992 10 17.77 | S | 7.4 | AA | 8.0 | B | | 10 | 5.4 | 1 | | | SHA02 |
| 1992 10 17.85 | B | 8.0 | AA | 15.0 | L | 4 | | 9 | | | | ROD01 |
| 1992 10 17.86 | S | 7.7 | AA | 25.5 | L | 4 | 77 | 6 | 1 | | | DIA |
| 1992 10 18.41 | B | 8.0 | S | 10.5 | R | 7 | 29 | >10 | 5 | | | OBU |
| 1992 10 18.73 | S | 7.7 | AA | 20.3 | T | 10 | 50 | 4.1 | 3/ | | | TAN02 |
| 1992 10 18.76 | S | 7.7 | AA | 10.0 | B | | 25 | 3.5 | 3 | | | MEY |
| 1992 10 18.77 | S | 7.7: | AA | 25.5 | L | 4 | 77 | 6 | 1 | | | DIA |
| 1992 10 18.79 | S | 6.5 | S | 8.0 | B | | 15 | | | | | JOH03 |
| 1992 10 19.44 | S | 7.5 | SC | 6.5 | R | 8 | 16 | | 3/ | | | NAK01 |
| 1992 10 19.67 | B | 7.3 | S | 11.0 | B | 4 | 20 | | 4 | | | CHE03 |
| 1992 10 19.72 | B | 8.7 | AA | 16 | L | 10 | | 2 | 2 | | | KOS |
| 1992 10 19.74 | B | 7.4 | S | 11.0 | B | 4 | 20 | & 6 | 4 | | | SIE |
| 1992 10 19.75 | S | 7.4 | AA | 10.0 | B | | 25 | 5.2 | 4 | | | MEY |
| 1992 10 19.76 | B | 7.6: | AA | 8.0 | B | | 20 | 7.5 | 3 | | | SPE01 |
| 1992 10 19.92 | B | 7.7 | AA | 10 | B | 5 | 25 | 8.0 | 3/ | | | PLE01 |
| 1992 10 19.96 | S | 7.4 | AA | 13 | L | 4 | 26 | 5.5 | 4 | 0.25 | 30 | KOR01 |
| 1992 10 20.01 | B | 7.3 | S | 11.0 | B | 4 | 20 | | 4 | | | CHE03 |
| 1992 10 20.61 | B | 7.3 | S | 11.0 | B | 4 | 20 | & 5.2 | 4 | | | SIE |
| 1992 10 20.69 | B | 7.3 | S | 11.0 | B | 4 | 20 | 7.1 | 5 | | | CHE03 |
| 1992 10 20.69 | B | 7.7 | S | 5.0 | R | 7 | 20 | | 4 | | | NES |
| 1992 10 20.76 | B | 7.8 | AA | 6.7 | B | | 20 | & 9 | 3 | | | SCI |
| 1992 10 20.77 | S | 7.5 | AA | 25.5 | L | 4 | 77 | 8 | 2 | | | DIA |
| 1992 10 20.91 | B | 7.7 | AA | 10 | B | 5 | 25 | 7 | 3/ | | | PLE01 |
| 1992 10 21.39 | B | 7.7 | S | 10.5 | R | 7 | 29 | & 8 | 5 | | | OBU |
| 1992 10 21.68 | B | 7.0 | S | 11.0 | B | 4 | 20 | & 8 | 5 | | | CHE03 |
| 1992 10 21.73 | S | 7.1 | AA | 5.0 | B | | 20 | 5.9 | 3/ | | 0 | TAN02 |
| 1992 10 21.77 | S | 7.3 | AA | 25.5 | L | 4 | 77 | 8 | 3 | | | DIA |
| 1992 10 21.78 | S | 6.5 | S | 8.0 | B | | 15 | | | | | JOH03 |
| 1992 10 21.80 | B | 7.0 | SC | 8.0 | B | | 15 | 8 | 3 | | | FEI |
| 1992 10 21.80 | S | 6.8 | SC | 8.0 | B | | 15 | 8 | 3 | | | FEI |
| 1992 10 21.84 | S | 6.9 | AA | 8.0 | B | | 10 | 7 | 3 | | | SHA02 |
| 1992 10 21.99 | B | 7.2: | S | 11.0 | B | 4 | 20 | | 4 | | | SIE |
| 1992 10 22.15 | S | 6.8 | SC | 20 | T | 10 | 63 | 2.9 | 3 | 0.25 | 30 | PRY |
| 1992 10 22.38 | B | 7.6 | S | 10.5 | R | 7 | 29 | &10 | 5 | | | OBU |
| 1992 10 22.40 | M | 7.0 | SC | 6.5 | R | 8 | 16 | 10 | 5 | | | NAK01 |
| 1992 10 22.63 | | | | 48.0 | L | 5 | 65 | 9.5 | 5 | 0.1 | | CHE03 |
| 1992 10 22.63 | B | 7.1 | S | 11.0 | B | 4 | 20 | & 7 | 4 | | | SIE |
| 1992 10 22.64 | B | 7.1 | S | 11.0 | B | 4 | 20 | 9.5 | 5 | | | CHE03 |
| 1992 10 22.73 | S | 7.1 | AA | 7.0 | B | | 20 | 7.6 | 4 | 0.9 | 358 | TAN02 |
| 1992 10 22.78 | B | 8.2 | AA | 16 | L | 10 | | 2 | 2 | | | KOS |
| 1992 10 22.80 | B | 7.6 | AA | 6.7 | B | | 20 | & 8 | 2/ | | | SCI |
| 1992 10 22.89 | B | 7.4 | AA | 6.6 | B | 6 | 20 | 8.0 | 3 | | | PLE01 |
| 1992 10 23.00 | B | 7.3 | AC | 5.0 | B | 4 | 7 | | 1 | | | SIM |
| 1992 10 23.59 | B | 6.8 | S | 8.0 | B | 4 | 10 | & 8 | 5 | | | CHE03 |
| 1992 10 23.59 | B | 6.8 | S | 11.0 | B | 4 | 20 | 7.5 | 5 | | | SIE |
| 1992 10 23.73 | M | 7.1 | AA | 7.0 | B | | 20 | 4.7 | 4/ | | | TAN02 |
| 1992 10 23.74 | B | 8.0 | AA | 16 | L | 10 | | 3 | 3 | | | KOS |
| 1992 10 23.76 | B | 6.9 | S | 6.0 | B | | 20 | &10 | 3 | | | RAF |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 10 23.80 | B | 7.2: | AA | 6.0 | B | | 20 | & 9 | 3/ | | | SCI |
| 1992 10 23.86 | S | 6.4 | AA | 8.0 | B | | 10 | 7 | 3 | | | SHA02 |
| 1992 10 23.98 | B | 7.4 | AA | 6.6 | B | 6 | 20 | 7.0 | 3/ | | | PLE01 |
| 1992 10 24.59 | | | | 48.0 | L | 5 | 65 | 8.3 | 5 | 0.06 | | CHE03 |
| 1992 10 24.60 | B | 6.6 | S | 8.0 | B | 4 | 10 | 8.3 | 5 | | | CHE03 |
| 1992 10 24.67 | B | 6.7 | S | 11.0 | B | 4 | 20 | | 5 | | | SIE |
| 1992 10 24.72 | B | 7.0 | AA | 6.0 | B | | 20 | &10 | 4 | &1.2 | 33 | SCI |
| 1992 10 24.73 | M | 6.9 | AA | 7.0 | B | | 20 | 6.0 | 4 | 0.9 | 7 | TAN02 |
| 1992 10 24.76 | B | 7.2 | S | 5 | R | | 8 | 5 | 3 | | | GAR02 |
| 1992 10 24.88 | B | 7.2 | AA | 6.6 | B | 6 | 20 | 9.0 | 4 | | | PLE01 |
| 1992 10 25.05 | B | 6.8 | SC | 8.0 | B | | 11 | & 5 | 5 | 0.1 | 10 | ROB03 |
| 1992 10 25.09 | M | 7.6 | AA | 13 | R | 15 | 25 | 12 | 4 | | | ZHU |
| 1992 10 25.09 | S | 7.8 | AA | 13 | R | 15 | 25 | 12 | 4 | | | ZHU |
| 1992 10 25.39 | B | 7.1 | S | 10.5 | R | 7 | 29 | & 8 | 5/ | | | OBU |
| 1992 10 25.40 | M | 6.9 | SC | 6.5 | R | 8 | 16 | 9 | 4/ | | | NAK01 |
| 1992 10 25.72 | S | 7.3 | AA | 5.0 | B | | 10 | 12 | 3 | | | ZHU |
| 1992 10 25.72 | S | 7.4 | AA | 12 | R | 5 | 23 | 12 | 4 | | | ZHU |
| 1992 10 25.73 | B | 7.0 | AA | 6.7 | B | | 20 | & 7 | 3/ | &0.13 | 25 | SCI |
| 1992 10 25.73 | M | 7.0 | AA | 7.0 | B | | 20 | 6.9 | 4 | | | TAN02 |
| 1992 10 25.77 | S | 7 : | S | 6.0 | B | 5 | 20 | &20 | 5 | | | PAR03 |
| 1992 10 25.81 | B | 7.2 | AA | 6.6 | B | 6 | 20 | 7 | 4 | | | PLE01 |
| 1992 10 26.10 | M | 6.6 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1992 10 26.38 | M | 7.0 | SC | 20.3 | T | 10 | 80 | 6 | 6 | | | KAT01 |
| 1992 10 26.40 | B | 6.9 | S | 10.5 | R | 7 | 29 | & 7 | 6 | | | OBU |
| 1992 10 26.40 | M | 6.8 | SC | 6.5 | R | 8 | 16 | 10 | 5 | | | NAK01 |
| 1992 10 26.61 | B | 6.4 | AA | 8.0 | B | 4 | 10 | 6.5 | 5 | | | CHE03 |
| 1992 10 26.63 | B | 6.4 | AA | 8.0 | B | 4 | 10 | 5.9 | 5 | | | SIE |
| 1992 10 26.73 | M | 7.0 | AA | 7.0 | B | | 20 | 5.7 | 4/ | | 0 | TAN02 |
| 1992 10 26.76 | S | 6.6 | SC | 8.0 | B | | 15 | 4 | 6 | | | FEI |
| 1992 10 26.78 | S | 6.1 | S | 8.0 | B | | 15 | &15 | | | | JOH03 |
| 1992 10 26.80 | B | 6.7 | SC | 8.0 | B | | 10 | | 4 | | | RAD01 |
| 1992 10 26.82 | B | 6.7 | SC | 8.0 | B | | 10 | | 4 | | | IOR |
| 1992 10 26.82 | B | 6.7 | SC | 8.0 | B | | 10 | | 4 | | | POR02 |
| 1992 10 26.84 | S | 6.5 | AA | 13 | L | 4 | 26 | 11 | 6 | 0.9 | 30 | KOR01 |
| 1992 10 26.85 | B | 6.4 | AA | 5.0 | B | | 7 | 10 | 5 | 0.6 | 30 | KOR01 |
| 1992 10 26.87 | B | 6.7 | SC | 8.0 | B | | 10 | | 4 | | | VEL02 |
| 1992 10 27.02 | B | 6.4 | AA | 8.0 | B | 4 | 10 | 6.0 | 5 | | | SIE |
| 1992 10 27.39 | M | 6.8 | AA | 20.3 | T | 10 | 80 | 8 | 6 | | | KAT01 |
| 1992 10 27.40 | B | 6.7 | AA | 10.5 | R | 7 | 29 | & 6 | 5/ | | | OBU |
| 1992 10 27.43 | M | 6.7 | SC | 6.5 | R | 8 | 16 | 7 | 5/ | | | NAK01 |
| 1992 10 27.61 | B | 6.4 | AA | 8.0 | B | 4 | 10 | | 5 | | | CHE03 |
| 1992 10 27.73 | M | 6.8 | AA | 7.0 | B | | 20 | | 4 | | | TAN02 |
| 1992 10 27.76 | S | 6.4 | AA | 5.0 | B | | 7 | 10 | 3 | | | SHA02 |
| 1992 10 27.81 | B | 7.0 | AA | 6.6 | B | 6 | 20 | 8 | 5 | | | PLE01 |
| 1992 10 27.85 | B | 7.2 | SC | 8.0 | B | | 10 | | 3 | | | IOR |
| 1992 10 27.85 | B | 7.2 | SC | 8.0 | B | | 10 | | 4 | | | POR02 |
| 1992 10 27.88 | B | 7.2 | SC | 8.0 | B | | 10 | | 4 | | | VEL02 |
| 1992 10 28.40 | B | 6.8 | AA | 10.5 | R | 7 | 29 | & 6 | 5 | | | OBU |
| 1992 10 28.40 | M | 6.6 | AA | 20.3 | T | 10 | 80 | 8 | 6 | | | KAT01 |
| 1992 10 28.63 | B | 6.8 | AA | 8.0 | B | 4 | 10 | | 5 | | | CHE03 |
| 1992 10 28.70 | B | 6.9 | AA | 8.0 | B | 4 | 10 | 7.5 | 5 | | | SIE |
| 1992 10 28.76 | S | 6.1 | S | 8.0 | B | | 15 | &15 | | | | JOH03 |
| 1992 10 28.84 | B | 7.0 | SC | 8.0 | B | | 10 | | 3 | | | RAD01 |
| 1992 10 28.87 | S | 6.1 | AA | 13 | L | 4 | 26 | 14 | 6 | 0.7 | 29 | KOR01 |
| 1992 10 29.65 | B | 7.1 | AA | 8.0 | B | 4 | 10 | 8.0 | 5 | | | SIE |
| 1992 10 29.65 | B | 7.2 | AA | 8.0 | B | 4 | 10 | | 5 | | | CHE03 |
| 1992 10 29.73 | M | 6.9 | AA | 7.0 | B | | 20 | 4.5 | 4 | | | TAN02 |
| 1992 10 29.76 | S | 6.9 | AA | 10.0 | B | | 25 | 5 | 5 | | | MEY |
| 1992 10 29.77 | S | 6.3 | SC | 8.0 | B | | 15 | 5 | 6 | | | FEI |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 10 29.78 | S | 6.8 | AA | 25.5 | L | 4 | 77 | 9 | 3 | | | DIA |
| 1992 10 29.81 | B | 6.5 | AA | 6.6 | B | 6 | 20 | 8 | 5 | 0.4 | 0 | PLE01 |
| 1992 10 29.81 | B | 6.5 | AA | 6.7 | B | | 20 | & 7 | 3/ | &0.22 | 30 | SCI |
| 1992 10 29.83 | B | 6.4: | S | 30.0 | L | 5 | 75 | & 8 | 6 | | | MAR02 |
| 1992 10 29.84 | B | 7.1 | SC | 8.0 | B | | 10 | | 4 | | | VEL02 |
| 1992 10 29.84 | S | 6.0 | AA | 13 | L | 4 | 26 | 9 | 5 | 0.6 | 30 | KOR01 |
| 1992 10 29.86 | B | 5.9 | AA | 5.0 | B | | 7 | 7 | 5 | 0.5 | 30 | KOR01 |
| 1992 10 29.87 | B | 7.2 | S | 10.0 | B | 5 | 25 | & 8 | 5 | &0.23 | 70 | FIL04 |
| 1992 10 29.98 | B | 6.4 | AA | 10 | B | 5 | 25 | 7.0 | 5 | 0.4 | 0 | PLE01 |
| 1992 10 30.03 | B | 7.1: | AA | 8.0 | B | 4 | 10 | | 5 | | | SIE |
| 1992 10 30.65 | B | 6.3 | AA | 8.0 | B | 4 | 10 | 6.6 | 5 | | | SIE |
| 1992 10 30.65 | B | 6.4 | AA | 8.0 | B | 4 | 10 | 8.5 | 5 | | | CHE03 |
| 1992 10 30.73 | S | 6.4 | AA | 5.0 | B | | 12 | 5 | 5 | 1.3 | 21 | TAN02 |
| 1992 10 30.76 | S | 6.0 | AA | 8.0 | B | | 10 | 6 | 3 | | | SHA02 |
| 1992 10 30.79 | S | 6.8 | AA | 25.5 | L | 4 | 77 | 9 | 3 | | | DIA |
| 1992 10 30.85 | B | 6.2 | AA | 5.0 | B | | 10 | 10 | 7 | | | ROD01 |
| 1992 10 30.85 | B | 6.5 | S | 30.0 | L | 5 | 75 | 7 | 5 | | | MAR02 |
| 1992 10 31.15 | M | 6.7 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1992 10 31.64 | B | 6.5 | AA | 8.0 | B | 4 | 10 | 6.5 | 5 | | | CHE03 |
| 1992 10 31.73 | B | 6.5 | AA | 8.0 | B | 4 | 10 | 6.4 | 5 | | | SIE |
| 1992 10 31.73 | S | 6.1 | AA | 5.0 | B | | 12 | | 4 | | | TAN02 |
| 1992 10 31.77 | B | 6.3 | AA | 5.0 | B | | 7 | 8 | 3 | | | MER |
| 1992 10 31.77 | S | 6.5 | AA | 25.5 | L | 4 | 77 | 9 | 3 | | | DIA |
| 1992 10 31.78 | S | 6.7 | AA | 10.0 | B | | 25 | 6.3 | 5 | &0.1 | | MEY |
| 1992 10 31.84 | | 5.9 | S | 0.0 | E | | 1 | 3 | 6 | | | GAR02 |
| 1992 11 01.10 | B | 7.5: | S | 18.0 | L | 5 | 37 | &10 | 5 | | | DOR |
| 1992 11 01.13 | B | 6.5 | AA | 19.9 | L | 4 | 46 | 11 | 4 | | | ZHU |
| 1992 11 01.13 | M | 6.3 | AA | 19.9 | L | 4 | 46 | 11 | 4 | | | ZHU |
| 1992 11 01.40 | B | 6.4 | AA | 10.5 | R | 7 | 29 | 6 | 6 | | | OBU |
| 1992 11 01.70 | B | 5.8 | S | 5.0 | R | 7 | 20 | | 5 | | | NES |
| 1992 11 01.72 | S | 6 : | S | 6.0 | B | 5 | 20 | &10 | 6 | | | PAR03 |
| 1992 11 01.79 | B | 6.0 | SC | 8.0 | B | | 10 | | 3 | | | VEL02 |
| 1992 11 01.80 | S | 6.5: | AA | 25.5 | L | 4 | 77 | 10 | 3 | | | DIA |
| 1992 11 01.81 | B | 6.3 | AA | 5 | B | 4 | 10 | 10 | 5 | 0.3 | 2 | PLE01 |
| 1992 11 01.83 | M | 6 : | S | 10.0 | M | 10 | 50 | 5.6 | 6 | | | PAR03 |
| 1992 11 01.90 | B | 6.6: | S | 30.0 | L | 5 | 75 | 7 | 5 | | | MAR02 |
| 1992 11 02.19 | S | 6.6: | S | 6.6 | B | 6 | 20 | | | | | FIL04 |
| 1992 11 02.39 | B | 6.5 | S | 10.5 | R | 7 | 29 | 7 | 6 | | | OBU |
| 1992 11 02.40 | M | 6.4 | SC | 6.5 | R | 8 | 16 | 9 | 5 | | | NAK01 |
| 1992 11 02.63 | B | 5.9 | AA | 8.0 | B | 4 | 10 | 10.1 | 5 | | | SIE |
| 1992 11 02.65 | B | 6.0 | AA | 8.0 | B | 4 | 10 | 9.8 | 5 | | | CHE03 |
| 1992 11 02.76 | B | 6.2 | S | 6.0 | B | | 20 | &10 | 5 | | | RAF |
| 1992 11 02.76 | S | 6.2 | SC | 8.0 | B | | 15 | 5 | 6 | | | FEI |
| 1992 11 02.79 | B | 6.2 | AA | 6.6 | B | 6 | 20 | 9 | 5 | 0.1 | 2 | PLE01 |
| 1992 11 02.82 | B | 6.2 | S | 6.6 | B | 6 | 20 | & 9 | 4/ | | | FIL04 |
| 1992 11 02.95 | S | 6.2 | AA | 35 | M | 10 | 90 | 8.9 | 5 | | | PLE01 |
| 1992 11 03.13 | S | 5.6 | SC | 8.0 | B | | 11 | 3.0 | 5 | 0.08 | 35 | PRY |
| 1992 11 03.74 | S | 5.7 | S | 10.8 | L | 4 | 22 | &10 | 6/ | | | BUS01 |
| 1992 11 03.75 | S | 5.5 | S | 6.7 | R | 4 | 14 | 12 | 6 | | | BUS01 |
| 1992 11 03.75 | S | 5.7 | SC | 8.0 | B | | 15 | 5 | 6 | | | FEI |
| 1992 11 03.76 | M | 6.7: | AA | 4 | B | | 11 | | | | | KOS01 |
| 1992 11 03.76 | S | 5.5 | S | 3.0 | B | | 8 | &15 | 5 | | | BUS01 |
| 1992 11 03.77 | B | 6.6 | AA | 8.0 | B | | 20 | & 4.4 | 5 | | | SPE01 |
| 1992 11 03.80 | B | 6.4 | SC | 8.0 | B | | 10 | | 6 | | | RAD01 |
| 1992 11 04.39 | B | 6.3 | AA | 10.5 | R | 7 | 29 | 7 | 5/ | | | OBU |
| 1992 11 04.59 | B | 5.7 | AA | 8.0 | B | 4 | 10 | 11.0 | 5 | | | CHE03 |
| 1992 11 04.62 | B | 5.8 | AA | 8.0 | B | 4 | 10 | 11.7 | 5 | | | SIE |
| 1992 11 04.74 | B | 5.9 | AA | 6.7 | B | | 20 | & 6 | 4 | &0.25 | 30 | SCI |
| 1992 11 04.75 | B | 5.6 | S | 6.0 | B | | 20 | 6.0 | 5/ | | | SIW |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 04.79 | B | 5.9 | AA | 5 | B | 4 | 10 | 9.0 | 5 | 0.3 | 5 | PLE01 |
| 1992 11 04.79 | B | 6.0 | S | 5.0 | B | 4 | 10 | & 7 | 5/ | &0.13 | 20 | FIL04 |
| 1992 11 05.38 | B | 6.4 | S | 10.5 | R | 7 | 29 | & 8 | 5/ | | | OBU |
| 1992 11 05.62 | B | 5.6 | AA | 8.0 | B | 4 | 10 | 10.0 | 5 | | | SIE |
| 1992 11 05.63 | B | 5.7 | AA | 8.0 | B | 4 | 10 | 10.5 | 5 | | | CHE03 |
| 1992 11 05.76 | S | 5.8 | AA | 25.5 | L | 4 | 77 | 10 | 3 | | | DIA |
| 1992 11 06.08 | M | 6.0 | SC | 5.0 | B | | 10 | | | | | HAL |
| 1992 11 06.59 | B | 5.8 | AA | 8.0 | B | 4 | 10 | 10.0 | 5 | | | CHE03 |
| 1992 11 06.59 | B | 5.8 | AA | 8.0 | B | 4 | 10 | & 8 | 5 | | | SIE |
| 1992 11 06.71 | M | 6.2 | AA | 7.0 | B | | 20 | | 5 | | | TAN02 |
| 1992 11 06.73 | S | 5.4 | AC | 20.0 | T | 10 | 77 | 12 | 7 | | | TOM01 |
| 1992 11 06.76 | S | 5.7 | AA | 25.5 | L | 4 | 77 | 10 | 3 | | | DIA |
| 1992 11 06.79 | B | 6.2 | S | 30.0 | L | 5 | 75 | 13 | 7 | | | MAR02 |
| 1992 11 07.39 | M | 5.8 | AA | 3.0 | B | | 8 | 10 | 6 | 0.3 | 30 | KAT01 |
| 1992 11 07.60 | B | 5.8 | AA | 8.0 | B | 4 | 10 | 8.5 | 5 | | | CHE03 |
| 1992 11 07.60 | B | 5.8 | AA | 8.0 | B | 4 | 10 | & 8 | 5 | | | SIE |
| 1992 11 07.71 | M | 5.9 | AA | 5.0 | B | | 12 | | 5 | | | TAN02 |
| 1992 11 07.71 | M | 6.0 | AA | 6.0 | B | | 20 | | | | | SWI01 |
| 1992 11 07.73 | B | 5.9 | AA | 6.7 | B | | 20 | & 6 | 4/ | &0.27 | 25 | SCI |
| 1992 11 07.73 | M | 5.6 | AA | 7.0 | B | | 11 | | 5 | | | KOS03 |
| 1992 11 07.73 | M | 5.6 | AA | 15.0 | L | 8 | 48 | | 5 | | | KOS03 |
| 1992 11 07.75 | B | 6.2 | AA | 31.2 | L | 4 | 86 | 4 | | | | PUJ01 |
| 1992 11 07.75 | M | 6.1 | AA | 11.0 | L | 7 | 32 | | | | | SWI01 |
| 1992 11 07.78 | B | 6.1 | AA | 5.0 | B | | 10 | 2.5 | 4 | | | IWA02 |
| 1992 11 07.79 | B | 6.1 | S | 30.0 | L | 5 | 75 | 10 | 7 | | | MAR02 |
| 1992 11 07.92 | B | 5.8 | AA | 10 | B | 5 | 25 | 11.0 | 5 | 0.2 | 12 | PLE01 |
| 1992 11 08.38 | B | 6.2 | AA | 10.5 | R | 7 | 29 | > 7 | 4/ | | | OBU |
| 1992 11 08.63 | B | 5.6: | AA | 3.0 | B | 4 | 6 | | 4 | | | CHE03 |
| 1992 11 08.63 | B | 5.8: | AA | 3.0 | B | 4 | 6 | | 5 | | | SIE |
| 1992 11 08.69 | B | 5.2: | S | 5.0 | R | 7 | 20 | | 5 | | | NES |
| 1992 11 08.69 | M | 5.9 | AA | 11.0 | L | 7 | 32 | 4.6 | 3 | | | SWI01 |
| 1992 11 08.69 | S | 6.5: | AA | 5 | R | 7 | 20 | | 3 | | | OSS |
| 1992 11 08.70 | B | 6.0 | AA | 7.5 | R | 3 | 15 | 2.8 | 4 | | | IWA02 |
| 1992 11 08.70 | B | 6.8 | AA | 7.0 | R | 5 | 26 | & 4.5 | 4 | | | CIC |
| 1992 11 08.71 | B | 6.8: | AA | 11 | L | 7 | 50 | | 4 | | | PER04 |
| 1992 11 08.71 | M | 6.0 | AA | 5.0 | B | | 12 | | 5 | | | TAN02 |
| 1992 11 08.71 | M | 6.0 | S | 15.0 | L | 8 | 40 | & 2.4 | 5 | | | KOM |
| 1992 11 08.72 | B | 5.4 | S | 5.0 | B | | 7 | | | | | KYS |
| 1992 11 08.72 | B | 6.4 | AA | 6.7 | B | | 20 | & 6 | 4/ | &0.27 | 20 | SCI |
| 1992 11 08.72 | B | 6.4 | S | 6.0 | B | 5 | 20 | & 9 | 5/ | &0.27 | 40 | FIL04 |
| 1992 11 08.72 | M | 5.6 | AA | 7.0 | B | | 11 | 1.7 | 5 | | | KOS03 |
| 1992 11 08.72 | M | 5.6 | AA | 15.0 | L | 8 | 48 | 1.7 | 5 | | | KOS03 |
| 1992 11 08.72 | S | 5.1 | S | 6.7 | R | 4 | 14 | 12 | 6/ | 1 | 30 | BUS01 |
| 1992 11 08.73 | B | 5.7 | AA | 11 | L | 7 | 50 | | 4 | | | KIE |
| 1992 11 08.73 | S | 6.6: | AA | 10.0 | B | | 25 | 3.3 | 5 | | | MEY |
| 1992 11 08.74 | S | 6.3: | AA | 6.0 | B | | 20 | | | | | OLE |
| 1992 11 08.74 | S | 6.6 | AA | 5 | R | 7 | 20 | | 2 | | | MAR11 |
| 1992 11 08.75 | B | 6.2 | AA | 31.2 | L | 4 | 86 | 4 | | | | PUJ01 |
| 1992 11 08.76 | B | 6.6: | AA | 5.0 | R | 8 | 20 | &15 | 5 | | | POW01 |
| 1992 11 08.77 | B | 5.7 | AA | 5.0 | B | | 7 | 10 | 5 | 0.7 | 40 | KOR01 |
| 1992 11 08.79 | B | 6.1 | S | 30.0 | L | 5 | 75 | 13 | 7 | | | MAR02 |
| 1992 11 08.83 | S | 5.8 | S | 266 | R | 15 | 164 | 5 | 6 | | | BAK |
| 1992 11 08.94 | B | 5.6 | AA | 10 | B | 5 | 25 | 11 | 4/ | 0.2 | 2 | PLE01 |
| 1992 11 09.67 | B | 6.0 | AA | 6.0 | B | | 20 | | 4 | | | ADA02 |
| 1992 11 09.69 | B | 5.6 | AA | 5 | B | | 10 | 13.5 | 6 | | | SZU |
| 1992 11 09.69 | B | 6.0 | AA | 6.7 | B | | 20 | & 6 | 4/ | &0.20 | 30 | SCI |
| 1992 11 09.69 | B | 6.1 | AA | 5.0 | B | | 7 | 3.0 | 6 | | | CNO |
| 1992 11 09.69 | B | 6.1 | AA | 8.0 | B | | 12 | | 4 | | | LUK03 |
| 1992 11 09.69 | B | 6.2 | AA | 8.0 | B | | 12 | | 5 | | | MOS01 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 09.70 | B | 6.7 | AA | 7.0 | R | 5 | 16 | | | | | CIC |
| 1992 11 09.70 | M | 6.0: | AA | 3.5 | B | | 7 | 8 | 3 | | | ZBR |
| 1992 11 09.71 | B | 5.9 | AA | 11 | L | 7 | 50 | | 4 | | | KIE |
| 1992 11 09.71 | S | 6.5 | AA | 6.4 | R | 12 | 30 | 2.5 | 3 | | | URB |
| 1992 11 09.72 | B | 5.7: | AA | 3.5 | B | | 7 | | 3 | | | CIU |
| 1992 11 09.72 | B | 6.3 | AA | 8.0 | B | | 20 | 5.4 | 5 | | | SPE01 |
| 1992 11 09.72 | M | 6.0 | S | 25.0 | L | 7 | 55 | & 2.6 | 5/ | | | KOM |
| 1992 11 09.72 | M | 6.4 | AA | 4 | B | | 11 | | 4/ | | | KOS01 |
| 1992 11 09.72 | M | 6.5 | AA | 31 | L | 7 | 80 | & 5 | 5 | | | KOS01 |
| 1992 11 09.73 | B | 6.0: | AA | 4.0 | B | | 11 | & 5 | 5 | | | RAF |
| 1992 11 09.73 | B | 6.2 | AA | 5.0 | B | | 7 | | | | | SPE01 |
| 1992 11 09.73 | M | 5.6 | AA | 7.0 | B | | 11 | 1.7 | 5 | | | KOS03 |
| 1992 11 09.73 | M | 5.6 | AA | 15.0 | L | 8 | 48 | 1.7 | 5 | | | KOS03 |
| 1992 11 09.74 | S | 6.1 | AA | 11 | L | 7 | 32 | & 4.7 | 4 | | | OSS |
| 1992 11 09.74 | S | 6.4 | AA | 11 | L | 7 | 32 | 3.2 | 3/ | | | MAR11 |
| 1992 11 09.75 | B | 6.1 | AA | 5.0 | B | | 10 | | 4 | | | MAT06 |
| 1992 11 09.75 | B | 6.2 | AA | 8.0 | R | 5 | 16 | 3.0 | 6 | | | CNO |
| 1992 11 09.76 | B | 6.2 | AA | 5.0 | R | 8 | 20 | &14 | 6 | | | POW01 |
| 1992 11 09.77 | B | 6.0 | AA | 5.0 | B | | 10 | | 4 | | | SWI |
| 1992 11 09.77 | S | 6.0: | AA | 6.0 | B | | 20 | | | | | OLE |
| 1992 11 09.79 | B | 6.3 | AA | 5.0 | B | | 7 | &15 | 6 | | | POW01 |
| 1992 11 09.81 | B | 5.9 | AA | 5 | B | 4 | 10 | 10 | 4/ | 0.15 | 23 | PLE01 |
| 1992 11 09.81 | B | 6.1 | S | 10.0 | B | 5 | 25 | & 8 | 5/ | &0.13 | 30 | FIL04 |
| 1992 11 09.82 | B | 6.7: | AA | 7.0 | L | 8 | 40 | 5.5 | 3 | | | GRO03 |
| 1992 11 09.92 | B | 5.8 | AA | 10 | B | 5 | 25 | 9.5 | 5 | 0.25 | 23 | PLE01 |
| 1992 11 10.39 | M | 5.5 | AA | 3.0 | B | | 8 | 10 | 6 | 0.5 | 40 | KAT01 |
| 1992 11 10.65 | M | 5.3 | AA | 12 | R | 5 | 23 | 12 | 5 | | | ZHU |
| 1992 11 10.67 | B | 5.8 | AA | 6.0 | B | | 20 | | 5 | | | ADA02 |
| 1992 11 10.67 | B | 6.1 | AA | 5.0 | B | | 7 | &15 | 6 | | | POW01 |
| 1992 11 10.68 | B | 6.0 | AA | 6.7 | B | | 20 | & 5 | 5 | &0.22 | 20 | SCI |
| 1992 11 10.69 | B | 6.1 | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 11 10.7 | B | 6.0 | AA | 6 | B | | 20 | | 5 | | | BEN04 |
| 1992 11 10.70 | B | 5.7: | AA | 3.5 | B | | 7 | | 3 | | | CIU |
| 1992 11 10.71 | B | 6.2 | AA | 5.0 | B | | 10 | | 4 | | | MAT06 |
| 1992 11 10.71 | B | 6.3: | AA | 7.0 | L | 11 | 22 | &15 | 5/ | | | POW01 |
| 1992 11 10.72 | B | 5.6: | AA | 3.0 | B | 4 | 6 | | 4 | | | CHE03 |
| 1992 11 10.73 | B | 6.0: | S | 12.0 | R | 5 | 27 | | 5 | | | SIE |
| 1992 11 10.74 | S | 5.1 | S | 6.7 | R | 4 | 14 | 12 | 7 | | | BUS01 |
| 1992 11 10.75 | B | 6.0 | AA | 8.0 | B | | 12 | | 3 | | | PER04 |
| 1992 11 10.75 | S | 5.1 | S | 3.0 | B | | 8 | &15 | 6/ | | | BUS01 |
| 1992 11 10.76 | S | 5.4 | AA | 25.5 | L | 4 | 77 | 10 | 3 | | | DIA |
| 1992 11 10.77 | B | 6.0 | AA | 5.0 | B | | 10 | | 4 | | | SWI |
| 1992 11 10.88 | B | 5.7 | AA | 6.6 | B | 6 | 20 | 9 | 4/ | 0.2 | 27 | PLE01 |
| 1992 11 11.40 | B | 6.0 | AA | 10.5 | R | 7 | 29 | > 7 | 5/ | | | OBU |
| 1992 11 11.63 | M | 5.4 | AA | 5 | R | | 7 | 15 | 5 | | | ZHU |
| 1992 11 11.64 | M | 5.4 | AA | 13 | R | 15 | 25 | 12 | 5 | 0.1 | 290 | ZHU |
| 1992 11 11.67 | B | 5.8 | AA | 6.0 | B | | 20 | | 5 | | | ADA02 |
| 1992 11 11.68 | B | 6.0 | AA | 5.0 | B | | 10 | | | | | PER04 |
| 1992 11 11.68 | B | 6.6 | AA | 6.0 | B | | 20 | & 5 | 5 | 0.53 | 25 | SCI |
| 1992 11 11.69 | B | 5.9 | AA | 5.0 | B | | 10 | 3.0 | 4 | | | IWA02 |
| 1992 11 11.69 | B | 6.1 | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 11 11.69 | M | 5.8 | AA | 11.0 | L | 7 | 32 | 5.6 | 3 | | | SWI01 |
| 1992 11 11.69 | M | 5.9 | AA | 3.5 | B | | 7 | &10 | 4 | | | ZBR |
| 1992 11 11.7 | B | 6.1 | AA | 6 | B | | 20 | | 5 | | | BEN04 |
| 1992 11 11.70 | B | 5.7 | AA | 3.5 | B | | 7 | | 4 | | | CIU |
| 1992 11 11.71 | B | 6.3 | AA | 5.0 | B | | 10 | | 4 | | | MAT06 |
| 1992 11 11.71 | S | 6.0: | AA | 6.0 | B | | 20 | | | | | OLE |
| 1992 11 11.73 | B | 5.3 | AA | 5.0 | B | | 10 | | 5 | | | BET01 |
| 1992 11 11.73 | B | 5.3 | AA | 5.0 | B | | 10 | 3.2 | 5 | 0.1 | 359 | WES04 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 11.74 | B | 5.0 | S | 5.0 | B | | 7 | | | | | KYS |
| 1992 11 11.76 | B | 6.3 | AA | 8.0 | R | 5 | 16 | 3.0 | 6 | | | CNO |
| 1992 11 11.76 | S | 5.4: | AA | 25.5 | L | 4 | 77 | &10 | 3 | | | DIA |
| 1992 11 11.78 | B | 5.6 | AA | 10 | B | 5 | 25 | 12 | 5 | 0.15 | 0 | PLE01 |
| 1992 11 11.79 | S | 5.0 | S | 3.0 | B | | 8 | &15 | 6/ | | | BUS01 |
| 1992 11 11.80 | S | 5.0 | S | 6.7 | R | 4 | 14 | 12 | 6/ | | | BUS01 |
| 1992 11 12.39 | B | 6.1 | S | 10.5 | R | 7 | 29 | 6 | 6 | >0.5 | 30 | OBU |
| 1992 11 12.41 | M | 5.4 | SC | 6.0 | R | 8 | 28 | 12 | 6 | | | NAK01 |
| 1992 11 12.68 | B | 5.6 | AA | 6.0 | B | | 20 | & 8 | 6 | | | RAF |
| 1992 11 12.68 | S | 5.2 | AC | 8.0 | B | | 11 | 12 | 7 | | | TOM01 |
| 1992 11 12.69 | B | 5.6 | AA | 3.5 | B | | 7 | | 4 | | | CIU |
| 1992 11 12.69 | B | 5.8 | AA | 5.0 | B | | 10 | 3.0 | 4/ | | | IWA02 |
| 1992 11 12.69 | B | 6.2 | AA | 6.7 | B | | 20 | & 5 | 5 | 0.62 | 20 | SCI |
| 1992 11 12.69 | M | 5.5 | AA | 7.0 | B | | 11 | 2.5 | 5 | | | KOS03 |
| 1992 11 12.69 | M | 5.5 | AA | 15.0 | L | 8 | 48 | 2.5 | 5 | | | KOS03 |
| 1992 11 12.70 | M | 5.6 | S | 15.0 | L | 8 | 40 | & 2.6 | 5 | | | KOM |
| 1992 11 12.70 | S | 5.0 | AC | 20.0 | T | 10 | 77 | 12 | 7 | | | TOM01 |
| 1992 11 12.70 | S | 5.8: | AA | 3.5 | B | | 7 | &10 | 5 | | | ZBR |
| 1992 11 12.73 | B | 6.2 | AA | 4 | B | | 12 | 1.3 | 4 | | | PIO |
| 1992 11 12.75 | B | 5.9 | S | 5.0 | B | 4 | 10 | &11 | 5 | &0.44 | 50 | FIL04 |
| 1992 11 12.75 | B | 6.1 | AA | 7.0 | R | 5 | 16 | & 5.5 | 6 | | | CIC |
| 1992 11 12.75 | S | 5.4 | SC | 8.0 | B | | 15 | 8 | 7 | | | FEI |
| 1992 11 12.75 | S | 6.0 | AA | 5 | R | 7 | 20 | | 4 | | | MAR11 |
| 1992 11 12.76 | B | 6.0 | AA | 6 | B | | 20 | & 4 | 5 | | | BEN04 |
| 1992 11 12.76 | M | 6.1 | AA | 10 | R | 10 | 25 | & 5 | 5 | | | KOS01 |
| 1992 11 12.76 | M | 6.2 | AA | 4 | B | | 11 | | 4/ | | | KOS01 |
| 1992 11 12.76 | S | 5.3 | AA | 6.4 | R | 12 | 30 | 3.0 | 4 | | | URB |
| 1992 11 12.76 | S | 6.2 | AA | 4 | B | | 11 | | 4/ | | | LIS01 |
| 1992 11 12.79 | S | 5.8 | AA | 6 | B | | 20 | 3.7 | 4 | | | OSS |
| 1992 11 12.91 | B | 5.7 | AA | 10 | B | 5 | 25 | 12.0 | 5 | 0.2 | 0 | PLE01 |
| 1992 11 13.08 | M | 5.2 | SC | 5.0 | B | | 10 | | | 0.5 | 53 | HAL |
| 1992 11 13.69 | M | 5.5 | AA | 7.0 | B | | 11 | 2.5 | 5 | | | KOS03 |
| 1992 11 13.69 | M | 5.5 | AA | 15.0 | L | 8 | 48 | 2.5 | 5 | | | KOS03 |
| 1992 11 13.70 | S | 5.7 | AA | 6 | B | | 20 | 4.8 | 4/ | | | OSS |
| 1992 11 13.72 | M | 5.8 | AA | 5.0 | B | | 12 | 5 | 5 | | | TAN02 |
| 1992 11 13.73 | B | 6.1 | AA | 4 | B | | 12 | 1.3 | 3/ | | | PIO |
| 1992 11 13.74 | S | 4.7 | S | 6.7 | R | 4 | 14 | 12 | 6/ | | | BUS01 |
| 1992 11 13.74 | S | 4.8 | S | 3.0 | B | | 8 | &15 | 6 | | | BUS01 |
| 1992 11 13.74 | S | 5.3 | S | 4.0 | B | | 8 | &12 | 7 | | | SCH04 |
| 1992 11 13.75 | B | 5.8 | AA | 14.2 | L | 6 | 44 | & 5 | 5 | | | OSS |
| 1992 11 13.75 | M | 6.2 | AA | 4 | B | | 11 | | 4 | | | KOS01 |
| 1992 11 13.75 | S | 4.9 | S | 10.8 | L | 4 | 22 | &11 | 7 | | | BUS01 |
| 1992 11 13.75 | S | 6.1 | AA | 4 | B | | 11 | | 4 | | | LIS01 |
| 1992 11 14.10 | S | 5.1 | A | 8.0 | B | | 11 | 8 | 6 | | | SPR |
| 1992 11 14.38 | M | 5.3 | AA | 12 | R | | 20 | 8 | 6 | 0.5 | 45 | KAT01 |
| 1992 11 14.39 | B | 5.7 | AA | 6.0 | R | 7 | 20 | 6 | 6 | 0.67 | 30 | OBU |
| 1992 11 14.40 | M | 5.3 | SC | 6.5 | R | 8 | 16 | 13 | 6 | | 45 | NAK01 |
| 1992 11 14.67 | B | 5.8 | AA | 6.0 | B | | 20 | | 5 | | | ADA02 |
| 1992 11 14.68 | B | 5.6 | AA | 5 | B | | 10 | 13.5 | 6 | | | SZU |
| 1992 11 14.69 | B | 5.7 | S | 5 | B | | 10 | | 5 | | | RZE01 |
| 1992 11 14.69 | S | 5.6 | AA | 6 | B | | 20 | 4.8 | 5 | | | OSS |
| 1992 11 14.70 | B | 6.0 | AA | 5.0 | B | | 10 | | 5 | | | SWI |
| 1992 11 14.71 | B | 5.9: | AA | 5.0 | B | | 10 | | | | | BET01 |
| 1992 11 14.72 | M | 5.6 | AA | 5.0 | B | | 12 | 4 | 4 | 0.8 | 29 | TAN02 |
| 1992 11 14.73 | S | 4.7 | S | 4.0 | B | | 8 | &13 | 7 | | | BUS01 |
| 1992 11 14.75 | M | 6.1 | AA | 4 | B | | 11 | | 4 | | | KOS01 |
| 1992 11 14.75 | S | 4.6 | S | 3.0 | B | | 8 | &15 | 6/ | | | BUS01 |
| 1992 11 14.75 | S | 4.6 | S | 6.7 | R | 4 | 14 | 15 | 7 | 2.5 | 35 | BUS01 |
| 1992 11 14.75 | S | 4.7 | S | 4.0 | B | | 8 | 14 | 7 | 2.5 | | BAK |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 14.75 | S | 4.7 | S | 10.8 | L | 4 | 22 | &11 | 7 | 2.5 | 35 | BUS01 |
| 1992 11 14.75 | S | 4.8 | S | 0.0 | E | | | | 6 | | | BUS01 |
| 1992 11 14.75 | S | 5.3 | S | 5.0 | B | | 10 | &10 | 7 | | | COM |
| 1992 11 14.75 | S | 5.4 | S | 5.0 | B | | 10 | 10 | 7 | | | LAA |
| 1992 11 14.75 | S | 6.2 | AA | 4 | B | | 11 | | 4 | | | LIS01 |
| 1992 11 14.76 | M | 6.2 | AA | 10 | R | 10 | 45 | & 6 | 5 | | | KOS01 |
| 1992 11 14.77 | S | 4.9 | AC | 8.0 | B | | 11 | 13 | 7 | | | TOM01 |
| 1992 11 14.90 | B | 5.5 | AA | 5 | B | 4 | 10 | 10 | 4/ | 0.15 | 0 | PLE01 |
| 1992 11 14.90 | B | 5.6 | AA | 6.6 | B | 6 | 20 | 8.0 | 5 | 0.2 | 0 | PLE01 |
| 1992 11 15.00 | B | 6.5 | AA | 5.0 | B | 4 | 7 | 5 | 6 | | | SIM |
| 1992 11 15.00 | B | 6.6 | AA | 5.0 | B | 4 | 7 | 7 | 4 | | | SIM01 |
| 1992 11 15.07 | B | 5.3 | SC | 8.0 | B | | 11 | &15 | 7 | 1.0 | 50 | ROB03 |
| 1992 11 15.11 | M | 5.4 | SC | 5.0 | B | | 10 | | | 0.8 | 49 | HAL |
| 1992 11 15.36 | M | 5.2 | AA | 5.0 | B | | 7 | | 7 | 0.2 | 45 | KAT01 |
| 1992 11 15.37 | B | 5.8 | AA | 6.0 | R | 7 | 20 | 6 | 6 | >0.5 | 30 | OBU |
| 1992 11 15.67 | B | 5.6 | AA | 6.0 | B | | 20 | | 5 | | | ADA02 |
| 1992 11 15.67 | B | 5.8 | AA | 5.0 | B | | 10 | | | | | PER04 |
| 1992 11 15.68 | B | 5.8 | AA | 6.7 | B | | 20 | & 5 | 5 | 0.22 | 0 | SCI |
| 1992 11 15.69 | B | 5.2 | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 11 15.69 | M | 5.3 | AA | 7.0 | B | | 11 | 2.5 | 5 | | | KOS03 |
| 1992 11 15.69 | M | 5.3 | AA | 15.0 | L | 8 | 48 | 2.5 | 5 | | | KOS03 |
| 1992 11 15.70 | B | 5.4 | AA | 3.5 | B | | 7 | | 5 | | | CIU |
| 1992 11 15.71 | S | 5.5 | AA | 6 | B | | 20 | 3.8 | 5 | | | OSS |
| 1992 11 15.72 | M | 5.5 | AA | 5.0 | B | | 12 | 5 | 4 | 0.8 | 36 | TAN02 |
| 1992 11 15.72 | M | 5.5 | AA | 11.0 | L | 7 | 32 | | 4 | | | SWI01 |
| 1992 11 15.75 | B | 5.6 | AA | 8 | R | 15 | 32 | 13.0 | 6 | | | SZU |
| 1992 11 15.75 | B | 6.0 | S | 6.6 | B | 6 | 20 | | | | | FIL04 |
| 1992 11 15.76 | B | 5.7 | S | 30.0 | L | 5 | 75 | 14 | 7 | | | MAR02 |
| 1992 11 15.83 | B | 5.7 | AA | 5 | B | 4 | 10 | 9 | 4/ | 0.2 | 0 | PLE01 |
| 1992 11 16.41 | B | 6.2 | S | 10.5 | R | 7 | 29 | 7 | 6/ | | | OBU |
| 1992 11 16.76 | S | 5.8 | AA | 11 | L | 7 | 32 | 3.5 | 5 | 0.5 | | MAR11 |
| 1992 11 16.80 | K | 5.4 | S | 8.0 | B | | 11 | 15 | 7 | 1.5 | 30 | MAR02 |
| 1992 11 17.38 | M | 4.9 | AA | 12 | R | | 20 | 10 | 6 | 1.0 | 40 | KAT01 |
| 1992 11 17.41 | M | 5.3 | SC | 6.5 | R | 8 | 16 | 9 | 6/ | | 45 | NAK01 |
| 1992 11 17.69 | S | 5.4 | AA | 6 | B | | 20 | 4.1 | 6 | | | OSS |
| 1992 11 17.71 | B | 5.9: | AA | 5.0 | B | | 7 | | | | | CEL |
| 1992 11 17.73 | B | 5.5 | AA | 5.0 | B | | 7 | 9 | 7 | 2.1 | 45 | KOR01 |
| 1992 11 18.38 | B | 5.4 | S | 10.5 | R | 7 | 29 | 7 | 6/ | 1.0 | 45 | OBU |
| 1992 11 18.38 | M | 4.7 | AA | 12 | R | | 20 | 10 | 6 | 1.2 | 40 | KAT01 |
| 1992 11 18.67 | B | 5.5: | AA | 5.0 | B | | 7 | &18 | 6/ | | | POW01 |
| 1992 11 18.70 | S | 4.8 | AC | 8.0 | B | | 11 | 15 | 7 | | | TOM01 |
| 1992 11 18.71 | B | 5.2 | AA | 6.0 | B | | 20 | | 5 | | | ADA02 |
| 1992 11 18.75 | B | 5.5 | AA | 5.0 | B | | 10 | | | | | PER04 |
| 1992 11 18.75 | S | 6.0 | AA | 5 | R | 8 | 20 | & 5 | 5 | | | LIS01 |
| 1992 11 18.77 | | 4.9 | S | 0.0 | E | | 1 | 5 | 3 | | | GAR02 |
| 1992 11 18.80 | B | 5.3 | AA | 5.0 | B | | 10 | | 6 | | | SWI |
| 1992 11 18.82 | B | 5.3 | S | 30.0 | L | 5 | 75 | 14 | 7 | | | MAR02 |
| 1992 11 19.38 | B | 5.3 | AA | 10.5 | R | 7 | 29 | 7 | 6/ | >0.5 | 50 | OBU |
| 1992 11 19.68 | S | 4.8 | AC | 8.0 | B | | 11 | 15 | 7 | | | TOM01 |
| 1992 11 19.71 | B | 5.1 | AA | 6.0 | B | | 20 | | 5 | | | ADA02 |
| 1992 11 19.72 | B | 5.0 | S | 5.0 | B | | 7 | | | 0.2 | | KYS |
| 1992 11 19.72 | M | 5.6 | AA | 5.0 | B | | 12 | 6 | 4 | 0.8 | 46 | TAN02 |
| 1992 11 19.72 | S | 5.5 | AA | 11 | L | 7 | 32 | 3.6 | 5/ | | | MAR11 |
| 1992 11 19.73 | S | 4.8 | S | 3.0 | B | | 8 | 8 | 8 | | | BUS01 |
| 1992 11 19.74 | B | 5.4 | AA | 5.0 | B | | 7 | 8.6 | 6 | 0.3 | 44 | SPE01 |
| 1992 11 19.74 | S | 4.5 | S | 6.7 | R | 4 | 14 | 10 | 7/ | | | BUS01 |
| 1992 11 19.75 | M | 5.1 | S | 5.0 | B | | 10 | &10 | 8 | >1 | 45 | COM |
| 1992 11 19.75 | S | 4.6 | S | 10.8 | L | 4 | 22 | 8 | 7/ | | | BUS01 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 19.78 | B | 5.8 | AA | 5.0 | B | | 7 | | | | | GRO03 |
| 1992 11 19.83 | B | 5.5 | AA | 6.6 | B | 6 | 20 | 12.0 | 5 | 0.15 | 1 | PLE01 |
| 1992 11 19.85 | S | 4.8 | S | 8.0 | B | | 15 | 10 | 7 | &0.5 | 45 | SCH04 |
| 1992 11 20.08 | | | | 5.0 | B | | 10 | | | 1.4 | 47 | HAL |
| 1992 11 20.08 | B | 5.0 | SC | 1.0 | E | | 1 | | | | | HAL |
| 1992 11 20.10 | S | 4.8 | A | 8.0 | B | | 11 | 6 | 6 | | | SPR |
| 1992 11 20.69 | B | 5.0 | AA | 5.0 | B | | 10 | 3.5 | 4/ | | | IWA02 |
| 1992 11 20.69 | B | 6.0 | AA | 6 | B | | 20 | | 5 | | | BEN04 |
| 1992 11 20.70 | B | 5.0 | S | 5.0 | B | | 7 | | | 1.5 | | KYS |
| 1992 11 20.70 | S | 4.8 | AC | 8.0 | B | | 11 | 15 | 7 | | | TOM01 |
| 1992 11 20.75 | B | 5.8: | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 11 20.79 | B | 5.1 | AA | 6.0 | L | 6 | 30 | | 5 | | | ADA02 |
| 1992 11 20.81 | B | 5.3 | AA | 30.0 | L | 5 | 75 | 10 | 7 | 2.0 | 40 | MAR02 |
| 1992 11 21.40 | M | 5.3 | SC | 6.5 | R | 8 | 16 | 8 | 7 | 1.3 | 40 | NAK01 |
| 1992 11 21.44 | B | 5.5 | AA | 10.0 | B | 5 | 25 | & 6 | 7 | >0.2 | 60 | OBU |
| 1992 11 21.69 | B | 6.0 | AA | 7.0 | R | 5 | 16 | | 6 | | | CIC |
| 1992 11 21.70 | B | 5.4 | AA | 5.0 | B | | 7 | 7.8 | 5 | | | GRO03 |
| 1992 11 21.71 | B | 5.0 | S | 5.0 | B | | 7 | | | | | KYS |
| 1992 11 21.71 | B | 5.4 | AA | 7.5 | R | 3 | 15 | 3.5 | 5 | | 87 | IWA02 |
| 1992 11 21.72 | B | 5.1 | AA | 5.0 | B | | 7 | 7.6 | 6 | 0.2 | 42 | SPE01 |
| 1992 11 21.73 | B | 5.2 | AA | 8.0 | B | | 20 | 7.6 | 6 | | | SPE01 |
| 1992 11 21.74 | M | 5.8 | AA | 4 | B | | 11 | & 6 | 5 | | | KOS01 |
| 1992 11 21.74 | M | 5.9 | AA | 10 | R | 10 | 45 | & 6 | 5/ | | | KOS01 |
| 1992 11 21.78 | s S | 4.6 | SC | 4.2 | B | | 7 | | 7/ | | 40 | FIE |
| 1992 11 21.80 | B | 5.4 | AA | 31.2 | L | 4 | 50 | 4.5 | | 1.5 | | PUJ01 |
| 1992 11 21.81 | S | 5.0: | AA | 25.5 | L | 4 | 77 | & 8 | 3 | &0.5 | 45 | DIA |
| 1992 11 22.36 | S | 4.7 | Y | 3.5 | B | | 10 | 10 | 6 | 0.4 | 45 | SHI |
| 1992 11 22.39 | M | 4.7 | AA | 5.0 | B | | 7 | | 6 | 1.5 | 45 | KAT01 |
| 1992 11 22.66 | B | 5.7: | AA | 5.0 | B | | 7 | &20 | 6 | | | POW01 |
| 1992 11 22.70 | B | 5.6 | AA | 8 | R | 15 | 32 | 13.5 | 6 | | | SZU |
| 1992 11 22.70 | S | 4.8 | AC | 8.0 | B | | 11 | 15 | 7 | | | TOM01 |
| 1992 11 22.70 | S | 5.3 | AA | 6 | B | | 20 | 4.0 | 6 | | | OSS |
| 1992 11 22.72 | S | 5.0 | AA | 6.4 | R | 12 | 30 | 4.5 | 5 | | | URB |
| 1992 11 22.73 | M | 5.0 | AA | 5.0 | B | | 12 | 6 | 4 | 1.4 | 51 | TAN02 |
| 1992 11 22.75 | S | 5.0 | AA | 25.5 | L | 4 | 77 | 9 | 3 | &0.5 | 35 | DIA |
| 1992 11 23.09 | S | 4.8 | A | 8.0 | B | | 11 | 5 | 7 | | | SPR |
| 1992 11 23.10 | S | 5.0 | SC | 8.0 | B | | 11 | 3.7 | 6 | 0.5 | 45 | PRY |
| 1992 11 23.12 | S | 4.9 | A | 20.0 | T | 10 | 64 | 7 | 7 | 0.25 | 85 | SPR |
| 1992 11 23.39 | M | 4.8 | AA | 5.0 | B | | 7 | | 6 | 1.5 | 45 | KAT01 |
| 1992 11 23.69 | B | 5.7: | AA | 5.0 | B | | 10 | | 5/ | | | BET01 |
| 1992 11 23.72 | M | 5.1 | AA | 5.0 | B | | 12 | 4 | 4/ | 0.9 | 51 | TAN02 |
| 1992 11 23.73 | S | 4.8 | S | 8.0 | B | | 15 | 10 | 7 | &0.7 | 45 | SCH04 |
| 1992 11 23.74 | M | 5.0 | S | 5.0 | B | | 10 | &10 | 7 | >1 | 60 | COM |
| 1992 11 23.74 | S | 4.5 | S | 4.0 | B | | 8 | 15 | 7/ | | | BAK |
| 1992 11 23.74 | S | 4.8 | S | 11.0 | L | 7 | 32 | 10 | 6/ | &1 | 45 | SCH04 |
| 1992 11 23.75 | S | 4.5 | S | 5.0 | B | | 10 | 10 | 6 | 0.5 | 30 | LAA |
| 1992 11 24.12 | S | 4.9 | A | 14.0 | S | 4 | 28 | 8 | 8 | 0.42 | 90 | SPR |
| 1992 11 24.13 | S | 5.1 | SC | 8.0 | B | | 11 | 3.6 | 6 | 0.75 | 45 | PRY |
| 1992 11 24.39 | M | 4.8 | AA | 5.0 | B | | 7 | 8 | 7 | 1.8 | 45 | KAT01 |
| 1992 11 24.41 | M | 5.0 | SC | 6.5 | R | 8 | 16 | 6 | 7 | | 40 | NAK01 |
| 1992 11 24.67 | B | 5.2 | AA | 5.0 | B | | 7 | 7 | 7 | 2.2 | 60 | KOR01 |
| 1992 11 24.68 | B | 5.5 | S | 5 | B | | 10 | | 5/ | | | RZE01 |
| 1992 11 24.68 | M | 5.4 | AA | 11.0 | L | 7 | 32 | 6.4 | 6 | | | SWI01 |
| 1992 11 24.69 | B | 5.4 | AA | 6.7 | B | | 20 | & 5 | 5 | &0.50 | 47 | SCI |
| 1992 11 24.69 | S | 5.1 | AA | 6 | B | | 20 | 4.2 | 6 | | | OSS |
| 1992 11 24.70 | B | 6.1 | AA | 6 | B | | 20 | | 4 | | | BEN04 |
| 1992 11 24.70 | M | 5.3 | AA | 5.0 | B | | 7 | | 6 | | | SWI01 |
| 1992 11 24.70 | S | 4.8 | S | 3.0 | B | | 8 | &10 | 7/ | | | BUS01 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 24.71 | M | 5.0 | AA | 5.0 | B | | 12 | 4 | 4/ | 1.4 | 46 | TAN02 |
| 1992 11 24.71 | S | 4.5 | S | 6.7 | R | 4 | 14 | 10 | 7/ | &2 | 40 | BUS01 |
| 1992 11 24.72 | M | 4.9 | S | 5.0 | B | | 10 | &10 | 7 | &2 | 50 | COM |
| 1992 11 24.72 | S | 4.7 | S | 10.8 | L | 4 | 22 | 9 | 8 | &2 | 50 | BUS01 |
| 1992 11 24.74 | S | 5.3 | S | 8.0 | B | | 15 | 6.5 | 7 | | | FEI |
| 1992 11 24.75 | S | 5.8 | S | 5.0 | B | | 10 | 8 | 5 | 0.5 | 60 | ZAN01 |
| 1992 11 24.77 | B | 5.4 | AA | 7.5 | R | 3 | 15 | 3.7 | 5 | | | IWA02 |
| 1992 11 24.79 | B | 5.4 | AA | 10 | B | 5 | 25 | 12.0 | 5 | 0.5 | 5 | PLE01 |
| 1992 11 25.36 | S | 4.7 | Y | 3.5 | B | | 10 | 8 | 7 | 1.3 | 45 | SHI |
| 1992 11 25.39 | M | 4.6 | AA | 5.0 | B | | 7 | 8 | 7 | 2.5 | 50 | KAT01 |
| 1992 11 25.69 | B | 5.2 | AA | 5.0 | B | | 7 | | 5/ | | | GRO03 |
| 1992 11 25.71 | M | 5.1 | AA | 5.0 | B | | 12 | | 4/ | | | TAN02 |
| 1992 11 26.10 | | | | 5.0 | B | | 10 | | | 1.2 | 50 | HAL |
| 1992 11 26.10 | B | 5.1 | SC | 1.0 | E | | 1 | | | | | HAL |
| 1992 11 26.68 | B | 5.5 | S | 5 | B | | 10 | | 5/ | | | RZE01 |
| 1992 11 26.69 | S | 5.3 | AA | 6 | B | | 20 | 3.8 | 6/ | 0.7 | 41 | OSS |
| 1992 11 26.70 | B | 5.3 | AA | 5.0 | B | | 7 | 5.4 | 7 | 0.4 | 50 | SPE01 |
| 1992 11 26.70 | S | 5.2 | AA | 11 | L | 7 | 32 | 3.8 | 5/ | &1.0 | | MAR11 |
| 1992 11 26.71 | B | 5.4 | AA | 6.7 | B | | 20 | & 6 | 5 | 0.27 | 60 | SCI |
| 1992 11 26.72 | M | 5.0 | AA | 5.0 | B | | 12 | 4 | 4/ | 1.8 | 48 | TAN02 |
| 1992 11 26.73 | B | 5.4 | AA | 8.0 | B | | 20 | 5.4 | 6 | 0.3 | 50 | SPE01 |
| 1992 11 26.74 | S | 4.5 | SC | 5.0 | B | | 10 | 10 | 7 | &1 | 50 | SCH04 |
| 1992 11 26.77 | B | 5.3 | AA | 10 | B | 5 | 25 | 11.0 | 5 | 0.7 | 27 | PLE01 |
| 1992 11 27.70 | B | 4.7 | S | 5.0 | B | | 7 | | | 1.0 | | KYS |
| 1992 11 27.71 | M | 5.1 | AA | 5.0 | B | | 12 | | 5 | | | TAN02 |
| 1992 11 27.71 | M | 5.2 | AA | 10.0 | B | | 25 | 6.5 | 7 | 0.5 | | MEY |
| 1992 11 27.71 | S | 4.7 | AC | 8.0 | B | | 11 | 20 | 7 | | | TOM01 |
| 1992 11 27.75 | | 4.6 | S | 0.0 | E | | 1 | | 7 | | | GAR02 |
| 1992 11 27.78 | S | 5.0 | AA | 25.5 | L | 4 | 77 | 8 | 3 | 1.0 | 35 | DIA |
| 1992 11 28.06 | B | 5.5 | SC | 8.0 | B | | 11 | & 8 | 8 | 1.2 | 40 | ROB03 |
| 1992 11 28.36 | B | 5.6 | AA | 10.0 | B | 5 | 25 | 5 | 7 | >1.0 | 75 | OBU |
| 1992 11 28.68 | B | 5.4 | AA | 7.5 | R | 3 | 15 | 4.0 | 5/ | | | IWA02 |
| 1992 11 28.68 | S | 5.0: | AA | 5.0 | B | | 10 | &10 | 5 | | | ZHU |
| 1992 11 28.70 | S | 5.4 | SC | 5.0 | B | | 7 | | 6 | 0.7 | 35 | SKI |
| 1992 11 28.72 | B | 5.3 | AA | 5.0 | B | | 7 | 5.5 | 7 | 3.2 | 45 | KOR01 |
| 1992 11 28.72 | M | 5.0 | S | 0.0 | E | | | &10 | 7 | | | COM |
| 1992 11 28.72 | M | 5.1 | S | 5.0 | B | | 10 | &10 | 7 | &2 | 50 | COM |
| 1992 11 28.74 | S | 5.6 | S | 5.0 | B | | 10 | 10 | 6 | 0.6 | 30 | ZAN01 |
| 1992 11 28.77 | B | 5.6 | AA | 31.2 | L | 4 | 50 | 4 | | 1.5 | | PUJ01 |
| 1992 11 29.10 | M | 5.1 | SC | 5.0 | B | | 10 | | | 1.5 | 43 | HAL |
| 1992 11 29.36 | B | 5.4 | AA | 10.0 | B | 5 | 25 | 5 | 7 | >1.2 | 75 | OBU |
| 1992 11 29.38 | M | 4.7 | Y | 5.0 | B | | 7 | 6 | 7 | 1.5 | 50 | KAT01 |
| 1992 11 29.41 | M | 5.2 | SC | 6.5 | R | 8 | 16 | 7 | 7/ | | 50 | NAK01 |
| 1992 11 29.63 | B | 5.1 | AA | 5.0 | B | | 10 | 10 | 5 | | | ZHU |
| 1992 11 29.65 | B | 5.6 | AA | 4.5 | B | | 12 | & 2 | 5 | | | LUK01 |
| 1992 11 29.67 | B | 5.4 | AA | 5 | B | | 10 | 13.0 | 5/ | | | SZU |
| 1992 11 29.68 | B | 5.3 | AA | 5.0 | B | | 10 | 4.0 | 6 | | | IWA02 |
| 1992 11 29.68 | B | 5.4 | AA | 8 | R | 15 | 32 | 13.0 | 5/ | | | SZU |
| 1992 11 29.70 | B | 5.0 | S | 5.0 | B | | 7 | | | 0.5 | | KYS |
| 1992 11 29.71 | B | 5.5 | AA | 5.0 | B | | 10 | | 4 | | | MAT06 |
| 1992 11 29.71 | M | 5.2 | AA | 10.0 | B | | 25 | 4.8 | 7 | 0.4 | | MEY |
| 1992 11 29.72 | M | 5.0 | AA | 5.0 | B | | 12 | | 4/ | | | TAN02 |
| 1992 11 29.77 | B | 5.6 | AA | 31.2 | L | 4 | 50 | 4 | | 1.5 | | PUJ01 |
| 1992 11 29.77 | S | 5.0 | AA | 25.5 | L | 4 | 77 | 8 | 3 | 1.0 | 35 | DIA |
| 1992 11 29.79 | B | 5.3 | AA | 5 | B | 4 | 10 | 10 | 5 | 0.2 | 350 | PLE01 |
| 1992 11 30.37 | B | 5.3 | AA | 10.0 | B | 5 | 25 | 5 | 7 | >0.7 | 75 | OBU |
| 1992 11 30.38 | M | 4.7 | Y | 5.0 | B | | 7 | 6 | 7 | 1.8 | 50 | KAT01 |
| 1992 11 30.64 | S | 5.2 | AA | 13 | R | 15 | 25 | 9 | 5 | 0.1 | 300 | ZHU |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 11 30.66 | B | 5.2 | AA | 5.0 | B | | 10 | | 4 | | | PER04 |
| 1992 11 30.66 | S | 4.8 | AA | 6.4 | R | 12 | 30 | 5.7 | 6 | | | URB |
| 1992 11 30.67 | B | 5.0 | AA | 25 | L | 6 | 100 | | 6 | 0.3 | | ADA02 |
| 1992 11 30.67 | B | 5.4 | AA | 5.0 | B | | 10 | | 5 | | | MAT06 |
| 1992 11 30.68 | B | 5.1 | AA | 25 | L | 6 | 100 | | 7 | | | SWI |
| 1992 11 30.68 | B | 5.2 | AA | 6.7 | B | | 20 | & 6 | 5 | 0.22 | 60 | SCI |
| 1992 11 30.68 | B | 6.0 | AA | 7.0 | R | 5 | 16 | & 5 | 6 | | | CIC |
| 1992 11 30.68 | S | 5.1 | AA | 6.7 | R | 12 | 30 | | 5 | | | DAL01 |
| 1992 11 30.68 | S | 5.1 | AA | 6.7 | R | 12 | 30 | | 5 | | | DAL01 |
| 1992 11 30.68 | S | 5.5 | AA | 6 | B | | 20 | 3.8 | 6 | 0.5 | 41 | OSS |
| 1992 11 30.69 | B | 5.1 | AA | 3.5 | B | | 7 | | 6 | | | CIU |
| 1992 11 30.69 | M | 5.1 | AA | 7.0 | B | | 11 | 2.5 | 5 | | | KOS03 |
| 1992 11 30.69 | M | 5.1 | AA | 15.0 | L | 8 | 48 | 2.5 | 5 | | | KOS03 |
| 1992 11 30.69 | M | 5.4 | AA | 5.0 | B | | 7 | 7.0 | 7 | | | SWI01 |
| 1992 11 30.70 | B | 5.3 | AA | 5.0 | B | | 7 | 4.4 | 7/ | 0.3 | 44 | SPE01 |
| 1992 11 30.70 | M | 5.0 | S | 15.0 | L | 8 | 40 | & 3.7 | 6 | | | KOM |
| 1992 11 30.70 | M | 5.6 | AA | 4 | B | | 11 | & 7 | 5 | | | KOS01 |
| 1992 11 30.70 | S | 4.3 | S | 6.7 | R | 4 | 14 | 9 | 8 | &2 | 45 | BUS01 |
| 1992 11 30.70 | S | 4.4 | S | 8.0 | B | | 15 | 8 | 7/ | &0.7 | 45 | SCH04 |
| 1992 11 30.70 | S | 5.4 | AA | 3.5 | B | | 7 | 10 | 6 | | | ZBR |
| 1992 11 30.71 | B | 5.2 | AA | 5.0 | B | | 7 | & 6.8 | 5/ | | | GRO03 |
| 1992 11 30.71 | B | 5.5 | AA | 5.0 | B | | 7 | 2.5 | 7 | | | CNO |
| 1992 11 30.71 | M | 4.9 | S | 5.0 | B | | 10 | &10 | 7 | >1.5 | 60 | COM |
| 1992 11 30.71 | M | 5.3 | AA | 5.0 | B | | 12 | 3 | 4 | 1.1 | 44 | TAN02 |
| 1992 11 30.71 | S | 4.5 | S | 3.0 | B | | 8 | &10 | 7/ | | | BUS01 |
| 1992 11 30.72 | B | 5.4 | AA | 20 | L | 7 | 40 | 12.5 | 5/ | | | SZU |
| 1992 11 30.72 | S | 4.8 | S | 5.0 | B | | 10 | 10 | 7/ | 1 | 40 | LAA |
| 1992 11 30.73 | B | 5.0 | AA | 5.0 | B | | 7 | 6 | 4 | | | MER |
| 1992 11 30.73 | B | 5.4 | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 11 30.73 | B | 5.5 | AA | 8.0 | B | | 12 | | 4 | | | MOS01 |
| 1992 11 30.73 | B | 6.8 | S | | B | | | & 7 | 5 | | | FIL04 |
| 1992 11 30.75 | B | 5.4 | AA | 5 | B | | 10 | 13.0 | 5/ | | | SZU |
| 1992 11 30.76 | B | 5.2 | AA | 10 | B | 5 | 25 | 9.0 | 5/ | 0.6 | 28 | PLE01 |
| 1992 11 30.76 | B | 5.7 | AA | 6.0 | B | | 20 | | 5 | | | SOC |
| 1992 12 01.10 | S | 5.2 | A | 8.0 | B | | 11 | 5 | 5 | | | SPR |
| 1992 12 01.65 | B | 5.2 | AA | 5.0 | B | | 10 | | 7 | | | SWI |
| 1992 12 01.65 | B | 5.5 | AA | 5.0 | B | | 7 | 2.0 | 7 | | | CNO |
| 1992 12 01.67 | B | 5.0 | AA | 6.0 | B | | 20 | | 6 | 0.3 | | ADA02 |
| 1992 12 01.67 | B | 5.3 | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 12 01.67 | B | 5.4 | AA | 6.7 | B | | 20 | & 5 | 5 | 0.27 | 75 | SCI |
| 1992 12 01.69 | B | 5.3 | AA | 5.0 | B | | 10 | 4.2 | 6 | | | IWA02 |
| 1992 12 01.76 | B | 5.2 | AA | 10 | B | 5 | 25 | 9.0 | 5/ | 0.6 | 1 | PLE01 |
| 1992 12 02.37 | B | 5.2 | S | 5.0 | B | | | | 6 | 1.2 | 45 | OHK |
| 1992 12 02.66 | B | 5.5 | AA | 5.0 | R | 8 | 20 | &30 | 7/ | | | POW01 |
| 1992 12 02.67 | B | 5.0 | AA | 6.0 | B | | 20 | | 6 | 0.3 | | ADA02 |
| 1992 12 02.67 | B | 5.3 | AA | 5.0 | B | | 10 | | | | | KIE |
| 1992 12 02.67 | B | 5.4 | AA | 6.0 | B | | 20 | & 5 | 6 | &0.3 | 48 | RAF |
| 1992 12 02.67 | B | 5.5 | AA | 5.0 | B | | 7 | 2.5 | 7 | | | CNO |
| 1992 12 02.68 | B | 5.3 | AA | 5.0 | B | | 10 | 4.4 | 6 | | | IWA02 |
| 1992 12 02.68 | B | 5.4 | AA | 5.0 | B | | 7 | &28 | 8 | | | POW01 |
| 1992 12 02.68 | B | 5.4 | AA | 6.7 | B | | 20 | & 5 | 5 | 0.82 | 60 | SCI |
| 1992 12 02.68 | B | 5.5 | AA | 6 | B | | 20 | 3.3 | 6 | &0.6 | 51 | OSS |
| 1992 12 02.68 | S | 4.8 | AA | 6.4 | R | 12 | 30 | | 6 | | | URB |
| 1992 12 02.69 | B | 5.1 | AA | 3.5 | B | | 7 | | 6 | | | CIU |
| 1992 12 02.69 | M | 5.3 | AA | 5.0 | B | | 7 | | 7 | | | SWI01 |
| 1992 12 02.70 | B | 5.3 | AA | 5.0 | B | | 7 | 4.2 | 7 | 0.15 | 36 | SPE01 |
| 1992 12 02.70 | M | 5.3 | S | 15.0 | L | 8 | 40 | & 1.6 | 7 | | | KOM |
| 1992 12 02.70 | M | 5.6 | AA | 4 | B | | 11 | & 7 | 5 | | | KOS01 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 12 02.71 | B | 5.2 | AA | 5.0 | B | | 10 | | 7 | | | SWI |
| 1992 12 02.71 | B | 5.3 | AA | 5.0 | B | | 10 | | 5 | | | MAT06 |
| 1992 12 02.71 | B | 5.4 | AA | 5.0 | B | | 7 | | 5 | | | GRO03 |
| 1992 12 02.71 | B | 5.4 | AA | 8.0 | B | | 20 | 4.6 | 7 | 0.2 | 36 | SPE01 |
| 1992 12 02.71 | B | 5.5 | AA | 5.0 | B | | 10 | | 3 | | | PER04 |
| 1992 12 02.71 | M | 5.6 | AA | 10 | R | 10 | 45 | & 7 | 5/ | | | KOS01 |
| 1992 12 02.71 | S | 5.4 | AA | 6.7 | R | 12 | 30 | | 3 | | | DAL01 |
| 1992 12 02.71 | S | 5.4 | AA | 6.7 | R | 12 | 30 | | 3 | | | DAL01 |
| 1992 12 02.72 | S | 6.2: | AA | 5.0 | B | | 7 | &20 | 5 | | | SAD |
| 1992 12 02.74 | B | 5.3 | AA | 6.0 | B | | 20 | | 5 | | | SOC |
| 1992 12 02.74 | B | 5.4 | AA | 5 | B | | 10 | 12.5 | 5 | | | SZU |
| 1992 12 02.75 | B | 5.2 | AA | 10 | B | 5 | 25 | 9.0 | 5/ | 0.2 | 350 | PLE01 |
| 1992 12 02.75 | B | 5.4 | AA | 20 | L | 7 | 40 | 12.5 | 5 | | | SZU |
| 1992 12 02.75 | B | 5.5 | AA | 6 | B | | 20 | | 4 | | | BEN04 |
| 1992 12 03.36 | B | 5.1 | AA | 10.0 | B | 5 | 25 | 5 | 7/ | >0.5 | 75 | OBU |
| 1992 12 03.39 | B | 5.1 | S | 5.0 | B | | | | 6 | | | OHK |
| 1992 12 03.78 | I | 5.5 | SC | 5.0 | B | | 7 | | 7 | | | SKI |
| 1992 12 04.09 | S | 5.4 | A | 8.0 | B | | 11 | 5 | 6 | | | SPR |
| 1992 12 04.66 | B | 5.1 | AA | 6.0 | B | | 20 | & 7 | 5 | 0.50 | 70 | SCI |
| 1992 12 04.66 | B | 5.4: | AA | 6.0 | B | | 20 | | | | | RAF |
| 1992 12 04.66 | B | 5.5 | S | 5 | B | | 10 | | 6 | | | RZE01 |
| 1992 12 04.68 | B | 5.4 | AA | 4.5 | B | | 12 | | 5 | | | LUK01 |
| 1992 12 04.68 | M | 5.3 | AA | 5.0 | B | | 7 | 7.0 | 7 | | | SWI01 |
| 1992 12 04.69 | B | 5.0 | AA | 8.0 | B | | 40 | | 5 | | | SOC |
| 1992 12 04.69 | S | 4.7 | AA | 6.4 | R | 12 | 30 | | 5 | | | URB |
| 1992 12 04.69 | S | 4.7: | AA | 6.0 | B | | 20 | | | | | OLE |
| 1992 12 04.70 | B | 5.4: | AA | 3.0 | B | | 8 | &25 | 7 | | | POW01 |
| 1992 12 04.70 | M | 5.0 | A | 5.0 | B | | 10 | &10 | 7 | >1 | 50 | COM |
| 1992 12 04.70 | M | 5.4 | AA | 4 | B | | 11 | | 5/ | | | KOS01 |
| 1992 12 04.70 | S | 4.8 | AC | 8.0 | B | | 11 | 20 | 7 | | | TOM01 |
| 1992 12 04.70 | S | 6.5 | AA | 5.0 | B | | 7 | | 3/ | | | SAD |
| 1992 12 04.71 | B | 5.7 | AA | 6 | B | | 20 | 2.7 | 5/ | 0.6 | 49 | OSS |
| 1992 12 04.71 | M | 5.2 | AA | 7.0 | B | | 20 | | 5 | 1.3 | 44 | TAN02 |
| 1992 12 04.73 | S | 4.6 | S | 8.0 | B | | 15 | 8 | 7 | | 50 | SCH04 |
| 1992 12 04.76 | B | 5.2 | AA | 6.6 | B | 6 | 20 | 7 | 5 | 0.22 | | PLE01 |
| 1992 12 05.36 | B | 5.2 | AA | 10.0 | B | 5 | 25 | 4 | 8 | >1.0 | 75 | OBU |
| 1992 12 05.38 | M | 4.8 | Y | 3.0 | B | | 8 | 6 | 7 | 0.5 | 50 | KAT01 |
| 1992 12 05.70 | S | 4.6 | S | 8.0 | B | | 15 | 8 | 7/ | &0.6 | 45 | SCH04 |
| 1992 12 05.70 | S | 5.6 | AA | 12 | R | 5 | 20 | 4.4 | 8 | 0.35 | 47 | KOR01 |
| 1992 12 05.71 | S | 4.4 | S | 6.7 | R | 4 | 14 | 9 | 8 | >1 | 45 | BUS01 |
| 1992 12 05.72 | B | 5.0 | AA | 5.0 | B | | 7 | 6 | 3 | | | MER |
| 1992 12 05.72 | B | 5.7 | AA | 5.0 | B | | 7 | 4 | 8 | 0.2 | | KOR01 |
| 1992 12 05.72 | S | 4.6 | S | 3.0 | B | | 8 | & 9 | 7/ | &0.5 | | BUS01 |
| 1992 12 05.72 | S | 4.8 | S | 5.0 | B | | 10 | 5 | 8 | | | LAA |
| 1992 12 05.72 | S | 5.1 | SC | 8.0 | B | | 15 | 4 | 8 | | | FEI |
| 1992 12 05.73 | B | 4.9 | AA | 3.0 | B | | 8 | 6 | 3 | | | MER |
| 1992 12 06.36 | B | 5.3 | AA | 10.0 | B | 5 | 25 | 5 | 7/ | >0.5 | 70 | OBU |
| 1992 12 06.68 | S | 4.8 | AC | 8.0 | B | | 11 | 20 | 7 | | | TOM01 |
| 1992 12 06.71 | B | 5.4: | AA | 5.0 | B | | 10 | 4.5 | 5 | | | IWA02 |
| 1992 12 06.73 | S | 5.3 | AA | 13 | L | 4 | 26 | 6 | 7 | 0.75 | 50 | KOR01 |
| 1992 12 07.64 | B | 5.3 | AA | 5 | R | | 7 | 10 | 5 | | | ZHU |
| 1992 12 07.64 | B | 5.4 | AA | 13 | R | 15 | 25 | 9 | 4/ | | | ZHU |
| 1992 12 07.71 | M | 5.5 | AA | 7.0 | B | | 20 | | 5 | | | TAN02 |
| 1992 12 08.39 | M | 4.9 | Y | 5.0 | B | | 7 | 5 | 7 | 0.8 | 55 | KAT01 |
| 1992 12 08.62 | B | 5.3 | AA | 30 | R | 15 | 72 | 8 | 6/ | | | ZHU |
| 1992 12 08.63 | B | 5.2 | AA | 5.0 | B | | 10 | 10 | 5 | | | ZHU |
| 1992 12 10.81 | S | 5.0: | AA | 25.5 | L | 4 | 77 | 4 | 3 | &0.5 | 45 | DIA |
| 1992 12 11.37 | M | 4.9 | Y | 3.0 | B | | 8 | 5 | 7 | 0.8 | 60 | KAT01 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 12 11.68 | S | 5.2 | SC | 5.0 | B | | 7 | & 5 | 7 | | | SKI |
| 1992 12 11.69 | B | 5.4 | AA | 5.0 | B | | 10 | 4.5 | 5 | | | IWA02 |
| 1992 12 11.72 | M | 5.1 | AA | 7.0 | B | | 20 | | 6 | | | TAN02 |
| 1992 12 11.72 | S | 4.9 | AC | 8.0 | B | | 11 | 20 | 7 | | | TOM01 |
| 1992 12 12.69 | M | 5.1 | AA | 7.0 | B | | 11 | 2.5 | 5 | | | KOS03 |
| 1992 12 12.69 | M | 5.1 | AA | 15.0 | L | 8 | 48 | 2.5 | 5 | | | KOS03 |
| 1992 12 12.71 | M | 5.4 | AA | 7.0 | B | | 20 | 2.6 | 6 | 0.9 | 47 | TAN02 |
| 1992 12 12.77 | K | 4.9 | S | 5.0 | B | | 12 | 10 | 5 | 2.0 | 37 | MAR02 |
| 1992 12 12.77 | S | 5.4 | AA | 25.5 | L | 4 | 77 | 4 | 3 | 0.66 | 50 | DIA |
| 1992 12 13.67 | B | 5.3: | AA | 20 | L | 7 | 40 | 13.0 | 5 | | | SZU |
| 1992 12 13.67 | B | 5.4 | AA | 8 | R | 15 | 32 | 13.0 | 5 | | | SZU |
| 1992 12 13.68 | B | 5.4 | AA | 20 | L | 7 | 75 | 13.0 | 5 | | | SZU |
| 1992 12 13.69 | B | 5.2 | AA | 5.0 | B | | 7 | & 7.0 | 5 | | | GRO03 |
| 1992 12 13.71 | B | 5.7 | AA | 6 | B | | 20 | | | | | OSS |
| 1992 12 13.74 | S | 5.4 | AA | 13 | L | 4 | 26 | 3.7 | 7 | 1.7 | 48 | KOR01 |
| 1992 12 13.78 | B | 5.3 | AA | 5 | B | 4 | 10 | 7 | 5/ | 0.1 | 45 | PLE01 |
| 1992 12 13.78 | B | 5.4 | AA | 6.6 | B | 6 | 20 | 6.0 | 5 | 0.15 | 45 | PLE01 |
| 1992 12 14.39 | M | 5.3 | SC | 6.5 | R | 8 | 16 | 6 | 7 | 1.2 | 50 | NAK01 |
| 1992 12 14.68 | B | 5.6 | AA | 5.0 | B | | 10 | 4.0 | 5 | | | IWA02 |
| 1992 12 14.70 | M | 5.4 | AA | 7.0 | B | | 20 | | 7 | | | TAN02 |
| 1992 12 15.07 | M | 5.0 | SC | 5.0 | B | | 10 | | | 1.8 | 58 | HAL |
| 1992 12 15.67 | B | 5.7 | AA | 5.0 | B | | 10 | 4.0 | 4/ | | | IWA02 |
| 1992 12 15.67 | S | 5.3 | AA | 6.7 | B | | 20 | & 5 | 4 | 0.17 | 60 | SCI |
| 1992 12 15.68 | B | 5.3 | S | 10.0 | B | | 25 | | | 0.6 | | ZNO |
| 1992 12 15.69 | S | 5.5 | AA | 6 | B | | 20 | | 5 | | | OSS |
| 1992 12 15.69 | S | 5.7 | AA | 14.2 | L | 6 | 30 | 3 | 6 | | | OSS |
| 1992 12 15.70 | B | 5.3 | AA | 5.0 | B | | 7 | | 5 | | | GRO03 |
| 1992 12 15.70 | S | 4.8 | S | 8.0 | B | | 15 | 7 | 7/ | &0.7 | 60 | SCH04 |
| 1992 12 15.71 | s M | 5.1 | AA | 10.0 | B | | 25 | 3.0 | 7 | 0.3 | | MEY |
| 1992 12 15.71 | M | 5.4 | AA | 7.0 | B | | 20 | | 6/ | | | TAN02 |
| 1992 12 15.74 | B | 5.2 | AA | 5.0 | B | | 7 | 4 | 4 | 2.0 | 27 | MER |
| 1992 12 15.77 | B | 5.2 | AA | 10 | B | 5 | 25 | 8.0 | 5/ | 0.15 | 357 | PLE01 |
| 1992 12 15.77 | B | 5.3 | AA | 5 | B | 4 | 10 | 6.5 | 6 | 0.1 | 357 | PLE01 |
| 1992 12 16.00 | B | 4.9 | SC | 8.0 | B | | 11 | < 5 | 8 | 1.5 | 60 | ROB03 |
| 1992 12 16.37 | M | 5.1 | Y | 5.0 | B | | 7 | 5 | 7 | 0.5 | 60 | KAT01 |
| 1992 12 16.60 | B | 5.2 | AA | 8.0 | B | | 12 | | | | | MOS01 |
| 1992 12 16.65 | B | 5.5: | AA | 5.0 | B | | 10 | | | | | KIE |
| 1992 12 16.66 | B | 5.3 | AA | 11.0 | B | 4 | 20 | & 5 | 5 | | | CHE03 |
| 1992 12 16.67 | B | 5.0 | AA | 5.0 | B | | 10 | | 5 | | | MAT06 |
| 1992 12 16.67 | B | 5.5: | AA | 5.0 | B | | 7 | 2.5 | 7 | | | CNO |
| 1992 12 16.69 | B | 5.3 | AA | 5.0 | B | | 7 | & 6.9 | 5/ | | | GRO03 |
| 1992 12 16.70 | S | 4.8 | S | 8.0 | B | | 15 | & 6 | 8 | | | SCH04 |
| 1992 12 16.70 | S | 5.2: | S | 5.0 | B | | 10 | | 7 | | | COM |
| 1992 12 16.70 | S | 5.4 | AC | 8.0 | B | | 11 | 20 | 7 | | | TOM01 |
| 1992 12 16.73 | S | 5.4 | AA | 13 | L | 4 | 26 | 4.3 | 6/ | 1.1 | 49 | KOR01 |
| 1992 12 16.75 | B | 5.3 | AA | 5 | B | 4 | 10 | 6 | 6 | 0.4 | 39 | PLE01 |
| 1992 12 16.75 | B | 5.5 | AA | 10 | B | 5 | 25 | 8.0 | 5/ | 0.7 | 39 | PLE01 |
| 1992 12 16.77 | B | 5.3 | AA | 6.0 | B | | 9 | 4 | 4 | | | MER |
| 1992 12 16.78 | S | 5.4 | AA | 25.5 | L | 4 | 77 | 4 | 3 | 0.5 | 50 | DIA |
| 1992 12 17.06 | M | 5.0 | SC | 5.0 | B | | 10 | | | 2.0 | 50 | HAL |
| 1992 12 17.40 | M | 5.6 | SC | 6.5 | R | 8 | 16 | 4.5 | 8 | 0.7 | 60 | NAK01 |
| 1992 12 18.09 | S | 5.2 | A | 8.0 | B | | 11 | 5 | 6 | 0.5 | 80 | SPR |
| 1992 12 18.64 | & B | 5.3: | AA | 13 | R | 15 | 25 | 5 | 5 | 0.05 | 150 | ZHU |
| 1992 12 18.67 | B | 5.3 | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 12 18.67 | B | 5.3 | AA | 8.0 | B | | 12 | | | | | PER04 |
| 1992 12 18.67 | S | 5.5 | AA | 6.7 | B | | 20 | & 5 | 4/ | 0.53 | 55 | SCI |
| 1992 12 18.73 | B | 5.6 | AA | 10 | B | 5 | 25 | 7 | 5/ | 0.2 | 0 | PLE01 |
| 1992 12 19.38 | M | 5.3 | Y | 5.0 | B | | 7 | 5 | 8 | 0.2 | 60 | KAT01 |

Periodic Comet Swift-Tuttle (1992t) [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 12 19.39 | M | 5.5 | SC | 6.5 | R | 8 | 16 | 6 | 8 | | 55 | NAK01 |
| 1992 12 19.62 | & M | 5.5 | AA | 12 | R | 5 | 23 | 4 | 5 | | | ZHU |
| 1992 12 19.63 | a B | 5.3 | AA | 5.0 | B | | 10 | 5 | 4/ | | | ZHU |
| 1992 12 19.65 | B | 5.5: | AA | 5.0 | B | | 7 | 2.0 | 7 | | | CNO |
| 1992 12 19.66 | B | 5.5 | AA | 5.0 | B | | 10 | | 5 | | | SWI |
| 1992 12 19.67 | B | 5.5 | AA | 5.0 | B | | 10 | | 5 | | | MAT06 |
| 1992 12 19.67 | B | 5.6 | AA | 8.0 | B | | 12 | | | | | KIE |
| 1992 12 19.67 | ) B | 5.6 | AA | 8.0 | B | | 12 | | | | | PER04 |
| 1992 12 19.67 | B | 6.0 | AA | 6.0 | B | | 20 | | 5 | | | ADA02 |
| 1992 12 19.68 | B | 5.8 | S | | B | | | & 7 | 5/ | &0.15 | 55 | FIL04 |
| 1992 12 19.68 | M | 5.6 | AA | 6.0 | B | 5 | 20 | & 6 | 4 | | | PAR03 |
| 1992 12 19.74 | B | 5.7 | AA | 10 | B | 5 | 25 | 6.0 | 5/ | 0.2 | 28 | PLE01 |
| 1992 12 20.07 | M | 5.6 | SC | 5.0 | B | | 10 | | | 1.2 | 57 | HAL |
| 1992 12 20.68 | B | 5.9 | AA | 5.0 | B | | 10 | 3.8 | 4 | | | IWA02 |
| 1992 12 20.73 | & B | 5.1 | S | 5 | R | | 8 | 1.5 | 6 | | | GAR02 |
| 1992 12 21.35 | B | 6.0 | S | 10.0 | B | 5 | 25 | & 4 | 7/ | | | OBU |
| 1992 12 22.39 | M | 5.8 | SC | 20 | L | 6 | 46 | 4 | 7 | | 70 | NAK01 |
| 1992 12 23.67 | B | 6.0 | AA | 6.0 | B | | 20 | | 4 | | | ADA02 |
| 1992 12 24.07 | | | | 20 | L | 6 | 55 | | | 0.3 | 60 | HAL |
| 1992 12 24.07 | M | 5.3: | SC | 5.0 | B | | 10 | | | | | HAL |
| 1992 12 26.38 | M | 5.7 | Y | 5.0 | B | | 7 | 3 | 8 | 0.5 | 60 | KAT01 |
| 1992 12 26.39 | M | 5.6 | SC | 20 | L | 6 | 46 | 3.5 | 7 | | 90 | NAK01 |
| 1992 12 26.74 | B | 6.0 | AA | 10 | B | 5 | 25 | 5 | 6 | 0.2 | 25 | PLE01 |
| 1992 12 30.37 | M | 6.0 | Y | 5.0 | B | | 7 | 3 | 8 | | | KAT01 |
| 1993 01 01.37 | I | 6.3 | Y | 5.0 | B | | 7 | | | | | KAT01 |
| 1993 02 17.63 | M | 8.8 | AA | 21.0 | L | 9 | 76 | 2.4 | 3 | | | WOL01 |
| 1993 02 17.63 | M | 8.9 | AA | 21.0 | L | 9 | 106 | 2.2 | 3 | | | WOL01 |
| 1993 02 17.63 | M | 8.9 | AA | 21.0 | L | 9 | 152 | 2.2 | 2 | | | WOL01 |
| 1993 02 17.69 | S | 9.1 | CS | 31.7 | L | 5 | 86 | 1 | 0 | | | JON |
| 1993 02 18.69 | S | 9.4 | CS | 31.7 | L | 5 | 86 | | 0 | | | JON |
| 1993 02 19.81 | S | 9.3 | AA | 10.0 | B | | 25 | & 3.5 | 4/ | | | SEA |
| 1993 02 21.61 | M | 9.2 | AA | 21.0 | L | 9 | 76 | 2.0 | 2 | | | WOL01 |
| 1993 02 21.61 | M | 9.2 | AA | 21.0 | L | 9 | 106 | 2.0 | 2 | | | WOL01 |
| 1993 02 21.61 | M | 9.2 | AA | 21.0 | L | 9 | 152 | 1.8 | 2 | | | WOL01 |
| 1993 02 22.75 | S | 8.8 | AA | 10.0 | B | | 25 | 8 | | | | SEA |
| 1993 02 23.75 | S | 9.5 | SM | 8.0 | B | | 20 | 4 | 0/ | | | CAM03 |
| 1993 02 24.76 | S | 9.2 | AA | 10.0 | B | | 25 | | | | | SEA |
| 1993 02 26.76 | S | 9.4 | SM | 8.0 | B | | 20 | 4 | 1 | | | CAM03 |
| 1993 02 28.56 | M | 9.6 | AA | 21.0 | L | 9 | 76 | 2.0 | 2 | | | WOL01 |
| 1993 02 28.56 | M | 9.6 | AA | 21.0 | L | 9 | 106 | 1.8 | 2 | | | WOL01 |
| 1993 03 01.75 | S | 9.4 | AA | 10.0 | B | | 25 | & 4 | 2 | | | SEA |
| 1993 03 03.76 | S | 9.7 | SM | 8.0 | B | | 20 | 3 | | | | CAM03 |
| 1993 03 13.56 | M | 10.5 | VN | 21.0 | L | 9 | 76 | 0.8 | 2 | | | WOL01 |
| 1993 03 13.56 | M | 10.6 | VN | 21.0 | L | 9 | 106 | 0.7 | 2 | | | WOL01 |
| 1993 03 13.56 | M | 10.8 | VN | 21.0 | L | 9 | 152 | 0.7 | 2 | | | WOL01 |
| 1993 03 21.75 | S | 10.0 | SM | 8.0 | B | | 20 | 5 | 0 | | | CAM03 |
| 1993 03 21.77 | S | 10.0 | SM | 20.3 | L | | 56 | 3 | 0 | | | CAM03 |
| 1993 03 23.74 | S | 10.2 | SM | 20.3 | L | | 56 | 3 | 0 | | | CAM03 |

Periodic Comet Brorsen-Metcalf (1989 X)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 07 23.74 | S | 8.7 | AA | 15 | L | 6 | 28 | 4 | 4 | | | YOS03 |
| 1989 07 24.75 | S | 8.0 | S | 15 | L | 6 | 28 | 6 | 4 | | | YOS03 |
| 1989 07 27.61 | S | 8.6 | S | 13 | L | 8 | 31 | 10 | 3 | | | KAN03 |
| 1989 07 27.68 | S | 8.1 | S | 15 | L | 6 | 28 | 6 | 4 | | | YOS03 |
| 1989 07 28.62 | S | 8.5 | S | 13 | L | 8 | 31 | 10 | 3 | | | KAN03 |
| 1989 07 30.76 | S | 8.3 | S | 13 | L | 8 | 31 | 6 | 5 | | | KAN03 |

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

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 08 03.67 | S | 8.0 | S | 13 | L | 8 | 31 | 6 | 5 | | | KAN03 |
| 1989 08 07.69 | B | 7.7 | S | 12.0 | B | | 20 | 6 | 2 | | | HIS |
| 1989 08 10.69 | S | 7.3 | S | 13 | L | 8 | 31 | 10 | 6 | | | KAN03 |
| 1989 08 10.74 | S | 6.4 | S | 5.0 | B | | 7 | 7 | 6 | | | YOS03 |
| 1989 08 12.74 | S | 6.7 | AA | 8.0 | B | | 11 | | 6 | | | MOM |
| 1989 08 12.77 | S | 7.1 | S | 31 | L | 6 | 56 | 7 | 6 | 0.17 | | KAN03 |
| 1989 08 13.73 | B | 6.9 | S | 12.0 | B | | 20 | 6 | 3 | | | HIS |
| 1989 08 15.78 | S | 6.3 | AA | 15 | L | 6 | 28 | 6 | 6 | | | YOS03 |
| 1989 08 20.76 | E | 6.0 | AA | 5.0 | B | | 7 | 6 | 6 | | | YOS03 |
| 1989 08 21.80 | S | 6.0 | AA | 8.0 | B | | 20 | 4 | 6 | | | YOS03 |
| 1989 08 22.80 | B | 6.3 | S | 12.0 | B | | 20 | 5 | 7 | | | HIS |
| 1989 08 22.80 | S | 6.0 | S | 7.0 | B | | 10 | 5 | 6 | 0.17 | | MIY |
| 1989 08 23.78 | B | 6.3 | S | 12.0 | B | | 20 | 4 | 7 | | | HIS |
| 1989 08 27.80 | B | 6.2 | S | 12.0 | B | | 20 | 3 | 7 | | | HIS |
| 1989 08 28.80 | S | 5.6 | AA | 5.0 | B | | 7 | 3 | 7 | | | YOS03 |
| 1989 09 01.80 | B | 5.4 | AA | 6.0 | B | | 15 | 12 | 5 | | | ASA |
| 1989 09 01.81 | S | 5.6 | AA | 7.0 | B | | 10 | 3 | 7 | | | MIY |
| 1989 09 09.81 | S | 6.2 | S | 7.0 | B | | 10 | 3 | 7 | | | MIY |

Periodic Comet Schwassmann-Wachmann 1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 09 02.00 | S[ | 13.8 | PA | 19.9 | L | 4 | 129 | ! 0.5 | | | | ZHU |
| 1992 09 03.09 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 09 26.06 | S[ | 13.3 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 10 01.41 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 10 03.02 | S[ | 13.0 | PA | 19.9 | L | 4 | 129 | ! 0.5 | | | | ZHU |
| 1992 11 15.19 | I[ | 13.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 11 27.83 | S[ | 13.3 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 11 28.92 | S[ | 13.3 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 11 29.33 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 15.19 | I[ | 13.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 17.30 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1992 12 18.93 | S[ | 13.8 | PA | 20 | R | 15 | 214 | ! 0.5 | | | | ZHU |
| 1992 12 18.98 | S[ | 13.8 | PA | 30 | R | 15 | 281 | ! 0.5 | | | | ZHU |
| 1992 12 20.76 | S[ | 13.3 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 21.76 | S[ | 13.0 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 26.85 | S[ | 13.4 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 27.98 | S[ | 13.5 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1992 12 29.98 | S[ | 13.5 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 02.10 | S[ | 13.4 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 13.20 | I[ | 13.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 01 17.82 | S[ | 13.5 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 19.00 | S[ | 13.3 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 01 20.32 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 01 22.00 | S[ | 13.5 | AC | 20.3 | T | 10 | 250 | ! 0.5 | | | | GAR02 |
| 1993 01 23.28 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 01 25.94 | ! V[ | 17.7 | HR | 19.0 | T | 4 | | | | | | MIK |
| 1993 02 08.76 | ! V | 12.8 | HR | 20.0 | T | 2 | | 0.8 | 8/ | | | MIK |
| 1993 02 10.14 | S | 12.7 | WA | 41 | L | 4 | 183 | | 2/ | | | HAL |
| 1993 02 13.75 | ! V | 12.6 | HR | 20.0 | T | 2 | | & 1 | 8 | | | MIK |
| 1993 02 13.95 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 02 14.83 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 02 15.82 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 02 16.74 | ! V | 12.8 | YF | 20.0 | T | 2 | | 0.5 | 8/ | 0.03 | 15 | MIK |
| 1993 02 18.29 | S | 12.8 | WA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 02 18.87 | S | 12.6: | AC | 20.3 | T | 10 | 250 | 0.3 | 2 | | | GAR02 |
| 1993 02 19.84 | S | 12.5: | AC | 20.3 | T | 10 | 167 | 0.5 | 2 | | | GAR02 |

Periodic Comet Schwassmann-Wachmann 1 [cont.]

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 02 20.78 | ! V | 13.4 | YF | 20.0 | T | 2 | | & 1 | 7 | | | MIK |
| 1993 02 20.89 | S | 12.9 | AC | 20.3 | T | 10 | 167 | 1 | 2 | 0.03 | 78 | GAR02 |
| 1993 02 23.81 | S | 13.8: | A | 28.0 | T | 10 | 168 | | 0 | | | COM |
| 1993 02 26.27 | I[ | 13.0: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 10.78 | ! V | 12.7 | YF | 20.0 | T | 2 | | & 2.5 | 5 | | | MIK |
| 1993 03 12.84 | C | 13.9 | HS | 57 | L | 5 | | + 0.5 | | | | PRA01 |
| 1993 03 14.76 | ! V | 12.9 | YF | 20.0 | T | 2 | | & 2 | 5 | | | MIK |
| 1993 03 16.80 | ! V | 13.1 | YF | 20.0 | T | 2 | | & 1.5 | 6 | | | MIK |
| 1993 03 17.23 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 18.77 | ! V | 13.1 | YF | 20.0 | T | 2 | | & 2 | 3 | | | MIK |
| 1993 03 18.83 | S[ | 13.2 | AC | 20.3 | T | 10 | 167 | ! 0.5 | | | | GAR02 |
| 1993 03 26.78 | ! V[ | 16.0 | YF | 20.0 | T | 2 | | | | | | MIK |
| 1993 04 08.82 | ! V | 13.3 | YF | 20.0 | T | 2 | | 1.5 | 4 | | | MIK |
| 1993 04 11.19 | I[ | 13.5: | | 41 | L | 4 | 183 | | | | | HAL |
| 1993 04 14.48 | C | 12.7 | HS | 60.0 | Y | 6 | | 0.5 | | | | NAK01 |
| 1993 04 17.82 | ! V[ | 15.5 | YF | 20.0 | T | 2 | | | | | | MIK |
| 1993 04 22.83 | ! V | 12.6 | YF | 20.0 | T | 2 | | 1.3 | 8 | | | MIK |
| 1993 04 23.84 | ! V | 12.8 | YF | 20.0 | T | 2 | | 1.1 | 8 | | | MIK |

Periodic Comet Väisälä 1 (1992u)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 02 13.90 | ! V | 13.5 | YF | 20.0 | T | 2 | | 1.0 | 8/ | | | MIK |
| 1993 02 20.88 | ! V | 13.5 | AA | 20.0 | T | 2 | | & 1 | 8 | | | MIK |
| 1993 02 21.39 | S | 13.1 | AA | 41 | L | 4 | 183 | & 1 | 5/ | | | HAL |
| 1993 02 22.34 | S | 13.1 | AA | 41 | L | 4 | 183 | & 1 | 5/ | | | HAL |
| 1993 02 25.57 | S | 13.0 | EA | 60.0 | Y | 8 | 200 | 0.8 | 5 | | | NAK01 |
| 1993 03 03.46 | S | 13.1 | AA | 41 | L | 4 | 183 | | 5/ | | | HAL |
| 1993 03 10.82 | ! V | 13.4 | YF | 20.0 | T | 2 | | 0.7 | 9 | | | MIK |
| 1993 03 17.35 | S | 12.9 | AA | 41 | L | 4 | 183 | | 5/ | | | HAL |
| 1993 03 18.80 | ! V | 12.9 | YF | 20.0 | T | 2 | | 1.0 | 8 | 0.04 | 150 | MIK |
| 1993 03 22.55 | S | 13.4 | GA | 60.0 | Y | 8 | 200 | 0.7 | 4 | | | NAK01 |
| 1993 03 25.29 | S | 13.2 | AA | 41 | L | 4 | 183 | | 4/ | | | HAL |
| 1993 03 26.90 | ! V | 13.8 | YF | 20.0 | T | 2 | | 0.6 | 9 | | | MIK |
| 1993 04 08.84 | ! V | 13.8 | YF | 20.0 | T | 2 | | 0.5 | 8/ | 0.04 | 125 | MIK |
| 1993 04 12.18 | S | 13.4 | AA | 41 | L | 4 | 183 | | 4 | | | HAL |
| 1993 04 14.54 | S | 13.8 | GA | 60.0 | Y | 8 | 200 | 0.8 | 5/ | | | NAK01 |
| 1993 04 17.83 | ! V | 14.2 | YF | 20.0 | T | 2 | | 0.5 | 8/ | 0.04 | 130 | MIK |
| 1993 04 20.95 | S | 14.2 | A | 45.0 | L | 4 | 113 | & 3 | 0/ | | | COM |
| 1993 04 26.95 | ! V | 14.2 | YF | 20.0 | T | 2 | | 0.5 | 8 | 0.06 | 130 | MIK |

Periodic Comet Shoemaker-Levy 9 (1993e)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 03 28.39 | S | 13.3 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 03 31.39 | S | 13.4 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 04 01.03 | ! V | 13.9 | YF | 20.0 | T | 2 | | | | | | MIK |
| 1993 04 01.71 | C | 14.1 | EB | 60.0 | Y | 6 | | 1.2 | | 0.06 | 258 | NAK01 |
| 1993 04 01.73 | S | 14.0 | AC | 60.0 | Y | 8 | 240 | 0.9 | 3/ | | | NAK01 |
| 1993 04 12.28 | S | 13.3 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 04 14.57 | C | 14.3 | HS | 60.0 | Y | 6 | | 1.0 | | 0.06 | 256 | NAK01 |
| 1993 04 14.59 | S | 13.9 | AC | 60.0 | Y | 8 | 253 | 0.9 | | | | NAK01 |
| 1993 04 16.91 | M | 12.6 | HS | 15 | R | 13 | 125 | 1.2 | 5 | | | ZNO |
| 1993 04 17.85 | ! V | 13.2 | YF | 20.0 | T | 2 | | | | | | MIK |
| 1993 04 19.30 | S | 13.5 | AA | 41 | L | 4 | 183 | | | | | HAL |
| 1993 04 20.90 | S | 12.8: | A | 25.0 | J | 6 | 115 | > 4 | 0 | | | COM |
| 1993 04 20.91 | M | 13.1 | HS | 15 | R | 13 | 125 | 1.2 | 4 | | | ZNO |
| 1993 04 23.98 | M | 13.6 | HS | 20 | R | 15 | 120 | 1.2 | 3 | | | ZNO |

# Recent News Concerning Comets

This issue of the *ICQ* was being delayed so that it could be mailed with the *1994 Comet Handbook* for those majority of *ICQ* subscribers who also get the annual *Handbook*, but the *Handbook* will be sent instead with the July *ICQ* (which will be printed early). Both this issue and the *1994 Comet Handbook* were delayed because of my March trip to Japan, which was largely organized by *Handbook* Editor Syuichi Nakano. I was the keynote speaker at the annual Comet Conference, which was held March 27-28 in Sumoto on the Japanese island of Awaji, and I was very impressed with the energy and enthusiasm with which the Japanese amateur astronomers hold their meetings. There were perhaps 100 people attending the Sumoto meeting, and in addition to regular talks at the two-day meeting, there were simultaneous Saturday evening workshops for discussion of certain topics such as orbit computation and comet discovery. In connection with my trip, I wrote a two-part article on the "ICQ Project" that was published in the March and April issues of *Tenmon Guide*, the popular Japanese astronomy magazine.

I had the privilege during my two weeks in Japan of visiting many interesting astronomical sites, including the Goto Planetarium and the National Astronomical Observatory in Tokyo (where I gave talks), the Nikon optical factory in Tokyo (where I was shown how glass is ground for lenses and mirrors used in cameras, binoculars, and telescopes; Nikon made the largest Schmidt telescope in Japan, at Kiso Observatory), and the Nobeyama radio observatory. The amateur observatories that I visited were truly amazing in terms of size and quality of equipment, and I was especially pleased to be able to visit the observatories/planetaria of well-known comet observers T. Seki and A. Nakamura on the island of Shikoku. I spent a night at the Yatsugatake South Base Observatory, located at the southern end of the Japanese Alps on Honshu island; this is a very ambitious enterprise by the husband-and-wife team Y. and R. Kushida, who are basically amateur astronomers who have leased a large lot of land on which amateurs build observatories and telescopes and on which the Kushidas teach astronomy to the general public for a small fee — like an observing planetarium.

While at the Sumoto conference, just before my return to the United States, I heard about a new comet Shoemaker-Levy 1993e, which was reported as being split into many different nuclei. This strange comet, at mag 13-14 and now known as P/Shoemaker-Levy 9, appears to have been orbiting Jupiter for some time. Evidently, comet 1993e had a very close encounter with Jupiter (within the planet's Roche limit) on 1992 July 8 which tore the comet apart into as many as 17 sub-nuclei spread out over a length of an arc minute or so by the time of discovery in March. And it now appears that P/Shoemaker-Levy 9 will pass within 0.0003 AU of Jupiter on 1994 July 25; the planet's radius is 0.0005 AU, so this suggests that at least part of the comet may well collide with Jupiter (see *IAU Circular* 5800).

In addition to comet 1993e, Carolyn Shoemaker also discovered comets 1992y and 1993h (on 18-inch Palomar Schmidt films) since I last wrote this column for the October 1992 issue, bringing her record total to 30 named comets. Jean Mueller has found her sixth and seventh comets (1993a and 1993d), both of long period, with the 48-inch Schmidt at Palomar. Amateur Nobuo Ohshita of Japan discovered long-period comet 1992$a_1$ with 25×150 binoculars on Nov. 24.8; the eleventh-magnitude comet was then moving northeastward in Virgo.

Jim Scotti (Lunar and Planetary Laboratory, University of Arizona) is once again monopolizing comet recoveries, having found P/Kojima (1992z), P/Bus (1993b), P/Tempel 1 (1993c), and P/Reinmuth 2 (1993g) with the 90-cm Spacewatch telescope, all of these comets being in the general magnitude range 21-22 upon recovery. Michael P. Candy at Perth Observatory (Australia) recovered P/Forbes (1993f) at mag 14 in March.

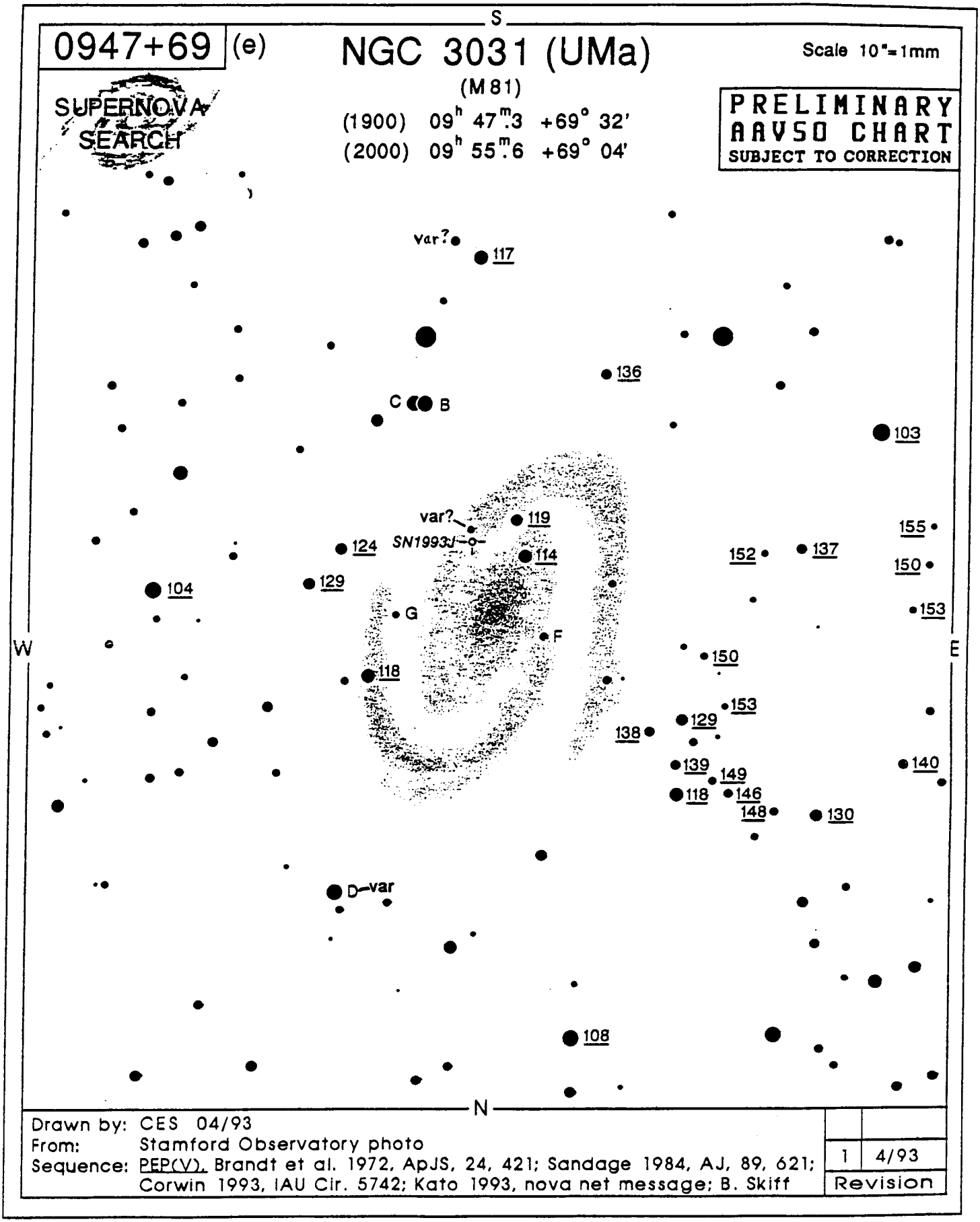
And two new asteroidal objects have been found in the past two months whose orbits take them beyond Neptune: 1993 FW is another 23rd-magnitude object out around 40 AU from the sun that may or may not cross the orbit of Neptune (*IAUC* 5730, 5796), and 1993 $HA_2$ appears to be another Chiron/Pholus object with its orbit basically beyond that of Saturn. How many of these objects might be comet-like in constitution? — D. W. E. Green (1993 May 25)

Φ Φ Φ

**The Last 10 Comets to Receive Provisional Letter Designations**

Listed below, for handy reference, are the last 10 comets which have been given letter designations (1989a is the first comet to be discovered/recovered in 1989, 1989b is the second comet..., etc.). After the "equal sign" is given the name, preceded by a star (⋆) if the comet is a new discovery (compared to a recovery from predictions of a previously-known short-period comet). Also given are such values as the orbital period (in years) for periodic comets, date of perihelion, $T$ (month/date/year), and the perihelion distance ($q$, in AU). Four-digit numbers in the second-to-last column indicate the *IAU Circular* containing the discovery/recovery announcement. The last column lists the 3-digit code for short-period comets as used internally in archival data (first 3 characters), and which should be used by those observers contributing data in computer-readable form. [This list updates that in the Jan. 1993 issue, p. 55.]

| *Desig.* | | | *Comet* | *P* | *T* | *q* | *IAUC* | P/ code |
|---|---|---|---|---|---|---|---|---|
| 1992z | = | | P/Kojima | 7.8 | 2/17/94 | 2.4 | 5667 | 515 |
| 1992$a_1$ | = | ⋆ | Ohshita | | 11/1/92 | 0.66 | 5668 | |
| 1993a | = | ⋆ | Mueller | | 1/12/94 | 1.94 | 5687 | |
| 1993b | = | | P/Bus | 6.5 | 6/28/94 | 2.2 | 5696 | 633 |
| 1993c | = | | P/Tempel 1 | 5.5 | 7/3/94 | 1.49 | 5698 | 507 |
| 1993d | = | ⋆ | Mueller | | 7/30/92 | 5.9 | 5723 | |
| 1993e | = | ⋆ | P/Shoemaker-Levy 9 | 17.5 | 4/20/94 | 5.4 | 5725 | 953 |
| 1993f | = | | P/Forbes | 6.1 | 3/14/93 | 1.4 | 5728 | 617 |
| 1993g | = | | P/Reinmuth 2 | 6.6 | 6/29/94 | 1.9 | 5772 | 618 |
| 1993h | = | ⋆ | Shoemaker-Levy | | | | 5803 | |


S
0947+69 (e)
NGC 3031 (UMa)
(M81)
(1900) 09h 47m.3 +69° 32'
(2000) 09h 55m.6 +69° 04'
Scale 10"=1mm
SUPERNOVA SEARCH
PRELIMINARY AAVSO CHART
SUBJECT TO CORRECTION
var?
117
136
C
B
103
var?
119
SN1993J
124
114
155
152
137
150
104
129
153
G
F
W
E
150
118
153
129
138
139
149
140
118
146
148
130
D—var
108
N
Drawn by: CES 04/93
From: Stamford Observatory photo
Sequence: PEP(V), Brandt et al. 1972, ApJS, 24, 421; Sandage 1984, AJ, 89, 621; Corwin 1993, IAU Cir. 5742; Kato 1993, nova net message; B. Skiff
1 4/93
Revision