THE INTERNATIONAL COMET QUARTERLY

WHOLE NUMBER 48 OCTOBER 1983 VOL. 5, NO. 4

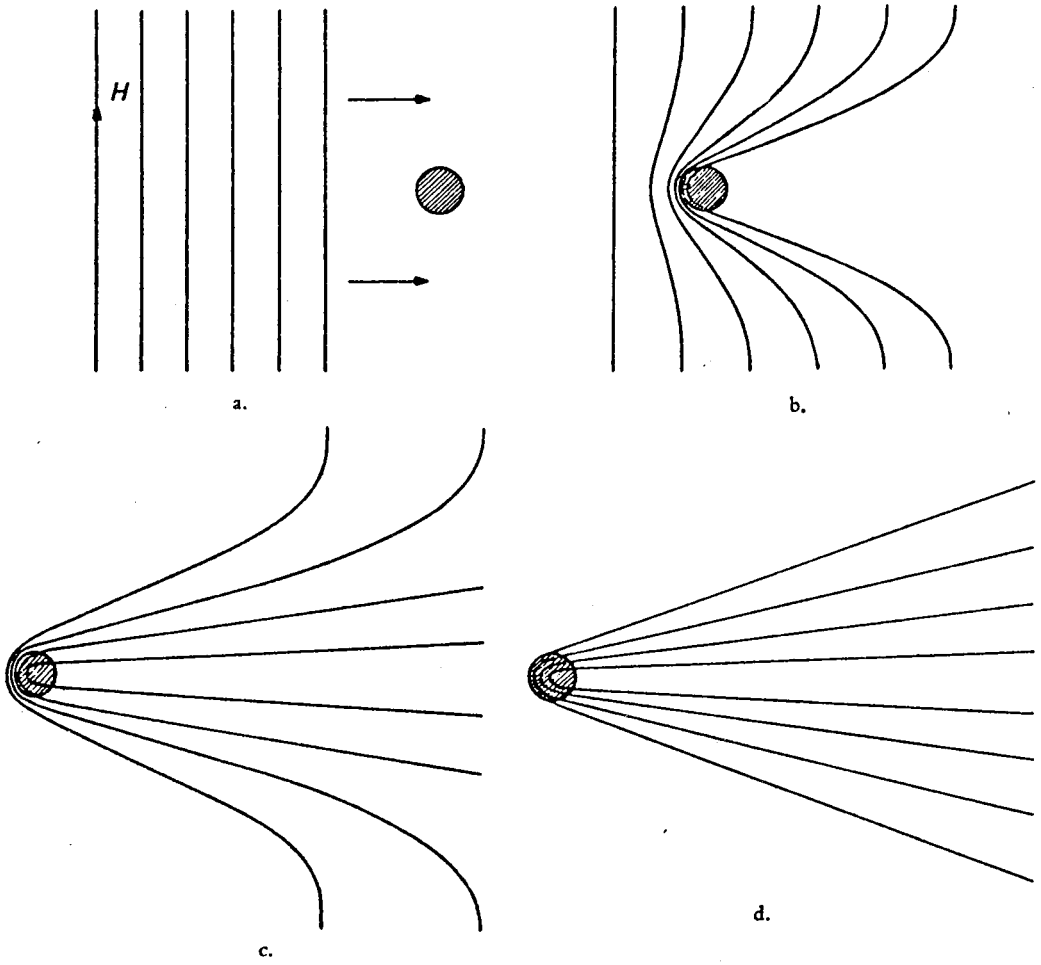


Figure 7 to "The Interaction of Comets with Solar Radiation and the Solar Wind" (see page 83): The "piling up" of the interplanetary magnetic field convected by the solar wind against the cometary ionosphere (from Alfvén 1957, Tellus 9, 92).

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INSIDE THIS ISSUE

THE INTERNATIONAL COMET QUARTERLY (ICQ) is a non-profit journal devoted to news and observation of comets. Issues are published 4 times per year (January, April, July, and October). The ICQ is published by the Department of Physics and Astronomy at Appalachian State University in Boone, North Carolina, U.S.A.

The regular (invoiced) subscription rate is US$14.00 per year. Subscribers who do not wish to be billed may subscribe at the special rate of US$8.00 per year, although such subscribers are NOT entitled to back issues lost by not renewing promptly. [For special subscribers, the last set of digits (after the second hyphen) on the top line of the mailing address label gives the Whole Number that signifies the last ICQ issue which will be sent under the current subscription status.] Make checks or money orders payable in U.S. funds to INTERNATIONAL COMET QUARTERLY and send to D. Green; Smithsonian Observatory; 60 Garden St.; Cambridge, MA 02138, U.S.A. Group subscription rates and advertising rates are available upon request. Manuscripts will be reviewed for possible publication; send typed, double-spaced copy to the Editor.

Cometary observations should be sent to C. S. Morris; R.D. 2, Box 96; Harvard, MA 01451, U.S.A., or to the Editor. Back issues are available from Dr. T. Rokoske; Dept. of Physics and Astronomy; A.S.U.; Boone, NC 28608, USA.



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This issue is No. 48 of the publication originally called THE COMET, founded in March 1973, and is Vol. 5, No. 4, of the ICQ. 

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## FROM THE EDITOR

Further to the notice on page 64 of the last issue, in which we stated the need for the use by observers of proper reporting methods for observations, we are having another serious problem with observations sent by a middle party. Recorders of various comet observing groups throughout the world should take extra precautions to assure that they send proper data to us. If observations are recopied from original manuscripts or report forms, they should be double-checked. We too often are finding many OBVIOUS mistakes on report forms -- and not only mistakes by group recorders, but also by individuals.

Our task in publishing these observations in the ICQ is in vain if extensive checking procedures are not used. A problem that has been growing is our receiving extremely poor photocopies of original report forms. These are quite simply unacceptable, as quite often many numbers are illegible. We strongly encourage individuals and group recorders alike to send us original forms. And we must insist more on the completing of report forms by use of a typewriter: many handwritten forms are done much too quickly, and are again quite messy and illegible. (Ss look like 5s, 3s look like 5s, 4s look like 9s, decimal points are lost, etc., etc.)

Needless to say, we will have to return such illegible report forms to individuals without gaining any information for publication. Part of the reason for publication delays of this and preceding issues of the ICQ is this problem with the reporting of observations. These delays can be shortened appreciably by proper communication of data by observers and recorders. Thank you for your help! —Daniel Green

# THE INTERACTION OF COMETS WITH SOLAR RADIATION AND THE SOLAR WIND. II.

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EDITOR'S NOTE: PART I OF THIS REVIEW PAPER WAS PUBLISHED IN THE LAST ISSUE.

## V. THE PLASMA TAIL AND THE NATURE OF THE COMET/SOLAR-WIND INTERACTION

Based on (a) the orientations of the type-I plasma tails of comets, (b) the large accelerations of the plasma tail structures (e.g., 'condensations' or 'knots'), and (c) the correlation between the disturbances in the type-I tail and the solar wind and geomagnetic disturbances, there is now general agreement that there is a strong, fluid-like interaction between the solar wind and the cometary plasma. Yet the details of this coupling still remain rather obscure and are the subject of vigorous discussion.

The dynamics of type-II dust tails can be explained largely in terms of the motions of dust particles under the combined effect of solar gravity and solar radiation pressure. The accelerations produced by each of these forces on micron-sized dust particles at 1 AU are typically about 0.6 cm per square second.

On the other hand, accelerations in type-I tails determined from the motions of condensations and kinks range from ~ 30-300 cm/s$^2$ and occasionally even larger. These are typically $10^2$-$10^3$ times the solar gravity at the point, and cannot be explained by the radiation pressure caused by the resonance scattering of solar radiation on the cometary ions.

The earliest suggestion, by Ludwig Biermann, that the solar electrons and the cometary ions were coupled via long-range Coulomb forces was shown to be incorrect by Hannes Alfvén in a classical paper about 25 years ago. Biermann had already noted that the solar wind would probably carry a magnetic field along. Alfvén developed this idea qualitatively to give a 'magnetohydrodynamic (MHD) model' for the interaction of this solar wind with the cometary plasma. This interaction is shown in Fig. 7. Briefly, the idea is that, as the solar wind, with its 'frozen-in' magnetic fields, hits the cometary plasma (or ionosphere), the field lines get 'hung up' there and are then dragged into the tail as shown. While Alfvén notes that this picture has a striking resemblance to the observed plasma structures in comets (streamers and envelopes), he also suggests that the observed wavy patterns and high velocities may be due to the propagation of hydromagnetic waves down the tail. He also considers the alternate possibility that the observed motion of the 'condensations' in the tail may be due to small gas clouds torn away from the head and accelerated by electromagnetic forces.

Alfvén also stressed that the plasma tail must be considered as an integral part of the comet, fastened to the head by the magnetic field lines which channel the tail plasma. This is the basis of the 'wind sock' model of the plasma tail, as opposed to Biermann's view, which may be described essentially as a 'smoke trail' model.

While Alfvén's semi-qualitative model indicates implicitly the role of the solar wind magnetic field in the coupling between the cometary and solar wind plasmas, it does not address the momentum transfer problem directly. Subsequently, several authors have shown quantitatively that the enhanced coupling between the two plasmas required to produce the observed accelerations may be caused by plasma turbulence driven by various plasma instabilities at their interface.

The most spectacular feature associated with a number of bright comets is their plasma (type I) tails, which when fully developed may extend 20-30 million kilometers and occasionally even to several hundred million kilometers.

This plasma tail is far from homo-

THE INTERACTION OF COMETS WITH SOLAR RADIATION AND THE SOLAR WIND. II.

geneous. It is characterized by a discrete and time-varying structure. While several forms variously described as 'kinks', 'condensations', and 'helical waves', as well as more irregular and large-scale structures, are often seen far down the tail (see Fig. 8), the most dominant feature observed, particularly in weakly-exposed photographs with high surface resolution of the cometary head and near-tail, is a series of long, straight, narrow 'rays' emanating from the head. Old drawings of visual observations of comets that made close approaches to the earth also show the same morphology.

These narrow rays, which are arranged in a roughly symmetrical pattern with respect to the tail axis, are first observed at large angles to the tail axis ($\theta \geq 60^{\circ}$). They gradually lengthen as they slowly close onto the tail axis. A 'folding umbrella' analogy has been invoked to describe this phenomenon.

While these narrow rays are typically $\leq 2000$ km in width, they sometimes appear to be merged into broader bundles -- when they are referred to as 'streamers' -- although the usage is not uniform. While the shorter rays are typically $\leq 10^5$ km long, a well-developed one close to the axis may extend well over $10^7$ kilometers.

Although the angular turning rates of the rays, with respect to the axis, are by no means uniform (often showing uneven, jerky variations over timescales of about 1 hour), their values, when

Figure 8. Comet Kohoutek (1973f = 1973 XII) on 1976 Jan. 13, showing a well-defined "helical" structure down the tail (JOCR photograph; from Brandt and Mendis 1979, Solar System Plasma Physics 2, C. F. Kennel et al., Editors, North Holland Publ. Co., p. 254).

## THE INTERACTION OF COMETS WITH SOLAR RADIATION AND THE SOLAR WIND. II.

averaged over several hours, seem to show a gradual decrease with time. The total time taken by individual rays to merge with the central tail-axis is typically 10-25 hours. The photographic sequence of comet Kobayashi-Berger-Milon (1975h = 1975 IX) taken on 1975 July 31 (Fig. 9) clearly shows a measured average rate of about 3 degrees per hour with respect to the axis.

As pointed out earlier, in the pioneering paper by Alfvén, these tail rays were identified as magnetic flux tubes which were dragged into the tail as the solar wind interacted with the cometary ionosphere. While some subsequent authors have identified them as neutral sheets in the solar wind, and as consequences of rapid changes in the field direction, and other authors have stressed the original identification, all authors imply that the observed rays delineate the direction of the magnetic field lines.

The 'folding' of the magnetic field lines onto the tail axis gives rise to a neutral sheet along the tail axis, carrying a cross-tail current which closes in the form of a 'Θ' across the tail. This current is calculated to be on the order of $10^6$-$10^8$ amperes. Also, it has been argued that, during a sudden disruption of this cross-tail current (analogous to a terrestrial substorm), electrons accelerated to 1-10 keV, or even larger, could be discharged into the cometary atmosphere, causing rapid ionization there (cometary 'aurora').

Whether there is any significant amplification of the magnetic field in the plasma tail, or whether it is comparable to the local solar wind value, is still a disputed question. Based on different observations, such as the ray-folding rates and the propagation of helical waves down the tail, different authors have come to opposite conclusions.

The recent observations of Venus, while exhibiting a magnetotail, show no enhancement of the magnetic field over interplanetary values. While this seems to contradict the idea of magnetic field enhancement in the cometary tail, one must use the Venus results merely as a guide and not as constraints on the cometary situation. While both magnetospheres share the common property that they are induced, the similarity ends there. The totally different scales of interaction brought about by the extensive mass-loading of the solar wind in the cometary case changes the interaction not only quantitatively but also

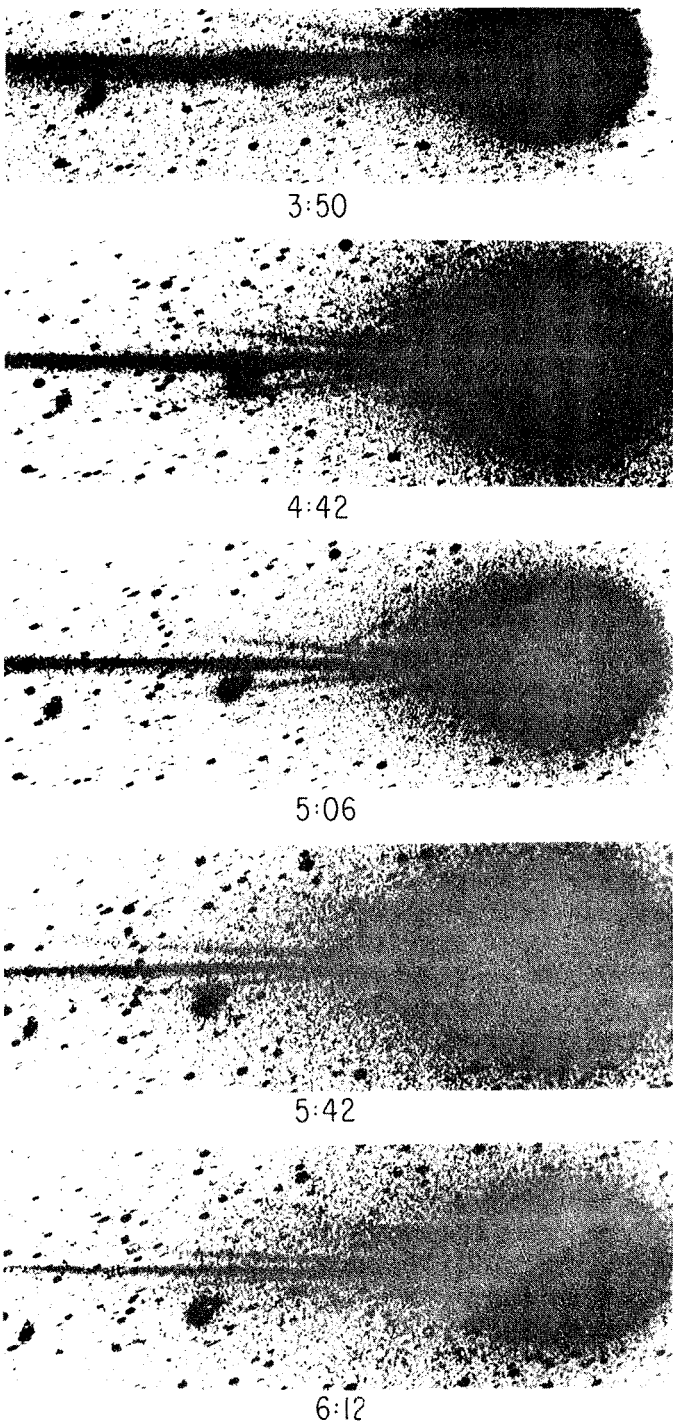



Figure 9. Photographic sequence of comet Kobayashi-Berger-Milon (1975 IX = 1975h) taken on 1975 July 31, showing the turning of the tail rays. Measured average rate is about 3° per hour with respect to the tail axis (JOCR photographs).

THE INTERACTION OF COMETS WITH SOLAR RADIATION AND THE SOLAR WIND. II.

qualitatively.

As we pointed out in the introduction, the plasma tails of comets are excellent natural probes of the solar wind, and in this role they have not been superceded by the advent of artificial space probes in recent years. This is because, while the latter are confined close to the ecliptic plane, comets approach the sun at all inclinations, and thus sample also the high-latitude solar wind. Furthermore, some of them have approached the sun closer than has (or can approach) any spacecraft. The recent discovery of a number of comets that may have actually collided with the sun, via the coronagraph exposures obtained from the U.S. Defense Department's P78-1 satellite (see Figure 10), is a case in point.

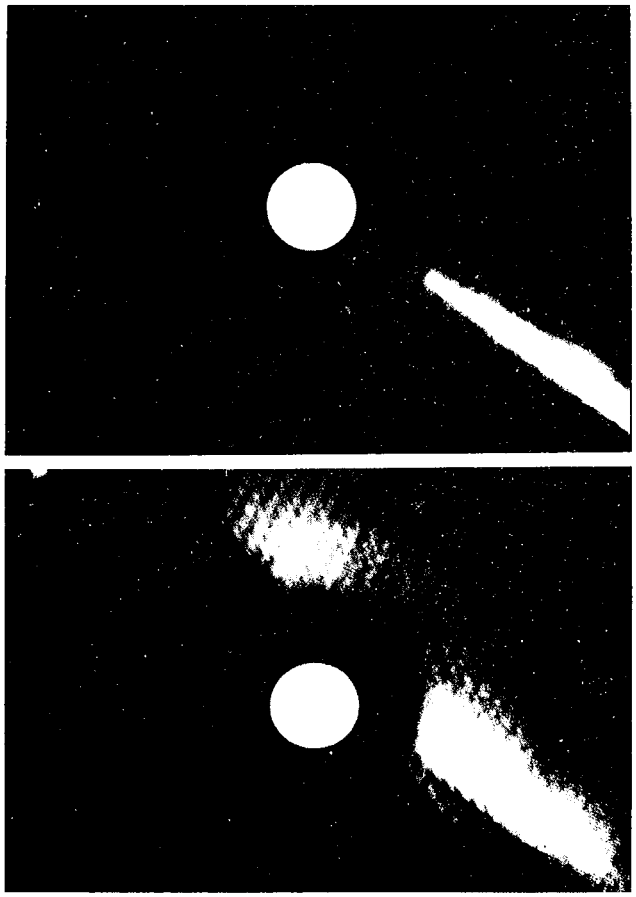
Historically, Ludwig Biermann used the orientation of the plasma tails to infer the existence of the continuous outflow of corpuscular radiation (the 'solar wind') from the sun. In fact, knowing the dynamical aberration angle ($\rho$) and the transverse component of the velocity of the comet (v), the radial solar wind velocity (w) is readily deduced from the equation:

$$\tan \rho \sim v/w \quad . \qquad (3)$$

This technique, with many refinements, has been extensively used over the years by J. C. Brandt and several co-workers to delineate the global solar-wind velocity field.

More interesting is the recent use of the sudden variations observed in the plasma tail of comets, to infer discontinuous variations in the solar wind. For instance, if a high-speed solar-wind stream were to strike the plasma tail, then a strong interaction according to the wind-sock model would predict a change in the aberration angle. Far out in the tail, where the influence of the fast stream has not yet been felt, the aberration angle would correspond to quiet solar-wind conditions. In the region close to the comet head, the aberration angle should be smaller, corresponding to high-speed stream. These two regions would be separated by an intermediate region which has not reached equilibrium with the ambient medium, and would show up as a kink in the plasma tail. Such an event was indeed observed with relation to a high-speed solar-wind stream on 1970 April 5, monitored independently by earth-orbiting satellites, hitting comet Bennett 1970 II. A similar event observed in the case of comet West 1976 VI on 1976 April 1 is shown in Figure 11.

More recently, Malcolm Neidner and Brandt, in a continuing series of papers, have shown the correlation of sudden disruptions of the plasma tail of comets (see Fig. 12) with traversals of magnetic sector boundary structures in the solar wind. This phenomenon has been explained in terms of a model which invokes magnetic-field-line reconnection in the cometary head as solar-wind plasmas of opposite polarity are pushed against the cometary ionosphere. Since high-speed streams are generally associ-



(a)

(b)

Figure 10. Apparent collision of the comet 1979 XI with the sun: (a) 1979 Aug. 30.847 UT. Comet heading apparently almost directly towards the sun, approaching the edge of the occulting disk on the satellite's coronograph. (b) Aug. 31.390. Comet's head does not appear behind occulting disk, although dust tail and dust halo are silhouetted in a wide sector around it. (From Science News, 10/17/81.)

## THE INTERACTION OF COMETS WITH SOLAR RADIATION AND THE SOLAR WIND. II.

ated with magnetic sector boundaries, it has also been suggested that the so-called flute instability of the cometary ionopause triggered by these high-speed streams may alternately be responsible for the tail disruption mechanism.

So far we have discussed only the morphology and dynamics of the plasma tail. What is known about its chemical composition? In the first place, all the ions shown in Table I (p. 53 of last issue) are observed not only in the cometary head, but also down the tail. By examining spectra such as the one shown in Fig. 3 (p. 54), one can get some idea about the extensions of the various ionic species down the tail, but they are not good enough to construct empirical ion density profiles along the tail axis. Due to the inhomogeneous nature of the plasma tail and the controlling role of the tail's magnetic field, it is not an easy matter to construct reliable models of the ion distribution in the tail which consider the ion pickup in the head and transport into the tail in a self-consistent manner. Consequently, very little quantitative work has been attempted in this area to date. The existing models are extremely rough and are based on highly questionable over-simplifications. (Part III will appear in the January issue -- Ed.)

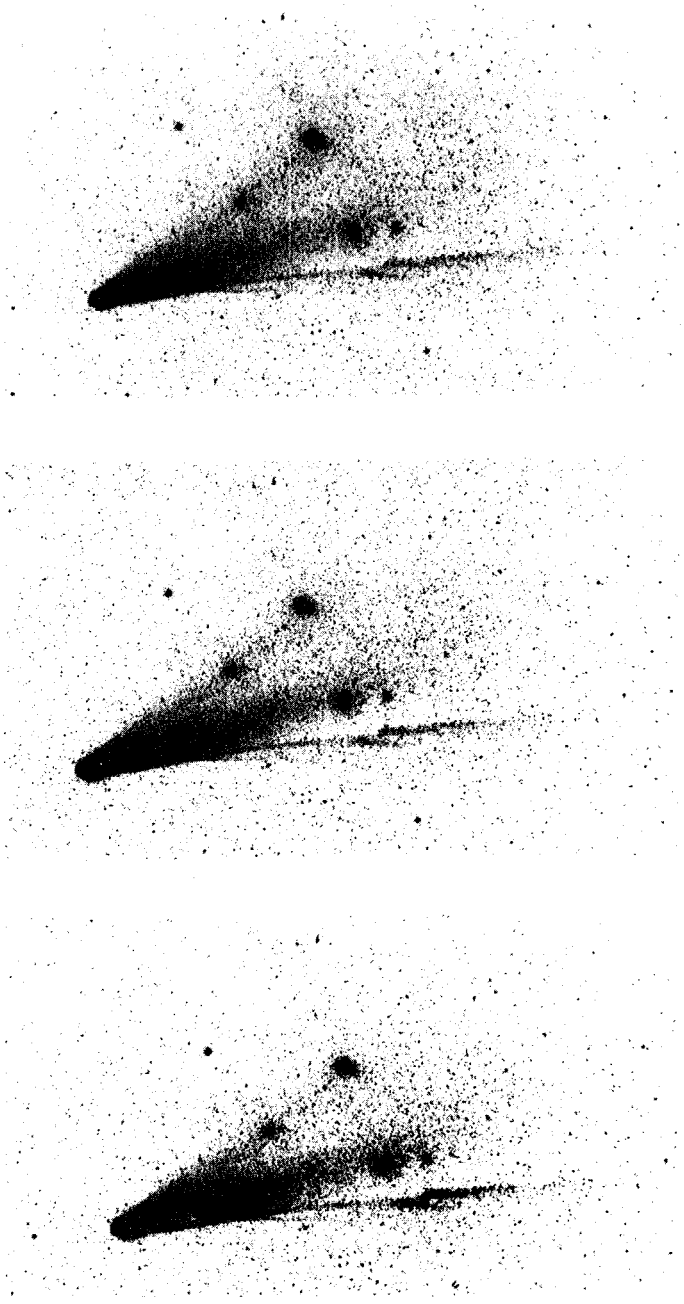


Figure 11. Photographic sequence showing the motion of a "kink" down the tail of comet West 1975n taken on 1976 April 1. Times of mid-point exposures from top to bottom are, respectively: 10:04 UT, 10:38:30, and 11:14:30. Measured velocity of the kink with respect to the nucleus is about 97 km/s (JOCR photo).

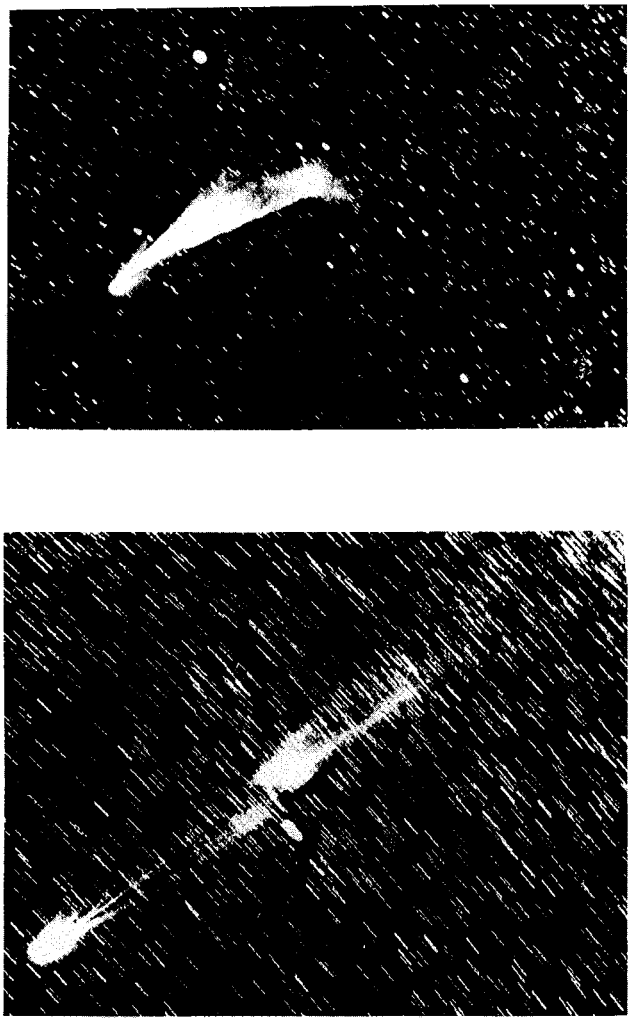


Figure 12. Comet Morehouse (1908 III): (a) on 1908 Sept. 30, showing the beginning of the separation of the tail from the head. (b) on Oct. 1, showing the tail widely separated from the head. (Yerkes Observatory photographs)

## RECENT NEWS CONCERNING COMETS

The second half of 1983 has seen even more comet discoveries/recoveries than the first half of the year. The Infrared Astronomical Satellite (IRAS) lost its helium cooling system during the week of November 20, ending a productive life in which it discovered no less than 6 comets. Since the report in the July issue, comets 1983o and 1983v were discovered by IRAS, and were named comets IRAS and Hartley-IRAS, respectively. Observations of both comets were not made in huge numbers. Comet 1983o was around magnitude 16, and with perihelion on Nov. 28 at a distance of 2.25 AU from the sun, it was only to fade (cf. IAUC 3860).

This is the first time ever that the alphabet has been extended past the letter "u" for a provisional comet designation. After 21 discoveries or recoveries, the month of December may push the count even higher. Malcolm Hartley discovered comet 1983v with the U. K. Schmidt telescope on Nov. 4 as a 15th-magnitude object. IRAS independently discovered the comet on Nov. 10. Comet Hartley-IRAS was moving slowly northward towards perihelion near Dec. 31 at a heliocentric distance of $\sim$ 1.4 AU. Comet 1983v was found at total visual mag 10.6 by John E. Bortle on December 1 (see p. 95). Comets 1983o and 1983v both apparently have highly-inclined, retrograde orbits. (See IAUC 3894.) David H. Levy, an amateur observer in Tucson, Arizona, independently discovered comet 1983v while hunting on the night of Nov. 30, and he estimated the magnitude as 12.5. We provide an ephemeris below, as comet Hartley-IRAS may be visible in a 10-inch reflector through March.

But by far the biggest news in the "comet arena" during the past few months has been that concerned with 1983 TB, an Apollo-type minor planet discovered (again by IRAS!) on Oct. 11 at magnitude 15.5. This object looked very unusual as the observations started to trickle in to the Minor Planet Center: not only was it moving fairly fast due to a moderately close approach to the earth, but its orbital elements showed 1983 TB to travel closer to the sun than any other known asteroid -- some 1.3 AU. It revolves around the sun once every 1.5 yrs in a highly-elliptical orbit (e = 0.9). Fred Whipple, retired Director of the Smithsonian Astrophysical Observatory, was quick to notice the similarity of 1983 TB's orbital elements with those of the Geminid meteor shower. There now seems to be no doubt that 1983 TB is connected with the Geminid meteors, which peak in mid-December and were not associated previously with any known comet (most meteor showers are thought to be associated with comets). This find is very important to the study of comets, for 1983 TB is almost certainly a defunct comet (that is, one that has lost all of its volatiles and appears asteroidal). Observers with moderately large telescopes are performing photometry and astrometry now, and it appears that 1983 TB will have even a better apparition in about a year.

Periodic comets which have been recovered during the past few months include P/Wolf 1983m (on Aug. 1 and 3 by J. Gibson at mag 20), P/Crommelin 1983n (on Aug. 9 and 13 by L. Kohoutek and S. Wyckoff/P. Wehinger, respectively; the latter observers found V = 19.66 and V-R = +0.57), P/Arend 1983q (on Sept. 16 and 17 by Gibson at mag 20.5; the comet had a tail of 15" in p.a. 285), P/Harrington-Abell 1983r (on Sept. 17 and 18 by Gibson at mag 20.5), P/Wild 2 1983s (on Sept. 18 by Gibson at mag 20 with a short tail), and P/Taylor 1983u (on Nov. 3 and 7 by E. Everhart at mag 19.5).

Comet 1983n is of interest, because it has been designated for a "trial run" by the International Halley Watch (IHW) for coordinating observers in preparation for P/Halley in 1985-86. An ephemeris is given below, with elements by Brian Marsden (from IAUC 3886) and predicted magnitudes after C. Morris (from IHW Newsletter No. 3, pp. 13ff).

Carolyn Shoemaker discovered comet 1983p from a plate taken with the 18-inch Schmidt telescope at Palomar on Sept. 7. It was diffuse and she estimated the total magnitude as 16 -- apparently much too faint. Several visual

## RECENT NEWS CONCERNING COMETS

observers have reported seeing this comet (see the Tabulation of Comet Observations elsewhere in this issue). At perihelion on Nov. 24 at a heliocentric distance of some 3.3 AU, this highly-inclined object is moving southward in December and January.

Charles Kowal discovered comet 1983t with the 48-inch Palomar Schmidt telescope in the course of an all-sky survey. While the plates were made in May, a lack of rapidly scanning the plates for unusual objects resulted in Kowal's not finding the comet until September! Fortunately, Zdenka Vávrová of the Kleť Observatory found the comet (although reported as a minor planet) on May 14 at mag 16.5, and A. Mrkos at the same location found an image on a May 31 plate. A subsequent search ephemeris by Marsden enabled K. Russell and J. Barrow to locate the comet on a Sept. 28 plate taken with the U.K. Schmidt telescope in Australia; comet 1983t had faded to mag 18. But we now know that this is a new periodic comet, P/Kowal-Vávrová, with a period of 16 years. Its perihelion passage occurred on 1983 Apr. 2 at a distance of 2.6 AU.

-- Daniel W. E. Green (11/30/83)

ELEMENTS AND EPHEMERIS FOR P/Crommelin 1983n (see text above):

T = JD 2445750.6679 = 1984 Feb. 20.1679 ET (Equinox 1950.0)
Argument of Perihelion = 195°.8527 Node = 250°.1926
Incl. = 29°.1030 q = 0.734522 AU e = 0.919195

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Mag. |
|---|---|---|---|---|---|---|---|
| 1983 | 12 12 | 20 45.84 | +07 18.2 | 1.639 | 1.437 | 60°.4 | 17.2 |
| 1983 | 12 17 | 20 56.42 | +06 57.8 | | | | |
| 1983 | 12 22 | 21 07.93 | +06 40.5 | 1.574 | 1.303 | 55.7 | 15.9 |
| 1983 | 12 27 | 21 20.40 | +06 25.7 | | | | |
| 1984 | 01 01 | 21 33.90 | +06 13.0 | 1.495 | 1.172 | 51.5 | 14.6 |
| 1984 | 01 06 | 21 48.51 | +06 01.5 | | | | |
| 1984 | 01 11 | 22 04.29 | +05 50.2 | 1.404 | 1.045 | 48.1 | 13.3 |
| 1984 | 01 16 | 22 21.32 | +05 37.7 | | | | |
| 1984 | 01 21 | 22 39.68 | +05 22.1 | 1.301 | 0.928 | 45.3 | 12.0 |
| 1984 | 01 26 | 22 59.45 | +05 01.1 | | | | |
| 1984 | 01 31 | 23 20.68 | +04 32.1 | 1.190 | 0.829 | 43.5 | 10.7 |
| 1984 | 02 05 | 23 43.38 | +03 51.8 | | | | |
| 1984 | 02 10 | 00 07.52 | +02 57.3 | 1.076 | 0.760 | 43.0 | 9.4 |
| 1984 | 02 15 | 00 33.02 | +01 45.7 | | | | |
| 1984 | 02 20 | 00 59.76 | +00 15.6 | 0.968 | 0.735 | 44.1 | 8.1 |
| 1984 | 02 25 | 01 27.63 | -01 32.8 | | | | |
| 1984 | 03 01 | 01 56.54 | -03 36.9 | 0.878 | 0.758 | 47.4 | 6.7 |
| 1984 | 03 06 | 02 26.44 | -05 52.2 | | | | |
| 1984 | 03 11 | 02 57.29 | -08 12.8 | 0.815 | 0.826 | 53.2 | 7.7 |
| 1984 | 03 16 | 03 28.99 | -10 32.0 | | | | |
| 1984 | 03 21 | 04 01.35 | -12 42.8 | 0.788 | 0.924 | 61.1 | 10.5 |
| 1984 | 03 26 | 04 34.10 | -14 39.1 | | | | |
| 1984 | 03 31 | 05 06.79 | -16 16.5 | 0.799 | 1.041 | 69.7 | 13.4 |
| 1984 | 04 05 | 05 38.95 | -17 32.7 | | | | |
| 1984 | 04 10 | 06 10.07 | -18 27.7 | 0.850 | 1.167 | 77.7 | 15.4 |

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UNIVERSAL TIME (UT): This time based on the Greenwich meridian is used throughout the ICQ; it is 24-hour time, from midnight to midnight. In North America, add the following numbers to standard times to convert to UT: EST, 5; CST, 6; MST, 7; PST, 8. For daylight savings time, add 4, 5, 6, and 7 hours, respectively.

EPHEMERIS for comet Hartley-IRAS 1983v (by Daniel Green):

This ephemeris is from an elliptical orbit based on 9 observations from Nov. 4-Dec. 1. The magnitude is based on m = 8.0 + 5 log Delta + 10 log r. (See John Bortle's observation in the Tabulation of Comet Observations elsewhere in this issue.) At the time of this writing (Dec. 2), the available observations are much better represented by an elliptical orbit than by a parabolic one, but the general solution used for the below ephemeris makes the comet a short-period one with a period of about 19 years. This is highly unusual for a comet of such high inclination (i = 96°, e = 0.82, q = 1.27 AU), and this comet could well have a much longer period (70 years or more). The IAU Circulars and Minor Planet Circulars will contain more information, as will the January issue of the ICQ, but the following ephemeris is provided due to the brightness of the comet. It may be off by a few arc minutes by mid-January, and much more by early March, but it does appear that this comet will be fairly well-placed for northern hemisphere observers into April, when it may still be brighter than mag 13.0.

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Mag. |
|---|---|---|---|---|---|---|---|
| 1984 | 01 01 | 20 47.11 | +11 16.2 | 1.744 | 1.280 | 46°.3 | 10.3 |
| 1984 | 01 06 | 20 46.67 | +13 20.3 | | | | |
| 1984 | 01 11 | 20 46.46 | +15 24.2 | 1.813 | 1.275 | 42.5 | 10.3 |
| 1984 | 01 16 | 20 46.43 | +17 29.0 | | | | |
| 1984 | 01 21 | 20 46.52 | +19 35.8 | 1.854 | 1.285 | 41.0 | 10.4 |
| 1984 | 01 26 | 20 46.71 | +21 45.6 | | | | |
| 1984 | 01 31 | 20 46.95 | +23 59.7 | 1.867 | 1.309 | 41.8 | 10.5 |
| 1984 | 02 05 | 20 47.19 | +26 19.3 | | | | |
| 1984 | 02 10 | 20 47.39 | +28 45.5 | 1.854 | 1.346 | 44.8 | 10.6 |
| 1984 | 02 15 | 20 47.47 | +31 19.5 | | | | |
| 1984 | 02 20 | 20 47.37 | +34 02.5 | 1.819 | 1.395 | 49.4 | 10.7 |
| 1984 | 02 25 | 20 47.00 | +36 55.7 | | | | |
| 1984 | 03 01 | 20 46.24 | +40 00.3 | 1.770 | 1.455 | 55.3 | 10.9 |
| 1984 | 03 06 | 20 44.92 | +43 17.2 | | | | |
| 1984 | 03 11 | 20 42.79 | +46 47.3 | 1.714 | 1.522 | 61.9 | 11.0 |

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## TABULATION OF COMET OBSERVATIONS

Don Machholz, San Jose, CA, writes concerning the instrument he has been using since the first of June 1983: "The exit pupil of this instrument implies that the true aperture size is actually 13.1 cm (5.1 in). This is despite the fact that the front lens of this telephoto-lens system (consisting of 5 lenses) measures 15.5 cm (6.2 in) in diameter and that this much light actually enters the sytem. However, since this instrument 'performs' like a 13-cm system, this is what I am now reporting it as." Mr. Machholz observes from a site at Loma Prieta Mountain in the Santa Cruz Mountains of California.

In the April 1983 issue (ICQ #46), on page 40, the observation for comet IRAS-Araki-Alcock on May 10.04 UT with the 25.0-cm reflector was by Robert Warren (WAR), not Rainer Kracht (KRA01). Please correct this in your copy.

NEW ADDITIONS TO THE OBSERVER KEY (cf. ICQ 5, 64):

| | |
|---|---|
| GYA | LA'SZLO' GYARMATI, HUNGARY |
| KES | LA'SZLO' KE'SZ, HUNGARY |
| LOW | DENNIS LOWE, AUSTRALIA |
| PRI | ROBERT T. PRICE, AUSTRALIA |
| STO02 | D. STOTT, ENGLAND |
| TAN02 | T. TANTI, MALTA |
| TEP | ISTVAN TEPLICZKY, HUNGARY |

TABULATION OF COMET OBSERVATIONS (Cont. from previous page)

NEW ADDITIONS TO THE INSTRUMENT KEY:
J = Jones-Bird telescope*

* According to Henk Feijth, several members of the Dutch Comet Section use a 10-inch-aperture (25.4-cm) Jones-Bird telescope, which is a modified Newtonian with a spherical f/4 primary mirror: "Just before the light strikes the flat after being reflected, it passes through a Barlow-like achromatic lens that corrects the spherical aberration of the primary mirror. The system is f/6 and also corrected for coma."

Comet Austin (1982g)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 08 18.87 | S | 4.9 | AA | 5.0 | B | | 10 | 7 | 7 | 0.08 | 20 | HUR |
| 1982 08 18.87 | S | 5.0 | AA | 8.0 | B | | 15 | 7 | 7 | 0.92 | 20 | HUR |
| 1982 08 18.87 | S | 4.8 | AA | 7.5 | L | | 40 | | | | | HUR |
| 1982 08 19.10 | B | 4.6 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 08 19.10 | S | 4.4 | Y | 6.0 | B | | 12 | 6 | 6 | 0.8 | 15 | WEG |
| 1982 08 19.87 | S | 4.8 | AA | 8.0 | B | | 15 | 7 | 7 | 0.50 | 32 | HUR |
| 1982 08 19.88 | S | 4.8 | AA | 5.0 | B | | 10 | 10 | 7 | 0.67 | 30 | HUR |
| 1982 08 19.89 | B | 5.3 | AA | 7.0 | B | | 15 | 4 | | 0.67 | 23 | TAY |
| 1982 08 20.09 | S | 4.6 | Y | 6.0 | B | | 12 | 7 | 6 | 1 | | WEG |
| 1982 08 20.09 | B | 4.8 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 08 20.78 | S | 4.8 | AA | 5.0 | B | | 12 | 6 | 6 | 0.10 | 20 | TAN02 |
| 1982 08 22.79 | S | 4.8 | AA | 5.0 | B | | 12 | 8 | 6 | 0.28 | 20 | TAN02 |
| 1982 08 22.90 | S | 4.9 | AA | 8.0 | B | | 15 | 8 | 7 | 0.67 | 35 | HUR |
| 1982 08 22.92 | B | 5.1 | AA | 7.0 | B | | 15 | 4 | | | | TAY |
| 1982 08 22.95 | S | 4.8 | AA | 7.0 | B | | 15 | | | | | TAY |
| 1982 08 23.80 | S | 4.8 | AA | 5.0 | B | | 12 | 8 | 7 | | | TAN02 |
| 1982 08 23.87 | S | 4.9 | AA | 8.0 | B | | 15 | 6 | 7 | 0.83 | 46 | HUR |
| 1982 08 23.87 | S | 4.8 | AA | 5.0 | B | | 10 | 6 | | 0.42 | 46 | HUR |
| 1982 08 23.89 | B | 5.3 | AA | 7.0 | B | | 15 | | | | | TAY |
| 1982 08 23.90 | S | 5.0 | AA | 4.0 | B | | 8 | 4 | | 1.00 | 30 | TAY |
| 1982 08 24.78 | S | 4.9 | AA | 5.0 | B | | 12 | 8 | 5 | | | TAN02 |
| 1982 08 25.78 | S | 4.9 | AA | 5.0 | B | | 12 | 7 | 5/ | 0.33 | 35 | TAN02 |
| 1982 08 25.87 | B | 5.8 | AA | 7.0 | B | | 15 | 8 | | | | TAY |
| 1982 08 26.79 | S | 5.0 | AA | 5.0 | B | | 12 | 6 | 6 | 0.22 | 25 | TAN02 |
| 1982 08 26.90 | B | 5.8 | AA | 7.0 | B | | 15 | 3 | | | | TAY |
| 1982 08 27.80 | S | 5.6 | AA | 5.0 | B | | 12 | 5 | 6 | | | TAN02 |
| 1982 08 27.84 | S | 5.2 | Y | 6.0 | B | | 12 | 7.5 | 6/ | 1.35 | 35 | WEG |
| 1982 08 27.84 | B | 5.4 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 08 28.79 | S | 5.4 | AA | 5.0 | B | | 12 | 5 | 5/ | | | TAN02 |
| 1982 08 29.00 | S | 5.2 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 08 29.00 | B | 5.4 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 08 29.11 | B | 5.9 | AA | 4.0 | B | | 8 | | 5 | 0.67 | 60 | TAY |
| 1982 08 29.79 | S | 5.5 | AA | 5.0 | B | | 12 | 5 | 6 | | | TAN02 |
| 1982 08 29.85 | B | 5.5 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 08 29.85 | S | 5.3 | Y | 6.0 | B | | 12 | | 6/ | | | WEG |
| 1982 08 29.94 | S | 5.6 | AA | 8.0 | B | | 15 | 5 | 8 | 0.25 | 42 | HUR |
| 1982 08 30.79 | S | 5.5 | AA | 5.0 | B | | 12 | 5 | 6 | | | TAN02 |
| 1982 08 30.85 | B | 5.6 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 08 30.85 | S | 5.4 | Y | 6.0 | B | | 12 | 5 | 6/ | 1.25 | 35 | WEG |
| 1982 08 31.78 | S | 5.6 | AA | 5.0 | B | | 12 | 4 | 5 | | | TAN02 |
| 1982 09 01.78 | S | 5.6 | AA | 5.0 | B | | 12 | | | | | TAN02 |
| 1982 09 02.84 | S | 5.7 | Y | 6.0 | B | | 12 | 6 | 6/ | 2.2 | 35 | WEG |

Comet Austin (1982g) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 09 02.84 | B | 5.9 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 09 02.85 | S | 5.9 | AA | 8.0 | B | | 15 | 3 | 8 | 0.08 | 52 | HUR |
| 1982 09 03.79 | S | 6.0 | AA | 5.0 | B | | 12 | 4 | | | | TAN02 |
| 1982 09 04.78 | S | 6.1 | AA | 5.0 | B | | 12 | 5 | | | | TAN02 |
| 1982 09 05.78 | S | 6.4 | AA | 5.0 | B | | 12 | 4 | | | | TAN02 |
| 1982 09 05.83 | S | 6.0 | Y | 6.0 | B | | 12 | 4 | 6 | 0.5 | | WEG |
| 1982 09 05.83 | B | 6.2 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 09 06.78 | S | 6.7 | AA | 5.0 | B | | 12 | 6 | | | | TAN02 |
| 1982 09 07.85 | S | 6.5 | AA | 8.0 | B | | 15 | 3.0 | 7 | 0.16 | 60 | HUR |
| 1982 09 08.84 | B | 6.8 | AA | 7.0 | B | | 15 | | | | | TAY |
| 1982 09 08.85 | S | 6.5 | AA | 8.0 | B | | 15 | 3 | 6 | 0.08 | 55 | HUR |
| 1982 09 09.77 | S | 6.8 | AA | 5.0 | B | | 12 | 3.5 | | | | TAN02 |
| 1982 09 09.83 | S | 6.2 | Y | 6.0 | B | | 12 | 3.5 | 5/ | 0.8 | 37 | WEG |
| 1982 09 09.83 | B | 6.4 | Y | 6.0 | B | | 12 | | | | | WEG |
| 1982 09 09.91 | B | 6.9 | AA | 4.0 | B | | 8 | | | | | TAY |
| 1982 09 10.77 | S | 6.8 | AA | 5.0 | B | | 12 | 3 | 7 | | | TAN02 |
| 1982 09 11.77 | S | 6.9 | AA | 5.0 | B | | 12 | 3 | 6/ | | | TAN02 |
| 1982 09 11.83 | S | 6.4 | Y | 6.0 | B | | 12 | 4 | 6/ | 1.3 | 30 | WEG |
| 1982 09 11.83 | B | 6.5 | Y | 6.0 | B | | 12 | | | 1.0 | 50 | WEG |
| 1982 09 13.82 | S | 6.5 | Y | 6.0 | B | | 12 | 3.5 | 6 | 1 | 35 | WEG |
| 1982 09 13.82 | B | 6.8 | AA | 6.0 | B | | 12 | | | | | WEG |
| 1982 09 13.84 | B | 7.5 | AA | 4.0 | B | | 8 | | | | | TAY |
| 1982 09 19.76 | S | 7.4 | AA | 5.0 | B | | 12 | | | | | TAN02 |
| 1982 09 21.82 | S | 7.1 | AA | 6.0 | B | | 12 | 4 | 6/ | &0.75 | 23 | WEG |
| 1982 09 21.83 | S | 7.8 | S | 8.0 | B | | 15 | 2 | 4 | | | HUR |
| 1982 09 21.83 | B | 7.3 | AA | 6.0 | B | | 12 | | | &1.5 | 33 | WEG |
| 1982 09 21.83 | B | 7.8 | AA | 7.0 | B | | 15 | | | | | TAY |
| 1982 09 26.82 | S | 7.5 | AA | 6.0 | B | | 12 | | 5/ | | | WEG |
| 1982 09 26.82 | B | 7.8 | AA | 6.0 | B | | 12 | | | | | WEG |
| 1982 12 23.23 | S | 12.1 | V | 29.8 | L | 5 | 62 | 1.5 | 1/ | | 45 | KEI |

Comet IRAS-Araki-Alcock (1983d)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 05 04.98 | S | 6.1 | S | 5.0 | B | | 10 | 15 | 2/ | | | KEI |
| 1983 05 05.00 | S | 6.0 | S | 5.0 | B | | 10 | 18 | 3 | | 45 | KEI |
| 1983 05 07.04 | S | 5.0 | AA | 5.0 | B | | 10 | 27 | 4 | | | KEI |
| 1983 05 08.91 | | 3.7 | AA | 0.0 | E | | 1 | 51 | | | | KEI |
| 1983 05 08.91 | | | | 8.0 | B | | 20 | | 4/ | 0.80 | 329 | KEI |
| 1983 05 08.91 | | | | 8.0 | B | | 20 | | | 0.33 | 167 | KEI |
| 1983 05 09.05 | | 3.5 | AA | 0.0 | E | | 1 | 72 | | | | KEI |
| 1983 05 09.91 | | 2.4 | AA | 0.0 | E | | 1 | 84 | | 1.00 | 300 | KEI |
| 1983 05 10.13 | S | 3.9 | AA | 2.4 | R | 5 | 6 | | | | | MOR03 |
| 1983 05 10.17 | S | 3.3 | AT | 3.0 | R | | 5 | 90 | 5 | | | MAR01 |
| 1983 05 10.20 | | | | 3.5 | B | | 7 | 74 | | | | MOR03 |
| 1983 05 10.88 | M | 2.0 | V | 5.0 | B | | 8 | &60 | 1 | | | KES |
| 1983 05 10.92 | | 1.9 | AA | 0.0 | E | | 1 | 163 | | 1.00 | 315 | KEI |
| 1983 05 11.01 | | | | 29.8 | L | 5 | 62 | 2.4 | | 0.07 | 253 | KEI |
| 1983 05 11.88 | M | 2.6 | V | 10 | L | 10 | 60 | 40 | 2 | | | GYA |
| 1983 05 11.90 | | 1.6 | AA | 0.0 | E | | 1 | 85 | | 8.00 | 78 | KEI |
| 1983 05 11.92 | | | | 5.0 | B | | 10 | 60 | 3 | | | KEI |
| 1983 05 12.10 | S | 2.8 | AA | 0.0 | E | | 1 | | | | | MOR03 |
| 1983 05 12.10 | | | | 3.5 | B | | 7 | 70 | | | | MOR03 |
| 1983 05 12.48 | S | 1.6 | V | 5.0 | B | | 7 | 100 | 4 | 0.42 | 200 | SMI05 |

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

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 05 13.55 | S | 3.9: | A | 5.0 | B | | 7 | 70 | 5 | 0.33 | 180 | SMI05 |
| 1983 05 14.44 | S | 3.5 | A | 8.0 | B | | 15 | 14 | 0 | | | PRI |
| 1983 05 17.51 | S | 5.3 | A | 5.0 | B | | 7 | 40 | 5 | | | SMI05 |
| 1983 05 30.4 | S | 8.3 | A | 20 | L | 8 | 64 | 3.6 | 5 | | | LOW |
| 1983 06 02.44 | S | 8.7 | A | 8.0 | B | | 15 | 6 | 0 | | | PRI |
| 1983 06 03.4 | S | 8.5 | V | 48 | L | 6 | 100 | 3.5 | 5 | | | LOW |
| 1983 06 04.40 | S | 8.8 | A | 8.0 | B | | 15 | 5 | 0 | | | PRI |
| 1983 06 05.41 | S | 8.8 | A | 8.0 | B | | 15 | 5 | 0 | | | PRI |
| 1983 06 05.44 | M | 8.9 | V | 48 | L | 6 | 100 | 3 | 5 | | | LOW |

Comet Sugano-Saigusa-Fujikawa (1983e)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 06 05.98 | S | 6.6 | S | 5.0 | B | | 7 | 15 | 0 | | | BUS01 |
| 1983 06 07.95 | M | 7.5 | V | 5.0 | B | | 7 | 15 | | | 250 | TEP |
| 1983 06 08.91 | M | 7.5 | V | 5.0 | B | | 7 | 20 | 3 | | | TEP |
| 1983 06 08.92 | M | 7.5 | V | 5.0 | B | | 7 | 10 | 4 | | | TUB |
| 1983 06 09.87 | S | 7.0 | AA | 15.2 | L | 5 | 24 | 14 | 0 | | | PEA |
| 1983 06 10.86 | S | 6.4 | AA | 6.5 | B | | 20 | 15 | 0 | | | PEA |
| 1983 06 10.86 | S | 6.5 | AA | 15.2 | L | 5 | 24 | 13 | 0 | | | PEA |
| 1983 06 11.31 | S | 6.7 | AC | 3.5 | B | | 7 | 33 | 0 | | | MOR03 |
| 1983 06 12.30 | S | 6.7 | AC | 3.5 | B | | 7 | 30 | | | | MOR03 |
| 1983 06 12.76 | S | 6.6 | AA | 41 | L | 4 | 86 | 28 | 0 | | | CLA |
| 1983 06 12.86 | S | 6.6 | AA | 6.5 | B | | 20 | 18 | 0 | | | PEA |
| 1983 06 12.86 | S | 6.7 | AA | 15.2 | L | 5 | 24 | 16 | 0 | | | PEA |
| 1983 06 13.01 | S | 6.3 | AA | 5.0 | B | | 10 | 27 | 1 | | | KEI |
| 1983 06 13.06 | S | 6.4 | AA | 5.0 | B | | 10 | 18 | | | | KEI |
| 1983 06 13.06 | | 5.5: | AA | 0.0 | E | | 1 | 60 | | | | KEI |
| 1983 06 13.85 | S | 6.6 | AA | 6.5 | B | | 20 | 20 | 0 | | | PEA |
| 1983 06 13.85 | S | 6.7 | AA | 15.2 | L | 5 | 24 | 20 | 0 | | | PEA |
| 1983 06 15.02 | S | 6.2 | AA | 5.0 | B | | 10 | 33 | 1 | | | KEI |

Comet Černis (19831)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 07 22.92 | S | 10.5 | AC | 15.2 | L | 5 | 30 | 2 | 5 | ? | 345 | PEA |
| 1983 08 03.33 | S | 10.6 | A | 32 | L | 6 | 88 | 0.8 | 5 | | | BOR |
| 1983 08 04.38 | S | 10.8 | S | 15.0 | R | 6 | 29 | 2 | 2 | | | MAC |
| 1983 08 06.42 | S | 10.8 | S | 15.0 | R | 6 | 29 | 2 | 2 | | | MAC |
| 1983 08 10.34 | S | 10.2 | A | 32 | L | 6 | 68 | 2.0 | 6/ | | | BOR |
| 1983 08 10.91 | M | 10.2 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 10.91 | S | 10.1 | AC | 15.2 | L | 5 | 30 | 1.8 | 7 | | | PEA |
| 1983 08 13.39 | S | 10.6 | S | 15.0 | R | 6 | 29 | 3 | 3 | | | MAC |
| 1983 08 13.88 | S | 10.2 | AC | 15.2 | L | 5 | 30 | 1.5 | 6 | | | PEA |
| 1983 08 14.06 | S | 9.9 | AC | 25.4 | L | 4 | 79 | 2.3 | 5 | 0.05 | 159 | CAV |
| 1983 08 14.33 | S | 10.0 | A | 8.0 | B | | 20 | 2 | 3 | | | BOR |
| 1983 08 14.33 | S | 10.0 | A | 32 | L | 6 | 68 | 1.7 | 7 | | | BOR |
| 1983 08 14.79 | S | 10.3 | AC | 41 | L | 4 | 86 | 2 | 7 | | | CLA |
| 1983 08 14.89 | S | 10.1 | AC | 15.2 | L | 5 | 30 | 1.8 | 6/ | | | PEA |
| 1983 08 14.89 | M | 10.2 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 15.32 | S | 9.9 | A | 8.0 | B | | 20 | 4 | 2 | | | BOR |
| 1983 08 15.32 | S | 10.0 | A | 32 | L | 6 | 68 | 1.9 | 6/ | | | BOR |
| 1983 08 15.83 | S | 10.3 | AC | 41 | L | 4 | 86 | 2 | 7 | | | CLA |

Comet Černis (19831) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 08 15.89 | S | 10.2 | AC | 15.2 | L | 5 | 30 | 1.6 | 6 | | | PEA |
| 1983 08 16.32 | S | 10.1 | A | 32 | L | 6 | 68 | 1.8 | 6/ | | | BOR |
| 1983 08 16.32 | S | 9.9 | A | 8.0 | B | | 20 | 4 | 3 | | | BOR |
| 1983 08 16.90 | S | 10.4 | AC | 15.2 | L | 5 | 72 | | 6 | | | PEA |
| 1983 08 16.90 | M | 10.3 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 16.90 | S | 10.2 | AC | 15.2 | L | 5 | 30 | 1.8 | 7 | | | PEA |
| 1983 08 17.89 | M | 10.2 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 17.89 | S | 10.1 | AC | 15.2 | L | 5 | 30 | 1.6 | 7 | | | PEA |
| 1983 08 18.84 | S | 10.0 | AC | 41 | L | 4 | 86 | & 2.5 | 7 | | | CLA |
| 1983 08 21.36 | S | 9.9 | A | 8.0 | B | | 20 | 4 | 3 | | | BOR |
| 1983 08 30.56 | S | 9.7 | AC | 8.0 | B | | 15 | | | | | SEA |
| 1983 08 31.58 | S | 9.8 | AC | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 01.58 | S | 9.7 | AC | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 02.35 | S | 9.0 | S | 15.0 | R | 6 | 29 | 2 | 3 | | | MAC |
| 1983 09 03.40 | S | 8.8 | S | 15.0 | R | 6 | 29 | 3 | 3 | | | MAC |
| 1983 09 04.35 | S | 10.0 | A | 8.0 | B | | 20 | 2.5 | 3 | | | BOR |
| 1983 09 04.35 | S | 10.1 | A | 32 | L | 6 | 68 | 1.6 | 5 | | | BOR |
| 1983 09 04.83 | S | 9.8 | AC | 15.2 | L | 5 | 30 | 3.2 | 8 | | | PEA |
| 1983 09 04.87 | S | 10.0 | AC | 41 | L | 4 | 86 | 3 | 8 | | | PEA |
| 1983 09 04.88 | S | 9.9 | AC | 41 | L | 4 | 86 | 3 | 7 | | | CLA |
| 1983 09 05.33 | S | 9.3 | A | 20 | C | 10 | 64 | 3.5 | 4 | | | SPR |
| 1983 09 06.32 | S | 9.0 | A | 20 | C | 10 | 64 | 3.5 | 4 | | | SPR |
| 1983 09 06.57 | S | 9.3 | AC | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 07.31 | S | 8.9 | A | 20 | C | 10 | 64 | 3.0 | 4 | | | SPR |
| 1983 09 07.55 | S | 9.4 | AC | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 07.79 | S | 9.7 | AC | 6.5 | B | | 20 | 3 | 7 | | | PEA |
| 1983 09 07.79 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 2.5 | 7 | | | PEA |
| 1983 09 07.79 | M | 9.8 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 09 07.94 | S | 9.2 | A | 26.0 | L | 6 | 63 | 4.0 | 3 | | | MER |
| 1983 09 08.36 | S | 10.0 | A | 32 | L | 6 | 68 | 1.8 | 6 | ? | 270 | BOR |
| 1983 09 08.36 | S | 9.7 | A | 8.0 | B | | 20 | 4.5 | 4 | | | BOR |
| 1983 09 08.79 | S | 9.6 | AC | 15.2 | L | 5 | 30 | 3.2 | 7 | | | PEA |
| 1983 09 09.30 | S | 8.9 | A | 20 | C | 10 | 64 | 3.0 | 4 | | | SPR |
| 1983 09 09.36 | S | 8.7 | S | 15.0 | R | 6 | 29 | 4 | 3 | | | MAC |
| 1983 09 09.36 | S | 10.1 | A | 32 | L | 6 | 68 | 1.8 | 6/ | ? | 90 | BOR |
| 1983 09 09.36 | S | 9.7 | A | 8.0 | B | | 20 | 4.5 | 4 | | | BOR |
| 1983 09 09.79 | S | 9.5 | AC | 15.2 | L | 5 | 30 | 3 | 7/ | | | PEA |
| 1983 09 09.79 | M | 9.6 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 09 09.80 | S | 9.3 | AC | 6.5 | B | | 20 | 3.5 | 7 | | | PEA |
| 1983 09 11.34 | S | 10.0 | A | 32 | L | 6 | 68 | 2.1 | 6 | ? | 45 | BOR |
| 1983 09 11.34 | S | 9.6 | A | 8.0 | B | | 20 | 5.5 | 5 | | | BOR |
| 1983 09 12.38 | S | 8.9 | S | 15.0 | R | 6 | 29 | 4 | 3 | | | MAC |
| 1983 09 12.54 | S | 9.3 | AC | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 13.29 | S | 9.0 | A | 20 | C | 10 | 64 | 2.75 | 4 | | | SPR |
| 1983 09 15.38 | S | 9.6 | A | 8.0 | B | | 20 | 4 | 4 | | | BOR |
| 1983 09 15.38 | S | 9.9 | A | 32 | L | 6 | 68 | 2.1 | 6 | | | BOR |
| 1983 09 15.81 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 3 | 7 | | | PEA |
| 1983 09 16.36 | S | 10.0 | A | 32 | L | 6 | 68 | 1.7 | 6 | ? | 0 | BOR |
| 1983 09 16.82 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 3.6 | 6/ | 0.3 | 30 | PEA |
| 1983 09 17.87 | S | 9.5 | AC | 15.2 | L | 5 | 30 | 2.5 | 6 | | | PEA |
| 1983 09 18.45 | S | 9.3 | S | 15.0 | R | 6 | 29 | 4 | 3 | | | MAC |
| 1983 09 28.47 | S | 9.2 | AA | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 30.93 | S | 9.8 | A | 26.0 | L | 6 | 63 | 4.4 | 3 | 0.05 | 239 | MER |
| 1983 10 01.13 | S | 9.4 | S | 9.6 | L | | | 1.5 | | | | DEA |
| 1983 10 02.46 | S | 9.3 | A | 8.0 | B | | 15 | | | | | SEA |

Comet Cernis (19831) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 10 04.36 | S | 8.9 | S | 13 | R | 7 | 29 | 3 | 6 | | | MAC |
| 1983 10 04.91 | S | 10.4 | A | 26.0 | L | 6 | 63 | 3.9 | 3 | | | MER |
| 1983 10 06.38 | S | 9.1 | S | 13 | R | 7 | 29 | 3 | 5 | | | MAC |
| 1983 10 07.91 | S | 10.7 | A | 26.0 | L | 6 | 63 | 3.7 | 3 | | | MER |
| 1983 10 08.20 | S | 9.3 | S | 8.0 | B | | 20 | & 5 | 1/ | | | GRE |
| 1983 10 08.20 | M | 9.4 | S | 20.3 | L | 6 | 68 | & 3.5 | 4 | | | GRE |
| 1983 10 08.27 | S | 9.5 | A | 8.0 | B | | 20 | 3.5 | 4 | | | BOR |
| 1983 10 11.92 | S | 9.9 | A | 26.0 | L | 6 | 63 | 3.5 | 3 | | 236 | MER |
| 1983 10 12.37 | S | 9.3 | S | 13 | R | 7 | 29 | 4 | 4 | | | MAC |
| 1983 10 12.91 | S | 9.3 | A | 26.0 | L | 6 | 39 | 5.1 | 3 | 0.07 | 311 | MER |
| 1983 10 12.91 | | | | 26.0 | L | 6 | 130 | | | 0.01 | 154 | MER |
| 1983 10 12.92 | S | 9.0 | S | 9.0 | L | 9 | 28 | 5.8 | 1 | | | MER |
| 1983 10 30.10 | S | 10.9 | A | 32 | L | 6 | 68 | 1.7 | 4/ | | | BOR |

Comet Shoemaker (1983p)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 09 15.30 | M | 12.3 | AC | 25 | L | 7 | 103 | 1.4 | 5 | | | MOR |
| 1983 09 16.31 | M | 12.3 | AC | 25 | L | 7 | 103 | 1.6 | 5 | | | MOR |
| 1983 09 25.01 | S | 11.9 | A | 32 | L | 6 | 88 | 1.5 | 5 | | | BOR |
| 1983 09 26.81 | S | 11.6 | A | 26.0 | L | 6 | 63 | 3.2 | 2 | | | MER |
| 1983 09 27.04 | S | 12.1 | A | 32 | L | 6 | 88 | 1.0 | 4 | | | BOR |
| 1983 09 27.81 | S | 11.6 | A | 26.0 | L | 6 | 63 | 4.7 | 2 | | | MER |
| 1983 09 28.81 | S | 11.7 | A | 26.0 | L | 6 | 63 | 6.0 | 2 | | | MER |
| 1983 09 30.81 | S | 11.7 | A | 26.0 | L | 6 | 63 | & 4 | 2 | | | MER |
| 1983 10 02.89 | S | 12.2 | A | 26.0 | L | 6 | 63 | 4.3 | 2 | | | MER |
| 1983 10 03.83 | S | 12.2 | A | 26.0 | L | 6 | 63 | & 4 | 2 | 0.06 | 248 | MER |
| 1983 10 04.86 | S | 12.2 | A | 26.0 | L | 6 | 63 | 4.5 | 2 | | | MER |
| 1983 10 07.07 | S | 12.3 | A | 32 | L | 6 | 88 | 1.1 | 4/ | | | BOR |
| 1983 10 07.14 | S | 12.7 | AC | 25 | L | 7 | 103 | 0.9 | 3/ | | | MOR |
| 1983 10 07.85 | S | 12.0 | A | 26.0 | L | 6 | 63 | & 3 | 4 | 0.04 | 217 | MER |
| 1983 10 08.07 | S | 12.2 | A | 32 | L | 6 | 88 | 1.1 | 2/ | | | BOR |
| 1983 10 08.08 | S | 12.8 | AC | 25 | L | 7 | 103 | 1.4 | 3 | | | MOR |
| 1983 10 08.22 | S | 12.5 | AC | 20.3 | L | 6 | 68 | & 1 | 0/ | | | GRE |
| 1983 10 11.88 | | | | 26.0 | L | 6 | 130 | | | 0.01 | 199 | MER |
| 1983 10 11.88 | S | 12.1 | A | 26.0 | L | 6 | 39 | & 3 | 3 | 0.02 | 14 | MER |
| 1983 10 12.87 | S | 11.8 | A | 26.0 | L | 6 | 63 | & 3 | 3 | 0.08 | 212 | MER |
| 1983 10 29.01 | S | 12.8 | AC | 25 | L | 7 | 103 | 1.4 | 2 | | | MOR |
| 1983 10 30.16 | S | 12.8 | AC | 25 | L | 7 | 103 | 1.6 | 2 | | | MOR |
| 1983 10 31.01 | S | 13.0 | AC | 25 | L | 7 | 103 | 1.1 | 1 | | | MOR |
| 1983 11 01.03 | S | 13.0: | AC | 25 | L | 7 | 103 | & 1.2 | 1/ | | | MOR |

Comet Hartley-IRAS (1983v)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 12 01.98 | S | 10.6 | AC | 32 | L | 6 | 68 | | 1 | | | BOR |

Periodic Comet Pons-Winnecke (1983b)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 05 16.87 | S | 12.3 | VN | 41 | L | 4 | 86 | 1.2 | 2 | | | PEA |
| 1983 05 19.89 | S | 12.0 | VN | 15.2 | L | 5 | 30 | 1 | 3 | | | PEA |
| 1983 05 20.89 | S | 12.0 | VN | 15.2 | L | 5 | 30 | 0.9 | 3/ | | | PEA |
| 1983 05 24.89 | S | 11.9 | VN | 15.2 | L | 5 | 30 | 1 | 3/ | | | PEA |
| 1983 06 09.84 | S | 12.6: | VN | 41 | L | 4 | 86 | 1.5 | 1 | | | CLA |

Periodic Comet Tempel 1 (1982j)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 03 15.02 | S | 12.5 | VB | 29.8 | L | 5 | 89 | 0.6 | 7 | | 220 | KEI |
| 1983 04 01.97 | S | 11.8 | VB | 29.8 | L | 5 | 62 | 0.5 | 7 | | 250 | KEI |
| 1983 04 03.88 | S | 11.3 | AC | 22.5 | R | 10 | 65 | | | | | COM |
| 1983 04 03.92 | S | 10.9 | AC | 25.4 | J | 6 | 59 | 3 | 3 | | | BOU |
| 1983 04 03.92 | S | 10.2 | AC | 25.4 | J | 6 | 59 | & 4 | 5/ | | | BUS01 |
| 1983 04 03.98 | S | 10.9 | AC | 25.4 | L | 6 | 57 | 2.5 | 6 | | | KUI |
| 1983 04 03.99 | S | 11.8 | AC | 25.4 | J | 6 | 75 | | 4/ | | | POI |
| 1983 04 06.91 | S | 11.7 | VB | 29.8 | L | 5 | 62 | 0.5 | 8 | | | KEI |
| 1983 04 08.91 | S | 10.7 | AC | 25.8 | L | 5 | 71 | | 5 | | | FEI |
| 1983 04 08.93 | S | 10.4 | AC | 15.6 | L | 5 | 29 | 4 | 2 | | | BOU |
| 1983 04 08.94 | S | 10.6 | AC | 25.4 | J | 6 | 59 | | 3 | | | BOU |
| 1983 04 08.94 | S | 11.0 | AC | 22.5 | R | 10 | 65 | | | | | COM |
| 1983 04 08.94 | S | 10.6 | AC | 25.4 | J | 6 | 59 | & 3 | 5/ | | | BUS01 |
| 1983 04 09.93 | M | 10.8 | AC | 25.4 | L | 6 | 57 | 2 | | | | KUI |
| 1983 04 12.91 | S | 11.3 | AC | 25.4 | J | 6 | 38 | 1 | 5 | | | POI |
| 1983 04 15.90 | S | 10.3 | AC | 22.5 | R | 10 | 65 | | | | | COM |
| 1983 04 15.91 | S | 10.8 | AC | 25.8 | L | 5 | 62 | | | | | COM |
| 1983 04 15.93 | S | 10.7 | AC | 25.8 | L | 5 | 71 | | 3/ | | | FEI |
| 1983 04 15.93 | S | 10.6 | AC | 25.4 | J | 6 | 38 | 0.5 | 4 | | | POI |
| 1983 04 15.94 | M | 10.7 | AC | 25.4 | L | 6 | 70 | 2 | | | | KUI |
| 1983 04 15.99 | S | 10.3 | AC | 25.4 | J | 6 | 59 | | 4/ | | | BUS01 |
| 1983 04 15.99 | S | 10.3 | AC | 25.4 | J | 6 | 59 | 3 | 4 | | | BOU |
| 1983 04 17.23 | S | 11.4 | AC | 15 | R | 5 | 62 | 1.7 | | | | MOR03 |
| 1983 05 02.88 | S | 10.2 | AC | 25.4 | J | 6 | 38 | 2 | 4 | | | POI |
| 1983 05 02.88 | B | 10.6 | AC | 25.4 | J | 6 | 38 | 2 | 4 | | | POI |
| 1983 05 03.43 | S | 10.2 | AC | 11.0 | L | 4 | 20 | | | | | BOU |
| 1983 05 04.52 | S | 10.1 | AC | 11.0 | L | 4 | 20 | | | | | BOU |
| 1983 05 05.44 | S | 10.3 | AC | 11.0 | L | 4 | 20 | | | | | BOU |
| 1983 05 05.96 | M | 10.3 | AC | 25.4 | L | 6 | 70 | 3 | | | | KUI |
| 1983 05 06.43 | S | 10.2 | AC | 11.0 | L | 4 | 20 | 2.5 | 2 | | | BOU |
| 1983 05 09.63 | S | 10.1: | AC | 15.2 | L | 5 | 30 | 2 | 5 | | | PEA |
| 1983 05 10.11 | S | 10.9 | AC | 15 | R | 5 | 62 | 1.7 | | | | MOR03 |
| 1983 05 10.44 | S | 9.9 | AC | 11.0 | L | 4 | 20 | 4 | 2 | | | BOU |
| 1983 05 10.48 | S | 9.7 | AC | 8.0 | B | | 15 | | | | | BOU |
| 1983 05 10.50 | S | 9.4 | AC | 5.0 | B | | 10 | 6 | | | | BOU |
| 1983 05 10.61 | S | 10.1: | AC | 15.2 | L | 5 | 30 | 2 | 6 | | | PEA |
| 1983 05 10.95 | S | 10.0 | AC | 25.4 | J | 6 | 38 | 1 | 4 | | | POI |
| 1983 05 11.52 | S | 10.1: | AC | 15.2 | L | 5 | 30 | 1.75 | 6 | | | PEA |
| 1983 05 11.93 | S | 10.2 | AC | 25.4 | J | 6 | 38 | 0.5 | 4 | | | POI |
| 1983 05 12.17 | S | 10.9 | AC | 15 | R | 5 | 62 | 1.7 | | | | MOR03 |
| 1983 05 12.45 | S | 9.5 | AC | 8.0 | B | | 15 | | 2 | | | BOU |
| 1983 05 12.47 | S | 9.8 | AC | 11.0 | L | 4 | 20 | & 3.5 | 2 | | | BOU |
| 1983 05 13.15 | S | 10.8 | AC | 15 | R | 5 | 62 | 1.4 | | | | MOR03 |
| 1983 05 15.42 | S | 9.5 | AC | 8.0 | B | | 15 | 5 | 2 | | | BOU |
| 1983 05 15.56 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 4 | 7 | | | PEA |
| 1983 05 15.90 | S | 10.2 | AC | 25.4 | J | 6 | 38 | 1 | 4 | | | POI |
| 1983 05 16.44 | S | 9.3 | AC | 8.0 | B | | 15 | 6 | 3 | | | BOU |
| 1983 05 16.45 | S | 9.4 | AC | 5.0 | B | | 10 | | | | | BOU |
| 1983 05 17.59 | S | 9.3 | AC | 15.2 | L | 5 | 30 | 4 | 7 | | | PEA |
| 1983 05 19.87 | S | 9.5: | AC | 15.2 | L | 5 | 30 | 3.5 | 7 | | | PEA |
| 1983 05 29.48 | S | 9.6 | AC | 41 | L | 4 | 86 | 4.5 | | 0.05 | 180 | CLA |
| 1983 05 30.48 | S | 9.6 | AC | 41 | L | 4 | 86 | 4.5 | | ? | | CLA |

Periodic Comet Tempel 1 (1982j) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 05 31.38 | S | 9.5 | AC | 11.0 | L | 4 | 20 | | | | | BOU |
| 1983 06 02.53 | S | 9.5 | AC | 41 | L | 4 | 86 | 4.5 | 7 | 0.03 | 180 | CLA |
| 1983 06 02.60 | S | 9.4 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 06 03.59 | S | 9.3 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 06 03.63 | S | 9.3 | AC | 5.0 | B | | 10 | | | | | POI |
| 1983 06 04.39 | S | 9.3 | AC | 11.0 | L | 4 | 20 | 4 | 2/ | | | BOU |
| 1983 06 05.98 | S | 10.9 | AC | 25.4 | L | 6 | 57 | 1.5 | 4 | | | KUI |
| 1983 06 06.11 | S | 10.7 | AC | 15 | R | 5 | 31 | 3.3 | | | | MOR03 |
| 1983 06 06.11 | S | 10.7 | AC | 15 | R | 5 | 62 | 2.6 | 3 | | | MOR03 |
| 1983 06 06.60 | S | 9.3 | AC | 15.2 | L | 5 | 30 | 3.5 | 5 | | | PEA |
| 1983 06 06.91 | S | 9.4 | AC | 8.0 | B | | 20 | & 3 | | | | CAV |
| 1983 06 06.97 | S | 10.6 | AC | 25.4 | J | 6 | 59 | | 1/ | | | BUS01 |
| 1983 06 07.57 | S | 9.3 | AC | 15.2 | L | 5 | 30 | 3.5 | 5 | | | PEA |
| 1983 06 08.57 | S | 9.2 | AC | 15.2 | L | 5 | 30 | 4 | 5 | | | PEA |
| 1983 06 08.60 | S | 9.5 | AC | 41 | L | 4 | 86 | 5 | 7 | 0.07 | 185 | CLA |
| 1983 06 09.50 | S | 9.6 | AC | 41 | L | 4 | 86 | 5 | 7 | 0.07 | 185 | CLA |
| 1983 06 10.58 | S | 9.3 | AC | 15.2 | L | 5 | 30 | 3.5 | 5 | | | PEA |
| 1983 06 11.12 | S | 10.5 | AC | 15 | R | 5 | 31 | 4.5 | 3 | | | MOR03 |
| 1983 06 12.41 | M | 9.6 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 06 12.57 | S | 9.6 | AC | 41 | L | 4 | 86 | 5 | | 0.03 | 185 | CLA |
| 1983 06 13.61 | M | 9.4 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 06 13.61 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 3 | 5 | | | PEA |
| 1983 06 14.56 | S | 9.5 | AC | 41 | L | 4 | 86 | 5 | 6 | 0.05 | 185 | CLA |
| 1983 06 30.42 | M | 9.4 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 07 01.49 | S | 9.6 | AC | 15.2 | L | 5 | 30 | 3 | 5 | | | PEA |
| 1983 07 02.50 | M | 9.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 02.50 | S | 9.6 | AC | 15.2 | L | 5 | 30 | 3 | 5 | | | PEA |
| 1983 07 03.49 | M | 9.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 03.49 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 3 | 4 | | | PEA |
| 1983 07 04.49 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 2.5 | 4 | | | PEA |
| 1983 07 04.56 | S | 10.2: | AC | 41 | L | 4 | 86 | 3 | 5 | | | CLA |
| 1983 07 05.52 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 2.8 | 4/ | | | PEA |
| 1983 07 06.41 | M | 9.7: | A | 8.0 | B | | 15 | | 0 | | | SEA |
| 1983 07 06.49 | M | 9.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 06.49 | S | 9.6 | AC | 15.2 | L | 5 | 30 | 3 | 5 | | | PEA |
| 1983 07 06.50 | S | 9.5 | AC | 6.5 | B | | 20 | | | | | PEA |
| 1983 07 09.60 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 3 | 4 | | | PEA |
| 1983 07 11.47 | S | 9.6 | AC | 15.2 | L | 5 | 30 | 3 | 3 | ? | 343 | PEA |
| 1983 07 12.48 | S | 9.6 | AC | 15.2 | L | 5 | 30 | 3 | 4 | | | PEA |
| 1983 07 12.48 | S | 9.5 | AC | 6.5 | B | | 20 | | | | | PEA |
| 1983 07 12.48 | S | 9.8 | AC | 15.2 | L | 5 | 72 | | | | | PEA |
| 1983 07 13.51 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 3.2 | 3 | | | PEA |
| 1983 07 14.54 | S | 10.4 | AC | 41 | L | 4 | 86 | 6 | 4 | | | CLA |
| 1983 07 15.61 | S | 9.7: | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 27.48 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 2.5 | 3 | | | PEA |
| 1983 08 05.50 | S | 9.8 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 07.54 | S | 10.8 | AC | 41 | L | 4 | 86 | 2.5 | 4 | | | CLA |
| 1983 08 08.48 | M | 9.8 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 08.48 | S | 9.8 | AC | 15.2 | L | 5 | 30 | 3.5 | 4 | | | PEA |
| 1983 08 09.48 | S | 9.8 | AC | 15.2 | L | 5 | 30 | 3.5 | 2 | | | PEA |
| 1983 09 04.53 | S | 11.1 | AC | 41 | L | 4 | 86 | 2 | 6 | | | PEA |
| 1983 09 04.83 | S | 11.0 | AC | 41 | L | 4 | 86 | 2 | 6 | | | CLA |

Periodic Comet Tempel 2 (1982d)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 05 15.77 | S | 9.5 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 05 15.78 | S | 9.3 | AC | 11.0 | L | 4 | 20 | & 3.5 | 5 | | | BOU |
| 1983 05 16.86 | S | 10.0 | VN | 15.2 | L | 5 | 30 | 3.5 | 3 | | | PEA |
| 1983 05 19.88 | S | 10.0 | VN | 15.2 | L | 5 | 30 | 3 | 3 | | | PEA |
| 1983 05 20.88 | S | 9.9 | VN | 15.2 | L | 5 | 30 | 3 | 3 | | | PEA |
| 1983 05 21.82 | S | 8.9 | AC | 11.0 | L | 4 | 20 | 5 | 3/ | | | BOU |
| 1983 06 06.83 | S | 8.6 | VN | 15.2 | L | 5 | 30 | 4.5 | 4 | | | PEA |
| 1983 06 07.85 | S | 8.5 | VN | 15.2 | L | 5 | 30 | 4.5 | 4 | | | PEA |
| 1983 06 08.71 | S | 9.1 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 06 08.89 | S | 8.5 | VN | 15.2 | L | 5 | 30 | 4 | 5 | | | PEA |
| 1983 06 09.72 | S | 9.1 | A | 8.0 | B | | 15 | | 4 | | | SEA |
| 1983 06 09.73 | S | 8.9 | A | 5.0 | B | | 10 | | | | | SEA |
| 1983 06 09.82 | S | 8.7 | AC | 41 | L | 4 | 86 | 6 | 3 | | | CLA |
| 1983 06 09.89 | S | 8.4 | VN | 15.2 | L | 5 | 30 | 5 | 5 | | | PEA |
| 1983 06 10.89 | S | 8.4 | VN | 15.2 | L | 5 | 30 | 5 | 5 | | | PEA |
| 1983 06 12.83 | S | 8.5 | AC | 41 | L | 4 | 86 | 6 | 3 | 0.05 | 30 | CLA |
| 1983 06 12.87 | S | 8.5 | VN | 15.2 | L | 5 | 30 | 4.5 | 6 | 0.05 | 35 | PEA |
| 1983 06 13.86 | M | 8.4 | VN | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 06 13.86 | S | 8.4 | VN | 15.2 | L | 5 | 30 | 5 | 6 | 0.07 | 38 | PEA |
| 1983 06 13.87 | S | 8.3 | VN | 6.5 | B | | 20 | 6 | 4 | ? | | PEA |
| 1983 07 07.67 | S | 8.4 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 07 09.87 | S | 8.4 | AA | 15.2 | L | 5 | 30 | 5.5 | 4 | | | PEA |
| 1983 07 10.71 | S | 8.7 | A | 8.0 | B | | 15 | | 2 | | | SEA |
| 1983 07 10.89 | S | 8.4 | AA | 15.2 | L | 5 | 30 | 6 | 4 | | | PEA |
| 1983 07 11.91 | S | 8.4 | AA | 15.2 | L | 5 | 30 | 6 | 3/ | ? | | PEA |
| 1983 07 12.69 | S | 8.8 | A | 8.0 | B | | 15 | 5 | 3 | | | SEA |
| 1983 07 14.66 | S | 8.9 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 07 15.90 | S | 8.5 | AA | 15.2 | L | 5 | 30 | 5.5 | 4 | ? | | PEA |
| 1983 07 16.90 | S | 8.6 | AA | 15.2 | L | 5 | 30 | 4.5 | 4 | 0.33 | 277 | PEA |
| 1983 07 16.90 | M | 8.7 | AA | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 17.81 | S | 9.2 | AC | 41 | L | 4 | 86 | 4.5 | 4 | 0.33 | 72 | CLA |
| 1983 07 19.88 | M | 8.6 | AA | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 19.88 | S | 8.6 | AA | 15.2 | L | 5 | 30 | 5 | 4 | ? | 275 | PEA |
| 1983 07 19.88 | S | 8.5 | AA | 6.5 | B | | 20 | | 3 | | | PEA |
| 1983 07 20.88 | S | 8.6 | AA | 15.2 | L | 5 | 30 | 4.5 | 5 | | | PEA |
| 1983 07 20.88 | M | 8.6 | AA | 15.2 | L | 5 | 30 | | | | 280 | PEA |
| 1983 07 20.89 | S | 8.5 | AA | 6.5 | B | | 20 | 5.5 | 3/ | | | PEA |
| 1983 07 21.31 | S | 9.6 | A | 32 | L | 6 | 68 | 3.1 | 2 | | | BOR |
| 1983 07 21.31 | S | 9.0 | A | 8.0 | B | | 20 | 5 | 1 | | | BOR |
| 1983 07 21.91 | M | 8.7 | AA | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 21.91 | S | 8.7 | AA | 15.2 | L | 5 | 30 | 5 | 4/ | | | PEA |
| 1983 07 22.92 | S | 8.6 | AA | 15.2 | L | 5 | 30 | 4.5 | 5 | | | PEA |
| 1983 08 06.41 | S | 9.6 | S | 15.0 | R | 6 | 29 | 7 | 1 | | | MAC |
| 1983 08 08.89 | S | 8.9 | AC | 15.2 | L | 5 | 30 | 6 | 4 | ? | 240 | PEA |
| 1983 08 10.33 | S | 10.4 | A | 32 | L | 6 | 68 | 3 | 1/ | | | BOR |
| 1983 08 10.90 | S | 9.0 | AC | 15.2 | L | 5 | 30 | 6.5 | 3/ | 0.17 | 248 | PEA |
| 1983 08 13.88 | S | 9.1 | AC | 15.2 | L | 5 | 30 | 5 | 3 | | | PEA |
| 1983 08 14.09 | S | 9.8 | AC | 25.4 | L | 4 | 79 | 4 | 1 | | | CAV |
| 1983 08 14.34 | S | 10.0 | A | 32 | L | 6 | 68 | 3.5 | 2 | | | BOR |
| 1983 08 14.34 | S | 10.0 | A | 8.0 | B | | 20 | 3 | 0 | | | BOR |
| 1983 08 14.77 | S | 9.6 | AC | 41 | L | 4 | 86 | 4 | 2 | | | CLA |
| 1983 08 14.88 | S | 9.0 | AC | 15.2 | L | 5 | 30 | 4 | 3 | | | PEA |
| 1983 08 15.33 | S | 10.0 | A | 32 | L | 6 | 68 | 4.0 | 2 | | | BOR |
| 1983 08 15.33 | S | 9.6 | A | 8.0 | B | | 20 | 6 | 0 | | | BOR |

Periodic Comet Tempel 2 (1982d) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 08 15.82 | S | 9.7 | AC | 41 | L | 4 | 86 | 4 | 2 | | | CLA |
| 1983 08 15.89 | S | 9.1 | AC | 15.2 | L | 5 | 30 | 4.5 | 3 | | | PEA |
| 1983 08 16.33 | S | 9.6 | A | 8.0 | B | | 20 | 4.5 | 1 | | | BOR |
| 1983 08 16.33 | S | 10.0 | A | 32 | L | 6 | 68 | 3.5 | 3 | | | BOR |
| 1983 08 16.34 | S | 10.3 | AC | 25 | L | 7 | 68 | 2.4 | 2 | | | MOR |
| 1983 08 16.89 | S | 9.1 | AC | 15.2 | L | 5 | 30 | 5 | 3 | | | PEA |
| 1983 08 17.88 | S | 9.2 | AC | 15.2 | L | 5 | 30 | 4 | 2/ | | | PEA |
| 1983 08 18.83 | S | 9.6 | AC | 41 | L | 4 | 86 | 4 | 2 | | | CLA |
| 1983 08 21.34 | S | 10.1 | A | 32 | L | 6 | 68 | 3.2 | 2 | | | BOR |
| 1983 08 21.34 | S | 9.7 | A | 8.0 | B | | 20 | 6 | 0 | | | BOR |
| 1983 09 04.30 | M | 10.6 | AC | 25 | L | 7 | 103 | 1.2 | 6 | | | MOR |
| 1983 09 04.34 | S | 10.4 | A | 32 | L | 6 | 68 | 2.7 | 5 | | | BOR |
| 1983 09 04.84 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 7 | 4 | | | PEA |
| 1983 09 04.85 | | | | 41 | L | 4 | 86 | | | 0.08 | | PEA |
| 1983 09 04.85 | S | 9.7 | AC | 41 | L | 4 | 86 | 7 | 3 | 0.08 | 15 | CLA |
| 1983 09 05.32 | S | 10.3 | AC | 25 | L | 7 | 103 | 4.3 | 3/ | | | MOR |
| 1983 09 07.79 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 5.5 | 3/ | | | PEA |
| 1983 09 08.34 | S | 10.4 | A | 32 | L | 6 | 68 | 3.2 | 1/ | | | BOR |
| 1983 09 08.34 | S | 10.2 | A | 8.0 | B | | 20 | 4.5 | 1 | | | BOR |
| 1983 09 08.35 | S | 10.2 | AC | 25 | L | 7 | 68 | 5.2 | 2 | | | MOR |
| 1983 09 08.80 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 5 | 2 | | | PEA |
| 1983 09 09.33 | S | 10.2 | AC | 25 | L | 7 | 68 | 5.2 | 2 | | | MOR |
| 1983 09 09.35 | S | 10.4 | A | 32 | L | 6 | 68 | 3.6 | 1 | | | BOR |
| 1983 09 09.35 | S | 10.3 | A | 8.0 | B | | 20 | 4 | 0 | | | BOR |
| 1983 09 09.78 | S | 9.4 | AC | 15.2 | L | 5 | 30 | 5 | 3 | | | PEA |
| 1983 09 11.36 | S | 10.5 | A | 32 | L | 6 | 68 | 3.1 | 1 | | | BOR |
| 1983 09 15.35 | S | 10.6 | A | 32 | L | 6 | 68 | 3.6 | 1/ | | | BOR |
| 1983 09 15.35 | S | 10.2 | A | 8.0 | B | | 20 | 5.5 | 0 | | | BOR |
| 1983 09 15.38 | S | 10.4 | AC | 25 | L | 7 | 68 | 5.4 | 2 | | | MOR |
| 1983 09 16.35 | S | 10.4 | AC | 25 | L | 7 | 68 | 4.6 | 1 | | | MOR |
| 1983 09 16.35 | S | 10.5 | A | 32 | L | 6 | 68 | 3.0 | 1 | | | BOR |
| 1983 09 16.83 | S | 9.7 | AC | 15.2 | L | 5 | 30 | 4.5 | 3 | | | PEA |
| 1983 09 30.95 | S | 11.1 | A | 26.0 | L | 6 | 63 | 3.6 | 2 | | | MER |
| 1983 10 07.28 | S | 10.7 | A | 32 | L | 6 | 68 | 3.0 | 1 | | | BOR |
| 1983 10 07.93 | S | 11.4 | A | 26.0 | L | 6 | 63 | 3.7 | 2 | | | MER |
| 1983 10 08.29 | S | 10.6 | A | 32 | L | 6 | 68 | 3.0 | 0/ | | | BOR |
| 1983 10 30.14 | S | 12.0 | A | 50 | L | 5 | 96 | 1.4 | 0 | | | BOR |

Periodic Comet Kopff (1945 V = 1951 VII = 1982k)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1945 06 04.32 | S | 12.0: | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 07.36 | S | 12.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 09.31 | S | 11.5 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 11.39 | S | 11.5 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 15.61 | S | 11.7 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 16.46 | S | 11.4 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 17.35 | S | 11.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 19.36 | S | 11.4 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 20.64 | S | 11.4 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 29.40 | S | 10.5 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 06 30.36 | S | 10.4 | V | 14 | R | 16 | 42 | | | | | JON |

Periodic Comet Kopff (1945 V = 1951 VII = 1982k) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1945 07 01.37 | S | 10.2 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 02.38 | S | 9.8 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 03.39 | S | 10.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 05.37 | S | 9.6 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 07.46 | S | 9.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 09.45 | S | 8.8 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 10.45 | S | 9.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 12.42 | S | 9.0 | V | 14 | R | 16 | 42 | | | | 330 | JON |
| 1945 07 14.37 | S | 8.5: | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 15.33 | S | 8.6 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 07 29.40 | S | 8.0 | V | 14 | R | 16 | 42 | | | | 310 | JON |
| 1945 07 31.46 | S | 8.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 08 04.30 | S | 8.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 08 10.49 | S | 8.5 | V | 14 | R | 16 | 42 | | | | 315 | JON |
| 1945 09 01.46 | S | 8.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 09 03.47 | S | 9.0 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 09 04.47 | S | 8.7 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 09 10.46 | S | 8.7 | V | 14 | R | 16 | 42 | | | | | JON |
| 1945 09 12.47 | S | 9.0 | V | 14 | R | 16 | 42 | | | | 315 | JON |
| 1951 08 19.32 * | S | 12.2 | V | 14 | R | 16 | 42 | 2 | 3 | | | JON |
| 1951 09 21.35 * | S | 11.3 | V | 14 | R | 16 | 42 | & 1.5 | 4 | | | JON |
| 1951 09 21.35 | S | 11.5 | V | 31.7 | L | 5 | 86 | | | | | JON |
| 1951 09 22.35 * | S | 11.4 | V | 31.7 | L | 5 | 86 | & 3.5 | 2 | | | JON |
| 1951 09 26.38 * | S | 10.6 | V | 14 | R | 16 | 42 | | | | | JON |
| 1951 09 26.38 | S | 10.9 | V | 31.7 | L | 5 | 86 | | 3 | | | JON |
| 1951 09 28.41 * | S | 10.8 | V | 14 | R | 16 | 34 | | | | | JON |
| 1951 09 30.39 * | S | 10.8 | V | 14 | R | 16 | 34 | | | | | JON |
| 1983 05 04.51 | S | 9.4 | AC | 11.0 | L | 4 | 20 | | | | | BOU |
| 1983 05 05.45 | S | 9.3 | AC | 11.0 | L | 4 | 20 | | | | | BOU |
| 1983 05 06.32 | S | 10.8 | AC | 15 | R | 5 | 62 | 1.7 | | | | MOR03 |
| 1983 05 06.45 | S | 9.1 | AC | 11.0 | L | 4 | 20 | | | | | BOU |
| 1983 05 06.47 | S | 9.0 | AC | 8.0 | B | | 15 | | | | | BOU |
| 1983 05 06.69 | S | 9.3 | AC | 15.2 | L | 5 | 30 | 4.5 | 5 | | | PEA |
| 1983 05 07.74 | S | 9.2 | AC | 15.2 | L | 5 | 30 | 4.5 | 5 | | | PEA |
| 1983 05 08.48 | S | 8.8 | AC | 11.0 | L | 4 | 20 | 7 | 3 | | | BOU |
| 1983 05 08.49 | S | 8.7 | AC | 5.0 | B | | 10 | | | | | BOU |
| 1983 05 09.03 | S | 9.4 | AC | 29.8 | L | 5 | 62 | 2.4 | 2/ | | | KEI |
| 1983 05 09.03 | S | 8.9 | AC | 8.0 | B | | 20 | 3.2 | | | | KEI |
| 1983 05 09.62 | S | 9.5 | AC | 15.2 | L | 5 | 30 | 3.5 | 3 | | | PEA |
| 1983 05 10.23 | S | 10.6 | AC | 15 | R | 5 | 31 | 3.5 | | | | MOR03 |
| 1983 05 10.47 | S | 8.7 | AC | 11.0 | L | 4 | 20 | 7 | 3 | | | BOU |
| 1983 05 10.77 | S | 9.1 | AC | 15.2 | L | 5 | 30 | 2 | 7 | ? | 89 | PEA |
| 1983 05 10.78 | M | 9.2 | AC | 15.2 | L | 5 | 30 | | 7 | | | PEA |
| 1983 05 10.78 | S | 9.0 | AC | 6.5 | B | | 20 | 2.5 | 6 | | | PEA |
| 1983 05 11.23 | S | 10.7 | AC | 15 | R | 5 | 62 | 1.7 | | | | MOR03 |
| 1983 05 11.54 | S | 8.6 | AC | 11.0 | L | 4 | 20 | 6 | 3/ | | | BOU |
| 1983 05 11.79 | S | 9.0 | AC | 15.2 | L | 5 | 30 | 2.5 | 6 | | | PEA |
| 1983 05 12.18 | S | 10.4 | AC | 15 | R | 5 | 31 | 3.5 | | | | MOR03 |
| 1983 05 12.56 | S | 8.4 | AC | 11.0 | L | 4 | 20 | | 4 | | | BOU |
| 1983 05 13.15 | S | 9.8 | AC | 15 | R | 5 | 31 | 4 | | | | MOR03 |
| 1983 05 14.29 | S | 9.9 | AC | 15 | R | 5 | 31 | 3.5 | | | | MOR03 |
| 1983 05 14.49 | S | 8.3 | AC | 11.0 | L | 4 | 20 | 6 | 3 | | | BOU |
| 1983 05 14.50 | S | 8.2 | AC | 5.0 | B | | 10 | | | | | BOU |

Periodic Comet Kopff (1945 V = 1951 VII = 1982k) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 05 14.68 | S | 9.0 | AC | 15.2 | L | 5 | 30 | 3.5 | 7 | | | PEA |
| 1983 05 15.55 | S | 9.0 | AC | 15.2 | L | 5 | 30 | 4.5 | 6 | | | PEA |
| 1983 05 16.50 | S | 7.8 | AC | 11.0 | L | 4 | 20 | 8 | 4 | | | BOU |
| 1983 05 16.51 | S | 7.7 | AC | 5.0 | B | | 10 | 10 | | | | BOU |
| 1983 05 16.51 | S | 7.7 | AC | 8.0 | B | | 15 | | | | | BOU |
| 1983 05 16.82 | S | 8.8 | AC | 15.2 | L | 5 | 30 | 5 | 6/ | ? | 260 | PEA |
| 1983 05 16.82 | S | 9.1 | AC | 41 | L | 4 | 86 | 4.5 | 7 | | | PEA |
| 1983 05 17.26 | S | 10.0 | AC | 15 | R | 5 | 31 | 3.5 | | | | MOR03 |
| 1983 05 17.59 | S | 8.7 | AC | 15.2 | L | 5 | 30 | 4.5 | 7 | | | PEA |
| 1983 05 19.68 | | | | 15.2 | L | 5 | 30 | | | 0.07 | 22 | PEA |
| 1983 05 19.68 | | | | 15.2 | L | 5 | 30 | | | 0.04 | 331 | PEA |
| 1983 05 19.68 | S | 8.7 | AC | 15.2 | L | 5 | 30 | 3.5 | 7 | 0.17 | 74 | PEA |
| 1983 05 21.76 | S | 8.0 | AC | 11.0 | L | 4 | 20 | 6 | 4 | | | BOU |
| 1983 05 21.77 | S | 8.0 | AC | 5.0 | B | | 10 | | | | | BOU |
| 1983 05 30.51 | S | 8.5 | AC | 41 | L | 4 | 86 | 8 | 7 | 0.20 | 295 | CLA |
| 1983 05 31.41 | S | 8.1 | AC | 11.0 | L | 4 | 20 | 6 | 3 | | | BOU |
| 1983 05 31.42 | S | 8.2 | AC | 5.0 | B | | 10 | | | | | BOU |
| 1983 06 02.01 | S | 7.8 | AC | 8.0 | B | | 20 | 3.0 | 4 | 0.17 | 22 | KEI |
| 1983 06 02.18 | S | 9.4 | AC | 15 | R | 5 | 31 | 4 | 3 | | | MOR03 |
| 1983 06 02.55 | S | 8.5: | AC | 41 | L | 4 | 86 | | 7 | | | CLA |
| 1983 06 02.60 | S | 8.1 | AC | 15.2 | L | 5 | 30 | 5 | 6 | | | PEA |
| 1983 06 02.95 | M | 9.5 | AC | 25.4 | L | 6 | 70 | 2.5 | | | | KUI |
| 1983 06 03.60 | S | 8.1 | AC | 15.2 | L | 5 | 30 | 5 | 6/ | | | PEA |
| 1983 06 03.60 | B | 8.1 | AC | 5.0 | B | | 10 | 5 | 6 | | | POI |
| 1983 06 03.61 | S | 8.0 | AC | 5.0 | B | | 10 | | | | | POI |
| 1983 06 04.37 | S | 8.1 | AC | 11.0 | L | 4 | 20 | | 3 | | | BOU |
| 1983 06 04.39 | S | 8.0 | AC | 5.0 | B | | 10 | 10 | 1/ | | | BOU |
| 1983 06 05.96 | M | 9.7 | AC | 25.4 | L | 6 | 57 | 3 | 6 | | | KUI |
| 1983 06 06.12 | S | 9.0 | AC | 15 | R | 5 | 31 | 5 | 5 | | | MOR03 |
| 1983 06 06.40 | S | 9.1 | A | 8.0 | B | | 15 | 9 | 0 | | | PRI |
| 1983 06 06.60 | S | 8.0 | AC | 15.2 | L | 5 | 30 | 5 | 6 | | | PEA |
| 1983 06 06.60 | S | 8.0 | AC | 6.5 | B | | 20 | 6 | 5 | | | PEA |
| 1983 06 06.93 | S | 9.1 | AC | 8.0 | B | | 20 | 4 | 2 | | | CAV |
| 1983 06 06.96 | S | 9.3 | AC | 25.4 | J | 6 | 59 | 6 | 4 | | | BUS01 |
| 1983 06 06.97 | S | 9.2 | AC | 11.5 | L | | 36 | 3 | 5/ | | | KUI |
| 1983 06 07.58 | S | 8.0 | AC | 15.2 | L | 5 | 30 | 5.5 | 7 | | | PEA |
| 1983 06 07.58 | S | 8.0 | AC | 6.5 | B | | 20 | 6 | 5 | | | PEA |
| 1983 06 08.18 | S | 9.1 | AC | 15 | R | 5 | 31 | 5 | 4 | | | MOR03 |
| 1983 06 08.58 | S | 8.1 | AC | 5.0 | B | | 10 | | | | | POI |
| 1983 06 08.58 | S | 8.1 | AC | 6.5 | B | | 20 | | 5 | | | PEA |
| 1983 06 08.58 | S | 8.1 | AC | 15.2 | L | 5 | 30 | 5.5 | 7 | | | PEA |
| 1983 06 08.59 | B | 8.4 | AC | 5.0 | B | | 10 | | 4 | | | POI |
| 1983 06 08.61 | S | 8.4 | AC | 41 | L | 4 | 86 | 8 | 7 | 0.25 | 285 | CLA |
| 1983 06 09.17 | S | 9.0 | AC | 15 | R | 5 | 31 | 5 | 4 | | | MOR03 |
| 1983 06 09.54 | S | 8.4 | AC | 41 | L | 4 | 86 | 8 | 7 | 0.42 | 260 | CLA |
| 1983 06 10.36 | S | 8.0 | A | 8.0 | B | | 15 | 9 | 0 | | | PRI |
| 1983 06 10.59 | S | 8.1 | AC | 15.2 | L | 5 | 30 | 5 | 7 | | | PEA |
| 1983 06 10.59 | S | 8.0 | AC | 6.5 | B | | 20 | 6.5 | 5/ | | | PEA |
| 1983 06 11.15 | S | 8.9 | AC | 15 | R | 5 | 31 | 5 | 6 | | | MOR03 |
| 1983 06 11.60 | S | 8.1 | AC | 11.0 | L | 4 | 20 | 6 | 3/ | | | BOU |
| 1983 06 12.14 | S | 8.9 | AC | 15 | R | 5 | 31 | 5.5 | 6 | | | MOR03 |
| 1983 06 12.41 | S | 7.5 | A | 8.0 | B | | 15 | | 4 | | | SEA |
| 1983 06 12.69 | S | 8.5 | AC | 41 | L | 4 | 86 | 7 | 6 | | | CLA |

Periodic Comet Kopff (1945 V = 1951 VII = 1982k) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 06 12.93 | S | 8.7 | AC | 8.0 | B | | 20 | 6.8 | 3 | | | CAV |
| 1983 06 12.98 | S | 7.9 | AA | 8.0 | B | | 20 | 6.0 | | | | KEI |
| 1983 06 13.04 | S | 7.8 | AA | 5.0 | B | | 10 | 6.0 | | | | KEI |
| 1983 06 13.62 | S | 8.0 | AC | 6.5 | B | | 20 | 7 | 6 | | | PEA |
| 1983 06 13.62 | S | 8.1 | AC | 15.2 | L | 5 | 30 | 5 | 7/ | | | PEA |
| 1983 06 13.63 | M | 8.1 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 06 14.60 | S | 8.4 | AC | 41 | L | 4 | 86 | 7 | 7 | | | CLA |
| 1983 06 14.97 | S | 8.0 | AA | 8.0 | B | | 20 | 3.0 | | | | KEI |
| 1983 06 15.46 | S | 8.7 | A | 5.0 | B | | 7 | 6 | 0 | | | PRI |
| 1983 06 16.62 | S | 7.1 | AC | 5.0 | B | | 10 | 6.5 | 4 | | | POI |
| 1983 06 17.68 | B | 8.3 | AC | 5.0 | B | | 10 | 2.5 | 3 | | | POI |
| 1983 06 17.68 | S | 8.1 | AC | 5.0 | B | | 10 | 2.5 | 3 | | | POI |
| 1983 06 27.34 | S | 7.7 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 06 29.42 | S | 7.4 | A | 8.0 | B | | 15 | | 5 | | | SEA |
| 1983 06 30.42 | S | 8.3 | A | 8.0 | B | | 15 | 8 | 0 | | | PRI |
| 1983 06 30.42 | S | 7.5 | A | 8.0 | B | | 15 | | 5 | | | SEA |
| 1983 07 01.49 | S | 7.9 | AC | 15.2 | L | 5 | 30 | 5 | 7 | 0.25 | 80 | PEA |
| 1983 07 01.49 | S | 7.7 | AC | 6.5 | B | | 20 | 8 | 7 | | | PEA |
| 1983 07 02.48 | M | 7.9 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 02.48 | S | 7.8 | AC | 6.5 | B | | 20 | 8 | 7 | | | PEA |
| 1983 07 02.48 | S | 7.8 | AC | 15.2 | L | 5 | 30 | 5.5 | 7/ | 0.25 | 85 | PEA |
| 1983 07 03.48 | S | 7.8 | AC | 15.2 | L | 5 | 30 | 5.5 | 7 | 0.22 | 80 | PEA |
| 1983 07 03.48 | S | 7.7 | AC | 6.5 | B | | 20 | 7 | 6 | | | PEA |
| 1983 07 03.49 | M | 7.9 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 04.43 | S | 8.5 | A | 5.0 | B | | 7 | 5 | 0 | | | PRI |
| 1983 07 04.48 | M | 7.9 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 04.48 | S | 7.8 | AC | 15.2 | L | 5 | 30 | 5.5 | 7 | 0.21 | 78 | PEA |
| 1983 07 04.49 | S | 7.6 | AC | 6.5 | B | | 20 | 7.5 | 6 | ? | | PEA |
| 1983 07 04.57 | S | 7.9 | AC | 41 | L | 4 | 86 | 9 | 7 | 0.67 | 90 | CLA |
| 1983 07 05.51 | S | 7.6 | AC | 6.5 | B | | 20 | 7 | 6 | ? | | PEA |
| 1983 07 05.51 | M | 7.8 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 05.51 | S | 7.7 | AC | 15.2 | L | 5 | 30 | 5.5 | 7/ | 0.25 | 85 | PEA |
| 1983 07 06.42 | S | 7.6 | A | 8.0 | B | | 15 | | 4 | | | SEA |
| 1983 07 06.49 | S | 7.5 | AC | 6.5 | B | | 20 | 8 | 6 | ? | 90 | PEA |
| 1983 07 06.49 | S | 7.6 | AC | 15.2 | L | 5 | 30 | 6.5 | 7 | 0.25 | 95 | PEA |
| 1983 07 06.49 | M | 7.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 07.42 | S | 8.5 | A | 8.0 | B | | 15 | 4 | 0 | | | PRI |
| 1983 07 08.44 | S | 8.6 | A | 15 | R | 16 | 50 | 3.5 | 0 | | | PRI |
| 1983 07 09.46 | S | 8.6 | A | 15 | R | 16 | 50 | 3 | 0 | | | PRI |
| 1983 07 09.61 | S | 7.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 10.12 | S | 8.4 | AC | 15 | R | 5 | 31 | 6 | 4 | | | MOR03 |
| 1983 07 10.41 | S | 7.7 | A | 8.0 | B | | 15 | 10 | 4 | | | SEA |
| 1983 07 11.39 | S | 8.6 | A | 8.0 | B | | 15 | 3 | 0 | | | PRI |
| 1983 07 11.48 | S | 7.7 | AC | 15.2 | L | 5 | 30 | 6 | 6 | 0.2 | 98 | PEA |
| 1983 07 11.48 | S | 7.6 | AC | 6.5 | B | | 20 | 8.5 | 6 | ? | | PEA |
| 1983 07 12.49 | S | 7.7 | AC | 15.2 | L | 5 | 30 | 6 | 6 | 0.18 | | PEA |
| 1983 07 13.51 | S | 7.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 13.58 | S | 8.6 | A | 8.0 | B | | 15 | 3 | 0 | | | PRI |
| 1983 07 14.21 | S | 8.5 | A | 14 | S | 4 | 20 | 5.0 | 2 | | | SPR |
| 1983 07 14.42 | S | 7.8 | A | 8.0 | B | | 15 | | 5 | | | SEA |
| 1983 07 14.54 | S | 8.6 | A | 8.0 | B | | 15 | & 3.5 | 0 | | | PRI |
| 1983 07 14.56 | S | 7.8 | AC | 41 | L | 4 | 86 | 9 | 7 | 0.58 | 90 | CLA |
| 1983 07 15.63 | | | | 6.5 | B | | 20 | 10 | 4/ | ? | | PEA |

Periodic Comet Kopff (1945 V = 1951 VII = 1982k) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 07 15.63 | M | 7.5 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 15.63 | S | 7.5 | AC | 15.2 | L | 5 | 30 | 7 | 5 | ? | | PEA |
| 1983 07 16.90 | B | 8.4 | S | 26.0 | L | 6 | 63 | | 2 | | | MER |
| 1983 07 17.22 | S | 8.8: | A | 14 | S | 4 | 20 | 4.0 | 2 | | | SPR |
| 1983 07 26.40 | S | 9.0 | A | 8.0 | B | | 15 | & 3.5 | 0 | | | PRI |
| 1983 07 27.07 | S | 7.7 | A | 8.0 | B | | 20 | 9 | 0 | | | BOR |
| 1983 07 27.08 | S | 8.7 | S | 25 | L | 7 | 68 | 5.7 | 4 | | | MOR |
| 1983 07 27.49 | M | 7.8 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 27.49 | S | 7.7 | AC | 15.2 | L | 5 | 30 | 8 | 5 | | | PEA |
| 1983 07 28.07 | S | 8.7 | S | 25 | L | 7 | 68 | 5.7 | 3 | | | MOR |
| 1983 07 28.08 | S | 7.9 | AA | 8.0 | B | | 20 | &10 | 2 | | | MOR |
| 1983 07 28.38 | S | 9.3 | A | 8.0 | B | | 15 | 3 | 0 | | | PRI |
| 1983 07 28.52 | M | 7.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 07 28.52 | S | 7.7 | AC | 15.2 | L | 5 | 30 | 7.5 | 5/ | ? | 100 | PEA |
| 1983 07 28.88 | B | 8.7 | S | 26.0 | L | 6 | 39 | & 6 | 2 | | | MER |
| 1983 07 29.26 | S | 8.8 | S | 15.0 | R | 6 | 29 | 7 | 3 | | | MAC |
| 1983 07 29.42 | S | 7.8 | A | 8.0 | B | | 15 | & 5 | | | | SEA |
| 1983 07 29.88 | B | 8.7 | S | 26.0 | L | 6 | 39 | 8.4 | 3 | | | MER |
| 1983 07 30.90 | B | 8.7 | S | 15.0 | L | 5 | 25 | & 8 | 3 | | | MER |
| 1983 08 01.26 | S | 8.8 | S | 15.0 | R | 6 | 29 | 8 | 2 | | | MAC |
| 1983 08 02.39 | S | 9.0 | A | 8.0 | B | | 15 | 5 | 0 | | | PRI |
| 1983 08 03.08 | S | 7.9 | A | 8.0 | B | | 20 | 6.5 | 2/ | | | BOR |
| 1983 08 03.10 | M | 8.7 | AA | 25 | L | 7 | 68 | 3.1 | 4 | | | MOR |
| 1983 08 03.10 | S | 8.2 | AA | 8.0 | B | | 20 | & 8 | | | | MOR |
| 1983 08 04.08 | M | 8.7 | AA | 25 | L | 7 | 68 | 3.2 | 5 | | | MOR |
| 1983 08 04.36 | S | 9.1 | A | 8.0 | B | | 15 | & 5.5 | 0 | | | PRI |
| 1983 08 05.45 | S | 8.3: | A | 8.0 | B | | 15 | 4 | | | | SEA |
| 1983 08 05.47 | S | 9.4 | A | 8.0 | B | | 15 | 5 | 0 | | | PRI |
| 1983 08 05.51 | S | 7.7 | AC | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 06.50 | S | 9.6 | A | 8.0 | B | | 15 | 6 | 0 | | | PRI |
| 1983 08 07.53 | S | 8.1 | AC | 41 | L | 4 | 86 | 4 | 7 | | | CLA |
| 1983 08 08.08 | S | 8.5 | A | 32 | L | 6 | 68 | 3.5 | 3 | | | BOR |
| 1983 08 08.08 | S | 7.9 | A | 8.0 | B | | 20 | 7 | 1 | | | BOR |
| 1983 08 08.49 | S | 7.7 | AA | 6.5 | B | | 20 | 7 | 8 | | | PEA |
| 1983 08 08.49 | S | 7.7 | AA | 15.2 | L | 5 | 30 | 6 | 8 | 0.5 | 68 | PEA |
| 1983 08 08.49 | M | 7.8 | AA | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 09.08 | S | 7.9 | A | 8.0 | B | | 20 | 7 | 1 | | | BOR |
| 1983 08 09.36 | S | 7.8 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 08 09.49 | S | 7.6 | AA | 15.2 | L | 5 | 30 | 6.5 | 6 | 0.5 | 65 | PEA |
| 1983 08 09.50 | M | 7.7 | AA | 15.2 | L | 5 | 30 | | | | | PEA |
| 1983 08 09.50 | S | 7.6 | AA | 6.5 | B | | 20 | 8 | 6 | | | PEA |
| 1983 08 10.08 | S | 8.4 | A | 32 | L | 6 | 68 | 3.8 | 2/ | | | BOR |
| 1983 08 10.08 | S | 8.0 | A | 8.0 | B | | 20 | 6 | 2 | | | BOR |
| 1983 08 10.09 | M | 8.4 | S | 25 | L | 7 | 68 | 5.4 | 4 | | | MOR |
| 1983 08 14.08 | S | 8.0 | A | 8.0 | B | | 20 | 5 | 0 | | | BOR |
| 1983 08 14.08 | S | 8.7 | A | 32 | L | 6 | 68 | 2.7 | 2 | | | BOR |
| 1983 08 14.53 | S | 8.2 | AC | 41 | L | 4 | 86 | 4 | 7 | | | CLA |
| 1983 08 28.40 | S | 8.7 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 08 29.42 | S | 8.7 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 02.06 | S | 8.3 | A | 8.0 | B | | 20 | 6.5 | 0 | | | BOR |
| 1983 09 02.06 | S | 8.8 | A | 32 | L | 6 | 68 | 4.0 | 1/ | | | BOR |
| 1983 09 04.03 | S | 9.2 | AA | 25 | L | 7 | 68 | 4.5 | 2/ | | | MOR |
| 1983 09 04.05 | S | 8.2 | A | 8.0 | B | | 20 | 7 | 0 | | | BOR |

Periodic Comet Kopff (1945 V = 1951 VII = 1982k) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 09 04.05 | S | 8.6: | AA | 8.0 | B | | 20 | 8 | | | | MOR |
| 1983 09 04.52 | S | 8.2 | AA | 15.2 | L | 5 | 30 | 6 | 5/ | | | PEA |
| 1983 09 04.52 | S | 8.7 | AA | 41 | L | 4 | 86 | 7 | 4 | | | CLA |
| 1983 09 04.82 | S | 10.0 | AC | 8.0 | B | | 20 | 5 | 1 | | | CAV |
| 1983 09 06.46 | S | 9.2 | A | 8.0 | B | | 15 | | | | | SEA |
| 1983 09 07.49 | S | 8.4: | AA | 15.2 | L | 5 | 30 | 4.5 | 5 | | | PEA |
| 1983 09 07.83 | B | 9.4 | A | 26.0 | L | 6 | 63 | & 4 | 3 | | | MER |
| 1983 09 08.01 | S | 9.0 | S | 25 | L | 7 | 68 | 5.8 | 2 | | | MOR |
| 1983 09 08.05 | S | 8.8 | A | 32 | L | 6 | 68 | 5 | 2 | | | BOR |
| 1983 09 08.05 | S | 8.3 | A | 8.0 | B | | 20 | 6 | 0 | | | BOR |
| 1983 09 08.57 | S | 8.3 | AA | 15.2 | L | 5 | 30 | 5 | 5/ | | | PEA |
| 1983 09 09.02 | S | 9.0 | S | 25 | L | 7 | 68 | 6.1 | 2 | | | MOR |
| 1983 09 09.03 | S | 8.5 | S | 8.0 | B | | 20 | 8 | 2 | | | MOR |
| 1983 09 09.05 | S | 8.3 | A | 8.0 | B | | 20 | 5.5 | 0 | | | BOR |
| 1983 09 09.05 | S | 8.9 | A | 32 | L | 6 | 68 | 4 | 1 | | | BOR |
| 1983 09 09.50 | S | 8.5 | AA | 15.2 | L | 5 | 30 | 4.5 | 5 | | | PEA |
| 1983 09 10.03 | S | 9.0 | S | 25 | L | 7 | 68 | 6 | 2 | | | MOR |
| 1983 09 12.02 | S | 9.0 | S | 25 | L | 7 | 68 | 6 | 2 | | | MOR |
| 1983 09 24.00 | S | 9.4 | AA | 25 | L | 7 | 68 | 5 | 0 | | | MOR |
| 1983 09 24.52 | S | 9.8: | VN | 41 | L | 4 | 86 | 5 | 2 | | | CLA |
| 1983 09 25.52 | S | 11.0 | VN | 41 | L | 4 | 86 | & 4.5 | 0 | | | CLA |
| 1983 10 07.82 | B | 9.7 | A | 26.0 | L | 6 | 63 | & 3 | 3 | | | MER |
| 1983 10 08.06 | S | 9.5: | AA | 20 | L | 6 | 67 | 4 | 2 | | | MOR |
| 1983 10 08.07 | S | 9.6 | AA | 20.3 | L | 6 | 68 | | 0/ | | | GRE |
| 1983 10 09.01 | S | 9.8 | A | 32 | L | 6 | 68 | 3 | 0/ | | | BOR |
| 1983 10 10.99 | S | 9.8 | A | 32 | L | 6 | 68 | 3.5 | 0 | | | BOR |
| 1983 10 28.98 | | | | 32 | L | 6 | 68 | 2.5 | 1 | | | BOR |
| 1983 10 29.99 | | | | 32 | L | 6 | 68 | 2 | 0 | | | BOR |

Periodic Comet Churyumov-Gerasimenko (1982f)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 12 17.89 | S | 10.0 | AC | 29.8 | L | 5 | 62 | 1.4 | 7 | 0.03 | 270 | KEI |
| 1982 12 19.95 | S | 10.0 | AC | 29.8 | L | 5 | 62 | 0.9 | 8 | | 270 | KEI |
| 1982 12 19.95 | S | 9.7 | AC | 8.0 | B | | 20 | | | | | KEI |
| 1982 12 21.94 | S | 9.7 | AC | 8.0 | B | | 20 | 1.4 | | | | KEI |
| 1983 01 06.95 | S | 10.4 | AC | 8.0 | B | | 20 | | | | | KEI |
| 1983 01 06.95 | S | 10.6 | AC | 29.8 | L | 5 | 62 | 1.1 | 6/ | 0.05 | 208 | KEI |
| 1983 01 07.99 | S | 10.3 | AC | 8.0 | B | | 20 | 1.3 | 6 | | 270 | KEI |
| 1983 01 09.85 | S | 10.5 | AC | 8.0 | B | | 20 | | | | | KEI |
| 1983 01 09.85 | S | 10.8 | AC | 29.8 | L | 5 | 62 | 1.1 | 6 | 0.03 | 278 | KEI |
| 1983 01 10.91 | S | 10.8 | AC | 29.8 | L | 5 | 62 | 1.1 | | | | KEI |
| 1983 01 13.80 | S | 11.1 | AC | 29.8 | L | 5 | 62 | 1.5 | 5 | | | KEI |
| 1983 01 18.94 | S | 11.0 | AC | 7 | R | 4 | 17 | 1.5 | | | | KEI |
| 1983 01 18.94 | S | 11.5 | AC | 29.8 | L | 5 | 62 | 1.1 | 4/ | 0.08 | 184 | KEI |
| 1983 01 19.92 | S | 11.5 | AC | 29.8 | L | 5 | 62 | 0.9 | 5 | 0.08 | 268 | KEI |
| 1983 02 02.82 | S | 11.8 | AC | 29.8 | L | 5 | 62 | 1.5 | 3 | 0.03 | 239 | KEI |
| 1983 02 07.90 | S | 11.3 | AC | 29.8 | L | 5 | 62 | 1.4 | 7 | 0.02 | 230 | KEI |
| 1983 02 08.89 | S | 11.5 | AC | 29.8 | L | 5 | 62 | 1.0 | 5 | | 280 | KEI |
| 1983 02 09.90 | S | 11.5 | AC | 29.8 | L | 5 | 62 | 1.4 | 4 | | | KEI |
| 1983 02 14.83 | S | 12.1 | AC | 29.8 | L | 5 | 62 | 1.0 | 1/ | | | KEI |

Periodic Comet Churyumov-Gerasimenko (1982f) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 02 16.98 | S | 12.5 | AC | 29.8 | L | 5 | 62 | 1.1 | 0/ | | | KEI |
| 1983 02 17.87 | S | 12.5 | AC | 29.8 | L | 5 | 62 | 1.7 | 2/ | | | KEI |
| 1983 02 19.00 | S | 12.3 | AC | 29.8 | L | 5 | 62 | 0.9 | 2/ | | | KEI |
| 1983 03 04.82 | S | 12.8 | AC | 29.8 | L | 5 | 62 | 0.8 | 2/ | | | KEI |

Periodic Comet Kearns-Kwee (1981 XX = 1981h)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 11 04.07 | S[ | 12.5 | VB | 32 | R | 18 | 95 | | | | | SHA02 |
| 1981 11 23.93 | S[ | 12.5 | VB | 32 | R | 18 | 95 | | | | | SHA02 |
| 1981 11 25.16 | S | 13.0 | VB | 32 | R | 18 | 95 | 0.7 | 3 | | | SHA02 |
| 1981 11 28.00 | S[ | 13.3 | VB | 32 | R | 18 | 95 | | | | | SHA02 |
| 1981 12 01.06 | S[ | 13.4 | VB | 32 | R | 18 | 95 | | | | | SHA02 |
| 1981 12 17.92 | S[ | 12.3 | VB | 32 | R | 18 | 95 | | | | | SHA02 |

Periodic Comet Schwassmann-Wachmann 1

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 02 23.15 | | 12.1 | V | 20 | R | 14 | 95 | 1.1 | 4 | | | SHA02 |

Periodic Comet IRAS (1983j)

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 08 15.34 | S | 12.5 | A | 32 | L | 6 | 88 | 0.6 | 3 | | | BOR |
| 1983 08 15.84 | S | 11.2 | AC | 41 | L | 4 | 86 | & 1.5 | 3 | | | CLA |
| 1983 08 16.34 | S | 12.4 | A | 32 | L | 6 | 88 | 1.3 | 4 | ? | 225 | BOR |
| 1983 08 18.85 | S | 11.2 | AC | 41 | L | 4 | 86 | & 1.5 | 3 | | | CLA |
| 1983 08 21.35 | S | 12.0 | A | 32 | L | 6 | 68 | 1.4 | 4 | ? | 225 | BOR |
| 1983 09 02.18 | S | 12.1 | AC | 25 | L | 7 | 103 | 2.0 | 3 | | | MOR |
| 1983 09 04.33 | S | 11.6 | A | 32 | L | 6 | 68 | 1.3 | 3/ | ? | 225 | BOR |
| 1983 09 04.87 | S | 10.6 | AC | 15.2 | L | 5 | 30 | 2 | 2 | | | PEA |
| 1983 09 04.87 | S | 11.0 | AC | 41 | L | 4 | 86 | & 1.75 | 2 | | | CLA |
| 1983 09 05.25 | S | 11.5 | AC | 25 | L | 7 | 68 | 3.0 | 3 | | | MOR |
| 1983 09 05.30 | S | 11.1 | A | 20 | C | 10 | 102 | 0.75 | 5 | | | SPR |
| 1983 09 06.27 | S | 11.1 | A | 20 | C | 10 | 102 | 1.0 | 4 | | | SPR |
| 1983 09 07.28 | S | 10.9 | A | 20 | C | 10 | 102 | 1.0 | 5 | | | SPR |
| 1983 09 07.80 | S | 10.7 | AC | 15.2 | L | 5 | 30 | 1.5 | 2 | | | PEA |
| 1983 09 07.88 | S | 12.2 | A | 26.0 | L | 6 | 130 | 4.0 | 5 | | | MER |
| 1983 09 08.37 | S | 11.3 | A | 32 | L | 6 | 68 | 1.6 | 4 | 0.06 | 210 | BOR |
| 1983 09 08.37 | M | 11.7 | AC | 25 | L | 7 | 103 | 1.3 | 6 | ? | 150 | MOR |
| 1983 09 08.78 | S | 10.6 | AC | 15.2 | L | 5 | 30 | 2.5 | 2 | | | PEA |
| 1983 09 09.27 | S | 11.1 | A | 20 | C | 10 | 102 | 0.5 | 5 | | | SPR |
| 1983 09 09.31 | M | 11.7 | AC | 25 | L | 7 | 68 | 2.4 | 5/ | ? | 180 | MOR |
| 1983 09 09.37 | S | 11.3 | A | 32 | L | 6 | 68 | 1.3 | 5 | 0.06 | 230 | BOR |
| 1983 09 09.77 | S | 10.5 | AC | 15.2 | L | 5 | 30 | 2.2 | 3 | | | PEA |
| 1983 09 11.37 | S | 11.4 | A | 32 | L | 6 | 68 | 1.5 | 5 | 0.10 | 245 | BOR |
| 1983 09 13.24 | S | 11.0 | A | 20 | C | 10 | 125 | 0.75 | 5 | | | SPR |
| 1983 09 14.23 | S | 10.8 | A | 20 | C | 10 | 102 | 1.0 | 5 | | | SPR |
| 1983 09 15.33 | M | 11.6 | AC | 25 | L | 7 | 68 | 1.4 | 7 | ? | 200 | MOR |

Periodic Comet IRAS (1983j) Cont.

| DATE (UT) | MM | MAG. | RF | AP. | T | F/ | PWR | COMA | DC | TAIL | PA | OBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 09 15.36 | S | 11.5 | A | 32 | L | 6 | 68 | 1.3 | 6 | 0.06 | 205 | BOR |
| 1983 09 15.80 | S | 10.5 | AC | 15.2 | L | 5 | 30 | 2 | 3 | | | PEA |
| 1983 09 16.33 | M | 11.6 | AC | 25 | L | 7 | 68 | 1.8 | 6/ | 0.03 | 210 | MOR |
| 1983 09 16.36 | S | 11.6 | A | 32 | L | 6 | 68 | 1.3 | 5 | 0.06 | 208 | BOR |
| 1983 09 16.81 | S | 10.5 | AC | 15.2 | L | 5 | 30 | 3 | 2 | | | PEA |
| 1983 09 27.05 | S | 11.0 | A | 32 | L | 6 | 68 | 1.9 | 5 | | | BOR |
| 1983 09 28.85 | S | 11.1 | A | 26.0 | L | 6 | 63 | 4.0 | 4 | 0.04 | 188 | MER |
| 1983 09 29.85 | S | 11.1 | A | 26.0 | L | 6 | 63 | 4.3 | 4 | 0.04 | 195 | MER |
| 1983 09 30.83 | S | 10.9 | A | 26.0 | L | 6 | 63 | & 3 | 4 | 0.03 | 183 | MER |
| 1983 10 02.84 | S | 11.3 | A | 26.0 | L | 6 | 63 | 3.3 | 3 | 0.04 | 156 | MER |
| 1983 10 03.84 | S | 11.5 | A | 26.0 | L | 6 | 63 | 4.6 | 3 | 0.05 | 200 | MER |
| 1983 10 04.88 | S | 11.4 | A | 26.0 | L | 6 | 63 | 3.2 | 3 | 0.03 | 146 | MER |
| 1983 10 05.84 | S | 11.5 | A | 26.0 | L | 6 | 63 | | 3 | | | MER |
| 1983 10 07.05 | S | 11.3 | A | 32 | L | 6 | 68 | 2.0 | 4 | ? | 180 | BOR |
| 1983 10 07.25 | S | 11.7 | A | 20 | C | 10 | 125 | 0.5 | 1 | | | SPR |
| 1983 10 07.26 | S | 11.9 | AC | 25 | L | 7 | 103 | 1.5 | 4 | ? | | MOR |
| 1983 10 08.05 | S | 11.1 | A | 32 | L | 6 | 68 | 1.4 | 5/ | ? | 180 | BOR |
| 1983 10 08.14 | M | 11.3 | AC | 25 | L | 7 | 68 | 1.4 | 3 | 0.02 | 135 | MOR |
| 1983 10 08.14 | M | 11.2 | AC | 20.3 | L | 6 | 68 | & 3 | 1/ | | | GRE |
| 1983 10 08.17 | S | 11.4 | AC | 20.3 | L | 6 | 68 | | | | | GRE |
| 1983 10 09.03 | S | 11.5 | A | 32 | L | 6 | 68 | 1.4 | 4 | ? | 180 | BOR |
| 1983 10 09.17 | M | 11.3 | AC | 25 | L | 7 | 68 | 2.0 | 7 | 0.05 | 150 | MOR |
| 1983 10 10.25 | S | 11.9 | A | 20 | C | 10 | 125 | 0.5 | 1 | | | SPR |
| 1983 10 11.01 | S | 11.3 | A | 32 | L | 6 | 68 | 1.3 | 4 | ? | 180 | BOR |
| 1983 10 11.23 | S | 11.9 | A | 20 | C | 10 | 125 | 0.5 | 2 | | | SPR |
| 1983 10 11.90 | S | 11.7 | A | 26.0 | L | 6 | 39 | & 7.0 | 2 | | 180 | MER |
| 1983 10 12.22 | S | 12.0 | A | 20 | C | 10 | 125 | 0.5 | 2 | | | SPR |
| 1983 10 12.83 | S | 11.7 | A | 26.0 | L | 6 | 63 | & 2.5 | 3 | 0.04 | 224 | MER |
| 1983 10 15.22 | S | 11.8 | AC | 25 | L | 7 | 103 | 2.1 | 3 | 0.07 | 150 | MOR |
| 1983 10 30.03 | S | 12.7 | A | 32 | L | 6 | 88 | 1.2 | 1 | | | BOR |
| 1983 10 30.21 | S | 12.5 | AC | 25 | L | 7 | 103 | 1.1 | 1 | | | MOR |
| 1983 10 30.99 | S | 12.6 | AC | 25 | L | 7 | 103 | 1.3 | 1/ | | | MOR |
| 1983 11 01.01 | S | 12.6 | AC | 25 | L | 7 | 103 | 1.3 | 1/ | | | MOR |
| 1983 11 02.01 | S | 13.0: | AC | 25 | L | 7 | 103 | & 1 | 0/ | | | MOR |

**********

## PERIODIC COMET KOPFF IN 1945

Charles S. Morris
Prospect Hill Observatory, Harvard, Massachusetts

The 1983 apparition of periodic comet Kopff has been well-documented by visual observers. However, this is not the first well-observed visual apparition of P/Kopff. In 1945 Albert Jones (JON) made a series of 30 observations with a 14-cm refractor covering the period June 4 to Sept. 12. These observations are listed in the Tabulation of Comet Observations in this issue.

The light curve constructed using Jones' observations is presented in Fig. 1. The observations have been corrected to a standard aperture of 6.78 cm and for the changing geocentric distance. As Figure 1 clearly illustrates, P/Kopff experienced an enormous surge in brightness prior to perihelion, which occurred

## PERIODIC COMET KOPFF IN 1945

(Cont. from previous page)
on 1945 August 11. Analyzed as a function of time, the comet's pre-perihelion brightness can be approximately represented by:

$$H_{\Delta} = 7.12 - 0.078\ (t - t_o),$$

where $H_{\Delta}$ is the comet's heliocentric brightness and $(t-t_o)$ is the time from perihelion in days. This formula is valid until about a week and a half prior to perihelion, after which the comet's heliocentric brightness was almost constant. The pre-perihelion surge of P/Kopff represents a brightness increase at a rate 11 times that of an average comet.

The 1983 apparition is apparently considerably different from the 1945 apparition, with the pre-perihelion brightness surge beginning much earlier. A complete report on P/Kopff with a comparison of these two and the 1951 apparitions will be presented in a future issue of the ICQ.

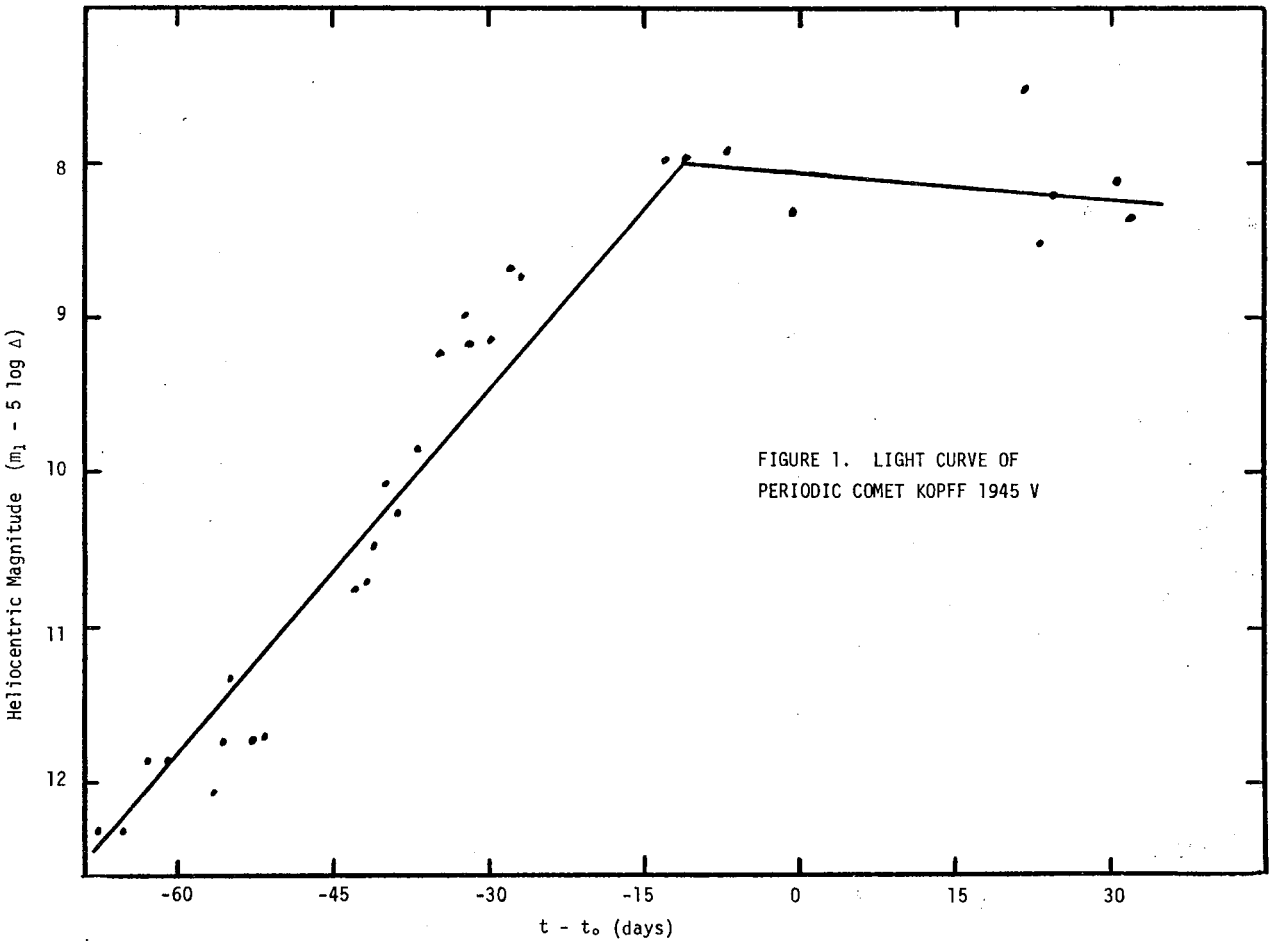
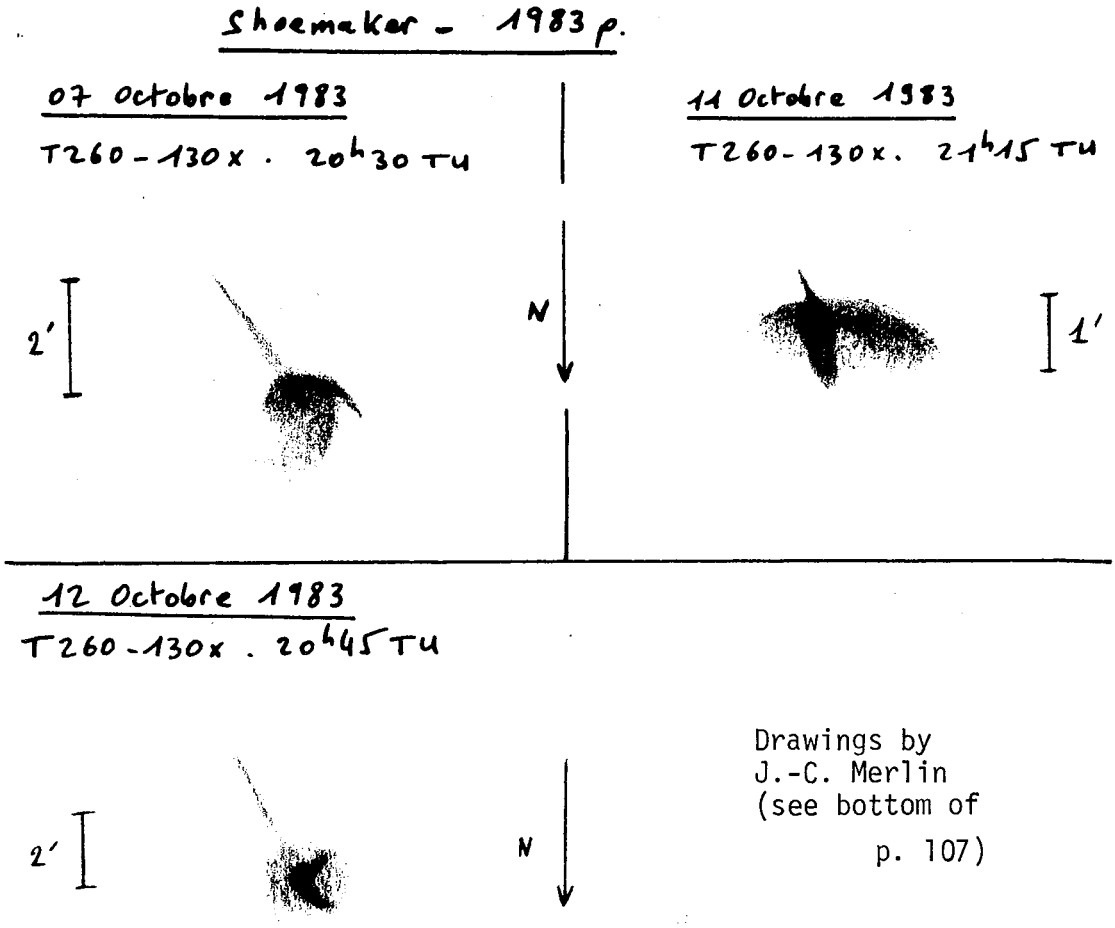



FIGURE 1. LIGHT CURVE OF PERIODIC COMET KOPFF 1945 V

**********

## DRAWINGS OF COMET SHOEMAKER 1983p FROM VISUAL OBSERVATIONS

On the following page are 3 drawings of comet Shoemaker 1983p by J.-C. Merlin of Le Creusot, France. Along with the drawings of on page 78 of the October issue, Mr. Merlin has sent us about 35 additional excellent drawings of the comae of many of the recently visible comets, and we plan to publish as many as possible in the coming issues.




Drawings by
J.-C. Merlin
(see bottom of
p. 107)

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