THE INTERNATIONAL COMET QUARTERLY

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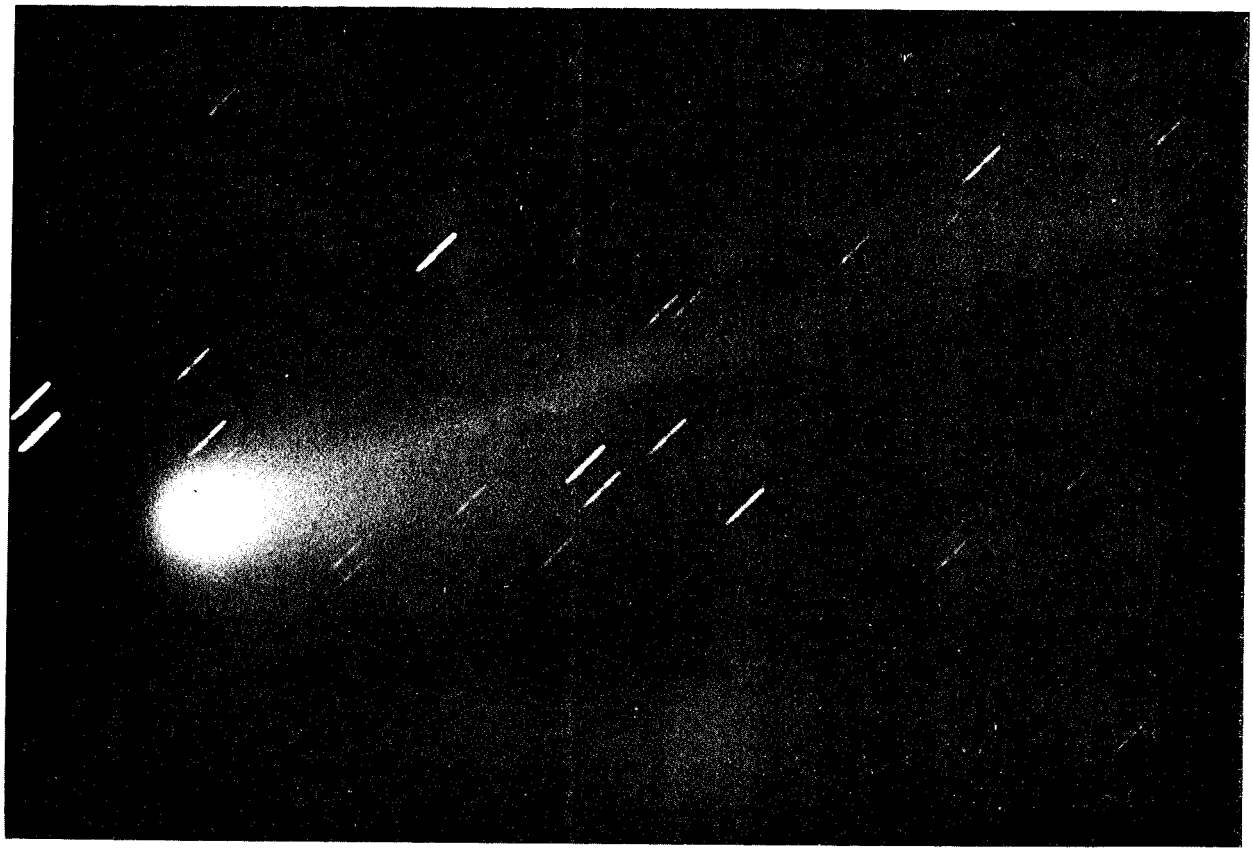

Photo of Comet Kohoutek 1973f, taken by W. E. Hughes and T. Henderson on 1974 January 12 with a 12.5-inch f/6 Newtonian telescope. Exposure 14 min on Tri-X.

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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 and is mailed from Boone, North Carolina, U.S.A.

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All cometary observations should be sent to C. S. Morris; Prospect Hill Rd.; Harvard, MA 01451, U.S.A. Back issues are available from Dr. T. L. Rokoske, Dept. of Physics and Astronomy; A.S.U.; Boone, NC 28608, U.S.A.

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This issue is No. 45 of the publication originally called THE COMET, founded in March 1973, and is Vol. 5, No. 1, of the ICQ.

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FROM THE EDITOR

This issue is a special one for two members of the Staff, your Editor and Dr. Tom Rokoske, who have worked with the ICQ since its beginnings in the winter of 1973. Exactly ten years ago, the March 1973 issue of The Comet was published. The Comet was the predecessor to the ICQ (it was called The Comet Quarterly for a couple of years prior to 1979), and it was from this base readership and Staff that the ICQ was able to become a leading journal in cometary astronomy.

We highly encourage all of our readers to help us in building our circulation by telling friends about the ICQ, particularly at astronomical meetings. Group subscription rates are available upon request from the Editor.

Comments to the ICQ Staff during the past 2 years concerning the banner on the cover has prompted us to search for a new cover design. Two artists have submitted proposals in the past year, and we had hoped to begin a new cover with Vol. 5, but a unanimous decision has yet to be reached. Sometime this year, however, there should be a change!

Daniel W. E. Green
Cambridge, Mass.
1983 February 1

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THE 1982 APPARITION OF PERIODIC COMET GRIGG-SKJELLERUP

Charles S. Morris
Prospect Hill Observatory

With a period of slightly over 5 years, periodic comet Grigg-Skjellerup has been observed at all but three of its returns since its discovery in 1902 by Grigg, observing from New Zealand. The initial apparition was only observed by Grigg. The comet was not seen again until it was rediscovered by Skjellerup (South Africa) in 1922.

The 1982 apparition of P/Grigg-Skjellerup began when the comet was recovered by Jim Gibson using the 1.2-m Schmidt telescope at Palomar on 1982 January 15. Being the first comet recovered or discovered in 1982, P/Grigg-Skjellerup was given the provisional designation "comet 1982a". The 1982 apparition was extremely favorable for Northern Hemisphere observers. An evening object throughout its visual apparition, the comet moved northward, reaching declination +39° before turning south on June 17.

The first known visual observation was made by the author (ICQ code "MOR") on April 20, when the comet was estimated to be magnitude 13.0. In the latter days of April, the comet was followed visually by Maurice Clark (CLA), Jean-Claude Merlin (MER), and the author. During this period, the comet 1982a was small (1′-2′ diameter, corresponding to approximately 20,000 to 40,000 km), slightly condensed, and no brighter than 12th magnitude.

During the nearly two-week interruption in the observations caused by the moon, the comet brightened two magnitudes, becoming visible in small reflectors and even moderate-sized binoculars. The comet's size also increased to 5′ (about 76,000 km).

During June and July, the comet slowly faded from 10th magnitude to 11 or 12, and decreased in apparent size. However, with the Earth-comet distance increasing, the physical size of P/Grigg-Skjellerup remained approximately constant at 70,000 km. Toward the end of the apparition, comet 1982a became totally diffuse. The last reported visual observation was made on July 22 by John Bortle (BOR).

To evaluate the light curve of P/Grigg-Skjellerup, a total of 71 visual

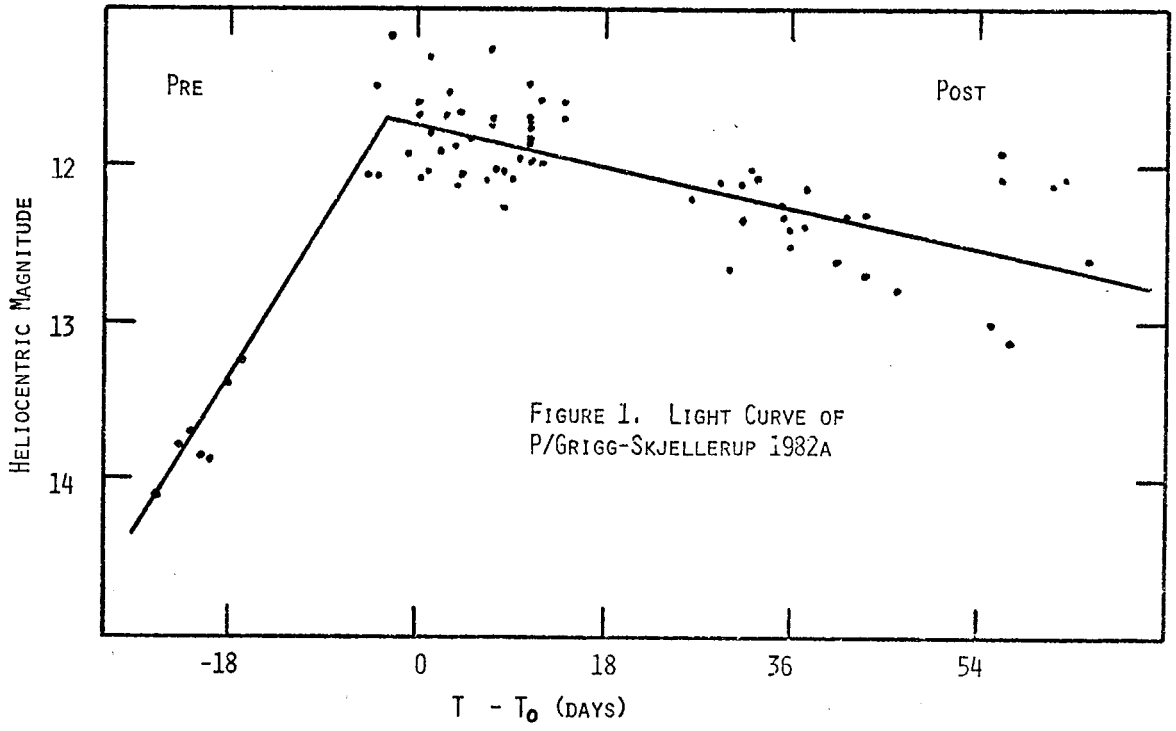

FIGURE 1. LIGHT CURVE OF P/GRIGG-SKJELLERUP 1982A

THE 1982 APPARITION OF PERIODIC COMET GRIGG-SKJELLERUP

observations made by 11 observers were selected for analysis. The observers and their totals are given below:

John E. Bortle (BOR)	9
Reinder J. Bouma (BOU)	3
Maurice L. Clark (CLA)	1
Graham Keitch (KEI)	7
Jean-Claude Merlin (MER)	13
Charles S. Morris (MOR)	17
Warren C. Morrison (MOR03)	2
Roy W. Panther (PAN)	2
David A. J. Seargent (SEA)	9
Jonathan D. Shanklin (SHA02)	3
C. E. Spratt (SPR)	5

The observations were aperture-corrected, using the method recommended by Morris (1973). Both a power-law solution and a linear correlation with time were derived from the observations. Figure 1 illustrates the light curve of comet 1982a as a function of time; it shows that the comet experienced a rapid rise in brightness just prior to perihelion. The two-mag. increase in brightness occurred over a very small orbital arc (r = 1.050 - 0.991 AU). A standard power-law solution for H_o and n show just how fast the pre-perihelion surge in brightness was. From 12 observations, we obtain:

$$H_o = 12.23 \pm 0.07 \text{ (p.e.)}$$
$$n = 41.42 \pm 2.60 \text{ (p.e.)}$$

The computed value of n is about ten times that found for a "normal" comet. The magnitude of the pre-perihelion surge is also illustrated when the comet's heliocentric brightness is correlated with time. When this is done, we obtain a regression equation:

$$H = H_t + n_t (t - t_o) \qquad (1)$$
$$H_t = 11.40 \pm 0.10 \text{ (p.e.)}$$
$$n_t = -0.110 \pm 0.006 \text{ (p.e.)},$$

where H is the comet's heliocentric magnitude, $(t - t_o)$ is the time (in days) from perihelion, and the errors are probable errors (p.e.). This result indicates that the comet's heliocentric brightness increased more than 0.1 magnitude/day during the final 20 days before perihelion.

The pre-perihelion surge in brightness suggest that P/Grigg-Skjellerup belongs to a small, but growing, group of periodic comets which exhibit similar surges in brightness just prior to perihelion. The most well-known member of this group is P/d'Arrest (Bortle 1977a, 1983). Another trait of this group of comets is the slow decline in brightness following perihelion. As shown in Fig. 1, comet 1982a slowly fades after reaching peak brightness near perihelion. Regression results give:

$$H_o = 11.88 \pm 0.03 \text{ (p.e.)}$$
$$n = 2.74 \pm 0.28 \text{ (p.e.)}$$

or

For equation (1):

$$H_t = 11.75 \pm 0.04 \text{ (p.e.)}$$
$$n_t = 0.014 \pm 0.001 \text{ (p.e.)}$$
59 observations
r = 0.989 - 1.315 AU

The calculated pre- and post-perihelion formulae suggest that the light curve was discontinuous around perihelion. This is obviously not the case. In Fig. 1, this has been rectified by extending the post-perihelion curve back to $(t - t_o) = -3$ days.

The absolute magnitude of P/Grigg-Skjellerup in 1982 is similar to that found by Bortle (1977b) for the 1977 apparition. However, in 1977 the comet's heliocentric brightness was greatest several weeks after perihelion. Such a time-lag in peak brightness was not observed at the recent apparition. In contrast, observers during early apparitions noted rapid fading of the comet after perihelion (e.g., Vsekhsvyatskii 1964), unlike the 1977 and 1982 apparitions. P/Grigg-Skjellerup clearly deserves special attention during future apparitions so that the nature and variability of its light curve can be established.

(Cont. on next page)

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REFERENCES

Bortle, J. (1977a). Sky Tel. 53, 152.
Bortle, J. (1977b). Sky Tel. 54, 107.
Bortle, J. (1983). Submitted to ICQ.
Morris, C. S. (1973). PASP 85, 470.
Vsekhsvyatskii, S. K. (1964). The Physical Characteristics of Comets

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BOOK REVIEW: THE COMET IS COMING!

The Comet is Coming! by Nigel Calder, 1981, Viking Press, 160 pp. $12.95 hardcover, $5.95 softbound.

There is a standing need for a well-written popular book on comets. Such a book should be suitable for the general public, but written so professionals and serious amateurs can appreciate it, as well. Nigel Calder, a well-known British television writer, has made an attempt to fill this void with his book, The Comet is Coming!, a light-hearted look at comets with emphasis on comet Halley and its coming return. Unfortunately, the book, which is subtitled The Feverish Legacy of Mr. Halley, narrowly misses the mark.

Mr. Calder suggests that "comets drive people dotty", which appears to be the premise of his book. The book contains a considerable amount of historical information, particularly about Halley and his comet. There is discussion of comet hunters, including modern-day discoverers. Comets, themselves, are reviewed in a historical context, starting with the Öpik-Oort Cloud (or Ooo cloud, as Calder prefers to call it), and proceding to Fred Whipple's dirty snowball theory, comet splitting, rotation, and their relationship to meteors. A whole chapter is devoted to Sir Fred Hoyle's linking comets with all sorts of illness. The possibility of the comet impacting the Earth is also explored. For those of us with comet fever, Mr. Calder has a remedy, and in the final chapter he discusses proposed missions to comets P/Halley and P/Tempel 2.

Mr. Calder's book is filled with a generous selection of photographs, some in color. There is, for instance, a spectacular picture of comet Bennett 1970 II over the Swiss Alps. There are photos of modern-day comet professionals, including Drs. Whipple, Marsden, Sekanina, and Yeomans.

There is ample discussion of the physical characteristics of comets with one interesting exception. There is little or no mention of comet brightness. While no detailed explanation is expected, some mention of a comet's ability to change rapidly in brightness (e.g., P/Schwassmann-Wachmann 1) is not too much to ask. This aspect of comets is totally missing in Mr. Calder's book.

The major flaw in the book is the author's attempt to make fun of comets and those who study them. There is no problem with poking a little fun at those interested in comets, but Calder carries the idea too far, making it tiresome. For instance, he suggests "Halley would count as a famous man of science had he not attached his name forever to a cosmic bauble."

The general public and some amateurs will find this book to their liking. Others may find the author's style irritating. Overall, the book is worth buying (particularly the cheaper paperback edition).

--Charles S. Morris

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BOOK REVIEW: ASTRONOMICAL FORMULAE FOR CALCULATORS (Second Edition)

Astronomical Formulae for Calculators, Second Edition, by Jean Meeus, 1982, Willmann-Bell, Inc., P.O. Box 3125, Richmond, VA 23235, 203 pp., $14.95.

This enlarged and revised 2nd edition is a very useful book for both amateur and professional astronomers (although any serious use by the latter should include some testing). This is a handbook and quick-reference guide which describes computational methods for a wide variety of astro-

BOOK REVIEW: ASTRONOMICAL FORMULAE FOR CALCULATORS (Second Edition)

(Cont. from preceding page)
nomical phenomena, and is to be recommended as a highly reliable source for one wishing to compute various times (such as Julian Dates, sidereal time, Date of Easter, etc.), distances (angular separation, planetary conjunctions, position angle of the moon's bright limb, etc.), and matters concerning celestial mechanics (precession, nutation, solar coordinates, principal planetary perturbations, ephemerides). Chapters are also included on stellar magnitudes, binary stars, eclipses, and linear regression analysis.

Those looking for a guide as to how to compute orbital elements from 3 or more observations will not find the answers here; such a subject is beyond the scope of this edition of Astronomical Formulae for Calculators. This book is designed for those who have desk calculators, with equations given in convenient form. Those who have access to a computer or minicomputer with wide programming capabilities (BASIC, FORTRAN, etc.) can use the formulae in their programs.

As in almost any book, this one has some problems, although few; these will likely be improved in succeeding editions of the handbook. For example, the discussion on planetary perturbations could benefit with more detailed explanation of the elements which contain perturbing-formulae. An explanation would be helpful as to why longitude and radius-vector formulae are given for some planets, and other elements for other planets. It appears that the terms for Jupiter's heliocentric latitude were accidentally left out. More definitions of certain terms would be useful to the user of the book, as well, and references to these definitions in other parts of the book would help. More information on longitude and latitude, with respect to the planetary perturbations, can be found elsewhere in the book -- but it may take awhile to do so. An index to the book is lacking, and a good index would help greatly. (There are 40 chapters, quite a number for 201 pages, so that the Table of Contents serves as a mini-index!)

A problem with many reference handbooks and tabular listings that are becoming available now is that they refer too often to "mean equinox of date". Meeus' book suffers to a small extent from this problem. It is much better to give formulae for a standard equinox (1950.0 is slated to be the primary standard for some time to come), and then present one chapter as to how to obtain mean equinox of date, rather than vice versa.

The small problems with this book are not to deter the reader, however. Anyone who does any computing in astronomical ventures should have this book on their shelf; it will likely be a much-used reference. Willmann-Bell, Inc., has done a commendable job in publishing a simple, yet attractive and very legible, layout.

— Daniel W. E. Green

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RECENT NEWS CONCERNING COMETS

The recoveries of three short-period comets have been reported since the news report in the last issue of the ICQ (4, 78): P/Tempel 1 (provisional designation 1982j) by T. Seki (Geisei, Japan) and E. Barker and E. Dutchover (McDonald Observatory) on 1982 December 11 and 16 at total mag 19; P/Kopff (1982k) by Barker and S. Odenwahn on Dec. 20 at nuclear mag 20; and P/Pons-Winnecke (1983b) by Edgar Everhart (Denver) and Seki on 1983 Jan. 12 and 14 at total mag 19. An object reported by M. Candy of Perth Observatory in Australia received the designation "comet 1983a", but it has since been proven to be a plate flaw.

(Continued on page 25)

TABULATION OF COMET OBSERVATIONS

Note the new additions to the Observer Key and the correction on page 16.

Comet Bowell (1980b)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 03 01.75	S	12.7	V	31.7	L	5	86		2			JON
1982 03 03.74	S	12.4	V	31.7	L	5	86					JON
1982 03 05.69	S	12.4	V	31.7	L	5	86	1				JON
1982 03 26.72	S	12.1	V	31.7	L	5	86					JON
1982 04 02.73	S	12.0	V	31.7	L	5	86	& 2				JON
1982 04 03.70	S	12.0	V	31.7	L	5	86					JON
1982 04 04.72	S	12.0	V	31.7	L	5	86	1	2			JON
1982 04 06.73	S	12.0	V	31.7	L	5	86		3			JON
1982 04 21.69	S	12.7	V	31.7	L	5	86					JON
1982 04 22.69	S	11.6	V	31.7	L	5	86					JON
1982 04 23.71	S	11.8	V	31.7	L	5	86					JON
1982 04 24.69	S	11.9	V	31.7	L	5	86					JON
1982 04 25.69	S	11.9	V	31.7	L	5	86					JON
1982 04 26.67	S	11.8	V	31.7	L	5	86					JON
1982 04 27.67	S	11.9	V	31.7	L	5	86					JON
1982 05 01.72	S	11.8	V	31.7	L	5	86		3			JON
1982 05 03.69	S	11.8	V	31.7	L	5	86					JON
1982 05 04.69	S	12.1	V	31.7	L	5	86		6			JON
1982 05 05.74	S	12.1	V	31.7	L	5	86		4			JON
1982 05 21.09		10.A	A	15.0	L	8	60	5	2/			POI
1982 05 22.70	S	11.8	V	31.7	L	5	86					JON
1982 05 24.70	S	12.3	V	31.7	L	5	86		4			JON
1982 05 27.69	S	11.9	V	31.7	L	5	86		3			JON
1982 05 29.72	S	11.9	V	31.7	L	5	86		4			JON
1982 05 29.72	M	11.8	V	31.7	L	5	48					JON
1982 05 31.69	S	11.9	V	31.7	L	5	86	& 0.5	3			JON
1982 06 01.69	S	11.8	V	31.7	L	5	86		3			JON
1982 06 15.43	S	11.8	V	31.7	L	5	86		1			JON
1982 06 16.43	S	12.0	V	31.7	L	5	86					JON
1982 06 19.48	S	11.8	V	31.7	L	5	86		3			JON
1982 07 06.36	S	11.8	V	31.7	L	5	86	& 0.5				JON
1982 07 09.33	S	11.9	V	31.7	L	5	86					JON
1982 07 11.42	S	11.8	V	31.7	L	5	86					JON
1982 07 16.35	S	11.9	V	31.7	L	5	86	& 0.5				JON
1982 07 17.46	S	11.9	V	31.7	L	5	86		3			JON
1982 07 21.39	S	12.0	V	31.7	L	5	86					JON
1982 07 22.39	S	12.2	V	31.7	L	5	86					JON
1982 07 24.33	S	12.3	V	31.7	L	5	86		0/			JON

Comet Austin (1982g)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 07 01.15	S	10.3	AA	12.0	R	5	21	3.0	5			CAM
1982 07 04.14	S	9.7	AA	12.0	R	5	21	3.5	5			CAM
1982 07 15.15	S	8.0	AA	12.0	R	5	21	5.0	5			CAM
1982 07 19.12	S	7.9	AA	12.0	R	5	21	5.0	7			CAM
1982 07 27.14	S	6.0	AA	12.0	R	5	21		6	0.05	175	CAM

Comet Austin (1982g) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 07 28.14	S	5.8	AA	3.5	B		7	6.0	6			CAM
1982 08 03.15	S	5.4	AA	3.5	B		7	6.0	6			CAM
1982 08 03.16	S	5.4	AA	12.0	R	5	21	5.5	6			CAM
1982 08 12.11		4.5:	Y	8.0	B	4	10					BUS01
1982 08 15.86	S	4.9	Y	8.0	B	4	20		5			BOU
1982 08 15.87	S	4.2	AA	8.0	B		20	4	5	0.33	40	SHA02
1982 08 16.86	B	4.5	Y	8.0	B	4	20	9	6	1.17		BOU
1982 08 16.87	S	4.2	Y	8.0	B	4	20					BOU
1982 08 17.81	S	6.2:	AA	20	L	4	50	2	4			MIL02
1982 08 17.82	S	4.8	AA	5.0	B	4	10					MIL02
1982 08 17.85	S	4.6	Y	8.0	B	4	20		6			BOU
1982 08 17.86	S	4.3	Y	5.0	B	4	10	10	5/	&0.5		BUS01
1982 08 17.87	B	4.5	Y	5.0	B	4	10	10	5/	&0.5		BUS01
1982 08 18.77	S	4.8	AA	5.0	B	4	10					MIL02
1982 08 18.78	S	5.6	AA	20	L	4	40	2.5	4	0.42	20	MIL02
1982 08 18.79	S	4.7	AA	3.0	B	4	6					MIL02
1982 08 18.85	S	4.7	AA	5.0	B		7					SHA02
1982 08 18.85	S	5.0	AA	8.0	B		20	4.5	6	0.58	13	SHA02
1982 08 18.86	S	4.5	Y	14.5	L	5	31					BUS01
1982 08 18.87	S	5.3	AA	15	L	8	67					SHA02
1982 08 18.87		4.8	HR	6.0	B		13	5	7	1.00		HEN
1982 08 18.88	B	4.8	AA	5.0	B		10	3.5				KEI
1982 08 18.88	B	5.0	AA	5.0	B		7		8/	1.00		STU
1982 08 18.88	S	4.7	AA	8.0	B		20			0.75		MCK
1982 08 18.88	B	4.7	AA	8.0	B		20	4.6	7	1.17	22	KEI
1982 08 18.89	S	5.4	AA	33.3	L	4	45			0.92	15	SHA02
1982 08 18.89		4.9	HR	5.0	B		10	6		0.83	12	ENT
1982 08 18.90		4.9	AA	4.0	B		8	5	7	1.00	20	RID
1982 08 19.09	S	4.6	Y	8.0	B	4	15					FEI
1982 08 19.09	B	4.8	Y	8.0	B	4	15					FEI
1982 08 19.10	B	4.7	Y	5.0	B	4	10					BOU
1982 08 19.10	B	4.5	Y	8.0	B	4	20	7	6	&1		BOU
1982 08 19.10	S	4.5	Y	5.0	B	4	10					BOU
1982 08 19.82	S	4.8	AA	5.0	B	4	10					MIL02
1982 08 19.82	S	4.7	AA	3.0	B	4	6					MIL02
1982 08 19.84	S	4.6	Y	5.0	B	4	10					POI
1982 08 19.84	B	4.9	Y	5.0	B	4	10	10		&0.92		POI
1982 08 19.85	B	5.0	Y	5.0	B	4	7					DRU
1982 08 19.87	B	4.6	Y	5.0	B	4	10					BOU
1982 08 19.87	S	4.4	Y	5.0	B	4	10	10	5/	&4	18	BUS01
1982 08 19.87	B	4.9	Y	4.0	R		20	& 6	5	0.42	0	KUI
1982 08 19.87	S	4.4	Y	5.0	B	4	10					BOU
1982 08 19.87	B	4.7	Y	5.0	B	4	10					BUS01
1982 08 19.88	B	4.8	Y	10.0	B	4	14	&10				DRU
1982 08 19.88	B	4.7	AA	8.0	B		20	3.8	7	0.57	24	KEI
1982 08 19.88	S	4.9	Y	8.0	B	4	10			&3.5		COM
1982 08 19.88	B	5.1	Y	8.0	B	4	15					FEI
1982 08 19.88	S	4.9	Y	8.0	B	4	15					FEI
1982 08 19.88	B	4.7	AA	5.0	B		10			0.83	24	KEI
1982 08 19.88	S	4.5	Y	8.0	B	4	20	8	7	&2	13	BOU
1982 08 19.89	S	3.9	Y	8.0	B	4	15					BRI01
1982 08 19.90	S	4.8	Y	8.0	B	4	20			&0.5		PAP
1982 08 19.90	B	5.0	Y	8.0	B	4	20					PAP
1982 08 19.92	S	4.8	HR	6.0	B		13	5	7	1.50		HEN

Comet Austin (1982g) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 08 19.96	B	4.8	AA	4.0	B		8	5	7	1.00	20	RID
1982 08 20.05	S	4.7	Y	5.0	B	4	8					POI
1982 08 20.80	S	4.6	AA	5	R		20					VEN01
1982 08 20.81	B	4.7	S	10	B	4	25					ANT
1982 08 20.89	B	4.8	AA	8.0	B		20	4.4	7	1.50	26	KEI
1982 08 20.90	B	4.8	AA	4.0	B		8	5	7	1.00	25	RID
1982 08 20.90	P									6.0		RID
1982 08 21.05	S	5.3	SC	10.0	B		14	5	3	1.25	17	SIM01
1982 08 21.05	S	5.2	SC	10.0	B		14	4	3	1.25	20	SIM
1982 08 21.80	B	4.8	S	10	B	4	25					ANT
1982 08 21.80	S	4.6	AA	5	R		20					VEN01
1982 08 21.85	B	4.7	Y	14.5	L	5	31					BUS01
1982 08 21.89	B	4.9	AA	4.0	B		8	5	7	1.50	30	RID
1982 08 22.05	S	4.8	SC	5.0	B		7		3			SIM01
1982 08 22.05	S	5.0	SC	5.0	B		7		3			SIM
1982 08 22.82	B	4.8	S	10	B	4	25					ANT
1982 08 22.82	S	4.8	AA	5.0	B	4	10	4	4	0.25	46	MIL02
1982 08 22.85	S	4.9	Y	5.0	B	4	10	10	8			POI
1982 08 22.89	S	5.2	HR	5.0	B		10	6		1.00	17	ENT
1982 08 22.93	S	4.8	Y	8.0	B	4	20					BOU
1982 08 22.93	S	5.1	AA	8.0	B		20	4	6	1.30	27	SHA02
1982 08 22.96	B	4.9	NO	5.0	B		10					KEI
1982 08 22.96	B	4.9	NO	8.0	B		20	4.7				KEI
1982 08 23.80	B	4.9	S	10	B	4	25					ANT
1982 08 23.82	S	4.9	AA	5.0	B	4	10	3.5	5	0.17	32	MIL02
1982 08 23.85	S	5.0	Y	5.0	B	4	10	15	8			POI
1982 08 23.88	B	5.3	Y	8.0	B	4	20					PAP
1982 08 23.88	B	4.5	Y	8.0	B	4	15		7			BRI01
1982 08 23.88	S	5.1	Y	8.0	B	4	20					PAP
1982 08 23.89	B	4.9	Y	5.0	B	4	10		6	2	35	BOU
1982 08 23.89	S	4.7	Y	8.0	B	4	20					BOU
1982 08 23.90	S	5.4	AA	8.0	B		20	6	5	1.05	31	SHA02
1982 08 23.90	S	4.9	Y	5.0	B	4	10		6	2		BUS01
1982 08 23.90	S	5.1	HR	5.0	B		10	4		1.17	25	ENT
1982 08 23.90	S	5.1	AA	5.0	B		7					SHA02
1982 08 23.91	B	5.2	Y	5.0	B	4	10					BUS01
1982 08 23.91	S	4.7	Y	5.0	B	4	10					BOU
1982 08 24.05	S	5.5	SC	5.0	B		7					SIM
1982 08 24.05	S	5.6	SC	5.0	B		7					SIM01
1982 08 24.08	B	5.3	Y	8.0	B	4	15					FEI
1982 08 24.83	B	5.1	S	10	B	4	25					ANT
1982 08 24.88	B	5.3	AA	8.0	B		20	4.8	7	1.50	35	KEI
1982 08 24.88	P									12.0		RID
1982 08 24.88	B	5.3	AA	5.0	B		10	5.2		4.00	35	KEI
1982 08 24.88	B	5.3	HR	4.0	B		8	5	8	1.50	30	RID
1982 08 24.88				29.8	L	5	62			0.07	96	KEI
1982 08 24.88				29.8	L	5	62			0.07	309	KEI
1982 08 25.80	S	5.0	AA	5	R		20					VEN01
1982 08 25.83	S	5.5	AA	5.0	B	4	10	5				MIL02
1982 08 25.84	B	5.1	S	10	B	4	25	6		5		ANT
1982 08 25.88				8.0	B		20			0.10	82	KEI
1982 08 25.88	B	5.4	HR	5.0	B		10					KEI
1982 08 25.88	B	5.4	HR	8.0	B		20	3.4	7	2.33	37	KEI
1982 08 25.88				8.0	B		20				58	KEI

Comet Austin (1982g) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 08 25.88	P									10.0		RID
1982 08 25.88				8.0	B		20			0.10	146	KEI
1982 08 25.88				8.0	B		20			0.10	279	KEI
1982 08 25.88	B	5.2	HR	4.0	B		8	5	8	1.50	33	RID
1982 08 25.96	B	5.3	Y	4.0	B	4	8					BEN02
1982 08 26.09	S	4.9	Y	5.0	B	4	10					BOU
1982 08 26.09	B	5.2	Y	8.0	B	4	20	6	5/	1.5		BOU
1982 08 26.09	S	5.0	Y	8.0	B	4	20					BOU
1982 08 26.80	B	5.2	S	10	B	4	25					ANT
1982 08 26.81	S	5.1	AA	5	R		20					VEN01
1982 08 26.85	B	5.2	Y	8.0	B	4	15					BRI01
1982 08 26.85	S	4.9	Y	8.0	B	4	15	3.5	7/	&0.75	240	BRI01
1982 08 26.86	S	5.7	AA	8.0	B		20	4	5	0.55	37	SHA02
1982 08 26.88	B	5.4	HR	4.0	B		8	4.5	8	2.0	36	RID
1982 08 26.90	B	5.3	Y	10.0	B	4	14			&1.25		DRU
1982 08 26.91	S	5.6	Y	5.0	B	4	10					POI
1982 08 27.80	S	5.2	AA	5	R		20					VEN01
1982 08 27.85	B	5.5	Y	8.0	B	4	15					BRI01
1982 08 27.85	S	5.2	Y	8.0	B	4	15		8	0.75	300	BRI01
1982 08 27.85	S	5.2	Y	8.0	B	4	15			&0.5	300	VAN03
1982 08 27.86	B	5.3	Y	5.0	B	4	7		5/	&1.5	40	BUS01
1982 08 27.86	S	5.1	Y	5.0	B	4	7					BUS01
1982 08 27.86	B	5.3	Y	5.0	B	4	7	6	6			KUI
1982 08 27.87	B	5.7	AA	8.0	B		20	3	7	1.33	32	KEI
1982 08 27.87	B	5.6	AA	5.0	B		10					KEI
1982 08 27.90	B	5.4	Y	10.0	B	4	14			&1		DRU
1982 08 27.90	S	5.4	Y	10.0	B	4	14					DRU
1982 08 27.91	S	5.3	Y	5.0	B	4	10		7/			POI
1982 08 27.92	B	5.5	Y	4.0	B	4	8					BEN02
1982 08 27.92	S	5.4	Y	8.0	B	4	20			1.5		PAP
1982 08 27.92	B	5.5	Y	8.0	B	4	20					PAP
1982 08 27.92	B	5.5	HR	4.0	B		8	4	7			RID
1982 08 27.93	S	5.3	HR	5.0	B		10	4.5		0.20	30	ENT
1982 08 28.10	B	5.6	Y	8.0	B	4	20					BOU
1982 08 28.10	S	5.4	Y	8.0	B	4	20					BOU
1982 08 28.10	S	5.2	Y	5.0	B	4	10					POI
1982 08 28.10	S	5.3	Y	8.0	B	4	20					POI
1982 08 28.79	S	5.3	AA	5	R		20					VEN01
1982 08 28.85	S	5.4	Y	8.0	B	4	15		8			BRI01
1982 08 28.85	B	5.7	Y	8.0	B	4	15					BRI01
1982 08 28.86	S	5.7	Y	8.0	B	4	15		7/			FEI
1982 08 28.86	S	5.8	Y	4.0	B	4	12					FEI
1982 08 28.86	B	5.9	Y	4.0	B	4	12					FEI
1982 08 28.87	S	5.4	AA	5.0	B		7					SHA02
1982 08 28.87		5.2	SC	10.2	R	15	60	5.5	5	0.50	50	MED
1982 08 28.87	S	5.5	AA	8.0	B		20	4.5	4	0.50	37	SHA02
1982 08 28.94	B	5.5	Y	4.0	B	4	8					BEN02
1982 08 29.08	S	5.2	Y	5.0	B	4	7					BUS01
1982 08 29.08	B	5.4	Y	5.0	B	4	7	15	5/	2		BUS01
1982 08 29.15				8.0	B		20			0.07	357	KEI
1982 08 29.15				8.0	B		20			0.07	90	KEI
1982 08 29.15	B	5.6	SP	8.0	B		20	2.0	6	0.17	41	KEI
1982 08 29.80	S	5.5	Y	5.0	B	4	10					BOU
1982 08 29.85	B	5.5	AA	8.0	B		20	2.6	6/	0.67	34	KEI

Comet Austin (1982g) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 08 29.85	B	5.8	Y	4.0	B	4	8					BEN02
1982 08 29.86	S	6.0	HR	6.0	B		13	5	7	0.50	45	HEN
1982 08 29.89	B	5.8	AA	4.0	B		8	3	8	0.25		RID
1982 08 29.89	P									4.0	39	RID
1982 08 30.81	S	5.4	AA	5	R		20					VEN01
1982 08 30.87	S	5.5	Y	5.0	B	4	10					BOU
1982 08 30.88	B	5.8	Y	5.0	B	4	10					BOU
1982 08 31.05	S	6.0	SC	5.0	B		7					SIM
1982 08 31.05	S	6.3	SC	10.0	B		14					SIM
1982 08 31.05	S	6.2	SC	10.0	B		14					SIM01
1982 08 31.80	B	5.8	S	10	B	4	25					ANT
1982 08 31.80	S	5.5	AA	5	R		20					VEN01
1982 08 31.84	B	5.8	HR	8.0	B		20	2	6/	0.67	37	KEI
1982 08 31.85	S	5.9	AA	8.0	B		10					SHA02
1982 08 31.85		5.9	AA	8.0	B		20	6		0.50		MCK
1982 08 31.85	S	6.0	AA	8.0	B		20	4	5	0.40	24	SHA02
1982 08 31.87	B	5.9	HR	4.0	B		8	3	7			RID
1982 09 01.05	S	6.3	SC	10.0	B		14					SIM
1982 09 01.05	S	6.3	SC	10.0	B		14					SIM01
1982 09 01.08	B	5.7	Y	8.0	B	4	20					BOU
1982 09 01.09	S	5.4	Y	8.0	B	4	20	5	6	2.25	35	BOU
1982 09 01.09	S	5.5	Y	5.0	B	4	10					BOU
1982 09 01.10	B	5.7	Y	5.0	B	4	10					BOU
1982 09 02.05	S	6.4	SC	10.0	B		14					SIM
1982 09 02.05	S	6.5	SC	10.0	B		14					SIM01
1982 09 02.82	S	5.8	SC	5.0	B		10	3.5	4			CAV
1982 09 02.83	S	5.9	Y	5.0	B	4	8	5	7			POI
1982 09 02.85	B	6.5	NO	4.0	B	4	8					BEN02
1982 09 02.85	B	5.9	AA	8.0	B		20	2	6/	0.33	37	KEI
1982 09 02.85	B	5.9	AA	5.0	B		10	2	6/	0.33	37	KEI
1982 09 02.88	B	6.1	HR	4.0	B		20	2	7			RID
1982 09 02.89	B	6.3	Y	10.0	B	4	14			0.5		DRU
1982 09 03.79	B	6.3	S	10	B	4	25					ANT
1982 09 03.80	S	6.0	AA	5	R		20					VEN01
1982 09 04.78	S	6.0	AA	5	R		20					VEN01
1982 09 04.83	B	6.1	Y	8.0	B	4	20	4	6	0.7		BOU
1982 09 04.84	S	5.8	Y	8.0	B	4	20					BOU
1982 09 04.85	B	6.2	HR	4.0	B		8	2	7			RID
1982 09 05.80	S	6.1	AA	5	R		20					VEN01
1982 09 05.81	B	6.4	S	10	B	4	25					ANT
1982 09 05.82	S	5.7	Y	5.0	B	4	8	& 7.5	8			POI
1982 09 05.82	B	6.0	Y	5.0	B	4	8					POI
1982 09 06.77	S	6.4	AA	5	R		20					VEN01
1982 09 06.84	B	6.1	Y	5.0	B	4	8					POI
1982 09 06.84	S	5.9	Y	5.0	B	4	8					POI
1982 09 07.78	S	6.8	AA	5	R		20					VEN01
1982 09 07.85				29.8	L	5	62			0.03	110	KEI
1982 09 07.85	B	6.4	AA	8.0	B		20	2.0	6	1.00	35	KEI
1982 09 07.85				29.8	L	5	62	2.7		0.03	318	KEI
1982 09 07.87	B	6.5	AA	4.0	B		8	2	8	0.50	40	RID
1982 09 08.85	S	7.0	NO	8.0	B	4	15		5			BRI01
1982 09 08.86	S	6.9	HR	5.0	B		10	3		0.33	34	ENT
1982 09 08.92	B	6.8	NO	4.0	B	4	8					BEN02
1982 09 09.79	S	6.8	AA	5	R		20					VEN01

Comet Austin (1982g) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 09 09.82	S	6.3	NO	15.0	L	5	30					POI
1982 09 09.82	B	6.3	Y	5.0	B	4	8					POI
1982 09 09.82	S	6.2	Y	5.0	B	4	8	& 4.5	8			POI
1982 09 09.82	B	6.4	NO	15.0	L	5	30					POI
1982 09 09.84	B	6.6	NO	8.0	B	4	20		6			BOU
1982 09 09.84	S	6.4	NO	8.0	B	4	20					BOU
1982 09 09.85	B	6.4	AA	8.0	B		20	2.6	6	0.50	35	KEI
1982 09 09.85	B	6.7	NO	5.0	B	4	10					BOU
1982 09 09.85	B	6.4	AA	5.0	B		10					KEI
1982 09 09.87	B	6.7	NO	8.0	B	4	20					PAP
1982 09 09.87	S	6.6	NO	8.0	B	4	20					PAP
1982 09 09.88	S	6.2	NO	4.0	R		9		6/			BUS01
1982 09 09.88	B	6.4	NO	4.0	R		9					BUS01
1982 09 09.95	B	6.8	HR	4.0	B		8	1.5	8			RID
1982 09 10.79	S	6.7	AA	5	R		20					VEN01
1982 09 11.79	B	7.2	S	10	B	4	25					ANT
1982 09 11.79	S	6.8	AA	5	R		20					VEN01
1982 09 11.82	B	6.6	NO	8.0	B	4	15					FEI
1982 09 11.82	S	6.6	NO	8.0	B	4	15					FEI
1982 09 11.83	B	6.7	NO	4.0	B	4	12					BUS01
1982 09 11.83	S	6.6	NO	8.0	B	4	15					BUS01
1982 09 11.83	B	6.6	NO	8.0	B	4	20					BOU
1982 09 11.83	S	6.3	NO	8.0	B	4	20			0.8		BOU
1982 09 11.83	B	6.7	NO	8.0	B	4	15					BUS01
1982 09 11.83	S	6.6	NO	4.0	B	4	12	3	7/	&1		BUS01
1982 09 11.84	B	6.8	NO	11.0	L	5	25					BUS01
1982 09 11.84	S	6.6	NO	11.0	L	5	25					BUS01
1982 09 11.85	S	6.3	HR	10.5	B		20	4				HEN
1982 09 11.86	S	7.2	NO	11.5	L		45					BRI01
1982 09 11.86	P			10		4				2.0	30	HEN
1982 09 11.86	B	6.7	NO	4.0	B	4	12					FEI
1982 09 11.86	S	6.6	NO	4.0	B	4	12					FEI
1982 09 11.87	S	6.4	NO	15.6	L	5	30	3	7			BOU
1982 09 11.87	S	6.8	NO	5.0	B	4	7		6/			KUI
1982 09 12.77	S	7.0	AA	5	R		20					VEN01
1982 09 12.87	B	7.1	HR	4.0	B		8	2	7			RID
1982 09 13.77	S	7.0	AA	5	R		20					VEN01
1982 09 13.79	B	7.5	S	10	B	4	25					ANT
1982 09 13.83	B	6.5	AA	5.0	B		10					KEI
1982 09 13.83				29.8	L	5	62				70	KEI
1982 09 13.83	B	6.5	AA	8.0	B		20	2.7	6	0.42	40	KEI
1982 09 13.83				29.8	L	5	62				330	KEI
1982 09 13.83	S	6.6	NO	5.0	B	4	7	4	6/	&2		BUS01
1982 09 13.83	S	6.5	NO	8.0	B	4	20	4	6	1.5		BOU
1982 09 13.83	B	6.8	NO	5.0	B	4	7					BUS01
1982 09 13.84	B	6.7	NO	8.0	B	4	20					BOU
1982 09 13.84	S	6.5	NO	5.0	B	4	10					BOU
1982 09 13.85	B	7.2	HR	4.0	B		8	2	7			RID
1982 09 13.86	S	7.1	NO	5.0	B	4	7		5			KUI
1982 09 14.84	B	6.5	AA	5.0	B		10					KEI
1982 09 14.84	B	6.6	AA	8.0	B		20	4	6	0.50	47	KEI
1982 09 14.85	S	6.6	HR	6.0	B		13		5	0.50	25	HEN
1982 09 15.79	S	7.0	AA	5	R		20					VEN01

(Continued on page 17)

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Vol. 4, No. 4 (Whole No. 44): October 1982, pp. 77-112

This index follows the style used in the previous index for Volume 3 (see ICQ 4, 16). Indices for each volume are published in the January issue of the following volume. References listed below indicate page number. For example, (39) indicates page 39, which was in Vol. 4, No. 2 (ascertained from the listing at the top of this page). --D.W.E.G.

LIST OF MAJOR ARTICLES, BY TITLE:

LIST OF MAJOR ARTICLES, BY AUTHOR:

LIST OF OTHER COLUMNS, NOTES, LETTERS, AND SHORT ARTICLES, BY TITLE:

[Here, the following abbreviations are used for the ICQ Staff:
DWEG = D. W. E. Green; CSM = C. S. Morris; BGM = B. G. Marsden]

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INDEX TO THE INTERNATIONAL COMET QUARTERLY: Volume 4

TABULATED OBSERVATIONS, NEWS, ETC., OF INDIVIDUAL COMETS (by name) (Cont.):

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NEW ADDITIONS TO THE OBSERVER KEY (cf. ICQ 4, 105):

BEN02	11	A. BENJAMINS, THE NETHERLANDS
BRI01	11	H. J. BRIL, THE NETHERLANDS
GEE	11	J. GEENEN, THE NETHERLANDS
LUN	11	M. LUNENBORG, THE NETHERLANDS
MED	07	K. MEDWAY, ENGLAND
VAN03	11	F. VAN DIJK, THE NETHERLANDS
VEN01	07	F. VENTURA, MALTA

CORRECTION: In ICQ 4, p. 29, P/Encke should be comet 1980 XI (not 1980 XX).

Comet Austin (1982g) Cont. from page 12

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 09 15.80	B	7.6	S	10	B	4	25					ANT
1982 09 18.81	S	7.3	S	5.0	B		10	5				CAV
1982 09 19.78	B	8.1	S	10	B	4	25					ANT
1982 09 19.78	S	7.5	AA	5	R		20					VEN01
1982 09 20.77	S	7.3	AA	15.2	R		50					VEN01
1982 09 21.81	B	7.5	NO	8.0	B	4	20					BOU
1982 09 21.84	S	7.4	S	8.0	B		20	3.5	6	0.17	40	KEI
1982 09 21.84	S	7.3	NO	8.0	B	4	20		5	1.0		BOU
1982 09 21.85	S	7.6	NO	8.0	B	4	15		7/			BRI01
1982 09 21.85	B	7.9	NO	8.0	B	4	15					BRI01
1982 09 21.85		8.0	S	10.5	B		20	2	5			HEN
1982 09 21.95	S	7.3	NO	5.0	R		16					BUS01
1982 09 22.81	B	7.7	NO	8.0	B	4	20					BOU
1982 09 22.81	S	7.2	NO	5.0	B	4	7					BUS01
1982 09 22.81	S	7.4	NO	8.0	B	4	20	4	6	0.75		BOU
1982 09 22.81	B	7.8	NO	5.0	R		16					BUS01
1982 09 22.81	B	7.4	NO	5.0	B	4	7					BUS01
1982 09 22.81	S	7.2	NO	8.0	B	4	20	6	5/	&1		BUS01
1982 09 22.81	S	7.4	NO	5.0	R		16					BUS01
1982 09 22.82	S	7.4	S	8.0	B		20	3.5	6/	0.67	35	KEI
1982 09 22.82	S	7.4	NO	5.0	B	4	10					BOU
1982 09 22.82	B	7.4	NO	8.0	B	4	20					BUS01
1982 09 22.82	S	7.4	NO	15.6	L	5	30	3				BUS01
1982 09 23.85	S	7.6	S	8.0	B		20	3	5			KEI
1982 09 23.85	B	8.1	S	8.0	B		20					KEI
1982 09 24.77	S	7.5	AA	15.2	R		50	2.0				VEN01
1982 09 24.82	S	7.9	S	8.0	B		20	4.2	5			KEI
1982 09 24.82	B	8.1	S	8.0	B		20					KEI
1982 09 26.82	S	8.0	S	8.0	B		20	3				KEI
1982 09 26.82	B	8.2	S	8.0	B		20					KEI
1982 09 26.83		8.4	S	8.0	R		40	1.5	4/			RID
1982 09 27.12	S	8.1	A	20.0	L	10	65	3.0	3			SPR
1982 09 27.14	S	7.9	A	8.0	B	4	20					BOU
1982 09 27.14	B	8.1	A	8.0	B	4	20		5			BOU
1982 09 30.19	S	8.3	AA	8.0	B		20	2.8	5			KEI
1982 10 04.80		8.5:	AA	8.0	B		20					KEI
1982 10 06.00	S	8.5	A	32	L	5	68	2.0	3			BOR
1982 10 10.99	S	8.8	A	32	L	5	68	1.8	3/	?	0	BOR
1982 10 14.78	S	9.2	A	5.0	R		16					BUS01
1982 10 14.79	S	9.1	A	15.6	L	5	30					BOU
1982 10 16.18	S	9.2	A	8.0	B	4	20	2.5	4			BOU
1982 10 17.77	S	9.2	A	14.5	L	5	31	2.5	4/	0.06		BUS01
1982 10 17.77	S	9.4	A	15.6	L	5	30					BOU
1982 10 18.39	S	9.5	MP	32	L	5	68	2.0	3			BOR
1982 10 19.78	S	9.8	A	15.0	L	5	25	& 9	0		0	MER
1982 10 20.40	S	9.7	MP	32	L	5	68	1.8	3			BOR
1982 10 23.40	S	9.6	A	32	L	5	68	1.9	2/	?	0	BOR
1982 10 24.19	S	9.3:	S	29.8	L	5	62	1.6	3/	0.05	38	KEI
1982 10 26.16	S	10.2	A	25.4	L	4	79					CAV
1982 10 27.40	S	10.1	A	32	L	5	68	1.7	1/			BOR
1982 11 15.20	S	10.6	AA	29.8	L	5	62	1.8	1/	0.03	44	KEI
1982 11 16.42	S	10.9	A	32	L	5	68	2.8	1			BOR
1982 11 23.20	S	11.0	A	15.6	L	5	30	1.5	2			BOU
1982 11 24.22	S	11.2	V	29.8	L	5	62	1.7	1			KEI

Comet Austin (1982g) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 11 29.23	S	11.3	V	29.8	L	5	62	1.8	1			KEI
1982 12 12.16	S	12.0	A	25.4	L	6	61					BUS01
1982 12 12.16	S	12.2	A	25.4	L	6	61	& 1.5	1			BOU
1982 12 18.27	S	11.7	A	25	L	7	103	2	0			MOR
1982 12 24.24	B	12.5	AC	26.0	L	6	130	2.0	3			MER
1983 01 08.00	B	12.6	AC	26.0	L	6	130	1.5	3			MER
1983 01 14.24	S[	13.0	AC	50.0	L	5	96					BOR

Periodic Comet Grigg-Skjellerup (1982a)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 03 14.85	P	15.0	UP	26.0	L	6			8			MER
1982 03 24.85	P	14.5	UP	26.0	L	6		& 0.7	7			MER
1982 03 26.85	P	14.5	UP	26.0	L	6		& 0.8	6			MER
1982 04 13.87	P	13.5	UP	26.0	L	6		& 0.8	3			MER
1982 04 22.86	P	12.5	UP	26.0	L	6		& 1	2			MER
1982 05 11.90	S	10.5:	A	25.4	L	6	61					BOU
1982 05 13.91	S	10.0	A	15.6	L	5	30					BOU
1982 05 13.92	S	11.4	A	25.4	L		70	& 2.5	1			KUI
1982 05 15.30	S	12.0	V	31.7	L	5	86	1.5	1			JON
1982 05 15.92	S	10.2	A	25.4	L	6	61	4	1			BOU
1982 05 17.93	S	9.6	AC	8.0	B		20	2.8	2			KEI
1982 05 18.94	S	9.5	AA	8.0	B		20	2.8	2			KEI
1982 05 23.95		10.0	AC	20	L	4	35	9	1			PAN
1982 05 25.93	S	10.3	V	20	R	14	40	2.9	3/			SHA02
1982 05 25.93	S	9.6	V	8.0	B		20	5.5	3			SHA02
1982 05 25.94				29.8	L	5	62				63	KEI
1982 05 25.94				29.8	L	5	62				2	KEI
1982 05 25.94				29.8	L	5	62		4		281	KEI
1982 05 25.94	S	9.6	AC	8.0	B		20	2.0				KEI
1982 05 25.96		9.8	AC	20	L	4	35	7	2			PAN
1982 05 28.96	S	10.2	V	20	R	14	40	2.2	3			SHA02
1982 06 12.99	S	10.3	AC	29.8	L	5	62	1.4	2			KEI
1982 06 13.97	S	10.6	A	15.6	L		30	3	0			BOU
1982 06 14.96	S	10.6	AC	29.8	L	5	62	2.0	1			KEI
1982 06 19.97	S	10.9	VB	29.8	L	5	62	2.1	2		270	KEI
1982 07 16.00	S	11.3	VB	29.8	L	5	62	2.0				KEI

Periodic Comet d'Arrest (1982e)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 09 08.55	S	9.7	A	15.2	L	5	72	2.5	2			PEA
1982 09 09.60	S	9.4	A	15.2	L	5	30	5.5	3			PEA
1982 09 12.53	S	9.2	A	15.2	L	5	30	5.7	3			PEA
1982 09 15.52	S	9.2	A	15.2	L	5	30	5	3			PEA
1982 09 17.59	S	9.1	A	15.2	L	5	30	5	2			PEA
1982 09 18.63	S	9.1	A	15.2	L	5	30	5.2	3			PEA
1982 09 23.65	S	9.1	V	25	L	9	70	6.5	1			CLA
1982 10 05.00	S	9.0	A	32	L	5	68	3.5	1/			BOR
1982 10 06.55	S	8.5	A	25	L	9	70	4	1			CLA
1982 10 06.60	S	8.4	A	15.2	L	5	30	3.5	3			PEA
1982 10 07.37	S	10.2	V	31.7	L	5	86	2	1			JON

Periodic Comet d'Arrest (1982e) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 10 07.37	S	9.5	V	7.8	R	8	30					JON
1982 10 07.46	S	9.8	A	8.0	B		15	& 7	0			SEA
1982 10 07.53	S	8.5	A	25	L	9	70	4	1			CLA
1982 10 07.59	S	8.3	A	15.2	L	5	30	4	4			PEA
1982 10 08.37	S	10.6	V	31.7	L	5	86	3	0/			JON
1982 10 08.37	S	10.2	V	31.7	L	5	48					JON
1982 10 08.37	S	10.0	V	7.8	R	8	30					JON
1982 10 08.38	S	9.7	A	8.0	B		15					SEA
1982 10 08.52	S	8.3	A	15.2	L	5	30	4	4			PEA
1982 10 08.60	S	9.7	V	32	L	6	120	4	0/			BRO
1982 10 09.99	S	9.0	A	32	L	5	68	3	1/			BOR
1982 10 10.39	S	9.9	V	7.8	R	8	30					JON
1982 10 10.39	S	10.4	V	31.7	L	5	86		1			JON
1982 10 10.51	S	8.1	A	6.5	B		20	7	2			PEA
1982 10 10.52	S	8.3	A	15.2	L	5	30	5	4			PEA
1982 10 11.00	S	9.1	A	32	L	5	68	3	0			BOR
1982 10 11.12	S	9.2	A	20.0	L	10	81	1.5	1			SPR
1982 10 11.51	S	8.3	A	15.2	L	5	30	5	4			PEA
1982 10 11.52	S	8.1	A	6.5	B		20	7	2			PEA
1982 10 12.12	S	9.1	A	20.0	L	10	81	2.0	1			SPR
1982 10 12.42	S	8.9	A	8.0	B		15					SEA
1982 10 12.54	S	8.4	A	25	L	9	70	5	2			CLA
1982 10 12.60	S	8.1	A	6.5	B		20	7.2	2			PEA
1982 10 12.60	S	8.3	A	15.2	L	5	30	5	4			PEA
1982 10 13.11	S	9.3	A	20.0	L	10	81	2.0	1			SPR
1982 10 13.40	S	9.9	V	31.7	L	5	48	3	0/			JON
1982 10 13.41	S	9.0	A	8.0	B		15	6	4			SEA
1982 10 13.52	S	8.5	A	25	L	9	70	5	2			CLA
1982 10 13.56	S	8.0	A	6.5	B		20	7.2	3			PEA
1982 10 13.56	S	8.2	A	15.2	L	5	30	5	4			PEA
1982 10 14.48	S	8.5	A	25	L	9	70	5	2			CLA
1982 10 14.60	S	8.3	A	15.2	L	5	30	5	4			PEA
1982 10 14.60	S	8.1	A	6.5	B		20	7.4	3			PEA
1982 10 15.41	S	10.0	V	31.7	L	5	48		1			JON
1982 10 16.39	S	10.1	V	31.7	L	5	48	2.5	0/			JON
1982 10 16.41	S	8.8	A	8.0	B		15	6	4/			SEA
1982 10 16.52	S	8.1	A	6.5	B		20	7.5	3			PEA
1982 10 16.52	S	8.3	A	15.2	L	5	30	5	4			PEA
1982 10 16.99	S	9.2	A	32	L	5	68	2.5	0			BOR
1982 10 17.99	S	9.0	A	32	L	5	68	3	0			BOR
1982 10 18.41	S	9.1	A	8.0	B		15	4	4			SEA
1982 10 18.51	S	8.3	A	15.2	L	5	30	4.5	4			PEA
1982 10 18.52	S	8.1	A	6.5	B		20	7.5	3			PEA
1982 10 19.37	S	10.0	V	31.7	L	5	48		0/			JON
1982 10 19.41	S	9.2	A	8.0	B		15	4	5			SEA
1982 10 19.53	S	8.4	A	15.2	L	5	30	4.5	4			PEA
1982 10 19.54	S	8.1	A	6.5	B		20	7.5	3			PEA
1982 10 20.41	S	9.2	A	8.0	B		15	5	4			SEA
1982 10 21.52	S	8.7	A	25	L	9	70	4	1			CLA
1982 10 27.39	S	10.6	V	31.7	L	5	86					JON
1982 10 27.51	S	8.9	A	25	L	9	70	4	1			CLA
1982 11 03.41	S	9.1	A	8.0	B		15	5	4			SEA
1982 11 04.38	S	10.6	V	31.7	L	5	48	& 2.25	1			JON

Periodic Comet d'Arrest (1982e) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 11 04.41	S	9.1	A	8.0	B		15	& 7				SEA
1982 11 06.41	S	9.2	A	8.0	B		15	5	5			SEA
1982 11 06.53	S	8.5	A	15.2	L	5	30	4.8	4			PEA
1982 11 06.54	S	8.3	A	6.5	B		20	7.8	2			PEA
1982 11 06.56	S	8.5	A	25	L	9	70	5	3			CLA
1982 11 06.99	S	9.8	A	32	L	5	68	3	0			BOR
1982 11 07.53	S	8.5	A	15.2	L	5	30	4.6	4			PEA
1982 11 07.97	S	9.8	A	32	L	5	68	2.5	0			BOR
1982 11 08.38	S	10.1	V	31.7	L	5	48	3	1			JON
1982 11 08.53	S	8.7	A	25	L	9	70	5	2			CLA
1982 11 09.40	S	10.1	V	31.7	L	5	48		1			JON
1982 11 09.40		9.5	V	7.8	R	8	30					JON
1982 11 09.41	S	9.5	A	8.0	B		15		1			SEA
1982 11 09.52	S	8.6	A	15.2	L	5	30	4.5	4			PEA
1982 11 09.57	S	8.8	A	25	L	9	70	5	1			CLA
1982 11 09.79	S	9.7	A	15.0	L	5	75	& 6	1			MER
1982 11 10.56	S	8.9	A	25	L	9	70	5	0/			CLA
1982 11 12.42	S	9.2	A	8.0	B		15	4	1			SEA
1982 11 12.56	S	8.7	A	15.2	L	5	30	4.0	4			PEA
1982 11 13.42	S	9.1	A	8.0	B		15					SEA
1982 11 13.53	S	8.7	A	15.2	L	5	30	3.9	4			PEA
1982 11 14.00	S	9.8	A	25	L	7	68	4	1			MOR
1982 11 14.40	S	10.0	V	31.7	L	5	48		0/			JON
1982 11 14.42	S	9.2	A	8.0	B		15	& 3.5	0			SEA
1982 11 14.54	S	8.8	A	15.2	L	5	30	2.3	4			PEA
1982 11 15.46	S	10.2	V	31.7	L	5	48	3				JON
1982 11 15.53	S	8.9	A	15.2	L	5	30	2.5	4			PEA
1982 11 15.54	S	9.2	A	25	L	9	70	4	1			CLA
1982 11 15.98	S	10.0	A	32	L	5	68	3	0			BOR
1982 11 15.99	S	10.0	A	25	L	7	68	4	0/			MOR
1982 11 16.40	S	10.5	V	31.7	L	5	48					JON
1982 11 16.53	S	9.0	A	15.2	L	5	30	2.6	4			PEA
1982 11 17.53	S	9.5	A	25	L	9	70	3.5	2			CLA
1982 11 17.54	S	9.1	A	15.2	L	5	30	2.8	4			PEA
1982 11 18.00	S	10.0	A	25	L	7	68	3	0/			MOR
1982 11 18.54	S	9.2	A	15.2	L	5	30	2.5	4			PEA
1982 11 18.54	S	9.6	A	25	L	9	70	3.5	1			CLA
1982 11 19.44	S	9.5	A	8.0	B		15	& 2.5	0			SEA
1982 11 20.45	S	10.1	V	31.7	L	5	86	2	0/			JON
1982 11 21.40	S	10.4	V	31.7	L	5	86					JON
1982 12 05.54	S	10.2	A	25	L	9	70	3	2			CLA
1982 12 06.44	S	11.0	V	31.7	L	5	48		0			JON
1982 12 06.55	S	10.4	A	25	L	9	70	3	3			CLA
1982 12 07.98	[	10.5		32	L	5	68					BOR
1982 12 13.42	S	11.8	V	31.7	L	5	86		0			JON

Periodic Comet Schwassmann-Wachmann 2 (1981 VI = 1979k)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1981 01 27.89	P	12.0	UP	26.0	L	6		& 1	3			MER
1981 02 10.85	P	12.5	UP	26.0	L	6		& 1	3			MER

Periodic Comet Churyumov-Gerasimenko (1982f)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 08 29.11	S	13.2	V	29.8	L	5	89	0.6				KEI
1982 09 17.06	P	12.5	UP	26.0	L	6		1.5	4			MER
1982 09 18.17	S	12.7	V	29.8	L	5	89	0.9				KEI
1982 09 24.13	S	12.4	V	29.8	L	5	89	0.9	4			KEI
1982 09 28.10	S	12.5	V	29.8	L	5	89	0.9	4			KEI
1982 09 30.15	S	12.4	V	29.8	L	5	89	0.9	5			KEI
1982 09 30.15	S	12.3	V	29.8	L	5	62	1.0			287	KEI
1982 10 13.77	S	11.4	A	25	L	9	70	1.25	3			CLA
1982 10 21.75	S	11.1	A	25	L	9	70	1.25	3			CLA
1982 10 24.02	S	11.2	V	29.8	L	5	62	0.8	7	0.02	270	KEI
1982 10 26.11	S	11.1	A	25.4	L	4	79	1.0	8	0.04	266	CAV
1982 10 27.10	S	11.6	V	32	R	18	95	0.8	8		330	SHA02
1982 10 27.13	S	11.3	V	15	L	8	67	0.8	8			SHA02
1982 10 27.15		11.0	AC	20	L	4	35	3	3			PAN
1982 10 27.83	S	10.9:	A	25	L	9	70	1.5	3			CLA
1982 10 28.11	S	11.6	V	32	R	18	240	0.7	8		320	SHA02
1982 10 28.11	S	11.5	V	32	R	18	95	0.8	8			SHA02
1982 10 28.85	S	10.7	A	15.2	L	5	72	0.75	7			PEA
1982 11 08.70	S	10.6	A	25	L	9	70	1.5	2			CLA
1982 11 09.25	S	10.0	A	25	L	5	67	1.5	5			SPR
1982 11 09.75	S	10.5	A	25	L	9	70	1.5	2			CLA
1982 11 09.82	S	10.2	AC	15.0	L	5	75	2.0	3	0.05	119	MER
1982 11 09.90	S	10.9	V	32	R	18	95	1.5	7			SHA02
1982 11 10.25	S	9.7	A	20	L	10	64	1.5	4			SPR
1982 11 10.93	S	11.0	V	32	R	18	240	1.5	7	0.02	280	SHA02
1982 11 12.70	S	10.1	A	8.0	B		15	& 1				SEA
1982 11 12.82	S	10.2	A	15.2	L	5	30	1.2	6			PEA
1982 11 12.98	S	11.0	V	32	R	18	240	0.9			285	SHA02
1982 11 13.24	S	9.8	A	20.0	L	10	81	1.25	4			SPR
1982 11 13.71	S	10.2	A	8.0	B		15					SEA
1982 11 13.82	S	10.2	A	15.2	L	5	30	1.2	6			PEA
1982 11 13.94	S	10.4	AC	29.8	L	5	62	0.8	7	0.03	263	KEI
1982 11 13.94				29.8	L	5	62				117	KEI
1982 11 13.94	S	10.3	AC	7	R		27					KEI
1982 11 13.95		10.5	AC	20	L	4	35	2				PAN
1982 11 14.15	S	11.2	V	32	R	18	95	1.2	8			SHA02
1982 11 14.21	S	10.0	A	8.0	B		20	3				MOR
1982 11 14.21	M	10.1	A	25	L	7	103	1.7	7/	0.03	290	MOR
1982 11 14.24	S	9.7	A	20.0	L	10	81	1.15	3			SPR
1982 11 15.22				29.8	L	5	62			0.02	95	KEI
1982 11 15.22	S	10.4	AC	29.8	L	5	62	1.4	8	0.05	260	KEI
1982 11 15.22	S	10.2	AC	29.8	L	5	53					KEI
1982 11 15.80	S	10.2	A	15.2	L	5	30	1.4	6			PEA
1982 11 16.19	M	10.1	AC	22.9	R	12	137					GRE
1982 11 16.19	S	10.0	A	8.0	B		20	4	4			MOR
1982 11 16.19	B	10.8	AC	22.9	R	12	137					GRE
1982 11 16.19	M	10.3	A	25	L	7	103	1.3	7	0.05	270	MOR
1982 11 16.19	S	10.0	AC	22.9	R	12	137	& 2.1	5			GRE
1982 11 16.94		10.4	AC	20	L	4	35	1.5	3			PAN
1982 11 18.14	M	10.1	A	25	L	7	103	1.2	8	0.05	300	MOR
1982 11 18.14	S	10.0	AC	22.9	R	12	96	& 1.6	4			GRE
1982 11 18.14				25	L	7	103			0.02	90	MOR
1982 11 18.14	M	10.7	AC	22.9	R	12	96					GRE
1982 11 18.14	B	11.0	AC	22.9	R	12	96					GRE

Periodic Comet Churyumov-Gerasimenko (1982f) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR		COMA	DC	TAIL	PA	OBS.
1982 11 19.22	S	10.5	V	32	R	18	95		0.8	8	0.04	280	SHA02
1982 11 19.23	S	9.3	V	8.0	B		20		1.5	6/			SHA02
1982 11 19.86	B	10.1	AC	26.0	L	6	39		2.4	3	0.1	228	MER
1982 11 19.94	B	10.0	AC	26.0	L	6	39						MER
1982 11 19.95	B	9.8	AC	9.0	L	9	28						MER
1982 11 20.14	S	10.5	V	32	R	18	95		1.2	7/	0.03	280	SHA02
1982 11 20.16	S	9.3	V	8.0	B		20		2.0	6			SHA02
1982 11 20.93	B	10.2	AC	26.0	L	6	39		2.0	3	0.05	253	MER
1982 11 21.17	S	9.7	A	25.0	L	5	67		1.0	3			SPR
1982 11 21.62	S	10.6	V	31.7	L	5	86						JON
1982 11 21.88	B	10.3	AC	26.0	L	6	39		2.0	3	0.05	271	MER
1982 11 22.18	S	9.5	A	20.0	L	10	64		1.0	3			SPR
1982 11 22.63	S	10.9	V	31.7	L	5	86		0.5	4			JON
1982 11 22.90	S	9.6	V	15	L	8	67		1.9	7			SHA02
1982 11 22.92	S	10.4	V	32	R	18	95		1.1	7	0.04	280	SHA02
1982 11 22.93		10.3	AC	20	L	4	35		1	4			PAN
1982 11 22.94	S	9.4	V	8.0	B		20		1.8	6			SHA02
1982 11 23.17	S	9.6	A	20.0	L	10	125		1.0	3			SPR
1982 11 24.18	S	9.9	A	20.0	L	10	81		1.0	2			SPR
1982 11 24.20	S	10.0	AC	29.8	L	5	62		1.3	7	0.07	277	KEI
1982 11 24.64	S	10.7	V	31.7	L	5	86			5			JON
1982 11 24.69	S	10.1	A	8.0	B		15	&	1				SEA
1982 11 25.18	S	9.9	A	20.0	L	10	113		1.05	2			SPR
1982 12 07.19	S	9.7	A	25.0	L	5	67		1.0	4			SPR
1982 12 08.21	M	9.2	A	25	L	7	68		2.0	7/	0.17	250	MOR
1982 12 09.16	M	9.2	A	25	L	7	68		2.0	7/	0.12	260	MOR
1982 12 10.18	S	9.5	A	20.0	L	10	113		1.25	3			SPR
1982 12 10.20	M	9.2	A	25	L	7	68		1.4	8	0.10	230	MOR
1982 12 10.20				25	L	7	68				0.10	260	MOR
1982 12 11.18	S	9.4	A	20.0	L	10	113		1.25	3			SPR
1982 12 13.12	M	9.4	A	25	L	7	68		2.0	7	0.08	265	MOR
1982 12 13.15	S	9.4	A	8.0	B		20		5	4			MOR
1982 12 13.83	B	9.4	AC	26.0	L	6	39		4.0	2	0.15	279	MER
1982 12 14.11	M	9.4	A	25	L	7	68		1.3	8	?	270	MOR
1982 12 17.11	M	9.3	A	25	L	7	68		2.0	7/	0.13	250	MOR
1982 12 17.21	S	9.0	AC	22.9	R	12	96						GRE
1982 12 17.21	M	9.2	AC	22.9	R	12	96	&	4.5	6/			GRE
1982 12 18.11	M	9.3	A	25	L	7	68		2.0	7/	0.17	250	MOR
1982 12 22.80	B	9.0	AC	26.0	L	6	39		4.0	3	0.12	273	MER
1982 12 23.16	M	9.3	A	25	L	7	68		2	7	0.12	210	MOR
1982 12 23.82	B	9.2	AC	26.0	L	6	39		4.1	2	0.1		MER
1982 12 23.83	B	9.0	AC	9.0	L	9	28						MER
1982 12 23.86	B	9.1	AC	26.0	L	6	39						MER
1982 12 24.15	S	10.1	A	25.0	L	5	67		0.75	6			SPR
1982 12 24.24	B	9.2	AC	26.0	L	6	39						MER
1982 12 26.16	S	9.9	A	20.0	L	10	125		0.75	5			SPR
1982 12 27.15	S	9.9	A	20.0	L	10	125		0.75	4			SPR
1982 12 30.46	M	9.5	A	25	L	7	68		2.1	6/	0.13	285	MOR
1983 01 01.14	S	10.5	A	20.0	L	10	125		0.75	4			SPR
1983 01 01.99	M	10.1	A	25	L	7	103		1.5	6/			MOR
1983 01 03.99	M	10.0	A	25	L	7	103		1.9	6			MOR
1983 01 03.99	M	10.0	A	25	L	7	68		2.1	6			MOR
1983 01 04.00	M	10.1	A	25	L	7	171		1.5	5			MOR
1983 01 04.00	M	10.2	A	25	L	7	240		1.1	4			MOR

Periodic Comet Churyumov-Gerasimenko (1982f) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 01 05.04	M	10.0	A	25	L	7	68	2.0	7			MOR
1983 01 06.93	B	9.1	S	15.0	L	5	25	& 4.0	3	0.1	258	MER
1983 01 07.82	B	9.1	S	26.0	L	6	39	5.1	3			MER
1983 01 07.83	B	9.1	S	9.0	L	9	28					MER
1983 01 07.98	B	9.2	S	26.0	L	6	39			0.1	246	MER
1983 01 08.96	B	9.2	S	15.0	L	5	25	4.4	3	0.07	245	MER
1983 01 08.99	M	10.2	A	25	L	7	68	2.0	6			MOR
1983 01 09.88	B	9.3	S	26.0	L	6	39	& 4	3	0.07	245	MER
1983 01 09.99	M	10.1	A	25	L	7	103	2.0	5			MOR
1983 01 10.83	B	9.3	S	15.0	L	5	75		3			MER
1983 01 12.20	M	10.3	A	25	L	7	103	1.5	5			MOR
1983 01 13.21	S	10.5	A	25.0	L	5	101	0.50	3			SPR
1983 01 13.21	M	10.4	A	25	L	7	103	1.5	4			MOR
1983 01 15.01	M	10.5	A	25	L	7	103	2.0	5			MOR
1983 01 15.16	S	10.6	A	32.0	L	7	71	0.75	3			SPR
1983 01 16.20	S	10.5	A	20.0	L	10	81	0.75	2			SPR
1983 01 17.76	S	9.5	AC	26.0	L	6	39	& 3	2	0.05	219	MER
1983 01 17.85	B	9.2	S	9.0	L	9	28					MER
1983 01 17.91	S	9.4	AC	26.0	L	6	39					MER
1983 01 18.03	M	10.6	A	25	L	7	103	1.5	4			MOR
1983 01 19.22	S	10.4	A	25	L	7	103	2.0	3/			MOR
1983 01 19.84	S	9.8	AC	26.0	L	6	39	2.5	2	0.06	218	MER
1983 01 20.13	S	10.4	A	25	L	7	103	2.0	3			MOR
1983 01 20.17	S	10.8	A	20.0	L	10	125	0.75	2			SPR
1983 01 20.83	S	10.0	AC	26.0	L	6	39	2.8	1	0.05	211	MER
1983 01 21.17	M	10.2	A	25	L	7	103	2.1	4			MOR
1983 01 22.16	S	10.6	A	20.0	L	10	81	1.0	2			SPR
1983 01 22.17	M	10.2	A	25	L	7	103	1.7	3			MOR
1983 01 22.85	S	10.1	AC	26.0	L	6	39	& 2	1	0.04	210	MER
1983 02 11.16	S	11.5	AC	22.9	R	12	274	& 1.3	2/			GRE

Periodic Comet Wild 2 (1978 XI = 1978b)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1978 03 02.17	S	11.5	A	20.0	L	10	40	1.5	3			SPR
1978 03 08.18	S	11.5	A	20.0	L	10	125	1.5	3			SPR

Periodic Comet Schwassmann-Wachmann 1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 04 13.92	B	12.0	A	25.4	L	6	61	0.25	8			BUS01
1982 04 13.92	S	11.8	A	25.4	L	6	61					BOU
1982 04 13.92	B	11.8	A	25.4	L	6	61	0.5	7			BOU
1982 04 13.97	B	11.7	A	25.4	L		70	0.4	8			KUI
1982 04 14.86		12.3	A	15.0	L	8	60		8			POI
1982 04 14.89	B	11.8	A	25.4	L		70	0.4	8			KUI
1982 04 14.89	S	11.8	A	22.5	R	10	65					COM
1982 04 14.92	S	12.0	A	25.4	L	6	61	0.3	8			BUS01
1982 04 14.92	S	11.9	A	25.4	L	6	61					BOU
1982 04 14.92	B	11.9	A	25.4	L	6	61	0.5	7			BOU
1982 04 15.90	B	12.1	A	22.5	R	10	65	0.3	7			BUS01
1982 04 15.91	S	12.0	A	22.5	R	10	65	& 0.45	6			BOU

Periodic Comet Schwassmann-Wachmann 1 (Cont.)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 04 15.91	B	12.0	A	25.4	L		105	0.3				KUI
1982 04 16.88	B	11.9	A	25.4	L		61	0.7	7			BOU
1982 04 16.89	S	11.8	A	25.4	L		61	0.7	7			BOU
1982 04 16.90	B	12.0	A	25.4	L		61	0.4	8			BUS01
1982 04 16.91	B	11.9	A	25.4	L		105	0.4	6			KUI
1982 04 18.89	B	12.2	A	25.4	L	6	61					BOU
1982 04 18.89	S	11.8	A	22.5	R	10	65					COM
1982 04 18.89	B	12.0	A	25.4	L		61	0.6	6/			BUS01
1982 04 18.89	S	12.0	A	25.4	L	6	61	0.8	5/			BOU
1982 04 18.90	S	12.3	A	25.4	L	6	105	0.3	5			KUI
1982 04 19.88	S	12.1	A	25.4	L	6	61	0.8	5			BOU
1982 04 19.89	B	12.3	A	25.4	L	6	61					BOU
1982 04 19.89	M	11.9	A	25.4	L	6	61	0.7	4/			BUS01
1982 04 19.90	S	12.4	A	25.4	L	6	105	0.2	5			KUI
1982 04 19.91	S	12.0	A	22.5	R	10	65					COM
1982 04 23.89	M	12.0	A	25.4	L	6	61	1	3/			BUS01
1982 04 23.90	B	12.1	A	25.4	L	6	61					BOU
1982 04 23.90	S	11.9	A	25.4	L	6	61	1.4	5			BOU
1982 04 24.92	S	12.2	A	25.4	L	6	61	1.2				BUS01

Periodic Comet Kearns-Kwee (1981h)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1981 11 01.96	P	13.5:	UP	26.0	L	6		& 0.5	2			MER
1981 11 20.92	P	13.5	UP	26.0	L	6		0.5	2			MER
1981 11 26.93	P	13.5	UP	26.0	L	6		0.5	2			MER
1982 02 14.84	P	14.0	UP	26.0	L	6		0.4	4			MER
1982 02 22.83	P	14.5	UP	26.0	L	6		0.4	5			MER

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LETTER TO THE EDITOR: CONCERNING MAGNITUDE DATA REFERENCES

Dear Sir:

Concerning the new list of references for comparison stars for making magnitude estimates of comets (cf. ICQ 4, 64), Revue des Constellations should not be listed as an acceptable source. This book, edited in 1964 by the Societe Astronomique de France (by R. Sagot and J. Texereau), includes drawn charts of the entire sky down to mag 7, but there is no reference catalog nor is there indication of the visual magnitudes of each star on the charts. In the chapters describing each constellation may be found some variable star charts; most of these charts are pretty old and have been re-edited since by the AFOEV. Visual magnitudes of selected stars are indicated in the text, chiefly for the brightest or double stars.

Another atlas made in France is from Antoine Brun (founder of the AFOEV), called the Atlas Photometrique des Constellations (1948). This atlas shows the sky from declination +90° to -30° with a scale of 7.5 mm per degree, to mag 7.5. Near each drawn star is indicated its magnitude: to hundredths of m_v for stars brighter than $m_v = 6.5$ (from Revised Harvard Photometry, Vol. 50 of the Harvard Annals); and to tenths of m_v for stars in the range 6.5 - 7.5 (data from Harvard Durchmusterung, Vol. 45).

Sincerely,

Jean-Claude Merlin
3 rue du Centre
71200 - Le Creusot
France

RECENT NEWS CONCERNING COMETS

(Cont. from page 6)

In addition, comet 1983c was just reported at press time by E. Bowell and B. Skiff of Lowell Observatory; this 16th-magnitude object was discovered with the same telescope that was used to discover Pluto in 1930. The object was diffuse with slight condensation and moving slowly southwestward in Leo, near the Cancer border.

P/Halley 1982i has been followed by several observers with CCD detectors on large-aperture telescopes, and it appears to be fluctuating in brightness somewhat (an idea first suggested by R. West from observations made at the European Southern Observatory, La Silla, Chile.

Observational evidence is mount- in favor of the dirty-ice model for cometary nuclei. H. Campins, G. H. Rieke, and M. J. Lebofsky report in a recent letter to Nature (1983, 301, 405) their infrared observations of comet Bowell 1980b, using telescopes in Arizona and Hawaii. As they explain, observations of actual ice molecules (water and ammonia) are difficult to obtain due to observational selection: when comets are close to the sun, the lifetime against evaporation of these molecules is extremely short; when comets are further from the sun, the comet is much fainter, making spectral observation much more difficult. It does seem that any given comet has a considerably different composition from another. Answers may not come until the satellite flybys of P/comet Halley in 3 years, when more concrete data will (hopefully!) tell us how the easily-observed single atoms actually combine in the nucleus of the comet as molecules.

P/comet Churyumov-Gerasimenko has been very widely observed at this recent apparition, as depicted in the Tabulation of Observations elsewhere in this issue. There have not been any other relatively bright comets during the past few months, but visual observers have three periodic comets coming in the next few months which should be observable with an 8-inch (20-cm) reflector: Tempel 1 (1982j), Tempel 2 (1982d), and Kopff (1982k). Ephemerides are provided below for these objects; the listed projected magnitudes are total visual estimates. The magnitudes for P/Tempel 2 are from an unpublished study by Charles S. Morris, based on observations made by A.L.P.O. observers in 1967. The magnitudes for P/Tempel 1 and P/Kopff are both based on H(10) values (i.e., n = 4), with H = 10 and 8.5, respectively.

Mark this date on your calendar: Saturday, October 1, 1983. Steve Edberg informs us that this is the scheduled date for the second American Workshop on Cometary Astronomy, to be held at the Jet Propulsion Laboratory in Pasadena, California. The ICQ will sponsor this coming workshop, as it did the Workshop last May 1 here in Cambridge. Because of the enthusiastic response to the concept of the Workshop, it is likely that such meetings will be held on an annual basis for the next several years, with the interest in Halley's comet. Further information on the Pasadena Workshop will be published in the ICQ as it becomes available.

Listed below are the recently-announced (cf. MPC 7517) permanent designations for comets with perihelia in 1981.

--D.W.E.G. (2/17/83)

Ephemeris for Periodic Comet Kopff 1982k (Elements from MPC 7022)

ORBITAL ELEMENTS (equinox 1950.0; epoch 1983 Aug. 14)

T = 1983 Aug. 10.33901 ET

ω = 162.°81426	q = 1.5762734 AU
Ω = 120.30735	e = 0.5445433
i = 4.72448	P = 6.44 years

(Cont. on next page)

Ephemeris for Periodic Comet Kopff 1982k (Elements from MPC 7022)

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Mag.
1983	03 17	15 30.90	-11 44.1	1.407	2.108	121.8	12.5
1983	03 22	15 34.98	-11 41.2				
1983	03 27	15 38.54	-11 35.6	1.264	2.051	129.8	12.1
1983	04 01	15 41.52	-11 27.6				
1983	04 06	15 43.88	-11 17.2	1.135	1.995	138.2	11.8
1983	04 11	15 45.57	-11 04.6				
1983	04 16	15 46.54	-10 50.3	1.021	1.941	147.0	11.4
1983	04 21	15 46.80	-10 34.6				
1983	04 26	15 46.34	-10 18.2	0.924	1.889	156.2	11.1
1983	05 01	15 45.19	-10 01.7				
1983	05 06	15 43.40	-09 45.9	0.847	1.840	165.1	10.8
1983	05 11	15 41.05	-09 31.6				
1983	05 16	15 38.29	-09 19.9	0.788	1.793	170.1	10.5
1983	05 21	15 35.27	-09 11.9				
1983	05 26	15 32.20	-09 08.4	0.750	1.749	165.6	10.3
1983	05 31	15 29.27	-09 10.1				
1983	06 05	15 26.67	-09 17.8	0.730	1.710	156.6	10.1
1983	06 10	15 24.61	-09 31.9				
1983	06 15	15 23.25	-09 52.6	0.728	1.674	147.1	10.0
1983	06 20	15 22.77	-10 19.8				
1983	06 25	15 23.25	-10 53.3	0.739	1.644	138.3	10.0
1983	06 30	15 24.76	-11 32.4				
1983	07 05	15 27.33	-12 16.6	0.763	1.618	130.3	10.0
1983	07 10	15 30.99	-13 05.2				
1983	07 15	15 35.73	-13 57.4	0.796	1.599	123.3	10.0
1983	07 20	15 41.53	-14 52.3				
1983	07 25	15 48.35	-15 48.9	0.837	1.585	117.3	10.1

ROMAN NUMERAL DESIGNATIONS OF COMETS IN 1981.

The following tabulation continues that published in ICQ 4, 14. Comets 1981 I and XIII are sungrazing comets that were not given provisional designations, nor will they receive names.

Comet	T	Name	Year/letter	Ref.
1981 I	Jan. 27.1	(SOLWIND 2)		IAUC 3718
1981 II	Jan. 27.3	Panther	1980u	MPC 6519
1981 III	Jan. 29.9	P/Reinmuth 2	1980n	IAUC 3514
1981 IV	Feb. 20.0	P/Borrelly	1980i	IAUC 3494
1981 V	Mar. 6.3	Russell	1980l	MPC 5837
1981 VI	Mar. 17.0	P/Schwassmann-Wachmann 2	1979k	IAUC 3434
1981 VII	Mar. 25.7	Gonzalez	1981g	MPC 6889
1981 VIII	Apr. 11.1	P/West-Kohoutek-Ikemura	1980r	IAUC 3538
1981 IX	Apr. 17.0	P/Kohoutek	1980j	IAUC 3499
1981 X	May 4.4	P/Howell	1981k	MPC 6889
1981 XI	June 11.4	P/Bus	1981b	MPC 6194
1981 XII	June 20.0	P/Finlay	1981e	IAUC 3603
1981 XIII	July 20.3	(SOLWIND 3)		IAUC 3719
1981 XIV	July 30.8	Bus	1981d	MPC 6945
1981 XV	Aug. 18.2	Elias	1981c	IAUC 6889
1981 XVI	Oct. 21.8	P/Longmore	1981a	IAUC 3561
1981 XVII	Nov. 18.8	P/Gehrels 2	1981f	IAUC 3612
1981 XVIII	Nov. 19.0	P/Slaughter-Burnham	1981i	IAUC 3621
1981 XIX	Nov. 27.5	P/Swift-Gehrels	1981j	IAUC 3622
1981 XX	Nov. 30.4	P/Kearns-Kwee	1981h	IAUC 3618

Ephemeris for Periodic Comet Tempel 1 1982j (Elements from MPC 7022)

ORBITAL ELEMENTS (equinox 1950.0; epoch 1983 July 5)
T = 1983 July 9.79576 ET
ω = 179°.04240 q = 1.4911198 AU
Ω = 68.32777 e = 0.5208967
i = 10.55534 P = 5.49 years

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Mag.
1983	03 17	13 09.87	+14 18.5	0.914	1.864	155.2	12.5
1983	03 22	13 07.35	+14 49.2				
1983	03 27	13 04.11	+15 16.0	0.843	1.811	159.4	12.2
1983	04 01	13 00.28	+15 36.9				
1983	04 06	12 56.00	+15 50.0	0.791	1.760	158.2	11.9
1983	04 11	12 51.46	+15 53.6				
1983	04 16	12 46.92	+15 46.2	0.759	1.712	152.2	11.7
1983	04 21	12 42.62	+15 26.7				
1983	04 26	12 38.80	+14 54.8	0.745	1.667	144.0	11.6
1983	05 01	12 35.64	+14 10.6				
1983	05 06	12 33.31	+13 14.5	0.745	1.626	135.6	11.5
1983	05 11	12 31.93	+12 07.3				
1983	05 16	12 31.60	+10 49.9	0.756	1.590	127.6	11.4
1983	05 21	12 32.35	+09 23.5				
1983	05 26	12 34.19	+07 49.1	0.778	1.558	120.4	11.4
1983	05 31	12 37.09	+06 07.9				
1983	06 05	12 41.02	+04 21.1	0.806	1.532	114.1	11.4
1983	06 10	12 45.93	+02 29.4				
1983	06 15	12 51.78	+00 33.9	0.841	1.512	108.7	11.4
1983	06 20	12 58.53	-01 24.5				
1983	06 25	13 06.11	-03 25.0	0.881	1.499	104.1	11.5
1983	06 30	13 14.46	-05 26.6				
1983	07 05	13 23.55	-07 28.5	0.928	1.492	100.1	11.6
1983	07 10	13 33.34	-09 29.9				
1983	07 15	13 43.80	-11 30.0	0.980	1.492	96.7	11.7
1983	07 20	13 54.90	-13 28.0				
1983	07 25	14 06.58	-15 23.0	1.039	1.499	93.7	11.8
1983	07 30	14 18.81	-17 14.3				
1983	08 04	14 31.57	-19 01.1	1.105	1.513	91.0	12.0
1983	08 09	14 44.83	-20 42.8				
1983	08 14	14 58.56	-22 18.8	1.179	1.533	88.4	12.2
1983	08 19	15 12.71	-23 48.6				
1983	08 24	15 27.23	-25 11.5	1.260	1.559	86.0	12.4
1983	08 29	15 42.09	-26 27.1				

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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.

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Ephemeris for Periodic Comet Tempel 2 1982d (Elements from IAUC 3676)

ORBITAL ELEMENTS (equinox 1950.0; epoch 1983 May 26)
T = 1983 June 1.53554 ET
ω = 190.92197 q = 1.3814036 AU
Ω = 119.15789 e = 0.5448930
i = 12.43749 P = 5.29 years

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Mag.
1983	03 27	20 04.27	-13 36.4	1.679	1.551	65.2	14.0
1983	04 01	20 20.48	-13 08.9				
1983	04 06	20 36.87	-12 37.8	1.584	1.507	67.0	13.6
1983	04 11	20 53.43	-12 03.2				
1983	04 16	21 10.12	-11 25.5	1.500	1.468	68.6	13.3
1983	04 21	21 26.92	-10 45.0				
1983	04 26	21 43.79	-10 02.0	1.426	1.436	70.0	13.0
1983	05 01	22 00.71	-09 17.1				
1983	05 06	22 17.64	-08 30.6	1.362	1.411	71.3	12.7
1983	05 11	22 34.54	-07 43.2				
1983	05 16	22 51.36	-06 55.5	1.307	1.393	72.6	12.5
1983	05 21	23 08.06	-06 08.0				
1983	05 26	23 24.60	-05 21.4	1.262	1.383	74.0	11.7
1983	05 31	23 40.93	-04 36.1				
1983	06 05	23 57.02	-03 52.9	1.224	1.382	75.6	10.8
1983	06 10	00 12.81	-03 12.2				
1983	06 15	00 28.25	-02 34.6	1.193	1.389	77.5	9.8
1983	06 20	00 43.29	-02 00.5				
1983	06 25	00 57.90	-01 30.4	1.166	1.404	79.8	10.0
1983	06 30	01 12.03	-01 04.6				
1983	07 05	01 25.63	-00 43.4	1.142	1.427	82.6	10.1
1983	07 10	01 38.67	-00 27.0				
1983	07 15	01 51.07	-00 15.7	1.120	1.458	85.9	10.3
1983	07 20	02 02.82	-00 09.6				
1983	07 25	02 13.85	-00 08.7	1.098	1.494	89.9	10.6
1983	07 30	02 24.14	-00 13.0				
1983	08 04	02 33.63	-00 22.5	1.077	1.537	94.5	10.9
1983	08 09	02 42.27	-00 37.2				
1983	08 14	02 50.01	-00 57.0	1.054	1.584	100.0	11.1
1983	08 19	02 56.79	-01 21.5				
1983	08 24	03 02.58	-01 50.4	1.033	1.636	106.3	11.5
1983	08 29	03 07.34	-02 23.4				
1983	09 03	03 11.02	-02 59.9	1.013	1.690	113.5	11.8
1983	09 08	03 13.57	-03 39.5				
1983	09 13	03 14.97	-04 21.3	0.997	1.748	121.5	12.0
1983	09 18	03 15.22	-05 04.3				
1983	09 23	03 14.36	-05 47.4	0.989	1.807	130.2	12.5
1983	09 28	03 12.41	-06 29.3				

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NOTICE: With apologies to the contributing observers of Comet West observations, we hope to publish those in the next issue. The large volume of recent observations, which we prefer to work on promptly, has been the chief cause for the delay in publishing the older requested data. -- The Editors