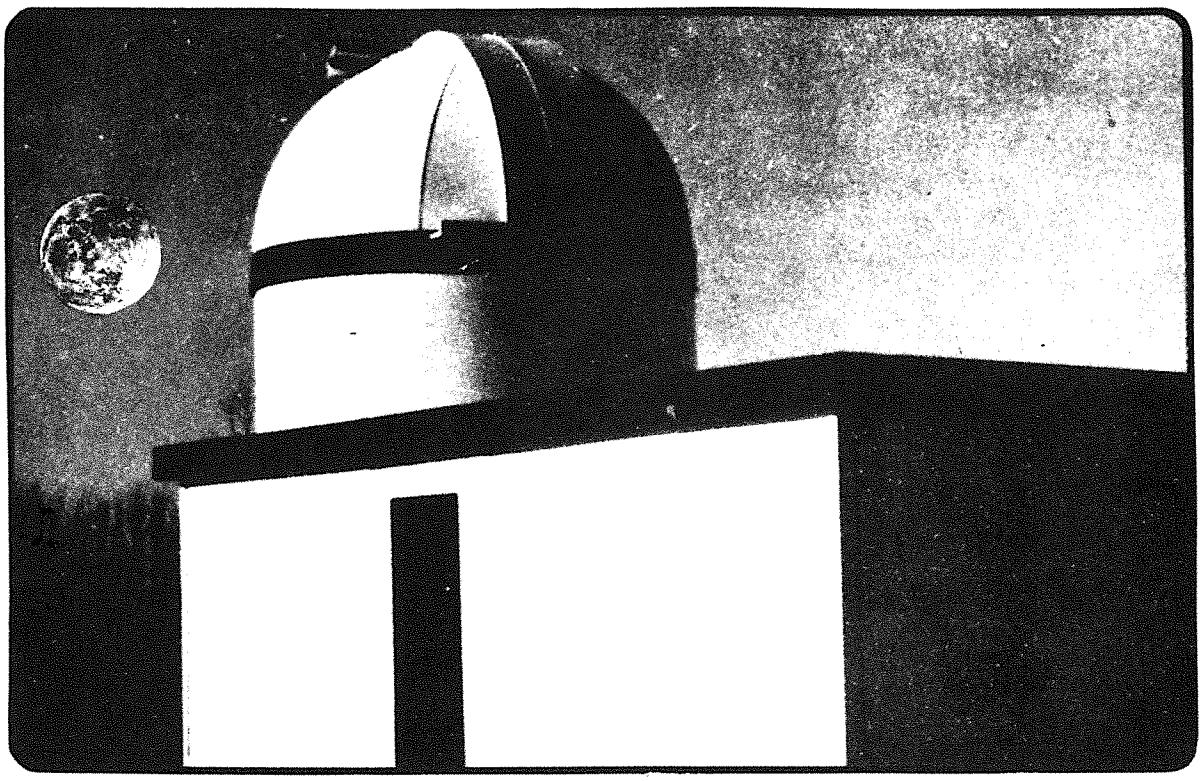

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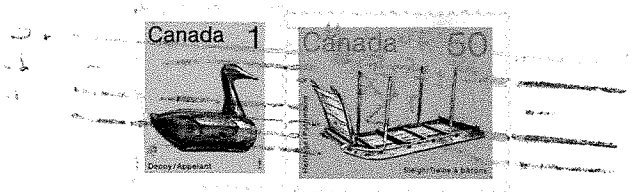

Mr. G. Westcott
2-825 Corydon Ave.
Winnipeg, Man.
R3M 0W6

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ADDRESS : .....

..... CODE : .....

PHONE : .....

Astronomical Interests : .....

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MEMBERSHIP SURVEY

EQUIPMENT

Telescope : Apeture _____ in/mm Type : _____
(S.C./Newtonian/Refractor)

Mount/Drive : _____ Camera : _____
(type) (yes/no)

OBSERVATIONAL INTERESTS (check)

Deep Sky _____ Planets _____ Lunar _____ Solar _____

Constellations _____ Meteors _____ Occultaions/Grazes _____

Variables _____

Other (please specify) _____

PHOTOGRAPHIC INTERESTS (check)

Wide field _____ Meteor _____ Aurora _____ Planetary _____

Solar _____ Lunar _____ Deep Sky _____ Comets _____

Other (please specify) _____

OTHER ACTIVITIES (please check)

Telescope building _____ Collection _____

Computer programs _____ Computer assisted devices _____

Photometry _____ Drawing _____

Other (please specify) _____

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SKY CALENDAR OCTOBER 1985

An aid to enjoying the changing sky

CURRENT SKY INFORMATION:
Call (517) 332-STAR

Use this scale to measure angular distances between objects on diagrams below.

0° 10° 20°

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
PLANETS AT DUSK: **Jupiter**, brightest evening object, is in SSE to S as sky darkens. **Saturn** is very low in SW to WSW, and disappears near month's end. **Evening diagrams** show sky ¾ hour after sunset.	**PLANETS AT DAWN:** **Venus** is brilliant "star" in E to ESE as sky brightens. **Mars** is faint, reddish, nearby; see diagrams. Planets 2° apart Oct 1, 0.4° apart Oct 4 & 5, 16° apart Oct 31. **Morning diagrams** show sky ¾ hour before sunup.	1 • Regulus Morning: ✶ Venus • Mars E ESE	2 • Regulus Morning: ✶ Venus • Mars E ESE	Mornings: 3 High SW to WSW Moon ○ Friday Oct 4 Aldebaran Pleiades Hyades Moon ○ Oct 3	Morning: 4 Face east. • Regulus Venus Venus-Mars within 4° apart this morning and tomorrow. Mars	Morning: 5 • Regulus Mars Venus
Morning: 6 • Regulus ✶ Mars Venus	Mornings: 7 High ESE to SE Castor • Pollux • Moon at Last Quarter Mon Oct 7 Moon Tues Oct 8	8 Using telescope, watch Jupiter's moons from 8:15 pm to 8:24 pm EDT. Europa, 2nd moon E of Jupiter, then fades by 2 mags and brightens again, as Io's shadow sweeps over it.	**Comet Halley** now 164 million miles from Earth and 207 million miles from Sun. On Oct 9-25, two hrs before sunup, there is little or no moonlight, and dark skies for viewing Halley! See box below.	Moon 10 • Regulus Morning: • Mars ✶ Venus	Morning: Regulus • 11 Moon • Mars ✶ Venus	Morning: 12 • Mars ✶ Venus Moon E ESE
Morning: Just 18 hr until New Moon from E Coast. 13 • Mars ✶ Venus Very old Moon (use binoculars) E ESE	14 New Moon 12:33 am EDT (9:33 pm PDT Oct 13). **Comet Halley** tomorrow morn: ½° N of 4.6-mag γ^2 Ori. Tomorrow night (Oct 15) about 7:45 pm PDT, Europa fades by 1.3 mag. Event similar to one listed Oct 8.	Evening: Moon, 15 42 hours old, is easy for naked eye. But look early, before it sets! Antares Saturn SW Young Moon WSW	Evening: 16 Antares Saturn Moon SW	Evening: 17 Moon Antares Saturn SW	Morning: 18 • Mars ✶ Venus E ESE	19 **Comet Halley** is 134 million miles from Earth and 195 million miles from Sun. Compare Oct 9. See box below.
Evenings: SSE to S 20 Jupiter ✶ Moon ○ Monday Oct 21 Moon at First Quarter ☽ Sunday Oct 20	21 Peak of Orionid meteor shower, associated with **Comet Halley.** Look in predawn darkness hours. Comet itself is ¾° N of the 4.4-mag star γ' Orionis. See Comet Halley notes below.	22 Gibbous Moon rises today about two hours before sunset. From northern U.S. Oct 22-30, Moon rises less than half an hour each day. West Coast viewers: Watch Europa 10:05 pm — 10:12 pm PDT. See Oct 8.	Morning: 23 Mars • ✶ Venus E ESE	24 Watch Moon rise farther north each evening through November 2nd.	25 Moon rises slightly south of due east just over an hour before sunset (as seen from latitude 40° N).	26 Moon rises just north of east within an hour before sunset.
Oct 27, morning: Mars • ✶ Venus E ESE	28 ○ Full Hunter's Moon. Exact time of opposition to Sun is 12:38 pm EST. Total lunar eclipse overhead in Indian Ocean, not visible in North America.	Evening: Can you 29 still see Saturn & Antares? Using binoculars, also try for Mercury. All are higher & easier from southern states. Antares Saturn SW Mercury • WSW	Oct 30, morning: can you see Spica yet? Try with binoculars. Mars • ✶ Venus E Spica • ESE	Mornings: 31 Face west. Aldebaran Moon ○ Thurs Oct 31 Hyades Pleiades Moon ○ Wed Oct 30	**COMET HALLEY,** speeding rapidly toward Earth and Sun, attains top speed toward Earth—35 mi/sec—on Oct 4. Halley's motion against stars increases from less than 0.1° WNW per day Oct 1 to nearly 0.9° W per day Oct 31. See Oct 9, 14, 19, 21. It rises in evening, but is highest in dark sky just before morning twilight begins. At 10th mag in mid-Oct, it is within easy reach of 3-4 inch diam telescope. Use low power! By mid-Nov Halley will be up all night and may be within reach of binoculars. Keep posted with Halley **info sheets,** mailed to all direct subscribers to ***Sky Calendar;*** subscription address below.	

Magnitudes: Venus −3.9; Jupiter −2.6 to −2.3; Mercury (late Oct) −0.2; Saturn +0.6 to +0.5; Mars +1.8. Comet Halley 11 to 9. **Motions:** The **Sun** goes 31° E, crossing from Virgo into Libra Oct 30. **Mercury** passes 4° S of Saturn Oct 29, but event is too low in eve twilight to be seen from N states. **Venus** goes 38° E, crossing from Leo into Virgo Oct 10. On Oct 4 & 5 Venus appears within 0.4° of Mars. By Oct 31 Venus has moved to 16° E (lower left) of Mars. **Mars** goes 19° E, crossing from Leo into Virgo Oct 16. See Venus. **Jupiter** ends retrograde and turns eastward on Oct 3. Jupiter is then 6½° W of 4th-mag Theta Capricorni, and will closely pass that star in early December. **Saturn** goes E about 0.1° per day in Libra. At midmonth Saturn is 7° W of Beta Scorpii and 15° from Antares. **Comet Halley** goes 12° W in Oct, crossing from Orion into Taurus Oct 23. See Oct 14, 21. On Oct 28 Halley passes 0.4° N of Zeta Tauri (Bull's southern horn), but full moonlight interferes with view.

Robert C. Victor, Jenny L. Pon, Robert D. Miller

Subscription: $5.00 per year, from ***Sky Calendar,*** Abrams Planetarium, Michigan State University, East Lansing, Michigan 48824.
ISSN 0733-6314

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SKY CALENDAR SEPTEMBER 1985

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0° 10° 20°

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Morning: 1 Venus Mercury Mars E	Morning: 2 Venus Mercury Mars Regulus E	Morning: 3 On what date will you first see Regulus? Venus (Binoculars show Beehive 1½° to north.) Mars Mercury Regulus E	Morning: 4 Venus (Mercury-Mars 0.5° apart) Mars Mercury Regulus E	Morning: 5 Venus (Mercury-Mars 0.6° apart) Mercury Mars Regulus E	Sept 6 morning: Mercury 0.9° N of Regulus. Venus Mars Mercury Regulus E Sept 7 Last Qtr Aldebaran Pleiades Sept 6 high in S	7 Venus Mars Regulus Mercury E
Morning: 8 Venus Mars Regulus Mercury E	Morning: 9 Mars 0.7° N of Regulus. Venus Mars Regulus Mercury E	High east: 10 Castor Pollux Moon Venus Mars Regulus Mercury E	Morning: 11 Venus Mars Regulus Mercury E	Morning 12 Moon Venus Regulus Mars Mercury E	Morning: 13 Wait a bit for Mercury rising 9° below Moon. Binoculars help. Venus Old Moon Regulus Mars **Eclipse** in eve; See below. E	14 New Moon 3:20 pm EDT (12:20 pm PDT). Comet Halley now 2.55 a.u. (237 million miles) from Earth and Sun. See note below.
Evening: Moon sets early in bright twilight from northern states and probably won't be seen. Try with binoculars; better from southern states. 15 Young Moon setting WSW Spica W	Evening: 16 Using binoculars, look for Spica 3° below Moon; higher and easier from southern states. Moon WSW Spica W	Evening: 17 Head of Scorpius Saturn Beta Lib Alpha Lib Moon SW	Evening: 18 Antares Saturn Moon Io fades 0.5 mag 10:15 pm EDT. See Feb '85 *S & T*, p 116. SW	Evening: 19 Moon Saturn Antares SW	Morning: 20 Venus Regulus Mars Europa fades 2 mags 11:03 pm PDT. See Feb '85 *S & T*, p 116. E	Morning: 21 Venus 0.6° from Regulus. Venus Regulus Mars Evening: First Quarter E
Sept 22, Morning: Regulus Venus Mars Autumn begins; Mercury beyond Sun. E	Evening: 23 Jupiter Moon SSE	Evening: 24 Jupiter Moon At 10:08 pm PDT, shadow of Ganymede falls on center of Callisto, causing latter to fade by 1.4 mags. Using telescope, watch Jupiter's outermost moon for 10 min before and after. SSE	25 Io emerges from Jupiter's shadow around 8:52 pm PDT. Look just E of planet's disk. Io skims through Ganymede's shadow around 10:00 pm PDT and fades by 1 mag. Watch Io for 4 min before and after. (Ganymede is then in transit, in front of Jupiter's disk.)	Sept 26, morning: Regulus Venus Mars Venus-Mars within 5° Sept 26-Oct 12. E	27 On Sept 30 at 7:28 pm EDT, shadow of Callisto falls on center of Ganymede, causing latter to fade by 0.8 mag. Watch moon farthest east of Jupiter for 8 min before and after. Visible from New England.	28 Harvest Moon rises in twilight tonight and next three nights. Watch it rise farther north each night.

Eclipse of one of Jupiter's moons by another takes place **Sept 13,** 11:15 pm to 11:29 pm EDT, when shadow of Io falls upon Europa. At deepest phase of this partial eclipse, at 11:22 pm EDT, Europa will fade by 1.4 mags. Visible across most of continental U.S., the dimming and brightening will be easily noted in small telescopes; watch middle one of 3 moons E of planet. Similar events are visible in parts of U.S. on the evenings of Sept 6, 18, 20, 24, 25, and 30. For details, see Feb '85 ***Sky & Telescope***, p 116.

Diagrams on this calendar show sky in middle of twilight at dusk or dawn, about ¾ hour after sunset or ¾ hour before sunrise.

EVENING PLANETS: **Jupiter** is brightest "star" at dusk, in SE to SSE. It passes due S at 11 pm local daylight time on Sept 1 and ½ hour earlier each week. **Saturn,** in SW at dusk, sets as Jupiter approaches S.

MORNING PLANETS: Brilliant **Venus** rises more than 2 hours before sunup and is well up in E at dawn. Faint **Mars** gets higher each day, while brighter **Mercury** drops back into sun's glare in 2nd week. See Sept 1-13, 20-22, 26.

COMET HALLEY, high in predawn darkness, is expected to brighten to mag 12 by mid-Sept, within easy reach of 6-inch diameter telescopes. Best time to look: about 2 hours before sunrise. On Sept 11 Halley is 21' due N of the 5th-mag star 71 Orionis. Comet is then moving 3' per day east and 1' per day north. On Sept 21 Comet slows to a turning point 0.6° NNE of 71 Ori and begins to move westward. **Info sheets** on Halley as it brightens in coming months will be sent to all direct ***Sky Calendar*** subscribers; subscription address below.

Magnitudes: Venus −4.2 to −3.9; Jupiter −2.7 to −2.6; Mercury (Sept 1-13) −0.6 to −1.4; Saturn +0.6; Mars +1.8. **Motions:** The **Sun** goes 29° E, crossing from Leo into Virgo Sept 16 and S across the equator Sept 22. **Mercury** opens Sept 17° W of the Sun in the eastern morn sky. Mercury increases its speed through Leo from 1.4° per day on the 1st to 1.9° per day on the 12th, and passes close to Mars and Regulus (see diagrams). Dropping into Sun's glare, Mercury passes superior conjunction (beyond Sun) on the 22nd. **Venus** goes 36° E, crossing from Cancer into Leo Sept 11. See Sept 3, 21, 26. **Mars** goes 19° E in Leo, while increasing its distance W of Sun from 14° to 24°. Mars is overtaken by Mercury Sept 4-5, passes Regulus Sept 9, and will be overtaken by Venus Oct 4-5. **Jupiter** retrogrades (goes W) 1.6°, increasing its dist W of 4th-mag Theta Capricorni to 6½°. **Saturn** goes 2.3° E in Libra; on Sept 19th it is equidistant from Alpha Librae and Beta Scorpii, 9° from each. **Uranus** goes 0.6° E in Ophiuchus, ending month equidistant from Antares and 3rd-mag Theta Oph, 7° from each. See finder on p 341 of April ***Sky & Telescope.***

Robert C. Victor, Jenny L. Pon, Robert D. Miller

Subscription: $5.00 per year, from *Sky Calendar*, Abrams Planetarium, Michigan State University, East Lansing, Michigan 48824.
ISSN [illegible]

List equipment planned for use in photography not already listed as a telescope. This can include Schmidt or aerial cameras or interchangeable lenses belonging to your photographic system.

Camera	Focal Length	f/ratio	Notes

Photometric Equipment:

Photomultiplier Tube _____ Cooled ____ Uncooled ____

Electronics: Photon Counting _____ Analog _____

Miscellaneous Accessories:

Diffraction Grating Source or Manufacturer _____

_____ gr/mm, blaze order _____

Prism: Glass Type _____ Apex Angle _____

Rotating Meteor Shutter Chop Rate _____

I understand that the data I contribute to the International Halley Watch may be used by IHW Archive users and that my contribution will be acknowledged in the usual manner in any publications resulting from such use. I understand that I may also publish my data in any manner I choose.

_____
Signature Date

	Novice	Moderate	Expert
Level of Observational Experience			
General Astronomical Observations			
Comet Observations			
Meteor Observations			

Are you planning on traveling to the southern hemisphere to observe Halley's Comet in March or April 1986? Yes ___ No___

Additional Comments:

OBSERVER INDEX

Please tear out this form and fill it in as completely as possible if you plan to submit observations to the IHW. Also fill in the duplicate in Part II for your own records. It is important to read Sections 2 and 4 and the section describing your area of participation in Part I of this manual before submitting this index form. Return this form to Stephen Edberg (Jet Propulsion Laboratory, 4800 Oak Grove Dr., T-1166, Pasadena, California 91109, USA).

Name (Last, First) _____ Telephone:

Mailing Address _____ Day _____
area code + number

_____

_____ Night _____
area code + number

_____

Areas of Participation: (check all that apply)

___ Visual Observations
___ Photography
___ Astrometry
___ Spectroscopic Observations
___ Photoelectric Photometry
___ Meteor Studies

List Regular Observation Site(s). Longitude, latitude, and altitude may be determined using topographic maps.

Name	Longitude	Latitude	Altitude
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Provide the information requested on telescopes you expect to use including the units of measurement. Indicate the site numbers (from the list above) where the telescope has a permanent mount or where a portable mount is regularly used for visual (V), photographic (PG), and/or photoelectric (PE) observing. Binoculars users should state the power and aperture (e.g., 7x50) with the word binoculars under telescope type and skip the next two columns. Meteor observers should write meteor and visual, photographic, or radio under telescope type and give the site numbers where these observations are usually made.

Telescope Type	Aperture	Focal Length	Mounting Site # Perm.	Port.	Observing V	PG	PE
_____	_____	_____	____	____	___	___	___
_____	_____	_____	____	____	___	___	___
_____	_____	_____	____	____	___	___	___
_____	_____	_____	____	____	___	___	___

Table 1. Ground-Based Observing Data, Comet Halley 1985–1986.

Date(1985)	Dark Hours North 45°	Dark Hours Lat. 30°	Dark Hours South 30°	Dark Hours Lat. 45°	Apparent Magnitudes M_1	Apparent Magnitudes M_2
Jan. 1	11.6	10.9	6.8	3.5		17.9
11	10.7	10.0	6.9	3.9		17.8
21	9.7	9.1	7.2	4.6		17.7
31	8.7	8.1	5.6	5.3		17.7
Feb. 10	7.7	7.2	5.0	3.7		17.6
20	6.8	6.4	4.4	3.3		17.6
Mar. 2	5.8	5.5	3.9	2.9		17.5
12	4.9	4.7	3.4	2.5		17.5
22	4.0	4.0	2.9	2.1		17.4
Apr. 1	3.2	3.2	2.4	1.8		17.4
11	2.3	2.5	1.9	1.4		17.3
21	1.4	1.7	1.5	1.0		17.2
May 1	0.5	1.0	1.0	0.6		17.1
11	0	0.3	0.5	0.2		17.0
21	0	0	0	0		16.8
31	0	0	0	0		16.7
June 10	0	0	0	0		16.5
20	0	0	0	0		16.3
30	0	0	0	0		16.1
July 10	0	0	0.3	0.1		15.9
20	0	0.5	0.8	0.5	14.8	15.7
30	0.5	1.2	1.3	0.9	14.4	15.4
Aug. 9	1.4	1.9	1.7	1.3	14.1	15.1
19	2.3	2.6	2.1	1.6	13.7	14.7
29	3.2	3.3	2.5	1.9	13.2	14.4
Sept. 8	4.1	4.0	2.9	2.2	12.7	13.9
18	5.0	4.8	3.3	2.5	12.2	13.5
28	5.9	5.6	3.8	2.8	11.6	12.9
Oct. 8	6.9	6.4	4.3	3.1	10.9	12.3
18	8.0	7.3	4.9	3.5	10.1	11.6
28	9.2	8.5	5.7	4.1	9.3	10.8
Nov. 7	10.7	10.0	6.8	5.0	8.3	10.0
17	11.1	10.6	7.3	4.9	7.2	9.0
27	10.6	9.8	7.0	4.2	6.4	8.4
Dec. 7	7.7	7.1	4.4	3.6	6.1	8.1
17	5.5	5.1	2.8	1.0	5.9	8.1
27	3.9	3.6	1.5	0	5.6	8.0

Date(1986)	Dark Hours North 45°	Dark Hours Lat. 30°	Dark Hours South 30°	Dark Hours Lat. 45°	Apparent Magnitudes M_1	Apparent Magnitudes M_2
Jan. 6	2.6	2.3	0.5	0	5.1	7.7
16	1.3	1.1	0	0	4.4	7.2
26	0	0	0	0	3.6	6.7
Feb. 5	0	0	0	0	3.0	6.2
15	0	0	0	0	3.1	6.2
25	0	0.3	0.7	0.5	4.3	6.4
Mar. 7	0.2	0.9	2.0	2.0	5.0	6.8
17	0.5	1.5	3.3	3.7	4.8	7.0
27	0.7	2.3	5.3	6.2	4.3	6.9
Apr. 6	0	3.8	9.1	9.4	4.0	6.7
16	6.0	8.3	10.0	9.9	4.4	7.2
26	6.2	8.0	9.2	10.0	5.5	8.5
May 6	5.5	5.1	7.7	8.3	6.5	9.7
16	2.7	4.3	6.7	7.3	7.3	10.7
26	1.9	3.5	6.0	6.5	7.8	11.4
June 5	1.0	2.8	5.3	5.8	8.3	12.2
15	0.2	2.1	4.6	5.1	8.8	12.8
25	0	1.5	4.0	4.5	9.3	13.3
July 5	0	0.9	3.4	3.9	9.8	13.8
15	0	0.4	2.7	3.2	10.3	14.2
25	0	0	2.1	2.5	10.8	14.6
Aug. 4	0	0	1.5	1.9	11.3	14.9
14	0	0	0.9	1.2	11.8	15.2
24	0	0	0.3	0.5	12.3	15.5
Sept. 3	0	0	0	0	12.7	15.7
13	0	0	0	0	13.1	16.0
23	0	0	0	0	13.4	16.2
Oct. 3	0	0	0	0	13.6	16.3
13	0	0.1	0.4	0	13.8	16.5
23	0.4	0.8	0.8	0.4	13.9	16.6
Nov. 2	1.2	1.5	1.2	0.7	14.0	16.8
12	2.0	2.2	1.7	1.0	14.1	16.9
22	2.7	2.8	2.3	1.4	14.1	16.9

Note: (1) For a particular observer's latitude, the number of dark hours is defined as the time interval during which the sun is below the local horizon by at least 18 degrees and the comet is simultaneously above the local horizon.

(2) Magnitude estimates are based upon the comet's observed behavior in 1909-10. Predictions are for ideal observing conditions.

Reprinted from "THE COMET HALLEY HANDBOOK" by Donald K. Yoemans.

Limiting Visual and photographic magnitudes for point light sources of Different telescope apetures. For Comets (diffused light sources) these limits are somewhat less.

APETURE inchs	APETURE mm	MAGNITUDE VISUAL	MAGNITUDE PHOTOGRAPHIC	APETURE inchs	APETURE mm	MAGNITUDE VISUAL	MAGNITUDE PHOTOGRAPHIC
2.4	60	10.5	14.5	8.0	200	13.3	17.4
4.5	115	11.8	16.2	10.0	250	13.8	17.7
6.0	150	12.7	17.0	14.0	355	15.0	18.2

Photographic values are for an f/5 system

The two shaded areas are to indicate the viewing restrictions for persons observing from the Northern Hemisphere. The lower shading indicates TUSCON'S (Arizona) horizon while the higher shading indicates WINNIPEG'S horizon.
Taken from "THE COMET HALLEY HANDBOOK" by Donald K. Yoemans.

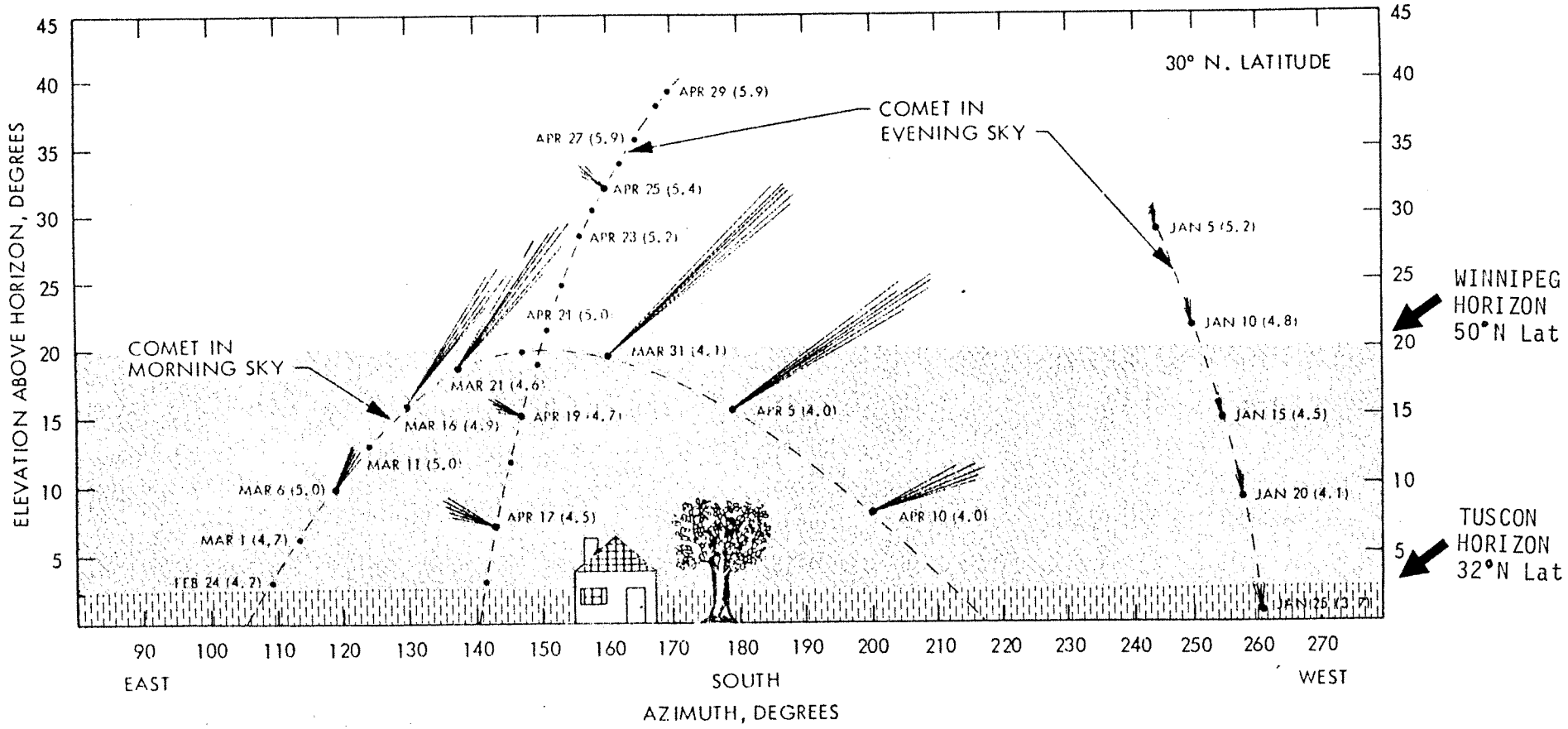

Fig. 10. Comet Halley Observing Conditions In 1986 for Observers Located at 30° North Latitude. Comet Positions are Given for Beginning of Morning Astronomical Twilight or End of Evening Astronomical Twilight. Approximate Total Visual Magnitudes are Given in Parentheses Following Dates. Viewing with Binoculars and Ideal Observing Conditions are Assumed.

than two hours if sky conditions are excellent as it moves obliquely down and to the right, toward the horizon. This interval decreases 7 minutes each day until, by the end of the month, the comet is near the horizon before the sky is really dark. During the first week of January look 30° above the horizon slightly north of southwest (100 minutes after sunset) but by the 15th the comet is lower and further west, only 15° above the horizon and 25° south of due west. Moonlight prevents the sky from becoming truly dark for the rest of the month. By the 25th the comet is just above the horizon, only 10° south of west and it is necessary to attempt observations earlier, when the sky is still relatively bright. During the entire month a short tail may be visible rising nearly vertically above the head of the comet, for those observers with a good dark sky.

February 1986. Halley's Comet passes perihelion, its closest point to the sun, on February 9, at a distance of 88 million km. About three days before perihelion the comet passes north of the sun as seen from Earth, from east to west, so it begins to rise before the sun. Once it is sufficiently far ahead of the sun it is observed as a morning object. By the end of the month it may just be detected with difficulty, in a moonlit sky, 25° or 30° south of east from 80 to 90 minutes before sunrise, but only in southern parts of Canada.

March 1986. The comet is visible low in the southeast before sunrise but our northern latitude is a severe problem. The moon may interfere before the 6th and again after the 22nd. Between these dates one might start looking near the horizon, somewhat north of southeast as early as two hours before sunrise. The tail rises before the comet head, slanting up and to the right, and the comet moves in this same direction as twilight progresses. The improved elevation of the comet above the horizon is gradually counteracted by the brightening sky and the best compromise may be 80 or 90 minutes before sunrise. North of latitude 49° the sky is not truly dark even at this time. In a dark sky there should be a straight bluish plasma tail toward the upper right with a whitish component due to dust, curving off to the left. As usual, binoculars add to the amount of detail to be seen.

April 1986. On April 11, Halley's Comet is 63 million km from Earth, its closest approach to us during this apparition and it is near its brightest. Unfortunately, it is deep in the southern sky and is invisible from Canada. Very early in the month the comet rises south of southeast and might still be seen in southern Canada before sunrise (but in moonlight). Moving rapidly from day to day against the background of stars, the comet reappears (in southern Canada) about the 14th or 15th, visible very low in the south from 4 to 6 hours after sunset, with a short tail stretching horizontally toward the east. From night to night it appears earlier and higher in the southern sky but moonlight is a problem until the 26th when the comet should be 10° to 20° above the southern horizon for most Canadians after dark and before moonrise. The comet fades rapidly this month and binoculars again become a necessity.

May 1986. The comet is positioned in the southwest evening sky but it is now out beyond Mars and about as faint as during November of 1985.

There is perhaps no single answer to the question, "When is the best time to look for Halley's Comet from Canada?" One possible answer is January 10 to 15, 1986 with the comet in the evening sky just before twilight, but it will be faint. March 15 to 22 may be the best time to look for the tail, in the morning sky before sunrise. This is much better for Canadians south of latitude 45° than for those living north of 50°. Soon after mid-April the comet is nicely located in the evening sky but it fades quickly and there is much bright moonlight. Many observers will try all these times and reach their own conclusions.

Local media sources will provide further information during the apparition.

Available through the cooperation of:

The Royal Astronomical Society of Canada
The Herzberg Institute of Astrophysics, National Research Council Canada
The National Museum of Science and Technology

April 1985

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National Research Council Canada | Conseil national de recherches Canada

Canada

HALLEY'S COMET

Bulletin No. 4

Although Halley's Comet has a reputation as a spectacular sight, the relative positions of the comet and the Earth in 1985 and 1986 are generally unfavorable and observers will have to plan with some care in order to see the comet clearly. This bulletin is intended to help Canadian observers with these plans. Most Canadians live between latitudes of 42° and 54°, so the visibility of the comet from this zone will be our primary concern. During March and early April of 1986 the comet will be at its best, but one would have to travel at least to the southern United States, and preferably to the southern hemisphere, to see it well during this interval. One compensation for the poor geometry is the fact that we can expect to see the comet both before and after its passage near the sun, so the comet might be observed with binoculars for six months, except when it is too close to the sun or too far south to be seen from Canada.

The visibility of the comet, especially its faint tail, depends on several factors. It will be important to find a location with a dark sky, not affected by bright city lights or haze. It will be difficult to observe the tail of the comet if there is bright moonlight or when the comet is so close to the sun that it is seen low in the sky in conditions of twilight. At times it should be quite possible to see Halley's Comet from Canada with the unaided eye, but the use of binoculars will greatly improve the amount of detail seen and lengthen the period when the comet can be observed. Some Canadians will have access to small telescopes which offer improved performance over binoculars.

Before attempting to locate Halley's Comet in the sky from the description given below for each month of interest, the reader may benefit by studying the following notes.

1. Locate the north, east, south and west points on the horizon, using a compass or the North Star (Polaris) as a starting point.

2. Local times for sunrise and sunset are given in newspapers and on radio stations in most cities. Use these times and the comments in the bulletin to determine the best times to see the comet near morning or evening twilight.

3. To estimate angles in the sky it is convenient to use the separation of the two "pointers" in the bowl of the Big Dipper as a scale of 5°. For larger angles, the separation from tip of the thumb to tip of the little finger, when fully stretched and held at arm's length in front of the eyes, is about 20°.

November 1985. Early in the month, Halley's Comet is almost twice as far from the sun as is the Earth and at least a small telescope may be required. At a typical Canadian latitude it passes about 60° above the southern horizon (two-thirds of the way from horizon to the overhead point) some 2 or 3 hours after midnight at the first of the month and near the same spot at midnight by mid-month. On the night of the 16th the comet passes only 2° below (south of) the Pleiades, a well known cluster of bright stars. The crescent moon sets early in the evening and the comet should be visible with binoculars as a fuzzy object without any prominent tail. On November 21 the Earth crosses through the orbit plane of the comet and on the 27th we are closer to the comet (93 million km) than at any other time before the comet's closest approach to the sun.

December 1985. Using binoculars, it should become relatively easy to see Halley's Comet this month. On the evening of the 6th it is 5° below the left side of the Great Square of Pegasus, somewhat more than half way from the southern horizon to the overhead point about 2-1/2 hours after sunset. The moon interferes from the 16th until the 29th or 30th, when it will be dark enough to see the comet briefly before moonrise. To find the comet at this time, wait about 100 minutes after sunset for the sky to darken sufficiently (90 minutes may be enough for those south of latitude 45°) and the comet is then 30 to 35° above the horizon in the southwest. At the end of the year Halley's Comet is very nearly at our distance from the sun but it is more than that distance away from us, as it starts to loop around behind the sun as seen from Earth.

January 1986. The comet brightens steadily this month but it also moves closer to the sun in the sky, so it is seen close to the twilight sky. There is only a short time each evening when the sky is dark enough and the comet is still high enough above the horizon to be seen. Observers will have to plan to make use of this short interval. As in December, the sky is dark enough to expect to see the comet 100 minutes after sunset and the positions given here are for that time. Early in the month it might be followed for more

.../7

HALLEY'S VISIBILITY FROM CANADA

Aug. 13-22, 1985	Halley visible in largest amateur telescopes
Aug. 23-Sep. 11	Moonlight interferes
Sep. 12-19	More easily seen in large amateur scopes
Sep. 20-Oct. 8	Moonlight interferes
Oct. 8-18	Most amateur telescopes should reveal Halley
Oct. 19-Nov. 2	Moonlight interferes
Nov. 3-18	Halley easily seen in telescopes (evening sky); should be visible in binoculars
Nov. 19-30	Moonlight interferes
Dec. 1-15	Easy binocular object; may be visible to naked eye (evening sky)
Dec. 16-28	Moonlight interferes
Dec. 29-Jan. 14	Easy binocular object in southwest (evening sky); should be readily seen by naked eye in dark sky; noticeable tail
Jan. 15-25	Although brightening, Halley moves toward the west horizon; moonlight a problem also; use binoculars (early evening)
Jan. 26-Mar. 6	Comet lost in solar glare
Mar. 7-22	The comet should be visible to the naked eye low in the southeast about 90 minutes before sunrise. Tail will point up and to the right. Binoculars help. Best views will be from extreme southern Canada. Comet will be very close to horizon and more affected by twilight glow north of lat. 49.
Mar. 23-Apr. 5	Halley still in morning sky but almost on horizon; moon interferes too. Difficult to see from extreme southern Canada; impossible elsewhere in the country.
Apr. 6-12	Prime period for southern hemisphere observation; bright tail possibly 10 degrees long
Apr. 18-26	In evening sky from Canada, but moon interferes; brightness falling
Apr. 27-May 22	Comet is binocular object (possibly naked-eye) in south in evening sky from Canada; still noticeable tail

THIS FALL'S METEOR SHOWERS

OCTOBER 9 - DRACONIDS

Unlike the Piscid meteors in October, the Draconids shower is of short duration, lasting only from October 7 through October 10. In any year when the Earth passes through the centre of this meteoric cloud, the numbers seen can be astonishing high. The main group of debris particles is still located direct behind the parent comet (Comet Giacobini-Zinner), so the years in which the comet passes close to the Earth's orbit are also good yearsfor sighting Draconid meteors. In 1933, for example, 30,000 meteors per hour were seen when the Earth encountered the centre of the swarm. In 1946 when the comet passed the Earth's orbit only 15 days prior 1000 per hour were seen. In any given year when the comet is even reasonably close, as many as 200 to 500 per hour can be expected.

The Draconid radiant is up any time, day or night, and the shower can occur during the daylight hours. You should go out as soon as possible after evening twilight ends and begin observing in a reclining position, feet pointed north, and eyes concentrated directly overhead. The actual hour of the greatest number of meteors to be seen, is uncertain, so the longer and more diligant you observe, the better your chances o9f seeing a great number of meteors. Position of Radiant) RA 17h 28m: Dec +54.
See below article on Comet G-Z - Editor

OCTOBER 20 - ORIONIDS

One of the best meteor showers to occur each year, the Orionids begin on October 2 and last until November 7. The radiant is positioned in the prominent constellation of Orion, near his club, rising about 9:30 local time. Conviently, the radiant will be just south of directly overhead when most meteors are expected - 5:00 a.m. in the morning. These also are very fast Meteors, entering the Earth's atmosphere at 67 kps. Like many other meteor showers the Orionids have as their origin the famous Halley's Comet. You can expect to see about 30 meteors per hour in dark skies. However, since most of the meteors are faint and are moving fast, only the observer dedicatedly watching the skies will see a great number. Orionid meteors present many varied colors; about one out of five leaves a smokey trail that can persist for as long as 2 seconds after the meteor vanishes.
Position of Radiant) RA 06h 20m; Dec +15.

Giacobini-Zinner Visible in Small Telescopes

Giacobini-Zinner 1984e, a moderately faint periodic comet, will be well placed for the next several months for viewing in moderate and small size telescopes. It is of interest for several reasons beyond its visibility. It will be the first comet to be intercepted by a spacecraft, the International Cometary Explorer (ICE), which will pass through the tail some 10,000 km from the nucleus on Sept. 11. The craft, formerly called the Third International Sun-Earth Explorer (ISEE-3), was launched in August, 1978 to study the interaction of the earth's magnetosphere with the solar wind, but was diverted in 1983 toward the comet in a complex series of maneuvers which used the moon as a gravitational "slingshot." After the Giacobini-Zinner encounter, ICE will be lying between Comet Halley and the sun between November 1985 and March 1986, and thus will serve as an "upstream" monitor of solar wind activity.

Secondly, Giacobini-Zinner is the parent comet of the Giacobinid (or Draconid) meteor stream, which in 1933 and 1946 produced spectacular meteor storms. When the earth passes 0.0329 AU from the comet's descending node only 26.5 days after the comet on Oct. 8.55 UT, there may be the small possibility of a spectacular meteor shower; but according to Dr. Donald Yeomans (The Comet Giacobini-Zinner Handbook, 1985), the meteor stream does not appear to be as wide as this separation distance. "Hence," he writes, "while the Giacobinid meteor shower is worth looking for in 1985, the activity may turn out to be modest or non-existent."

Recent orbit elements by Yeomans (IHW Astrometry Network Newsletter, May, 1985) give T = 1985 Sept. 5.2058 ET, $\omega = 172^{\circ}4856$, $\Omega = 194^{\circ}7060$, $i = 31^{\circ}8784$, $q = 1.208255$ AU, and $e = 0.707518$. Tne ephemeris from that publication is extracted for five-day intervals:

1985 UT	R.A. (1950)	Dec.	Δ	r	m_1
July 28.0	0^h44^m50	$+59^{\circ}37'8$	0.63	1.16	8.9
Aug. 3.0	1 26.81	59 39.3	0.60	1.13	8.7
8.0	2 11.33	58 38.3	0.57	1.10	8.6
13.0	2 55.42	56 26.1	0.54	1.08	8.4
18.0	3 36.58	52 59.6	0.51	1.06	8.3
23.0	4 13.29	48 22.8	0.49	1.05	8.2
28.0	4 45.11	42 45.4	0.48	1.03	8.1
Sep. 2.0	5 12.34	36 21.8	0.47	1.03	8.0
7.0	5 35.57	29 31.0	0.47	1.03	8.1
12.0	5 55.45	22 27.5	0.47	1.03	8.2
17.0	6 12.51	15 31.9	0.48	1.04	8.3
22.0	6 27.21	8 55.8	0.50	1.06	8.4
27.0	6 39.87	2 47.5	0.52	1.07	8.6

COMET NEWS SERVICE is a quarterly review of cometary news and research, with additional timely special issues for newly-discovered bright comets. Operating revenues derive from subscription fees and from the St. Louis Science Center. All material not otherwise bylined is by the Editor, who is responsible for the content. Editorial correspondence ONLY (letters, manuscripts, observations, photographs) should be sent directly to the Editor, 6805 "A" Plaza, No. 51, Omaha, NE 68106, USA (TELEPHONE 402-397-6197 eve.; -449-4959 day). *Copyright (C) 1985 St. Louis Science Center.*

Editor . . . . . Joseph N. Marcus (Omaha)
Circulation . . . . Marie D. Oleson (Truckee, CA)
Publisher . . . . . St. Louis Science Center

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Make checks or money orders payable to COMET NEWS SERVICE and mail to CNS, P.O. Box TDR No. 92, Truckee, CA 95734 (TELEPHONE 702-851-4151). INTERNATIONAL SUBSCRIBERS: Send bank draft drawn on a U.S. bank payable in U.S. currency — contact your local bank for assistance. Expiry date is indicated in upper right of address label. To avoid lapse, renew at least one month in advance. Rates:

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MANITOBA FREE PRESS,
WINNIPEG WEDNESDAY,
MAY 25, 1910.

CAUGHT ONLY GLIMPSE OF COMET

Was Visible to Winnipeggers Last Night Before Setting—May be Viewed Tonight.

Halley's comet should have been visible for three hours last night, but owing to a persistent cloud, was not favorably seen in the city, the cloud obscuring it until almost the time of its setting, which was 11 20.

The comet, when seen in the early part of the evening, was well up in the sky and not far from the star Regulus, and was travelling in a south-western direction. It set about 25 degrees south of the setting point of the sun at this date. This evening, should the western horizon be free from clouds, the comet will be seen to good advantage from 9 o'clock to midnight.

VIEWED COMET AT GRETNA.

Was Plainly Visible During Eclipse of Moo. -Saw the Tail

CENTRE NOTES *by Stan Runge*

THIS ISSUE ... is considered the SPECIAL COMET HALLEY EDITION. I've attempted to collect a few articles of interest and benefit to the members, and place them in one complete package. With the major magazines going full-forward with Halley articles, I hope we won't need anymore here.

The next issue of WINNICENTRICS will be an Observers Edition. Members are asked to send in articles on all of the various aspects of observing. This covers a wide range of topics for writing about.

Possible Trip - Allan Rahill was mentioning an interest in arranging an ASTRONOMY TRIP by bus up to Riding Mountain Park about October. Members would take along their equiupment for a couple nights of pure observing with great skies, while camping. We'll discuss this at our September General Meeting if anyone is interested.

Going for Halley ? - The Calgary Centre is planning a group tour to Australia via ANZA Travel, between April 5th and 26th. It involves visiting a variety of locations including the Siding Spring Observatory. Costs start at about $ 4050. per person frow Winnipeg, sharing twin room accomodations. I've got the brochure if anyone's interested.

Orionids - Len Gamache had organized a photographic recording session for the Perseids. It was to be a trial run for the Orionid shower which is associated with Comet Halley. He will be trying again. Anyone interested can contact Len at 453-4684.

Skyline - A telephone to the stars... Sky & Telescope magazine has a free recorded message service giving a 3 minute update on the lastest happenings in astronomy. I called to here more about Comet Machholz. After 6 p.m. it only costs about 60 cents per minute or $ 1.80 per call for long distance charges. It's even cheaper on Sundays. Call 1-617-497-4168.

For Sale - Telescope , Celestron 8 with coatings, wedge, tripod. Bought about 4 years ago but in excellent condition. It come complete with many accesories including a drive corrector, camera adapter and 3 eyepieces. Asking about $ 1700 . Call George Allan at 888-3889 for more.

Monthly Star Party - We will be attempting to arrange a monthly star party on the third Saturday of every month. This will be held in conjunction with the MAS and the University. Dates are shown in the Calender page and we will play it by ear. This will allow us to bring new members to the observatory.

Planetarium Show - "Comet Halley Returns" is being shown. Call 943-3142 for program details. Also "The Sky Show", a mini astronomy course is held every second Sunday of the month. Call the Planetarium for details.

Comet Halley Hats ? - Yes and we sell them. Guy Westcott has designed a great insignia for the caps which sell for $ 6.00 each. We will have them available at our meetings.

Southern Hospitality - At the GA in Edmonton, famed astronomer David Levy mentioned that the American Astronomy Societies have a hospitality group for Canadian Observers who travel south. I'm not certain of the areas covered but can give you Davids address to contact.

New Editor - The unthankfull job of Editor has been accepted by myself and I'll need to know how to improve. All members are welcome to suggest ideas or topics. Maybe you'll want to thank me ?? A hand of applause goes out to former Editor Guy Westcott for the many years of articles.

WINNIPEG

CALENDAR

FALL SCHEDULE

SEPT 4/5 COMET OCCULTATION/GRAZE - Comet Giacobini-Zinner will occult or graze a 6th magnitude star (SAO 58030) somewhere between Winnipeg and Pinawa. Pat O'Conner is organizing a timing group. Call him at 1-753-2440 if interested. See Sept. SKY & TELESCOPE for more details.

SEPT 9 GA 86 PLANNING COMMITTEE MEETING. - Details to follow.

SEPT 13 * GENERAL MEETING @ 8:30 p.m. - GUEST SPEAKER - BILL PETERS
Topic - THE FUTURE OF THE PLANETARIUM
Bill is employed by the Manitoba Planetarium and has produced some of the shows there. His insight will certainly enlighted us AFTERWARDS all the members will be allowed to ' Show and Tell' some of their summer activities.

SEPT 21 STAR PARTY AT GLENLEA - We'll meet with some University student and M.A.C. members. Bill Peters will try to arrange setting up the 17.5 inch Dobsonian. Members are asked to be at the observatory at dusk. Anyone needing directions can call Stan at 632-4038.

SEPT 28 SHOPPING CENTRE DISPLAY - I need some volunteers to assist for short periods of time (2 hrs) for a Display at the KILDONAN MALL between 9:30 a.m. and 6:00 p.m.. Our last display was a great sucess and this one will help us increase our membership. Call Stan at 632-4038.

OCT 8/9 DRACONIDS - See the article on Comet G-Z about this meteor shower

OCT 11 * BUSINESS MEETING @ 8:30 p.m. - ELECTIONS and VIDEOS.
Elections will bve held and all reports read. We'll discuss this upcoming year's program. All members are asked to attend and to provide ideas and input.
AFTERWARDS Dr. Richard Bochonko will show some scenes from NASA laser disks. They include the Jupiter flyby of the Voyager spacecraft. Be sure to attend this meeting.

OCT 19 STAR PARTY AT GLENLEA - See Sept 21 for details. All members are invited to attend.

OCT 20/21 ORIONID METEOR SHOWER - Len Gamache will organize a photographic group to record this event. See elsewhere in this issue for details or call LEN at 453-4684.

NOV 4 COUNCIL MEETING - Details to follow.

NOV 8 * GENERAL MEETING - Details in next WINNICENTRICS.

* MEETINGS ARE HELD IN ROOM 217 LOCKHART HALL AT THE UNIVERSITY OF WINNIPEG

Vol. 25 Nos. 4

WINNICENTRICS

September/October 1985

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1984 - 1985

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PRESIDENT: Mr Stan Runge
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WINNICENTRICS EDITOR - Mr Stan Runge

« CENTER ELECTIONS »

WINNIPEG CENTRE

In accordance with the by-laws of the Winnipeg Centre, nominations fot the open Executive and Council positions were solicited. The follow list of nominations were received by the deadline. The Nominations Committee also nominated for several positions. The List of nominees is as follows:

President	- Mr. Stan Runge	*	COUNCILLORS
		*	
1st Vice President	- Mr. Guy Westcott	*	Mr. Bud Fairley
		*	Mr. Len Gamache
2nd Vice President	- Mr. Lorence Mlodzinski	*	Mr. John Haines
		*	
Treasurer	- Mr. Dave Trimble	*	
		*	
Secretary	- Mr. Bernard Land	*	
		*	

The above positions being unchallenged are hereby ELECTED BY ACCLAIMATION with effect from October 11, 1985, with ratification from the members.

NOMINATIONS COMMITTEE
1985