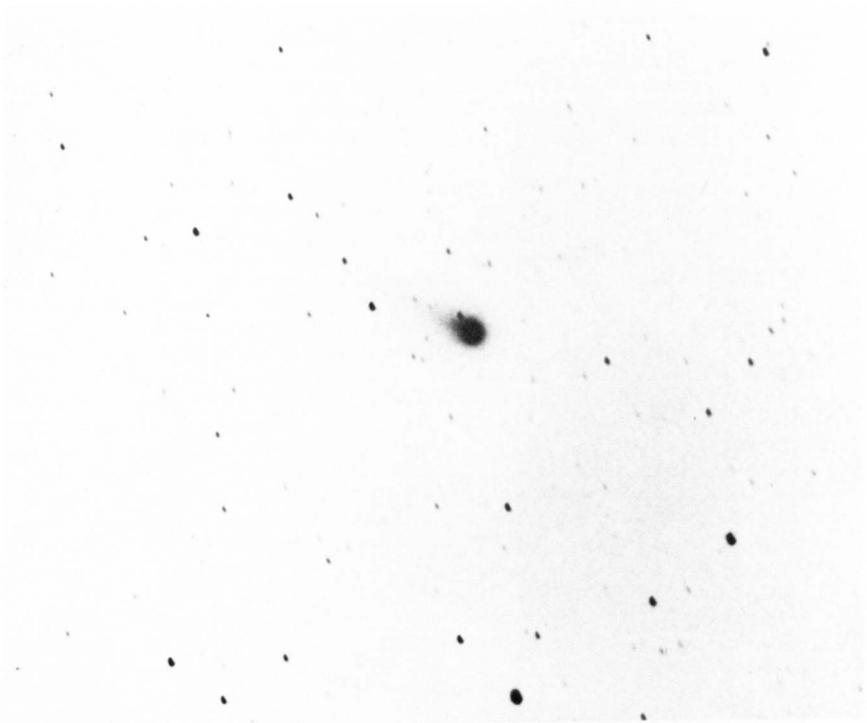

NATIONAL NEWSLETTER

Royal Astronomical Society of Canada

Supplement to the *Journal*

Vol. 80, No. 2 April 1986



Gerard Bourque of the Sudbury Astronomy Club captured this image of Comet Halley on the evening of January 3, 1986. The comet had just crossed inside the Earth's orbit and was seen against the background stars of Aquarius. Photo taken with a 450 mm lens, piggybacked and guided for 20 minutes using hypered 2415 film.

NATIONAL NEWSLETTER

The *National Newsletter* is a publication of the Royal Astronomical Society of Canada and is distributed together with the Society's *Journal*. Inquiries about the Society should be directed to its National Office at 136 Dupont Street, Toronto, Ontario, Canada M5R 1V2.

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Deadline for August issue is June 15.

Editorial

by Ian G. McGregor

The media loves "instant science". We have had many examples of this since the beginning of the year as a series of events relating to space have taken place and more or less for each event the media – television, radio, and newspapers – have been there to give an on-the-spot interpretation of what happened. In some ways this has been good as we all know there is relatively little science programming on the airwaves and our national newspapers like to limit their science coverage to a special page once a week.

However, what happened with media coverage of events such as the Voyager flyby of Uranus, the spacecraft encounters with Halley, and the launch of the new Soviet space station into Earth orbit is what could be called "instant science". The media hear there is a story and then attempt to get spokespeople who can give an interpretation of the event. This would be fine if the effort was made to give proper background information to each event and recognition given to the fact that proper scientific interpretation takes time. But when scientists and educators are interviewed almost invariably, the reporter wants an instant interpretation of the sensational aspects of what has been discovered. "How has this event of the past few hours changed our understanding of the Universe?" or, "Here is a picture which you have never seen before. Tell us all about it and how it will change the life of the average person in the street!"

As an individual who has frequently gone through this experience with the media over the past few months I find it a very exasperating experience as I am sure many other members of the scientific community also do. In particular we have to avoid the temptation offered by interviewers to give instant interpretations of "off the cuff" comments by scientists halfway around the world. The Giotto encounter with Halley comes to mind in this regard. But still, if we don't give interviews the media will ignore the event and then there will be little public awareness of interesting events taking place in the universe.

The proper interpretation of scientific discoveries takes time and this is something the mass media does not have. Thus we are caught between sharing our interest, knowledge and enthusiasm with a viewing audience and being faced with often less-than-intelligent questions and sometimes giving less-than-intelligent answers! Probably the best solution is to anticipate in advance media interest and prepare visuals or key ideas so that we can lead the interviewers rather than being lead by them. What a marvelous experience it is!

The William Herschel Society And The R.A.S.C.

by Roy L. Bishop
National President, R.A.S.C.

The William Herschel Society was formed in Bath, England in the fall of 1977 for the purpose of advancing the education of the public in the life and times of William Herschel and, in furtherance of this, to acquire, restore and maintain Herschel's house and workshop at 19 New King Street, Bath, and to maintain a museum there relating to Herschel's scientific and musical achievements. Two members of the Society, Dr. and Mrs. Leslie Hilliard, generously offered to buy the house pending its transfer to the Society when funds became available. At the present time a trust is being established to which ownership of 19 New King Street can be transferred.



Caroline Herschel (1906–1985) opening the door of Herschel House, 19 New King Street, Bath, England, for two members of The Royal Astronomical Society of Canada: John and Carol Howell of the Victoria Centre. (Photograph by John Howell, July 1983).

19 New King Street is part of a row-housing development built in 1766. Many repairs and renovations have been carried out on the property since it was acquired in 1978. The Herschel Museum now occupies the basement, main floor, and second floor, and these areas have been redecorated to appear as they may have looked when Herschel lived there. Through the generosity of the National Maritime Museum and several other organizations and individuals, many pieces of furniture, books, tools, scientific and musical instruments have been given or loaned to the Herschel Society for display.

On March 13, 1981, the bicentenary of Herschel's discovery of the planet Uranus from the garden of 19 New King Street, the Museum was opened to the public and the first annual Herschel Lecture was delivered by the Society President, Patrick Moore. Despite a Society membership of a few hundred, and several thousand visitors to the Museum, the financial state of the Society reached a critical stage in 1984. Special appeals for funds that year resulted in generous donations, including a three-year grant from the Royal Society of London. The future of the Museum now seems secure.

The Royal Astronomical Society of Canada was one of the early contributors to the Herschel Society (Council minutes, September 1980), and during the past six years several R.A.S.C. members have travelled to the lovely city of Bath in order to visit the Herschel Museum. In 1983, John and Carol Howell were there (John is a past-president of the Calgary Centre and now lives in Ganges, B.C.). Their visit was particularly memorable for they received a personally-conducted tour of the museum by Caroline Herschel, one of the founders of and the Patron of The William Herschel Society, a native of Canada, and (at that time) the last surviving descendant of Sir William Herschel bearing the family name. John Howell took a photograph of Caroline Herschel opening the door to the museum. After Caroline Herschel's death in May 1985, John donated a copy of this photograph to the R.A.S.C. with the suggestion that it be framed and presented to the Herschel Society as a gift from our Society. This generous offer was accepted by Council last September and I had an opportunity to present this gift (along with an *Observer's Handbook*) to the Herschel Society on January 2nd of this year.

On my arrival in Bath I was met by Alan Sims, the Honorary Secretary of the Herschel Society. Although the Museum was not normally open on that day, Mr. Sims brought me there where a lunch had been prepared by Elizabeth Hilliard and Dr. Leslie Hilliard, the Chairman and Honourary Treasurer, respectively, of the Herschel Society. We ate in the kitchen where the original Caroline Herschel prepared meals for her brother, William. After lunch we entered the adjoining workshop built by William for pouring speculum minors and building telescopes. From there we walked out into the small garden from which Uranus was discovered and reflected on the arrival of Voyager 2 at this planet later in the month. A tour of the Museum followed.

After my return to Canada, Mr. Sims sent a letter which reads, in part:

"This is a brief word to repeat the thanks of our committee, and indeed our whole Society, for the very kind gifts which you left with us during your visit to Bath and the Museum earlier this month.

"The photograph of our late Patron is now mounted prominently in the entrance room of the Museum, and though it may perhaps arouse a certain sadness in those who knew her well, it is nevertheless a permanent reminder of our links with her illustrious great-great-grandfather.

"I have been looking through the *Observer's Handbook* which you also kindly left with us and I must say that it strikes me as a masterpiece of compilation and compression, confirming my first impression that it carries more detailed and comprehensive information than is contained in the B.A.A. *Handbook*.

"Once again, our best thanks to yourself and to The Royal Astronomical Society of Canada for your kind presentations."

Membership in The William Herschel Society is available by sending £4 to the Membership Secretary of the Society: Mr. W.A. Alan Barnard, The Cedars, 91 Winsley Road, Bradford-on-Avon, England, BA15 1PA. Donations are also very welcome. Visitors to the Herschel Museum are reminded that the hours during which it is open are somewhat limited: usually Sunday afternoons during the winter, and on Wednesday, Saturday and Sunday afternoons from March through October. For additional information see:

National Newsletter, L5, February 1981.

Sky and Telescope, 61, 192, March 1981.

Sky and Telescope, 68, 317, October 1984.

Scientific American, 106, February 1986.

Giacobinids Disappoint Canadian Observers

by Peter Brown and Mark Zalcik
Edmonton Centre

As reported in the October 1985 issue of the *National Newsletter*, the Giacobinid meteor shower, which was predicted to peak on October 8–9, had the potential to produce a very impressive display of celestial fireworks. Several observations were sent to the authors by Canadian observers. Todd Lohvinenko from Winnipeg, Manitoba recorded a total of seven Giacobinids between 0130 and 0230 UT on October 8–9. On the same night, Michael Boschat from Halifax, Nova Scotia saw two Giacobinids from 0200–0300 UT and seven in the following hour. Also on October 8–9 Peter Brown from Ft. McMurray, Alberta recorded two Giacobinids from 0200–0300 UT and three between 0300 and 0400 UT.

These are the only observers who made hourly counts. However, Dr. Stephen Edberg, in Edmonton, Alberta, noted that an unusual number of fireballs were seen by people at the Edmonton International Airport on October 7–8. Also from Edmonton, and on the same night, Mark Zalcik reported no activity during occasional sky checks from 0900–1200 UT. From the limited number of observations one might be led to conclude that no outburst of the Giacobinids occurred.

This, however, turns out not to be the case. Japanese meteor observers who were watching on the evening of October 8 managed to see meteor rates as high as 300/hour in the early twilight sky. The display began at about 0900 UT and was over by 1200 UT. For radio and visual observations the peak of activity came sometime between 0930 and 1030 UT, with rates varying dramatically among Japanese observers due to local observing conditions. Although not as spectacular as the outbursts in 1933 and 1946, the Giacobinids did live up to their name, at least to those in Japan.

Observers are encouraged to make a special effort to see the Eta Aquarids during their period of highest activity this year. Due to the mid-March encounter with the Earth's orbit of Comet Halley, the shower's parent comet, good meteor displays are very possible on May 3–4 and 4–5.

Unfortunately, because of equatorial position of the shower's radiant and its apparent proximity to the Sun, Canadian observers will not be able to witness the full splendor of such a display. The radiant rises after 0300 local time, and with twilight advancing rapidly in May, this provides a rather small window for meteor watching, with conditions getting even worse as one goes farther north. However, activity should be noticeable to some degree, as swift streaks dart from the origin low in the east during this time period. With their velocity of 65 km/s, faster than the Perseids, a high percentage of Halley's outbound meteors leave trains. According to some observers, the material is somewhat fainter than meteors of most other major streams.

Normally a rather tame shower with rates of 15 meteors per hour, the Eta Aquarids may be the surprise of the year, furnishing a fitting finale to our latest encounter with a very famous celestial visitor.

Note. The authors would be pleased to receive observations of the Eta Aquarids or any other meteor showers. Write to Peter Brown, 181 Sifton Avenue, Ft. McMurray, Alberta T9H 4V7, or Mark Zalcik, #2-14225 82 St., Edmonton, Alberta T5E 2V7.

Canadian Space Computer

Spar Aerospace of Toronto, the inventors/manufacturers of the famous Canadarm, are now developing an onboard modular microcomputer for use in space. One of its unique features distinguishing it from others already in use is its modular design which will make it possible for each computer to be tailored to the user's needs. The system will be able to accommodate 8-, 16-, or 32-bit microprocessors. An error detection and correction capability added to the RAM memory handles the problem of single event upsets caused by cosmic rays in space. The computer is self-monitoring and should last at least 10 years in a space environment.

Report of January 1986 National Council Meeting

by Leo Enright
National Recorder

The first meeting of 1986 of the National Council took place in the Library at the National Office on Saturday, January 25. Ten Centres of the Society were represented by officers or Council Representatives. The agenda items included reports from the officers, the standing committees, and four of the ad hoc committees. The National President, Roy Bishop, was in the chair.

The National Treasurer, Ralph Chou, presented the unaudited Financial Statement for 1985 which showed an approximately \$10,000 deficit. This was approved by Council. The proposed 1986 Budget based on the current fee schedule showed an almost \$8,000 deficit. This was also approved by Council. The Treasurer then proposed a new fee schedule for the 1987 membership year which would see regular membership fees go from \$20 to \$25, youth membership from \$12.50 to \$15 and life membership from \$300 to \$500. This was approved.

As the Society's publications account for such a large part of the annual expenses the Editing Committee was instructed to review the cost of the Society's publications and obtain quotes from alternative printers. Reports were received from the *Journal* Editor, Alan Batten, the *Handbook* Editor, Roy Bishop, and the *Newsletter* Editor, Ian McGregor.

A new venture of the Society was the establishment of an ad hoc committee to work on a campaign for increasing the Society's Endowment Fund. Three members were initially elected to the Committee with possibly more to be added at the General Assembly.

The Awards Committee proposed the awarding of the Society's Chant Medal to Warren Morrison of the Kingston Centre for his significant observational record including the discoveries of Nova Cygni in 1978 and recurrent nova RS Ophiuchi in 1985 as well as thousands of variable star estimates. The Committee also proposed that Randall Brooks of the Halifax Centre receive the Service Award for his vigorous promotion of astronomy both in Nova Scotia and on a national level.

To assist the operations of the National Office, the Computer Use Committee was authorized to purchase a computer system. This should significantly assist the work of the Society's Executive Secretary, Rosemary Freeman.

Other items of business included: the decision to jointly cosponsor with the Canadian Astronomical Society the 1986 Helen Hogg Public Lecture to be held at the time of this year's General Assembly in Winnipeg; the approval in principle to cosponsor with the Canadian Astronomical Society the creation of a new national award for a graduate student in astronomy; approval of a grant to the Quebec Centre for the publication of its *Almanach Graphique*; distribution of an information package on this year's International Astronomy Day; and approval of an invitation from the Victoria Centre to host the 1988 General Assembly.

Copies of the official Minutes of the Meeting have been distributed to all Centre Presidents and National Council Representatives.

Events Calendar

- May 4-6 Canadian Science Writers' Association Annual Meeting, Kingston, Ontario.
- May 9-10 3rd Annual Meeting and Conference of the Association for the Advancement of Science in Canada, Edmonton, Alberta.
- May 24 Niagara Frontier Council of Amateur Astronomical Associations (N.F.C.A.A.A.) Spring Meeting. Hosted by Toronto Centre R.A.S. C., Toronto, Ontario.
- June 9-13 17th Annual Meeting of the Canadian Astronomical Society, Penticton, British Columbia.
- June 27-30 R.A.S.C. General Assembly. Hosted by Winnipeg Centre, Winnipeg, Manitoba.
- July 31- Mount Kobau Star Party, Mount Kobau, British Columbia.
- August 4
- August 8-10 5th Annual Starfest Conference, Mount Forest, Ontario.

Budget 1986

The 1986 Budget of the Royal Astronomical Society of Canada was approved at the National Council meeting held in Toronto on January 25, 1986. The following is a condensed version of the approved budget with various categories grouped together. The complete Budget was attached to the Minutes of the meeting of January 25 and distributed to the National Council Representatives and Presidents of each Centre.

	1985 Actual	1986 Budget
<i>Revenue</i>		
Membership Fees	\$38,789.96	\$39,500
Grants, donations	10,185.00	10,000
Publications – <i>Journal</i>	26,280.58	27,000
<i>Handbook</i>	56,229.75	70,000
Interest	11,946.00	7,500
Rent	9,600.00	9,950
Miscellaneous	801.52	300
Total Revenues	\$153,832.81	\$164,250
<i>Expenditures</i>		
Publications		
Journal – Printing	\$45,557.66	\$46,000
Reprints	1,809.71	2,000
Assistant	1,000.00	1,000
<i>National Newsletter</i>	12,145.00	13,000
Distribution	12,699.83	12,000
<i>Handbook</i> – Printing	27,310.41	30,000
Misc	4,056.79	5,100
Salaries & Benefits	27,646.34	31,600
Speaker Exchange	120.67	1,000
G.A. Travel Grants	1,919.00	3,000
Council Travel Expense	1,035.95	4,000
National Library	674.47	1,000
Building	7,918.18	6,250
Miscellaneous	19,604.24	16,150
Total Expenditures	\$163,498.25	\$172,100
Surplus (Deficit)	(\$9,665.44)	(\$7,850)

Notes

1 The 1985 Actual figures for revenue and expenditures are unaudited. The *Annual Supplement* will contain the audited 1985 figures.

2 Revenue from membership fees for Youth and Regular members is based on a 60/40 split between the National Society and the individual centres.

Predicting October's Eclipse

by Gunther Moller
Alpine, Texas

The solar eclipse of October 3, 1986 will be annular-total, but for observers in North America it will be partial. The accompanying Figure displays a sequence of phases computed for the Toronto, Ontario area.

Readers who wish to predict the local circumstances of the eclipse for their own place of residence are referred to the method set forth by this author in the April 1984 issue of the *National Newsletter*.

The calculations of the Greenwich hour angle of the moon (GHAM), of the sun (GHAS), the declination of the moon (DecM) and of the sun (DecS) at a given universal time T are as follows:

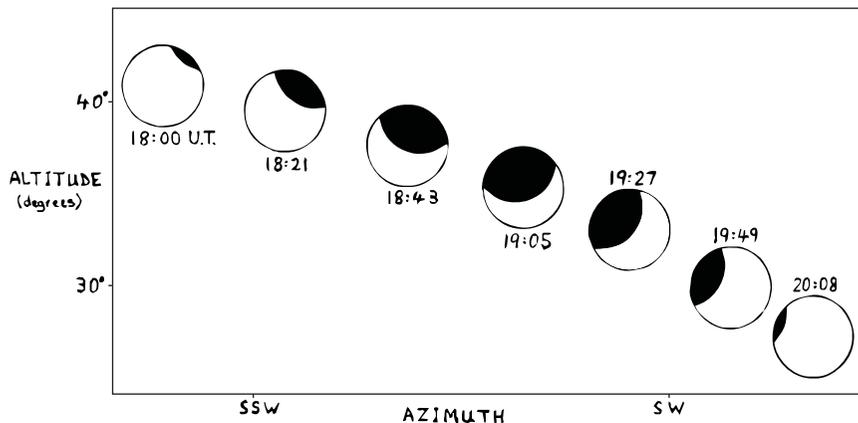
$$\text{GHAM} = 78^{\circ}.2650 + (T-17) 14^{\circ}.52714$$

$$\text{GHAS} = 77^{\circ}.7417 + (T-17) 15^{\circ}.00333$$

$$\text{DecM} = -2^{\circ}.6450 - (T-17) 0^{\circ}.27524$$

$$\text{DecS} = -4^{\circ}.0350 - (T-17) 0^{\circ}.01619$$

Use $0^{\circ}.9775$ for the lunar horizontal parallax, and $16'$ for the semidiameter of both moon and sun. Clear skies to you.



A series of sketches shows the changing appearance of the Sun during the course of the partial solar eclipse as seen using safe observing techniques by an observer in Toronto, Ontario.

North America's Partial Solar Eclipse October 3, 1986

This year there are a total of four eclipses – two of the Sun and two of the Moon. For North American observers, the lunar eclipses of April 24 and October 17 will be visible in varying degrees to observers in different parts of the continent while the October solar eclipse will be visible in its partial phases for most North Americans.

The October 3 solar eclipse is a total/annular eclipse but due to the short duration of totality (one-third of a second) and the location of totality (in the North Atlantic ocean off the coast of Greenland) it is unlikely that many humans will be trying to observe it near totality. However, most of North America will see the partial phases as the Moon covers part of the face of the Sun. For further details see the 1986 *Observer's Handbook*.

Fox Lake Meteorite Hunt

by Peter Brown
Edmonton Centre

Last September, a small but enthusiastic group of meteorite hunters began to make their way into the forest surrounding the Indian reserve at Fox Lake. The fireball of March 2nd 1985, which was witnessed all over northern Alberta at about 10:30 am. on a clear Saturday morning, was believed to have come down about 20–30 km to the south-east of Fox Lake. We were to begin the search in this area.

The participants of this hunt included Dr. R.E. Folinsbee and Dr. Dorian Smith of the University of Alberta, Mr. Andy Garret and myself. Upon flying in to Fox Lake Dr. Smith and I were promptly met by Dr. Folinsbee. We proceeded to load supplies onto horse driven wagon, our means of transportation to the area of the fall. The trip along the various cutlines to the east of Fox Lake was bumpy but more desirable than walking. We finally decided to set up base camp near the true ground point of the fireball.

The next day turned out to be bright and sunny, ideal for meteorite hunting. After doing some last minute calculations and considering some new eyewitness reports, a search plan was decided upon. In order for the ellipse-shaped area of fall to be covered on foot part of the group would be required to walk about 20 km south of our base camp and spend the night in the open and probably return the next day before nightfall. So Dr. Folinsbee, Dr. Smith and I began making our way to the northern outskirts of the ellipse while Mr. Garret searched the area within several kilometres of the camp. After an initial four hours of walking Dr. Smith and Dr. Folinsbee began the long trek due south while I headed due north to the northern limits of the ellipse where larger fragments may have made it to the ground.

I quickly realized that the entire area to the north and to the west of my position, which was my route back to camp, was heavily covered by muskeg and in places the water was two metres deep. I finally made it back to camp after trudging through the terrain for eight hours with a five kilogram knapsack on my back. It was evident that it would be fruitless to search the area because any fragments would be buried beneath the surface or under water.

However my little “adventure” does not compare with Dr. Folinsbee’s and Dr. Smith’s twelve hour walk on the next day. Apparently the terrain in the entire northern section of the ellipse (both the eastern and western section), is heavily covered with muskeg. One bright note may be worthy of mention. When Dr. Smith and Dr. Folinsbee arrived near the base of the ellipse there apparently was a clear path traversing the ellipse longitudinally. Although they were only able to search about three hundred metres to the west and east of the cut line they were following (which had a north-south alignment), it did appear that the path was a trapline and trappers as well as natives in the area had been alerted to the possible presence of a meteorite somewhere along their traplines.

From the extensive dust cloud left by the fireball, it seems that the meteorite is probably of the stony variety and it is possible, as in other documented cases of meteorites with extensive dust clouds, that a good majority of it disintegrated into this cloud of fine particles.

So it appears that the local residents may have the best chance of recovering any small fragments of the Fox Lake meteorite that may have made it to the ground. Large fragments are not to be found due to the unfavourable terrain in the area. But the Fox Lake meteorite, like the Grande Prairie meteorite, will remain an open file for possible future recovery.

Reprinted from *Stardust*

Phobos and Deimos to be Explored

The Soviet Union plans to send two robot spacecraft to explore the two tiny moons of Mars in 1988/89. They would fly to within 100 m of the moons, fire lasers and ion beams to vaporize surface material, and then carry out a remote chemical analysis of it, relaying back to Earth the results. The two moons are thought to be captured asteroids.

Across the R.A.S.C.

HAMILTON: In response to great public interest in Comet Halley, public nights at the Centre's Observatory have been held twice a month and have been very successful. John Gauvreau has been acting as host for these events. Bob Speck has been handling the Beginners Course which has been meeting at the planetarium at McMaster University and the Centre's observatory. Mike DeVillaer has been regularly showing pictures at Centre meetings he has taken of Comet Halley since October. Mike Jefferson is the new observing director.

VANCOUVER: The 1986 council was elected in December with Karl Miller as the new President. In his first President's Message in *Nova*, Karl indicates his hope for the Centre to establish a permanent observatory and the planned Centre incorporation will assist these efforts. The recent loss of the prime "near city" observing site due to artificial lights has strengthened this resolve. David Dodge reports a 25 cm f/15 cassegrain telescope is on long term loan from the Gordon Southam Observatory. The Annual Dinner was scheduled for February 14.

LONDON: A Telescope Fund is being established to obtain a new Centre telescope. A new "home" is being sought for the library which recently had two cartons of magazines added to it. To decrease the cost of *Astronomy London*, the editor is now going to use a standard cover for each issue.

WINDSOR: The new name for the Centre's newsletter is *Windsor Centre News*. Matt Bourdeau, the Director Of Observing, is trying to form a group interested in deep sky observing. President Randy Groundwater was the guest speaker at the 75th anniversary dinner of the Essex Region Girl Guide Leaders. Two Comet Halley observing parties were planned for late March at Eagle Conservation area and Point Pelee.

KINGSTON: In recognition of the Centre's 25th anniversary, *Regulus* is reprinting a series of letters and documents which trace the early beginnings of the Centre in 1961. The anniversary banquet held on January 23 with National President, Dr. Roy Bishop, as guest speaker was a great success. Leo Enright reports good aurora displays on the nights of February 8-9 and February 11-12. As well, the zodiacal light was easily photographed on the night of February 3-4.

WINNIPEG: A new Ash dome for the Centre's Glenlea Observatory has been ordered and is expected by May. The 36 cm Schmidt-Cassegrain telescope will then be installed on the existing pier. Everything should be operational by the General Assembly at the end of June.

OTTAWA: The Centre has organized a series of monthly beginners sessions which will be held on the second Sunday of every month at the National Museum of Science and Technology. Observers Group Chairman Doug George reports "hearing" a meteor on the evening of January 6 at 9:45 pm EST shortly after spotting a fireball near the horizon. Variable Star Coordinator Sandy Ferguson reports the completion of the long-awaited photometer for measuring the brightness of objects will appreciably help the variable star programme.

EDMONTON: The 45 cm primary mirror for the Centre's telescope was stolen in December and possibly cannot be replaced before the end of the year. Weighing in at about 20kg, the mirror was stored in a van because of its lack of easy portability. Congratulations to Bryce Heartwell who won the Centre's Astrophotographer of the Year Award and to Tony Whyte who won the President's Award. About half a dozen members headed for Arizona in March to see Comet Halley.

VICTORIA: The Centre is looking at holding some form of Observing Workshop to discuss observing workshops, instruments, and objects for the beginner. Five members participated in the public "Halley-Look" programmes at the Dominion Astrophysical Observatory during the pre-perihelion viewing window. In May the Centre holds an "Activities Night" when members give brief 2-5 minute talks on their activities.

SASKATOON: Centre member and, currently, world traveller Rick Huziak is contributing a series of articles to *Saskatoon Skies* on his astronomical adventures starting with Fiji and New Zealand.

TORONTO: The influence of Comet Halley has been most noticeable in terms of the additions to the Centre's membership. So far for 1986 the Centre has over 350 new members alone! To introduce these members to the Centre a New Members Night is being planned for the spring. In March a computer users group was established with possible plans to establish a bulletin board after a membership survey has been completed. The Centre will be hosting the Spring Meeting of the Niagara Frontier Council of Amateur Astronomical Associations (N.F.C.A.A.A.) on Saturday, May 24. It is hoped members from Centres across southern Ontario will join with American groups to participate in this event. Members went to Australia, Hawaii, the Galapagos Islands, and the southern United States to see Comet Halley in April.

NIAGARA FALLS: Centre President, Charles Fassel, offered to phone members at home about 3 or 4 in the morning in March to let them know if the sky was clear to see Comet Halley. Seems Charles regularly works midnight shifts and has his eye on the sky at these hours. The Centre's Board was completely re-elected at the January Annual Meeting. A Centre display will be at the Centennial Library in St. Catharines during the month of April. Edra Thompson reports having seen at very bright fireball on February 15 and additional reports of this event are being sought.

CALGARY: The January Annual Meeting saw the election of a new council with Geoff Kennedy succeeding Bob Loblaw as President. Brian St. Goddard has succeeded Allison Laffra as editor of *The Starseeker*. Membership now exceeds 200 people and attention is being paid to encouraging more members to participate in Centre activities.

HALIFAX: A 20 cm Schmidt-Cassegrain telescope suddenly appeared on sale in a downtown store in December and was quickly purchased by the Centre as a loan instrument to members.

MONTREAL: The Centre has started up again a series of Saturday evening talks at its observatory. Several short talks followed by refreshments and observing through the Centre's 36 cm Schmidt-Cassegrain telescope highlight the evenings. Last December an 8 cm refractor belonging to the founder of the Montreal Centre was formally presented to the Centre. The instrument had been refurbished by Bert Widdop, Ronald Pow and Harold Rasmussen over a 2-year period.

Across the R.A.S.C. is a regular feature of the *Newsletter*. Centre Editors and/or Secretaries should send reports and newsletters to the Newsletter Editor. Deadline for the August issue is June 15.

Binocular Buying Tips

by Peter Ceravolo
Edmonton Centre

A pair of binoculars is perhaps one of the most useful accessories for observers, expert and beginner alike. For the experienced observer, binoculars are a valuable aid at the telescope; for the beginner, an excellent introduction to the night sky. A good pair of binoculars can have a lifetime of usefulness, unlike the first department store telescope which can be quickly outgrown.

Binoculars are labelled by magnification and objective lens diameter. For example, a pair of 7 x 50s has a magnification of 7 and a lens diameter of 50 millimetres. The exit pupil for this binocular size is about 7 millimetres ($50/7 = 7$ approx): ideal for astronomical or nighttime application, but much too large for daytime use. For a particular size of binocular, the eyepiece usually defines the magnification and field coverage, the focal length of the objective remaining constant (usually f/4).

Last year, Ron Galna and the writer toured a few camera stores to see what binoculars were available. We found quite a variety: there are binoculars for every budget. Binoculars not longer only vary in size and field coverage, they also vary in design. The old standard is the familiar porro-prism type, with the

widely spaced objectives. A variation on that theme is the reverse porro-prism design, which in the smaller sizes is compact because the objectives are closer together. Some have internal focusing, i.e., the eyepieces do not move. This means a sturdier instrument with better protection against dust. For those in a higher tax bracket, a set of roof prism binoculars should be considered. These can be quite expensive (over \$700 for a pair of 10 x 40 Leitz Trinovid binoculars), but they are incredibly compact and have internal focusing. Beware of cheap substitutes, especially when intended for astronomical observing. The roof prisms are more difficult to make than ordinary porro-prisms and they have to be very good. The 90 degree angle in the roof has to be accurate to at least a few seconds of arc. One measure of quality is to check for vignetting of the exit pupil. While looking at the sky or an illuminated surface, hold the binoculars several centimetres away from your eyes. What you will see is a bright disc: the exit pupil. It should be evenly illuminated with no darker areas around the edge. The dark areas are caused by undersized prisms cutting off some of the light from the objective. This reduces the light gathering efficiency. You should expect this to be present in inexpensive binoculars. It is also advisable to check for sturdiness in the focusing device; too much play can cause problems.

The greatest factor influencing the choice is, of course, price. Once you have narrowed the price range, which will also determine the design of the binocular, the next question is size. As with telescopes, most think bigger is better. You should carefully consider the application. A smaller pair may be easier to handle and more efficient. If the only interest is nighttime observing of faint objects, a pair of night glasses, particularly 7 x 50s yielding a 7 mm exit pupil to match the dark-adapted eye's pupil are optimum. These binoculars are not well suited to daytime observing however. In daylight, the pupil contracts to about 3 mm, so the effective diameters of the binoculars are reduced to 22 mm, but the bulk of the 7 x 50s is still there. You should also consider that a slightly higher power (say 8 x 35s or 10 x 50s) has the effect of reducing the sky brightness, yielding higher contrast images and actually increasing the limiting magnitude. With inexpensive binoculars, too high a power (above 10x) can reveal poor alignment of the optics which would not be evident at a lower power. High power binoculars are also more difficult to hold steady. You should be wary of the extra wide field binoculars. Although it is visually pleasing to have a huge apparent field of view, that extra bit is practically useless because of the severely distorted images. A way to check this in the store is to look at a light bulb filament or tree branches in the distance. Focus carefully, then move the object out to the edge of the field of view. Some deterioration of the image is to be expected. Choose the pair of binoculars that combine a reasonably wide apparent field of view with reasonable edge of field definition. A wise precaution would be to inquire if you could exchange the set if you find them unsuitable for astronomical use. Nearly all modern optics have anti-reflection coatings to increase light transmission. These coatings are very important for binoculars because of the many lens and prism elements. Quite often inexpensive binoculars have only the first surface of the objective and the last lens surface of the eyepiece coated for cosmetic reasons. The light loss can be as much as 35% if no coatings are applied to the inner elements.

Although we do not yet have designer binoculars, the brand name is still an important selling point. You might think that if it sounds German it must be good. If the name Zeiss is on it, it is probably excellent. The Zeiss synonymous with quality is Carl Zeiss of West Germany. The binoculars are excellent; they are also very expensive. Recently Zeiss Jena of East Germany (the company split when Germany did) has come out with some relatively inexpensive binoculars that don't match the quality of the West German set. The best way to judge the quality of binoculars is usually the price. You get what you pay for.

Reprinted from *Stardust*

New Canadian Satellite

A new Canadian satellite designed to protect shipping and oil exploration platforms from ice floes in the Canadian Arctic will be launched in 1991. Named Radarsat, the spacecraft will have a multiple beam synthetic aperture radar system. To give continuous 24 hour coverage, it will be placed in a Sun-synchronous polar orbit with an altitude of 1000 km.

Halley Fever in New Zealand

by Rick Huziak
Saskatoon Centre

Editor: Rick Huziak has been a Saskatoon member for over ten years and an amateur astronomer for eighteen years. Currently, he is on a one-year around-the-world trip and contributing regular reports on his experiences to his Centre's newsletter. The following report relates his experiences last autumn.

Throughout New Zealand, one can immediately notice that Comet Halley is regarded as a big event. The March–April period is being widely promoted in many circles including amateur astronomy clubs, planetariums, public information bureaus, and elsewhere. Displays are everywhere.

The most noticeable signs of the event are the large number of books available on the comet. You could probably count 40 or more different titles by strolling from bookstore to bookstore. Some books are unique to the Southern Hemisphere, being written in New Zealand or Australia. Most are excellent. Also available are T-shirts, postcards, pins, calendars and many other mementos of the coming attraction.

Almost every camera shop or department store is in on the act as well. Many are displaying telescopes up to 20 cm in their windows with the typical “Don't miss Halley” posters beside them. One camera store in Dunedin that I heard about was importing one hundred 7.6 cm Japanese telescopes in anticipation of coming sales at \$399.00 each!

Most Public Information Bureaus also have Halley pamphlets, brochures or displays. These are generally written by local amateur astronomers or by Mount Johns National Observatory. Many of the display boards also have excellent pictures of the comet taken in recent months by these same amateurs. The popular film is hypered Technical Pan (2415) film.

Both public observatories in New Zealand, the One Tree Hill Observatory in Auckland (North Island) and the Beverley Begg Observatory in Dunedin (South Island), have weekly observing sessions for the public to see and learn more about the comet.

I accidentally stumbled across another observatory when I was hiking on a nature trail in Oamaru (South Island). The town was setting up an observatory especially for the comet because it was judged to have the greatest percentage of clear nights in the area. All that I saw was the 5 m dome which had been transported from Christchurch. The telescope had not yet arrived.

On November 27, I attended a lecture at the Otago Museum of Natural History in Dunedin presented by Graham Wolf of the Canterbury Astronomical Society. His illustrated presentation dealt with all aspects of the comet and for beginning observers he demonstrated the use of small telescopes and binoculars. The talk was well-received and very informative.

Two interesting bits of information came out of Graham Wolf's talk. First, the Canterbury Astronomical Society was negotiating with the Dunedin City Council to turn off the street lights during the week of best viewing so that everyone would get a chance to see the comet from the city. The Council was apparently receptive to the idea. Second, New Zealand Television would be doing a two-hour special on March 13 covering the final approach of the Giotto spacecraft to Comet Halley.

This is basically the state of “Halley Fever” in New Zealand last autumn. From New Zealand I travelled to Australia and therefore will not see the outcome of all the promotional work done by the amateurs. I wish them the best of luck with their observations and sincerely hope that it will stop raining (40 of my 58 nights were cloudy or rainy nights) by the spring in time to glimpse the comet.

Reprinted from *Saskatoon Skies*

Collecting Stamps on Comet Halley

by Andrew Yee
Toronto Centre

To commemorate the return of Comet Halley, many countries have issued postage stamps. The exact number of postal administrations that eventually issue a set of stamps on Comet Halley is not known but

it is possible that more than 50 countries will follow suit.

It is not difficult to assemble a complete collection although it might cost several hundred dollars. The alternative would be to choose a motif, or theme, and collect only those stamps, for example, depicting the spacecraft encounters with the comet.

Last autumn at least eight postal administrations released an issue: Bermuda – set of four; Czechoslovakia – souvenir sheet; India – set of one; Marschall Islands – set of five; Niger Republic – set of five; Palau – set of four; Turks and Caicos Islands – set of four on the 1985 International Youth Year with the 24 cent denomination showing the comet; and the United States with a 36 cent aerogramme on the dual themes of the 150th anniversary of Mark Twain and the return of the comet.

Great Britain issued in February a set of four stamps. One features a caricature of Edmond Halley, a second shows the Giotto spacecraft encounter with the comet, a third has the legend “Maybe Twice In A Lifetime” and a picture of the comet, and the fourth shows the comet orbiting the sun.

Other postal administrations intending to issue comet-related stamps are: Ascension Island, British Antarctic Territory, Central Africa, Fiji, Hong Kong, Jersey, Malawi, Mauritius, Niue, Papua-New Guinea, Penrhyn, St. Helena, Seychelles, Solomon Islands, Swaziland, Tristan Da Cunha, West Samoa, and Vanuatu.

A Deep Sky Project

by Alister Ling and Paul Brown
London Centre

For over a year, we have been exchanging observations and drawings of open star clusters. As we began to realize that some of our drawings did not match well even after considering small errors in star positions and brightness estimates, our interest in these objects increased considerably. Additional comparison of our drawings with those found in the Webb Society Handbook Volume 3: *Open and Globular Clusters* (1980) occasionally confused the matter even more.

We are looking for observers who are interested in drawing clusters (especially ones that are not Messier objects) under a range of magnifications and apertures in a systematic fashion. Photographs of less well-known star clusters are most welcome considering the rather poor coverage found in the major astronomical periodicals. Among our concurrent secondary interests are objects not found in the *New General Catalogue* (NGC), and class 7, or non-existent, clusters listed in the *Revised New General Catalogue* (RNGC), many of which can be observed in binoculars or small telescopes. We are very interested in receiving reports using very low powers as well as high power observations within clusters.

Written descriptions of a cluster do not convey the appearance of the majority of open clusters as well as can be achieved with sketches and drawings. Indeed, we have found that positive identification of an object from nearby marker stars and asterisms can be difficult, even when the two of us have observed using the same instrument. We believe that with a group effort, significant contributions to deep sky astronomy can be made. At the very least, the beauty of some often overlooked objects can be shared among more observers.

This past season we chose a short list of lesser known open clusters to make observations on. These included NGC 133, King 14, Trumpler 1, NGC 957, and NGC 1444. To assist interested individuals we can exchange drawings of these objects to promote discussion and standard formats and give inspiration for further observation.

We would be most pleased to hear from interested individuals who would like to join our deep sky venture.

(Ed. Observers can contact Alister Ling at 750 Riverside Drive, London, Ontario 519 471-7214 and Paul Brown at R.R. 2, Goderich, Ontario N7A 3X8 519 524-2848.)

Light Pollution: The Battle continues

by Betty Robinson
Assistant Editor

The amount of electrical energy devoted for outdoor lighting purposes has grown much faster than the increase in population, so that at present, it accounts for more than 50% of electrical energy consumption. It also accounts for the phenomenal increase in light pollution. Light pollution is the excessive or misplaced illumination produced by inefficient street lighting and outdoor ad lighting practices.

In the United States, science writer Fred Schaaf founded an organization called Dark Skies for Comet Halley (DSCH). Since many city dwellers may be deprived of the once-in-a-lifetime sight of the comet, Schaaf founded DSCH to focus public awareness on the financial and environmental problem of light pollution.

Schaaf's organization offers a light-reduction solution for city-dwellers, a solution he claims has been shown feasible even in large cities and could produce tremendous savings in both money and energy throughout the United States and Canada. Says Schaaf, "Not only would reform in outdoor lighting practices restore a view of the Comet Halley spectacle to millions of people, it would also save cities hundreds of thousands or millions of dollars a year." Schaaf cites dark sky legislation in such places as Phoenix and San Diego as proof that outdoor lighting waste can be greatly reduced with enormous savings and the general satisfaction to the public.

The DSCH solution is to adhere to three major principles of good outdoor lighting: outdoor lighting only *when* needed, only *where* needed, and of the *kind* which is most efficient and cost-effective. For most purposes, Schaaf claims the best kind is low-pressure sodium (LPS) lighting. LPS is essentially monochromatic and hence easy to filter out; it is also free of glare, and this is the primary reason for its choice as runway lights on U.S. navy aircraft carriers; LPS lighting on highways has resulted in a 36% decrease in accidents compared to other types of illumination.

In such Arizona cities as Flagstaff and, most recently, in San Diego County, California, legislation has been passed requiring that all advertising lighting of businesses not open to the public after 11:00 p.m. or midnight be turned off at that time. Such legislation has met with approval from Arizona businessmen who claim that sales have not been adversely affected and that they have saved money. A study by the U.S. Department of Justice in the late 1970s has shown no correlation between outdoor lighting and crime levels so that this argument has no basis in fact. (Yet the costly myth persists!) Lowell Observatory has measured a reduction of one-third in skyglow from Flagstaff, Arizona at 11:00 p.m., when advertising lighting goes off.

Schaaf suggests the most important reform to achieve lighting only *where* necessary may be the establishment of streetlight placement codes. Many American cities have their spacing of streetlights determined haphazardly, and therefore wastefully, by a combination of electric company and individual interests, rather than community interest. But this too can be rectified. For example, by making greater use of dark surfaces such as grass and asphalt, not only would glare be greatly reduced, but just as importantly, there would be as much as a 90% reduction in skyglow over urban areas. Outdoor lights could also be shielded with cut-offs preventing light from extending to the horizontal. At present 40% of light is directed to the sky; furthermore, another 30 to 50% is reflected to the sky from bright surfaces such as concrete, contributing to a 70 to 90% wasted illumination. Those cities which have adopted systematic codes for the spacing of lights have found that many misplaced or redundant lights could be removed, producing a great financial savings with actually safer illumination. A study conducted by East Brunswick, a northern New Jersey municipality of no more than 40,000 people, concluded in 1983 that the city's streetlighting budget could be reduced in this manner by almost one-third, with a savings of approximately \$100,000. Giant electric company rate hikes have greatly diminished the amount the city has actually been able to reduce its budget in the period after that prediction, but East Brunswick is continuing its conservation efforts and is cited by Schaaf as an excellent model of reducing the amount of lighting for greater efficiency and savings.

In Ontario, the need for some sort of light dimming program in order to provide city dwellers of Ontario with an enhanced view of Comet Halley in March 1986 came up in the Ontario Legislature on Dec. 13, 1985. The member bringing up this matter was Richard Allen, MPP for Hamilton West. We

should commend and encourage him to research means for permanent reforms.

Perhaps amateur astronomers could help reduce the light pollution problem by educating the public on the costly aspects of wasteful outdoor practices. Planetaria could address the issue via simulation of the effects of urban light pollution as well as providing attendants with brochures on the cause and curse of the problem.

Daniel Kahraman continuously monitors this problem, and encourages all readers to keep him informed of their local situations. Send your reports to Daniel Kahraman, R.R. 3, Wheatley, Ontario N0P 2P0.

1986 R.A.S.C. General Assembly June 26 to June 30, 1986 Winnipeg, Manitoba

The General Assembly is the annual conference of our Society and each year is hosted by a different Centre. From its beginnings as purely a business meeting for the election of new officers and the presentation of financial reports, the G.A. has grown to a splendid four day event highlighted by paper sessions, banquets, luncheons, display competitions, slide shows, song contests, and tours of local sites. This year's General Assembly is being hosted by the Winnipeg Centre which is also celebrating its 75th anniversary as a member of the Society.

Programme Highlights:

Thursday, June 26	Helen Sawyer Hogg Lecture
Friday, June 27	Buffalo Bash (Wine & Cheese Party); Murphy Slide Night; Song Contest
Saturday, June 28	Paper Sessions; Visit to Manitoba Museum/Planetarium; Riverboat Cruise
Sunday, June 29	Paper Sessions; Annual General Meeting; Banquet & 75th Birthday Party
Monday, June 30	Tours to Pinawa Nuclear Research Station and Seven Sisters Hydro Generating Station

Conference Registration: Forms were sent to all Centres in March. Members interested in attending should return a form plus cheque payable to R.A.S.C. Winnipeg Centre by May 30 to: Lorence Mlodzinski, 901 Fleming Avenue, Winnipeg Manitoba R2K 1V7 (204) 668-3974.

Fees: Basic Conference fee, \$60.00.

Additional charges for Sunday Banquet (\$22.00) and Monday Tours (\$15.00).

Accommodation at University of Manitoba (\$20-Single, \$14-Double).

University Transportation \$10.

Meals at University (B-\$3; L-\$4.60; D-\$5.40).

Paper Sessions: Paper are limited to 10 minutes in length. Abstracts of 150 words approved by your Centre Council should be forwarded to Chris Rutkowski of G.A. Paper Committee. Deadline for abstracts being received is April 30.

Display Competition: This is open to all members. Prizes available for winning entries. Details found in December 1985 *National Newsletter* and in Registration Package. Exhibit Registration Form available.

Murphy Slide Night and Song Contest: Bring along your favourite slides and your favourite astronomical songs.

Plan to Attend!