

---

# NATIONAL NEWSLETTER

Royal Astronomical Society of Canada

Supplement to the *Journal*

Vol. 81, No. 5    October 1987

---



The western portion of the Veil Nebula (NGC6960) in the constellation of Cygnus. Prime focus photograph using a 10 inch Newtonian telescope and 45 minutes on hypered 2415 film. *Photo by Bryce Heartwell.*

## 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.

*Editor:* IAN G. MCGREGOR

*Mailing Address:*  
McLaughlin Planetarium  
100 Queen's Park  
Toronto, Ontario M5S 2C6

*Editorial Staff:*  
HARLAN CREIGHTON, DAVID LEVY, DAMIEN LEMAY, BETTY ROBINSON, STEVEN SPINNEY  
*University of Toronto Press Liaison:* AL WEIR

Deadline for February issue is December 1.

### Observations About Graze Observations

by Frank Shinn  
Victoria Centre

Mark Zalcik's account in the June *Newsletter* (Vol. 81 No. 3 June 1987, 48) brought several experiences to my mind, some of these go back quite a time, and back to Winnipeg as a "Standard Station."

One thing we learned early in the game was the necessity of checking out the observing sites before the time of the intended graze expedition. Never was that more brought to my attention than on one graze when it had been predicted that the graze path would cross the Trans Canada Highway within two miles of my residence. "Oh yes," I said to myself, "that's at the intersection of the highway and that certain road. I know that. No sense in wasting timing going there, I know the site perfectly."

We got the group together early at our home, went through the procedures, selected who would be at which station, and departed, confident that we would locate our precise latitude and longitude by easy measurement from the intersection. When we got there we found a highway construction crew had dug up the entire intersection, detours were in force, and the road I had intended to use as a measuring edge was completely blocked off half a block from the planned observation position. We quickly discussed our plans in view of the new conditions, then each took off looking for a site to make observations. After the event, two or three of us had timings and one reported a miss though from his reported position he should have seen an occultation. A report was sent to Dr. David Dunham and it was duly acknowledged with the additional comment that he thought we had reported the "coldest graze on record." The temperature had been minus 15 degrees Celsius!

Cold was one of our troubles in Winnipeg. There was an expedition one November which required us to be on the west shore of Lake Winnipeg at about 10:30pm. Everyone agreed to go – they were an enthusiastic lot and distance was no deterrent. However, none of us had ever been that far up the west shore before. An inquiry to the Motor League assured us that the road was open even though the winter had begun.

We left Winnipeg in three cars in the late afternoon and headed north. At the town of Riverton we stopped facing the railway crossing and looked for someone to give us directions. I found a barber about to begin his ministrations to a chap who had just seated himself in the chair.

“Could you tell me where we find the road north from here?” I asked.

“Sure, you just cross the tracks and go straight on out” he replied.

I returned to the expedition, reported the directions and we crossed the tracks. About 100 metres along the road changed direction to the north and the snow at the edges got deeper. Two hundred metres further along the road petered out. We stopped to turn around and one of the vehicles got stuck in the snow. We manhandled the car back on the road and returned towards the railway tracks. En route we overtook a couple of teenagers.

“Where do we find the road north?” we asked.

“Oh, just cross the tracks and it heads right out,” they assured us.

We again crossed the tracks and this time headed west. But this was still not right. We stopped and returned to the barbershop.

“Believe it or not,” I said, “I’m still here. How did you say we find the road north?”

“Just head north across the tracks and keep going” he replied.

I returned to the car which was facing north and suddenly noticed that the railroad track divided just beyond our original crossing, and a western branch crossed the road I was facing. If we proceeded in that direction all we had to do was “cross the tracks and head on north.” We continued on our trip but arrived ten minutes too late at Ground Zero for the graze.

For another graze taking place south of Winnipeg only Paul Moffat and I were available to go. We arrived at the predetermined ground zero point, set up our telescopes and timing equipment and awaited the predicted time. It came, and so did a brilliant aurora which permitted the moon to be seen but obscured the star!

Then there was the time when Dr. Dunham sent us very precise predictions of a graze which was to cross the Trans Canada highway east of Winnipeg. As the graze was being used to test motions of the North American continent, we needed to know our latitude and longitude to a maximum error of about nine metres! Sheila Nixon was president of the Winnipeg Centre at that time. We had a planning meeting and five carloads of observers decided to try to make observations. We located a road intersection and decided to use it as a starting point from which precise measurement would be made in the daylight if we successfully observed the graze.

We left the city, the sky became beautifully dark, and the stars shone with unbelievable brilliance. We reached the intersection and moved the estimated distance to bracket ground zero and the graze path. But where were we? Right in front of the only gas station between Winnipeg and Lake of the Woods complete with mercury vapour lights. The proprietor of the station was very curious when five cars suddenly stopped in front of his station. I went across to him, pulled out my membership card and explained what we were doing. “O.K., its after 11:00 pm anyway. I’ll shut them off for you.” he said. The lights went out and I returned to the cars. Sheila said “I don’t think he needs to, look up.” I did. Clouds had moved in.

There were other grazes but one stands out in my memory. It was an early morning graze of Venus, a truly rare event, and I certainly checked out the predicted site well in advance. I had detailed maps, pinpointed an intersection, and even found a survey stake with a number and latitude and longitude markings on it.

The morning arrived and we were joined by groups from Minneapolis and Chicago. Unfortunately, clouds covered the moon but a shift in location gave us both the moon and planet. I got out the telescope while Roy Belfield got ready to photograph the event. The two objects were in the same field at the same time and were both in the same crescent phase! It had never occurred to me that both would be lighted by the Sun in the same way. I can still see that image but unfortunately not the graze. The clouds returned before the predicted time.

After returning to the city, I checked the latitude and longitude as shown by the road intersection on my map and the survey stake. They did not agree. I contacted the Provincial Surveyor, Ralph Miller, whom I had known since school days.

“What was the number on the stake?” he asked. When I had answered, he said, “Oh, that is one of the old survey markers. In the old days they were using chains to measure distances, but after some years of use the links were so worn their distances are all too long.”

If you are going on a graze expedition plan well in advance to check out your site and determine your position and the graze path.

## Across the RASC

by Betty Robinson  
Assistant Editor

**KINGSTON:** Kingston Centre held their Astronomy Day activities on May 9. Over a dozen members took part in two activities: a display at the Frontenac Mall and a public star night in MacDonald Park. At the May meeting, Dr. Gunter Wessel of the Syracuse Astronomical Society presented a fascinating talk and slide show on the rotation of galaxies. Member David Stokes was invited to Washington in May to attend a conference with international experts on the subject of lunar calendars and early sightings of the new moon.

**KITCHENER-WATERLOO:** In May and June, the centre hosted two star nights. Two groups of public school students from Guelph travelled to the centre's Ayr Observatory to observe through the 12-inch reflector. A star night was also held at the Guelph Lake Conservation Area, this time for the general public. On Saturday, June 20, the annual picnic was held but due to hazy skies only five members attended. They were however rewarded with the sighting of a brilliant -8 to -10 magnitude fireball.

**LONDON:** Youth member Alexander Wieckowski took first place in the Senior Physical Sciences category at the London District Science Fair. His project was the N-body problem in space. One of his prizes is a 1988 membership in the RASC.

**NIAGARA:** The garage sale scheduled for late May was a huge success. The Centre raised \$235 towards the purchase of a photocopier. A second sale was scheduled for July 11. On June 6, Niagara Centre set up a display at the Niagara Square shopping mall. A club crest should be ready soon. Secretary Walter Jutting ordered 20 car bumper stickers with "RASC NIAGARA – ASTRONOMY IS FUN!" on them. They are to be sold to members, with profits going towards the Centre's building fund. Busy summer activities included public star nights, a display at the St. Catharines Centennial Public Library for the month of July and trips to the Syracuse Summer Seminar in Vesper, New York. After five years of service, Ron Gasbarini is stepping down as editor of *Niagara Whirlpool*. The Historical Committee is making steady progress in the reprinting of documents for their book, *A Brief History of the Niagara Centre*. Hopefully, the book will be available in about two years. Reverend Norman Green, one of the founding fathers of the Niagara Centre, has offered to write the foreword to the book as well as an article.

**OTTAWA:** The Mississippi Valley Conservation Authority has submitted a proposal for construction of a new access road to the Ottawa Centre's observatory. Members Paul Comision and Rob McCallum are thinking about starting an equipment loan library within the centre.

**QUEBEC:** La saison festive est une période où de nombreuses activités astronomiques occupent les gens du Centre de Québec.

En juin nous avons tenu notre assemblée annuelle. Aucune décision importante a marqué la réunion. Cependant l'équipe se réjouit de l'impact positif qu'ont donné les changements sur les différentes activités. La participation des membres à celles-ci atteint une moyenne intéressante. De plus quelques membres sont sur des projets de construction d'instruments d'observations. Entre autres, Luc Simard a réalisé un radiotélescope du type hélicoïdale dont la fréquence d'observations est de 400 MHz. Certaines vérifications au niveau du récepteur sont à effectuées mais déjà un autre radiotélescope est sur le point d'entrer en opération. Il existe dans la région un club de radioastronomie *Chevalier Des Ondes* qui possède deux (2) antennes. A l'une d'entre elle nous lui avons fabriqué un dipôle pour travailler à 400 MHz. A deux reprises nous avons fait des observations du soleil. Malheureusement il nous est impossible de tirer de ces observations une quelconque conclusion.

Les 19, 20 et 21 juin se déroulait un autre Congrès de notre association provinciale (l'Association des Groupes de Amateurs Astronomes). Pour la première fois le Centre a rapporté un prix, celui du meilleur kiosque.

Au cours du mois de juillet deux événements majeurs se sont produits. *L'Expo-Science Internationale et le Festival de la Mont-Mégantique*. La première manifestation se déroulait à l'Université Laval du 10 au 13. Quelques centaines de scientifiques amateurs d'une trentaine de pays exposaient leur réalisation. Ce que les membres du Centre retiendront de ces quelques jours, c'est la soirée d'observation avens tenue sur la terrasse Duferin. Un endroit dans le vieux Québec avec une vue sur le fleuve où des milliers de personnes défilent, particulièrement à cette date. Le cinquième Festival de la Mont-Mégantique revenait cette année les 17, 18 et 19 juillet. Encore une fois des représentants du centre ont participé mais pas Dame Nature.

SASKATOON: Although Astronomy Day was considered to be a success this year, public attendance was less than last year. Star nights at Diefenbaker Park were scheduled for July 3 and 4, with a member's picnic also planned for the Saturday.

TORONTO: Public star nights were held at Harbourfront in July and August. Astronomy Day was also held at Harbourfront on August 22. All events were reasonably well-attended, although not as popular as last year's events. The annual picnic and open house at the David Dunlap Observatory were scheduled for September 19, and the annual awards banquet for November 21. The Solar Eclipse committee is organizing an expedition open to all RASC members to the March 1988 eclipse in the Philippines.

VANCOUVER: Members travelled to the Goldenvale Observatory in southern Washington state in June. Another field trip was scheduled for July to Manning Park. President Karl Miller moved to Toronto in mid-August. Greg Soderling will be acting president until the centre's annual meeting in November.

WINDSOR: Dan Taylor, Brian Perry, Al Legary and some other members took pictures and observed the spectacular occultation of Venus on April 25.

## **Awards of the RASC 1987–1988**

As outlined in the Annual Report of the Society for 1978, page 31 ff, awards may from time to time be conferred upon members in recognition of meritorious service or achievement. Recommendations for such awards should in most cases be made through the Council of the local Centre. Unattached members may submit recommendations, if they so wish, to the National Council for consideration by the National Council. Centre Councils will, of course, submit recommendations as they see fit to the National Council for final approval.

### *CHANT MEDAL*

The Chant Medal of the Society was established in 1940 in appreciation of the great work of the late Professor C.A. Chant in furthering the interests of astronomy in Canada. This medal is awarded, not oftener than once a year, to any amateur astronomer resident in Canada on the basis of the value of the work which he or she has carried out in astronomy and closely allied fields of investigation. Nominations (including citations) should reach the National Office by December 31.

### *SERVICE AWARD MEDAL*

The Service Award was established in 1959, on recommendation of a special committee of the National Council. This bronze medal is presented to members who have performed outstanding service to a centre or to the National Society. Nominations should reach the National Office by December 31.

*KEN CHILTON PRIZE*

The Ken Chilton Prize was established in 1977 by the National Council of the Society in remembrance of the late K.E. Chilton, an active member of the Hamilton Centre. The prize is awarded annually to an amateur astronomer resident in Canada, in recognition of a significant piece of astronomical work carried out or published during the year. Nominations should reach the National Office by December 31.

*SIMON NEWCOMB AWARD*

The Simon Newcomb Award is named in honour of the famous Canadian astronomer Simon Newcomb (1835-1909) who was born in Nova Scotia and later served for 20 years as Superintendent of the American Ephemeris and National Almanac Office at the United States Naval Observatory in Washington. The award was created in 1978 by the National Council on the initiative of the Halifax Centre. The intent of the Simon Newcomb Award is to recognize literary ability among members of the Society who are not professional astronomers. Submitted articles must be original and should not have been previously published in any substantially similar form (although appearance in Centre newsletters is permissible).

*Who can enter?* Any member of the Society who does their astronomy purely as a hobby.

*Format:* The article(s) should be no more than 2,500 words in length, be written in proper grammatical form, and be presented typewritten and double-spaced. Diagrams need not be in a finished form but should be complete and ready for drafting. Photographs may also be submitted and, if possible, original negatives should accompany the submission. The author(s) name(s) should appear only on the title page and reference to Centre affiliation should not appear in the article.

*Submission of Entries:* Articles must be received by the National Awards Committee between January 1 and March 31. Members of Centres must first submit their entries to their Centre Executive for its approval before submission to the National Awards Committee. Unattached members should make their submissions directly to the Committee c/o RASC National Office.

*Judging:* Articles are judged on their scientific accuracy, originality, and literary merit.

*Presentation:* The award is presented at the General Assembly and remains in the hands of the winner's Centre for display until the following April.

For further details on the Simon Newcomb Award, contact the Awards Committee, RASC National Office, 136 Dupont Street, Toronto, Ontario M5R 1V2, or contact your Centre Secretary.

**Due\$ Due**

The 1988 membership year began October 1, 1987. It is time for all regular and youth members to renew their memberships with the Society. The national fees for the 1988 year are:

Regular Membership	\$25.00
Youth Membership (under 18 years of age)	\$15.00
Life Membership	\$500.00

For all foreign members, residents in the United States and overseas, these amounts are quoted in U.S. Funds.

Fees should be sent to your Centre Treasurer, or if you are an unattached member, directly to the National Office. By the time you read this note the new 1988 *Observer's Handbook* should be in the hands of Centres and ready for distribution to paid-up 1988 members.

RASC membership is one of the best bargains around. Renew now!

## Binocular Testing

by Paul Bigelow  
Kitchener-Waterloo Centre

A few years ago before I got really interested in astronomy, I bought a pair of 7 x 35 Carl Wetzlar Navigator binoculars for general purpose use. After I became interested in both astronomy and birding, I bought a pair of Bushnell Sportview 7 x 50s, as a compromise for both uses.

The Carl Wetzlar 7 x 35s were rated as a "best buy" in a survey of binoculars under \$100 in the July 1983 issue of *Canadian Consumer* magazine. The price varies a lot, depending on whether or not they are on sale, but usually they are in the \$30 range. They are marked as having a field of view of 358 feet at 1000 yards which is equivalent to a viewing angle of slightly less than seven degrees. When used with eyeglasses, the viewing angle is reduced further to five degrees or less. Although the right eyepiece is adjustable for vision compensation, I almost never use binoculars without my eyeglasses. It is a real pain to keep taking off and putting on glasses to refer to star maps or to do a naked eye observation. Because it always feels like I am looking down a long tunnel, I have always hated using these binoculars. Also, there are no rubber eyecups and I am always afraid of scratching my glasses on the hard plastic eyepiece tube.

I purchased the Bushnell 7 x 50s for \$110. They are stamped as having a field of view of 394 feet at 1000 yards which is equivalent to about 7.5 degrees. When used with eyeglasses, the viewing angle is only slightly reduced. They came with rubber eyecups which tore off after only a few flexings. However, the rubber bases left behind provide good cushioning. These binoculars are a real joy to use with eyeglasses. They too have an adjustable right eyepiece for vision compensation. The larger objective lenses admit more light which allows much fainter objects to be seen in the sky, as compared to the 7 x 35s. They are rather heavy to carry on long birding hikes, but they are great for seeing birds in dim forests. This model has an "Insta-focus" touch bar rather than a center wheel for focusing. This is fantastic for looking at a nuthatch 15 feet away and then a hawk soaring a mile above, but it is real annoyance when observing the night sky. I want to set the focus to infinity and then not have to touch it for the rest of the evening. The "Insta-focus" bar is so responsive that I am always knocking it out of focus. Just the weight of the binoculars pressing against my face when I look straight up is enough to affect the focus.

Storm Dunlop in his book *Astronomy: A Step-by-Step Guide to the Night Sky* lists a number of simple visual tests that can be performed to test binoculars. I ran through them for both pairs of binoculars.

*Internal reflections* can be reduced by coating the optics. If the reflection of a light bulb in the lenses looks coloured that probably means that they are coated. The 7 x 35s did not appear to be coated. When viewing bright objects like the moon, I did not get double images but the background was completely fogged with bright light. The 7 x 50s had a purple reflection and indeed they were stamped "fully coated optics". When viewing the moon I did get faint double and triple images but the background stayed relatively dark.

*Chromatic aberration* shows up as colours on a sharp dividing line between dark and light such as the edge of a distant building or the limb of the moon. Neither pair showed any colour in the daytime but I thought I could see very slight colouration in both when viewing the moon. Definitely not a major problem.

*Distortion* shows as a bowing in or out when scanning a straight line or a rectangular pattern like a brick wall. Both pairs showed slight bowing but it was more noticeable in the 7 x 35s.

*Astigmatism* shows up as non-circular images of stars. This should be checked both in and out of focus. Both showed some evidence of this, especially when out of focus. The effect was much more pronounced in the 7 x 50s. Both binoculars have the very annoying problem of turning the bright stars and the planets into crosses instead of points or discs. This means that I have no hope of trying to see the "ears" of Saturn, and Jupiter's moons have to be fairly far from the planet's disc before I can resolve them. I am not sure if this is a symptom of astigmatism or of internal reflections. Anybody know for sure?

*Curvature of field* shows up as objects at the edge being out of focus when the center is in sharp focus. This was very noticeable in the 7 x 35s but only slightly present in the 7 x 50s.

*Coma* is elongation of images at the edge of the field I did not notice any in either pair.

*Alignment* is tested by holding the binoculars away from your eyes and then examining a straight edged object. A horizontal line should continue at exactly the same level from one eyepiece to the other. I noticed no problems with either pair, but according to the *Canadian Consumer* article, it can be a very severe problem with some cheap binoculars.

*Light transmission* can be impeded by the fact that objectives are round and prisms are not. If you hold the binoculars about a foot away, the light coming through the eyepieces should appear circular and evenly illuminated. Both binoculars showed "squaring of the circle" with dimmer patches at the edges. The 7 x 50s had larger dim patches than the 7 x 35s. This dimming around the edges is very common in lower priced binoculars

If I had a second chance, would I buy them all over again? In short, no.

I definitely would not buy the Carl Wetzlar 7 x 35s again because they are almost unusable with eyeglasses. However for someone with 20/20 vision they might be a good buy. Terence Dickinson in his book *Nightwatch* recommends against buying any binoculars under \$100 and he recommend either 7 x 50s or 10 x 50's. However, if you are on an extremely tight budget, something that lets you observe objects beyond naked eye range is probably better than nothing at all. Interestingly, Leslie Peltier in *Guide to the Stars: Exploring the Sky with Binoculars* said that all things being equal, he preferred 7 x 35s. He felt that in urban skies the darker field of the 7 x 35s gave sharper contrast. All things are not equal between my two binoculars, but I find that the darker field of the 7 x 35s is just that-darker! The extra light gathering ability of the 7 x 50s allows me to see things that are just not visible in the 7 x 35s.

I have been a lot happier with my Bushnell Sportview 7 x 35s but still, astronomy is the most exacting use that binoculars could be used for, and I do not feel that they can quite measure up. It mostly comes down to how much I can afford. Since I do not have \$700 to \$1000 for high class binoculars like Leitz, I think my best move would have been to spend the \$200 for one model range up, like the Bushnell Explorer. I would however stay away from any model with "Insta-focus." The 10 x 50 extra wide angle Bushnell Explorer II has been recommended and I would agree that the 10 x 50 size makes more sense. Although some writers say that magnifications greater than 7 are hard to hold steady, I think that 10 is still within reason. I have often wished for a bit more magnification, and the smaller exit pupil makes a darker background.

Are you happy with your binoculars? I would be interested in hearing about them and probably so would the rest of our readers. Write to me at: 114 Westvale Drive, Waterloo, Ontario N2T 1J2.

Reprinted from Kitchener-Waterloo's *Pulsar*

## Solar Eclipse '88

by David Hurd  
H.R. MacMillan Planetarium

It is mid-morning, March 18, 1988. Aboard the luxury liner Sea Princess located offshore in the Celebes Sea south of the Philippines, the sky darkens. Solar eclipse 1988 occurs.

Vancouver's H.R. MacMillan Planetarium, in conjunction with P. Lawson Travel, is arranging a tour to view the 1988 eclipse. Eclipse viewing from on board the Sea Princess will take place somewhere along the path of totality between eastern Borneo and General Santos city on Mindanao in the Philippines. Although land-based observing is superior from a photographic perspective, the mobility of the ship will allow us to sail to clear weather if clouds are a problem.



The cruise has ports of call at Singapore, Bangkok, Kota Kinabalu, Manila and Hong Kong. We are expecting as many as 200 Canadians to be aboard. The cruise is of 14 or 17 days duration, and includes all connecting airfare. Prices are in the range of \$4000 to \$10,000 CDN. There will be a number of experienced tour guides on board to advise on eclipse viewing, photography, and the various aspects of eclipses. They will include MacMillan Planetarium staff members, members of the Vancouver Centre RASC, and possibly some celebrities.

For further information contact any P. Lawson Travel Office or Eric Dunn, David Dodge, or David Hurd at the MacMillan Planetarium. The planetarium can be reached at: H.R. MacMillan Planetarium, 1100 Chestnut Street, Vancouver, British Columbia V6J 3J9, or by phoning (604) 736-4431.

## Observer's Cage

by David H. Levy

### Saying Goodbye

If you are interested in observing faint fuzzies under a good sky, you really should consider going to some dark site in Arizona, New Mexico, or Texas. One such opportunity is provided by the Texas Star Party which is held at a ranch a few kilometres from the MacDonald Observatory. Here, the sky is darker than almost anywhere else.

The 1986 Star Party was held in early May to provide one final look at the departing Comet Halley. Observers came to set up their telescopes to see the fading comet while others had just returned from the southern hemisphere and wanted one more look to say goodbye. Most of the others, tired of Halleymania, were just happy to see it go. I was saying farewell to a comet I had loved and had studied intensely as both an amateur and a professional. I felt I was losing a friend.

I should not have been so worried, for Halley had no intention of saying goodbye just yet. In November, the comet reappeared from conjunction with the sun and was a bit brighter than expected. During 1987 it has faded slowly but always remained visible in large amateur telescopes. In March, April and early May I participated in a project with the 60 inch University of Arizona telescope to try to determine the rotation period. Halley seems to display two periods of 2.2 and 7.4 days and we hoped to find out which one was observable. Then in late April, Halley surprised everyone by suddenly erupting by almost 1.5 magnitudes over a couple of days before fading.

Thus a year later after we had all said goodbye we were all back at the Texas Star Party saying goodbye again. I used some pretty good star charts and a 24 inch telescope belonging to some observers from Oklahoma who had at least some tolerance for my desire to look at Halley one more time. Most of the other telescopes were run by people who did not want to give little Halley the time of night. "Deep Sky!" was their chant, as they turned their telescopes to the thousands of fixed faint fuzzies all over the sky. These objects are star clusters, bright and dark nebulae in our own galaxy, and distant galaxies scattered about the edge of creation. Last year we looked at one of them in which a supernova had erupted. "My," we had thought, "what if we get a nearby supernova!" We did. This year's supernova is in the nearby Large Magellanic Cloud, too far south to be seen from Texas. but as we looked through the telescopes we spoke of it often, seeing it as some sort of extragalactic twist on a Beatles song such as "There Goes The Sun". Whenever we talked supernovae, or nebulae or galaxies, everyone was a friend. But mention little Halley, and people would not let you get near their telescopes.

I can understand this reaction. The press covered Halley as if it would be the apparition of the century. Those of us who enjoy all comets saw it as just another really interesting comet, a better way to feel, since we are left with an undiminished love for these objects.

In any event, the Oklahoma club did not mind if I used their beautiful telescope to look for a beautiful comet. The field was strewn with faint galaxies, but right where it belonged was a circular, faint smudge of light, Comet Halley shining at magnitude 13.8. Several other comets had come and gone in the meantime, yet here was one that seemed to want to stay for a while. If it did not walk off the stage with the rave reviews it got in 1910, Halley certainly gave us all a time we will never forget and a memory we can leave for our next generation.

## Beginners' Guide To Astrophotography Part 4

by Bryce Heartwell  
Edmonton Centre

### *What is guiding?*

Guiding is necessary when prime focus photography or piggyback photography with long focal lenses is attempted.

Celestial objects appear to move across the sky because of the rotation of the earth. Therefore, a telescope used for photography must be equipped with some type of drive to compensate for this movement. Most telescope drives track relatively well but even the best do not track the stars perfectly. Due to this imperfection, the telescope drive must be corrected during long photographic exposures by using a drive corrector and/or some other type of manual correcting device. The observer makes corrections while monitoring the motion of a "guide star" which is centered in the eyepiece of a guide telescope or off-axis guider. The guide star is near the celestial object that is being photographed.

The process of making corrections during a photographic exposure is known as "guiding."

### *When is guiding required?*

Any time a long exposure is made of celestial objects with a telescope or long focal length lens, the exposure must be guided. If the exposure is not guided, the stars on the film will form lines or streaks rather than pinpoint images and the object that was being photographed will be blurred.

### *Reasons for Guiding*

#### 1) *Telescope R.A. drive gear inaccuracy:*

It is impossible to manufacture absolutely perfect gears for drives and these imperfections show themselves during long exposure photographs. The gears have microscopic peaks and valleys on them which make the drive speed up or slow down. There are higher quality drives available for telescopes and these drives reduce the number of corrections that are required in right ascension (R.A.), however, corrections still have to be made periodically.

#### 2) *Poor Polar Alignment*

Any drift of the guide star in declination (north or south) is caused by poor polar alignment. The drift will always be in one direction and at a steady pace. The farther out the polar alignment is, the faster the drift will be.

#### 3) *Atmospheric Refraction*

The earth's atmosphere is never still and the air tends to layer because of temperature differentials. These layers act like lenses which refract starlight as it passes through them. The guide star will be seen moving around in the eyepiece. Also the air will sometimes be so turbulent that photography becomes difficult or impossible.

#### 4) *Power Supply Fluctuations*

If the drive is running off a power source that is not stable, the drive will not track properly. If the drive is being fed from an AC power source, any change in supply frequency will cause the drive to track improperly if a synchronous motor is being used.

### *Equipment for Guiding*

1) A telescope with an equatorial mount with a R.A. drive and a Declination slow motion (manual or motorized – motorized – Newtonian-type telescopes).

2) A drive corrector, either single or dual axis. The drive corrector is a device that alters the power supply frequency that is feeding the main R.A. drive gear motor. This has the effect of speeding up or slowing down the motor to allow corrections to be made. A dual axis drive corrector has the ability to make adjustments in right ascension as well as declination by operating a second motor for declination.

3) An illuminated reticle eyepiece. This is a special eyepiece that has reticle lines inscribed in it that are illuminated to show up against the dark sky. A guide star is placed at the center of this eyepiece and is kept there during an exposure by making corrections.

4) An off-axis guider or guide telescope. A guide telescope is a second scope that is mounted along side the main instrument and is used to monitor the guide star. An off-axis guider is a device that allows both photography and guiding using only one telescope. It is used for prime focus photography. The off-axis guider has many advantages over a guide telescope. For piggyback photography the main telescope can be used as a guide telescope.

### *Guiding Magnification*

To allow the photographer to see guiding errors before they show up in the picture, the guiding system, whether it is a guide telescope, or an off-axis guider must have enough magnification. There is a rule of thumb about magnification for guiding when prime focus photography is done:

The guiding magnification should be at least five times the focal length (in inches) of the telescope being used to take the photograph.

For example: An 8 inch f/10 telescope has a focal length of  $8 \times 10 = 80$  inches. Therefore, the minimum guiding magnification should be  $5 \times 80 = 400$  times.

This example shows that a small refractor guide telescope would have a tough time reaching the required magnification if it were being used for guiding. This is where an off-axis guider is a good choice as the main telescope's optics would be used for guiding and an 8 inch telescope should have no trouble reaching 400x. A Barlow lens would probably be necessary to help the telescope achieve the high magnification required.

### *How To Guide*

In previous articles, I described how to set up for various types of photography. The following assumes the telescope has been properly set up, polar aligned, balanced and the object has been centered in the camera.

1. After a guide star has been selected, install a Barlow lens and illuminated reticle eyepiece into the guide telescope or off-axis guider. One point to remember is to try and locate the guiding eyepiece in a position that will be comfortable while guiding. If the eyepiece is in an uncomfortable position, guiding will be difficult and the photographer will not be able to guide for long or mistakes will be made.
2. Turn on the power supply for the reticles and focus them. Carefully adjust the brightness of the lines so that the guide star will not be drowned out. It is also important not to make the lines too dim as your eyes become tired after guiding for long periods of time and the reticle lines may "disappear" after a while which will result in mistakes.
3. Align the reticles to correspond to directions in the sky (ie. right ascension and declination).
4. Center the guide star in the eyepiece and monitor the drift for a minute to see how the drive is working and how much declination drift there is.
5. Check that the camera shutter speed is set to "time" and again check that the object is still centered in the camera viewfinder.
6. Once everything is ready, check the time and using a cable release, open and lock the shutter.
7. Once the shutter is open, you must guide the shot. In other words, you must keep the guide star centered in the reticle eyepiece during the entire exposure by making corrections with the drive corrector. In the reticle eyepiece, the star will be seen to drift away from the center. If the reticle lines

are aligned properly, you will easily be able to determine which type of correction is required (i.e. right ascension and/or declination) to bring the star back to the center.

8. After the desired exposure time, close the shutter, log the exposure information, and move to a new object.

To take good long exposure photographs, the guiding must be good. To become good at guiding requires practice and after a short time anyone can become good at guiding and astrophotography. Try experimenting with different types of films and techniques. A major requirement in becoming a good astrophotographer is patience.

This concludes the series of articles on astrophotography. If anyone has questions, please write to me and I will try to answer them. I also wish to acknowledge the book *A Complete Manual of Amateur Astronomy* by P.C. Sherrod, Prentice-Hall, New Jersey, 1981 as a reference.

Bryce Heartwell  
Box 1082  
Stony Plain, Alberta  
T0E 2G0

## Alberta Star Party

by Simon Hum  
Calgary Centre

The First Annual Alberta Star Party was held July 24–26 in Chain Lakes Provincial Park situated in the southwest foothills of Alberta.

The idea of an Alberta Star Party was conceived several years ago and fashioned after the well-known U.S. based star parties, such as the Texas Star Party. Many Alberta observers had expressed keen interest in a regional event since the Mt. Kobau Star Party in British Columbia, and other similar events elsewhere in Canada were too far for them to attend. Then, earlier this year, I approached the Calgary Centre Council to sponsor an Albertan event.

The purpose of this project was to support and bring together amateur astronomers from across the province, to have a social gathering, and to hopefully do some dark sky observing. The attendance of any out-of-province enthusiasts would make the gathering all the more interesting. Another idea was to promote regional amateur astronomy by holding the Star Party at a different location within the province each year. The Calgary Centre had the task of planning and hosting this first gathering.

The Star Party was promoted through the media as well as through provincial astronomical newsletters, major astronomical publications and city press coverage.

Prior to the event, the weather in July had been terrible. Statistically, June is Alberta's wet month while July and August are relatively moisture free. This year, of course, things had reversed. I had monitored the weather for the five weekends prior to the event, and all were rainy. The rain in fact continued until July 22, when remarkably, the weather improved.

The next day the skies cleared and on the 24th we were on our way. Chain Lakes Provincial Park is about 14 hours drive south of Calgary (assuming one heeds the speed limit). Fellow amateurs from throughout the province came and in total over 140 people attended. Many brought telescopes, the largest being an 80 cm trailer mounted classical Cassegrain design from Calgary. This was as much a social event for hardcore observers as it was to the novice who had no optical aid. After all, the object was to promote and enhance amateur astronomy.

Guest speakers were featured at the start of each evening's activities. This year the speakers were: Peter Ceravolo, president of the Edmonton Centre, speaking on "Choice Optics"; Alan Dyer of the Edmonton Space Sciences Centre speaking on "Riverside '87" (one of the most famous annual star parties); Jim Himer, a Calgary Centre past president who presented a talk on "Astronomical Seeing"; and your writer who spoke on "Astrophotography".

The skies cooperated on both evenings with seeing conditions good enough to resolve four of the five components of Stephen's Quintet with a 30 cm telescope. The town of Nanton (population about 2000)

located 40 km to the east was the closest populated site. This was not a serious problem, as no stray light was noticeable on the horizon. Therefore, viewing continued until before dawn when we would crawl into out tents for a brief nap until awakened by the morning activities.

The response to the First Alberta Star Party was favourable and we wish Edmonton, the host for 1988, success. Those interested in attending next year's event should contact the Edmonton Centre early in the upcoming year.

## **Syracuse Summer Seminar**

by **Denise Sabatini**  
**Syracuse Astronomical Society**

The Syracuse Astronomical Society held its 17th Niagara Frontier Council of Amateur Astronomical Associations (NFCAAA) seminar August 14 to 16 at the Darling Hill Observatory in Vesper, New York. Among the groups represented were the Niagara Centre RASC, the Kingston Centre RASC, the London Centre RASC, the Rochester society, the Corning-Elmira society, the Waterdown society and the Syracuse society.

Participation in the four contests (Photography, Bake-Off, Observing and Kite Flying) was good. Tom Dey from the Rochester Society took first place in the Deep Space and Solar System categories in the Photography contest. His photos of the Rosette Nebula and the asteroid Astraea as it was passing through the M44 star cluster were nothing short of spectacular.

In addition to the paper talks, a special exhibit of lunar soil samples was presented by Rose Camarda. The six samples showed basalt, breccia, highland soil, anorthosite rock, mare soil and orange soil and as well, NASA provided a film and tapes to accompany the samples.

A special feature held this year was a tour of the Holden Observatory at Syracuse University to celebrate its 100th anniversary. The Observatory houses an 8 inch Alvin Clark refractor which was installed by Alvin Clark. Apart from the replacement of the weight driven clock drive and the gas lights, the building remains much as it was in 1887. The dome and shutter are still moved by hand.

Dr. Martha Haynes, professor of astronomy at Cornell University, was the guest speaker. She is a radio astronomer who works in the winter at Arecibo, Puerto Rico. One of her many impressive credentials is that she observes the night sky as we amateurs do. She not only knows the night sky but conducts observing sessions for her students and the public, her topic was "The Large Scale Structure in the Universe".

The Syracuse Astronomical Society enjoys conducting this annual event and invites you to attend next year.

## **Nominations for 1988 R.A.S.C. Officers**

The By-Laws of the Society provide for a Nominating Committee composed of the three surviving immediate Past Presidents, whose duty it is to prepare a slate of candidates for the officers of the Society.

In 1988, we must elect a new President, First Vice-President, Second Vice-President, Recorder and Librarian. If any member wishes to make suggestions for nominations, they should contact the Chairman of the Nominating Committee (Dr. Roy Bishop, Avonport, Nova Scotia B0P 1B0) as soon as possible.

The By-Laws provide that "any five members of the Society, in good standing, may nominate candidates for any office, provided that such nomination, accompanied by a letter of acceptance from the nominee, shall be received by the Secretary of the Society, not less than sixty (60) days before the date of the annual meeting."

As the Society's Annual Meeting will be held at the Victoria General Assembly in late June 1987, nominations, together with a short resume should be submitted no later than April 15, 1988 to allow for printing and mailing of ballots to be completed as required.

Full details pertaining to nominations are outlined in By-Law 1, Article 11(a), as published in the Journal, June 1969, pp 155-168.

## And Miles To Go

by Dennis Ryan

### Montreal Centre

“...Climb every mountain, search high and low ...

These words are lyrics from the famous musical, *The Sound Of Music*. They are words suggesting how far a person should be willing to go in order to find true love. Unfortunately, they also suggest how far the amateur astronomer might soon have to go to find decent skies for observing.

Recently, there has been much talk about light pollution and the steps that can be taken to alleviate it, such as better designed lampposts. But another problem is looming on the horizon, if it does not already to a certain extent, exist. The problem is the rapid expansion of our cities.

Toronto is the most obvious example. We visited the David Dunlap Observatory just north of Toronto during this year's General Assembly. I had visited the observatory in 1980 and all around the observatory there still existed farmlands and open fields. But the present economic boom experienced by Toronto is bringing housing complexes to these same fields. In just a few years, the David Dunlap Observatory has found itself in a suburban neighbourhood.

The same is true for Montreal, and probably most cities in Canada. Outlying suburban areas, like Chateauguay, south of Montreal, used to enjoy relatively dark skies. But now, dark skies are a thing of the past as reported by a relative of my wife who has lived in Chateauguay all his life.

The problem is we live in a civilization where the standard for travel speed by private means, the car, is still about 90 km/hr. Of course, the quality of the sky one would get would depend on what was in an area with a 90 km radius. If the area in question was not too built up, the chances of getting good skies would be better.

But as cities expand, it becomes more difficult to find good skies. Since speed limits continue to exist, the idea of getting out into the country with your telescope and perhaps a few like-minded friends for an evening of observing, especially for one of those celestial events better observed under dark skies will become rare. An hour's travelling time is not too bad in most people's minds. But exceed an hour, including coming and going and the time it takes to set up and take down your telescope, and especially during the work week, and the effort required to find a dark site becomes not too appealing.

There is no doubt that this 90 km/one hour standard will be surpassed. It is being passed by public transport but I do not see too many amateurs taking a bus or train to their observation areas. Of course, amateurs can and will move into these outlying suburban areas, if only to be nearer dark skies. But a large city with a bad lighting system also means greater skyglow as well.

There is, in my opinion an imbalance here. The planet's population is growing, and this means the cities will get larger. Unless we have a system of transportation which allows amateur astronomers to get out under dark skies within an hour's time, the idea of getting out of town during the week will no longer exist and even for a weekend will mean going to greater distances. Large observatories are already having problems and for the amateur astronomer, the near future does not look promising.

## Satellite Receives Emmy Award

The federal government's Department of Communication has received an Emmy Award for its work in developing the Hermes satellite which pioneered work in satellite technology. The Hermes satellite was launched into earth orbit in January 1976 and ceased operation in November 1979. It pioneered the use of the Ku band in which satellites receive signals at 14 billion cycles per second (14 KHz) and return them to earth at 12 billion cycles per second (12 GHz). The high power and frequency enables television programs to be broadcast to home dish antennas less than a metre wide and costing less than \$500.

The use of the super high-frequency band operated by Hermes permitted direct broadcasting of television programs, medical data and educational programs to the most remote parts of the world. Today, fourteen satellites operate in the Ku band and broadcast programs of TVOntario, Radio Quebec and some American and Canadian pay TV networks

## Thoughts on Light Pollution

by Alister Ling

On a recent visit to Montreal, I was shocked to notice how some areas had become much brighter due to newly-installed high pressure sodium lights since my last visit. These lights will again reduce the sky quality at the observing sites around the city. What is worse, the fresh, clear winter skies will receive even more scattered light due to the higher reflectivity of the snow. And they say that nuclear bombs are not useful.

While I was in Brisbane, Australia in the spring of 1986 for Comet Halley, the local astronomy club was studying the problem with the help of the city councillors. Incredible, you say? Well, the real reason was to find a way to turn off the city lights for a short time during the passage of Comet Halley so that city-bound people could get a decent look. The street lights were turned off but all pleas to the business community to turn off their lights went largely unheard. During the semi-blackout, various club members ran around the city with simple photometers to measure the brightness of the sky, while their colleagues were showing the comet to the people.

Although the final results are not yet in, the astronomers were able to come to some interesting conclusions:

- 1.) In areas without much business lighting, there was a marked improvement of the sky conditions.
- 2.) City regions towards the core recorded scarcely any improvement.
- 3.) Conflicting observations arose from members located further away from the city, one person noting a better sky overhead, while another mentioned that the sky toward the city showed the greatest change. It is difficult to achieve a representative quantitative sampling of the skies.

Perhaps the most surprising finding was that it tends to be the business lights which contribute most to a city's light pollution. There are a number of reasons for this. Many office complexes leave their fluorescent lights on all night because I am told that the energy required to start them up is more than required to leave them on. The most important fact, though, is that advertising signs have been designed to catch the eye. In other words, they are bright, flashing, dazzling. Furthermore, flat signs with no internal lighting are, in the vast majority of cases lit from below. Any light that misses the sign goes straight up, followed by the light that reflects off the sign.

Nevertheless, the poor design of city lights continues to be the rule. Witness the lighting of St. Catherine Street in downtown Montreal. The lights were put up for "decorative" reasons. Because the lamps are held on their sides, they are free to radiate 50% of their energy straight up, in addition to the light reflected off the street or winter snow.

All of this contributes to the deteriorating sky conditions which can only be improved through education and (wishful thinking) legislation. The only way to approach either government or business is to do so in a helpful manner, rather than lashing out and blaming them. Try to point out ways to improve the efficiency of their lighting by introducing shades to make sure all of the available light is going to its proper place. The power output of the lighting system can then be reduced, saving money (remember, money "talks"! ). If someone can find the designers for regular street lighting and show them that light arriving on the ground one hundred metres away from the source does not really contribute to visibility, they might be tempted to place shades that will make sure no light escapes upward.

Reprinted from Montreal's *Skyward*

## Forty Years of Observing Trends

by Paul Comision  
Ottawa Centre

I first became interested in astronomy after reading the book *Our Wonderful Universe* written by Clarence Augustus Chant. Dr. Chant was instrumental in establishing the David Dunlap Observatory just outside Toronto.

In 1943, at the age of 14, I purchased my first telescope at the great cost of 50 cents. This consisted of

a paper tube with a 1" convex lens at one end. A smaller sliding tube at the other end held a 1" concave lens. This was an excellent time to start into astronomy, as war-time blackouts were in effect. From our backyard in north-western Toronto, the skies were as dark as those of the Ottawa Centre's Indian River Observatory are today.

In the summer of 1944, I joined the Toronto Centre of the RASC as a student member. It was quite fashionable in those days to spend a fair amount of time in observing and learning the face of the moon. Planets were thoroughly studied, including Uranus and Neptune. The big game in deep sky was the splitting of double stars. A typical conversation was "OK, but you were using a 4" reflector-I did it with a 2.4" refractor."

Most club members had binoculars, refractors of 3" and under, and home-made 6" reflectors. The centre had a 5" German-made refractor, which was used four times a year for star nights. Most amateur telescopes at that time had altazimuth mounts. Equatorial mounts were either manually advanced or driven by clockwork. You can guess that with those mounts and slow film there was little, if any, astrophotography.

Through the 1950's, the telescopes began to grow. Amateur telescope makers produced 8", 10", and 12" reflectors. Manufacturers such as Unitron and Tasco began to produce 3" and 4" f/15 refractors, and a few astronomically-priced 5" and 6" telescopes. I had a 3" Tasco with 0.965" eyepieces. Looking through this telescope, by today's standards, was like looking through a pipe. Even with a 40 mm eyepiece, there was a very small field of view. Good eyepieces such as Orthoscopics, Erfles, and Konigs were not available, and there were no 2" eyepieces.

When the Soviet Union's Sputnik satellite went into orbit in 1957, the general public took a quantum leap in their interest in astronomy. The big fad was observing satellites. Elbow telescopes were built, and thousands of pairs were sold. With the beginning of the American space program, astronomy moved from an obscure to an "in" science.

About this time. John Braymore developed a production model of the Questar telescope, and soon after appeared the Celestron make of telescope. First, the Celestrons appeared in 10" and 22" models which later changed to 8" and 14". These telescopes, with electric drives, setting circles, and a full line of accessories helped to popularize astronomy. Deep sky observing and photography came easily within the reach of the amateur.

Today, the amateur has become much more sophisticated. We are observing quasars, BL Lacertae objects, and other exotic things. Our equipment was the equipment of professionals 40 years ago. Some amateurs have telescopes larger than used by William Herschel.

And now the future looks even brighter (not just the brighter skies either). New equipment is on the horizon, such as computer-controlled telescopes, CCD's, image intensifiers, etc. Oh how I wish that we had this equipment 40 years ago, when skies were not as light polluted as they are now. If some action is not taken, we may eventually return to observing only the Moon.

Reprinted from Ottawa Centre's *Astronotes*