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BULLETIN

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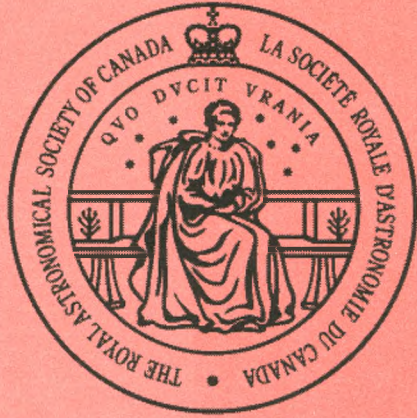


The approach of the November 28th total lunar eclipse. All photographs were taken on Fuji Velvia (ASA 50) film, using an Astrophysics 125 mm f/8 refractor with a 2x Barlow photographic lens, giving the equivalent of a 2000 mm f/16 system. All exposure times were 1/15 sec, except for the lower right image which was 1/8 sec. Photographs by Michael S.F. Watson.

1993

Annual Report

1993



BULLETIN

is a publication of the Royal Astronomical Society of Canada and is distributed together with the society's *Journal*. It contains articles on current activities of the R.A.S.C. and its centres across Canada, as well as articles from members and non-members which are of general interest to members of the society. Inquiries about the society should be directed to its national office at 136 Dupont Street, Toronto, Ontario, Canada M5R 1V2 (416) 924-7973.

Supplement to the *Journal* Supplement au *Journal*

Cover Picture: Whale watching off St. John's. Species include humpback, minke, fin and sperm whales.

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June issue deadline is May 15th.

Council Highlights

Walter MacDonald
Kingston Centre

A national council meeting was held in Toronto on Saturday, March 5th. This meeting turned out to be quite boring after all the high drama of the previous two meetings! The meeting was to end at 5:00 P.M. but was extended to 5:30 to finish everything on the agenda.

President Peter Broughton opened his report with some good news. He announced that Terry Dickinson had an asteroid (#5272) named after him. Peter told us that he and other R.A.S.C. members had made presentations to the Royal Commission on Learning, and were recommending that astronomy be a compulsory unit in high school. Hopefully this will come to pass. The Helm Fund G.I.C. has come up for renewal, and has been put into a balanced mutual fund as G.I.C. rates are now quite low. The controversy involving the London Centre has been resolved to the satisfaction of all the parties involved. The controversy involving Montreal Centre appears to be on the road to resolution: the expelled member has been attending meetings again, and the centre president has asked the centre executive to reverse their expulsion order.

The office of second vice-president will remain open until the G.A., as anyone filling the position between now and the G.A. would not be eligible to run for the position again at the G.A. Two consecutive terms are not allowed by the society's by-law. By-law changes will be proposed at the annual meeting to allow anyone serving an interim position to stay on for a full term immediately afterwards. Peter then informed us that Terry Hicks will be stepping down as treasurer at the G.A. Terry has been ably filling the role of treasurer for two (rather stormy!) years and his dedication to organizing the society's finances will definitely be missed. Garry Woodcock (librarian) and Mary Anne Harrington (recorder) will also be stepping down at the G.A.

Secretary Randall Brooks gave his report next. The National Capital Commission is looking for ideas to commemorate significant achievements by individual Canadians. Anyone with any ideas in this regard should contact Randall directly. The terms of the society's national insurance policy have been looked into closely. Liability coverage for personal injury applies to any sanctioned official function of an R.A.S.C. centre. This means there is no provision for property damage, and no coverage of any kind for private observatories. The insurance policy was originally purchased to cover Astronomy Day events (mall displays and star parties) held by centres, and it may not cover other events. Two resignations were received: Frank Shepley has resigned as chair of the membership and promotion committee, and as a member of the computer use and light pollution committees; Suzanne Moreau has resigned as centre rep and from the membership and promotion and the long range planning committees. A revised R.A.S.C. manual is due out in the near future. Niagara Centre has a new e-mail address: RASCNIAG@spartan.ac.brocku.ca. A new Messier Certificate application form was distributed, and allows candidates who cannot find witnesses (e.g. unattached members or those who live in isolated locations) to apply.

Treasurer Terry Hicks reported that the Millman Fund G.I.C. of \$101,600 is coming up for renewal. This will be split into two G.I.C.s so that the entire amount will be covered by deposit insurance. Terry has made a change to the national council meeting travel expenses: any unused funding for a particular meeting will be carried over to the next meeting (but not beyond the end of the year). The 1994 budget was, after some discussion, approved.

Terry also discussed the issue of charitable donation receipts for R.A.S.C. membership. He and Michael Watson had spoken with Revenue Canada and gotten different information. A vote was taken, and it was decided to not issue receipts without something in writing saying that we are allowed to do so.

A report from the Observer's Handbook editor, Roy Bishop was read. About 13 000 1994 handbooks were printed, and due to slower sales about 1 000 fewer 1995 handbooks will be printed. The idea of using a spiral binding for the handbook was voted down.

Beginner's Observing Guide editor Leo Enright reported that sales of the guide were going well. Unfortunately, little headway has been made with Scouts Canada on listing the guide in their catalogue. Efforts in this regard are continuing.

First Vice-President Doug Hube gave the publications committee report. Work by Dave Lane on the combined *Journal* / **BULLETIN** mock-up is proceeding on schedule, and should be available for this summer's G.A. Desktop publishing software (PageMaker) has been purchased for this project. Up to \$1 000 from the Centennial Fund was approved at this meeting to help complete this project. It was felt by several people present that, due to the importance of this venture, the final mock-up should be as "real" and of as high a quality as possible. To achieve this, it was felt that (after the mock-up is complete and been examined by national council) the services of a professional graphics designer should be employed to tweak the mock-up into final form. Also, it was felt that the final copy should be professionally printed so that it will be of the same quality as the eventual publication (should it be ultimately approved).

Doug also reported on the Edmonton Centre's grazing occultation expedition to Fort Nelson. The clouds thinned enough just before the event to allow most of the stations to get good observations. After some more work the data will be sent to I.O.T.A. The expedition was welcomed by several hundred people (most of the town's population!) and was even given the keys to city hall! The expedition was a success and Doug thanked the society for its support.

Bob May gave the property committee report. A new appraisal will be sought for the Dupont Street property so that the proper insurance

coverage can be obtained. Right now the society could be caught short if the building was destroyed.

Damien Lemay gave the nomination committee report. So far, the nomination slate is:

President	Doug Hube	(Edmonton)
1st V.P.	Michael Watson	(Unattached)
2nd V.P.	Don Hladiuk	(Calgary)
Treasurer	[TO BE DETERMINED]	
Recorder	[TO BE DETERMINED]	
Librarian	[TO BE DETERMINED]	

Randy Attwood presented the B.O.G. marketing committee report. About 30% of the B.O.G.s have been distributed so far, and a one page promotional ad has been prepared for use by centres.

Peter Broughton reported (as the centennial committee report since centennial funds were used) that the publication date for "Looking Up" is now late March.

A submitted report from the light pollution committee was read. The Calgary Centre has awarded five "good lighting" certificates. An article will be appearing in an upcoming **BULLETIN** in which they will share their experiences in this regard. It was hoped that other centres will start awarding these certificates too.

Randy Attwood gave the 1994 annular solar eclipse committee report. Several Ontario institutions have collaborated on the design of an information flyer giving not only information specific to the upcoming eclipse, but about eclipses in general. Centres will be receiving this flyer and other information shortly. Also, solar eclipse viewers will be distributed to centres for public eclipse viewing gatherings. The committee will be purchasing 5 000-6 000 of these.

Leo Enright read a letter of intent from the Kingston Centre, saying that it intended to submit a bid for the 1997 G.A. This would be Kingston's first. The list of upcoming G.A.'s looks like this:

- 1994 St. John's
- 1995 Windsor
- 1996 Edmonton (pending approval)
- 1997 Kingston (pending approval)

Randy Attwood told us that the Toronto Centre is concerned about the increasing cost of observer's handbook distribution. He asked that both the finance and publications committees look into finding a way to reduce the cost of handbook distribution.

Finally, Rajiv Gupta presented a report on the R.A.S.C. Observing Calendar. Up to \$3 800 was approved for printing and distribution of the 1995 calendar. ☼

Photographing the May 10th Solar Eclipse

Michael S. F. Watson
Unattached Life Member

I well remember becoming interested in astronomy in 1970 and admiring enviously the photographs of the March 7th 1970 total solar eclipse that appeared in *Sky & Telescope* magazine that spring. In the more than two decades since, I have observed and photographed many total and partial solar eclipses (as well as two beaded annular eclipses, in 1984 and 1987), and have compiled a list of techniques and photo ideas that experience shows work well. By observing a few basic principles and by practising beforehand, even the novice astrophotographer can produce an impressive photographic record of the upcoming spectacle.

Using a Solar Filter

The challenge presented by most astrophotography is that celestial objects are faint, and long exposures are required to capture their images on film. Solar eclipses present the opposite problem: The Sun floods us with too much light! As a result, except in unusual circumstances (such as an extremely low altitude eclipse) the solar eclipse photographer must use a filter to diminish drastically the quantity of light entering the camera lens or telescope, in order to avoid catastrophic equipment failure and permanent eye damage. Happily, safe solar filters are both readily available and (depending on the type desired) inexpensive.

Any filter that is safe for visual use will protect your photographic equipment suitably, and most of the rules for visual use of filters apply as well to eclipse photography. Make sure that your filter is affixed firmly to the front of your lens or telescope, and that it is at right angles and not askew to the barrel or tube, in order to avoid multiple or 'shadow' images caused by refraction and reflections within the filter.

The optical quality of filters varies considerably, but most filters give good to excellent images, if the photographer is careful to focus properly and to eliminate vibration. Even inexpensive coated mylar filters show surprisingly crisp images, provided they are mounted loosely in their cells and are not pulled or stretched too tightly. Photos made through welder's glass (only number 14 shade is safe), which is not of optical quality and usually yields fuzzy and somewhat distorted images, will nonetheless show the phases of the eclipse quite clearly. Welder's glass is cheap and, provided that you use care in mounting, can give useful images with shorter focal length lenses.

If you are using black and white film, the colour of your solar filter will not be significant, but not so for colour film. Optical glass filters usually give pleasing orange, yellow or whitish images, while coated mylar filters such as Solar Skreen are often blue in colour. Welder's glass is a distinctive green in colour. This may be an aesthetic factor that influences your choice of filter.

Focal Length

Perhaps the single most important decision for the solar eclipse photographer is the focal length of the lens or telescope to use. The tiny size of the Sun's image that a standard or even short telephoto lens gives is surprising to some beginners: A 50 mm lens yields a solar image size of barely 0.5 mm at the film plane, while a 135 mm lens expands the image to less than 2 mm. Images of such a small size usually show little detail, and when expanded to a usable size, in the darkroom or with a slide duplicator, are of low resolution.

The general rule is to use the longest focal length lens available, provided that you can secure it steadily on your tripod or telescope mount. Most experienced astrophotographers use lenses of at least 500 mm focal length, and more often between 1000 and 2000 mm. For partial or annular eclipses, in which the solar corona is invisible and cannot be photographed, even 2500 mm is a good choice of focal length, because the half-degree image of the Sun fits comfortably within the 24 mm short dimension of standard 35 mm film. Photographic focal length doublers can be used to boost the image size, but remember that they reduce the speed (or 'f ratio') of your lens, and introduce additional optical elements that may degrade image quality. Beware of these unless they are of good quality.

Choosing Your Film

With lots of light to work with, the solar eclipse photographer has the luxury of being able to choose fine grain, high contrast film. Either black and white or colour film of between ISO 25 and 200 is usually the best bet. In the weeks before the eclipse, try several films with your solar filter, and select the film that gives the best combination of colour balance, grain, contrast and reasonable shutter speed with your combination of equipment.

The Correct Exposure

Each among the great variety of solar filters available today has its own filter 'factor' (or density), making it impossible to predict proper exposures with any certainty. The solution is to experiment beforehand, which is something I do in the months before every eclipse. Use exactly

the same setup—camera body, lens or telescope, filter and film—that you plan to use during the eclipse. Take a light meter reading on the filtered image of the Sun using your camera body's internal light meter, which virtually all single lens reflex cameras incorporate. This will give you a very rough idea of the correct exposure. Make a series of between one and two dozen photos centred on the starting exposure, changing the shutter speed by one setting, or stop, each time. This is referred to as 'bracketing'. Be sure to keep a written record of the shutter speeds and the number of exposures.

When you examine the developed film later, you will be able to pick the best exposure and determine with precision the shutter speed and f-stop combination that gives the best image. Start the roll with a general pictorial photo, so that you will be able to tell where your Sun photos start; this is important if you begin your test sequence with shorter exposures that may be too brief to record any solar image at all. Better still, start with the longer exposures. They will be burned in, but at least you will know where on the roll your test sequence starts.

Eclipse photography guides and books on the subject often refer to the "correct" exposures for solar eclipse and other types of astrophotos, but this is a misconception. The correct exposure is a subjective evaluation, and is nothing more than the exposure that gives the most pleasing image for any particular viewer. Experience has shown, however, that the best photos are made when a couple of rules are kept in mind. First, there is a temptation to overexpose the film. This can cause flare and image bleeding, which degrade the sharp image of the lunar limb that you want to capture. It can also mask completely the delicate surface granulation of the Sun, visible sunspots, and solar limb darkening that give eclipse photos so much of their appeal and the three-dimensional quality that creates realism and interest. To avoid this, choose an exposure that is one or two shutter speeds below the point where these features become lost.

If you are located within the path of annularity, during the annular phase try increasing your exposures by one or two stops. During this phase the uneclipsed ring of Sun is so narrow that no differential limb darkening can be seen or captured on film between the inner and outer edge of the annulus. As well, an exposure that one judges to be right for the partial phases often gives an image that seems a little too faint during the annular phase, when the photo is dominated by a large black disk and the image of the Sun is such a thin ring. Bracketing with several different exposures during annularity will give you the best chance of that single perfect photo

that you want. In fact, bracketing your exposures during all phases of the eclipse is a good idea; getting only half a dozen good photos out of a roll of film is well worth the cost, given the rarity of this type of event.

If thin cloud dims the Sun on eclipse day, you may think that all of your test exposure results will be useless, but this is not necessarily so. To avoid this problem, before eclipse day correlate your "ideal" test exposure with the light meter reading that you used to determine the starting point during your pre-eclipse test session. This will give you an exposure "offset", expressed in a number of stops, which can be used to estimate the correct exposure on eclipse day in the event that cloud reduces the brightness of the Sun. This will work best if your camera has a spot light meter, which you centre on the Sun's image for your meter reading.

Focusing the Camera

Standard or short telephoto lenses can be reliably focused at infinity using their focusing rings, but be sure that you do not inadvertently jar or twist the focusing ring away from infinity during the excitement of the eclipse! This can be avoided by fixing the focusing ring to the lens barrel with duct or masking tape. Longer telephoto lenses, and especially mirror lenses, actually focus past infinity, partly to accommodate changes in the position of the film plane caused by temperature variations; these lenses, as well as camera bodies that are attached to telescopes, must be focused visually through the viewfinder. Camera bodies with split image focusers are the easiest to focus: Centre the image splitter on the limb of the Sun, and adjust the focusing ring or mount carefully until the discontinuous image of the Sun fuses into a smooth curved line.

Camera bodies with microprism focusers are more difficult to use; they turn dark and are unreliable when used in conjunction with lenses or telescopes that are slower than about $f/5.6$, as are almost all optical systems that have a suitably long focal length for eclipse photography. For these cameras, or if your camera body is equipped only with a ground glass focusing screen, you have two options. The first is to estimate the best focus on eclipse day visually by targeting a prominent sunspot, and adjusting your camera to achieve the sharpest image with the highest contrast. The second option is to focus your system one night (or, better yet, during twilight) before eclipse day, and then lock the focusing mount of your telescope (or tape the focusing ring of your lens) in place until the eclipse. Choose a moderately bright star, place it about half-way from the centre of the field of view toward the edge, and focus until the image is as small as you can make it. Focusing on a

star that is too bright produces flare that will mask the point of best focus.

Reducing Vibration

One of the most common causes of ruined eclipse photographs is vibration, which makes the tripod or telescope mount shake, together with the lens or telescope and camera body, and blurs the images on the film. Use the heaviest and most stable tripod or telescope mount available. Many creative photographers enhance the stability of a flimsy mount by attaching bags filled with sand to the tripod legs or pan head. Choose a stable and not springy or elastic surface for your observing location. Finally—the simplest and most important rule of all—always use a cable release of at least 50 cm length, or your camera's built-in self-timer, to trip the shutter. This avoids jarring the camera with your over-excited hand!

Not all camera bodies are created equally, and some are noisier, and create more vibration, than others. One source of vibration is the upward slap of the internal mirror of a single lens reflex camera during the exposure. Many cameras have devices that allow the mirror to be locked upward before the exposure. This is a good idea if test photos before eclipse day show that mirror slap vibration is a problem for your camera. Be sure that you focus and frame your photo carefully, and that you do not jar the assembly when you then lock the mirror up immediately before the exposure. You may want to borrow or purchase a low-vibration camera body for the eclipse. Often, older mechanical camera bodies, which can be purchased at used camera counters, prove to be quieter than the newer, fully automated electronic varieties.

Tripods and Mounts

Determine beforehand what the Sun's altitude will be for your observing location during various stages of the eclipse, and especially at mid-eclipse. Many photographic tripods are severely limited in the range of elevations through which they can be swung. If you will be using a tripod for your camera, in order to avoid a nasty surprise make sure before eclipse day that its head can be pivoted high enough to allow you to point your camera at the Sun. Some tripod pan heads swing further down than up. If your tripod does this, try turning your camera 180 degrees around on the pan head—"down" will then be "up", allowing you to point the camera higher in altitude, although the pan head control handles may now be inconveniently located.

If you intend to use a German equatorial mount for your telescope, make sure that at the critical time of mid-eclipse, your telescope tube or camera lens will not strike the central post or tripod, making it impossible to follow and photo-

graph the eclipse without losing time in swinging the assembly to the opposite side of the mount.

Eclipse Photo Ideas

It is a very simple task to centre the Sun's image in your viewfinder and to make a good, large-scale photo of the eclipse. Remember that the eclipse is a two-hour process, however, and that an interesting story is revealed by a series of photos taken at uniform intervals of, say, ten or fifteen minutes. Do not forget to make a photo of the completely uneclipsed solar disk just before first contact, to introduce your eclipse photo show later. As annularity approaches, the appearance of the eclipsed Sun will change rapidly, and you may want to decrease the intervals between your photos to five minutes, and then even to one minute or less. Record the times and details of your exposures on a portable tape recorder.

If your photographic program requires more than one roll of film, avoid changing film rolls within about five minutes of mid-eclipse, when you will be too excited to perform the task quickly, and inevitably something will jam.

Give some thought to the orientation of your camera body. If you place your camera body parallel to the ground, your photos will record the orientation of the Moon covering the Sun as it appears in the sky to an observer looking upward rather than through a telescope. A series of photos can reveal the 5.15° inclination of the Moon's orbit to the ecliptic, however, if the camera body is turned instead so that it is parallel to the ecliptic rather than to the horizon or to the celestial equator.

At the Sun's right ascension on May 10th, the ecliptic makes an angle of about 15° to the celestial equator, so that if you turn your camera body 15° clockwise from due east-west, you will achieve the correct orientation. In your camera viewfinder, the Moon will then appear to move at a shallow angle from upper right to lower left across the Sun, providing a graphic demonstration through a series of photos that this eclipse occurs at the descending node of the Moon's orbit. The correct orientation will be easiest to achieve if you use an equatorial mount, with which you can reckon the orientation of the celestial equator quite easily, and then measure the required 15° clockwise rotation of the camera body with an inclinometer that can be purchased at most hardware stores. Be sure to measure the angles and perform the camera rotation with the telescope or lens moved to a position in which the back of the camera body is perpendicular to the ground, no matter where in the sky the Sun happens to be at the time—otherwise the inclinometer will give inaccurate readings, and the 15° offset will not be determined accurately.

From past experience during the partial phases of total eclipses and at beaded annular eclipses, the bright planet Venus usually becomes visible to keen-eyed observers at least twenty minutes or so before mid-eclipse. On May 10th, Venus will shine at magnitude -3.9 , 28° to the east of the Sun, and should be readily visible for observers located near or within the path of annularity.

When Venus (or any other celestial object) can be seen with the naked eye, it can also be photographed. Try placing the eclipsed Sun in one corner or near one edge of the frame, and Venus in the diagonally opposite corner, or near the opposite edge. You will need an 85 mm or shorter lens to fit both into the frame. Although the exposure required to capture Venus will probably overexpose the eclipsed Sun significantly, during the annular phase one exposure may show both the planet and the uneclipsed annulus in one frame.

Estimate the right exposure by taking a light meter reading on the sky between the Sun and Venus, and start with an exposure that is one or two stops below this reading. This should produce a high contrast image of a bright Venus in a slightly darkened sky, and bracketing by two stops in both directions should ensure at least one useable image. Mercury will lie between the them, shining at magnitude -1.2 , and will probably be visible, if at all, only in binoculars.

A favourite photo project is a two to three-hour series of exposures on one frame of a firmly tripod-mounted camera equipped with a standard or short telephoto lens and a solar filter. The idea is to trip your camera's shutter repeatedly, without advancing the film, every few minutes. As you make a series of exposures, the Earth's rotation will move the image of the partially eclipsed Sun across the field of view exactly one degree every four minutes. A time separation of about ten to fifteen minutes seems to space the images about right on the frame.

Try to point your camera to the location in the sky where the Sun will appear at mid-eclipse, and to orient the camera so that the Sun enters the field of view, about an hour to ninety minutes before mid-eclipse, near one corner of the frame. Be careful not to move or jolt the camera tripod during the exposures. Not all camera bodies will permit you to easily (or at all) fire the shutter more than once without advancing the film. As with all of these ideas, check out your equipment and practise well before eclipse day.

Eclipse photographers often like to make double exposures of the eclipsed Sun in the same frame as an interesting foreground object or distant horizon scene. The latter is photographed separately, usually with a standard lens and after the eclipse photo is made. If you

want to try this, remember to compose your scenic photo so that there is a suitably large area of empty sky in which to place (or in which you have already placed) the eclipsed Sun for your other exposure. Your eclipse photo should probably be made with a lens of between 100 and 500 mm focal length—anything shorter will not give you a striking eclipse image, while a longer lens will make the eclipsed Sun's image so large that it will dominate the photo and make it very difficult to compose an interesting foreground scene. Consider locating the eclipsed Sun off-centre, for increased interest. Finally, the usual double exposure rule of cutting the normal exposure time of both photos in half does not apply to this type of double exposure. The reason is that the solar filter and the short exposure used for the eclipse photo will leave the surrounding sky completely black—this will be filled in later with a normally exposed general scene. Do not worry—the blue sky will not overwhelm the image of the eclipsed Sun, unless you underexpose the latter.

Consider composing your general photo by pointing in a direction about 90° from the Sun and using a polarizing screen, which can darken the sky without affecting the brightness of the balance of the scene. The result will be a suitably bright foreground subject, with a dramatic dark blue sky in which a crisp, large image of the partially or annularly eclipsed Sun will appear. One note—for most of North America, the Sun will be at high altitude during virtually all of this eclipse. If you photograph the eclipse, and then swing the camera down to the horizon for your scenic shot, the resulting double exposure will imply erroneously that the Sun was close to the horizon during the eclipse. If you wish to avoid this misimpression, you might wish to use a tall building, church spire, tree or other high altitude foreground object for your general scene.

If you plan to incorporate your photos into a show after the eclipse, consider photographing the waning crescent Moon in the morning before eclipse day (the 9th), and the waxing crescent Moon on the evening of the 11th, for added interest.

Good luck, and remember: practise beforehand, and use lots of film! ☼

A very small cause which escapes our notice determines a considerable effect that we cannot fail to see, and then we say that the effect is due to chance. If we knew exactly the laws of nature and the situation of the universe at the initial moment, we could predict exactly the situation of that same universe at a succeeding moment.

Jules Henri Poincaré
French mathematician/astronomer (1854-1912)

Honorary Members

Dr. V.A. Ambartsumian (C.I.S.)	Dr. Helen S. Hogg (Canada)
Dr. R. B. Baldwin (United States)	Dr. W. Iwanowska (Poland)
Dr. F. M. Bateson (New Zealand)	Mr. Patrick Moore (United Kingdom)
Dr. R. Hanbury Brown (Australia)	Dr. Grote Reber (Australia)
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Dr. Owen Gingerich (United States)	Dr. A. Unsold (Germany)
Dr. Stephen W. Hawking (United Kingdom)	Prof. H.C. van de Hulst (Netherlands)

President's Report

The society's annual report is a yearly reminder of the miraculous variety of activities taking place within the R.A.S.C. I am always amazed at the great diversity of topics presented at meetings and the tremendous dedication of centre members as organizers and participants in public education. The decline in membership numbers is surely more a sign of the times than any lack of success in maintaining excellent programs.

Observers, as always, focused their attention on a wide range of objects, some simply enjoying the view, others taking care to sketch, photograph or record what they saw. Congratulations to the thirteen members who received Messier certificates. Two widely observed events this year were the Perseid meteor shower (somewhat better than normal, thanks to the 1992 return of Comet Swift-Tuttle) and an eclipse of the Moon beautifully situated between the Hyades and Pleiades.

The national council met four times during 1993. While a great deal of the business at these meetings is necessarily routine, some special accomplishments should be mentioned. The results of the survey of members were tabulated and summarized in the **BULLETIN**, giving an unprecedented cross section of characteristics, interests and opinions of members. Computerized membership reports were instituted with the intention that centres will be able to keep their records in a standard format, making communication more efficient with the national office. Good lighting certificates were approved as a means of giving public recognition to those who take conscious measures to combat light pollution. An amended proxy form was authorized, specifically to clarify the possibility of abstentions, an issue which caused some bad feelings following the annual meeting.

Several other initiatives were undertaken which had some financial cost but which will be of long-term benefit to the society. These included a speaker travel assistance program, special project grants enabling the Windsor Centre to purchase a new slide projector and assisting the Edmonton Centre with an expedition to observe a grazing occultation during November's lunar eclipse.

In tune with the general state of the economy, steps were taken to increase revenue and cut expenses. Sharply lower interest rates would mean less investment income for the society so fees went up \$4, the first increase in three years. Senior memberships were eliminated. Officers had accommodation expenses eliminated, centre reps had their travel expenses capped, and reimbursement was now to be on the basis of the cheapest ABC fares available. Quotations were received from other printers to see if publication costs could be reduced and steps were begun to see if a new format for the *Journal* and **BULLETIN** could be economical and at the same time attractive to the membership.

Though the success of these measures will not be fully evident until the next annual report, there is, this year, a substantial surplus produced largely by the publications. While we have come to expect sales of the *Observer's Handbook* to produce revenue to offset the costs of the other publications, the unusual surplus is due to a larger number of contributors to the *Journal* paying page charges. The fact that our professional friends tend to "pay their own way" should not be forgotten and our gratitude to N.S.E.R.C. for their annual grant should be recorded.

Sincere thanks must go to all those who have given a tremendous amount of time and effort to produce high quality publications for the society—Roy Bishop, Leo Enright, Rajiv Gupta and Pat Kelly. Special tribute goes to Jeremy Tatum who has just completed five years of devoted work as editor of the *Journal*. I would also like to take this opportunity to thank David Tindall who stepped down after six years of outstanding service as national secretary.

The annual General Assembly in Halifax was a highlight of the year, with a selection of excellent papers and a fascinating address by David Levy, the Ruth Northcott Lecturer for 1993. Mary Lou Whitehorne not only received the Chant Medal but organized a memorable G.A. with fine facilities, lots of fun and great tours.

By the time you receive this report, my two-year term as president will be almost over. It has been an enriching experience and I would like to thank all who helped to invigorate the R.A.S.C. (and to develop my character) through friendship, criticism, expectations and support. I have always known the R.A.S.C. was a great organization but now, having visited fifteen centres, the pride I feel in your accomplishments is even stronger. I am looking forward to seeing many of you in St. John's.

Peter Broughton, President

Having just completed the first six months of my term as national secretary, I am beginning to appreciate the full extent of the role played by the society's executive secretary, Rosemary Freeman, and of the tremendous contribution that the outgoing national secretary, Dr. David Tindall, has made in his six years as national secretary. I am sure that Rosemary is as grateful to David as I for having assembled his R.A.S.C. manual which provides, in one document, almost everything that one really needs to know about the running of our organization. For those centre executive members unfamiliar with the manual, you should search it out as it will provide invaluable guidance on what is expected of you and when. I will be providing periodic updates and will consider recommendations for further inserts. I thank David for leaving this manual as his legacy. The Service Award granted him at the General Assembly will continually remind him of the thanks of the society!

As she has for many years, Rosemary continues to provide the continuity required to allow members to assume their new positions on the executive or national council. If, at the end of my term, I appear to have been an effective secretary, it will be because she has provided and organized just about everything that I have had to deal with!

1993 was a year of several significant changes. Dr. Ian Halliday completed his term as honorary president, being succeeded by Dr. Alan Batten. Dr. Batten has had a distinguished career at the Dominion Astrophysical Observatory and is known to R.A.S.C. members for his research on variable stars, as a past editor of the *Journal* and, in recent years, for his interest in the history of astronomy. Dr. Jeremy Tatum has provided a hawkish eye as editor of the *Journal* for five years but is now handing on this onerous job to Dr. David Turner. On behalf of all R.A.S.C. members, I would like to extend the gratitude of the society to Dr. Halliday and especially to Dr. Tatum. There are only three living members of the society (all past editors of the *Journal*!) who really appreciate the amount of work that is required of our editor. Despite the desire of some members to have a different style of publication, every member can appreciate the tremendous and meticulous job with which Dr. Tatum has undertaken his duties.

1994 may be a pivotal year in the history of the society with the potential for a bit of trauma. However, I would like to remind all members, and especially members of national council and of centre councils, that we belong to the organization because we love astronomy and want others to share our interest. It concerns me that our membership is slipping from the peak reached in the wake of Halley-mania. Because the centres are our front lines, we must rely on you to review your programmes and how your centre functions to ensure that you provide members with an environment and with activities that will keep old and new members coming back for more. As a member of a centre executive in the past, I always carefully reviewed the annual reports to see which centres were doing something a bit different and its potential to add to our centre's activities. At the end of 1994, I hope I will be able to see an increase in each centre's membership figures reflecting the vitality and success of your efforts.

The membership figures for 1993 are compared with those of previous years in the following table:

CENTRES	1993	1992	1991	1990	1989	1988	1987
Calgary	198	197	192	213	277	213	242
Edmonton	125	125	121	130	123	136	115
Halifax	134	138	160	174	171	138	145
Hamilton	95	99	86	87	76	86	84
Kingston	60	50	52	48	38	35	46
Kitchener-Waterloo	25	25	24	34	30	32	29
London	32	46	39	48	46	43	46
C.F. de Montréal	25	36	35	36	38	43	39
Montréal	114	110	99	116	123	103	111
Niagara	53	48	61	61	81	64	48
Ottawa	235	243	258	263	254	228	241
Québec	53	65	36	70	73	60	74
Regina	19	21	29	57	-	-	-
St. John's	35	38	34	30	16	19	22
Sarnia	17	11	8	8	12	8	11
Saskatoon	42	35	43	47	42	45	41
Thunder Bay	24	38	29	31	40	-	-
Toronto	807	855	921	1038	1022	1052	1035
Vancouver	190	177	109	132	167	167	147
Victoria	127	129	127	127	137	135	143
Windsor	45	41	46	56	46	49	48
Winnipeg	57	45	56	70	59	60	61
UNATTACHED							
Canada	243	268	269	275	306	301	318
U.S.A.	240	258	291	328	351	306	369
Overseas	52	53	53	60	58	62	57
Honorary	15	15	14	14	14	14	13
TOTAL	3062	3165	3192	3553	3600	3399	3534

It is with regret that I must inform you of the deaths of the following members in 1993: Charles Bartwick (Toronto), Roy Belfield (St. John's), Edwin R. Burford (unattached, Canada), Arthur Cockerton (Saskatoon), Dr. Robert Graham (Toronto), Dr. Helen Sawyer Hogg (honourary member), Patrick Langan (Windsor), Jan H. Oort (honourary member), Donald Park (Ottawa), Walter Stillwell (Calgary) and James Thompson (Toronto).

Finally, if I may be of assistance, please contact me through the national office or via e-mail (brooks@husky1.stmarys.ca).

Randall Brooks, National Secretary

Secretary's Report

Nine general meetings were held in 1993.

January 21	Alberta Science Centre Expansion Plans by Bill Peters; Variable Star Observing by Paul Sventek
February 18	B-E Star by Dr. Sean Doherty
March 18	Space Program Update by Joel Powell
April 15	Time and Tides by Dr. Alan Clarke
May 20	A Shot in the Dark: Astrophotography by John Mirtle
June 17	Tour of the Rothney Observatory by Dr. David Fry
September 17	Members night; various short topics
October 21	Solar Eclipses Past by Peter Faulkner
November 18	Annual Elections, and Alan Dyer

Calgary

On an unhappy note, Dr. Walter Stillwell, the founder of the Calgary Centre (in 1958), and for many years our honorary president, passed away late this year.

As in previous years, we maintained our programs of introductory astronomy courses, teacher's workshops, and classroom visits. An advanced course, to complement the introductory one, was started this year.

Planning for our 1994 eclipse tour is well in hand, though we have felt it necessary to change our venue from Southern Peru to Northern Chile, due to concerns about the activities of the terrorist group Sendero Luminoso. We would look too much like a lot of rich bourgeois gringos, ripe for kidnapping!

Our 237-STAR information line received 1,435 calls in 1993. Of these, 706 required no response. Among the rest, eighty-eight inquired about W.C.O. tours or school speakers; twenty-seven wanted membership information; eighteen inquired about the Alberta Star Party; sixteen for the Fish Creek and Zoonival star nights; fourteen about the youth group; eight were in connection with the introductory astronomy courses; eight had seen things in the sky; four had bought telescope-shaped objects from a discount store (and needed help); and one benighted soul wanted information on astrology and palm reading.

Our booth at the spring and fall Home Shows were fairly successful, raising the profile of astronomy, and such problems as light pollution.

The Zoonival star party, always popular, enjoyed relatively clear skies, and an attendance of some 5,000 people. The Astronomy Day star party in Fish Creek Park also had good sky conditions, and we were graced with a view of the Mir satellite as it passed directly overhead. The fall star party in the park was not entirely clouded out, but several hundred visitors did enjoy our displays and the occasional view of Saturn through holes in the overcast.

The Alberta Star Party, organized jointly with the Edmonton Centre, drew some 100 registrants, and was held this year at Eagle Lake Campground, south of Strathmore, to coincide with the Perseids meteor shower.

Tours of our Wilson Coulee Observatory numbered twenty-seven, or about 650 people, mostly from schools and Scout/ Guide groups. Twenty-one school visits were conducted, giving classroom talks to some 1,200 students.

Our youth group has become very active of late, quadrupling in numbers to twenty-eight members. Several projects are underway, including building a telescope around a donated mirror.

Glenn Hawley, Secretary

The Edmonton Centre continued to thrive in 1993. Many members achieved personal accomplishments, a significant group project was undertaken successfully, and the society as a whole increased its visibility and the popularity of astronomy in the community. Under the leadership of President Sylvia Smith, attendance at meetings increased, while overall membership remained stable at about 135.

Edmonton

Fort Nelson Graze Expedition: The highlight of the year for the Edmonton Centre was a successful expedition to Fort Nelson, B.C., to observe the Moon graze the star ZC 646 during the total lunar eclipse of November 29th. This was part of an international experiment organized by I.O.T.A. to measure the Moon's polar diameter. Fifteen Edmonton Centre members spent a day each way on a bus, and most of eclipse day making a comprehensive astronomy presentation to the citizens of Fort Nelson. These were well received by large crowds, and the visiting astronomers were extremely impressed with the town's enthusiasm and generosity. The graze itself was witnessed successfully as the clouds lifted at almost literally the last minute to allow observation of the event. As this report went to press, we were still awaiting final results from I.O.T.A. interpolating the findings of the expedition to Baja California with our own. The project was sponsored by the Edmonton Centre, the R.A.S.C. National Office, and I.O.T.A., and was additionally subsidized by the participants. A detailed write-up will appear in the next issue of the BULLETIN.

Public Education: The Edmonton Centre continues to be active in the area of public education, with this involvement to grow as the benefits of the 1992 casino windfall became manifest.

Our major platform continues to be the operation of the public observatory of the Edmonton Space & Science Centre, where R.A.S.C. volunteers run the observatory on weekends year-round almost entirely on a voluntary basis. Under the direction of Larry Wood, thirty volunteers recorded nearly 1,700 hours of service, and well in excess of 10,000 people had the opportunity to observe the sky. A new addition to the battery of telescopes was a 7-inch Starfire refractor on a Losmandy mount, which the Edmonton Centre purchased with casino funds. This instrument affords superb views of the Moon and planets, and will be indefinitely housed in the observatory for public use.

The Edmonton Centre once again put on our annual Star Nights on the Astronomy Day weekend. Unfortunately, the weather was (as usual) uncooperative, but on the Saturday night a couple of hundred people turned out to the observatory where a number of members had set up their private telescopes. The Perseid meteor shower attracted unprecedented public interest, with at least 500 people turning up at our dark sky site near Elk Island Park, and another 500 or so at the observatory. Cloudy conditions prevailed until around midnight, after which a fine show of meteors ensued. The fourth annual Astronomy Workshop was held in April at Blue Lake Centre near Jasper National Park. The event was attended by over thirty people, and featured invited speakers Alan Dyer and Ken Hewitt-White.

Meetings: Our regular meetings continued to be well-attended with anywhere from sixty to ninety persons usually present. As usual, feature presentations were about evenly divided between members and invited guests. In January, the keynote speaker was Wayne Rogers of the Illuminating Engineering Society who spoke on light pollution. February's meeting featured Dr. Don Page of the University of Alberta who gave an address on cosmology. In March, Dr. Brian Martin of King's College gave a presentation on CCD astronomy. At the April (Fool's) meeting, distinguished Yugoslavian scientists Dr. Boris Dontknotenough and Dr. Douglasevitch Hubesky—who bore an amazing resemblance to Paul Campbell and Russ Sampson—covered some amazing scientific breakthroughs they had culled from the likes of Weekly World News. May was a member's night, while the June meeting featured member Bob Drew with a presentation on unusual telescopes. Members' nights were held in September through November, while in December Dr. Gordon Rostoker of the University of Alberta gave a talk on aurora.

Observing: The Edmonton Centre harbours a large group of active observers. When weather conditions permitted, scheduled observing sessions were well-attended, with upwards of thirty people at the observing site on occasion. Observers group coordinator Paul Campbell did yeoman service, particularly in helping newcomers.

Three members, including Arnold Rivera, Cathy MacKinnon and Tyler Foster constructed telescopes during the year, while Ben Gendre and Bruce McCurdy completed their Messier certificates. ShirLee Adamson completed her home observatory with the help of her husband Martin. Club members were shocked and saddened when Martin passed away suddenly shortly thereafter.

Alister Ling of the Edmonton Centre assisted in the organization of the Alberta Star Party in Eagle Lake Campground, which was well-attended and featured good skies for much of the week. No fewer than eighteen Edmonton Centre representatives carried on to the Mount Kobau Star Party the following week, where Harold Jacobsen received a design award for his innovative binocular mount.

Awards: At the annual meeting in January 1994, Sylvia Smith presented the President's Award for Service to Bob Drew for his numerous contributions to the society, most of which are done behind the scenes with little recognition. Russ Sampson was Observer of the Year, primarily for the hundreds of hours of work he put into the Fort Nelson graze expedition, but also for his ongoing project of monitoring sunrise and sunset times. Arnold Rivera received the Angus Smith Award for Telescope Making, for the impressive feat of completing two Newtonian reflectors, a 13-inch "prototype" and its 17-inch big brother. Murray Paulson was recognized as Astrophotographer of the Year.

Bruce McCurdy, General Secretary

Probably the biggest single item that marked 1993 for the Halifax Centre was the hosting of the General Assembly. A lot of time and effort went into the preparations for this event (we even had to call in a few favors from the folks at Environment Canada to ensure good weather!) and by all accounts the result was a great success. Congratulations should go to all of the people who worked on the organizing committee and helped out as volunteers, but special thanks are due to Mary Lou "The General" Whitehorne, David "Lost 'Em" Lane and Joe "Scissorhands" Yurchesyn!

Halifax

As usual we had a lot of observing, or at least as much as the weather would permit. (It should be noted that during the year, almost without fail, if there was only one really good observing night each month, it was on the night of the regular monthly meeting!) Five members braved the early January weather to make detailed observations of the Quadrantids meteor shower. The observations, once corrected, gave zenith hourly rates of from 70 to 130, depending on the direction that the observer was facing. In addition, as in past years, an unusually large number of sporadic meteors were seen coming from the zenith. Plans are underway to continue these observations in the event that they are the result of an unknown shower.

Roy Bishop, Dave Lane and Greg Palman attended the Winter Star Party in Florida and were very impressed with the observing (and the climate!). They brought back some excellent slides to share with us, and in addition, in the case of Dave, an acute case of sunburn! Greg was also a bit surprised to find that when he returned home he had left the pier to his Astrophysics

refractor at his parent's home in Florida. This quickly earned him the nickname "Pierless" Palman (although he insists, based on his scope's optics that we are misspelling it and it should be "Peerless")!

Later in the spring, there were two attempts made at a Messier marathon. Bill Thurlow and his group in Summerside, P.E.I. observed ninety-eight objects, with poor weather causing them to miss some of the pre-dawn objects. Dave Lane and Paul Gray observed from Beaverbank and were able to get quite a few objects, but were also foiled by poor weather.

As usual, we had a great time at NOVA EAST. We got two clear nights, one of which had centre members and other regulars giving park visitors slide presentations and talks followed by a public observing session. We estimate that around 600 people in total participated in these public events. While there were a lot of interesting telescopes and gadgets to look at, the big story this year was the use of CCD cameras at the actual observing site. (You have to keep in mind that this is an area without electrical service.) After some searching, the view of Stephen's Quintet appearing on the computer monitor was an event that many present will never forget. This event continues to draw a large number of amateurs from all over the Maritimes and we invite any amateurs who might be travelling in the Maritimes during the event to drop in.

The centre is now engaged in a serious search for a new, permanent observing site, which the centre would hopefully be able to purchase. This would allow us to have access to a darker location and eventually allow us to build an observatory, possibly with several roll-off roof structures for members' telescopes.

Our centre newsletter, NOVA NOTES, continues to be an excellent source of reading material for our centre members, thanks to the hard work on Dave Lane's part as editor. Issues included articles ranging from a retrospective of the Apollo 17 mission, to words of wisdom from Gazer, the centre's unknown version of Ann Landers. A special issue to mark the G.A. included a history of the Halifax Centre by Murray Cunningham, our centre's honorary president, and a reprint of David Levy's article from a 1970 issue called *The Art of Comet Hunting*, which set the stage nicely for his Northcott lecture.

Centre members continue to be involved in the Nova Scotia Planetarium Advisory Committee, which recently completed a feasibility study to look at the possibility of getting a major planetarium built in the Halifax area. The results of the study were sufficiently positive to continue with the final phases of the study, which would look at more specific details such as the location, size, etc. of such a facility.

The regular meetings for the year are shown below.

January 15	ρ Persei—A Misbehaving Binary Star by Mary Lou Whitehorne
February 19	Meteor Showers and Meteor Observing by Paul Gray
March 19	What is the R.A.S.C.? by Peter Broughton, National President
April 16	Astrophotography Extravaganza by Brian Segal and David Lane
May 14	General Assembly Organizing Meeting
June 18	Members' Night
September 17	Neutrinos from the Sun by Dr. Malcolm Butler, Saint Mary's University
October 15	Deducing Asteroid Shapes from the Earth (or An Amateur Astronomer Having Fun with a CCD on a Research Telescope) by Dr. Larry Bogan, Acadia University
November 19	Annual Meeting and Members' Night
December 17	Ask the Astronomer and Christmas party

Patrick Kelly, Secretary

Our members had much to enjoy in 1993. Observing workshops were held at the observatory to introduce new members to telescopes and to study variable stars and the planet Mars. The cosmology group also met regularly at the observatory. Group observing included the Perseid meteor shower and the lunar eclipse.

The new drive was installed on the mount for the 5" refractor in the dome. The 5" Brashear refractor was completely overhauled, cleaned and remounted on its pier in the Chilton roll-off building.

Fund-raising events such as car washes and garage sales were held to add to the new telescope fund. Public education also provided a great deal of income as groups were hosted at the observatory and the McMaster Planetarium.

Many interesting talks were given at the monthly meetings, which were held at the McMaster Medical Centre. These included: Globular Clusters (Peter Jedicke - London Centre), Spectroscopy (Dr. Doug Welch), Millimetre Wave Astronomy (Dr. Christine Wilson), Amateur Telescope Making (Jim Winger), William Herschel (Garry Woodcock), Split-ring Horseshoe Equatorial Mounts (Eric Golding), A Clearer View of the Galactic Neighbourhood (Dr. Marshall McCall), John Brashear (Garry Woodcock) and Atmospheric Effects (John Gauvreau)

ORBIT, our monthly publication, contained many fine articles by members and was edited by Ann Tekatch for the first half of 1993 and by Eric Golding in the second half. Eric also provided photocopying of each issue, as well as many excellent, original articles.

To all who gave their time and efforts so generously, the centre is truly grateful. We look forward to a happy and active 1994.

Garry Woodcock, Secretary

Hamilton

As the leaves change colour and fall to the ground, and the winter constellations appear over the horizon, it means that another year has come and gone at the Kingston Centre of the R.A.S.C.

The Kingston Centre can take great pride in its people and its organization. We have had a great year. Messier Certificates were awarded to Dan Rombaugh and Bill Broderick. We also received Canadian recognition, for our contributions to the 1993 General Assembly. The Kingston Centre took two first place awards, one for the best centre display and the other for best cartoon poster. Honourable mentions went to Leo Enright for his astrophotography presentation and congratulations to Bill Broderick for being able to serve on the national light pollution committee and also to his honourable mention for the light pollution display.

Along with our twelve regular and executive meetings, and a few public star parties that went rather well, the Kingston Centre was treated to several interesting talks by well known astronomers. The highlight of the year was the talk given by Jack Newton, on CCD imaging. This talk was sponsored through a travel grant from the national council in conjunction with the London and Windsor Centres, both of which also hosted Jack at centre meetings and listened to his wonderful presentation. Terry Dickinson gave us an awe inspiring talk and slide show on his trip to Las Campanas, Chile. We were brought up to date on the S.N.O. (Sudbury Neutrino Observatory) project, by Dr. Hamish Leslie, who has promised to come back at a later date and continue his presentation on the observatory.

Dr. Richard Heinrickson, intrigued us with the depths of cosmology, and David Levy whisked us on a voyage around Jupiter on the most dramatic comet of this lifetime.

Our annual Members Night included five members giving talks that covered solar imaging, the Mars Observer, variable stars and slides on the General Assembly, making us wish we had all gone. Well, maybe next year!

The Kingston Centre's Dr. A. Vibert Douglas Award was awarded to our president, Christine Kulyk for bringing to the centre such interesting speakers and enthusiastic ideas. Good going Christine!

The Kingston's Centre most prize possession this year by far is the handmade bookcase which holds the centre's library. With much hard work by our librarian, David Stokes, and with auctions and donations this was made possible. I would like to thank once again, our main contributor to this project, Arthur Covington. His generous donation has made this dream a reality.

With each passing day there is something new and exciting waiting to be discovered, explored and marvelled. So let us just bundle up in warmth, bring out our scopes and binoculars and put eye to eyepiece and gaze endlessly into the night time sky.

Kim Hay, Secretary

Kingston

It was a good year for the Kitchener-Waterloo Centre as we experienced a year full of activities in 1993. There were a number of exciting

events carried out and many things to see throughout the year. Our monthly meetings were full of a variety of topics and reports of observing which provided something for everyone.

The January meeting was an opportunity for individuals to see the photos and slides of Darryl Archer who was the main speaker. His subjects ranged from deep sky objects to planetary photography and the results he has obtained are excellent. As well, Peter Daniel showed some slides he had made of Mars. On January 16th, the club had its annual dinner at Angie's Kitchen in St. Agatha. It was well-attended and many members went to Ray Koenig's place later for hot chocolate and computer games.

In February, the main speaker was Ray Koenig who spoke on "How to Measure the Earth". He explained how a person could change their elevation at sunset and measure their angle to the Sun to calculate the radius of the Earth. The math involved was not very complicated but as yet, no one has reported trying it out. Jeff Brunton gave the constellation talk and spoke about Cancer. Some of the members decided to start a telescope making group and we look forward to seeing the results.

At our March meeting John Molson was the main speaker and gave a talk on mirror figuring. He explained polishing, figuring and testing. By setting up a video camera with his Foucault tester he was able to demonstrate the shadow patterns on a video screen. The constellation talk was on Delphinus and was given by John Anderson.

In April, Peter Daniel spoke on the U.K. Schmidt Telescope using a series of slides and commentary. It included views of the instrument as well as some of the work it has done. It was a fascinating talk on what a powerful telescope can accomplish. Oscar Cole Arnal spoke on the constellation Leo and pointed out many of the galaxies one can observe within it.

For the May meeting, a video on black holes and warped space-time was shown which explained many of the features such objects would present. Jim Graham gave the star talk and spoke on Corvus. On May 29th, many of our members made a pilgrimage to the David Dunlap Observatory and were rewarded with clear skies. A number of Toronto Centre members had telescopes set up on the grounds and it was an opportunity to compare observing notes.

In June, our last formal meeting before the summer, Ray Koenig tested those present with one of his first year astronomy exams. Jeff Collinson spoke on the constellation of Hercules and June 12th was picked as the day of the annual club picnic at

Kitchener-Waterloo

the observatory. Arrangements were made for summer observing sessions on July 13th and August 10th.

In August many members made the trek to Mt. Forest for the annual Starfest. The skies were very clear and the seeing was excellent. Many of us got to look through the telescopes of Jeff Collinson and Darryl Archer and were rewarded with some spectacular viewing. The tent talks were interesting, as always, making it a successful weekend.

A return to our regular meetings in September saw Mike Gore speak on CCD cameras. He has been working on his own device for a number of years and he shared some of the obstacles he has had to overcome. Much of the talk was on the recent Perseid meteor shower and the varying counts many of our members recorded. The telescope building group that was formed earlier in the year reported they were ready to order mirror blanks. Peter Daniel showed some slides of his recent travels through Europe and of the various observatories he visited.

In October, Ray Koenig spoke on the topic of redshifts. This is a hotly debated topic within our club and made for interesting discussions following the talk. The star talk was given by Rick Stemmier who spoke on Vulpecula. Jeff Collinson reported that his 8" f/2 mirror for a Schmidt camera was nearing completion.

At the November meeting Oscar Cole Arnal spoke of his trip to the Starhill Inn in Sapello, New Mexico. It is a retreat for astronomers where you can rent telescopes or bring your own to take advantage of the clear skies. He enjoyed meeting other people from across North America and would recommend such a vacation to others. Tim Spiegelberg spoke about the constellation Cassiopeia and pointed out many of the deep sky objects near it.

At the final meeting of the year, in December, a new executive was elected. There was a lot of talk about the previous month's lunar eclipse and many members had pictures of the event. A video was shown which included part of "The Dream is Alive". As well, many members watched the Hubble Space Telescope repair mission and are hoping for the best. Arrangements were made for next month's annual banquet.

In 1993 the renovation work on the club's 12 1/2" Newtonian stalled. Our new executive has decided to make it a priority to get it back in commission; perhaps this will be the year. Some repair work was done at the observatory site and there is talk of building an outhouse. The club appreciates the extra work many of our members do in keeping our facility in good shape. *The Pulsar*, our monthly newsletter, continues under the care of Paul Bigalow who manages to keep it interesting and informative.

We hope 1994 will bring good viewing and clear skies.

Jeff Brunton, Secretary

1994 has been a year of change for the London Centre. Progress on the observatory has taken an interesting turn of events. A ready-made observatory has been graciously donated by Mr. Arthur Claughton. We now need a site for the observatory, and a decision needs to be made on what sort of instrument we are going to place in the observatory. A difficulty has arisen here, because the observatory is too small for our DS16.

Once again we helped out with the University of Western Ontario's Cronyn Observatory public star nights. These are held on Saturday nights from the Victoria Day weekend through to Labour Day. Members of the centre volunteered their time and telescopes in order to let the general public have more of a look see, and to answer any pertinent questions.

Eric Clinton, our newsletter (*Astronomy London*) editor, received the National Service Award of the R.A.S.C. in recognition of his outstanding contributions to the society over the years. Since Eric could not attend the G.A. in July, the award was presented to him by society president Peter Broughton at our annual banquet. Eric also became a father near the end of the year. Our congratulations are extended.

We had to move our library this year. As a result, a lot of material has been given away.

We had members attend the Winter Star Party, Starfest, and the Huronia Star Party. As well we have had several observing sessions at past president Joe O'Neil's parents' farm just north of the city. In August the famed Perseids (although not quite what you would call a storm) were seen out at the home of John Rousom, our former treasurer. Although they did not reach the intensity expected it was still quite a show. While we were stuck on the continent, Peter Brown and Martin Beech travelled to the south of France, where they conducted observations of the shower. According to them, it was quite intense.

We changed our location for our meetings from upstairs at the police station (I guess some people felt uncomfortable about that) to a meeting room at Masonville Mall.

Our centre secretary for more than five years, Grant Carscallen, has stepped down. We extend our thanks and appreciation to Grant for all his hard work and dedication.

There were many exciting speakers this year, one of the most recent being Terry Dickinson, who gave us an account of his trip down to Chile, and the (WOW!!) southern sky. Here is a list of the topics and speakers.

January	Peekskill Fireball by Martin Beech and Peter Brown
February	no data
March	The Winter Star Party by Dave Toth
April	CFHT and Astronomy in the South of France by Dr. John Landstreet, University of Western Ontario
May	Perseids 1993, Storm or Shower? by Peter Jedicke
June	Astrophotography Techniques by Jack Newton

London

Annual Banquet	A History of the R.A.S.C. by Peter Broughton, society president
July	Construction of the Tranquillity Telescope by Dan Taylor, Windsor Centre president
August	No meeting
September	The Perseids of 1993 from the South of France by Martin Beech and Peter Brown.
October	Starfest '93 by Dave Toth and Eric Clinton
November	X-Ray Binaries by Chris Blake, University of Western Ontario
December	A Trip to Los Campanos by Terry Dickinson

Dan McMillan, Secretary

Cette année, les activités du centre ce sont déroulées dans un local réannagé. La nouvelle disposition a permis aux membres d'assister aux conférences, de faire des achats au Comptoir, d'emprunter des livres, de fabriquer des miroirs de télescopes et avoir accès à l'ordinateur dans un seul local.

C. F. de Montréal

Pour la première fois depuis des années, les activités ont eu lieu à toutes les deux semaines pendant la période de l'été. Madame Anne Blouin nous a présenté des conférences sur l'astronomie générale qui furent appréciées de tous.

Plusieurs professeurs de l'Université de Montréal présentèrent leur projet de recherche tel que: Les premières images de la sonde Magellan, les planètes mineures, les phases de Vénus, les étoiles pulsantes et plusieurs autres. Les autres mardis, les membres ont eu droit à des cours d'initiations aux observations et à une introduction à l'utilisation de la caméra CCD.

Le centre a participé à des activités publiques en organisant un kiosque et de l'observation lors de la journée internationale de l'astronomie sur la Place du 350ième anniversaire avec plus de 300 visiteurs. Un autre kiosque a été organisé pour le concours annuel des fabricants de télescopes amateurs (C.A.F.T.A.) et il organisé une conférence dans le cadre de la Quinzaine des sciences sur "les constellations et le corps humain", intertré par le président de centre, Monsieur Pierre Paquette.

Alain Roussel, Secrétaire

The year 1993 marked the 75th anniversary of the Montreal Centre. Special events were held to commemorate this occasion. Mr. Terence Dickinson was our guest lecturer for the Townsend Lecture, which was held at the Dow Planetarium on March 3rd. Mr. Dickinson gave two talks that evening due to the large number of people wanting to attend. In September we held a special dinner at Mother Tucker's. Thirty-five people attended this event. We were treated to an interesting talk by David Levy. Mr. Levy shared with us some special moments from the centre's past. We were delighted to have Miss Isabelle Williamson, longtime member of our centre, present for this dinner.

Montreal

Again this year, our Saturday night talks were held twice a month. Both amateur and professional astronomers gave talks on a variety of topics in astronomy. We would like to thank all those who gave a talk.

On August 21st Mr. Keith Withnall hosted a successful star party at his country home in Vermont. The party ran from 4:00 P.M. to 3:00 A.M. the next morning. The report from those who attended was that of an excellent evening: dark skies, only a few clouds and M31 visible to the unaided eye. We are looking forward to acquiring an out-of-town observatory in the future. A number of members have already made donations to this project.

An interesting project called MUNDUS was put forth two years ago by Louie Bernstein. After almost two years of work, funding for this project has been approved by the provincial and federal governments. MUNDUS, which stands for *An Urban Astronomy Project*, will consist of approximately ten granite plaques strategically placed in downtown and old Montreal pointing at some of the brighter stars.

Mr. Mario Caluori provided a system by which members were able to use the telescope in the dome from the comfort of the main meeting room at the observatory.

Our observers' group, under the directorship of Mr. George Livadaras, began to meet on Saturday nights. Mr. Livadaras was recently awarded his Messier Certificate.

In the course of this year, there have been some differing opinions between the Montreal Centre and the national office. Let us hope that these matters will be resolved in 1994.

Dominique Mackenzie, Secretary

The Niagara Centre had a very active and eventful year. All meetings were held in the LaMarsh Room of the Niagara Falls Public Library on the fourth Thursday of the month, except for July and August. The year's meetings featured a wide variety of topics and were generally well attended. The following is a list of the speakers and topics for our regular meetings in 1993.

Niagara

January 28	A Solar Eclipse Down Under by Dan Marcus, Buffalo Astronomical Association; Annual Meeting: election of new directors, reports from officers and members
February 25	The Perseus Talk by Grant Dixon, Hamilton Centre; antique telescope display; slides by Carl Milazzo
March 25	What is the R.A.S.C.? by Peter Broughton, National President; slides by Carl Milazzo
April 22	Members' Night; reports; slides by Carl Milazzo
May 27	Meteors by Peter Brown, London Centre
June 24	The Great 1994 Annular Eclipse by Michael Watson; slides by Carl Milazzo
September 23	Members' Night; review of summer activities; slides by Carl Milazzo
October 28	Solar Astronomy by Dennis O'Connell, Elmira-Corning Astronomical Society; members' reports; slides by Carl Milazzo
November 25	Chaos by Dr. John Black, Brock University; members' reports; slides by Carl Milazzo
December 23	Kepler and His Plans to Conquer the Universe by Peter Jedicke, London Centre

Throughout the year, the centre conducted many observing sessions both for our members and the public. The observers' group, chaired by Robert Lenz, had very successful star nights. Some of the highlights included observing supernova 1993J in M81, a Perseid watch and viewing the November 28th total lunar eclipse. Attendance at observers' group star nights was noticeably greater in 1993, partly due to the fully operational status of the centre's Al Kindy Memorial Observatory and its 17.5" scope. The observatory was closed in September for renovations and re-opened with many improvements. The centre plans to increase the number of public events held at the observatory now that it is better equipped to accommodate groups.

In addition to the centre's 8" Coulter Odyssey reflector, both a Celestron C-8 and an Edmund Scientific Astroscan were recently acquired courtesy of Dr. John Black of Brock University. All three telescopes will be available for one month loans to members and will be used at our public events.

1993 saw an increase in the number and variety of public star nights. Observing sessions were held at Lester B. Pearson Park in St. Catharines, as well as two extremely successful star nights for campers at Rock Point Provincial Park on Lake Erie. Centre members also conducted viewing sessions at the centre observatory for local school groups, all of which were a great success. As well, eleven telescopes were set up by centre members for a September 30th star night at Brock University. Approximately 150 Brock astronomy students enjoyed an evening of observing and learning to recognize the constellations.

Niagara Centre members travelled to several weekend observing sessions, including the Huronia Star Party, Syracuse Summer Seminar, the Gateway to the Universe, Stellafane and Starfest. Other events held during the year included a February 20th field trip to the McLaughlin Planetarium in Toronto and a centre barbecue held July 20th at the centre observatory.

Late in the year the centre acquired an Internet account enabling us to exchange information more readily between centres and the national office. More members are becoming involved with computers and experimenting with astronomy software. The centre plans to install a computer/CCD system in our observatory for membership use and public education.

After several years of effort by centre member Walter Jutting, the national council approved a new Bylaw Number One of the R.A.S.C. Niagara Centre at a meeting of the council held on July 2nd. Thank you Walter for a job well done.

All in all, it was a very successful year during which we saw an increase in membership participation and attendance at public events. The board of directors expresses their appreciation and thanks to all members who helped make 1993 a very rewarding year for the Niagara Centre.

Ron Gasbarini, Secretary

The Ottawa Centre membership for 1993 was 235 members, consisting of 162 regular, thirty-four senior, six youth and thirty-three life members. This number shows a decrease over 1992 membership by eight people.

Our first vice-president, Robert Dick once again provided the Ottawa Centre with a variety of very interesting speakers. The year began in October with a talk by Dr. Randall Brooks on "Instrumental Development and the Advancement of Astronomy". The talk looked at some of the fundamental problems being addressed at approximately

Ottawa

half-century intervals and how the instrumentation of the day impeded or advanced the state of astronomical knowledge.

Our annual dinner meeting, held on November 20th, 1992, featured a talk by Terence Dickinson entitled "The Evolution of Amateur Astronomy". It was an excellent talk enjoyed by the members. The centre meeting of January 22nd, 1993 heard Dr. Peter Watson in a talk entitled "What is the Universe Really Made Of?". He discussed our current knowledge of dark matter. On February 19th, Dr. Parvez Kumar of the Canada Space Agency spoke on "The High Frontier". We again broke with tradition in March and had our own centre members present "Adventures in the Spring Sky".

On April 17th our speaker was Dr. David Fisher of the Geological Survey of Canada who discussed "The Polar Caps of Mars". He reviewed our current understanding of the evolution, dynamics, and nature of the polar caps. In May the centre was addressed by Dr. Russell Redman whose topic was "The Surfaces of Asteroids". He discussed what we have learned about these minor planets and raised our awareness of these distant worlds. Our September meeting featured Paul Klauninger speaking on "The Night Time Ottawa Sky".

The Ottawa Centre's Observer of the Year Award was presented to Brian Burke who for many years has been our occultation and graze co-ordinator.

Again this year, *Astronotes* featured many good articles and fine editorials under the direction of Doug George.

We are again grateful to Dr. Peter Watson of Carleton University for his sponsorship and for providing us with rooms and facilities for our council, centre and observer's group meetings as well as our library.

Both the Stan Mott Book Library (managed by RoseAnne Mussar and assisted by Gary Mussar and Rob McCallum) and the Ted Bean Instrument Loan Library (operated by Patrick Laffey) were well used by our membership during the year. Some new books were purchased and a video library was started thanks to the efforts of Rob Dick and Jon Buchanan in video taping and editing our centre meeting talks.

Council met on February 12th, 1993; May 28th, 1993; and September 24th, 1993.

Jane Lund, Secretary

In 1993 many spring and summer stargazing nights at the Regina Centre were cancelled due to rain, overcast skies or mosquitos. The centre still managed, though, to hold four excellent stargazing nights at the Davin observing compound. The most memorable of these was for the Perseid meteor shower in August. Members saw several intense displays of fireballs streaking across the sky—their long trails remaining visible for ten to thirty seconds. Viewing conditions were also excellent during the total lunar eclipse in November.

The centre also purchased a 10" Meade telescope which members will be able to use for astrophotography. The purchase of the telescope was funded by the membership surcharge and a Xerox employee grant.

Regina

1992/1993 was another good year for the St. John's Centre, with numerous centre activities well-planned and attended. Current membership stands at thirty-two regular, four life and one associate. A major change for 92-93 was the monthly *NOTICE*, an information sheet sent informing members and friends of the where and when of monthly meetings and other pertinent news. This was a change from the custom of phoning. The *NOTICE* is a collaboration between myself and vice-president Fred Smith. Over fifty people currently receive the *NOTICE*, that is, thirty-seven members and nearly twenty interested people. Centre activities have been well-attended this year. Our first event in 1992 was the centre's Christmas party. About twenty members attended, were very generous in their donations to our potluck celebration, and a good time was had by all. In March, national president Peter Broughton honoured us with a visit and once again we asked members to donate food to the reception. Again they were generous. Speakers at monthly meetings have included Fred Smith instructing us on how to best use our Observer's Handbook, Bryan Payton talking about his telescope mount, and Keith Legrow speaking on the Big Bang. All speakers have our thanks for their efforts. Average member attendance at monthly meetings has generally ranged between fifteen and twenty members.

For Astronomy Day we were invited to the "SET Square", an event in which science and technology is celebrated through displays, which occurred at the Marine Institute in St. John's. About fifteen members showed up to man our display throughout the day, and for a short time in the morning we wondered if we would get in each other's way, but, by the time the day ended, we were thankful we all stayed. We could not count the visitors we had, but we all felt it numbered in the hundreds, perhaps as many as a thousand. Eight people expressed an interest in joining our centre. Many thanks again to all who participated, and especially to Bryan Payton for his continuing "donation for the day" of his display board, magnificently decorated with photos and information about the centre.

We thank Doug Skinner for once again arranging access to the Marine Institute's planetarium, in June, to show members the summer sky. Both a member and a teacher at the institute, Doug has always been generous in arranging this event.

Other accomplishments during the year include renovating the Russel telescope from an altazimuth to a Dobsonian, for which we thank John Bell and Gary Dymond. Malcolm Simpson attached wheels to Keith Legrow's donated bookcase to make

St. John's

Centre Reports

a portable library and members have been generous in their donations to this library. The centre's 1994 General Assembly organizing committee's first meeting was held on February 14th, 1992, to get some preliminaries discussed. Public relations topped the list, such as pins and the possibility of getting valises with a logo. Also important was the goal of finding a speaker for the Helen Sawyer Hogg lecture. At the time of this report that goal has been reached.

According to observing chairman Gary Dymond, we had an "O.K." year observing. The weather plays a major role in observing in Newfoundland and there is general agreement it really did not cooperate very much this year. Gary reported that we had thirteen nights out at the centre's observing site in Butterpot Park. In keeping with our agreement with park authorities, we held two public star nights. One of those nights, the night of the magnificent Perseid Meteor Shower, drew thirty-five members and twenty interested people from the park. Our yearly "Star-B-Q", generally held in late August in Terra Nova National Park, did not attract as many members this year, but park authorities were apparently very pleased with the public response and there were good crowds at the public lectures. We were also busy lecturing to seventeen different organizations. The St. John's Centre's growth as a centre has astounded many, I think at times, including ourselves. We have a lot for which to be proud, and 1994, the year of the historic St. John's Centre's General Assembly, promises to be even better.

Dennis Ryan, Secretary

As of January 1993, our membership stood at sixteen, not too bad for a small place like Sarnia. Plans are already in motion for the hopeful purchase of a telescope through which we could educate the public at large about the stars, planets and other wonders of the universe. Often, as I am sure has happened in every other centre, one or more of our members have been asked to give a small show for the various Boy Scout, Cub, Girl Guide and Brownie groups. The purchase of a club scope would be of tremendous assistance in circumstances such as these. The project was going to be financed by a grant from a local group that Kathy Milliken has a contact with. Regretfully, due to her leaving, that project has been placed on hold until such time that we can find another group willing to support this undertaking.

Sarnia

For Astronomy Day a display was set up in a local mall at which several people were present to promote interest in our stargazing activities. It began as a slow day, but in the end was very promising as six to ten individuals expressed that they were enjoying the talks and wanted to know more about the R.A.S.C. and the Sarnia Centre. The most enjoyable of the situations that arose were the children that tried to look through the rear end of one of the two Newtonians set up on display!

In the days prior to the Perseids, through the help of our president, Alice Lester and future member Robert Davidson, a star party was set up. It was a great success with some people staying until 1:00 A.M.

In September we had arranged for another star party for the public. Anyone who wished to come was invited to bring a lawn chair and they would be taken on a tour of the heavens. A large turnout was expected as notices were placed in convenience stores around the local area, and a large turnout was what we got! Many questions were posed and answered, ranging from what the stars were to the possibility of other intelligent life in the universe. In addition, the sights were viewed and described by some of our members who turned out and I still remember the look on one inexperienced person's face as he feasted his eyes on Saturn through my Newtonian. It was a big success.

There are many other activities that occurred during the year that I could brief you on, but that would extend this report to a great length. Suffice it to say that future monthly meetings will have many presentations, discussions, software demonstrations and pieces of astronomical equipment brought in by members. Centre members will also report on observational activities that they have taken part in or done on their own and many projects are planned for 1994.

James Selinger, Secretary

The past year has seen an explosion of activity in the Saskatoon Centre as can be witnessed by the list of activities below. In 1993, we decided to change our programming emphasis from a few 'big name' lectures to a lot of smaller, more diverse topics on amateur astronomy itself. This was done as an effort to raise the interest level in the centre so that newcomers felt

Saskatoon

as if they were actually learning something practical at the meetings. We found that a good way to discourage a member from rejoining was to subject them to long and dry 'lectures' where they did not learn much about amateur astronomy. We now do shorter and more diverse presentations. The response has been very positive.

In addition to the listed events, we also held "Observers Group Meetings" at our Rystrom Observatory every month throughout the year. As many O.G. meetings were clouded out, we have now implemented rain (or snow) dates for these meetings to increase the chances of having a clear night. Besides all the star nights and presentations, we also managed to do some badly needed repairs to the Rystrom Observatory. Jim Young, Al Hartridge and Gord Sarty spent many mosquito-infested days fibreglassing the dome to eliminate leaks. We have also done a lot of work in membership and promotions this year, resulting in a dramatic increase in membership and in visibility of the centre. Hats off to Sandy Ferguson for organizing so many of the events

and to Mike Wesolowski, who almost single-handedly took on public school astronomy education. Each and every one of the executive worked very hard this year for positive results. Our membership at large also helped out a lot. Here's to a great 1992-93 and an even better 1993-94!

January 18	Video "Canada's Stargazers: From Louisbourg to Supernova"
February 15	Space Shuttles, Space Stations and Crystals by Dr. L. Delbaere
March 15	Astronomy for Beginners by S. Ferguson; December's Lunar Eclipse by M. Wesolowski; STARLAB Portable Planetarium by R. Waldron and Y. Bousquet
April 19	Planetarium Programs and other Astronomy Software by J. Young
May 1	Astronomy Day Display at Market Mall and Public Starnight
May 17	The Dominion Radio Astrophysical Observatory by Dr. E. Valk
May 21	Public "Starday"—Public Viewing of the Partial Solar Eclipse at the Mendel Art Gallery
June 1&16	Brightwater Camp Public School Starnight
June 17	School Starnight at Bonne Madone Beach
June 21	Video: "Buying Your First Telescope"; Proposal for Meteor Searches by K. Mysyk; Astronomy Day, Starnight and the May Solar Eclipse by S. Ferguson; Summer Constellations by S. Ferguson
July 23/24	Annual Summer Public Star Night at Diefenbaker Park
July 30/31	Public "Starday"—Solar Sidewalk Astronomy at the Fringe
August 11	Perseid Meteor Shower at the Rystrom Observatory
August 12	Wanuskewin Perseid Public Starnight
September 17/18	1st Annual Fall Public Starnight at Diefenbaker Park
September 20	Noctilucent Clouds of June 20, 1993 by R. Huziak; The Mount Kobau Experience by G. Sarty; The 1993 Halifax General Assembly by J. Young
October 12	Light Pollution Presentation to Saskatoon City Council by G. Sarty, R. Huziak
October 18	Election of New Executive Council; Summer Activities Slides by M. Wesolowski; Rystrom Observatory Repairs by A. Hartridge; Report on the City Council Light Pollution Presentation by R. Huziak
October 23	Hugh Cairns School Starnight
October 30	Great Fireball of Saskatchewan and Manitoba Occurs by R. Huziak and G. Sarty
November 15	Observing Variable Stars by M. Wesolowski; Preliminary Results from the October 30 Fireball by R. Huziak
November 28/29	Total Eclipse of the Moon at the Rystrom Observatory
December 13	The 'Winter Six' Constellations by S. Ferguson; The Importance of Meteorites in Geology by Dr. L. Coleman

Bill Hydomako, Secretary
Richard Huziak, President

Since September of 1992, membership renewals and new memberships have shown a continued downward trend. Larger centres must soon recognize the needs and financial constraints of the smaller centres. The average small centre has fewer than fifty members and with only 40% of the membership fee retained, there is just barely enough to pay for the production and mailing of a local newsletter.

In its short history, this centre has helped shape the direction of the national society in several areas by providing the initial idea for sample centre bylaws; recommending and providing input on the establishment of the national public liability policy for all centres; providing leadership for a meeting with Ontario Hydro to have them reconsider their standards on street lighting and light pollution; and chairing and presenting the now accepted national speakers travel grant. Other than local members, over the past seven years, the centre has only hosted two out-of-town speakers, Lloyd Higgs and Damien Lemay.

The Thunder Bay Centre members meet monthly from September to May and then have multiple summer activities. This year, we concentrated our efforts on a summer program at Sleeping Giant Provincial Park. The event, called Giant Weekend, was a joint venture presented by the Thunder Bay Centre and the Thunder Bay Field Naturalists. Events were run all day and late into the night on Friday, Saturday and Sunday. The centre presented a display of equipment and also ran N.A.S.A. movies each day. An evening astronomy slide show, which was followed by star gazing, gathered a crowd of over 200 people from all over North America. The telescopes were kept busy into the wee hours of the morning.

Thunder Bay

August took our group to Quetico Park for our annual Perseids meteor program. This year was a real treat. Under extremely clear skies and pitch-black surroundings, three pairs of observers surrounded by forty-five campers enjoyed a warm bug-free night and recorded an average count of 150 meteors per hour. The observers sat back-to-back, facing east and west, with each person equipped with a paper pie plate with a line drawn down its middle. Each plate had a notch in the edge which was lined up to the north position and then each observer drew a line on the plate to indicate the location of each meteor that they saw. All of the observations were transferred to a star chart the next day.

Our newsletter, *Northern Sky* continues to help us keep members up to date, which is important as some live 300 km east and west of Thunder Bay with others living 200 km north.

The November 29th lunar eclipse provided a flurry of news media activity with many members joining us at our chosen observing location. The clouds gave us some problems prior to first contact but from then on a clear sky gave everyone a great view. It sure was cold and there was about a foot of snow on the ground, but it was worth it. All things being equal, the Thunder Bay Centre should be just as active next year. Keep looking up!

Bob Bishop, Secretary

On December 1st, 1868, eight men gathered to form the Toronto Astronomical Club. From this modest beginning grew the Royal Astronomical Society of Canada—Toronto Centre. This year marks the 125th anniversary of the Toronto Centre and the Ninth Annual Awards Banquet, held on the evening of April 3rd, was the perfect way to kick off the festivities.

The evening's program was expertly chaired by Guy Nason with Ian McGregor handling the award portion of the program. Following a delicious main course, a huge birthday cake was rolled into the dining room with candles blazing. A distinguished group took part in the blowing out of the candles and the official cutting of the 125th anniversary cake.

Congratulatory letters were read from Peter Broughton (R.A.S.C. National President), June Rolands (Mayor of the City of Toronto), the Right Honourable Bob Rae (Premier of the Province of Ontario) and from His Excellency The Right Honourable Ray Hnatyshyn (The Governor-General of Canada).

The guest speaker for the evening, Dr. Emlyn Koster, Director General of the Ontario Science Centre, spoke on the topic of "Opening Minds to Science and Technology". Dr. Koster presented an enjoyable and thought provoking look at the importance of science literacy in our society and the barriers that we need to overcome.

The awards presented were: The Andrew Elvins Award for promotion of interest in astronomy, won by Robert Taylor; The Bertram J. Topham Award for significant observing activities, won by Guy Nason; and The Bert Winnearls Award for efforts in supporting the centre's activities went to Terence Dickinson. Many thanks to Perceptor for their assistance with the door prizes. Thanks also go to Mary Anne Harrington for organizing a very special and memorable evening.

This past year was another active one for the public education committee thanks to the efforts of numerous volunteers. Astronomy Week continues to be our main event. Running from April 24th to May 1st, about seventy-five volunteers and staff drawn from the Toronto Centre, the Deep Sky Observer's Club, the McLaughlin Planetarium, the Ontario Science Centre, the University of Toronto, and York University pooled their efforts to bring astronomy to the people of Toronto.

Shopping mall displays remain a key component in introducing the Toronto public to astronomy. Four displays were coordinated and run this year by Bob Taylor and a highly motivated team of volunteers. Summer public star nights continue to attract newcomers to astronomy. Events were held this year on July 20th and August 17th, both at Morningside Park in Scarborough and Humber Bay Park West in Etobicoke.

School and group talks and telescope displays, coordinated by Steven Spinney and John Ginder are also an important part of the Toronto Centre's outreach program. Sixteen such talks were given during the past year to a total of sixteen volunteers.

D.D.O. Saturday nights continued our well-established tradition of assisting the staff of the David Dunlap Observatory with their Saturday night public viewing program. Coordinated by Steven Spinney, a few of our members brought out their telescopes and met with the public on clear nights from April 17th to October 2nd. Also, R.A.S.C. volunteers helped out at the Ontario Science Centre on December 9th, 1992 by setting up their telescopes for the lunar eclipse.

The observational activities committee, chaired by Guy Nason, organized many events. Steven Spinney and Bill Gardner organized twenty members' observing workshops in Scarborough and Etobicoke respectively. Bob Chapman conducted a series of ten deep sky observing workshops at Camp Robin Hood near Markham. Attendance at these events varied from six to sixty depending on the weather and observing conditions. A special thank you is extended to Camp Robin Hood for allowing us to use their site. Clouds continued to plague the occultation team in 1992-1993. Of eight planned lunar graze expeditions, only two were successful and all three planned asteroidal occultation expeditions were clouded out. Good results were obtained from two of the successful grazes and these were submitted to the International Occultation Timing Association and the International Lunar Occultation Centre. Many thanks go to Guy Nason and all those who helped organize and conduct these events.

Dr. John Percy arranged a diverse and very interesting program of speakers. These were:

October 30th

The Canadian Space Program: Past, Present and Future by Mr. Kieran Carroll

Toronto

November 27th	The History of Life on Earth by Dr. David Kobluk
January 15th	How University Students Perceive Astrology and Astronomy: A Survey by Prof. Michael de Robertis
February 12th	The A.A.V.S.O. and Space Astronomy by Dr. Janet Mattei
March 12th	Millimetre and Sub-millimetre Astronomy: The Last Electromagnetic Frontier by Dr. Ernest Seaquist
April 16th	What's New in Astronomy Education by Dr. John Percy
May 14th	The Harvard Time Machine by Dr. Martha Hazen

A joint meeting with the Royal Canadian Institute was held on January 24th where Dr. Wendy Freedman spoke on measuring the expansion rate and size of the universe.

Membership on September 30th, 1993 included 587 regular, 108 senior, twenty-four youth and eighty-four life members for a total of 802. There were also sixty-three associate members. The death of Dr. Helen Sawyer Hogg this year was a great loss, not only to the Toronto Centre and the R.A.S.C. but to the Canadian and international astronomical communities.

I would like to extend a vote of thanks to our members who have generously donated to the centre over the past year. While most donations are financial, some consist of equipment or astronomical publications. Mrs. Hughes, in memory of her son, James M. Thompson, donated his very extensive collection of astronomical books as well as some ten years worth of *Astronomy* magazine. This was a very generous gift to the centre and it is deeply appreciated.

In 1993, the Toronto Centre will observe the 125th anniversary of the founding of the Toronto Astronomical Club. Otmar Eigler is continuing to work on the archival binder project, which is a photographic history of the centre.

The centre's newsletter, *Scope*, continues to be our main line of communication with our members and the credit for its production as an appealing and informative vehicle must go to its editor, Mary Anne Harrington. Special thanks go to Steven Spinney who served as, to quote his term "Temporary Editor" for the Sept./Oct. and Nov./Dec. 1992 issues and for continuing to provide much-needed assistance as assistant editor for the remaining issues of the 1992-93 membership year. Thanks also to Paul Fjeld for his welcomed assistance and to the many members who contributed articles.

Congratulations go to Jason Harlow who was awarded the 1993 Toronto Centre Gold Medal. Mr. Harlow is a fourth-year student in the astronomy and physics specialist program at Victoria College. Steven Spinney presented Mr. Harlow with the medal and the best wishes of the membership at the October 1st, 1993 meeting.

The optical workshop operated this past year under the direction of Bill Gardner and Issac Kravec. The group meets Saturdays and is currently working on four mirrors.

Thanks go to Randy Attwood for organizing a successful second annual centre garage sale fund-raiser during the June 11th members' night. Thanks also to Paul Markov for surveying, producing and distributing the 1993 centre membership directory.

This year's picnic was combined with our annual open house at the David Dunlap Observatory, which was held on September 11th. The open house at the D.D.O. has become one of the centre's best attended events and we thank the director, staff and students for their hospitality. Finally we thank the staff of the McLaughlin Planetarium for their hospitality and offer them our congratulations as they celebrate their 25th anniversary this fall.

Tony Horvatin, Secretary

We had our usual busy year with twelve regular meetings and more than the usual twelve council meetings due to extra business. We have continued to have outstanding speakers—thanks to Barry Shanko—several members' nights and one planetarium show. For public astronomy, Astronomy Day itself was a washout but we held two successful sidewalk astronomy nights in the west end, one in the spring and one in the fall.

We again participated in the Fraser River Festival in June and a small but very dedicated group of volunteers attended the Pacific National Exhibition on fifteen out of seventeen days—from 10:00 A.M. to 10:00 P.M.—to give out information. Other volunteers helped the Girl Guides at their Maple Ridge summer camp with their "guide stars" program. Our education coordinator, Steve Whitehouse, gave talks to seniors and others at several community centres.

Four members went to the Halifax G.A. and several made a special trip to Pine Mountain Observatory in Oregon. Observing weekends were held at Manning Park and also at Mount Kobau (with rather mixed weather).

Raj continues to produce his excellent calendar, both locally and nationally. Our own membership award was given to Mike Chutter and June Kirkcaldy received her national Messier Certificate.

Speakers during 1993:

January	Members' Night: Eyepieces and Astrophotography
February	Red Giants at TRIUMF by Dr. John D'Auria
March	Ovendon Memorial Lecture
April	Swift-Tuttle by Dr. Jeremy Tatum
May	Looking at the Milky Way by Lee Johnston

Vancouver

June	Dark Matter in the Universe by Dr. Harvey Richter
July	The Russian Space Program—A Summer at Baikonur by Chris Gainor
August	Bringing UFOs Down to Earth by Phil Klass
September	The Andromeda Galaxy by Dr. Paul Hodge
October	Members' Night
November	Touch the Sky Planetarium Show
December	Multiple Stars by Dr. Colin Scarfe

What an interesting year! If we overlook the sad news that our membership dropped from 130 a few years ago to 106, we more than made up for it in other ways. We are hoping an improved economy will perk up membership in the future.

Members' nights are always popular. For instance, in April we had a slide show from a member who built an observatory that dwarves his two-story house and an hilarious video tape made of *Journal* editor Jeremy Tatum's appearance on the T.V. program *Front Page Challenge*.

Jack Newton continues to wow everyone with his incredible colour CCD images. His cold camera has been pushed into the corner of a cupboard, his darkroom is now a storeroom and the only time he uses his camera is to photograph his computer screen. CCD software manufacturers occasionally send him their products to "test drive" before marketing them. The centre meets at Jack's mountain-top home for Observers' Nights every third Wednesday in the month, giving us an opportunity to use the 25" Newtonian that takes pride of place in the observatory that he built right into his house. After an observing session, or if the skies are cloudy, everyone gathers in his computer room, located beneath the dome, to examine his most recent images and learn more about the art of tri-color imaging. Slowly, but surely, some members are getting hooked on CCD imaging and with dedicated software increasingly becoming available, it should soon entice many more.

Most of the monthly speakers we enjoy listening to are due to the efforts of Dr. James Hesser, director of the Dominion Astrophysical Observatory, who is also a member of the Victoria Centre. He arranges for members of his professional staff to come down and address the centre on some current topic. Some, who were only visiting the D.A.O. were steered our way while others generously donate time out of their busy teaching schedules at the University of Victoria. One June 24th, the annual meeting of the Canadian Astronomical Society, CASCA '93, was held in Victoria, giving us a unique opportunity to attend public lectures that were held at UVic.

Each spring the centre sets up a booth at Victoria's four-day annual hobby show. The show attracts a lot of people, giving our booth staffers a chance to answer questions and also invite people to join. On the other hand, public star parties have always been a problem. In the past we have had to ask for municipal permits to set up telescopes on a particular day. Invariably it was cloudy or raining. A break came last year when we were able to obtain permits for three months at a time, which allows us to set up scopes in a favourite waterfront park whenever the skies are clear, on any day we choose, without asking permission first.

About ten years ago the centre built a 0.5 metre computerized telescope, mounted on a large trailer. The contraption proved too unwieldy and it was not very popular. It sat in a field, unused, for years. In 1993, following a suggestion made by members Jack Newton and Jean Goldin, a decision was made to put it to good use. We have loaned it to Pearson College of the Pacific, in Victoria, which is one of a chain of similar colleges around the world. They have begun building a large, well-equipped observatory to house the telescope on their dark site near the ocean. The best part is that upon completion the centre members will have access to the entire installation in return for the loan... and we are getting the trailer back to use for something else!

An almost-new Takahashi 100 mm doublet fluorite refractor was recently donated to the centre. This, along with a newly-completed 20" Dobsonian which Gene Steeves began and George Bell completed, and other, older telescopes, now lets our members take advantage of an excellent arsenal.

Each year, in November, we hold our annual meeting and dinner. Last year we assembled at the Imperial Inn to meet our new officers for the coming year. Once we had put the business part aside we settled back to listen to Jeremy Tatum tell us about the "killer rocks" that threaten to do us all in and how a University of Victoria study period is cataloguing the rogues. He admits it is not altogether clear what we could do about an asteroid on a collision course with Earth... there may not be enough time.

The topics of the monthly meetings for the last year were:

October 1992	Galaxies: Their Nature and Formation by Dr. Henrik Vedel
November	Annual Banquet: The Canada-France-Hawaii Telescope: A Resident Astronomer's View by Dr. Timothy Davidge
December	Astronomy and the Cultural Revolution in China by Linzhuang Gao, Beijing Astronomical Observatory
January 1993	Cataclysmic Variables by Dr. Peter Garnovich, Dominion Astrophysical Observatory
February	Pre-main Sequence Evolution and Lithium Burning by Dr. Fritz Swenson, University of Victoria

Victoria

March	Binaries: Cooking and Feasting by Dr. Graham Hill, Dominion Astrophysical Observatory
April	Members' Night
May	Awesome, Stupendous Astrophotography by Jack Newton
June	The Mountains of Chile: Observations and Observatories by Dr. Doug Geisler, Cerro Tololo Inter-American Observatory
September	Site Testing in Saudi Arabia by Ernie Pfannenschmidt
October	75 Years of Science at the Dominion Astrophysical Observatory by Dr. Robert McClure, Dominion Astrophysical Observatory

1993 for the Windsor Centre carried on quite well in achievements, particularly with the announcement that the national council had granted our centre the privilege to host the 1995 General Assembly of the society.

This was Dan Taylor's third and final year as president of the centre. At our January 1993 meeting we had the good opportunity to hear a presentation from our national president, Peter Broughton.

We readily anticipate the release of his book on the history of the society.

The Windsor Centre suffered a great loss, being the passing away on Easter Sunday, April 11th, of Pat Langin, a long-time and active member. We shall genuinely miss the contributions that this man has made.

The centre hosted a very successful Astronomy Day display at Devonshire Mall on April 17th. Some good publicity was done there. We had a successful observing social conducted by our director of observing, Susan Sawyer-Beaulieu, at Heritage Village in Essex County on May 15th. While there, some members saw supernova 1993J in the spiral galaxy M81. The centre was able to obtain a much-needed slide projector through the generous donations of its members and with a matching grant from the national council.

In June we had the privilege of hearing from Jack Newton and were quite impressed with his ability to process cold camera pictures and CCD images. Some members attended the Starfest and Astrofest conventions during the summer months. We had a fairly well-attended observing session of the Perseid meteor shower near Eagle, Ontario on the night of August 11th.

Randy Groundwater wrote two articles on the Moon and the total lunar eclipse that were featured on a full-page in the *Windsor Star's* Spotlight section. Members also viewed the dark total lunar eclipse on the night of November 28th at our meeting place, St. Stephen's Church, in Essex County. Randy Groundwater and Bert Hunealt completed the first year of writing high quality monthly articles on astronomy for the *Windsor Star*. They have been well received by the Windsor area public.

Special thanks are sincerely expressed to all speakers and others who have contributed to the centre's progress this year. The Windsor Centre held nine membership meetings during the year, three council meetings, two observing sessions, one major public display and one social. Membership meetings were as follows:

January 19	R.A.S.C. History Highlights by Peter Broughton, National President
February 16	1992QB1 by Jack Brisbin, President, Detroit Astronomical Society
March 16	Observing Variable Stars by Dan Taylor
April 20	Globular Clusters by Peter Jedicke, London Centre
May 18	The Sun by Frank Shepley
June 9	Cold Camera Photography & CCD Imaging by Jack Newton, Victoria Centre
September 21	Earth as a Planet by Joady Ulrich
October 19	Amateur Meteor Observing by Peter Brown, London Centre
November 16	Magellan's Radar Views of Venus by Tom Sharron and Partial Solar Eclipse in Washington State by Frank Shepley

C. Joady Ulrich, Secretary

The year 1993 was a fulfilling one for Winnipeg Centre members. Although not a large centre, Winnipeg still can boast of an energetic and dedicated group, with interests varying from cosmology to sundials.

Astronomy Day celebrations were once again held at the Forks Market, which overlooks the scenic confluence of the Red and Assiniboine Rivers. Several telescopes were set up, and astronomy videos were shown during the day. Several eye-catching astrophotos taken by Jay Anderson were also on display at our indoor booth. The scheduled evening observing session had to be cancelled because of overcast skies.

Windsor

Winnipeg

Centre Reports

Our centre also hosted a group of fifty very bright, and very inquisitive grade eight students at Glenlea Observatory on August 16th. These young people were participants in Manitoba's first week-long Space Camp organized by the provincial Department of Education and funded by private industry. The students were divided into groups of ten, and took in displays and activities related to astronomy. The evening culminated with an observing session where the students participated in a constellation search. Most had never looked through a telescope before, and found the experience "cool". Unfortunately this activity had to be shortened because of an unusually large mosquito infestation. Winnipeg had earlier been subjected to torrential downpours which flooded many homes and caused huge property losses. The resulting standing water transformed much of the province into a giant mosquito ranch.

Many of our members have undertaken interesting projects in 1993. As an example, Chris Brown began an on-going study on the reliability of local long-range weather forecasts. He also began making auroral observations, and has requested reports from other members. The data collected will be used as part of a study to determine the relationship between seeing aurora and detecting large fluctuations in the earth's magnetic field.

A few new telescopes have seen first light locally in 1993. Paul Paradis, a dedicated "telescope nut" and machinist *extraordinaire*, unveiled his third incarnation of a 10" f/6 reflector. This scope is a fine example of exquisite craftsmanship.

Stan Runge encouraged our members to work towards obtaining their Messier Certificate, and several members are actively pursuing this challenge.

Our general meetings were held at Saint Paul's College, with most council meetings taking place beforehand.

January	Astronomy Software II by centre members
February	The Get-Away Special by Darrin Gates of Bristol Aerospace
March	Thirty Years of Pushing Glass by Paul Moffat
April	Modelling of Variable Stars With Large "Starspots" by Dr. John Rice
May	C.C.D.'s in Astronomy by three University of Manitoba students
June	Annual Glenlea Barbeque and Great Messier Race
September	Observing In Your Back Yard by Stan Runge
October	Elections Night and Member Forum
November	Choosing Your First Telescope by five centre members
December	Johannes Kepler Live by Dr. Martin Clutton-Brock

The Winnipeg Centre gang sends out all of our best wishes to you for clear skies and a rewarding 1994.

Gilbert Raineault, Secretary

Sunny skies and very pleasant weather greeted delegates to the 1993 G.A., held over the July 1st weekend in Halifax. The G.A. was held on the campus of Mount Saint Vincent University located on the Bedford Basin.

A long, hot council meeting was held on Friday afternoon. As the members of the national council only meet four times a year (twice at the G.A.) there is always a great deal of society business that needs to be dealt with. Fortunately a motion was made at the beginning of the meeting to limit its duration to five hours. The motion was carried unanimously! The business remaining at the end of this meeting (you didn't think five hours would be enough, did you?) was deferred to the next council meeting on Sunday. It is no wonder that the wine and cheese party is held on the Friday evening. It is a great way to unwind and meet your fellow delegates.

After the wine and cheese was the traditional song contest and Murphy's slide show, which was hosted by none other than Johannes Kepler (or at least, his twin!). There was actually only one song entered when the contest began (written by Mary Lou Whitehorne and her daughters) and it wound up to be the winner. However, as people got into the spirit, more entries came forth. David Levy sang some songs of G.A.'s past, and several people wrote some little ditties on the spot. Perhaps the highlight of this particular event was a skit parodying the exploits of National Council and the centre council reps. Starring in this farce were none other than Peter Broughton, David Tindall, Doug Hube, Mike Watson, Mary Anne Harrington, and Cathy Hall. Among other things, several unsuccessful attempts were made to abolish the *Journal*, and \$900,000 was given to the Charlottetown Centre for its seven month anniversary celebration bash aboard the space shuttle. All in all, a good time that broke the ice and established the relaxed and friendly atmosphere that characterized this General Assembly. Afterwards, many people retired to the hospitality suite (where some people spent more time there than in their room!) About three in the morning, Guy Nason and Tim Mullings from Toronto, and Scott Young from Winnipeg, drove out to a deserted school yard to try and observe an asteroid occultation but clouds and moonlight interfered, but it was fun anyway.

Saturday morning saw the start of the paper sessions. Topics included "CCD Colour Imaging" by Jack Newton (Victoria); "Responsible Lighting: Worthy of Praise" by Ruth Lewis (Calgary); "Monster Telescopes of the 1990s" by Alan M. MacRobert (Sky & Telescope); "CCD Imaging" by Doug George (Ottawa); "The Earth Centered Universe: A Sky Atlas Computer Program for Amateur Observers" by David Lane (Halifax); "Rating Binoculars for Astronomy" by Dr. Roy Bishop (Halifax); and "Who Really Made the First Telescope?" by Dr. Randall Brooks (Halifax and Ottawa).

The '93 G.A.

Many excellent displays were set up and included a display on light pollution by Ruth Lewis (Calgary), chairperson of the national light pollution committee; a centre display and a light pollution display from the Kingston Centre; some marvellous images from Jack Newton (Victoria); and a computer demonstrating "The Earth Centered Universe: A Sky Atlas Computer Program for Amateur Observers" by David Lane (Halifax). Rajiv Gupta, who does much of the astrophotography for the R.A.S.C. calendar, showed some of his amazing black-and-white photographs. Talk about pinpoint star images! His work was enough to make me consider ditching the CCD and getting back into conventional photography. Wow!

Saturday night was a bit dreary, but our *Bluenose II* harbour cruise went ahead. Participants were warned to dress warmly—most listened, but not everyone. It is an amazing feeling to be on a ship under full sail. A bit of wind and rain only added to the experience, as did the view of the "Old Man of the Sea" (a.k.a. Roy Bishop) in his sou'wester, spyglass in hand, sighting on a distant shore. Then it was back to the hospitality suite for more late-night discussions of things astronomical.

Sunday morning the paper sessions concluded and then on Sunday afternoon the society's annual meeting was held. Representatives of seventeen centres were present as well as three unattached members. In addition, many of the members held proxy votes from members of their centres who were unable to attend. In total there were 132 valid proxies. These proxies had been handed in to the secretary, Dr. Tindall, following the Friday council meeting in order that the proxies could be counted in advance and therefore expedite matters. A special meeting was held with all of the proxy holders to review the status of the proxies prior to the annual meeting. It was noted at the meeting that proxy holders had the legal right to vote or not vote the proxies they were holding. There was some discussion on this matter and some proxy holders did choose not to cast some of the proxies that they were holding.

The annual meeting ran quite smoothly with the two main items being a by-law amendment to delete the senior category of membership and a motion to increase the society's fees for the 1993-94 membership year. Following lengthy discussions and the use of the proxy votes, the motion to delete the senior category of membership was passed by a two-thirds majority. The increase in membership fees was also approved. Dr. David Tindall completed his term as national secretary and stepped down. The new national secretary is Dr. Randall Brooks, a member of both the Halifax and Ottawa Centres. Following the annual meeting, a second national council meeting was held with the main item on the agenda the reforming of all of the various committees of the national society.

Sunday evening, the awards banquet was held at the Rosaria Conference Centre. Following dinner—your choice of lobster or roast beef—numerous awards, including the society's national awards, were presented. The award winners of the display contest were presented with commemorative, sterling silver medallions designed by Halifax Centre member, Nat Cohen. National president, Peter Broughton read the citation and presented the Service Award to Dr. David Tindall of the Halifax Centre and retiring national secretary. A Service Award was also awarded to Eric Clinton of the London Centre, but this presentation had been made earlier in the year at a special meeting of the London Centre. Next, Mr. Broughton read the citation and presented the Chant Medal to Mary Lou Whitehorne of the Halifax Centre.

Following the banquet, delegates made their way to the Seton Academic Centre for the Ruth Northcott Lecture featuring guest speaker, Mr. David Levy. Not surprisingly, the title for David's talk was "The Art of Comet Hunting: Part II" The lecture was also open to the public and it was extremely well-attended. (Air conditioning would have helped!) David recounted his early years in Montreal and Wolfville, Nova Scotia and he shared his ideas on what comet hunting really is: "a bit of art, a bit of sport and occasionally some science." At the present time, David Levy has seven visual discoveries of comets and twelve photographic ones shared with Carolyn and Eugene Shoemaker. It was a marvellous presentation and well received by the audience. Following his talk, he signed (and sold) copies of his book "*Clyde Tombaugh: Discoverer of Planet Pluto*"

Monday was the tour day, with tours of the Maritime Museum of the Atlantic and the Halifax Citadel in the morning, and Peggy's Cove in the afternoon. There were two "surprise" sights visible from the Citadel that were not on the itinerary. One was the *H.M.C.S. Toronto*, one of Canada's new frigates, the other was the sail-by of two Russian navy ships, the missile cruiser *Marshal Ustinov* and the destroyer *Admiral Kharlamov*. Some delegates has skipped the Sunday morning paper sessions to visit the Russian ships, which were having an open house. They got to walk around the ships, take pictures, talk to the sailors and even sit in one of the helicopters. That night, much of the group took in the Nova Scotia International Tattoo, which by all accounts was incredible.

Most people left Tuesday, but some stayed and drove out to Acadia University to see David Levy's second talk at his old school. Again, David wowed the full house with his dynamic presentation and unique charm. Even though he is one of the most famous astronomers in North America, he is still an amateur at heart, and an all-around nice guy.

The final "event" of the G.A. was a small get-together at Roy Bishop's house on Minas Bay (home of the nine metre tides). We sat on the deck, and toured Roy's attached observatory, which is a ten foot Ash dome. After ten years, Roy has finally completed a 17.5" Dobsonian for his observatory. Few telescopes on this planet are as finely crafted as his instrument and the ergonomics of the instrument are well thought out. The scope rests on the floor of the observatory—there is no pier—but it is rock solid thanks to careful positioning of the observatory and house framing. The solidness has to be experienced to be believed. This scope is a marvel; it has so many innovative ideas and features that they are impossible to list. Perhaps we will see it in the pages of *Astronomy* or *Sky and Telescope*.

Many thanks to the members of the Halifax Centre for making the G.A. such an enjoyable experience, and special thanks go to Mary Lou Whitehorne, the chair of the G.A. organizing committee.

[This summary combines reports from three centre newsletters written Mary Anne Harrington (Toronto), Scott Young (Winnipeg) and Walter MacDonald (Kingston).]

Minutes of the 1993 Annual Meeting

The 1993 Annual Meeting of The Royal Astronomical Society of Canada was held on Sunday, July 4, 1993 in the Seton Academic Centre, Auditorium D, Mount Saint Vincent University, Halifax, Nova Scotia, with the President, Mr. Peter Broughton presiding. The meeting was called to order at 1:10 p.m.

Mr. Broughton welcomed members to the 1993 Annual Meeting. On behalf of all present, he thanked the members of the Halifax Centre for their hospitality and a special vote of thanks to Ms. Whitehorne for organizing such an enjoyable General Assembly. A round of applause voiced the member's support of Mr. Broughton's comments. Mr. Broughton then asked the members of each Centre to stand and be acknowledged as he called out the list of Centre names. Members were present from seventeen of the twenty-two Centres as well as several unattached members.

Mr. Broughton stated that any member of the Society is entitled to vote at the Annual Meeting and members may also vote by proxy. He then asked if there was anyone who was still holding proxies which had not been submitted to the Secretary, Dr. Tindall. There were no additional proxies. Mr. Broughton reminded members holding proxies that the proxies could be voted on any motion made during the Annual Meeting. He stated, however, that he would only be calling for the proxy votes on the motions which related to the by-law amendments and the proposed fee increase. He stressed again that members were free to vote their proxies on any motion, they simply had to notify the chairperson that they wished to do so.

1) APPROVAL OF THE AGENDA

AM9301 It was moved by Ms. Whitehorne and seconded by Ms. Lewis, to approve the agenda of the 1993 Annual Meeting. The motion was CARRIED.

2) ADOPTION OF THE MINUTES OF THE 1992 ANNUAL MEETING

AM9302 It was moved by Ms. Goodman and seconded by Mr. Lane, to adopt the minutes of the 1992 Annual Meeting. The motion was CARRIED.

3) REPORTS OF THE COUNCIL, OFFICERS AND COMMITTEES AND ADOPTION OF THE AUDITED FINANCIAL STATEMENTS

3.1) REPORT OF THE PRESIDENT

Mr. Broughton stated that his report was contained in the 1992 Annual Report, which was published in the April 1993 issue of the Bulletin. He commented that after completing his first year as President, he was extremely proud of the Society and the tremendous diversity of interest and talents among the members.

3.2) REPORT OF THE SECRETARY

Dr. Tindall stated that his report was also contained in the 1992 Annual Report. Members then rose as Dr. Tindall read the list of members who had passed away during the past year. A minute of silence was then observed.

Mr. Broughton thanked Dr. Tindall for his report.

3.3) REPORT OF THE TREASURER

Mr. Hicks read the report which he had presented to National Council at the meeting on Friday, July 2, 1993. In the report, he discussed at length the accounting methods and the ACCPAC and LOTUS software programs used at the National Office. He expressed his concerns and those of the Finance Committee over increasing travel costs on which, at the present time, there are no caps on spending. He stated that, at the Council Meeting following today's Annual Meeting, the Finance Committee will be proposing a cap on travel expenses for the Fall meeting of National Council. In conclusion, Mr. Hicks stressed that something must be done and very quickly about travel costs. A lengthy discussion followed.

AM9303 It was moved by Mr. Levy and seconded by all present, that the Society give a vote of thanks to Mr. Hicks for the excellent job he is doing as the National Treasurer. The motion was CARRIED by a unanimous round of applause.

Further discussions followed.

AM9304 It was moved by Mr. Fraser and seconded by Mr. Dick, that the Finance Committee study the possibility of stock investments as opposed to GIC's. The motion was CARRIED.

A brief discussion followed.

AM9305 It was moved by Mr. Hicks and seconded by Mr. Runge, to adopt the audited financial statement as published in the 1992 Annual Report. The motion was CARRIED.

Mr. Broughton thanked Mr. Hicks for his report.

3.4) REPORT OF THE NATIONAL LIBRARIAN

Mr. Broughton reported that the National Librarian, Mr. Woodcock, was not present but if anyone had any questions regarding the Library, they could speak to Mr. MacDonald, a member of the Library Committee.

3.5) REPORT OF THE NATIONAL RECORDER

There was no report from the National Recorder.

3.6) REPORT OF THE EDITOR OF THE JOURNAL

Mr. Broughton reported that Dr. Tatum was not present but that he had sent a report to Council and the chairperson of the Publications Committee would be willing to answer any questions about The Journal.

3.7) REPORT OF THE EDITOR OF THE OBSERVER'S HANDBOOK

Dr. Bishop summarized the report which he had presented to Council on Friday, July 2, 1993. He stated that the Handbook sales for 1993 were slightly behind the 1992 level. Dr. Bishop stated that costs for a single copy of the 1994 edition would be \$15.89 plus G.S.T., bringing the total cost to \$17.00. A brief discussion followed.

Mr. Broughton thanked Dr. Bishop for his report.

3.8) REPORT OF THE EDITOR OF THE BULLETIN

Mr. Kelly reported that, due to the fact that the April issue of the Bulletin was the 1992 Annual Report, he expected the printing costs to be some \$3000 below budget. He also commented that he does look forward to receiving articles from members, but, he would really like to receive a lot more photographs showing various Centre activities. He emphasized that all slides or prints submitted would be returned to the sender.

Mr. Broughton thanked Mr. Kelly for his report.

3.9) REPORT OF THE EDITOR OF THE BEGINNER'S OBSERVING GUIDE

Mr. Enright summarized the report which he had presented to Council on Friday. The new edition is expected from the printers on July 26, 1993. There have been several changes since the last edition. It is a smaller format and contains information for three years — 1994-96. The Guide will sell for \$8.88 plus G.S.T. for a total cost, in Canada, of \$9.50.

Mr. Broughton thanked Mr. Enright for his report.

3.10) REPORT OF THE ASTRONOMY DAY COORDINATOR

There was no report from the Astronomy Day Coordinator.

3.11) REPORTS OF STANDING COMMITTEES

3.11.1) REPORT OF THE AWARDS COMMITTEE

Mr. Lemay reported that the 1992 award winners of the Plaskett Medal and the Service Award were listed on the back page of the 1992 Annual Report.

Mr. Broughton thanked Mr. Lemay for his report.

3.11.2) REPORT OF THE CONSTITUTION COMMITTEE

Mr. Watson reported that the Committee has had a very busy year including the approval, by Council, of the Sample Centre By-Laws; approval of new by-laws for both the Calgary and Niagara Centres; and the proposed by-law amendments which will be discussed later in this meeting.

Mr. Broughton thanked Mr. Watson for his report.

3.11.3) REPORT OF THE EXECUTIVE COMMITTEE

Mr. Broughton stated that there was no report from the Executive Committee.

3.11.4) REPORT OF THE FINANCE COMMITTEE

Mr. Hicks stated that there was no further report from the Finance Committee.

3.11.5) REPORT OF THE HISTORICAL COMMITTEE

Dr. Brooks reported that 1993 marks the 125th anniversary of the founding of the Toronto Astronomical Society. He stated that a special lecture will be held on December 2, 1993 at the National Museum of Science and Technology, in Ottawa, to honor the late Dr. Helen Sawyer Hogg. The speaker will be Dr. Christine Clement from the University of Toronto, who will speak, not only on the many contributions of Dr. Hogg but also on the study of globular clusters.

It was also reported that the Montreal Centre and the Dominion Astrophysical Observatory are both celebrating their 75th anniversaries this year.

Dr. Brooks also noted that Isobel and Alfred Bader have donated Herstonceaux Castle, on the grounds of the Royal Greenwich Observatory (RGO), to Queen's University in Kingston. It is expected that the facility will be used as an overseas campus for Queen's students. Some of the telescopes and domes, left behind when the RGO moved and combined with the astronomy department at Cambridge University, will be available for use by the University for research and instruction.

Mr. Broughton thanked Dr. Brooks for his report.

Mr. Broughton felt that this was an appropriate time to inform the members that the Department of Astronomy at the University of Toronto have established the Helen Sawyer Hogg Distinguished Visitorship as a memorial to Dr. Hogg. He encouraged members who wished to honor Dr. Hogg's memory, to donate to this very worthwhile program.

3.11.6) REPORT OF THE LIBRARY COMMITTEE

There was no report from the Library Committee.

Minutes of the 1993 Annual Meeting

3.11.7) REPORT OF THE NOMINATING COMMITTEE

Mr. Lemay read a brief biography of Dr. David Turner before introducing Dr. Turner, a Life member of the Halifax Centre, to the members as the new editor of The Journal.

Mr. Broughton thanked Mr. Lemay for his report.

Mr. Broughton noted that the Secretary will be sending a letter of appreciation to Dr. Tatum for his years of service as the Editor of The Journal.

3.11.8) REPORT OF THE PROPERTY COMMITTEE

Mr. May stated that he had presented his report to Council on Friday and that the property was in good shape.

Mr. Broughton thanked Mr. May for his report.

3.11.9) REPORT OF THE PUBLICATIONS COMMITTEE

Dr. Hube summarized the report which he gave to Council on Friday. He stated that the Society had received a grant from NSERC for The Journal — \$5000 for this current year and \$3000 for next year. Dr. Hube noted that several changes are being looked at in regard to The Journal, including the use of a different publisher. These matters are being looked into by the Publications Committee including the new Journal Editor, Dr. Turner, as well as the out going Journal Editor, Dr. Tatum.

Mr. Broughton thanked Dr. Hube for his report.

3.12) REPORT OF SPECIAL COMMITTEES

3.12.1) REPORT OF THE BEGINNER'S OBSERVING GUIDE MARKETING COMMITTEE

There was no report from The Beginner's Observing Guide Marketing Committee.

3.12.2) REPORT OF THE CENTENNIAL COMMITTEE

There was no report from the Centennial Committee.

3.12.3) REPORT OF THE COMPUTER USE COMMITTEE

There was no report from the Computer Use Committee.

3.12.4) REPORT OF THE GA GUIDELINE COMMITTEE

There was no report from the GA Guideline Committee.

3.12.5) REPORT OF THE LIGHT POLLUTION COMMITTEE

Ms. Lewis reminded Centre Representatives to please see her before the end of the weekend to pick up copies for their Centres of the certificate, designed by the Light Pollution Committee, for "Responsible Lighting."

Mr. Broughton thanked Ms. Lewis for her report.

3.12.6) REPORT OF THE LONG RANGE PLANNING COMMITTEE

Mr. Watson reported that the Committee has been waiting for the results of the Membership Survey and now that this information is available the Committee can now begin reviewing the findings.

Mr. Broughton thanked Mr. Watson for his report.

3.12.7) REPORT OF THE MEMBERSHIP SURVEY COMMITTEE

Mr. Hawley reported that 447 responses to the membership survey have now been processed and the results are now available to all Centres on spreadsheets and/or discs. He reminded Centre Representatives to please pick up the material from him before the end of the weekend. Mr. Hawley noted that many of the comments made on the survey relate to local Centre issues and Centres should take note of these comments. A brief discussion followed.

Mr. Broughton thanked Mr. Hawley for his report.

3.12.8) REPORT OF THE MEMBERSHIP AND PROMOTION COMMITTEE

There was no report from the Membership and Promotion Committee.

3.12.9) REPORT OF THE SOLAR ECLIPSE 1994 COMMITTEE

Mr. Watson stated that the purpose of this Committee is to prepare a public education program for the May 1994 annular solar eclipse, visible over Southern Ontario. The Committee plans to order a large quantity of "eclipse viewers" and prepare press kits which will be available to Centres for the eclipse.

Mr. Broughton thanked Mr. Watson for his report.

3.12.10) REPORT OF THE SPEAKER TRAVEL COMMITTEE

There was no report from the Speaker Travel Committee.

4) BY-LAW AMENDMENTS

Mr. Broughton asked if there was anyone in the room who was holding proxy votes of which Dr. Tindall was not aware. He also reminded members that if they had filled in a proxy form but were now present at the meeting, that the proxy was invalid as they would now be voting in person on the motions. Mr. Broughton stated that there were 132 valid proxies and 23 proxy holders. Dr. Bishop was appointed by the Executive to hold the proxies where no proxy holder had been stipulated or the person named

on the proxy was not present.

AM9306 It was moved by Dr. Hube and seconded by Mr. Shepley, that Council appoint Ms. Freeman and Mrs. Lee as scrutineers for the counting of the votes when the proxies are used. The motion was CARRIED.

Mr. Broughton then outlined the procedure that would be followed for the use of the proxies during the meeting. A brief discussion followed.

4A) Society Fees

Mr. Broughton read the proposed by-law amendment.

AM9307 It was moved that By-Law Number One of the Society be amended by a) renumbering articles 3.06(2) through (9) as articles 3.06(3) through (10), and b) adding, as article 3.06(2), the following: Any member of the Society who proposes an ordinary resolution of the Society to change any of the annual Society's membership fees shall give notice of such resolution to the Secretary of the Society at least 60 days prior to the meeting of the Society at which it is proposed to move the resolution which notice shall specify the change proposed. The agenda for any meeting at which it is proposed to move any such resolution shall include the specifics of the proposed resolution. At the meeting at which the resolution is considered the resolution may be amended without further notice to the members of the Society.

Mr. Watson outlined the reasoning behind the motion. A brief discussion followed and the following amendment was proposed:

AM9308 It was moved by Mr. Nason and seconded by Mr. Broderick, that the item (b) of the motion, second sentence, be amended to change "...any of the annual Society's membership fees..." to read "...any of the Society's annual membership fees..." The motion to amend was CARRIED.

The vote on AM9307 as amended was then taken, including the proxy votes.

Motion AM9307, as amended, was CARRIED by a two-thirds majority.

4B) Senior Membership

Mr. Broughton read the proposed by-law amendment. Mr. Watson explained the reasoning behind the amendment.

A brief discussion followed.

AM9309 It was moved that By-Law Number One of the Society be amended by deleting the senior category of membership, and in particular by:

- a) repealing Article 3.02(4) and renumbering Articles 3.02(5) through (7) as Articles 3.02(4) through (6);
- b) amending Article 3.02(1) by replacing the word "five" with the word "four", and deleting "senior" in the first line;
- c) amending Article 3.06(1) by deleting the third sentence, and
- d) deleting all references to senior members and the senior category of membership except in Article 3.02(5).

The proxy votes were again counted on this motion.

Motion AM9309 was CARRIED by a two-thirds majority.

4C) Membership and Promotion Committee

Mr. Broughton read the proposed by-law amendment. Mr. Watson commented briefly on the rationale behind the formation of the Membership and Promotion Committee, as well as the reasoning behind proposed by-law amendments 4D) Proxies and 4E) Society Fees.

(Please note that the proxies were not voted on amendments 4C, 4D or 4E.)

AM9310 It was moved that By-Law Number One of the Society be amended by establishing a "Membership and Promotion Committee" as a Standing Committee of Council, and in particular by:

- a) amending Article 7.01(1) by (i) renumbering clauses (g) through (i) as clauses (h) through (j), and (ii) adding, as clause (g), the words "Membership and Promotion Committee", and
- b) renumbering Articles 7.12 through 7.16 as Articles 7.13 through 7.17, and adding, as Article 7.12, the following:
"7.12 Membership and Promotion Committee:

- 1) The Membership and Promotion Committee shall consist of at least three and not more than five members of the Society.
- 2) The Membership and Promotion Committee shall a) recommend to Council and implement measures to maintain and to increase the membership of the Society, b) promote public awareness of and the reputation of the Society, c) consider and recommend to Council, as may be desirable from time to time, measures to enhance and make more effective the Society's services to its members, and d) have such other duties as may be prescribed by the Council."

Motion AM9310 was CARRIED by a two-thirds majority.

4D) Proxies

AM9311 It was moved that By-Law Number One of the Society be amended by adding thereto, immediately before the period at the end of Article 8.07, the words ", such written proxy to be in substantially such form as may be adopted from time to time by the Council." AM9311 was CARRIED by a two-thirds majority.

4E) Society Fees

AM9312 It was moved that By-Law Number One of the Society be amended by changing the end of the first sentence in Article 3.06(2) "...immediately upon election (although back issues of the publications of the Society may not be available by summer)."

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to read "...immediately upon election. Persons whose applications for membership are received between 31 January and 31 July will be entitled to receive only those Society publications that are produced after their applications have been processed, together with The Observer's Handbook."

AM9313 It was moved by Mr. Connors and seconded by Mr. Dick, the AM9312 be amended by adding following the words "...publications that are produced..." the expression "in that membership year as provided in Article 3.05,..." The motion to amend was CARRIED.

Motion AM9312, as amended, was CARRIED by a two-thirds majority.

5) ELECTION OF OFFICERS OF THE SOCIETY

Dr. Tindall stated that, as noted on the agenda, the following Officer of the Society is elected by acclamation:

Secretary: Dr. Randall C. Brooks

Mr. Broughton thanked Dr. Tindall for his tireless efforts on behalf of the Society. A round of applause followed.

6) ELECTION OF THE AUDITOR

AM9314 It was moved by Mr. Hicks and seconded by Mr. Lee, that the firm of C.J. Tinkham & Associates be appointed as the auditors of the Society for another year. The motion was CARRIED.

7) PROPOSED MEMBERSHIP FEE INCREASE

Mr. Broughton then read the motion dealing with the proposed fee increase.

AM9315 It was moved by the Finance Committee that the membership fees for the 1993/94 membership year should be set at \$36 for ordinary members, \$22.50 for youth members and \$900 for life members.

Mr. Hicks discussed a graph comparing membership fees, the inflation rate as published by Statistics Canada and the accumulated inflation expressed as a percentage since 1982. He also discussed a graph, prepared by Dr. Bishop for the February National Council Meeting, which dealt with a comparison of membership fees since 1970, the number of members and a comparison of membership fees expressed in 1971 dollars. A very lengthy discussion followed.

The vote was finally taken on AM9315. The proxy votes were again counted on this motion. Several proxy holders declined to vote some of their proxies. This led to a brief discussion as to whether or not this could be done. It was noted by Mr. Watson that proxy holders do have the right to decline to vote the proxies that they hold, if they so choose. The vote continued.

Motion AM9315 was CARRIED.

8) OTHER BUSINESS

1994 Eclipse Tour — Ms. Lewis stated that the Alberta Science Centre, in conjunction with the Calgary Centre, is organizing a ten day tour to Peru for the November 3, 1994 total solar eclipse. Any members who would like more information should see Ms. Lewis following the meeting.

9) ADJOURNMENT

AM9316 It was moved by Dr. Tindall and seconded by Miss Harrington, that the meeting adjourn. The motion was CARRIED.

The meeting was adjourned at 4:05 p.m.

Respectfully submitted:



Mary Anne Harrington,
National Recorder

Quotes

I have steadily endeavored to keep my mind free so as to give up any hypothesis, however much beloved (and I cannot resist forming one on any subject) as soon as the facts are shown to be opposed to it.

Charles Darwin
English naturalist
(1809-1882)

What is called science today consists of a haphazard heap of information, united by nothing, often utterly unnecessary, and not only failing to present one unquestionable truth, but often as not containing the grossest of errors, today put forward as truth, and tomorrow overthrown.

Leo. N. Tolstoy
Russian author
(1828-1910)

There is no inductive method which could lead to the fundamental concepts of physics. Failure to understand this fact constituted the basic philosophical error of so many investigators of the nineteenth century.

Albert Einstein
German/American physicist
(1879-1955)

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- National Council Representative • Robert C. Bishop, 135 Hogarth Street, Thunder Bay, Ont. P7A 7H1 (807) 767-5689

Toronto

- Centre Address • c/o McLaughlin Planetarium, 100 Queen's Park, Toronto, Ont. M5S 2C6 (416) 777-4300
- Electronic Mail • bchou@watserv1.uwaterloo.ca
- Honorary President • Dr. Ernest Seaquist, P.O. Box 360, Richmond Hill, Ont. L4C 4Y6 (416) 884-2112
- Past Presidents • Randy Attwood, 4348 Dallas Court, Mississauga, Ont. L4W 4G7 (416) 624-4629
- Ian McGregor, 4086 Blue Grass Court, Mississauga, Ont. L5C 3Y4 (416) 586-5743
- President • Steven Spinney, 154 John Tabor Trail, Scarborough, Ont. M1B 2P8 (416) 281-2392
- First Vice-President • Mary Anne Harrington, 118 Wolfrey Avenue, Toronto, Ont. M4K 1L3 (416) 463-2326
- Second Vice-President • Dr. John Percy, Erindale College, Mississauga, Ont. L5L 1C6 (416) 828-5343
- Secretary • Tony Horvatin, 8 Mountainview Avenue, Toronto, Ont. M6P 2L3 (416) 763-4339
- Treasurer • Dr. B. Ralph Chou, 5190 Mississauga Road, Mississauga, Ont. L5M 4Z2 (416) 567-8694
- Recorder • Neil Kinnear, 16 Park Road, RR#2 Sutton West, Ont. L0E 1R0 (416) 722-9963
- Honorary Councillor • Frederic Troyer, 1703-2330 Bridletowne Circle, Scarborough, Ont. M1W 3P6
- Councillors • Robert Chapman, Brian Cheaney, John Ginder, Bill Hodges, Robert May, Guy Nason, Gordon Skerratt, Kim Sprague, Robert Taylor
- National Council Representatives • Randy Attwood, Robert May, Ian McGregor, Steven Spinney, Frederic Troyer

Vancouver

- Centre Address • c/o Gordon Southam Observatory, 1100 Chestnut Street, Vancouver, B.C. V6J 3J9
- Electronic Mail • skene@ucs.ubc.ca
- Honorary President • Dr. John S. MacDonald, 6237 Marguerite Street, Vancouver, B.C. V6M 1E5
- President • Steve Whitehouse, #202 7425 18th Avenue, Burnaby, B.C. V3N 1H6
- Vice-President • Frank Marino, 20199 Hampton, Maple Ridge, B.C.

- Secretary • Reid Hart, 7332 Dunvegan Court, Burnaby, B.C. V5A 3R5
- Treasurer • Cecile Dar Santos, 2483 Yew Street, Vancouver, V6J 5C2 (604) 732-4564
- Editors of NOVA • Mike Chutter, Ken Nelson
- Librarian • Heather McNabb, 4577-56A Street, Delta, B.C. V4K 3C7 (604) 946-7849
- Director of Telescopes • Duncan Munro, 7517 Turner Street, Mission, B.C. (604) 826-9523
- Councillors • Victor Amey, Giovanni Andreis, Dan Collier, Usman Majeed, Omar Mayaga, David Savelieff
- National Council Representative • Rajiv Gupta, 2476 West 1st Avenue, Vancouver, B.C. V6K 1G6 (604) 733-0682

Victoria

- Electronic Mail • rasc@uvvm.uvic.ca
- Honorary President • Dr. John Climenhaga, 2450 Sutton Road, Victoria, B.C. V8N 1J2
- Past President • Don Dundee, 928 Claremont Avenue, Victoria, B.C. V8Y 1K3 (604) 658-8458
- President • Gareth Shearman, 1216 Clovelly Terrace, Victoria, B.C. V8P 1V6
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- Second Vice-President • Bill Almond, 354 Benhomer Drive, Victoria, B.C. V9C 2C6 (604) 478-6718
- Secretary/Treasurer • Bill Almond, 354 Benhomer Drive, Victoria, B.C. V9C 2C6 (604) 478-6718
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- Director of Telescopes • Sid Sidhu, 1642 Davies Road, Victoria, B.C. V9B 5T9
- Recorder • Sandy Barta, 277 Plowright Road, Victoria, B.C. V9B 1P4 (604) 479-0259
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- National Council Representative • Jack Newton, 640 Cairns Way, RR#1 Sooke, B.C. V0S 1N0 (604) 642-6601

Windsor

- Electronic Mail • jhusch@ucc.uwindsor.ca
- Honorary President • Dr. Mordechat Schlesinger, University of Windsor, Windsor, Ont. N9B 3P4
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- President • Tim Bennett, RR#2 13003 Pinkerton Side Road, Essex, Ont. N8M 2X6 (519) 776-8901
- Vice-President • Susan Sawyer-Beaulieu, 1112 Coachwood Plcae, Windsor, Ont. N9H 2G3 (519) 972-5516
- Secretary • C. Joady Ulrich, 5450 Haig Avenue, Windsor, Ont. N8T 1K9 (519) 945-3132
- Treasurer • John Hurley, RR#1 427 County Road 34, Essex, Ont. N8M 2X5 (519) 839-5565
- Assistant Treasurer • Frank J. Shepley, RR#2 344 South Middle Road, Maidstone, Ont. NOR 1K0 (519) 723-2389
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- Assistant Director of Observing • Mike Mastronardi, 8630 Jerome Street, Windsor, Ont. N8S 1W9
- Librarian • Tom Sharron, 409 Matthew Brady Boulevard, Windsor, Ont. N8S 3J5
- Recorder • John McDermott, 1758 Marentette Avenue, Windsor, Ont. N8X 4E6
- Councillors • Joan Bennett, Rod Clark, Randy Groundwater, David Hamilton, Bert Huneault, Henry Lee, Dave Marchand, John McDermott, Jim Meredith, Mike Mastronardi, Dan Taylor
- National Council Representative • Frank J. Shepley, RR#2 344 South Middle Road, Maidstone, Ont. NOR 1K0 (519) 723-2389

Winnipeg

- Centre Address • Room 110, St. Paul's College, 430 Dysart Road, Winnipeg, Man. R3T 2M6
- Electronic Mail • cbrown@ccm.umanitoba.ca
- Past President • Chris Rutkowski, P.O. Box 1918, Winnipeg, Man. R3C 3R2 (204) 269-7553
- President • Stan Runge, 35 Cunard Place, Winnipeg, Man. R3T 5M1 (204) 261-9984
- First Vice-President • Paul Paradis, P.O. Box 244, St. Adolphe, Man. R0A 0T6 (204) 883-2411
- Second Vice-President • Scott Young, P.O. Box 19, St. Germain, Man. R0G 2A0 (204) 254-4422
- Secretary • Gil Raineault, 12 Greenmount Road, Winnipeg, Man. R2J 1T4 (204) 253-4989
- Treasurer • Chris Brown, 183 Canora Street, Winnipeg, Man. R3G 1T1 (204) 253-6392
- Editor • Andora Jackson, 595 Arlington Street, Winnipeg, Man. R3G 1Z6
- Councillors • Jay Anderson, Kevin Black, Andora Jackson, Chris Rutkowski, Mike Wegner, Guy Westcott
- National Council Representative • Stan Runge, 35 Cunard Place, Winnipeg, Man. R3T 5M1 (204) 261-9984

One may conceive light to spread successively, by spherical waves.

Christian Huygens
Dutch astronomer/ physicist
(1629-1695)

Astronomy was the daughter of idleness.

Bernard Le Bovier
Sieur de Fontenelle
French philosopher
(1657-1757)

It is a most beautiful and delightful sight to behold the body of the moon.

Galileo Galilei
Italian astronomer/physicist
(1564-1642)

Centre Councils for 1994

Quotes

Centre Finances

	Calgary	Edmonton	Halifax	Hamilton	Kingston	Kitchener Waterloo	London	Montréal	C.F. de Montréal	Niagara	Ottawa
REVENUE											
Membership Fees (Regular)	\$5,418	\$4,571	\$3,062	\$2,790	\$2,014		\$828	\$2,932	\$672	\$2,024	\$5,960
Membership Fees (Basic Surcharge)	\$1,512	-	-	\$1,235	\$466		\$206	\$1,765	-	-	-
Membership Fees (Special Surcharge)	\$615	-	-	\$200	-		-	-	-	-	-
Life Member Grants	\$230	\$128	\$997	\$26	\$102		\$77	\$243	\$13	\$38	\$435
Donations	\$1,478	\$117	\$41	\$1,697	\$330		\$54	\$1,040	\$50	\$180	\$1,394
Fundraising	-	\$155	\$1,271	\$887	-		\$117	-	-	\$71	-
Educational Activities	\$1,922	\$500	-	\$3,277	\$279		-	-	-	\$363	-
Interest & Dividends	\$460	\$1,148	\$492	\$67	\$6		\$119	\$4,032	\$38	\$17	\$734
Sale Of Handbooks (Net)	\$118	(\$10)	\$454	\$38	\$160		\$6	\$12	-	\$30	\$153
Sale Of Calendars (Net)	\$170	\$21	\$77	\$89	\$192		(\$11)	\$291	-	\$18	\$149
Sale Of Beg. Observing Guides (Net)	-	\$27	\$50	\$401	\$169		\$90	(\$126)	-	-	-
Advertising	-	\$136	-	\$227	-		\$40	\$20	\$108	-	\$50
G. A. (inc. Travel Grants)	\$199	-	\$1,297	-	\$492		-	\$104	-	-	-
Miscellaneous	\$1,277	\$78	\$828	\$500	\$336		\$100	\$305	-	-	\$412
Total Revenue	\$13,398	\$6,871	\$7,969	\$11,434	\$4,546	No Report Received	\$1,626	\$10,618	\$881	\$2,741	\$9,287
EXPENDITURES											
Fees to National Office	\$3,252	\$2,789	\$1,819	\$1,694	\$969		\$497	\$1,755	\$403	\$888	\$3,576
Library	\$13	\$257	-	\$340	\$150		-	\$350	\$40	-	-
Meetings	\$50	\$118	\$221	\$361	-		\$107	\$217	\$45	\$256	\$252
Newsletter	\$2,154	\$1,198	\$872	\$1,766	\$618		\$270	\$911	\$65	\$422	\$1,838
Annual Dinner (Net)	\$542	-	-	-	-		\$43	-	-	-	-
G. A. (inc. Travel Grants)	\$399	-	-	-	\$450		-	\$200	-	-	\$210
Equipment & Supplies	\$1,247	\$18,167	-	\$1,339	\$486		-	-	\$71	\$485	-
Office Administration	-	\$159	\$122	\$317	\$180		\$3	\$848	\$127	-	\$804
General Expense & Audit	\$1,326	\$40	-	\$427	\$14		\$158	\$1,098	-	\$137	-
Educational Activities	\$756	\$3,361	-	\$731	\$279		-	-	-	-	\$436
Insurance	\$1,063	\$100	-	\$488	-		-	\$856	\$80	-	\$496
Awards & Donations	-	\$4,172	\$222	\$100	\$104		-	\$162	-	\$67	-
Observatory	\$1,135	-	-	\$1,125	-		-	\$2,090	\$45	\$360	\$499
Miscellaneous	\$674	\$43	\$44	\$317	\$828		\$208	\$969	\$5	\$9	\$100
Total Expenditures	\$12,611	\$30,404	\$3,300	\$9,005	\$4,078		\$1,286	\$9,456	\$881	\$2,624	\$8,211
Surplus (Deficit)	\$787	(\$23,533)	\$4,669	\$2,429	\$468		\$340	\$1,162	-	\$117	\$1,076
Balance from 1992	\$16,272	\$47,053	\$10,464	\$3,557	-		-	-	-	\$366	\$29,746
Balance to 1993	\$17,059	\$23,520	\$15,133	\$5,986	-		\$340	-	-	\$483	\$30,822

	Québec	Regina	St. John's	Sarnia	Saskatoon	Thunder Bay	Toronto	Vancouver	Victoria	Windsor	Winnipeg
REVENUE											
Membership Fees (Regular)	\$3,069	\$677	\$1,023	\$371	\$1,121		\$21,588	\$6,045	\$3,315	\$1,336	\$1,660
Membership Fees (Basic Surcharge)	-	-	-	-	\$122		-	\$1,575	\$241	-	\$781
Membership Fees (Special Surcharge)	-	\$167	-	-	\$40		-	\$422	-	-	-
Life Member Grants	\$20	-	\$51	\$13	\$51		\$1,114	\$205	\$294	\$26	\$13
Donations	\$61	\$560	-	-	\$533		\$2,351	\$50	\$17	\$1,008	\$161
Fundraising	\$186	-	-	-	-		-	\$1,543	-	\$198	-
Educational Activities	-	-	-	-	-		-	-	-	\$231	\$50
Interest & Dividends	\$125	\$9	\$133	\$7	\$154		\$1,785	\$39	\$682	\$11	\$30
Sale Of Handbooks (Net)	\$60	\$4	\$87	-	-		-	\$176	\$11	\$235	\$80
Sale Of Calendars (Net)	\$68	\$13	\$90	-	\$12		-	\$2,290	\$5	\$310	\$27
Sale Of Beg. Observing Guides (Net)	-	-	\$5	\$20	-		-	\$105	\$77	-	\$10
Advertising	\$250	-	-	-	-		\$645	\$236	-	-	-
G. A. (inc. Travel Grants)	-	-	-	-	-		-	-	\$594	-	-
Miscellaneous	\$806	-	\$5	-	-		\$2,384	\$404	-	\$44	\$159
Total Revenue	\$4,645	\$1,430	\$1,394	\$411	\$2,033		\$29,867	\$13,090	\$5,236	\$3,399	\$2,971
EXPENDITURES											
Fees remitted to National Office	\$1,630	\$251	\$622	\$271	\$684		\$13,593	\$4,500	\$1,987	\$802	\$996
Library	\$1,648	\$103	\$62	-	\$91		-	\$5	\$49	\$64	-
Meetings	-	-	-	\$112	-		\$1,166	\$1,487	-	\$90	\$105
Newsletters	-	\$182	-	\$47	\$495		\$6,146	\$3,852	\$1,376	\$181	\$327
Annual Dinner (Net)	\$145	-	\$106	-	-		\$416	\$118	\$302	-	-
G. A. (inc. Travel Grants)	-	-	-	-	-		-	\$442	\$1,085	-	-
Equipment & Supplies	\$387	\$2,000	\$186	-	-		\$542	\$2,634	-	\$1,384	-
Office Administration	\$312	-	\$58	-	\$116		\$3,820	\$709	-	-	-
General Expense & Audit	-	-	\$38	-	-		\$722	-	\$318	\$371	\$12
Educational Activities	\$140	-	-	-	\$57		\$696	\$57	-	\$213	\$499
Insurance	-	-	-	-	\$273		-	-	-	-	-
Awards & Donations	-	-	-	-	-		\$160	\$105	\$68	\$165	\$201
Observatory	\$445	\$358	-	-	-		-	-	-	-	-
Miscellaneous	\$764	\$74	\$129	\$33	\$599		\$2,476	\$2,714	\$24	\$69	-
Total Expenditures	\$5,471	\$2,968	\$1,201	\$463	\$1,717		\$29,737	\$16,623	\$5,209	\$3,339	\$2,242
Surplus (Deficit)	(\$826)	(\$1,538)	\$193	(\$52)	\$316		\$130	(\$3,532)	\$27	\$60	\$729
Balance from 1992	\$2,994	\$787	\$458	\$638	\$15,590		\$47,078	\$10,737	-	\$515	\$1,143
Balance to 1993	\$2,168	(\$751)	\$651	\$586	\$15,308		\$47,208	\$7,205	\$1,700	\$575	\$1,872

No Report Received

Centre Finances

Activities



Aboard the *Bluenose II*, Damien Lemay borrows a telescope from Roy Bishop to scan the horizon for pirate ships. The rest of the "crew" look like they know they are in good hands!



At the G.A. banquet, Halifax member Norman Scrimger demonstrates the art of eating lobster, while, next to him, Walter Zukauskas elaborates on the theory!



Eric Clinton's service award was presented at a meeting of the London Centre. From left, David Toth, President, London Centre; Eric Clinton; Peter Broughton, National President.



At the awards banquet, Nat Cohen presents society executive secretary, Rosemary Freeman, with a silver medal in appreciation of her dedication to the society.



Nat Cohen, in proper astronomical attire, prepares to emcee the Murphy slide show and song contest.



The G.A. brought together four Chant Medal winners. From left: Jack Newton, Mary Lou Whitehorne, David Levy, Damien Lemay.

Tinkham & Associates

CHARTERED ACCOUNTANTS

C.J. Tinkham, C.A., C.M.C.
 D.C. Tinkham, B. Comm., C.M.C., F.C.A.
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AUDITORS' REPORT

To the Members
 of

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
 LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA

We have audited the balance sheet of The Royal Astronomical Society of Canada as at December 31, 1993 and the statements of income and retained earnings for the year then ended. These financial statements are the responsibility of the company's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the company as at December 31, 1993 and the results of its operations for the year then ended in accordance with generally accepted accounting principles.

TORONTO, Ontario
 March 2, 1994

CHARTERED ACCOUNTANTS

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA BALANCE SHEET AS AT DECEMBER 31, 1993

ASSETS

	1993	1992
CURRENT		
Cash and short term investments	\$ 118,401	\$ 101,671
Accounts receivable	35,452	33,182
Prepaid expenses	1,897	1,874
Accrued interest receivable	11,258	11,298
	<u>167,008</u>	<u>148,025</u>
SPECIAL PURPOSE FUNDS (Schedule C)		
Cash and short term deposits (including accrued interest)	80,512	79,309
Guaranteed investment certificate	101,600	101,600
	<u>182,112</u>	<u>180,909</u>
CAPITAL ASSETS		
Office building, furniture, equipment, library (nominal value)	1	1
	<u>\$ 349,121</u>	<u>\$ 328,935</u>

LIABILITIES

CURRENT		
Payables and accrued charges	\$ 5,923	\$ 19,824
Deferred revenue	30,599	30,822
- Membership fees for ensuing year	23,515	20,353
- Journal subscriptions	33,512	33,996
- Unappropriated life membership fees (Schedule A)	<u>93,549</u>	<u>104,995</u>
	<u>182,112</u>	<u>180,907</u>
SPECIAL PURPOSE FUNDS (Schedule C)		

EQUITY

EQUITY		
Balance, January 1	43,016	29,936
Add: Excess of revenue over expenditure	34,097	13,097
Less: Transfer to Endowment Fund Balance, December 31	<u>(3,653)</u>	<u>(43,033)</u>
	<u>\$ 349,121</u>	<u>\$ 328,935</u>

On behalf of the Council of the Society

A. Brayton, President
P. H. ..., Treasurer

Accounting principles - Note 1

Tinkham & Associates

National Finances

National Finances

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
 LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
 STATEMENT OF REVENUE AND EXPENDITURE
 FOR THE YEAR ENDED DECEMBER 31, 1993

	1993	1992
REVENUE		
Membership fees		
- R.A.S.C. Centres	39,338	45,459
- Individual members	19,814	17,180
- Life membership: annual appropriation	<u>1,764</u>	<u>1,789</u>
	60,916	64,428
Grants and Donations		
- Government of Canada-annual grant	5,000	5,000
- Miscellaneous donations	<u>3,225</u>	<u>-</u>
	8,225	5,000
Net publication revenue (Schedule B)	<u>20,291</u>	<u>5,058</u>
Miscellaneous income		
- interest on investment	17,109	16,885
- insignia sales and annual meeting	2,266	948
- rent	<u>13,417</u>	<u>12,790</u>
	32,792	30,623
	<u>122,224</u>	<u>105,109</u>
EXPENDITURE		
Office salaries and employee benefits	43,639	39,312
Postage and shipping expense	5,317	4,656
General and office expense	4,377	6,499
Stationery, printing and supplies	851	771
Life membership allotment to Centres	3,902	3,520
General assembly and travel expense	13,694	17,178
Professional fees	2,075	1,925
Insignia, medals and awards	729	563
Telephone	1,328	1,068
Insurance	3,384	4,081
Library expense	215	191
Office equipment purchases	78	103
Grant	1,426	3,649
Bad debts	961	-
Building expenses	<u>6,151</u>	<u>8,496</u>
	88,127	92,012
EXCESS OF REVENUE OVER EXPENDITURES	<u>\$ 34,097</u>	<u>\$ 13,097</u>

Tinkham & Associates

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
 LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
 NOTES TO THE FINANCIAL STATEMENTS
 DECEMBER 31, 1993

NOTE 1 ACCOUNTING POLICIES

The financial statements of the Society have been prepared in accordance with accounting policies generally followed by similar non-profit organizations. The significant accounting policies observed in the preparation of these statements are summarized below.

(a) Membership fees:

Members' fees are credited to income for the related membership year. Accordingly, fees received at the end of the year for the ensuing year are included in deferred revenue. Life membership fees are credited to deferred revenue when received. Five percent of the life membership fund is transferred annually to membership fees revenue.

(b) Publications:

Subscriptions to the R.A.S.C. Journal are credited to income for the subscription period.

(c) Investments:

Investments are stated at cost. Investment income is recorded on the accrual basis.

(d) Special purpose funds:

The special funds of the Society are classified in accordance with the objectives specified by the donors or in accordance with directives issued by Council. The income of the various funds is recorded on the accrual basis.

(e) Fixed assets:

The office furniture, equipment and the library of the Society are carried in the accounts at a nominal value. The cost of additions to and replacements of fixed assets are expensed as they are incurred.

NOTE 2 ORGANIZATION

The Royal Astronomical Society of Canada is a Canadian corporation without share capital and a registered charitable organization, incorporated for the purpose of stimulating interest and promoting astronomy and related sciences.

Tinkham & Associates

The following awards were presented to society members in 1993:

Plaskett Medal

Dr. Pierre Brassard (Université de Montréal)

Chant Medal

Mary Lou Whitehorne (Halifax)

Service Award Medal

Eric John Clinton (London)
Dr. David A. Tindall (Halifax)

Messier Certificate

Charles Baetsen (Hamilton)	George Livadaras (Montreal)
Paul H. Brock (Unattached-U.S.A.)	Reg Henderson (Halifax)
Bill Brooderick (Kingston)	Blair MacDonald (Halifax)
Peter Jedicke (London)	Douglas Middleton (Montreal)
June Kirkcaldy (Vancouver)	Marc Ricard (Montreal)
Daniel Lazar (Calgary)	Dan Rombough (Kingston)
Frank Tomaras (Montreal)	

Membership Certificate

Daniel B. Taylor (Windsor)
Dr. David Turner (Halifax)

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Halifax	9	Hamilton	30
Hamilton	10	Kingston	30
Kingston	11	Kitchener-Waterloo	30
Kitchener-Waterloo	11	London	30
London	12	C. F. de Montréal (1993)	30
C. F. de Montréal	13	Montreal	31
Montreal	13	Niagara	31
Niagara	14	Ottawa	31
Ottawa	14	Québec (1993)	31
Québec not received in time, see June issue		Regina	31
Regina	15	St. John's	32
St. John's	15	Sarnia	32
Sarnia	16	Saskatoon	32
Saskatoon	16	Thunder Bay	32
Thunder Bay	17	Toronto	32
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