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The Royal
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of Canada

BULLETIN

La Société
Royale d'Astronomie
du Canada

The 1992 G. A.

Grant Dixon
Hamilton Centre
reprinted from *Orbit*

In my opinion, the general assembly must succeed on three levels to be great: business, scientific and social. This article will give my impressions of the most recent G.A. which was held this summer in Calgary.

The Business

The national council representative of any centre should attend at least two council meetings and the annual meeting. This representative attended these three, a meeting of proxy holders and many backroom lobbying sessions.

Even before the question of the dues increase came up, it was obvious that the financial tone of the R.A.S.C. was about to take a shift. A motion was passed that the finance committee would recommend only balanced budgets in the future and that only a deliberate act by the national council would change this. The Beginner's Observing Guide was not granted any money to continue until a better pricing system was presented. (At present there is no thought given to the editor's expenses, nor to shipping, promotion and printing cost overruns.) An amendment to the by-laws was proposed for the next G.A. that would make it mandatory that all members be informed ahead of time if there was to be a proposed change in the dues structure. The thrust of all of the council meetings was very positive.

Before the annual meeting there was a separate meeting to discuss the proxy votes as the wording used often differed from centre to cen-

tre. In addition, at the annual meeting Michael Watson explained the legal rights and obligations of the users of proxies. David Tindall then went on to how the different wordings had been interpreted. There were nine centres with proxies and all agreed that they were handled in a fair and equitable manner.

The annual meeting went quite smoothly until the presentation for justifying the fee increase. This was followed by a heated debate that was based more on emotion than reason. (At this time most of the arguments, both pro and con, were well-known.) When the vote was called and the proxies were added up, the motion was defeated! Next, Randy Attwood presented a motion that in essence proposed an increase of dues that amounted to half of the original proposal. Another debate ensued and the motion was again defeated. There was an uproar of approval that was almost embarrassing. The final results of the votes were as follows:

Increase to	Floor		Total	
	For	Against	For	Against
\$40	44	22	57	268
\$36	44	22	155	171

It should be pointed out that without the proxies the increase would have gone through.

The Science

The scientific aspect of the G.A. took on the form of tours, paper sessions and workshops. Four tours were offered; two to Banff, one to the K/T boundary and one to visit two observatories.

The tour of the K/T boundary was the one I chose because it would mesh well with Dr. Alan Hildebrand's talk which was scheduled for later that evening. The tour director was Roland Dechesne (geologist, Calgary Centre member and all-round nice guy). He took us first to Dry

Island Buffalo Jump and amid the spectacular scenery, he pointed out a one centimetre wide rusty strip of sediment that marks the end of the dinosaurs. Then it was on to the Royal Tyrrell Museum in Drumheller. In the midst of an arid badlands setting is a supermodern museum devoted to the Cretaceous era. If you like museums, you will love this one. It was a very informative trip.

I also decided to tour the two observatories. The first stop was the Rothney Astrophysical Observatory where the main telescope is a 1.5 metre metal infrared telescope on an alt-alt mount. It is quite disconcerting to see a mirror coated with gold instead of aluminium, but it is the right coating for the particular job. We were given a lecture on the Rapid Alternate Detection System (known as R.A.D.S.) that is used to take light curve measurements of stars under adverse conditions. The data taken here is combined with radial velocity data from the Dominion Astrophysical Observatory in Victoria, and a sophisticated computer produces detailed models of binary systems. The mirror of this telescope will soon be replaced by a 1.83 metre glass honeycomb mirror.

A fast-moving satellite tracking telescope was being installed at the site. When I say fast, it can slew so fast that the operator runs the risk of being crushed if he is in the dome with it. When I say fast, I'm talking about $f/0.8$ (sky fog in seconds)! But for me, the high point was a professional 0.4 metre Cassegrain. I would kill for an instrument of that calibre!

Then it was on to the Wilson Coulee Observatory. What more need you say about the Calgary Centre's own observatory than this: a Celestron 14 in a twelve foot Ash dome with warm-up

(continued on page 2)



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. Manuscripts (in English or French) should be submitted to the editor at the address below. Inquiries about the society should be directed to its National Office at 136 Dupont Street, Toronto, Ontario, Canada M5R 1V2.

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Editor: Patrick M. Kelly, RR#2 Falmouth,
Nova Scotia, Canada B0P 1L0
E-mail Address: pkelly@watt.ccs.tuns.ca
FAX: (902) 423-6672
Phone: (902) 420-7604(w), (902) 798-3329(h)

Editorial Staff: Diane Brooks, Harlan Creighton
Rédacteur pour les Centres français: Marc Gélinas,
11 Pierre-Ricard, N-D-Ile-Perrot, Québec, Canada
J7V 8M6

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sleeping quarters that would put many homes to shame. It is very nice to get government grants, but nicer to get decent ones! Well done Calgary!

The Helen Sawyer Hogg Lecture, hosted by the R.A.S.C. and C.A.S.C.A., had Dr. Alan Hildebrand as its guest speaker. His talk was entitled "The Cretaceous/Tertiary Boundary Impact (or The Dinosaurs Didn't Have a Chance)". He made an almost irrefutable argument for the Chicxulub impact crater in Mexico as being the cause of the K/T boundary debris. While he made a strong case for this impact causing the demise of the dinosaurs, it is still too early to make that leap in faith, in my humble opinion anyway.

The paper sessions were a collection of sixteen talks by fourteen speakers. They ranged from very easy to understand to complex. I will not try to give a description of all of them, but will give a few highlights instead.

Beautiful Category: Randy Attwood's eclipse video, Patrick Kelly's essay on stamps in astronomy, Steven Morris' photos from the South Pole, Jack Newton's CCD images.

Hobby Category: Don Hladiuk's construction of a backyard observatory and how he destroyed his expectant wife's vegetable garden.

Technical Category: Rob Dick's shadowband experiments, James T. Himer's talk on CCD imaging, Dave Lane's Micro-Guider.

Interesting Category: Martin Connor's creative use of computers and data from J.P.L.

Fastest Talker Category: James T. Himer condensing a one hour talk into fifteen minutes by speed talking, thus having to leave nothing out! If there was a category for best dress, he would also have won that. (It is suspected that the "T" in his name stands for Texas. Calgarians sure like their western heritage!)

The Best Category: This has to go to ShirLee Adamson of Edmonton, whose talk "My Twelve Years as a Rank Beginner in Astronomy" had everyone doubled up with laughter. This woman bared her soul and told of all the silly errors that

she had made as an amateur astronomer. They were even funnier because all of us have made them but most don't have the nerve to tell others about them. Consider the time that she was determined to find an NGC object. She spent many hours going over the star charts until she found the largest of them all and then spent hours trying to find it only to be told that she had misread NGP as NGC!

There were four workshops. All were of interest but two were exceptional.

John Mirtle gave a workshop on the use of filters in astrophotography. He first discussed the use of filters to help eliminate light pollution, both man-made and natural. While the northern lights have very little effect on observing at lower latitudes, they create a real problem in Calgary. It was very interesting to see how their effect could be negated with the use of filters. Then he went on to show how optics could be improved by the use of filters (i.e. removal of chromatic aberration). Finally, he used filters to create special effects as an art photographer would. While this was of limited scientific use, the results were spectacular.

Jack Newton's workshop was on the use of CCD cameras. He started out by showing 22nd magnitude images taken with his 25" reflector using thirty minute exposures. He stated that no guiding was necessary because he took thirty one minute exposures and integrated them in the computer. Pictures of the central star in the Ring Nebula were burned in on a ten second exposure. There was a photo of the Owl Nebula that blew my socks off. It was taken during a Full Moon! Jack said that light pollution had little effect on the CCD images. A colour image of the Crab Nebula showing the central star was breathtaking. Finally, an image of Jupiter showing detail in the Red Spot rivalled the best I have seen. I would find it hard to imagine one single person who attended this workshop who is not at this minute putting money aside to set themselves up with a CCD imaging centre.

The Social

The social events took on two forms: the organized and the left-up-to-your-own devices. There were five main organized events: two field trips, two banquets and a wine and cheese party, plus cake and coffee meetings everywhere.

The field trips were on the first day (to observe the Canada Day fireworks) and on the last day (to go to the Calgary Stampede grandstand show). Being very allergic to horses (no kidding — I get giant hives all over my body if I even smell a horse!), I chose to go to the first event only. It was a great carnival atmosphere and was a fine place to meet new friends and set a tone of good will. I was told that the Stampede was a spectacle beyond compare.

After the Hogg Lecture there was a wine and cheese soiree in the Discovery Hall at the Alberta Science Centre, where a Dinamation display was currently on exhibit. Have you ever drunk wine, eaten cheese and sampled cake among full sized dinosaurs that were writhing, seething and roaring in mechanical perfection? At one point, a remote control dinosaur was used to attack Damien Lemay. It seems it was after his cake!

There were two huge banquets. The first was a western-style barbecue and I have never, in all my life, seen so much beef! There were ribs so large I would have suspected them to be from dinosaurs, if I hadn't known better. The second
(continued on page 3)

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was the awards banquet and there was even more beef here than there was at the barbecue!

As to the left-up-to-your-own-devices entertainment, what can I say? On the best night I had three hours of sleep. We closed the campus pub every night. We were threatened by the campus security police at least three times. I think that it suffices to say that after the G.A. I rented a car, drove to Jasper and went mountain climbing with my son to relax!

Conclusion

The sponsor of the 1992 G.A. was the Calgary Centre and the G.A. Planning Committee Chairman was Don Hladiuk. Don did a magnificent job and I am sure that his twenty or so volunteers made his job less arduous. I was made to feel right at home from the time that I was picked up at the airport by Stetson-hatted Peter until the time that I was dropped off by Joe Clark (no, not that one!) at the car rental agency. Calgary deserves very hearty congratulations and thanks for a wonderful G.A. As I was told in Calgary, a sign of western approval is a great big "YeeeeeeeHaaaaaw!!!" (Did I spell it right, Ruth?)

Finally, I would like to say "Hello!" to some of the people that I shared experiences with at the G.A. Hi Pat, David, Leo, Terry, Christine, Ian, Eric, Suzanne, Rosemary, Jonathan, Paul, Robert, Mary, Alan, Rolf, Cathy, John, Fred, Bob, Randy, Peter, Mary-Anne, Steve, June, Karl, Jack, Jeremy, Henry, Frank, Mike, ShirLee, Alistair, Doug, Ruth, Don, Fred, Peter, Roger, Bruce, John, Grace, James, Roland and any others whom I might have left out. ☺

The 1992 Mount Kobau Star Party

June Kirkcaldy
Vancouver Centre
reprinted from NOVA

Mount Kobau — what a time we had! For me it was the best one out of the three that I have attended. It started on Monday when I left Vancouver armed with the most up-to-date weather forecast available — what a mistake! It was supposed to be clear and warm up to Wednesday, then slowly cloud over and rain by the weekend. I soon learned that forecasts were a dime a dozen on the mountain. It depended on whether you listened to the Chamber of Commerce radio station or looked beyond the mountain as far as you could see. As I motored along I passed Manning Park which was clear as a bell, then I saw the clouds slowly build. I figured that I still had a long way to go yet, but unfortunately it wasn't long enough. Looking for the



June demonstrates graphically that she intends to stay for the entire star party. Fellow observers (and a greatly relieved RV) appear to be convinced!

right road to get to the top had always been a bit of a challenge for me, but I knew I had the right one when I saw the darkest cloud of all parked directly overhead!

The road wasn't nearly as bad as I had remembered, although this time I tried a new technique. Drive fast, turn up the tunes and keep your eyes closed! I was one of the first to arrive which surprised me. I thought I would be the **only** one to arrive that early. I wasn't even the first to tent it, John Mirtle from Calgary had that honour.

So, off I went. I parked my car and started scouting the area. I found a spot and started unloading the car when all of a sudden, **POP!**, my car decides to go on a trip of its own. There I am, on a dark night with thunderclouds overhead, going for a jog with my car! As I run along all sorts of things are going through my mind like, "Why did I have to be on the passenger's side?", "Why did I pack the car so tight that I can't get into it?" and "How bad will it be when my car takes out the RV from California?". Luckily (!!) the car hit a rock. Since it had been picking up

speed and I was losing the race, I guess you could call it luck! After my senses came back I roused Gerry Knight who checked out the situation and broke the news; the car was definitely parked for the night!

The night ended up clearing and being quite beautiful, albeit cold. Since there had been snow two days before, we were fortunate. After all of my excitement and the busy day, I fell asleep exhausted.

The main event on Tuesday involved getting my car mobile again. The car was actually wedged between two rocks, one on either side of the crossbar. After a great deal of work the rocks were free, and so was the car (with little damage). Some of the "paint" had been taken off of the oil pan and the crossbar had a nick out of it but it was quite driveable. Both Tuesday and Wednesday nights had several hours of clear sky so we got some observing in.

Thursday was a busy time — sleeping, eating and thinking — but not necessarily in that order. With the star party officially underway the place started to get pretty packed. There were RV's, tents and scopes everywhere. The afternoon talks didn't go quite as they had been planned. They started with Bill Phillips talking about N.A.S.A. It was tough going for although the talk was great, nature was not cooperating. The wind started to blow the tent around and then the rain came down so hard that Bill had to yell to be heard. Finally, at the very end, he found out that there was a loudspeaker system available. Typical, huh?

We then trooped over to the trailer to see some slides from the Okanagan guys. Ken Hewitt-White started by giving us a rundown on some of the plans for Kobau as well as his "dream" of a possible observatory in the interior. On with the slides. Oops, no. The bulb burnt out. It had been working five minutes ago. Oh well, off we trudge to our tiny, wet tents. By nightfall (continued on page 8)



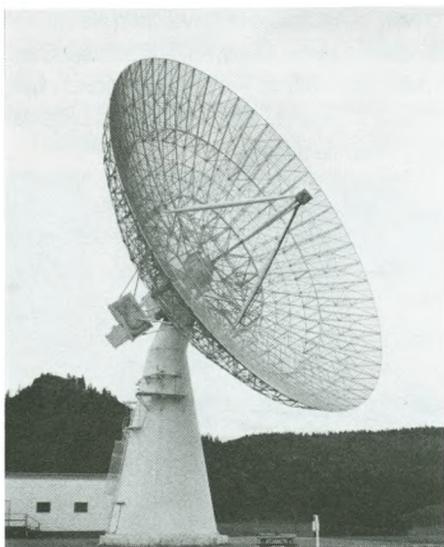
The honours for Best Looking Club was won by the Vancouver Centre! Photo by Victor Amey.

A Brief Tour of the Dominion Radio Astrophysical Observatory

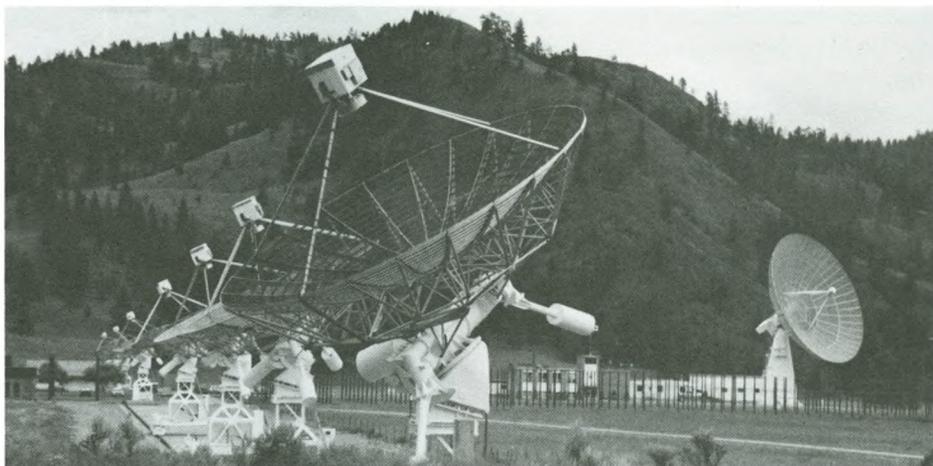
by Tim Novak
Vancouver Centre
reprinted from NOVA

While vacationing in the Okanagan Valley, I dropped by the Dominion Radio Astrophysical Observatory (D.R.A.O.), located just south of Penticton, British Columbia. Since I was there on a weekday I merely took the usual taped tour but later I was able to talk with Dr. Peter Dewdney, one of the researchers. Dr. Dewdney is very congenial and obviously enjoys his work at this facility. He answered my questions and described the research that he carried out with consideration for my non-technical background in the science of radio astronomy. He graduated with a PhD from the University of British Columbia in 1978.

The D.R.A.O. facility is comprised of four radio telescopes, three of which are in current use. The one telescope not now being utilized was constructed in the 1960's to map the distribution of the radio emissions at the very long wavelength of 13.5 metres. The telescope is comprised of about 1 700 cedar poles arranged in a "T" shape with wires running between them to act as a huge antenna. The very long wavelength emissions could only be mapped during the sunspot minimum of the 1970's, after which the study was concluded.



The 26 metre dish, in use since 1957. The size of this instrument can be visualised by observing the picnic table near the base. All photos for this article are by Tim Novak.



The seven 9 metre dishes of the synthesis telescope. The 26 metre dish can be seen to the right.

The most powerful telescope at the facility is the synthesis telescope, which is composed of seven 9 metre dish antennas arranged in an east-west direction. Three of these dishes are movable on a railroad track which allows for adjustment in both the aperture and frequency of the telescope. This telescope is one of the most powerful of its type in the world as it uses a technique known as "aperture synthesis" to create very high resolution images of radio objects located primarily in the Milky Way.

The telescope receives three bands of radio waves, one at 74 cm and two at 21 cm. The 74 cm wavelength band has an 8° field of view and is used to study large low-brightness objects. It is also used in conjunction with the 21 cm bands to separate thermal and non-thermal radiation. Thermal emissions are typically produced by regions of atomic hydrogen whereas non-thermal emissions identify regions of synchrotron radiation. Thermal and non-thermal radiation may be present in a single object or may be from separate objects that overlay each other along the same line of sight.

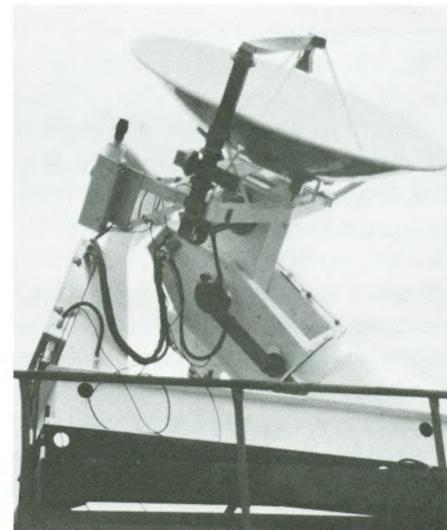
The first 21 cm band is used to study continuum radiation emission objects such as supernova remnants. Most of these are unknown in the visible spectrum as their visible light is blocked by the gas and dust in the plane of the Milky Way. However, the facility has also done remarkable work with some of these objects which are well-known visually. For example, it has created the most detailed radio image available of the Veil Nebula.

The second 21 cm band is used to study line radiation which is the emission line of atomic hydrogen located in diffuse interstellar clouds. Since these emission lines are subject to the Doppler effect, they are used to map the Milky Way's galactic arm structure.

The next telescope at the facility is the 26 metre dish antenna which, because of its large size, dominates the site. This instrument was con-

structed in 1959 and has been in continuous use ever since. The telescope is used to study the hydroxyl radical (OH), which is present in molecular clouds comprised of oxygen and hydrogen atoms. These clouds are galactic objects associated with the spiral arms. Also studied are OH/IR stars which, in a late phase, emit infrared radiation which excites astronomical masers composed hydroxyl. These stars are typically associated with the galactic halo. The telescope is also used in conjunction with those of other facilities for very long baseline interferometry. Observations made with the telescope have been co-ordinated and combined with similar ones in Ontario and the United Kingdom. There is also a current project with the Russians to combine this telescope with a 10 metre antenna in Earth orbit to achieve a resolution equivalent to a single dish antenna of six to seven Earth diameters. This project is scheduled for operation in 1996 and, so far, the Russian government is committed to its completion.

The final radio telescope installation at D.R.A.O. is the smallest, but it is of the most
(continued on page 8)



The 2 metre solar flux telescope.

the

Inter Section

Dr. Eric J. Chaisson

SPACE TELESCOPE SCIENCE INSTITUTE
DIRECTOR, WRIGHT CENTER, TUFTS

Cosmic Evolution: Toward a New Scientific Philosophy

Friday, November 20, 1992

University of Toronto
Faculty of Arts and Science
Tenth Anniversary
Wiegand Foundation
Lecture Series

of

Science and

Dr. Christopher J. Corbally, S.J.
JESUIT ASTRONOMER
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Astronomy and Religion: Contributors or Contestants

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The Intersection of Science and Spirit...The Tenth Anniversary Wiegand Foundation Lecture Series

Dr. William Wiegand, an alumnus of the University of Toronto with a B.A. in Chemistry and an M.A. in Physics, had a lifelong interest in the dichotomy of Science and Non-Science. After gaining international recognition and the prestigious Colwyn Medal of the Rubber Industry for his pioneering work in rubber compounds, he turned to the study of Theology and Classics and received a M.A. in Greek from Columbia University. In 1959, he received an honorary Doctorate of Laws from the University of Toronto.

Upon Dr. Wiegand's death his family established the Wiegand Foundation to further his intellectual interests in the dialogue between science and faith in the modern world. The Faculty of Arts and Science at the University of Toronto is proud to work with the Foundation to offer the Wiegand Lecture Series. During the past ten years, some of the world's leading intellects have been Wiegand lecturers and have given outstanding, often controversial, lectures in areas of new thought in the still uncharted borderline between science and faith.

Cosmic Evolution: Toward a New Scientific Philosophy

Dr. Eric J. Chaisson

Prior to joining Tufts University as Director of the H. Dudley Wright Center in Science Education, Dr. Eric Chaisson spent five years as senior scientist and Director of Education Programs at the Space Telescope Science Institute at Johns Hopkins University. One of his tasks was directing public relations for the Hubble Space Telescope.

Trained initially in condensed-matter (atomic) physics, Dr. Chaisson obtained his doctorate in astrophysics from Harvard University. He received his B.Sc. from the University of Massachusetts at Lowell and his A.M. at Harvard. Dr. Chaisson has been a member of the faculty of Harvard University, the Harvard-Smithsonian Center for Astrophysics, Massachusetts Institute of Technology and Wellesley College. Currently, he is a Research Professor of Physics and Astronomy and Education at Tufts University. Dr. Chaisson has written many books including *Cosmic Dawn: The Origins of Matter and Life*, which won several literary awards such as the Phi Beta Kappa Award, the American Institute of Physics Award, and was a National Book Award finalist for distinguished science writing. His current scientific research focuses on a thermodynamic study of physical and biological phenomena, searching for underlying clues to the origins and evolution of material systems. His educational research interest involves developing novel curricula to enthuse teachers and instruct students in all aspects of science, mathematics and engineering. Dr. Chaisson is a very religious person and is well known for his ability to discuss his scientific work in a religious context.

Astronomy and Religion: Contributors or Contestants

Dr. Christopher J. Corbally, S.J.

As Vatican astronomer and principal project scientist for the Vatican Advanced Technology Telescope, Dr. Christopher Corbally is charged with overseeing the building of a new Vatican Observatory in Tucson, Arizona. Dr. Corbally normally spends his time as one of a dozen astronomers to the Pope in the Vatican. He has served as Dean of the Vatican Observatory Summer Schools, and is an adjunct professor at the University of Arizona. An annual participant in the Star Island Conference of the Institute on Religion in an Age of Science, Dr. Corbally has served on the Institute's Council, and as Vice-President for Interdisciplinary Affairs.

Dr. Corbally received his B.Sc. in Physics at Bristol University, his M.Sc. in Astronomy at the University of Sussex and his Ph.D. in Astronomy at the University of Toronto. He has been a member of the Society of Jesus since 1963 and was ordained as a Roman Catholic priest in 1976. Dr. Corbally has been a guest investigator at telescopes all over the world, including the Canada-France-Hawaii Telescope, the Cerro Tololo Inter-American Observatory in Chile, and at the South African Astronomical Observatory in Cape Town. His current research interests are stellar spectral classification, peculiar and metal-weak stars, multiple star systems, galactic structure and telescope technology.

Nova East '92

Doug Pitcairn
Halifax Centre

On August 28th, astronomers from all over the Atlantic Provinces gathered at Fundy National Park for Nova East '92. As many of last year's respondents suggested, we initiated a registration fee. This fee of \$10 was optional, but had to be paid before your name went into the draw for the various door prizes, (donated by various suppliers in return for advertising kudos). We had thirty-five registered astronomers with friends and family bringing the total to about seventy-five. We have responded to past comments, and this year's spaces in the registration form for comments were almost exclusively positive.

I think the ultimate test of a star party is a clouded out weekend. This astronomical equivalent of a becalmed kite festival allows the participants to really get to know each other. We gabbed, prayed for clear skies, ate, hiked, laughed, examined telescopes and had a great time, all without collecting very many photons. Sunday night reluctantly cleared for about one hour, and that was it. For the participants, and especially for those brave souls who spent the only clear hour showing the public some sights, the clouds were a disappointment. But we have had at least one clear night for every Nova East weekend so far. Perhaps we just played the odds once too often. We are considering switching to the Thanksgiving Day weekend the first time that the Moon will allow. It should be cool but bug-free and beautiful.

Was Nova East '92 a success? I think so. We did less advertising and had a larger attendance including people from the state of Maryland and the islands of St. Pierre & Miquelon!! We've got something started here folks and we would love to see you there next year. ☺

Montréal 350e, la SAM y était

Marc Gélinas

La ville de Montréal fêtait en 1992 le 350e anniversaire de sa fondation. A l'occasion des spectacles et des activités continuelles ont été mis sur pied au centre ville. Prétextant les Perséides, le comité organisateur des fêtes a invité la SAM à animer pour le public une heure d'astronomie par jour les 11, 12 et 13 août.

L'animation devant se faire de 13h 30 à 14h 30, il n'était pas question de compter les étoiles

filantes, nous avons donc axé la présentation sur trois volets: l'observation du Soleil, l'explication du phénomène des Perséides et un rappel du ciel de Montréal en 1642.

Pour l'observation la Maison de l'astronomie et le planétarium Dow nous ont aidé grandement. La première en fournissant des instruments classiques, le second en envoyant Marc Jobin opérer le Schmidt-Cassegrain du Planétarium équipé du filtre H-alpha. C'est ainsi que pendant deux jours ensoleillés des centaines de personnes ont pu voir le Soleil sous un jour nouveau. Le troisième les nuages seuls ont vu le Soleil, par le haut.

Pour illustrer la vie d'une Perséide, nous avons créé une bande dessinée illustrant le passage de la comète Swift-Tuttle: la perte de matériaux cométaires qui polluent l'orbite, puis la Terre qui franchit cette orbite, qui frappe les débris, produisant une pluie d'étoiles filantes.

Enfin nous avons prévu illustrer le ciel de 1642 grâce à un programme de planétarium sur ordinateur, mais en plein jour l'écran d'un ordinateur est pratiquement invisible. On a du se contenter d'en parler. En faite M. Jean-Pierre Urbain, tout au long de l'heure qui nous était impartie, a donné une causerie sur les trois thèmes sus-mentionnés. L'expérience n'en était pas une de recrutement pour la SAM, mais elle s'insérait plutôt dans la branche promotion de l'astronomie dans la communauté, on pourra dire - aux fêtes de Montréal 350, nous y étions pour l'astronomie... ☺

R.A.S.C Chairpersons - 1992-93

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Heavenly Harkenings

Ricardo Chong
Toronto Centre

The following poem was inspired while looking at page 232 of the handbook:

People often watch the stars at night,
Without realizing that they can also hear;
No, I don't mean to give you a fright,
Though at first the very idea frazzled my hair.

Watching Betelgeuse set in the west,
I murmured a gentle goodnight to my old friend;
When suddenly, Procyon, the pest,
Barked at the Crab which then turned, itself to defend.

"Quit that", hollered Pollux from above,
"You might wake up Castor who has been sick of late";
Then his brother turned and with a shove,
Tried to kick the little dog while cursing his fate.

"Only one head is sick", Castor growled,
"And that is the lesser light, three arc-seconds away",
Just then Procyon began to howl,
As Cancer, gleefully, his tail began to fray.

"I'll eat you all, if you don't stop now!"
Bellowed the Lion, a little toward the east;
Then uncanny silence spread, and howl!
For every one was afraid of that glaring beast.

"What's up?", asked Hydra, looking around,
Only his head was seen above the Phoebe path;
"Go bury your head back under the ground",
Said the mighty Leo now in raging wrath.

"Bite his head", cried Corvus from afar,
His evil caw making the slimy snake shiver;
Then with a flash came a shooting star,
And lit a path to the distant Milky River.

From reverie I returned at last,
And shook my sleepy head to get the cobwebs out;
I looked at the stars the meteor passed,
And all were there, just as before, from north to south.

Next time I go star gazing, I'll know,
Better than to spike the coffee with so much rum;
Right now I'll fold up the chair and go,
Back in. That's it. My star gazing tonight is done.☺

The Great Eclipse: A Video Documentary

Suzanne Moreau
Montreal Centre

The offer of a free copy of the Great Eclipse video to whatever centre, a member of which would review it for the *BULLETIN*, seemed too good an opportunity to add to our growing library of video tapes to pass up, so I volunteered. I suspect some of my colleagues may have questioned my sanity because they know that I am one of the three or four Canadians who has no TV at home, much less a VCR. Moreover, I haven't had a TV for twenty five years, so what was I doing playing video critic. Well, who is better qualified to review a video than someone who is video illiterate and who avoids the medium. If it really catches my attention and interest, it should certainly appeal to the general public.

Did I like it? You bet I did! It is a splendid record of the eclipse. In this summer of rain and cold, the sunny, white beaches of La Paz, Baja California, where both amateur and professional astronomers had set up their equipment, made me green with envy — and, I hadn't seen anything yet. Dennis di Cicco, of *Sky and Telescope* fame, introduces the event with an outline of the steps to organize the activities he had undertaken in the months leading up to the arrival of the eclipse viewers. For example, the general area had to be evaluated for good viewing sites. Meteorologist Jay Anderson, also explains his examination of weather patterns and gives his assessment of likely weather at eclipse time. There were other lectures and discussions as part of the whole "star party", although none were shown on the video. What is evident throughout the video is the flavour of the Mexican setting, with shots of its people, its music and its art.

Also notable was the number of people attending the pre-eclipse briefing session. The ages of observers ranged from the teens to the quite elderly, but the enthusiasm seemed the same for all. Interviews with people who have been chasing eclipses for years emphasizes this passion some have for this "predictable" phenomenon. It is fascinating to hear these amateur astronomers describe the lengths to which they are prepared to go to view an eclipse. As they talked, the camera would occasionally follow the preparation of equipment taking place on the beach and capture snippets of conversation. To my ears, it often sounded remarkably

laconic, much like control room conversation at the Johnson Space Center during the preparation for an arduous space launch. The underlying excitement was there, but emotions were still contained.

di Cicco also gives a brief explanation, accompanied by appropriate graphs, of the various types of eclipses, so that first-time observers especially would have a good understanding of the basic theory and of what they could expect to see with this particular eclipse. As the camera pans over the beach activities, the wide variety of telescope and camera set-ups are also striking. Advice on photographing the eclipse, and on taking time actually to look at it is also given by di Cicco. All the while, the eclipse time is approaching and the excitement mounts. When it begins, voices gradually rise and feverish last minute adjustments are made to various pieces of equipment. As it grows noticeably darker, everybody gets ready and the countdown is heard. When the full eclipse occurs, many minutes seem to go by with the camera simply focused on the eclipse itself, to the point where the viewer almost feels he or she is actually seeing the event live. It is quite magical. Even the reappearance of the Sun is thrilling. Although the whole event lasted only about six minutes, there is no letdown afterwards. The feeling left with the viewer is a strong desire to get to the next eclipse as quickly as possible, to experience the event all over again.

Is the video perfect? Not quite. Some shots of di Cicco and other interviewees suffer from poor lighting, likely the result of limitations of the venue where they were taken. However, this barely detracts from the overall excellence of this record of the "longest eclipse until 2132". Finally, as a member of the Montreal Centre, even without seeing it, I would have been prejudiced in favour of this video-tape because of Montreal Centre Honorary President, David Levy's appearance in it. His poetic description of the place of man in a celestial event, such as this eclipse, gives us a perspective that invites us to examine our place in the universe with different eyes.

Get this video! See for yourself! You won't regret it. The National Office has a copy which can be borrowed. Get in touch with Rosemary Freeman for the particulars.

The Great Eclipse is available for sale from Berliner Productions for \$39.95 U.S. It is 48 minutes in length and comes in VHS format for both U.S. and international video standards. It can be obtained at the following address: P.O. Box 1473, Davis, California, 95617. Their telephone number is (916) 757-1982 and their fax number is (916) 753-4875. ☼

A Successful Messier Marathon

Paul Markov
Toronto Centre

Challenges have always fascinated mankind, and that's probably the reason why someone came up with the idea of a Messier marathon. This event entails viewing all 110 deep-sky objects listed in the Messier catalogue in one night. The challenge is staying awake from sunset to sunrise while star-hopping from one Messier object to the next, not forgetting to observe any, at a pace such that every object is observed before it sets below the horizon.

The consensus is that from Toronto's latitude (+43.7°) you cannot observe all 110 objects. From experience I can now agree, however I believe you can see as many as 106, after having found 100 objects on first my Messier marathon.

The Messier marathon is possible during a span of only a few weeks at the end of March and the beginning of April. This is possible because the orbit of the Sun, in respect to the background stars, places it where there are no Messier objects. At the end of March the Sun is in the constellation of Pisces and if you look at a star chart you will see that there are no Messier objects nearby which will be in the sky at the same time that the Sun is.

I became interested in amateur astronomy in 1982 so I thought that a Messier marathon would be a great way to celebrate my 10th anniversary as an amateur astronomer. Initially I had viewed the entire Messier catalogue in just under two years, most of it with a 4.25-inch reflecting telescope. This time around I was armed with an 8-inch Schmidt-Cassegrain telescope, ten years of experience, and after having bagged 460 different deep-sky objects I was fairly confident the marathon would work well.

The night of March 28/29, 1992 provided the opportunity to try out my marathoning skills. I observed from Long Sault Conservation Area, which is about twenty minutes north of Bowmanville. Conditions here were not ideal: strong light pollution in the south-west and trees blocking part of the western horizon. Other than that, the rest of the sky was reasonably dark. Fortunately, the sky remained clear throughout the night, and no aurora developed. One problem which I was aware of was a twenty-five day old Moon due to rise early in the morning.

I arrived at the observing site at 7:45 P.M. greeted by a crystal clear sky, cool tempera-

tures, and strong northerly gusts. Below are a few important statistics for March 28/29, 1992:

EVENT	TIME (E.S.T.)
Sunset	6:40 P.M.
End of Twilight	8:20 P.M.
Moonrise	3:50 A.M.
Beginning of Twilight	4:25 A.M.
Sunrise	6:05 A.M.

At 8:15 P.M. I was ready to start the Messier marathon. I had a list of the Messier objects, sorted in the correct order to be viewed, Sky Atlas 2000, and both volumes of Uranometria. The 8-inch Schmidt-Cassegrain had time to equalize and no dew cap was needed, courtesy of the strong wind. At this time evening twilight was nearly over. The first two objects on the list were M74, an 11th magnitude galaxy in Pisces, and M77, a 10th magnitude galaxy in Cetus. Not having prepared completely I was not aware of three things: the trees were blocking the view completely, the light pollution was much too strong to see such faint objects, AND the two objects were half a degree and one degree, respectively, above the horizon! Needless to say I did not even attempt to view these two galaxies. Even if circumstances had been perfect, it would have been impossible to see these two objects at such low altitude. Looking for them earlier in the evening, say at 8 P.M. would have placed them about 5° higher, however evening twilight would have still been strong. In other words, I don't think these two objects can be seen during a Messier marathon from Toronto's latitude.

Next was M33, a 6th magnitude galaxy in Triangulum. At 8:30 P.M. this galaxy was 10° above the horizon, but unfortunately my view was blocked by a tree. I borrowed a pair of 11x80 binoculars but they did not reveal this large, low-surface brightness galaxy. This time the light pollution was responsible. Perhaps, had the telescope not been blocked by trees, I could have seen this object.

Just north of M33 is M31, the Andromeda Galaxy, with its two satellite galaxies M32 and M110. At an altitude of 11° my telescope was still blocked by the trees, however the 11x80 binoculars did show M31. M32 and M110 (9th and 8th magnitude) could not be seen through the binoculars. Once again they could have been visible in the telescope.

The last miss in the evening sky was M79, an 8th magnitude globular cluster in Lepus. At 8:30 P.M. it was still above the horizon, but only by 8°, and located in the most light polluted part of the sky. Although the telescope was pointing right at it, it was not visible and light pollution was to blame once again.

Here is a summary of the first seven Messier objects to be observed in a Messier marathon, with their altitude and set times from Toronto's latitude:

Object	Altitude (°)		Local Set Time
	8:00 P.M.	8:30 P.M.	
M74	0.5	5	8:33 P.M.
M77	1	6	8:36 P.M.
M79	8.5	12	9:36 P.M.
M33	10	15	9:47 P.M.
M31/32/110	11	15	10:28 P.M.

From here on it was smooth sailing right through the night until morning twilight. I was able to spot Messier objects non-stop from 8:40 P.M. until 4:46 A.M. the next day, at an average rate of one every five minutes.

The most challenging part of the marathon was "galaxy-hopping" through the Coma-Virgo cluster of galaxies. This region of the sky is rich with galaxies, except that they are mostly NGC objects which at times interfered with Messier observations. Nevertheless, I took the opportunity to observe an additional four galaxies which I had not seen before. Objects in Ursa Major were literally a "pain in the neck" to observe, mostly because of the eyepiece location in my fork-mounted telescope. At about 3:50 A.M. the Moon rose nearly due east, and was followed by morning twilight at 4:25 A.M.

About half-hour before moonrise Scorpius and Sagittarius were rising in the south-east and at the same time that part of the sky seemed to deteriorate. Haze, and perhaps some light from the soon-to-be-rising Moon, made observations difficult. All objects in Scorpius and Sagittarius were observed, with the exception of M55, a 7th magnitude globular cluster in Sagittarius. At 4:30 A.M., M55 was only 5° above the horizon. This object may prove to be quite a challenge for any marathoner.

Both M72, a 10th magnitude globular cluster, and M73, a 9th magnitude open cluster in Aquarius could not be seen due to the proximity of the Moon, which was only a couple of degrees away. Had the Moon not been there, they should have been visible.

The last object I spotted was M75, a 9th magnitude globular cluster in Sagittarius, at 4:46 A.M. At an altitude of 9° it was very hard to see due to the encroaching twilight, moonlight, and haze. The only object left was M30, a globular cluster in Capricornus. At 5:00 A.M. this Messier object was still half a degree below the horizon! At that time the sky was quite bright with only the brightest stars still visible in the east. Therefore, I don't think this object could ever be visible in a Messier marathon from our latitude.

Here is a summary of the last five Messier objects to be observed in a Messier marathon,

with their altitude and rising times from Toronto's latitude:

Object	Altitude (°)		Local Rise Time
	4:30 A.M.	5:00 A.M.	
M55	5	8	3:45 A.M.
M75	9	13	3:22 A.M.
M72	10	14.5	3:29 A.M.
M73	9	13.5	3:35 A.M.
M30	-5	-0.5	5:02

Something that I realized only the next day was that the Andromeda Galaxy, along with M32 and M110, had come into view again in the morning sky (after having set the evening before). At 4:30 A.M. these three objects were a full 10° above the horizon! Had I been paying more attention I could have seen another two Messier objects.

In total, I was able to observe 100 of the 110 Messier objects during the one-night observing marathon. Of the ten that I did not view, six were in the evening sky and four in the morning sky. The evening sky objects I missed were M74, M77, M33, M32, M110 and M79. I think all can be found with an unobstructed horizon and a dark western sky, with the exception of M74 and M77 which were both far too low in the sky to be seen. The morning objects I missed were M55, M72, M73 and M30. M72 and M73 could be seen (I only missed them because the Moon was very close by), while M55 would be quite a challenge, if not impossible. Lastly, I think M30 is out of the question since thirty-five minutes after the beginning of twilight it was still half a degree below the horizon.

In conclusion, I think that from Toronto's latitude, given a low horizon all around and no light pollution, a maximum of 106 Messier objects will be visible during a one-night observing marathon. These are encouraging results and I look forward to trying the Messier marathon again next year and viewing all 106 objects. ☺

On one occasion committee members were asked by the chairman, who was also in charge of the project, to agree that a certain machine be run at a power which was ten percent lower than the design value. [Franz Eugen] Simon objected, arguing that "design value" should mean what it said. Thereupon the chairman remarked, "Professor Simon, don't you see that we are not talking about science, but about engineering, which is an art." Simon was persistent: "What would happen if the machine were run at full power?" "It might get too hot." "But, Mr. Chairman," came Simon's rejoinder, "Can't artists use thermometers?"

*Nicholas Kurti
British physicist (1908-)*

The 1992 Mount Kobau Star Party

(continued from page 3)

the weather shaped up and we had an all-nighter. At least some of us did. The wind was blowing with hurricane force. Everyone on the top had packed it in by midnight. Those of us on the lower area (around some shelter) kept at it until the wee hours. We had our own little corner of the universe — Lee's 17.5", Dr. Bob's 16", and Gerry's 12.5", not to mention my little 10", Reid's refractor and Victor's S.C.T. Talk about selection! It was an incredible night!

Friday. Although I missed the talks (too busy catching some ZZZ's), I heard that they were good. No slides again, but the radio astronomy was apparently quite good. Radio astronomy, yeah, that's the ticket. Something where clouds don't matter. We could replace the 14"...

Now the place was busy. More RVs, more tents, more scopes. The Vancouver contingent arrived en masse. The whole mountain to choose from and what happens? We camp practically on top of one another. (You can take the camper out of the city but you can't take the city out of the camper.) We called it Little Vancouver. Next time we'll put numbers on the tents so we will know which one is which.

What a night! It was the best. Clear, cool and dry. The seeing was good. Things were looking up. Finally I left the "local group" and ventured out on some touring of some of the other scopes that were set up, including the 36" Dobbie from Olympia, Washington and Lance & Gary's 25".

On Saturday the weather turned ugly: cool, cloudy, typical. Once again I missed the talks, but once again I heard that they were great. They finally got a slide projector that worked so John Mirtle's astrophotography talk went without a hitch along with Bob Drew's talk on how to build an aluminium telescope and live to tell the tale. Meanwhile the Vancouverites were doing a tour (I won't mention any names) but suffice it to say that no scope was safe from the critical, unfeeling eyes of those who know too much!

The skies were darkening with no hope in sight, but by 7:00 things began to break up and it was hard to say what was happening. Some had already pulled out, others had just arrived, and still others had given up and gone "bottle observing". The weather was set to go either way. Luckily it went our way. You guessed it, it was the best night of the lot. It was even warm (I only needed three layers of clothes instead of my normal four!) It was the ultimate, a full all-nighter. Everyone was into "scoping". Our resident astrophotographer was going great guns. In fact, he even tried a whole new technique:

what would happen if you sat patiently guiding for a whole half hour and then decide to take the cap off? What a breakthrough in the art! The Orion Nebula brought on a whole new religious experience, proving that aperture really is everything. I watched the dawn and thought it ironic that as I crawled into bed an RV was leaving down the hill.

Sunday was the end. Kobau was saved, at least for this year, but the weather is still so unpredictable. A few of us had planned to stay one more night but when it started to rain in midafternoon, it was time to pack. It was a good thing, too, as there wasn't a break in the clouds all the way back to Vancouver. It was a Kobau to remember. ☪

A Brief Tour of the Dominion Radio Astrophysical Observatory

(continued from page 4)

practical use of everyday life. This is the 11 centimetre solar flux telescope that has been in constant use since 1949. The study began in Algonquin Park, Ontario and was paralleled here, where it has continued since the decommissioning of the Ontario facility. This instrument is comprised of a two metre dish antenna and is recognized as the worldwide calibrated measure for solar flux emissions and solar flare studies. The results are transmitted daily to Boulder, Colorado where they are broadcast globally. This project is an ongoing study of the Sun to determine the nature of the solar cycle. So far, only four solar cycles have been measured. This project is important to world and space communications and will depend on future generations of astronomers to continue the work.

Overall, the D.R.A.O. facility is very impressive and well worth the visit. The radio astronomy studied at this site is at the leading edge of the science and is considered one of the most sophisticated facilities on the planet. ☪

New Promotional Items for Christmas

The R.A.S.C. has some great new items for the winter season!

R.A.S.C. Turtle-necks: Warm and cosy in navy blue or black with R.A.S.C. emblem in yellow. Adult size, XL.

R.A.S.C. Toques: Great for those cold nights at the telescope! Navy blue with yellow horizontal band and navy R.A.S.C./S.R.A.C. lettering.

R.A.S.C. Stickers: Royal blue vinyl stickers with our new R.A.S.C. emblem in white, 3.75" diameter, laminated for durability — great for telescopes, clipboards and car bumpers!

We will also be getting other sizes of turtle-necks later in the season, and we still have some golf shirts left in stock — adult, small in white, and adult, medium in white or light blue.

Item	Price	Shipping
Turtle-necks	\$20.00	\$4 each
Golf Shirts	\$20.00	\$4 each
Toques	\$15.00	\$2 each
Stickers	\$1.25	\$1 per order

The figures include all taxes. Items are available by sending a Canadian cheque or money order made payable to "Royal Astronomical Society of Canada" to:

R.A.S.C. Promotional Items
136 Dupont Street
Toronto, Ontario
M5R 1V2

Group orders can be arranged. Contact Ms. Cathy Hall in Ottawa at (613) 828-8807. ☪

They're too close to the trees to see the forest. People in California or New York understand that Alaska is not so big. They live in places where the wilderness once seemed limitless, but they know it disappears.

*Edgar Wayburn
American environmentalist (1970)*

Show your support for the R.A.S.C.!

Christmas is the time of year when all of us look at our special charities and good causes to see what we can contribute, even if only in a modest way.

This year, why not give something special? Make a donation to the R.A.S.C. to help us further our aims of promoting and increasing knowledge in astronomy and related sciences? The R.A.S.C. has many worthwhile projects across Canada, from Newfoundland to Vancouver Island, that could use your generous support.

Donations are tax deductible and you will receive an official tax receipt for your kindness. Cheques should be made payable to "The Royal Astronomical Society of Canada" and mailed to: R.A.S.C. Donations, 136 Dupont Street, Toronto, Ontario M5R 1V2.

In order to receive your tax receipt with a 1992 date, donations should be received by December 31st.

This year, show that you care. Give a gift to the R.A.S.C.!