

General Assembly



1890 ~ 1990
Centennial

Events Programme

June 29 ~ July 3, 1990
Carleton University
Ottawa, Canada

Royal Astronomical Society
of Canada

WELCOME

The Ottawa Centre's GA Organizing Committee wishes to extend a warm welcome to all delegates and guests attending the 1990 General Assembly. This package, along with the various pieces of literature available at the registration desk, should give you all the information you'll need to enjoy this year's event. Don't hesitate, however, to ask us if you need any help!

Enclosed in your registration package along with this programme should be the following material. Please check to make sure you have everything you need:

- Name tags (for you and your non-participating guests)
- Receipt
- Tickets for breakfast-lunch-dinner, Barbecue and Group Photo
- Map of Carleton University
- Comment Sheet
- Tour and Conference Centre Brochure
- July issue of Ottawa Centre *AstroNotes*
- List of Delegates

Available at the registration desk is the following:

- Ottawa and Hull Tourist Maps
- Ottawa and Hull Visitor Guides and other tourist information
- "You and the Universe" Programmes
- Bus Schedules
- Literature from our display competition prize donors

Name tag: Your name tag is your ticket to several of the weekend activities, so please make sure you have it with you at all times. The coloured dots indicate you have signed up for the following:

- W Wine and Cheese
- B Banquet
- M Museum of Civilization Tour
- S Solar Observatory Tour

You'll note that most of the name tags are white: these are for fully registered delegates. The

orange-red name tags are for your non-participating guests and blue indicates a member of the GA Organizing Committee.

ABOUT CARLETON

The enclosed map of Carleton University (more are available at the registration desk) should help you find your way around campus. We suggest you identify the following buildings:

Commons: Regular meals, displays, Friday National Council Meeting, Wine and Cheese

Physical Recreation Centre: Friday evening baseball game

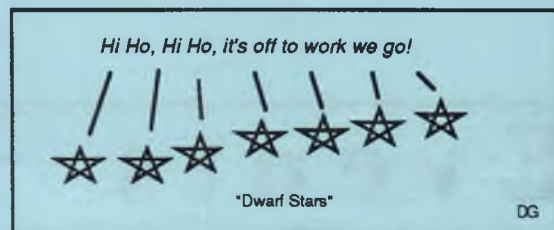
Russell: Residence Accommodation

Steacie: Friday evening slide show

Herzberg: Carleton Observatory open house

Alumni Theatre (Theatre A): Symposium, Helen Hogg Lecture

Tory: Papers, Annual Meeting, Sunday National Council Meeting



The Tour and Conference Centre brochure enclosed with your registration package describes the University facilities available for use. A few points of specific interest to GA delegates follow.

Tunnels: All buildings on campus are joined by a series of tunnels, shown in blue on the map. They may look quite straightforward, but they are not well signed and it is quite easy to get lost in them. Be careful! If the weather is good, it is probably easier and faster to walk outside.

Reception Desk: Located in the lobby of the Commons Building, the reception desk is staffed 24 hours a day. Ice is available here, and this is the place to go if you have any security problems or medical emergencies. If your family needs to get in contact with you during the General Assembly, messages can be left at the reception desk at (613) 788-5609.

Accommodation: Those who have requested accommodation will be housed in Russell House. We have complete use of the second floor on Thursday night, and both second and third floors Friday to Monday nights, including use of the TV lounges.

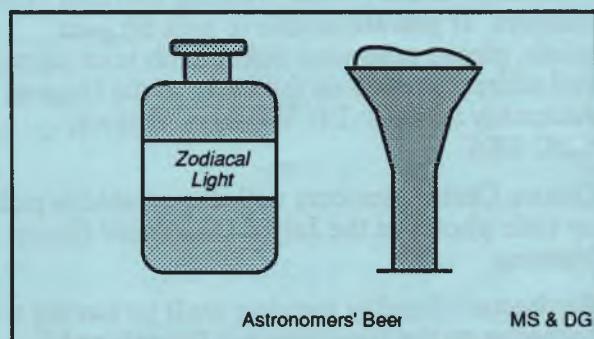
Those arriving earlier than Thursday or staying after Monday night will be housed for the extra days in Glengary House.

Checkout time is 12 noon. When leaving, please drop off your keys at the reception desk.

Meals: The Commons Dining Room is where all meals except the Banquet and Barbecue will be served. It is located on the third level, just above the lobby. Service is cafeteria-style, all-you-can-eat. If you require additional meal tickets, they can be purchased at the reception desk in the lobby (cash is not accepted in the Dining Room). Meals are served at the following times:

| | |
|-----------|---------------|
| Breakfast | 07:30 - 09:00 |
| Lunch | 12:00 - 13:30 |
| Dinner | 17:00 - 18:30 |

Parking: Free parking is available in Lot 6A from Friday evening to Tuesday morning. The cost at other times is \$2.00 (flat rate - pay each time you park). Fifteen minutes free parking is permitted in the small lot in front of the Commons Building for luggage loading.



Alcohol: You are permitted to consume alcoholic beverages in the residence buildings (Russell and Glengary in our case), including the TV lounges. Please remember that not all astronomers are late-night people - watch noise levels.

GENERAL ASSEMBLY

A couple of pages later in this programme you'll find a detailed schedule of activities. Among the highlights of the weekend:

National Council Meeting: The Friday council meeting will be held in Room 213 Commons, located down the corridor from the main lobby. There will be a coffee break about 14:30.



If Ford sold telescopes...

ML&DG

Baseball Game: Hopefully the start of an annual tradition, we'll try to split teams up into "east versus west". We will be playing in the athletic field beside the Physical Recreation Centre.

Slide Show: A number of delegates have signed up to show a few slides, sing songs, and whatever else they can think of. We may still have time to squeeze in a few more people - see Rolf Meier, the slide show moderator, before we start. Room 103 Steacie is located on the main level near the foyer.

Don't forget the "best of show" competition - the best slide will be published in the national Newsletter/Bulletin. Ian McGregor, our judge, has promised us that he will be completely subjective and biased when making his decision.

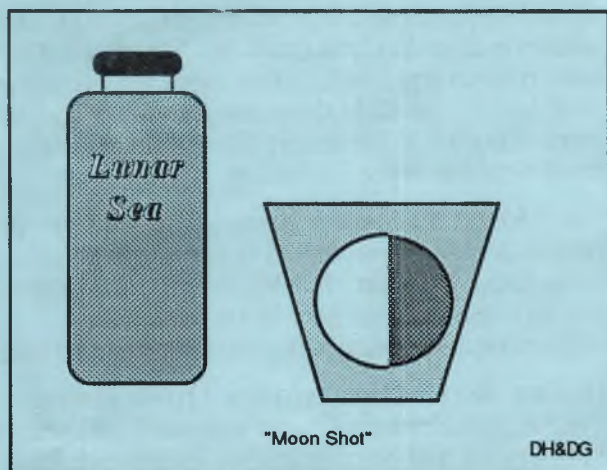
Indian River Observatory Open House: The Ottawa Centre's Observatory will be open on both Friday and Sunday nights for anyone who would like to see our 40 cm (16 inch) Newtonian telescope and other Centre equipment. IRO is about a 45 minute drive west of Ottawa and is not that difficult to find - a map with directions is included in this programme (page 14).

If you'd like to head out Friday night, we'll be leaving in "convoy" 30 minutes after the conclusion of the slide show. You can either take your own car or hook up with one of the Ottawa Centre volunteer drivers. We will meet in front of the Commons Building.

On Sunday night IRO will be open from 21:00 onwards, if you'd like to see the site during semi-daylight. Depending on what people want, we'll see about having another convoy.

Carleton University Observatory: If a trip to IRO on Friday would make for a later night than you'd like, you can always visit the observatory on the roof of the Herzberg Building. The dome, with its Celestron 14 telescope, will be open for viewing immediately following the slide show. To reach the roof, take the elevator (located to the left of the Foucault Pendulum in the Herzberg Building foyer) to the 5th floor, turn left and go through the doors, turn right and go through the next set of doors, and watch for the stairway on your right. Take these stairs up one storey to the roof.

"You and the Universe" Symposium: In celebration of the RASC's centenary, National Office is sponsoring this special public event. The symposium will be held in the Alumni Theatre (also known as Theatre A). For more information, please pick up a copy of the blue programme available at the registration desk.

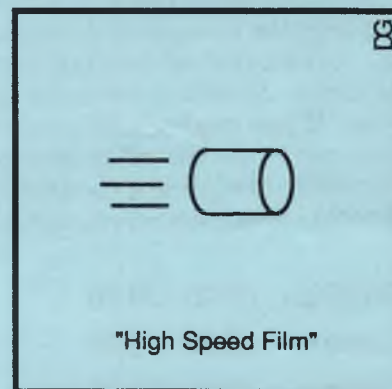


Wine and Cheese: The General Assembly Wine and Cheese party is being held on Saturday night, following the Helen Hogg lecture, in the

Commons Lounge (located on the main level, off the lobby). We hope you'll get a chance to meet our symposium speakers and other guests.

In addition to wine and a limited amount of beer, a non-alcoholic punch will be available.

Papers: The papers session will be held in 360 Tory. This room, also known as the "Egg", is the large lecture hall in the middle of the main level foyer. Please refer to the schedule for the order of presentations. Paper abstracts are included towards the end of this programme.



Group Photo: The group photo will be taken immediately following the morning papers session at a location close to the Tory building. The organizers will direct you.

Group photos will be available on Monday at the conclusion of the Annual Meeting and later at the banquet. If you are unable to pick up your photo, please send your ticket, with your name and address printed on the back, to the General Assembly address: 191 Wilshire, Ottawa, K2C 0E6.

Ottawa Centre members will also be able to pick up their photos at the July 6 Observers' Group Meeting.

Barbecue: Sunday evening we'll be having a barbecue on the lawn between Russell and St. Pat's. Don't get us mixed up with the other conference having a similar activity on the lawn in front of Grenville! If there is rain, service will be in the Commons Dining Room.

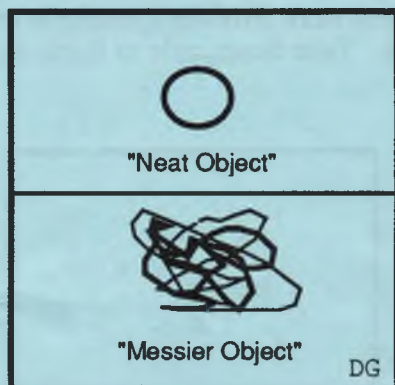
Canada Day Activities: After the barbecue, we highly recommend you head down to Parliament Hill for the Canada Day festivities. There will be a concert from 19:00 to 22:00 in

front of the Parliament Buildings, and a country music concert over in Major's Hill Park. You may just want to wander around the Byward Market area, where there are lots of bars, cafes and interesting buildings to see. The Queen, who will be present, will be participating with the Prime Minister and the Governor General in some of the evening's events. The fireworks display should occur around 22:00.

Now for the tough part: how to get there. If you want to drive, be patient with the traffic, and don't expect to find a parking spot much closer than about a kilometre from the Hill. Be warned that returning home is often *much* more difficult!

You can try taking the bus. Route 7, which goes onto the Carleton campus, will take you right downtown. Please note that the route shown on the schedule - available at the registration desk - changes slightly after 18:00 on Canada Day. This should not cause any problems when going downtown, but when returning to Carleton you must catch the bus on Albert Street. Route 4 can also be taken, but this bus doesn't go onto the campus - you'll have to catch it at Bronson and Sunnyside. It also will be running along Albert when returning.

Don't rule out walking. If you're reasonably fit you should be able to cover the distance in about 45 minutes. The most scenic way is to follow the walkway alongside Colonel By Drive; the shortest would be to follow Bronson. Perhaps you could take the bus downtown, and walk home.



Museum of Civilization Tour: Buses for this event leave in front of the Commons Building at 8:15 sharp - *don't be late!* After

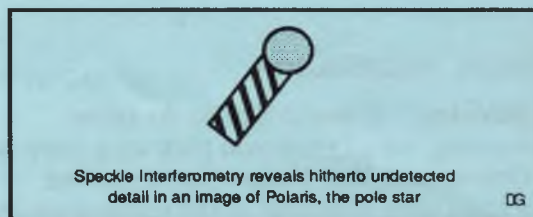
seeing "The Dream is Alive" in the CinePlus theatre, you'll be allowed to tour the museum, either with guides provided for us or on your own. If you were impressed with the theatre, and don't mind paying an additional \$6.00, you may wish to see the regularly scheduled show, "To the Limit". It will be shown in English at 10:00 and 12:00 and in French at 11:00.

Lunch can be purchased in the Museum cafeteria or you may wish to visit one of the area restaurants. Buses leave for the return trip to Carleton at 13:00 - again, *please be on time!*

Annual Meeting and Second National Council Meeting: These events will be held in the Tory Egg (Room 360).

Banquet: Buses leave in front of the Commons Building at 18:15 for the National Arts Centre. Our banquet address will be by Dr. Lloyd Higgs, our retiring National President. An abstract of Dr. Higgs' talk, and a banquet agenda, is included later in this programme.

Those who have requested special meals should speak to the NAC staff before being served.



Ottawa River Solar Observatory Tour: Contrary to earlier expectations, we have not had to split this tour into two groups. There will be only one departure time - 9:00, in front of the Commons Building. The bus will return to Carleton about 12:15.

If this change in schedule causes any problems, please let us know and we'll refund your money.

Although checkout time at Carleton is 12:00, the University has agreed to allow those taking the Solar Observatory tour to keep their rooms a little longer. Please check out immediately upon returning to the campus.

Displays: The Display Competition entries can be seen in Room 208 Commons. A list of all entries is included later in this programme. A number of companies have generously donated

prizes for this competition; please consider these firms (listed later) when making your next astronomical purchase. The display room will be open at the following times:

| | |
|------------------|---|
| Friday 29 June | 10:00 - 23:00 |
| Saturday 30 June | 12:00 - 13:30 16:00 - 19:30 |
| Sunday 1 July | 12:00 - 13:30 17:00 - 18:00 20:00 - 22:00 |
| Monday 2 July | 10:00 - 17:30 |



GENERAL INFORMATION

Sightseeing: If you'd like to do some sightseeing, we suggest you pick up a copy of the *Ottawa and Hull Visitor Guide* and the associated map, available at the registration desk. This book lists absolutely everything there is to see and do in the Ottawa area.

We would like to point out two points of astronomical interest: first, you may wish to visit the *National Museum of Science and Technology*, open from 9:00 to 18:00 every day except Friday, when it is open until 20:00. To get there, take Highway 417 east to St. Laurent, go south about 2.1 kilometers to Smyth-Lancaster, where you turn left. The museum is ahead on your left.

A brief (20 minute) tour of the museum's *Helen Hogg Observatory*, current site of the Dominion Observatory's 38 cm (15 inch) refractor, is held every day at 10:00 and again at 17:00. For those interested in driving to the museum following Dr. Racine's symposium talk on Saturday, A

group will meet in front of the Commons Building at 16:30.

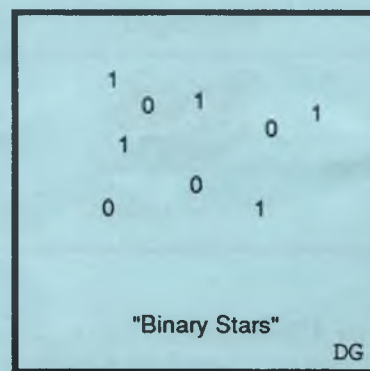
The second point of interest is the original site of the *Dominion Observatory*. Anyone who saw Mary Grey's talk during her presidency might wish to see first-hand the site of so much of Canada's early astronomical research. To find the observatory - it is not open to the public - take Bronson north to Carling, turn left and go about 1.5 kilometers to Irving (at the top of the hill). The observatory is on your left.

Bus Service: OC Transpo can transport you to most locations in the Ottawa area. Route 7 operates between Carleton University and downtown; schedules are available at the registration desk. A single adult fare is 90¢ at all times except during weekday peaks (6:00 - 8:30 and 15:00 - 17:30), when it is \$1.80. Please note that you require exact change. Tickets can be purchased at the reception desk in the Commons Lobby. For additional route information, call 741-4390.

Taxi: The largest fleet of taxis is operated by Blue Line Taxi, phone 238-1111.

Shopping: The Ottawa area has many fine shopping centres. Note that shopping hours are limited by law within the City of Ottawa. Refer to the *Ottawa and Hull Visitor Guide* for more information.

Liquor/Beer: The nearest liquor store (LCBO) is in Billings Bridge Shopping Centre. Take Sunnyside (the street across from University Drive at Bronson) to Bank, turn right; Billings Bridge is just past the Rideau River Bridge. The nearest beer store (Brewer's Retail) is at 900 Bank. Take Sunnyside to Bank and turn left.



1990 GA TIMETABLE

| <u>TIME</u> | <u>ACTIVITY</u> | <u>LOCATION</u> |
|---|---|-------------------|
| Friday June 29 | | |
| 07:30 - 09:00 | Breakfast | Commons Cafeteria |
| 09:00 - 11:30 | Committee Meetings | 213 Commons |
| 12:00 - 13:30 | Lunch | Commons Cafeteria |
| 13:00 - 17:00 | National Council Meeting | 213 Commons |
| 17:00 - 18:30 | Supper | Commons Cafeteria |
| 18:30 - 20:00 | East vs West Softball Game | Athletic Field |
| 20:30 - 22:00 | Slide Show | 103 Steacie |
| Evening | Indian River Observatory Open House | IRO (see map) |
| Evening | Observing at Carleton U. Observatory | Herzberg Roof |
| Saturday June 30 "You and the Universe" Public Symposium | | |
| 07:30 - 09:00 | Breakfast | Commons Cafeteria |
| 09:15 - 09:30 | Introductory Remarks | Alumni Theatre |
| 09:30 - 10:30 | Planet Earth as a Life Support System: Lydia Dotto | Alumni Theatre |
| 10:30 - 11:00 | Coffee and Tea Break | Loeb Lounge |
| 11:00 - 12:00 | Naturalists of the Night: Terence Dickinson | Alumni Theatre |
| 12:00 - 13:30 | Lunch | Commons Cafeteria |
| 13:30 - 14:30 | The Value of Astronomy for a Civilized Society: Richard Jarrell | Alumni Theatre |
| 15:00 - 16:00 | Astronomical Research - Pain and Bliss: Rene Racine | Alumni Theatre |
| 17:00 - 18:30 | Supper | Commons Cafeteria |
| 19:30 - 20:30 | The Helen Sawyer Hogg Lecture Exploration of the Solar System - Voyager and Beyond: Joseph Veverka | Alumni Theatre |
| 21:00 - 23:00 | RASC Reception - Wine and Cheese | Commons Cafeteria |

| <u>TIME</u> | <u>ACTIVITY</u> | <u>LOCATION</u> |
|----------------------|--|--|
| Sunday July 1 | | |
| 07:30 - 09:00 | Breakfast | Commons Cafeteria |
| 09:00 - 10:15 | Paper Session I Peter Leonard, The Origin of OB Runaway Stars J. E. Kennedy, Rare Books on Astronomy Chris Brown, Computer Assisted Photometry Ian McGregor, Getting the Last Laugh on the Stars | 360 Tory (Egg) |
| 10:15 - 10:30 | Coffee and Tea Break | Tory Foyer |
| 10:30 - 11:50 | Paper Session I, Continued Frank Roy, IRO Radio Interferometer Sky Survey Chris Rutkowski, Public Knowledge About Astronomy Paul Mortfield, Schmidt Camera Photography Steve Dodson, Centennial Astronomy Week Peter Ceravolo, TOMA | 360 Tory (Egg) |
| 11:55 - 12:00 | Group Photo | Outside Tory |
| 12:00 - 13:30 | Lunch | Commons Cafeteria |
| 13:30 - 14:30 | Paper Session II Richard W. Miller, Quebec Power Disruption Joe Yurchesyn, Aurorae and the Power System John Percy, et. al., P Cygni - A Blue Hypergiant | 360 Tory (Egg) |
| 14:30 - 14:45 | Coffee and Tea Break | Tory Foyer |
| 14:45 - 17:00 | Paper Session II, Continued Doug George, Amateur Astronomy in the Ottawa Area Douglas Hube, G. Aikman, 3 Vulpeculae Ian McGregor, Reflections and Refractions on a Society Scott Young, Stan Runge, Electronic Imaging at Glenlea | 360 Tory (Egg) |
| 18:00 - 19:30 | Barbecue Supper | Between St. Patrick's and Russell House |
| Evening | Canada Day Activities | Parliament Hill |
| Evening | IRO Open House | IRO (see map) |

| <u>TIME</u> | <u>ACTIVITY</u> | <u>LOCATION</u> |
|----------------------|---|------------------------|
| Monday July 2 | | |
| 07:30 - 09:00 | Breakfast | Commons Cafeteria |
| 08:15 | Buses leave for Museum of Civilization Tour | Commons |
| 09:00 - 13:00 | Tour - Museum of Civilization & CinePlus Theatre featuring the NASA film, "The Dream is Alive" Lunch on your own in Museum Cafeteria or in area restaurants. | Hull, Quebec |
| 13:00 | Buses leave Museum of Civilization for Carleton | |
| 12:00 - 13:30 | Lunch (for those not on Museum Tour) | Commons Cafeteria |
| 14:00 - 15:30 | Annual Meeting | 360 Tory (Egg) |
| 15:30 - 17:00 | National Council Meeting | 360 Tory (Egg) |
| 18:15 | Buses leave for Banquet (National Arts Centre) | Commons |
| 18:30 - 19:30 | Cash Bar | NAC Terrace |
| 19:30 - 22:15 | Banquet | NAC Mezzanine |
| 22:15 | Buses leave NAC for Carleton | |

Tuesday July 3

| | | |
|---------------|--|-------------------|
| 07:30 - 09:00 | Breakfast | Commons Cafeteria |
| 09:00 | Buses leave for Ottawa River Solar Observatory | Commons |
| 09:45 - 11:30 | Tour - Ottawa River Solar Observatory | Shirley's Bay |
| 11:30 | Buses leave observatory for Carleton | |
| 12:00 - 13:30 | Lunch | Commons Cafeteria |

PAPER SESSION ABSTRACTS

COMPUTER-ASSISTED PHOTOMETRY AT THE GLENLEA OBSERVATORY

Chris Brown, Winnipeg Centre

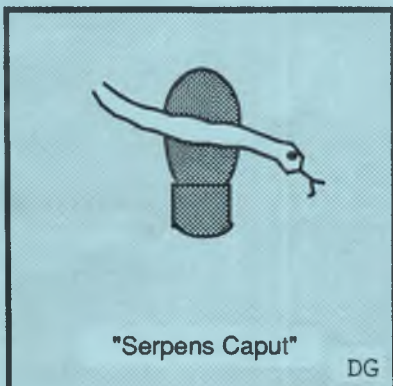
A normal set of photometric observations for a variable star requires about 200 calculations to reduce the data. Most are simple addition or multiplication, but the sheer volume can quickly take the fun out of the hobby!

At the Glenlea Observatory a personal computer now collects the readings directly from the photometer and reduces them on the spot to standard, fully-corrected magnitudes.

TOMA - AN IDEA WHOSE TIME HAS COME

Peter Ceravolo, Ottawa Centre

Consumer confidence in commercial optics is at an all time low, due to bad press with respect to poor quality and misleading advertising. TOMA (Telescopic Optics Manufacturer's Association) has recently been formed to deal with these problems. Discussion will centre on what to expect and what not to expect from TOMA.



CENTENNIAL ASTRONOMY WEEK - A CELEBRATION ACROSS CANADA

Steve Dodson, Ottawa Centre

If you could have been 'beamed' from Centre to Centre at 'light speed' during Centennial

Astronomy Week in April, making up your agenda from all the events offered everywhere in the country, what would your week have been like?

This talk is an attempt by your National Astronomy Day Coordinator at providing a birds-eye (or perhaps better, Starship Enterprise Bridge Screen view) of the recent celebration.

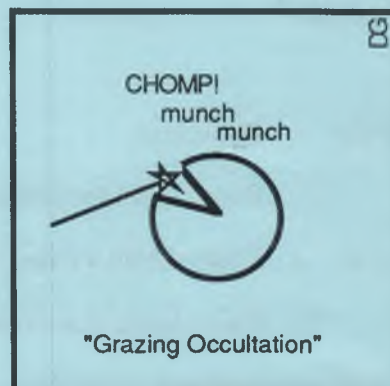
AMATEUR ASTRONOMY IN THE OTTAWA AREA

Doug George, Ottawa Centre

In 1906 the first Centre of the RASC outside of Toronto was formed in Ottawa, due in large part to the construction of the Dominion Observatory. The Observer's Group was formed in 1954 by members of the small but enthusiastic Amateur Telescope Making Group. Since then, members of the Ottawa Centre have gained a reputation for their keen interest in observational astronomy.

This talk will briefly describe the history of the Ottawa Centre's Observers' Group. Highlights include the 'Quiet Site' meteor observing station, construction of the 16-inch telescope and North Mountain Observatory in 1971, and the move to Indian River Observatory in 1977.

The present state of observational astronomy and observing facilities in the Ottawa area will be described. Finally, the light pollution threat will be discussed.



3 VULPECULAE: A BRIGHT NEW PULSATING VARIABLE IN A ONE-YEAR BINARY SYSTEM

Douglas P. Hube, Edmonton Centre
G.C.L. Aikman, Victoria Centre

3 Vulpeculae is a naked-eye star which recently has been discovered to be a member of a binary system, with an orbital period of approximately one year. It also appears to be an intrinsic variable, almost certainly a member of the non-radially pulsating 53 Persei Class of variable stars. Photometric variations are to be expected at the level of a few hundredths of a magnitude.

RARE BOOKS ON ASTRONOMY

J. E. Kennedy, Saskatoon Centre

Atlas Coelestis by Andreas Cellarius and de Revolutionibus by Nicolaus Copernicus, two rare books on astronomy, are among the many treasures to be found in the McGill University Library System.

There is general agreement that the Atlas contains twenty-nine of "the most beautiful star maps ever made." While the McGill copy of de Revolutionibus is not annotated, the donor, Sir William Osler, had the foresight to have the preface and introduction of this treatise translated and added at the back of the book.

As far as is possible to determine, the McGill copies of Cellarius and Copernicus are the only ones in a Canadian library. These are rare and valuable reference works for the historian of pre-19th century astronomy. A selection of star maps will be shown on slides, together with a few extracts from the preface and translation.

THE ORIGIN OF THE OB RUNAWAY STARS

Peter J. L. Leonard, University of British Columbia - Plaskett Medal Winner

The OB runaway stars are massive young O or B-type stars which are observed to be moving away from the galactic plane at high speeds (greater than 30 km s⁻¹) and/or which lie at large distances from the plane (a few hundred parsecs or more). The hypothesis that these stars were ejected from the plane as a result of strong dynamical interactions in young open star

clusters has been investigated via N-body simulations and binary-binary scattering experiments. It is found that the dynamical ejection hypothesis can reproduce the maximum velocity, binary frequency, and mass-velocity relation of OB runaways. Dynamical ejection also appears to be able to account for the observed number of OB runaways per unit surface area of the Galactic disk. In conclusion, dynamical ejection can explain the OB runaway stars.

REFLECTIONS AND REFRACTIONS ON A SOCIETY: THE RASC AS SEEN THROUGH ITS CENTRE NEWSLETTERS

Ian McGregor, Toronto Centre

The principal means of communication the Centres of the Society have with their members is through their newsletters. Whether a Centre has a large membership or a small membership, whether its members are geographically concentrated or isolated, the regularly published newsletter puts each member in contact with his or her Centre. What message do the newsletters communicate to their members and what do the newsletters tell us about the state of amateur astronomy in Canada? Examples will be taken from current newsletters.

GETTING THE LAST LAUGH ON THE STARS

Ian G. McGregor, Toronto Centre

Amateur astronomers develop a very special sense of humour as a result of the challenges they face in enjoying their hobby. The search for clear observing skies, the problems of light pollution, the operation of new equipment, the role of new technology, and the unusual circumstances in which amateur astronomy is experienced, all can provide sources for laughter, jokes, riddles, and paradoxes. Much of this humour, and the experiences, adventures and observations which generate it, often goes unrecorded and is lost. What is recorded is found only in the pages of club newsletters. In this illustrated talk, the joys and trials of amateur astronomy will be highlighted through the humour it has sparked among amateur astronomers.

SOLAR-TERRESTRIAL CONDITIONS ASSOCIATED WITH THE QUEBEC POWER DISRUPTION OF MARCH 1989

Richard W. Miller, Unattached

During Carrington Rotation 1813, in March 1989, solar active region SESC 5395 produced some of the most energetic flares of solar cycle 22 to date. The resulting geomagnetic disturbance produced a brilliant aurora which was observed over much of North America. Reports were received from as far south as Jamaica. At 02:45 EST on March 13, 1989, much of the province of Quebec was plunged into darkness when the largest geomagnetic disturbance since 1960 resulted in the separation of the La Grande transmission network from the main power grid. During the next 36 hours, many power utilities in North America reported events on their systems due to geomagnetic disturbances. This paper will summarize the solar activity which was associated with these events. As well, it will review in some detail the geomagnetic data from Canadian magnetic observatories and discuss the relationship of these data to some of the power system disturbances which occurred.

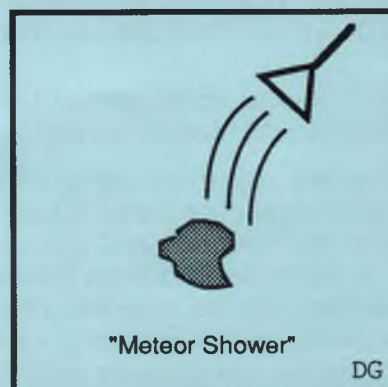
SCHMIDT CAMERA PHOTOGRAPHY

Paul Morfield, Ottawa Centre

The lure of the Schmidt Camera with its perfect pinpoint images, fast f /ratio and large field of view is an ideal tool for the astrophotographer. However, many have shied away due to problems of focus, film scratches, or using single pieces of film. To correct the problem we must view the camera as just one part of a complete photographic system which includes everything from a solid mounting to film holders to choice of guide scope.

This paper discusses the changes made to a commercially-produced Schmidt camera and with the addition of specially selected peripherals has produced a high calibre system for research or serious photography.

A series of photographs taken with the camera will help trace the evolution of the system.



THE PHOTOMETRIC VARIABILITY OF P. CYGNI - A BLUE HYPERGIANT

John R. Percy, Matthew Lester, and Rene Plume, University of Toronto

Wayne E. Clark, Howard J. Landis, and Russell E. Milton, American Association of Variable Star Observers

P Cygni (34 Cyg, HR 7763, HD 193237) is a blue hypergiant which, between 1600 and 1700 varied in brightness from magnitude 3 to 6. Since 1800, it has remained approximately constant ($V = 4.9$), with small variations ($\Delta V = 0.2$) on a time scale of weeks. P Cygni is also losing mass at a significant rate, possibly in 'bursts' every few months. Despite P Cygni's interesting properties and history, it has been relatively neglected by variable star observers until quite recently.

In this paper, we report on photoelectric photometry of P Cygni from 1985 to 1990, obtained as part of the photoelectric photometry program of the American Association of Variable Star Observers (AAVSO) and, in the summers, with the 0.4 m telescope of the University of Toronto. We will also comment on the possible relationship between the photometric and spectroscopic variability.

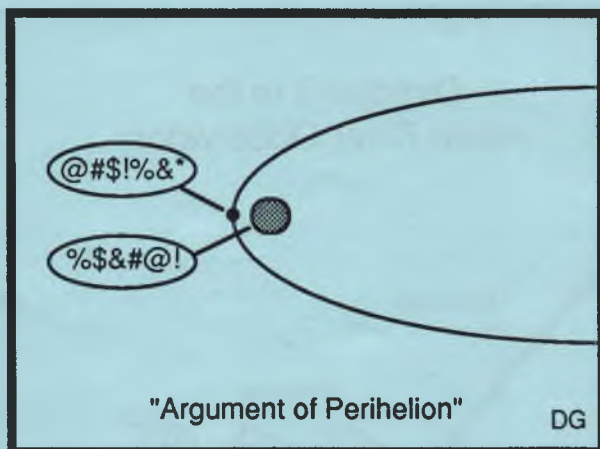
PRELIMINARY RESULTS FROM THE IRO RADIO INTERFEROMETER 238 MHZ SKY SURVEY

Frank Roy, Ottawa Centre

The radio interferometer at the Indian River Observatory has been operational since late 1978. It consists of two parabolic cylinders, each 15 metres by 5 metres, separated by 155 metres. The operating wavelength is 1.26 metres.

In September of 1987, a small group started to use the instrument to make a sky survey. Both galactic continuum and discrete source maps will be produced. A digital data acquisition system, based upon a PC-XT microcomputer, with custom-designed hardware and software, is being used to record the data.

The project and its progress to date will be discussed.



A STUDY OF GENERAL PUBLIC KNOWLEDGE ABOUT ASTRONOMY

Chris Rutkowski, Winnipeg Centre

A sample population was surveyed for general knowledge about astronomy, and in particular the relative sizes/distances of astronomical objects. Statistical results showed that people have considerable difficulty in comprehending the sizes and distances involved in basic astronomy.

ELECTRONIC IMAGING AT GLENLEA OBSERVATORY

Scott Young & Stan Runge, Winnipeg Centre

The availability of a Model ST-4 Star Tracker/Imaging Camera coupled with the Winnipeg Centre's new computer has opened up a new avenue of observing at our Glenlea Observatory. This paper will describe our use of this new electronic equipment and show some of the images we will have obtained. We will also describe the many uses for this equipment and some possible projects for the future.

AURORAE AND THE POWER SYSTEM

Joe Yurchesyn, Halifax Centre

The sun, the solar system's ultimate power source, threw a wrench into a man-made counterpart on March 13, 1989 - knocking out almost all of Quebec for about five hours, with some customers in the dark for close to two days.

Aurorae induce very low frequency - on the order of millihertz - currents in modern power systems, particularly northerly ones lying on very resistive bedrock like the Canadian Shield. These currents come about by the aurora's ability to distort the Earth's magnetic field. The movement of the normally static magnetic field lines induce Earth Surface Potentials (ESP's) across the ground of typically 5 V/km. The high resistance of the bedrock is paralleled by lower resistance transmission lines, connected to ground at various points through transformer neutrals. The result is a flow of current through the neutrals of these transformers and the lower resistance transmission line, rather than through the bedrock.

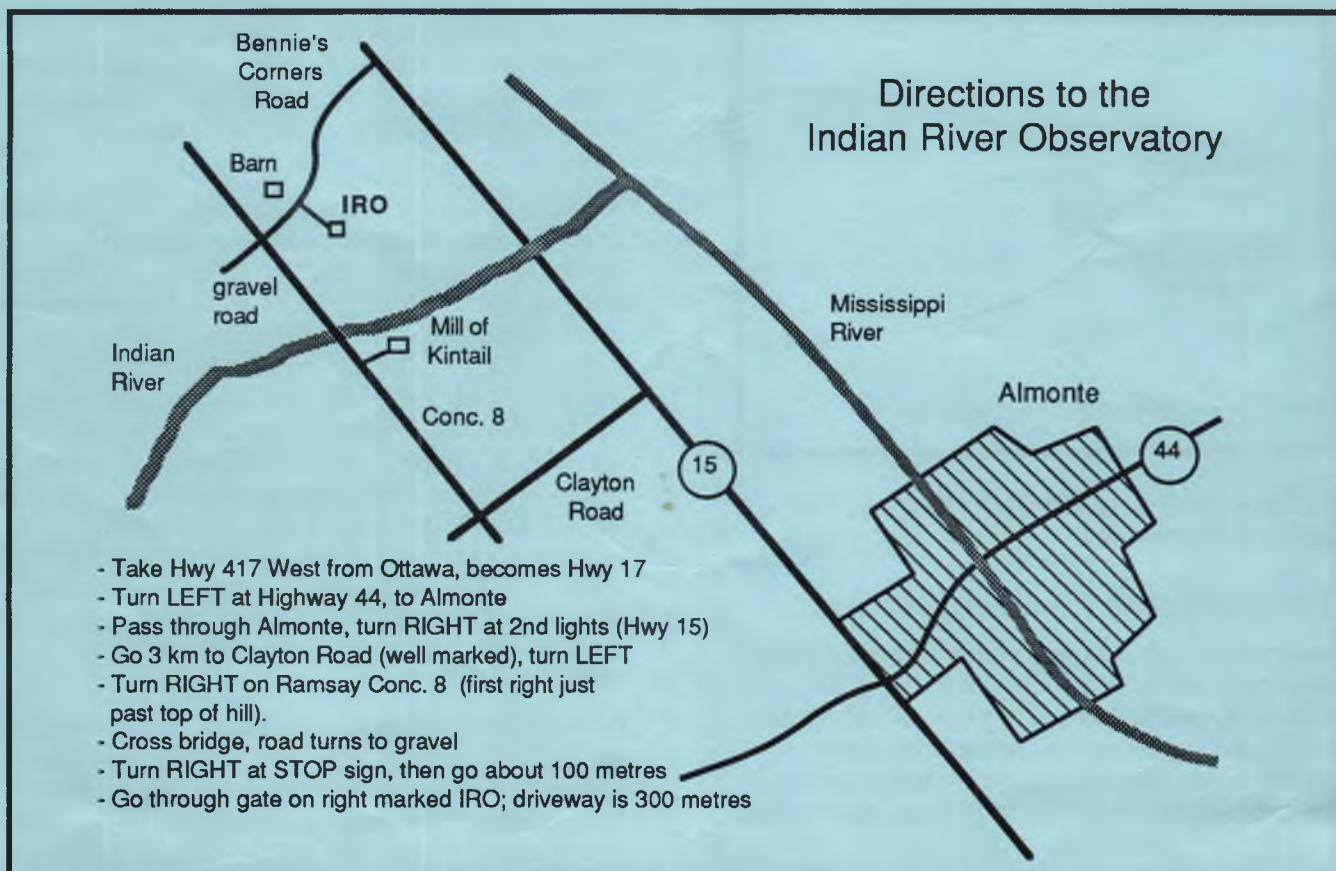
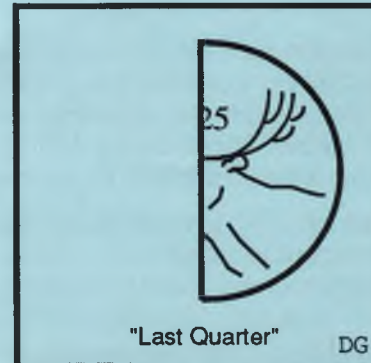
Low frequency neutral currents in transformers are difficult to detect and can cause damage or failure of the transformer by overheating. They also generate harmonic voltages (multiples of the fundamental 60 Hz frequency), causing problems for today's most modern power system device, the Static Var Compensator or SVC. SVC's are high-tech devices which switch capacitors and reactors at high speed to damp out system

disturbance oscillations and provide dynamic stability for the power system.

The modern power system evolved into one where the generating equipment is remote from load centres and interconnected by long transmission lines requiring the use of SVC's for stable operation. This circumstance has the double disadvantage of subjecting the lines to large ESP's (since the ESP magnitude is proportional to the line's length), and the mandatory need for SVC's, which are sensitive to harmonic voltages generated indirectly by the ESP. If generation was close to load, transmissions lines would be shorter, subjected to lower ESP's and not require the use of SVC's.

Some design changes can reduce the effect of ESP's on the power system at the expense of

other operational restrictions. Accurate prediction of magnetic storms offers the best means for power utilities to cope.



DISPLAY COMPETITION

OBSERVATIONAL - SOLAR SYSTEM

Amateur Observation of Jupiter Decametric Radio Emissions

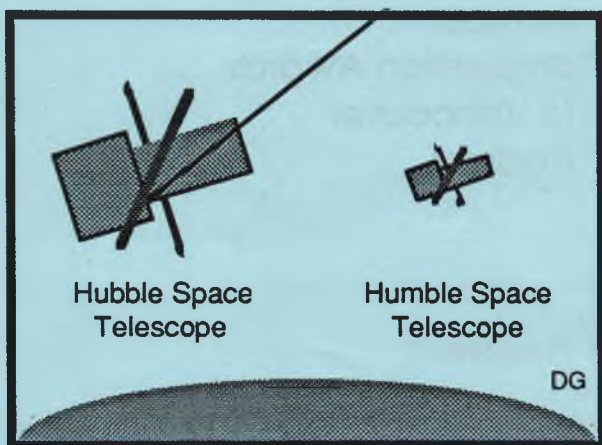
Richard W. Miller, Hillsburgh, Ont.

Mounted Photographs (22nd Solar Cycle)

Dan A. MacLennan, Halifax Centre

Oak Heights Astrophotography, Shots of the Moon

Andreas Gada, Toronto, Ont.



OBSERVATIONAL - OBJECTS BEYOND THE SOLAR SYSTEM

Deep Sky Schmidt Camera Astrophotographs

Paul Mortfield, Ottawa Centre

Astrophotographs

Rajiv Gutpa, Vancouver Centre

Results from the Indian River Observatory Radio Interferometer 238 MHz Radio Survey

Frank Roy, Ottawa Centre

Pictures of Objects Beyond the Solar System

Damien Lemay, Quebec Centre

Messier Objects of Ursa Major

Andreas Gada, Toronto, Ont.

NON OBSERVATIONAL

Photo Display on Light Pollution

Don Hladiuk, Calgary Centre

Legacy of Lunar Landing

John Howell & the Victoria Centre

Short History of the RASC

Real Manseau, Drummondville, Que.

INSTRUMENTATION

Home-made 8" f/4.5 Reflecting Telescope

John M. Thompson, Ottawa Centre

A Hypersensitizing Chamber

Damien Lemay, Quebec Centre

Spectrographic Analysis of Various LPR (Light Pollution Reduction) Filters and Their Application in Visual and Photographic Astronomy

Dr. Gary S. Susick, Ottawa Centre,

Dr. Fred Lossing, Ottawa Centre

NON-COMPETITIVE

The Ghost of GA's Past

Peter Broughton, Toronto Centre

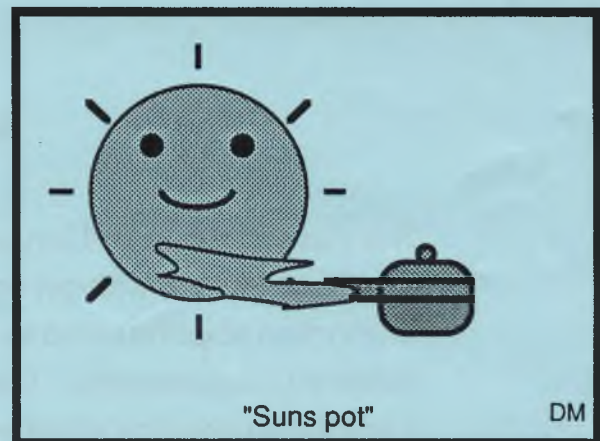
The American Association of Variable Star Observers

John R. Percy, Toronto Centre

President of AAVSO

SETI at Hay River

Bob Stevens, Algonquin Park



BANQUET

PLACE: National Arts Centre

AGENDA: 18:30 Cash Bar
19:30 Dinner
Greetings
National Awards
Display Competition Awards
Invitation to Vancouver
Banquet Address

GUEST SPEAKER Lloyd A. Higgs, Past President

TITLE 1990 and Beyond:
The Prospects for Canadian Astronomy

ABSTRACT

The current status of Canadian astronomical research will be briefly reviewed, with an emphasis on the contributions that Canadian scientists and institutions are making on the forefront of astronomy. The prospects for growth in Canada's research effort will be described. The picture that emerges is one of optimism, and there is every indication that Canada will enter the 21st century in a position to continue its major contributions to the advancement of astronomical knowledge.

ACKNOWLEDGMENTS

Many people deserve thanks for their hard work in making this General Assembly a reality.

1990 GENERAL ASSEMBLY ORGANIZING COMMITTEE

| | |
|-----------------|---------------------------------------|
| Rob McCallum | Chairman, Carleton Liaison |
| Doug George | Vice-Chairman, Symposium Publicity |
| Jane Lund | Registration |
| Sandy Ferguson | Paper Sessions |
| Pat Laffey | Programme, Transportation |
| Rick Wagner | Display Competition |
| Gary Mussar | Display Competition |
| RoseAnne Mussar | Tours |
| Derek MacLeod | Banquet |
| Mercedes Pelayo | Treasurer |
| Brian Burke | Accommodation |
| Rolf Meier | Slide Show |

SPECIAL THANKS

We would like to especially thank the following for their special contributions to the General Assembly: Ken Tapping, Fred Lossing, Mary Grey, Mike Richardson, Vic Gauzuskas, Ian McGregor, Peter Broughton, Robert Morris, Ian Halliday, Roy Bishop, and Lloyd Higgs. A special thanks to Richard Butt for his graphics, and Mary Geekie for the group photos. Thanks also to those Ottawa Centre members who helped out on the weekend with registration, transportation, tours, and other activities.

We would like to thank Carleton University for providing meeting facilities, audiovisual equipment, and a grant for the Wine and Cheese.

Ottawa-Hull Tourism Inc. deserves thanks for assistance with conference promotion.

Thanks to the National Research Council for permitting us to tour the Ottawa River Solar Observatory.

DONATIONS

From: **Camden House Publishing/
Terence Dickinson**

- Five copies: Nightwatch, Terence Dickinson
- Five copies: The Universe and Beyond, Terence Dickinson
- Five copies: Exploring the Night Sky, Terence Dickinson

From: **Saunders College Publishing**

- Realm of the Universe 4th Edition, Abell, Morrison & Wolff
- Astronomy: From the Earth to the Universe, J.M. Pasachof
- Frontiers of Astronomy, Morrison & Wolff
- Exploration of the Universe, Abell, Morrison & Wolff

From: **Tele Vue Optics, Inc.**

- 19 mm Wide Field Eyepiece

From: **Lumicon**

- Two \$25.00 gift certificates

From: **Kalmbach Publishing
Co./Astronomy Magazine**

- One set of astrophotographs: The Finest Galaxies
- One set of astrophotographs: Deep Sky Photography from Jack Newton
- One set of astrophotographs: Kim Zussman's Precision Astrophotography
- Two copies: The Universe From Your Backyard, David J. Eicher
- Two - one year subscriptions to Astronomy Magazine
- Two copies: Neptune Posters
- 100 leaflets "Your Guide to Astronomy"

From: **Roger Tuthill, Inc.**

- 6" Solar Skreen

From: **W3 Public Relations**

- Audio tape: Authentic Space Sounds Found on Voyager LP by Keyboardist/Composer Micheal Lee Thomas

CONTRIBUTOR ADDRESSES

Camden House Publishing, 7 Queen
Victoria Road, Camden East, Ontario
Canada K0K 1J0

Saunders College Publishing, The Curtis
Center Independence Square West,
Philadelphia, PA 19106 U.S.A.

Tele Vue Optics, Inc., 20 Dexter Plaza
Pearl River, NY 10965 U.S.A.

Lumicon, 2111 Research Drive #5,
Livermore, California 94550 U.S.A.

Astronomy Magazine, Kalmbach
Publishing Co., 21027 Crossroads Circle
P.O. Box 1612, Waukesha, WI 53187
U.S.A.

Roger Tuthill, Inc., P.O. Box 1086,
Mountainside, New Jersey 07092-0086
U.S.A.

INDEX

| | Page |
|---|-------------|
| Welcome | 2 |
| About Carleton | 2 |
| General Assembly | 3 |
| General Information | 6 |
| 1990 GA Timetable | 7 |
| Paper Session Abstracts | 10 |
| Computer-Assisted Photometry at the GlenLea Observatory | 10 |
| TOMA - An Idea Whose Time has Come | 10 |
| Centennial Astronomy Week - A Celebration Across Canada | 10 |
| Amateur Astronomy in the Ottawa Area | 10 |
| 3 Vulpeculae: A Bright New Pulsating Variable in a One-Year Binary System | 11 |
| Rare Books on Astronomy | 11 |
| The Origin of the OB Runaway Stars | 11 |
| Reflections and Refractions on a Society: | 11 |
| Getting the Last Laugh on the Stars | 11 |
| Solar-Terrestrial Conditions Associated with the | |
| Quebec Power Disruption of March 1989 | 12 |
| Schmidt Camera Photography | 12 |
| The Photometric Variability of P. Cygni - A Blue Hypergiant | 12 |
| Preliminary Results from the IRO Radio Interferometer 238 MHz Sky Survey | 13 |
| A Study of General Public Knowledge About Astronomy | 13 |
| Electronic Imaging at Glenlea Observatory | 13 |
| Aurorae and the Power System | 13 |
| Display Competition | 15 |
| Observational - Solar System | 15 |
| Observational - Objects Beyond the Solar System | 15 |
| Non Observational | 15 |
| Instrumentation | 15 |
| Non-Competitive | 15 |
| Banquet | 16 |
| Acknowledgments | 17 |
| 1990 General Assembly Organizing Committee | 17 |
| Special Thanks | 17 |
| Donations | 17 |
| Contributor Addresses | 18 |

Notes:

