SCOPE

The Newsletter of
The Royal Astronomical Society of Canada, Toronto Centre

In a country like ours it is particularly true that the art of government is largely one of seeking to reconcile rather than to exaggerate differences.
-W.L.M. King, 1931

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COVER PHOTO: DDO Pride by **@ddobservatory**

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Next *SCOPE* Pub. Deadline
September 16th

Editor: Eric Briggs
Copy Editor: Sue Kralik

Welcome to New Members:
D. Bannerman, R. Baruco, A. Cameron, W. Cameron, B. Carruthers, H. Chen, N. Cyprys, B. Franchi, E. Galeota-Alfarno, P. Gopalan, T. Gregorski, M. Gumusay, M. Harris, R. Heisey, the Hoffmann family, L. Johnson, T. Jokinen, L. Lin, the Mac family, D. Marshall, D. Moneta, L. Myslicki, S. Nikias, C. Park, T. Placha, H. Rane, M. Saldana, J. Saringer, the Shortt family, M. Tarrant, M. Thurston, S. Uadiale, J. Yerrapragada and the Ying family

Editorial by Eric Briggs

If you've been reading the SCOPE newsletter for more than a few months, I hope that the historical anecdotes haven't escaped your attention. I have inserted these many times to demonstrate that the broad foundation of membership now in the RASC Toronto Centre is also very deep. The "father of Canadian astronomy", Clarence Chant, who edited all the RASC's publications for fifty years, also wrote the appropriate school textbooks and created the Department of Astronomy at the University of Toronto, and seconded the RASC council motion in 1927 that created the Toronto Centre as a distinct entity. And with his trademark quiet persistence and persuasion, he founded the David Dunlap Observatory.

The next generation, Helen Sawyer Hogg and Ruth Northcott, and more astronomers up to the present day, have continued to attract the RASC to the Dunlap Observatory.

As a witness to the most recent eight years of the DDO's history with the RASC, I have been part of a team that wants to keep Dr. Chant's drive alive in all of our members as we do public outreach in astronomy in Richmond Hill and elsewhere. I want to give all the credit to our three presidents during this period, Paul Mortfield, Charles Darrow and Ralph Chou, and everyone who has worked on council and on our DDO Committee. Bearing in mind that we are the largest unit of the largest and oldest astronomical society in Canada, whose members have included the vast majority of those who worked at the Dunlap for generations, it is still logical that our members can succeed in all of the projects we attempt, except in situations that are beyond our control.

After our original agreement to lease the DDO from Corsica Development in 2009, in 2012 we signed a "lease and offer to purchase" agreement which was kept confidential at the developer's request for some time, for longer than we had hoped. In the meantime, various administrative procedures took place and the composition of the local town council in Richmond Hill changed. We also escorted more than 30,000 visitors through the observatory. You read about the announcement of the donation of the DDO from Corsica to the Toronto Centre in these pages last year. At the time, it was effectively an endorsement of our continued presence there.

At the time of the 2015 announcement, there was some criticism that the Observatory was not being transferred to a "public agency", although as a registered charity we are a public entity. Concerns were raised about the financial risks associated with our ownership of a landmark property. We were prepared to take those risks, as long as we had the co-operation of the town council. We were cheered up by the developer, which funded an expensive roof repair of the Admin Building last year that would have depleted our cash reserves and our line of credit, had we had to go it alone. The town council did not participate in that project, although they contributed some funds towards the recommissioning of the DDO Sundial that was otherwise paid for mostly by Corsica.

However, in February this year, Richmond Hill Town Council made a separate arrangement with the developer to have the observatory buildings transferred to their ownership without our consultation, with lease negotiations to be undertaken with us later. It was a disappointment, but in the new situation the costs of upkeep of the observatory would be borne by funding sources that are available to the town, and not by our members, pending our lease agreement.

The RASC Toronto Centre Council was prepared to negotiate a lease under certain terms, which we communicated to the Town. The proposed "Net Net" lease we received back in June was a bitter pill that required us to re-check our position as fiduciaries of this corporation. You have already read Paul Mortfield's announcement that we decided not to continue with a second try at a lease.

The draft lease proposed that costs of upkeep of the observatory and property taxes would be borne by the occupant, and that a more expensive insurance policy than our current coverage was required. Our negotiators expressed to us that although a second try at negotiations would probably bring slow progress, no deal was likely to meet many of the terms we had outlined, and that there would be tangible costs to occupancy. Additionally, the renewed negotiations would continue with the participation of legal counsel retained by the Toronto Centre at considerable expense.

After moving to leave off lease negotiations, our Council consulted with our members who are qualified to operate the DDO's 74-inch telescope, to assess their willingness to proceed in alternate usage negotiations that wouldn't involve either our ownership or lease of the observatory, and the telescope operators advised us they were not willing to proceed.

It's not an accurate statement to say that the DDO is going to be closed. That's outside the scope of this problem, and all parties want to see it continue. Also, there is no rationale to say that we have decided to leave the observatory completely. Your Council's still obliged to negotiate with the Town for any role at the DDO that the members of the RASC Toronto Centre would like to participate in. There is now a pending Council meeting at which we will try to articulate to each other how we should proceed. And I contend that absent the RASC, the DDO would have to struggle to find its future.

Here are a couple of quotations from a previous RASC generation that I hope still apply. What we choose to do at the DDO next depends on YOU.

"The very existence of the Society and of the Observatory is largely due to one remarkable man, Dr. C.A. Chant. With quiet persistence and persuasion he did an enormous amount to elevate astronomy in Canada to an international status. There is no doubt that the Society has played a major role in the existence and strength of the David Dunlap Observatory. We of the Observatory staff like to think that over the years we have made some repayment of the Observatory's debt to the Society."

-John F. Heard, October 1967 (*JRASC*)

Call for Nominations

At the Annual General Meeting to be held on 2016 November 23, the following positions on the Toronto Centre Council will expire: Honorary President, President, 1st Vice President, 2nd Vice President, Treasurer and three Councillors.

Members in good standing are invited to submit nominations for these positions. All such nominations must be submitted by two members in good standing and include a statement by the nominee agreeing to stand for the office. All nominations must be received in writing or email on or before 2016 November 9 by Tom Luton, Secretary (**secretary@rascto.ca**) or Ralph Chou, Nominations Committee Chair (**membership@rascto.ca**) .

"The Toronto Centre is a focal point for astronomically-minded people from all walks of life, from elementary school students to corporation presidents. Many younger members (and some older ones too) eventually take up careers in astronomy or related sciences. Some members have generously provided financial support for the Observatory; David Dunlap, Walter Helm and Carl Reinhardt were all members of the Centre. However, the benefits which accrue to the Observatory from the Toronto Centre go far beyond the occasional generous bequest. In the membership of the Toronto Centre, we have a willing audience, staunch supporters, and fervent missionaries of the astronomical cause."

-John Percy, April 1971 (*David Dunlap Doings*)

Dr. Geoff Gaherty, Jr. (1941-2016)

*Condensed from **www.space.com**, by Denis Grey and Pedro Bragança in co-operation with Starry Night software*
Photo by Jim Low

We are deeply saddened to inform our readers that longtime Night Sky columnist Geoff Gaherty died on July 7, 2016, from complications following a kidney transplant.

Geoff had many interests, including music and nature conservancy, but amateur astronomy had a special place in his heart. The word "amateur" comes from the Latin "amare," which means "to love." An amateur is first and foremost someone who does something because he or she enjoys it. Terence Dickinson describes an amateur astronomer as a "naturalist of the night." That is to say, amateur astronomers are to professional astronomers what birdwatchers are to ornithologists.

Geoff believed that anyone could be passionate about the night sky. They might just need someone to provide them with the spark to ignite that passion.

Born in 1941, Geoff's interest in astronomy goes all the way back to 1957, when he was still a teenager. He got hooked on amateur astronomy because of a newspaper report of a bright comet, Arend-Roland. On May 1, 1957, he went out on his back porch in Montreal to look for this comet. Here's how he described it:

"It was the appearance of a bright comet, Arend-Roland, in 1957 that first piqued my interest in astronomy, even though I never saw it…but I became interested in a bright object high in my southern sky. With the help of a book (no software back then — no desktop computers in fact) I identified this object as the planet Jupiter. Soon I was looking at telescope ads, and ordered a 'Palomar Jr.' 4.25-inch reflector from Edmund Scientific. The telescope was delivered on July 4. I put it together and, as dusk fell, pointed it first at the moon and then at Saturn. Saturn was simply unbelievable: 'It really has rings!' I said to myself … I was hooked on astronomy. A few months later, I made an independent discovery of another bright comet, Mrkos. Spotting Mrkos hanging in the northern sky above our cottage in the Laurentians is one of my all-time most vivid astronomical recollections."

He joined the Montreal Centre of the RASC and became a skilled planetary observer, made many sketches of Venus and Jupiter, served as national coordinator for the society's planetary observing program in the early 1960s and recorded hundreds of variable star observations for the American Association of Variable Star Observers.

Geoff's stories from those days tell of a different kind of hobby than one might imagine today. Amateur astronomers attended formal meetings and bought expensive telescopes; astronomy was "work" back then and there was a real focus on making a real scientific contribution with your observations. There was also a lot of fellowship. One of his fellow travelers from the Montreal Centre was the well-known comet hunter and writer David Levy, who still remembers Geoff to this day.

Geoff went on to graduate with a B.S. in mathematics and physics from McGill University in 1964 and then moved to Toronto, where he received a Ph.D. in anthropology from the University of Toronto in 1970. This period also marked a long hiatus from amateur astronomy.

Fast-forward 34 years, spent getting educated, married, divorced and remarried — little time for astronomy! Geoff was spending his university's "March Break" in New York City in 1997 with his wife, Louise, and son, David, when he looked out of his hotel window on 57th Street early one morning and was amazed to see a bright comet hanging above the skyscrapers to his north. This was Comet Hale-Bopp — one of the most spectacular comets of the 20th century — and once again a comet lured him into amateur astronomy.

He started reading magazines, and then got the telescope out of the closet. Shortly after, he rejoined the RASC, this time with the Toronto Centre, and became an active observer again.

One of Geoff's mantras during his "second coming" to astronomy was that it had to be "fun." He had no interest in the administration and operations of his astronomy club. Instead, he just went ahead and did things that he liked to do, things he wanted to do, and in so doing made richer, larger and longer-lasting contributions to his club and the wider astronomy community.

Later in life, Geoff become a prolific writer, astronomy communicator and mentor to many. He presented "The Sky this Month" at our meetings for more than five years.

For the RASC Journal, he wrote a column called "Through the Eyepiece," for which he won the Ostrander-Ramsay Award for Astronomical Writing. Most recently, Geoff penned the text portion of "The Sky Month by Month" for the RASC's venerable "Observer's Handbook."

Since the early 2000s, he was an active participant in many astronomy forums and email groups, where he helped countless people with their astronomy, observing and equipment questions. He moderated two of the most popular astronomy forums on Yahoo Groups — Talking Telescopes and Starry Nights.

He loved trying out different astronomy equipment. He owned more than 25 telescopes since his youth. Many of his authoritative reviews of telescopes ended up in various publications.

His weekly column on Space.com in partnership with Starry Night software enabled him to reach millions of readers on a regular basis. In addition to maintaining his own blog and social media outlets, Geoff also traveled to numerous astronomy clubs to deliver talks. The internet is sprinkled with his knowledge and wisdom in the form of forum postings, articles, blog posts, e-books and observing guides.

In addition to his awards for writing, Geoff was the 28th recipient of the prestigious Chant Medal in 2008 (see photo) which he received at the General Assembly in Toronto. This medal is awarded to an amateur astronomer resident in Canada on the basis of the value of the work carried out in astronomy and closely allied fields.

Geoff's accomplishments included:

- Earning the society's Messier certificate (fourth person to do so in Canada).
- Earning the society's Finest NGC certificate in March 2001.
- Earning the challenging Herschel 400 certificate in 2006 (48 years after he began observing the 400 required Herschel objects).
- Making more than 1,500 variable star observations for the American Association of Variable Star Observers.
- Regularly observing Jupiter and its rotation for the Association of Lunar and Planetary Observers.

We also have to speak about "Gaherty's Law," which Geoff described as follows:

"This is an in-joke in the RASC Toronto Centre. A few years ago I did a presentation on telescopes and binoculars, and I mentioned that any purchase of new equipment inevitably leads to cloudy skies commensurate with the cost of the purchase. Unfortunately, this truth has become permanently associated with my name.

"It became a corollary to Gaherty's Law that any event I described would be clouded out. Finally, in desperation I declared during my presentation that absolutely nothing was going to happen this month!"

Tom Luton responded to Geoff's passing with the well-known poem "The Old Astronomer," by Sarah Williams. The poem is written from the perspective of an old astronomer on his deathbed speaking to a beloved student.

Though my soul may set in darkness, it will rise in perfect light;
I have loved the stars too fondly to be fearful of the night.

Good night, Geoff, and farewell. Your light broke into our hearts. We will think of you often whenever we see a starry night.

Dr. Thomas Clarke

A member of the RASC Toronto Centre since 1964, Dr. Clarke passed away peacefully surrounded by family after a short illness caused by his recurring cancer. Born in Montreal West, son of Nancy and Roy, he spent the first 2 years of his life being shuttled between Montreal West and various mining operations that were focused on Canada's war effort. After a stay in Montreal West, while his father was enlisted in the Royal Canadian Engineers, the family settled in Toronto in 1952.

Throughout school, Tom was at or near the top of the honour roll and in his final year in high school was valedictorian. Tom also enrolled in the scouting movement as a cub scout. After moving through the ranks of Scout, Queen Scout and Rover, he served as the leader of a Venturer company for a number of years.

A love of the stars led Tom to attend U of T, eventually receiving a PhD in Radio Astronomy. At the McLaughlin Planetarium from day one, he served as Director from 1976 until its closure. He very much enjoyed designing, assembling and presenting the many programs over the years. The closure of the Planetarium in 1995 was a sad event for Tom but he continued to work on special projects at the Royal Ontario Museum until his retirement in 2003. Not one for slowing down, Tom kept busy by staying involved in Scouts Canada (56 years of service) and on various committees at Fairlawn United Church and the United Church of Canada.

Tom also found joy in gardening, history and storytelling, family, and most recently being grandfather to Benjamin and Holly. He leaves behind his wife of 38 years Kathy, children Christopher and Caroline, brothers Allyn and Warner, nieces and nephew, cousins, and Bill, Bob, and Bud Ralph.

A service of remembrance will be held at FAIRLAWN AVENUE UNITED CHURCH, 28 Fairlawn Avenue on Wednesday August 10 at 2pm. The family will receive friends on Tuesday August 9, from 6 to 9 p.m. at Morley Bedford Funeral Home, 159 Eglinton Ave. West (2 stoplights west of Yonge Street), Toronto. In lieu of flowers, please consider a donation to charity.

photo by John Ginder

Dr. Clarke received the 1994 Elvins Award on behalf of the McLaughlin Planetarium staff.

Beginner's Astro Imaging Workshop Weekend June 24-26

By Diana Salerno

On the weekend of Friday June 24 through to Sunday June 26, 2016, the Carr Astronomical Observatory hosted a tremendously successful Beginner's Astrophotography Workshop for members of the Toronto Centre looking to expand their horizons (pun intended) and appreciation of the night sky beyond star gazing and faint fuzzies. The workshop's Lead Mentor, Risa Horowitz, did an excellent job coordinating the weekend itinerary and organizing mentorship presentations, as well as delivering some great presentations herself. All participants of the workshop owe a big THANK YOU to our incredible Mentor Team members Risa Horowitz, Dietmar Kupke, Ben Lappalainen, Steve McKinney, and Ian Wheelband, and voluntary assistance from Ian Donaldson, for making the weekend such an incredible success, and for volunteering not only their time, but also for sharing their valuable expertise in all the areas that interested participants. We also owe a very sincere Thank You to our CAO Supervisors - Blake Nancarrow, Phil Chow and Lora Chow - for the warm welcome and for organizing and offering such excellent accommodations.

Weekend activities included an excellent daytime Lecture Series and well rounded succession of informal tutorials on topics including Night Sky Camera Settings, Shooting Calibration Frames, Star Trails, Time Lapse Photography, Wide Field and Narrow Field Imaging, Tracking Mounts, and Pinhole Solargraphs, as well as software tutorials including various stacking software, QuickTime, Adobe Photoshop and Light Room and more. An exceptional Summary Document prepared by Risa can be downloaded from the Yahoo Group files section titled "RASC CAO Beginner Workshop.pdf" for all members to enjoy. Even if you were not able to join us for the weekend, this PDF includes a lot a useful information and web links to online tutorials and videos on topics reviewed during the workshop. It also outlines the details of the weekend itinerary and topics covered.

The 15 participants of the workshop were fortunate enough to enjoy reasonably good sky conditions on Friday June 24 before moonrise, while Saturday night only offered about 1.5 hours of darkness before the clouds rolled in. Despite having limited time to practice, participants produced some impressive work and should be very proud of their accomplishments thus far. With all this great information and knowledge in hand, stay tuned for astrophotography-related follow up sessions this coming Fall. In the meantime, participants and members are encouraged to practice the techniques they have learned, and to collect some good data over the summertime!

As a member, you are invited to show your slides, drawings, or discuss your observing program. Please contact the chairman, **Paul Markov**, at 905-470-6642 or *membersnights@rascto.ca* well before the meeting date to discuss your presentation. Updated listings are at: www.rascto.ca

Upcoming Meeting and Event Schedule

RECREATIONAL ASTRONOMY NIGHT Wednesday, August 17th: 7:30 PM
Location: Ontario Science Centre
Chris Vaughan: The Sky This Month
Denis Grey: Pole Master: Polar Alignment Made Easy?
Frank Dempsey: Interesting NASA Space Weather Products

RECREATIONAL ASTRONOMY NIGHT Wednesday, September 14th: 7:30 PM
Location: Ontario Science Centre
Allard Schipper: The Sky This Month
Mehdi Bozzo-Rey: Moon Vacations: Tips for Planning a Good Trip
Alex Stanomir: Chile observatories - visit to ALMA and Milky Way intelligent civilizations - a Java representation

LECTURE NIGHT Wednesday, September 28th: 7:30 PM
Location: Ontario Science Centre
Speaker: Rachel Friesen, Dunlap Institute

University Observatory Public Tours

U of T holds public lectures and tours on the first Thursday of each month, including planetarium shows and views through the 200mm Goto refractor and 40cm Boller & Chivens reflector.
http://www.astro.utoronto.ca/astrotours
York University holds online public viewing on Monday nights between 9 and 11 PM on their website, **http://astronomy.blog.yorku.ca**
Also on Monday evenings between 9 and 10, they broadcast an online radio show from **http://www.astronomy.fm**. The York observatory and its 40cm LX200 are open to the public on Wednesday evenings. ***Take a Tour!***


Photo by Sharmin Chowdhury

Ontario Science Centre Report: Summer Star Party July 16th

Partnering with the Aga Khan Museum and Ismaili Centre Toronto, we hosted a star party at the Ontario Science Centre's Teluscape on Saturday evening, July 16th to mark the arrival of NASA's *Juno* spacecraft at the planet Jupiter. We were accompanied by a musical performance by Rajasthan Josh, an 8-piece ensemble.

Rachel Ward-Maxwell from the Science Centre estimates 200 visitors attended, and between our volunteers we had ten telescopes to share the views of Jupiter, Mars, Saturn and the waxing gibbous Moon. We also observed the optical binary stars Mizar and Alcor and the globular cluster Messier 13.

In no particular order, thank you to Dan McRae (with his monster 18" reflector), Katrina Ince, Sharmin Chowdhury, Eric Peters, Patrick MacDonald, Denis Grey, Bryon Czarnik, Frank Dempsey, Ron Macnaughton, Anne Stadlmair and Shawn Lee. This event was extra-special in that on a night when our members were already heavily-committed at both David Dunlap Observatory and the Carr Observatory (for the Star-B-Que, p.8) we still had great participation from our volunteers at Don Mills.

Special Thanks to Rachel Ward-Maxwell and the OSC crew (staff and security) for hosting this Star Party. A grand time was had by all.

-Shawn Lee


Photo by Sharmin Chowdhury

Awards and Volunteer Appreciation BBQ August 21st Invitation

Volunteers are the lifeblood of our organization and once again it is time to honour those members of the RASC Toronto Centre who have made significant contributions in the past year. All RASC-TC members and their families are invited to the Awards and Volunteer Appreciation Barbecue at the David Dunlap Observatory.

Beverages and food will be provided. Please bring a salad or dessert to share on the communal table. We also recommend lawn chairs, sunscreen, bug spray, etc. This will be a rain or shine event!

Date: Sunday, August 21st, 2016

Location: David Dunlap Observatory (DDO), Richmond Hill

Start Time: 2:00 p.m.
End Time: 7:00 p.m.

Parking: Free but limited on-site so car pooling is encouraged.

Alcohol and pets are not permitted. There is no wheelchair access to the observatory or bathrooms. Access to the telescope and bathrooms requires the use of stairs.

If you would like to attend, please RVSP with the number of adults and children attending, vegetarian preference and contact info via the following link:
https://www.surveymonkey.com/r/2SYCY3R
This will allow us to plan for beverage and food purchases.

Hope to see you there!

Photo by Sharmin Chowdhury

Dunlap Observatory Summer Schedule

Family Nights are a great introduction to the night sky for our younger (and older) guests. Look through telescopes, make some space crafts, visit the Skylab and find out what's really up there!

While we welcome the public for our DDO public programming, our schedule depends on participation from you, our member volunteers, to run the observatory. Member volunteers should contact the DDO Committee to co-ordinate our volunteer activities.

Family Nights require tickets to be purchased in advance. This program runs regardless of sky or weather conditions. If skies are clear you can check out the night sky through a variety of telescopes including the largest optical telescope in Canada! The evening also includes a presentation in our special Skylab that offers great (virtual) night sky viewing.

Tickets for Family Nights are non-refundable since the program runs regardless of sky or weather conditions. If it's cloudy, hang onto your tickets for free telescope viewing only, on a future evening.

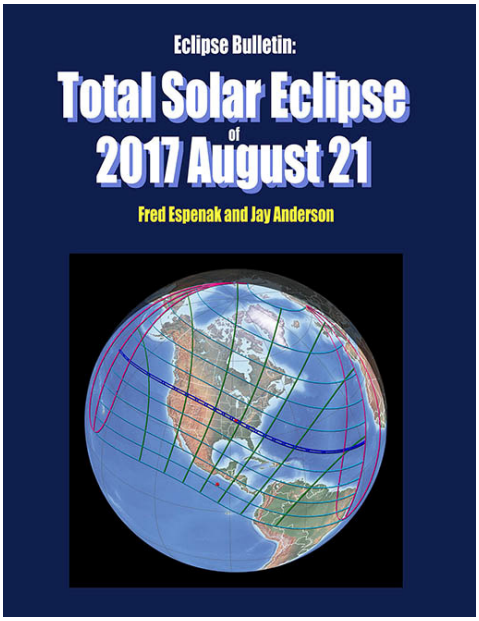
For safety reasons, children under 7 years of age are not permitted in the big dome, but are welcome to look through the smaller telescopes on the lawn.

Who can attend: Everyone
Fee: $8.00

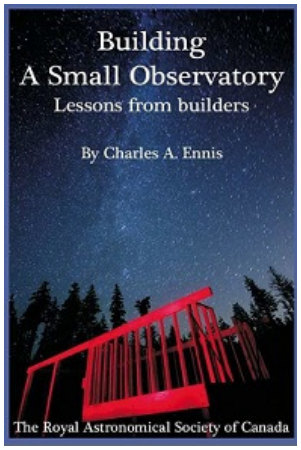
Aug 6 Family and Friends Night 8:45 PM (Sold Out)
Aug 11 Perseid Meteor Shower TBD
Aug 13 Star Talk and Stargazing with **Rachel Ward-Maxwell** from the **Ontario Science Centre** (Sold Out)
Aug 20 Star Talk and Stargazing (Sold Out)
Aug 27 Star Talk and Stargazing (Sold Out)

RASC Observer's Calendar 2017

The Observer's Calendar 2017 showcases RASC members' astro images with information on what's up in the sky tonight. The perfect gift for the beginner and a must-have for the experienced observer.
Designed with the observer in mind, the calendar contains comprehensive astronomical data such as daily Moon rise and set times, significant lunar and planetary conjunctions, eclipses, and meteor showers. The RASC Calendar is a winner of 5 printing awards of excellence for its graphical quality and design.



New RASC Publications



Building a Small Observatory

This book is the result of interviews with 140 small observatory owners in 10 countries to discover what it takes to fund, build, and operate a small observatory. As a planning guide, it will help you maximize your chances of successfully creating a trouble-free installation, and help find the best site and equipment. Learn from the experience of those who went before you. Don't make the mistakes that others have made!

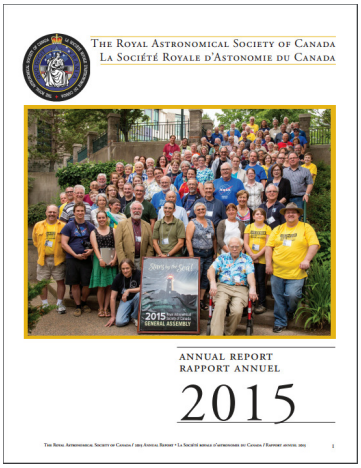
2017 Total Solar Eclipse Guide

On Monday, August 21, 2017, a total eclipse of the Sun will be visible from the contiguous United States for the first time since 1979. The Eclipse Bulletin is the ultimate guide to this highly anticipated event. Written by two of the leading experts on eclipses, the bulletin is a treasure trove of facts on every conceivable aspect of the eclipse.

Published by Astropixels*, this title is available from the RASC National Office like other titles published in-house by the RASC.*

2015 RASC Extended Annual Report

The National RASC's official report for the previous financial year was published earlier in July, online at:
http://rasc.ca/annual-report-2015-extended
The report includes the secretaries' and treasurers' financial and activities reports from the RASC's 28 centres across Canada, excluding the new Yukon Centre which was accepted at the General Assembly in May.



May 28th Carr Observatory Work Party Report by Emma Seabrook

On the gorgeous, sunny weekend of May 27th to May 29th, the Carr Astronomical Observatory held its semi-annual work party to fix up the observatory for the upcoming season. Unlike the fall work party of last year, we had great warm and sunny weather with Friday- high of 22°C, Saturday 31°C and Sunday 30°C. It really boosted everyone's mood.

The pre-work party started Friday when some of the members arrived early to set up and get things organised. Other members arrived later in the evening. Sadly, it got quite cloudy and it became a search for what was visible in the clear patches. We did, however, see Saturn and its glorious rings, Jupiter, M82 (also known as "Cigar Galaxy"), M81 (Bode's Galaxy), and 3 or 4 satellites. The International Space Station passed over heads looking up, and quite a few shooting stars were noticed by people. Most didn't stay too late though because the next day, everyone had to get up early.

Saturday morning, we had an early start at 8:00AM, with a delectable breakfast prepared by Lora Chow. Right after, we had a briefing by Tony Horvatin and Blake Nancarrow on the tasks that needed to be done. Everyone applied sunscreen, chose a task and set off to work. There was a wide variety of tasks to be completed. In the morning, the back deck was power washed, the lawn was cut and weeds were removed from the walkway. After a couple of hours of work, everyone headed in for refreshments. Quite a bit of work was done on the GBO: the wheels and tracking of the sliding roof was jacked, cribbed and adjusted, new red up valance lighting strings, and six replacement drop down door slide bolts were installed and interlock magnets were transferred. All this work was making people hungry.

Lunch was burgers prepared by Phil Chow. After lunch, it was back to work with all the members doing their best to get the CAO in shape. Tackling indoor tasks was a way of avoiding the heat outside and there were a number of such jobs to be done. Rubber base boarding was prepared and installed in the Great Room; two new donated bed sets were placed in the Cygnus and Aquila Rooms (old units went to the trailer for dump); vibration isolation pads were installed under the server computer case; the steel desk in the library was dismantled in preparation for a computer station counter; the counter top was delivered and the legs were prepared for the White Light Lounge computer station, the bedroom door bottoms were cut to improve room ventilation, a "clover type" power cord was installed on the power bar on the drop ceiling at the projector mount in the Great Room; a new CO detector was installed in the main hallway; a wooden cupboard unit was hung above the floor trolley in the lower bathroom; an info sheet on A/V sound playback, hookups operations was placed in the living room, and clear caulk was applied inside the kitchen cupboard door panel joints to reduce vibration noise upon closings. The installation of two AC outlets on the work bench face was completed. All of these were great indoor tasks that could be done to escape the heat. However, a number of outdoor jobs was completed by those who enjoyed warm days. These tasks included the following: rain flashing strips at the front deck were installed; gaps under the garage roll up doors were repaired to prevent animals and snow from entering; the failed lattice panels on the pergola top were removed and replaced while protecting the vines. Some new door knobs at the garage entrance door were installed; The body/mount/optics and eyepiece suite optics of the C14 telescope were cleaned. Some bird decals were applied on deck glass railings and the Swann DVR unit in the garage was replaced.

That's not all! There were also a lot of seasonal jobs that were completed. The GBO entrance screen door was re-installed, some vacuuming was done, cobwebs were cleaned up and mold and insect markings were washed; the storm windows were removed; the generator was inspected; the picnic tables were unstacked; the garage was cleaned up and re-organized; equipment was moved up into the rafters; the trailer was loaded with rubbish to be taken to the county dump and all scrap metals were transferred back to Toronto for sale.

The kitchen crew, Sharmin and her helper Coralie, laboured away for hours to prepare a delicious Mughalai dish which was well enjoyed by everyone. After dinner, the last few tasks of the day were finished as the clouds rolled in. Sadly there wasn't a lot of observing to do but a great card game tournament took place in the living room, adults vs teens. Later, everyone retired for the night.

Certificate Corner

SCOPE tracks the progress of Toronto Centre members towards the Observing Certificates.

- Eric Beresford, Explore the Universe, 55/55
- Eric Briggs, Messier, 65/110
- Kersti Meema, Messier, 38/110
- Jack Pennings, Messier, 98/110
- Finest NGC, 58/110
- Allard Schipper, Explore the Universe, 21/55

To register for Certificate Corner, e-mail to: SCOPEeditor@rascto.ca.

More about working towards an RASC Observing Certificate:

- Send an e-mail with your inquiry to observing@rascto.ca
- See the National web site Certificate Page at **http://www.rasc.ca/observing/certificate-programs**

To apply for a certificate and pin, send your observation information by e-mail to: observing@rascto.ca

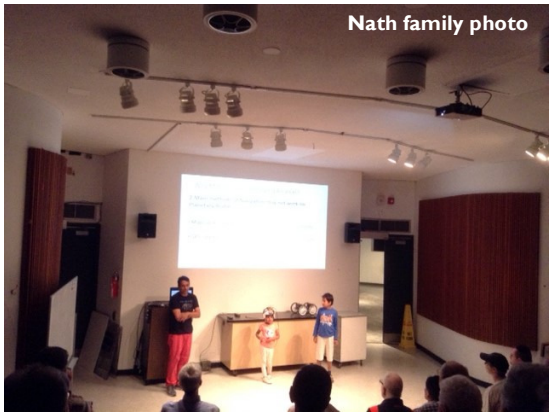
On Sunday morning, breakfast was eaten and final tasks were finished. People packed up and went home knowing that they had worked well and accomplished something over the course of the weekend. The last of Lora's delicious snacks were eaten and the work party officially ended when the CAO was closed up for the weekend around lunch time.

A big "Thank you" to the following volunteers who dedicated their time to fixing up the CAO at this year's spring work party: Thomas Bernard, Doug Carman, Lora Chow, Phil Chow, Sharmin Chowdhury, Diana Davey, Rick Davey, Ian Donaldson, Wayne Gilbank, Paul Ginsherman, Risa Horowitz, Tony Horvatin, Tom Luton, Al McAdam, Steve McKinney, Blake Nancarrow, Sailu Nemana, Peter Richards, Tessie Salman, Coralie Seabrook, Emma Seabrook, Geneviève Seabrook, Ed Trejis, Susan Woolsey.

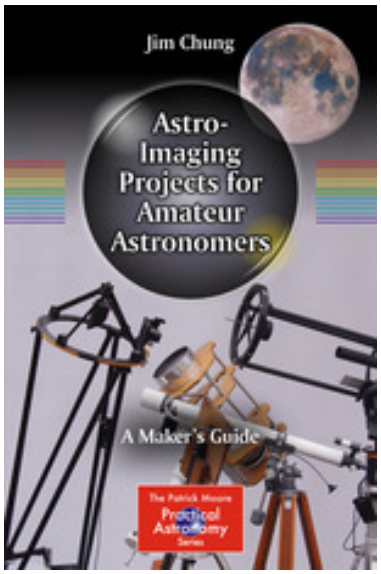
We also would like to thank the people involved in the "behind-the-scenes work" that led to another amazing spring work party.
Clear Skies,
Thank you.

Recreational Astronomy Night Report June 22nd

After Denis Grey presented 'The Sky This Month', Vikas Nath and kids Artash Nath (10 years) and Arushi Nath (6 years) gave a presentation of the path-finding Rover they built at home for planetary exploration. The Rover takes a snapshot of its surrounding using a camera and processes this image using edge detection and gradient mapping tools of Matlab to convert it into a visual maze. The Rover then applies the maze-solving algorithm to find the best path forward. The coordinates of this path are sent to the driving mechanism of the Rover using Arduino and the Rover is able to drive forward avoiding obstacles. It took them over two months to build and program the Rover.


Nath family photo

Jim Chung spoke about his personal journey from getting published in Sky & Telescope to writing his book which was released last summer.
It was a humorous behind-the-scenes look at the nonfiction scientific publishing world. It was at times confrontational, some battles won and some lost, and the importance of making your Indian production editor your best new friend. After revealing the good, the bad and the ugly magazine and Amazon reviews it was determined that Jim will unlikely be selling any movie rights to his book anytime soon.



RASC
Royal Astronomical Society of Canada
TORONTO CENTRE

Carr Observatory Star-B-Que Report
By Lora Chow

Photos by Malcolm Park

Members old and new along with their families gathered at the CAO for the Star-B-Que on Saturday, July 16, 2016. 40% of the attendees were first time visitors to the CAO.

It was a perfect, sunny summer's day. The day commenced with a interpretive hike of the Margaret Paull Sidetrail led by Tony Horvatin with Phil Chow bringing up the rear to ensure the group stayed together. This was followed by kite flying. Doug Isherwood brought many beautiful kites and permitted us to fly them - Mona Lisa, Munch's The Scream, and Cathedral Window to name just a few. Sadly the winds were sparse and this limited our ability to make these kites soar. At the same time, solar scopes were set up on the observing pad and Dietmar Kupke operated the solar scope in the Geoff Brown Observatory.

The next activity was rocket launches, always a crowd favourite, led by Tony and Malcolm Park with building assistance from Paul Ginsherman, Artash, Arushi and Vikas Nath. Big Bertha did not disappoint and a new rocket, 'Double D Honey Bee' built with the assistance of Iosif and Emanuel Budulai weeks before, had her first launch. Malcolm dusted off his rockets which had sat idle for many years. We had a 100% success launch rate! Thanks go to Ricardo and Sophie Baruco, Jeff Booth, Artash and Arushi and Peter Richards for rocket retrieval. Special mention goes to Jeff for furthest retrieval distance-wise (we thought we'd never see him again) and Peter for wading through knee high grass to get one rocket very near to the edge of the pond. We are also happy to report that no rockets were lost this year.

Chris & Sue Vaughan made sure everyone had a name tag and received a raffle ticket. Grace and Tony Horvatin looked after the raffle draw. There were many door prize winners and our grand prize winner was Charline Norgrove who went home with a pair of Celestron binoculars. Hopefully this will make up for one rocket landing right in front of her feet.

Ian Donaldson, the event photographer, took the group photo and then it was time to eat. Ian also got the charcoal BBQ going and the kitchen table groaned under the selection and quantity of food thanks to the contribution of all the participants.

Our neighbours to the east, Batta and Luba Vukasinovic, dropped in to the CAO for the first time and were given a tour of the facility. They graciously plow out space at the end of their driveway each winter for members to park their cars.

After sunset, a bonfire was lit and many people sat around the fire singing songs and roasting giant marshmallows. We were treated to the sounds of a didgeridoo played by James Chilton. Others set up on the observing pad to share the view or gathered around the C14 and except for the dew, the skies did not disappoint. Various telescopes that are available for members to use while at the CAO were set up for demonstration purposes. Peter found it a bit of a challenge to stay awake until 3:00 am as Artash and Arushi were keen observers and weren't ready for bed just yet. They managed to view all 8 planets!

Photos from the Star-B-Que can be viewed at:
https://groups.yahoo.com/neo/groups/rasctoronto/photos/albums/2123922190
We encourage you to add your photos to this album.

A huge thank you to everyone who assisted in making this a wonderful day:

Ricardo & Sophie Baruco, Connie & Jeff Booth, Denise & James Chilton, Bev & Ian Donaldson, Ralph Chou, Lora & Phil Chow, Paul Ginsherman, Grace & Tony Horvatin, Doug Isherwood, Dietmar Kupke, Tom Luton, Blake Nancarrow, Artash, Arushi & Vikas Nath, Charline Norgrove, Malcolm Park, Millie Rayakovich, Peter Richards (Supervisor Extraordinaire), Chris & Sue Vaughan, Ian Wheelband, and Susan Woolsey.

Recreational Astronomy Night July 20th Report

The first speaker of the evening, Michael Watson, presented about 40 photos of constellations (UMa, UMi, Lyr, CBr), the Milky Way, close-ups of hydrogen gas clouds and the Veil Nebula in Cygnus, Cepheus and Sagittarius, and other deep-sky objects. He showed the audience some photos made during twilight and explained how best to produce photos taken during that time of day.

Almost all of Michael's photos were taken in the last three months from his dark-sky observing location in Algonquin Park and they illustrate how a dark sky can really enhance the capturing of faint objects. A variety of lenses was used, from ultra-wide angle (14 mm) to 1200 mm (through a 152 mm (6") apochromatic refractor).

Michael also discussed techniques for photographing the sky, and particularly wide angle views. His tips included the importance of stopping a lens down at least two stops in order to get pinpoint star images and eliminating vignetting (light fall-off) at the edges of the frame, and framing your target using a heavy-duty ball head to hold the camera. He also discussed ISO speeds, the quality of modern digital camera sensors, and the use of a Softon filter to enhance the bright stars in constellation photos.

The next speaker, Patrick McDonald, gave a report on observing Mercury and Venus. He described how both planets have terrible surface conditions, yet another reason why no one lives there. They are, however, fun to observe.

Venus is white as chalk whereas Mercury is somewhat pinkish. Because they tend to be close to the horizon, crescent moons and background features can often be worked into photographs. Through a telescope, Venus has interesting phases in its own right. Since both planets are closer to the Sun than the Earth is, we can observe them when they transit the Sun. They are currently visible low in the Western Sky.

Stuart Heggie presented a short retrospective of his nearly 20 years developing as an astrophotographer. He shared some shots from his film days and discussed the transition to DSLR and CCD imaging. He then led the group on a tour of images taken with progressively longer and longer focal length lenses and scopes, hoping to illustrate that at any level of technology and complexity, very pleasing images are attainable.

Public Observing at Millennium Square, Pickering, June 10th

Sponsored by Gary Wilkins of Durham Skies Astronomy & Birding, 5a-1410 Bayly St., Pickering, ON

Thin clouds did not interfere with our ability to show Sunspots and prominences, and a 6-day-old Moon, to our guests who were out enjoying an evening at the very popular Millennium Square, as we set-up our telescopes for an evening of public stargazing.

Millennium Square, at the foot of Liverpool Road in Pickering, is an ideal venue to stage a public stargazing event. The Square is a magnet for crowds, whether couples on a date, families out for a fun time with their children, cyclists and joggers enjoying the Waterfront Trail, or seniors out for an evening stroll. The Square is situated in the heart of a picturesque nautical village with Frenchman's Bay marina, a sandy beach and boardwalk, splash pad and playground, restaurants, snack bars and ice cream parlors. We are guaranteed to attract hundreds of interested people of all ages as we setup our telescopes on the Square. As well, the Square is situated on the north shoreline of Lake Ontario, providing unobstructed views from the southeast to the southwest, allowing us to follow the Sun, Moon and planets as they track along the ecliptic. Later, in the summer and early autumn, Sagittarius rises above the lake with its wealth of Messier objects in and around the constellation, giving us a wide variety of objects to aim at. Simply put, Millennium Square is an ideal location for bringing an evening of astronomy to hundreds of people of all ages.

June 10 was ideal. The Sun fortunately had some spots (it was spotless at the Solar Observing session at the OSC six days earlier) and easily-seen prominences that wowed our guests. Many visitors attempted to take photos of the crescent Moon with their cell phones at the eye piece. The Moon's terminator that evening cut through Mare Serenitatis (Sea of Serenity, mid-northern latitude) enhancing Dorsa Smirnov, a wrinkle ridge formed when a flood of molten lava cooled and contracted. We encouraged our visitors to find the ridge (showing them a printout of the ridge to help them identify it) which gave us a talking point about the Moon's origin, its once molten interior and how the lava would seep through cracks from severe impacts to flood the surface and form Mare – the dark smooth plains once thought to be seas.

Shortly after sunset (8:57), Jupiter made its appearance 7.5° from the Moon, and by 9:30, Mars (just a week from closest approach in over a decade) and Saturn (just days since opposition) had cleared the haze over the horizon. We had at least one telescope on each of the planets and the Moon while the thin clouds from the start of the evening gave way to a beautiful clear night. Our visitors – an estimated 500! – had a wonderful time, going from one telescope to the next to see the Moon and three planets in great detail. And to top it off, the ISS made a high pass that everyone watched.

Before we knew it, it was 11 pm and time to call an end to a perfect outreach evening. With any luck, we will enjoy clear skies and pleasant temperatures on our remaining Millennium Square dates this year (August 12, September 9 and October 7).

A big thank you to Durham Skies for being our sponsor, and to all of the volunteers for giving our visitors a great astronomy experience. Please contact the writer at **arnbrody@gmail.com** if you would like to participate at any of the remaining Millennium Square stargazing dates. Thank you!

-Arnold Brody

Volunteers: Kathy & Paul Berry, Sam Bosnick, Frank Dempsey, Warren Gallagher, Dan McRae, Charline Norgrove, Eric Peters

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Peter Hiscocks, *LessLight@rascto.ca*

Property Management
Tom Luton

Librarian
Tom Luton, *librarian@rascto.ca*

David Dunlap Observatory (DDO)
Paul Mortfield, *DDO@rascto.ca*

Telescope Loan Program rascto.ca/content/telescope-loans
George Slavinski, Marc Teitelbaum, Peter Richards

NASA Astronomy Picture of the Day

Malcolm Park was featured on the world's most popular astronomy webpage on July 2nd for his composition of 'Firefly Trails and the Summer Milky Way'. This is about the eighth time Malcolm's work has been featured:

http://apod.nasa.gov/apod/ap160702.html

Special Offer - SkyTools

After the successful campaign within the Toronto Centre in 2010, Blake wondered about elevating the offer to all RASC members coast-to-coast.

The RASC is considering a plan to extend discounts to RASC members for the SkyTools software. The developer offers reduced pricing for astronomy groups and clubs. If you are interested in obtaining this software, please let us know. With sufficient interest we will obtain the software which members can then purchase via the RASC online store.

Show of hands, please?

SkyTools is a powerful astronomy planning application. It is used by visual astronomers as well as photographers. One can plan observing or imaging sessions, filter target lists based on the date and time, location, Moon phase, target elevation, etc. It works well for star hoppers and people using push-to and go-to telescopes. The tool includes a variety of visualizations and charts and supports logging. See the April 2015 Journal for a review.

For more information go to the SkyHound web site:
http://skyhound.com/skytools.html.

Contact Blake Nancarrow at **astronomy@computer-ease.com** to register your interest.

Genevieve Seabrook took this astrophoto of the Summer Milky Way at the Carr Observatory Astro-Imaging Workshop (see p.5)

Journal of the RASC Note

The front cover feature of the August *JRASC* is this image of the Transit of Mercury by **Ian Wheelband**. **Joel Parkes** provided the inside front cover photo of the Rosette Nebula. Editor **Nicole Mortillaro** described her first RASC General Assembly experience.

Blake Nancarrow's column 'Binary Universe' features the ALadin online database of astronomical objects.

John Percy's *JRASC* column is 'In Praise of Librarians', more specifically about the librarians at the U of T astronomy department and at the RASC archives.

For *JRASC* current PDF issues, just login to the National site using your personal username and password, then click the link at **www.rasc.ca/jrasc/recent** to get the issue of your choice.
If you haven't logged in and are unsure of the procedure, or if you are having difficulty with your login, please go to the Login Assistance page at **www.rasc.ca/login-assistance** or drop by the RASC office at **4920 Dundas St. W. at Burnhamthorpe** for support. The office phone number is **416-924-7973 .**

SkyNews

Additionally, Manuel Guerrero was featured for the *SkyNews* Photo of the Week feature in early July for his "Saturn Low in the South" photo.
http://www.skynews.ca/photo-of-the-week-saturn-low-in-the-south-by-manuel-guerrero/

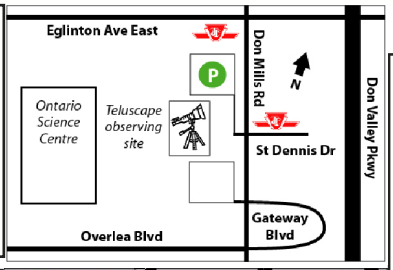
Observing Nights

Join your friends from the Toronto Centre for Observing Sessions and Public Star Nights.

Observing takes place on the first clear night listed. Go on-line at www.rascto.ca or check the e-mail list, or our FaceBook group and Twitter feeds,www.twitter.com/RASCTC for confirmation after 6:30 PM if conditions are questionable.

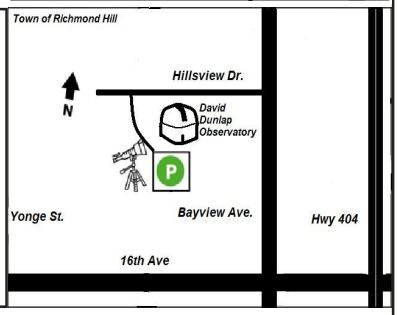
Solar Observing

Ontario Science Centre Teluscape
10:00 AM - August 6th, September 10th
(August 13th, September 17th weather dates)
Contact: Shawn Lee 416-759-0650



David Dunlap Observatory

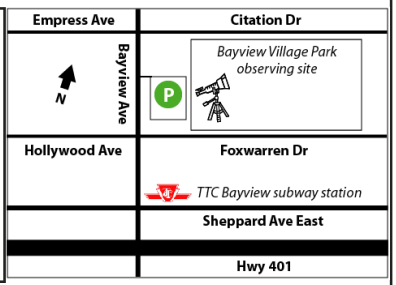
Please stay tuned to our **Yahoo! Groups** and other electronic media for updates on members-only DDO opportunities. Public events are listed elsewhere, and we need our member volunteers to support these events.



City Observing

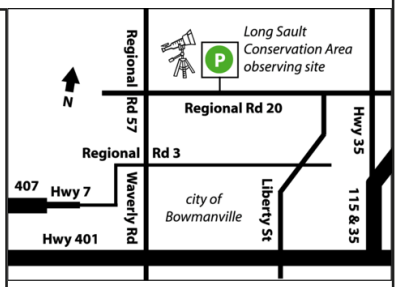
Bayview Village Park
August 8th, 9th, 10th or 11th
September 12th, 13th or 15th

(first clear night)



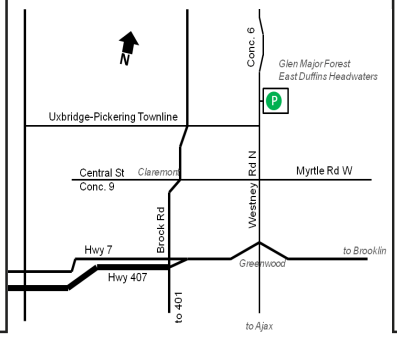
Dark Sky Observing

Long Sault Conservation Area
August 29th, 30th, 31st or September 1st
October 31st, November 1st, 2nd or 3rd
Contact: Stuart McNair
416-725-6840 C



See right for the new map to the **Glen Major Forest (East Duffins Headwaters)** observing site, which will be used for Dark Sky Observing under special circumstances. The entrance to the site is on the east side of **Uxbridge Concession 6, and 850 metres north of the Pickering-Uxbridge**

Glen Major Forest Map



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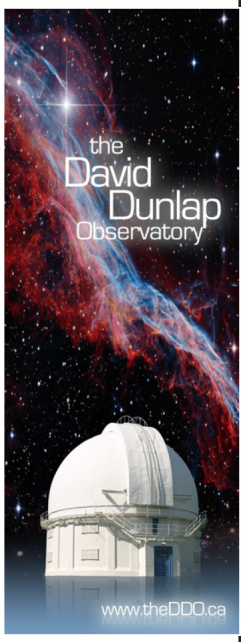
Membership Fees are:

Regular $ 85.00 per year
Family $ 80.00 primary + $11 per person
Youth (under 21) $ 45.00 per year
Affiliate(from other RASC centres) $ 33.00 per year
Carr Observatory Annual Pass: $85pp/$140fam

Benefits of Membership:

-SCOPE Newsletter
-SkyNews Magazine
-The Journal and Bulletin
-Observer's Handbook
-Telescope loan program
-First Light Program for new astronomers
-Optional use of the Carr Astronomical Observatory
-RASC Insurance



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