Winnicentrics

The Royal Astronomical Society of Canada - Winnipeg Centre

Upcoming Events

RASC Winnipeg Centre Monthly Meetings

September 9, 2022
October 14, 2022

Members' Observing Nights

September 10, 2022
October 15, 2022

Oak Hammock Marsh Astronomy Night

Cancelled for telescopes

Regular meetings of the Winnipeg Centre are normally held in the Robert B. Schultz Lecture Theatre in St. John's College at the University of Manitoba, 92 Dysart Road. Free parking is available in the lot across the street. The theatre is on the lower (basement) floor of the College. Meetings are usually held on the second Friday of each month from 7 p.m. to 10 p.m. After the meetings, members who wish to do so usually retire for pizza and more conversation about astronomical subjects. The meetings moving forward will also be available via Zoom.

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YouTube https://bit.ly/2FrcZJZ

https://bit.ly/3iSmFed

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Winnicentrics is published six times or more each year by the Winnipeg Centre, RASC. Winnicentrics is produced by and for the members of the Winnipeg Centre.
Any opinions expressed are those of the author. Any questions or comments please email:
newsletter@winnipeg.rasc.ca
Or contact one of your Councillors above

Quick Notes

The Glenlea Observatory LX200 / Dome is CLOSED due to flood damage. Please contact **observatory@winnipeg.rasc.ca** for current info, assistance, or to request training on the telescope and dome. Glenlea Warm Room and Pad are OPEN but please observe any Public Health requirements in effect. There is a portable toilet on site at present, pending a plan on repairs to the dome building. It is currently not known when the dome will reopen.

Members Observing Nights are held the Saturday night after the Monthly meeting (weather permitting) at the observatory.

Member Meetings are now hybrid in-person and Zoom, please watch your email for more information.

Boston Pizza after-meeting social events are in-person again.

Visit our web site at:
www.winnipeg.rasc.ca
Visit our Facebook group at:
www.facebook.com/groups/rascwinnipeg

President's Corner

By Dennis Lyons, RASC Winnipeg Centre President

By the time you read this we will be nearing the Spruce Woods Star Party. If you have not already registered, I encourage you to. It is a great way to meet other members and to see a wide variety of observing equipment. Inexpensive field camping ensures helps to remove barriers. Please note that only members and their families of the RASC will be there. There will also be a ceremony recognizing the park as a Dark Sky Preserve. The first one in Manitoba. Registration information is on the website.

During the flood this year Glenlea did have some damage. An engineering firm has been hired to provide an assessment that will be used to apply for flood relief from the province. It does bring up the question of what do we want or need for the Winnipeg Centre. Please take a few minutes to think about this and let us know. While things are being sorted out at Glenlea the observatory is still closed but the warm room is open. A porta potty has been placed onsite as well.

As you all should be aware of now is that Winnipeg Centre has moved to Groups.io as our primary means of communication. The email list that served the Centre well was difficult to maintain and was not in direct control of the centre has been retired. Access to the Groups.io site is limited to members only. What this means is that the National list of members is reviewed monthly and if your name is not on that list you will be sent a reminder to renew. Renew and you will not notice anything. Miss renewing and access to the Groups.io list will cease. The reason this has been done is that this format is a privilege of members. The Centre maintains a Facebook page for interaction with the public. Getting used to the new format will take some time but I suggest you poke around in your Groups.io site and set your preferences. For instance, you can set it up to get one email with the updates instead of multiple. You can choose to join or leave any of the subgroups (that is a hint for what tab they live in) such as armchair astronomy. Most of the groups are open to everyone. The only ones that may have an application requirement are the committees. So please go and poke around and personalize your page.

Everyone by now should know that our September meeting will also be a vote on the amended bylaws. You can find them on the website in the member's section. Please take time to review them. The committee has done an excellent job of addressing any concerns that were raised when the current bylaw was passed and generally improved the document overall. If you have a question, please reach out to a member of Council before the meeting so we can give you the time you need. The bylaw amendment will be voted on after the joint meeting guest speaker. Also, a financial policy has been adopted by Council to support the Bylaw.

Council continues to work on your behalf, and I am very grateful for the time they put in for the Centre. With darker skies on the way you will start to see members night start again and hopefully some Council sponsored events at Glenlea. Hope to see you then.

Clear Skies,
Dennis Lyons

Editor's Message

By Gord Tulloch, RASC Winnipeg Centre

My last newsletter as Editor will be the next November/December 2022 issue. If you think you might be interested in taking on the newsletter, contact me at newsletter@winnipeg.rasc.ca to find out what's involved and start working into the role slowly.

I wish you clear skies and happy observing!

Upcoming Meetings

Sept 9 2022 Meeting

- gAIL Wise, Beginner's Session
- Bryan Stach, RASC Winnipeg Centre "Whats Up?"
  - Dr. Michelle Boyce, University of Manitoba "What's New?"
  - Main Speaker: Martin Bergeron (Manager, Planetary Exploration and Astronomy Missions, Canadian Space Agency) - Canada's technological contributions to the JWST
    JOINT meeting with Mississauga Centre

October 14, 2022 Meeting

- TBA, Beginner's Session
- Bryan Stach, RASC Winnipeg Centre "Whats Up?"
- Dr. Michelle Boyce, University of Manitoba "What's New?"
- Main Speaker: Dr. Renée Hlozek, University of Toronto - Observational and theoretical cosmology work, including use of the Atacama Cosmology Telescope

Mike Karakas – Mars - Only 9.1 arc secs diameter, this image was taken under very good seeing conditions (8-9/10) on the morning of Aug.20th, and captured with Firecapture, then processed with Autostakkert, Registax and PhotoShop. Celestron C11, ASI 224MC@F21, UV/IR cut filter, ADC. Total of 3 videos derotated with Winjupos.

Dr. Tapping's Corner: Loss of an Icon

By Ken Tapping, NRC-CNRC

In December 2020, when the Arecibo radio telescope collapsed, radio astronomy lost an icon. This instrument was regarded as a research tool for radio astronomy, but actually a nice, big dish antenna can be used for a variety of radio projects. In short, for almost anything requiring collecting a lot of weak radio energy coming from something in the sky, such as radio astronomy, or detecting radio signals from distant spacecraft, or even extraterrestrial civilizations. It was also used for interplanetary radar, which involves squirting an immense amount of radio energy in the direction of a distant planet or asteroid, and then detecting the incredibly weak signal echoed back. The echoes could be used to measure the precise distance and movement of an object and even image it. Until spacecraft landed on the surface of Venus, the only way we had seen the surface of that permanently cloud-shrouded world was by radar. The antenna also had military applications. However, for us it was a radio astronomy icon, a key instrument of its time.

Back in the 1960's when young, wanna-be radio astronomers were getting radio astronomy books from their local libraries – yes, those libraries did have books on radio astronomy – there were always pictures of two iconic radio telescopes, which were state-of-the-art at the time. They were the 75-m diameter dish at Jodrell Bank, in the UK, and the 305-m diameter antenna at Arecibo, Puerto Rico. The Jodrell Bank instrument was mounted so that it could be pointed at any point in the sky, and was probably the largest radio telescope of that kind achievable at the time. It was, and still is an engineering challenge to make a large dish that will stay precisely in shape as it moves around, and is subject to the wind and uneven temperatures across it. Something bigger would require a completely new approach.

That's when, in the early 1960's someone pointed out the potential of a large, saucer-shaped sinkhole, located near Arecibo, in Puerto Rico.

The idea was to mount a fixed dish in that depression. It could be solidly and precisely mounted because it was not intended to move. Of course a fixed antenna like this has one huge shortcoming; it is permanently looking straight up. However, the engineers got around this problem to some extent by making the dish with a spherical profile rather than a parabola, like almost all dish antennas, and by moving the signal collection point to different positions over the dish. Collecting signals from a spherical antenna is not easy, because they are not fully focussed, which is why everyone uses parabolic antennas. On the other hand, the result was a dish with a diameter of 305 metres, easily the biggest in the world, capable of seeing a large patch of sky centred overhead.

There are still some radio telescopes being built that use large, fixed antennas. The CHIME instrument at our observatory is an example, but by using modern signal processing techniques, it can see most of the sky over the observatory, without mechanically moving anything. However, the mainstream these days is to make huge radio telescopes out of lots of small dishes. The Square Kilometre Array, now under construction in South Africa and Australia, will use thousands of them. The big difference is that today we have the computing power needed to process all those signals. In the 1960's we did not.

Arecibo was a film star too. It was used in the movie "Contact". It also played a role in the James Bond movie, "Goldeneye". This unique instrument will not only be missed by scientists; it will also be missed by moviegoers.

A video of the collapse can be seen at https://www.youtube.com/watch?v=ssHkMWcGat4

RASC Winnipeg Centre Certificate Recipients

New recipients in **bold**.

Explore the Universe

Gail Wise, Mike Stephens, Janet Pollock, Janice Low, F. Lindsay Price, Ralph Croning, Terra Jentsch, Corey LeBerge, Corrine Robinson, Kevin Dromereski, Robin Clarke

Explore the Moon - Telescopic

Corrine Robinson, Kevin Dromereski, Margaret Childs

Messier Catalogue

Grant Gussie, Kevin Black, Richard Turenne, John Smith, Alan Sherlock, Timothy Zacharias, Gail Wise, Raymond Andrejowich, Stan Runge, Bernie Plett, Michael Karakas, Sean Ceaser, Gilbert Raineault

Finest NGC

Kevin Black, Gail Wise, Stan Runge, Mike Stephens, Gilbert Raineault, Sean Ceaser

Isabel Williamson Lunar

Mike Stephens

Herschel 400

Gilbert Raineault, Mike Stephens

Astroimaging - Deep Sky

Sheila Wiwchar

Astroimaging - Wide Field

Sheila Wiwchar

Building A Micro-Observatory Pt 1 – Planning & Demolition

By Gord Tulloch, RASC Winnipeg Centre

Figure 1 - Previous 10x10 Observatory with Runoff Roof

Construction of the Snowy Plains Astrophysical Observatory was completed in 2002. The site was my back yard in the Southeast end of the city, on the East side of the property offering excellent views of the N-NE- E-SE-S-SW and Zenith skies. To the W and NW the house impedes the view, with a tree that eventually had to come down due S. At the time the land to the South was completely devoted to farmland so light pollution was extremely minimal. Since then, the Sage Creek sub-division has increased light pollution immensely, rendering the observatory much less useful than in previous years. Clearly, I need to move the whole thing to darker skies.

Originally the observatory was designed to house a 16" f5 reflector on a horseshoe mount with an 8" f10 "planet killer" telescope mounted on top. The building was in fact built around the large mount for this telescope to avoid having to manhandle it into the shed after completion. This setup included a large pad instead of a pier for the horseshoe mount. Eventually it was clear that the telescopes for the shed were not going to get completed very quickly (and in fact are just starting to get worked on again 20 years later!) so instead a pier was added to the pad for the telescope and an 8" SCT mounted in the shed. The pier for the mount was bolted to the pad and over the decades has not shifted at all. Whether this is a characteristic of using pads instead of drilling piers deep below the frost line is not clear and may just be fortuitous for the patch of land the observatory sits on.

In May once the snow finally subsided and the observatory went back into full operation with a 10" F/4.7 scope on an NEQ6 (above) I noticed that over the winter some of the 4x4 supports for the runoff rails have shifted, and it looked like the 600 lb roof had a real possibility of a sideways excursion through the neighbour's fence at any time. While this could be corrected, it instead made me move a micro-observatory (MO) project to the front burner, since anything I build will need to be capable of relocating to a dark sky site. Building the MO will involve demolishing the existing building and using the materials to

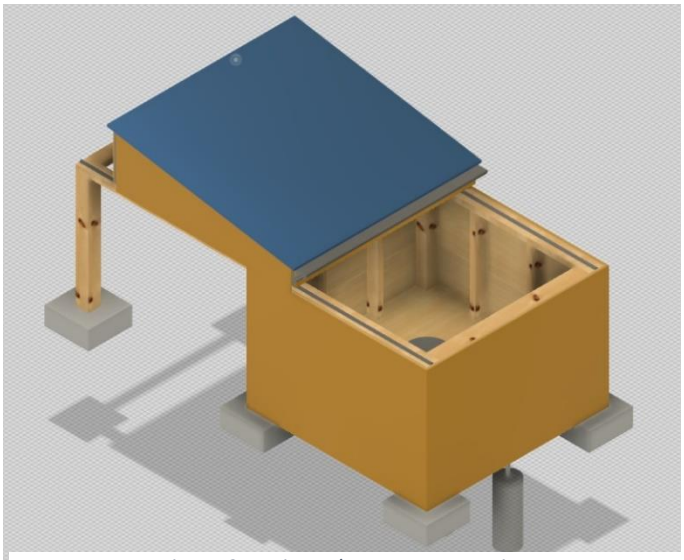


Figure 2 – Micro-observatory overview

build with. This is helpful as materials are now extremely expensive, so reusing what I have makes this a very low-cost project.

Figures 2 and 3 are from a model in Fusion 360 showing the concept for the MO. Overall this is pretty much the same concept as my larger observatory, scaled down from 10x10 to about 5x5. Reducing the size of the roof simplifies automation immensely.

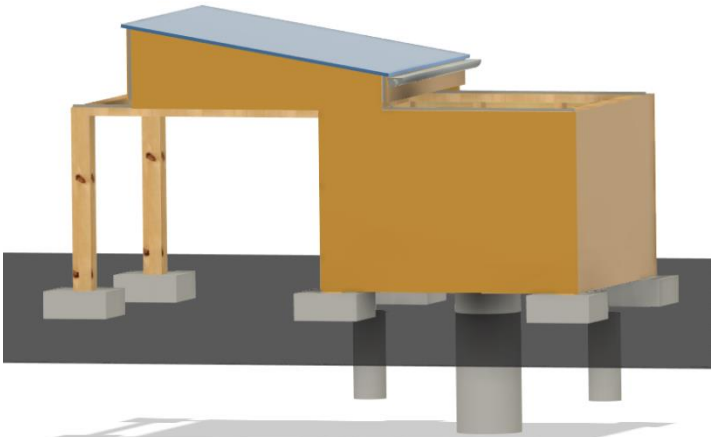


Figure 3 - Side view of MO

The MO is a square building sufficient for the telescope only without needing room for a person to stand in the shed to operate it. The building sits on concrete cottage blocks as do the supports for the roof runoff. The roof slides back on 4 V groove wheels per side on steel angle iron rails. The roof runs off to the North to facilitate viewing South, and is tilted to facilitate solar panels with a rain gutter required to ensure moisture running off the roof does not end up in the structure.

Figure 4 – Early March 2022 Snow

Automation is planned using an an Arduino running the open-source OnStep Observatory Control System[1] (OCS) that drives an Aleko AR1550 sliding gate opening system. This system uses a toothed wheel and gear rail to allow the software to open and close based on the time and weather. My intention is to keep the observatory busy any time the sky is clear 4 seasons with photometric observations and astrophotography. This will also require a weather station and AllSky camera, which I am already operating near my existing observatory. The new Allsky software I'm using also detects clouds, so combined with a IR temperature sensor and rain detector the observatory should be able to detect when it's safe to open and close when inclement weather threatens.

Accommodation of winter weather to keep the rails clear and deal with snow will require some experimentation. Given my current observatory is often unusable December-March due to being buried in snow, clearly this problem will be even worse with a smaller building so I'll be looking at different active measures to keep the building snow-free. One technique I am planning will use snow fencing to accumulate snow in the area S of my yard so the large drifts we normally see are minimized.

[1] https://onstep.groups.io/g/onstep-ocs/wiki

This will be a completely automated observatory, continuing a process of automation I've been engaged in for many years. My current observatory has gotten the to point where the only time I need to be in there is to roll the roof on and off, and to occasionally troubleshoot cables and connections. Often all problems are resolved by simply cycling the power, so the new shed will need this capability.

Figure 5 – Mifi Wireless Hub

Since the MO will be a remote off-grid observatory eventually it will need to be solar powered, and have some form of Internet to allow me to control it remotely and download data. When the MO moves out to a dark site I'll use a Mifi cellular wireless hub I already own to communicate. Since this device uses a cellular data plan that can be costly, so I will have a computer in the building that will process most data (e.g. calibration, stacking, and differential photometry) and simply send me the resulting images and data, rather than gigabytes of unprocessed data. With sub-exposures from my ZWO ASI183MM camera now topping 28megs each in FITS format, I currently move a ton of data around on my home network. This is unfeasible for a remote observatory.

Figure 6 - Mini-computer for image processing

Fortunately, the software tools to create a system of this nature are available free from the Open Source community. Currently my setup uses Stellarmate on a Raspberry Pi 4[2] (RPi4) to run the mount, focuser, filter wheel, imaging camera, guide camera, and GPS using the INDI[3] server system operated from my desk inside the house with KStars and EKOS. Adding image processing with SIRIL[4] to do automated calibration/stacking and using Python to process science images complete the picture. This will be done on an HP EliteDesk 800 mini desktop computer I already own, which has lots of RAM and a powerful CPU. To make integrating with the RPi4 easier this computer runs Ubuntu Linux. The HP will connect to the Mifi wirelessly and to the rest of the observatory via a 1GB wired network and provide Internet to all of the other devices. For more info on the software I use and develop in Python check out my Python page[5] on my website. All software I build for this MO will be Open Source and published on my page.

Initially I expect power and network will be provided by house electrical and PowerLine ethernet, but eventually will move to a pair of 33 Ah battery packs, each charged via a 40W solar panel on the roof of the building. Each panel includes a 7A charge controller to prevent overcharging the batteries. Hopefully this will keep the batteries charged to the degree they can operate the building and telescope as often as needed but testing will determine if something with larger capacity is required.

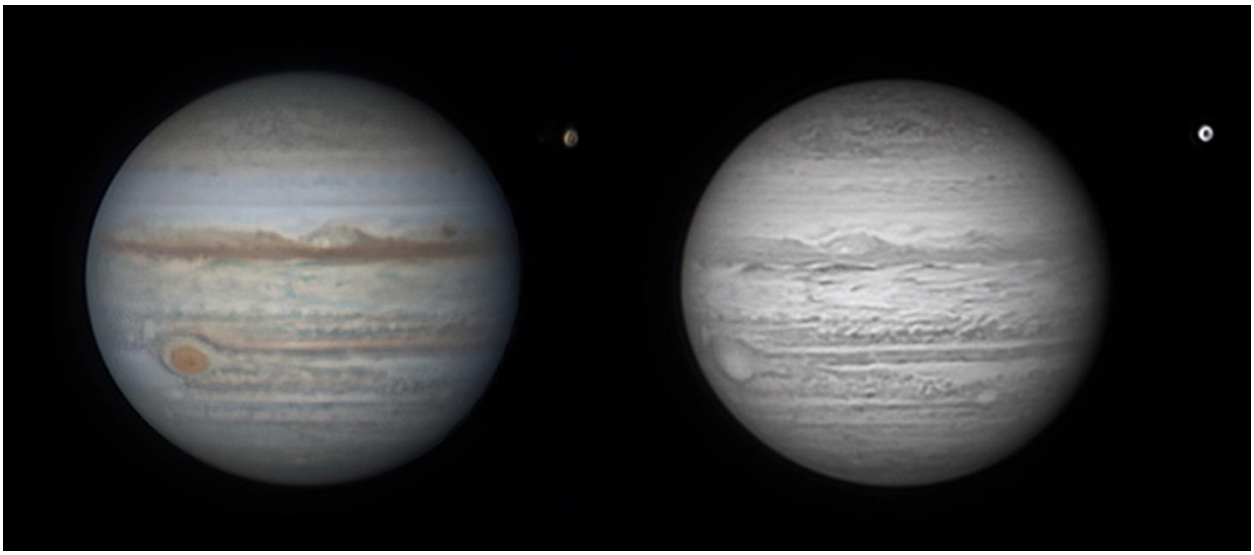
Figure 7 - Solar Panels

[2] https://www.raspberrypi.org/
[3] https://indilib.org/
[4] https://siril.org/
[5] https://www.gordtulloch.com/python/

In mid-June 2022 during the Solstice period where not much activity occurs in my observatory, I demolished the existing observatory to make room and collect materials for constructing the new one. Below is a series of images of the deconstruction process that happened over a few weeks between torrential downpours and scorching temperatures where I could only work during early morning mild temperatures and thereafter with frequent water and rest breaks.

Eventually by mid-July, the job was done, and the site was restored, which included some re-landscaping to not only add some grass where the shed had sat for 20 years, but also to improve drainage in the area to avoid an annual Spring mud bath for the dogs. Yard improvements are very important to ensure spousal enthusiasm for the project as well! Next time, details on the construction process.

Member's Photo Gallery



Mike Karakas: Jupiter with Ganymede taken on July 29th. Both IR and colour images were captured with Firecapture and processed with Autostakkert, Registax and PS. Coloured image: ASI 224MC, UV/IR cut filter, ADC. Total of 5 videos derotated with Winjupos. IR image: ASI 462MC, 742nm IR filter, Single video with 10,000 frames stacked.

Ian Dixon: Iris Nebula NGC7023 with 5" triplet refractor/AP 900 GTO mount

Ian Dixon: Cocoon Nebula IC 5146 with 5" triplet refractor/AP 900 GTO mount

Spruce Woods Star Party Registration

By Russell Brown, SWSP Registrar

The Spruce Woods Star Party is less than a month away, and registration is open. This year, we will be under the stars for 4 nights from Thursday, September 1st to Monday September 5th. Check out the packed schedule of events at https://winnipeg.rasc.ca/spruce-woods-star-party, which include Gerry's famous Bino Tour, raffle prizes, and the public event to officially designate Spruce Woods as a Dark Sky Preserve!! While you're there, be sure to fill out the registration form to let us know you are coming.

This is a members only event, so confirm your membership is active and renewed by logging in at https://secure.rasc.ca/membership/members/payment. Family guests are welcome if sharing the same camping unit, and be sure to encourage your friends to experience this amazing event by becoming a member, see https://winnipeg.rasc.ca/becoming-a-member.

I look forward to seeing you all under the stars,

Russell Brown
SWSP Registrar

GLP-TRAINED USERS AND SPOTTERS

The following Members have received training in the proper use of Green Laser Pointers and may apply to receive a permit to conduct an astronomy outreach session in accordance with applicable law and RASC policies respecting green laser pointers.

20 June 2022 (expires 20 June 2025)

Heather Matheson

10 June 2022 (expires 10 June 2025)

Lucille Eustache	Catherine Lee	Marc Sarrasin	Christopher Desrochers
Russell Brown	Gail Lorraine Wise	Mike Karakas	Gilles Ferrand
Michelle Boyce	Gerry Smerchanski	Kamala K Nanjundeshaiah	Krishnamoorthy Viswanathan
Kris Keller	Darren Hennig	Mark Irvine	Stan Runge
Michael Fry	Abdul Al Manni	Ed Rajfur	Bryan Stach

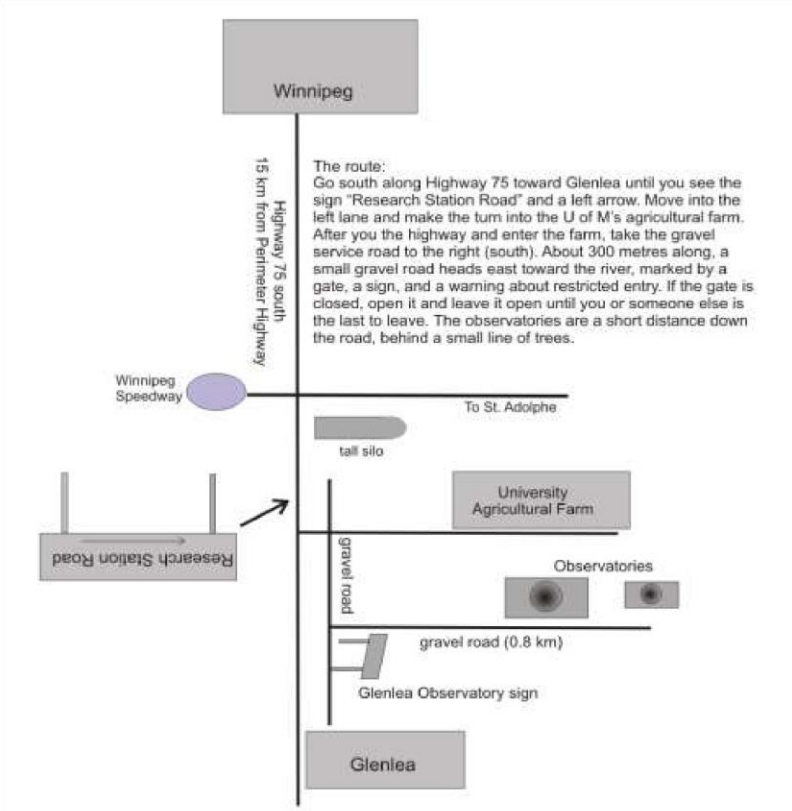
6 February 2021 (expires 5 February 2024)

Paul Paradis

13 December 2019 (Expires 12 December 2022)

Trevor Bryant	Stephen Altstadt	Ed Johnson	Robin Clarke
Adelle Kennedy	Lucille Eustache	Timothy Kennedy	William McDonald
Kevin McGregor	Michelle Paquette		

Glenlea Observatory Information



The Winnipeg Centre maintains a working observatory, pad, and warm room at the University of Manitoba's Research Farm. The observatory contains a 30 cm Meade LX200 telescope on a fork mounting. Members of the Centre may sign up to use this telescope by emailing: observatory@winnipeg.rasc.ca

provided they have first taken a short instruction course on its use.

The Meade provides outstanding views of the night sky. Its large aperture collects more than 1800 times as much light as the human eye. It is capable of magnifying more than 500 times under favourable conditions.

The warm room also provides a convenient place for members to take refuge from winter temperatures and summer mosquitoes, or to wait out a passing cloud. The building also provides desk space and lighting for planning a night's observing session. A concrete pad in front of the warm room and observatory provides a convenient space to place members' telescopes while conducting personal observing programs. A computer is available as well.

Etiquette requires that you approach the observing site with your headlights off if that's possible on your model of car. Headlights should remain off, but you can still use your parking lights to drive. Proceed slowly, and be careful about parked cars along the road, or people walking. If you cannot turn off your headlights, make a cardboard or garbage bag mask to dim the lights or, raise the parking brake lever one click-stop. This usually turns the headlights off on most, if not all, cars. You might wish to turn around at the end of the road so that you are facing the direction back toward the highway at the end of the evening.

Remember to turn off all lights, make sure doors are locked, and close the gate if you are the last one to leave!