Winnicentrics

The Royal Astronomical Society of Canada - Winnipeg Centre

Upcoming Events

RASC Winnipeg Centre Monthly Meetings

November 18, 2022
December 9, 2022

Members' Observing Nights

November 19, 2022
December 10, 2022

Oak Hammock Marsh Astronomy Night

Cancelled for telescopes

Regular meetings of the Winnipeg Centre are 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, Facebook, and Youtube.

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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 OPEN! 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 repairs to the dome building.

Meetings are now hybrid virtual and in-person events at the Robert B. Schultz Lecture Theatre in St. John's College at the University of Manitoba Fort Garry campus. Those members attending virtually can do so by using Zoom – a link will be emailed the week of the meeting. The meeting will also be livestreamed to our Facebook and YouTube sites. If you are attending in-person, please ensure that you bring a mask and wear it when coming into the building. The University has a continuing mask mandate on campus described at https://umanitoba.ca/covid-19/health-safety. Our usual potluck for the break will not be allowed due to U of M rules. Boston Pizza after-meeting social events are in-person again.

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

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

Well, it has been good to be able to have a few in person meetings lately. Thanks to Ed, Scott and others the Centre has been able to have our monthly meetings in person, zoom, and Facebook. This is no small undertaking. Please give our volunteers a thank you for bringing the meetings and speakers to our members and the larger astronomy community.

Glenlea has been reviewed by an engineering firm and there is some damage but nothing that is not repairable. If you have not already heard Glenlea is fully open to the members now. A special thank you to the clean up crew who went out to clean everything up so it is presentable to the members. Of course, the first members night was one of our worst skies in months and had to be cancelled. There will be more so watch groups.io for the next one. We are looking for volunteers for the observatory committee and if you are interested, please let someone on Council know. Please note that a porta potty is on site.

Everyone should now be on groups.io. This is our main way to communicate with members. If you are not on this yet, please let us know so we can check into it. Please note that this group is kept up to date by the National membership roll. So if you have not renewed you may not be on the list. Not sure if your membership is paid up just check with the National office or contact a member of Council.

If you were not aware the membership approved the revised Bylaw at the September special meeting. The next thing that Council is working on as per the strategic plan is incorporation. This will be the focus of a committee of Council for the next couple of months likely. The goal is to incorporate the Centre as The RASC Winnipeg Centre. National has approved the use of the RASC. There is a great deal of points that need to be discussed and likely a gap analysis will be developed to work through to ensure that once we incorporate future Councils will be able to easily keep the incorporation active. If you have questions on this, please let me know.

Work with the Nature Conservancy of Canada (NCC) has begun again and there is great support from them and the local communities for a Dark Sky Preserve. This is a major undertaking but other in the Centre have paved the way through the Spruce Woods Dark Sky Preserve. We will update you as these progresses.

Just to remind everyone there are volunteer opportunities to assist with First Fridays at the Manitoba Museum and at Oak Hammock Marsh Astronomy nights.

Our AGM is approaching fast and that means elections. I encourage you to put your name forward for election to Council or appointment to one of the committees/positions. Many only require a few hours a month. Many hands make light work and a greater experience for all of us in the Winnipeg Centre.

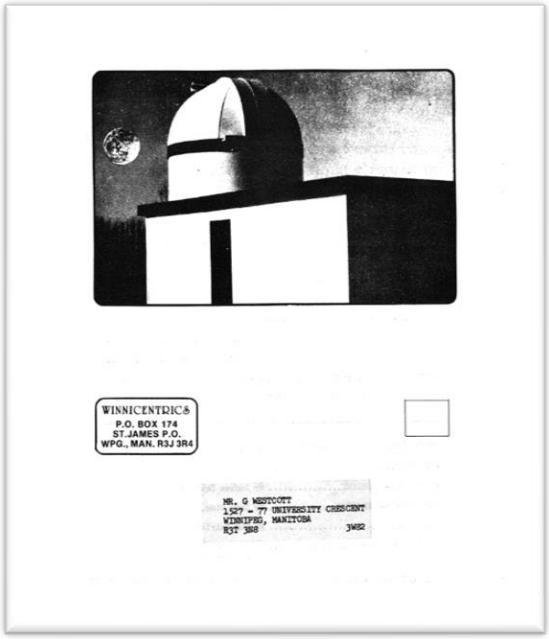
As always, a big shout out to all our volunteers and especially to those who do public outreach. Recently one of the members provided a zoom presentation to an international audience. This is just one example of members bringing the science of astronomy to the public at large. Thank you!

Clear Skies,
Dennis Lyons

Editor's Message

By Gord Tulloch, RASC Winnipeg Centre

In my last newsletter as Editor, I think it's appropriate to reflect on this newsletter and it's importance to the club, and how you may participate in keeping WinniCentrics vital and a resource for many years to come.



My earliest memories of this newsletter are as a folded few pages with the Glenlea Dome on it that came in the mail to a friend who got my 8 year old self hooked on Astronomy. Below is an example, addressed to our late friend Guy Westcott who was already an institution in the club when I was a young astronomer playing with astronomy programs on an Apple II and building my first 13.1" dobsonian telescope.

As well as this newsletter I remember receiving a package of excellent information on colorful pages as a new member, which I saved for many years thereafter. This was the product of dedicated work of volunteers, many of whom have passed on but many others are still in the club, resting on their considerable laurels and offering sage advice to newcomers.

The newsletter is not just a vehicle to inform the membership of current events and interesting new developments in astronomy. It is also a time capsule for future members to be able to look back and re-experience formative times in their astronomy careers, and learn about the hobby by partaking in the wisdom of the many, many enthusiastic members of the club.

I was privileged to help get early issues of the newsletter up on the website when I was helping to get it up and running, with the earliest being February 1972. While many missing issues remain to be found (perhaps in someone's basement?), it is interesting to look through these old issues and see what was important at the time. In 1972 the moon landings were over but still fresh in our memories. Comet Halley was coming in the 80s, creating fresh excitement in the club. These issues are still there and available to logged in members at

`https://winnipeg.rasc.ca/winnicentrics/`

Hopefully they will be kept available and new issues added to the collection as they are published. Please do peruse the collection and take advantage of it!

I am taking some time off from Club activities to work on personal projects. Thank you to everyone who contributed articles and images to Winnicentrics over my tenure. Don't stop now! I'm sure the email address newsletter@winnipeg.rasc.ca will be duly redirected to the new Editor, and this institution within our club will continue for many, many years to come. Best of luck to our new Editor!

I wish you clear skies and happy observing!

Reflections on Coordinating Regular Meetings

By Judy Anderson, RASC Winnipeg Centre

So many people look up, often to marvel at the beauty and wonders within vast volume of space. That's probably what attracts a large fraction of our members to join an astronomy club. The range of expertise among our members is huge, as some read and even debate the contents and implications of professional papers. Others are simply curious to learn more about objects, topics, or advancements that they hear about: the Moon and Sun and their conjunctions and seasonal changes, the planets, galaxies and clusters, nebulae, the evolution of stars, new technologies, and life on Earth or elsewhere. Still others are interested in observing one or more of the above, in some way: visually, by telescope or binoculars, or in the data generated by massive international investments in technology and telescopes on earth and in space. Members join the Centre to meet people and/or to learn a little or a lot, about astronomy.

There's also a huge range of personalities amongst members, from shy, to extroverted, to outspoken on most anything. "It takes all kinds" and that diversity is a good way to build opportunities for learning and interactions. Not everyone is comfortable with speaking up to ask a question, even if it's dark and people are looking up during a bino tour at SWSP (thank you Gerry Smerchanski!); nor will all of us want to give presentations to the members or the public at outreach events. Every one of us has an idea of our own strengths, and that gets us through life situations in a way we each can accept. However, this is a bit of a nudge to consider finding a new way to express your inner person.

I've been coordinating the content and list of speakers for meetings for more or less a year and a half now, as a willing volunteer. Thanks to our regular speakers: Michelle Boyce and Danielle Pahud doing "What's New?" and Bryan Stach (and previously Jay Anderson) doing "What's Up?", I've mostly focused on topics and speakers for Beginner Sessions, and finding someone to present as the main speaker for our regular meetings. I try to vary the topics and include a range of practical topics as well as up-to-the-minute topics in space exploration and cosmology. A few members have made suggestions or found a great speaker, as well. And I do hear back from a few people who enjoy a speaker (thank you, people!). The feedback is fascinating, too as it re-emphasizes for me, the wide range of interests and expertise in the members.

Here's the main point: I don't hear from very many people about talks or topics that were either enjoyable or broadened their knowledge or both. Very fortunately, Zoom™ technology has helped us populate our list of speakers – the range is virtually worldwide, as long as a speaker is available at a reasonable hour. Theoretically we could even record a presentation to accommodate a large number of time zones between us and a speaker, and show it later at a meeting, although we haven't tried that yet. And with the ability to do hybrid meetings, members' access to the meetings is better than pre-Zoom. We have a good platform for ongoing planning and lots to learn about all things astronomical.

Reflections on Coordinating Regular Meetings (Cont.)

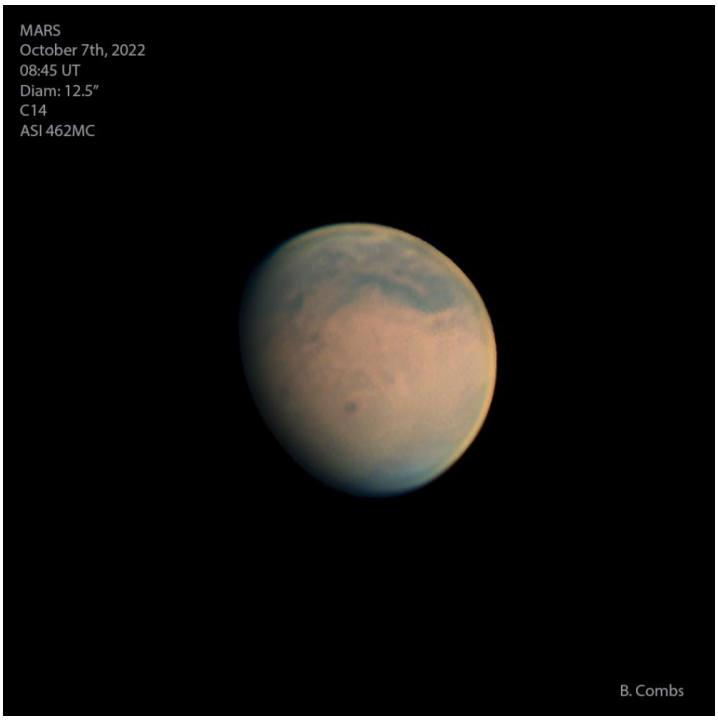
So, now's your chance to make further suggestions. Please send me a note by email about someone you'd like to hear, or some topic that tweaks your interest. We haven't had a debate or panel discussion for a while, and your ideas for those meetings would really be valuable. Sometimes I think an evening of "short snappers" – 5- or 10-minute talks by 8-10 people would be interesting, something like what happened after people got home from experiencing the 2017 solar eclipse. Volunteering yourself as a speaker, is also a tremendous help, as it shows your interest and that you're willing to take the risk of giving a presentation. The risk is pretty low, really: it's dark during presentations, and you may be relating ideas from other sources. You might start by giving a Beginner session, just to get the hang of having people listen and look toward you – and there's nothing that says you have to be at the meeting in person, to give a presentation, right!?

Please do consider giving me a heads up about a subject that fascinates you, or a format you like or dislike. I'll try to track down someone willing and able, in the hope you'll feel comfortable learning as part of a group. Not being an expert in anything astronomical, except for eclipse photography I suppose, is actually an advantage, as almost any topic takes me further into learning something. And then I can talk to one of you, and learn even more! This learning is fun! For sure, your ideas on what you'd like to learn will help everyone. You can contact me at judy.anderson@umanitoba.ca, and I'll do my best to make you smile inside as you look up with renewed vision. That group enjoyment is what makes me smile, so please let me know if you're happy and/or have suggestions that will make meetings fun.

Clear skies! to you, Judy

Dr. Tapping's Corner: Focusing on Mars

By Ken Tapping, NRC-CNRC



Mars on 10-05-22 courtesy of Brian Combs, ALPO MarsObservers List. Best of 4000 frames RGB with a C14/Saturn MSQR camera on Paramount MEII – Buena Vista, GA

The latest flotilla of spacecraft to arrive at Mars must make that world the most-visited planet in the Solar System. There are two reasons for this "group visit". The missions were timed to be when Mars was particularly close to us. A shorter trip and an easier rendezvous means a given launcher can accommodate a bigger and more capable spacecraft. Since our current method for travelling between planets involves a big shove followed by "falling all the way there", the laws of orbital dynamics apply, which requires the launches to fall within a restricted window of time. It is like throwing a baseball into the air and then throwing another one so that it gently nudges it. We want to arrive at Mars with a low enough relative velocity to require just a small rocket shove to enter orbit or to dive into the atmosphere at the right angle.

The second reason is that Mars is currently a candidate for being the most fascinating object in the Solar System. Even today, as a cold desert world with a thin atmosphere, out of all the planets in the Solar System it is the one most like ours, and one we could live on for long periods, with a lot of technical help of course. Then there is the discovery that Mars was once a warmer, wetter world, with a thick atmosphere. There are dry watercourses, canyons, lakes and seas over most of the surface. The dry riverbeds are floored with water worn pebbles and little round pellets of salts precipitated as the water disappeared. Actually, today there is a lot of water on Mars, as layers of ice below the surface. On a really warm, summer day, close to the equator, temperatures may reach 20 C. This melts some of the underground ice, causing short-lived water flows down sandy slopes. Even on those summer days, the temperature dives to far below zero at night. This raises the next fascinating issue; billions of years ago, when Mars was warmer and wetter, was there life? We know that life appeared on our world very early, around 3.5 billion years ago, more or less as soon as our world had cooled enough for liquid water to accumulate on its surface. Why could it not have been the same for Mars too? We are looking hard for traces of that ancient life, or even better, some it its hard-bitten descendants eking out a tough existence somewhere below soil level. Thanks to our robot explorers, we are learning about Martian geology and weather, and are piecing together what happened to Mars, and just as important, why it didn't happen here.

In addition to our scientific curiosity, we have a special cultural attachment to the Red Planet. Ever since Percival Lowell mapped the canals, which were actually a combination of wishful thinking and poor

Dr. Tapping's Corner: Focusing on Mars (cont.)

observing conditions, and launched the idea of the Martians working hard to sustain life on a dying planet, we got the idea that the Martians might just want to come here. This launched a stream of novels, movies and radio plays. We were usually saved by sheer luck. In "War of the Worlds", it was our bacteria, to which the Martians were not immune. In "Mars Attacks", it was the lucky discovery that Martians could not tolerate yodelling country music. Actually, it is unlikely that Martian life had a chance to evolve to the point of achieving interplanetary travel. Until around 500 million years ago, life here was single-celled bacteria and algae. Then things started to happen, with complex life forms appearing. It looks as though Mars became the hostile place it is today, more than a billion years ago. Since Earth and Mars formed at the same time, it is reasonable that if life appeared on Mars, it happened at the same time as it did here, but never had time to get past the bacterial and algal stage. We could be wrong! These videos of Mars are well worth watching:

https://www.youtube.com/watch?v=7zpojhD4hpI

https://www.youtube.com/watch?v=0NRFk_jNhek

the bacterial and algal stage. We could be wrong!

More on Mars…

Our December 2022 meeting will include a Feature Presentation by Roger Venable of the Association of Lunar and Planetary Observers on ***The Current Apparition of Mars*** - Mars's declination, opposition date, apparent size, and season, recent images and drawings (incl. dust storm), some recommendations for observing Mars, then, briefly the occultation of Mars by the Moon on Mars's date of opposition, and contact info Mars observing news and how to submit observing reports. Don't miss it!

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

The Value of Amateur Contributions for Planetary Study

By Mike Karakas, RASC Winnipeg Centre

In 2022, we have seen Jupiter closer to Earth than it has been in 59 years. It rises higher than it did last year, and it will continue to do so over the next several years. Mars too, is in a favorable opposition this year being extremely well placed in our skies at over 62 degrees in elevation. I do hope that many of you take advantage of these opportunities this year.

As some of you may know, I have been actively contributing my planetary imagery for both Mars and Jupiter to organizations committed to pro-am collaboration, so I wanted to share my findings with you.

I've been in communication with both Dr. John Rogers and Dr. Richard Kim of the BAA (British Astronomical Association), who are the coordinators of the Jupiter and Mars sections respectively. Both have sent me a note of appreciation when I first started submitting images to them this year. Not because my images are that special, but because *I'm the only contributor to the BAA from Canada*. On top of that, it turns out that the last time a Canadian submitted anything to them was a distant 17 years ago. That's a long absence and I'm hoping we, the Winnipeg RASC, can improve on that dismal record.

To date, I have come across only one other Canadian (also from Winnipeg, but not associated to the RASC) who has submitted images to either the BAA or ALPO (Association of Lunar & Planetary Observers) this year.

Only TWO from Canada. How could this be when so many of us enjoy looking at planets??

The reason why I am sending this out is to emphasis the value that **you** can bring to the table. There is real value in documenting astronomical objects that are constantly changing, and planets are a primary example. So, I want to encourage you fine folks that your sketch or image is more than just a pretty picture. Real science can be done with them.

I know that we have observers who prefer sketching instead of imaging planets. In this day and age dominated by high resolution imagery, it's easy to discount the value of an accurate sketch. But it's important to note that sketching still serves a useful role in planetary study, and both the BAA and ALPO happily accept them. My take away from being in this game for a long while is that both sketches and images work in tandem with each other to achieve the common goal of monitoring planetary surface developments.

In case you weren't aware of the work organizations like the BAA and ALPO do, they collect images from around the world and store them in their database for professional astronomers to access – and yes, professionals do access them. They each have guidelines for your image submissions and templates for your sketches, and you can access them free of charge. Best of all, they are very willing to help the aspiring amateur. Be sure to check out their websites for guidance.

ALPO: https://www.alpo-astronomy.org/

BAA: https://britastro.org/

The Value of Amateur Contributions for Planetary Study (cont.)

Here are the email addresses for John Rogers and Richard Kim. They would welcome receiving your work.

jrogers11@btinternet.com
richardmckim@btinternet.com

Also, please also consider sending them to ALPO. Here's where to send your images for Jupiter and Mars:

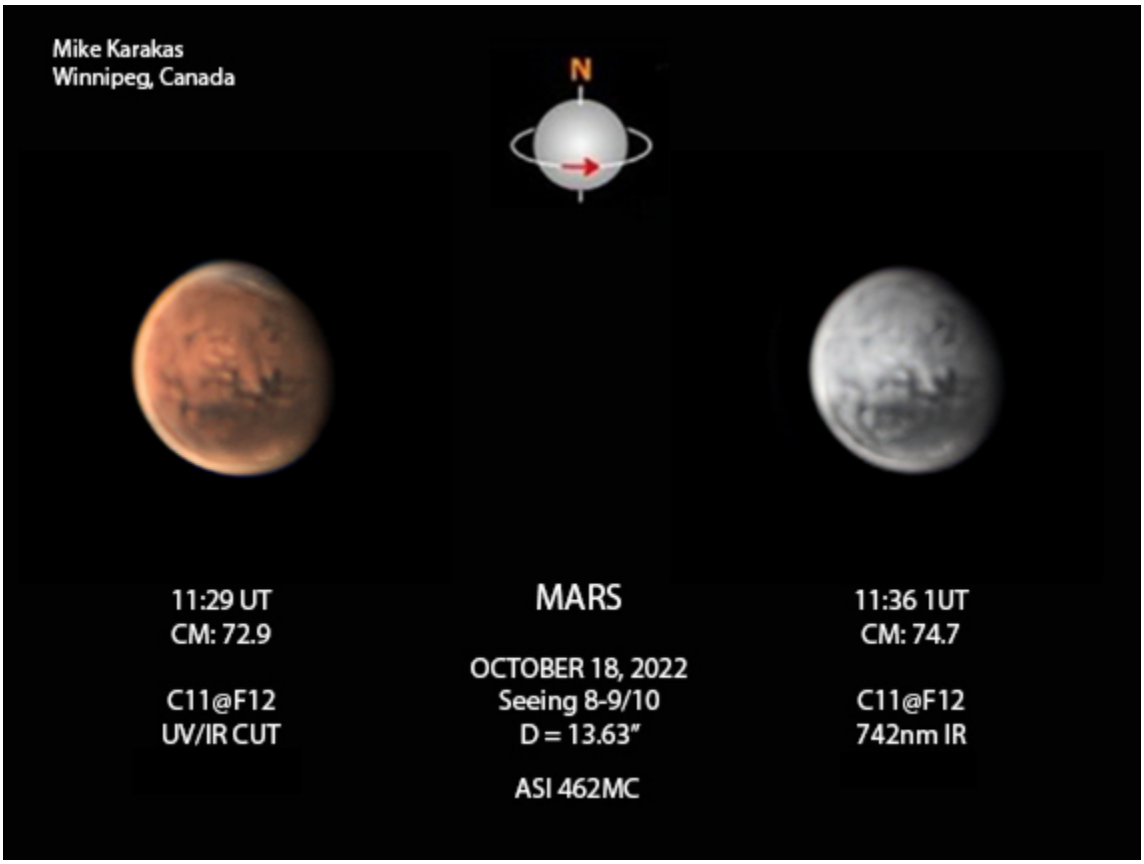
Mars@alpo-astronomy.org
jupiter@alpo-astronomy.org

Here's the ALPO submission guidelines to submit your work to ALPO's online gallery:

http://www.alpo-astronomy.org/alpo/wp-content/uploads/2022/04/AlpoGalleryGuidelines.html

If you need assistance in any way, just send me a note and I'll do my best to help.

Clear, steady skies
Mike



Building A Micro-Observatory Pt. 2 - Construction

By Gord Tulloch, RASC Winnipeg Centre

Once the space formerly occupied by my 10x10 observatory was re-landscaped and ready for the new construction, it was time to make final adjustments to the design to ensure that the space allocated for the telescope was sufficient to move without hitting the building during any operation. One particular aspect I needed to explore was how to build the building such that it could easily be disassembled for transportation to a dark site.

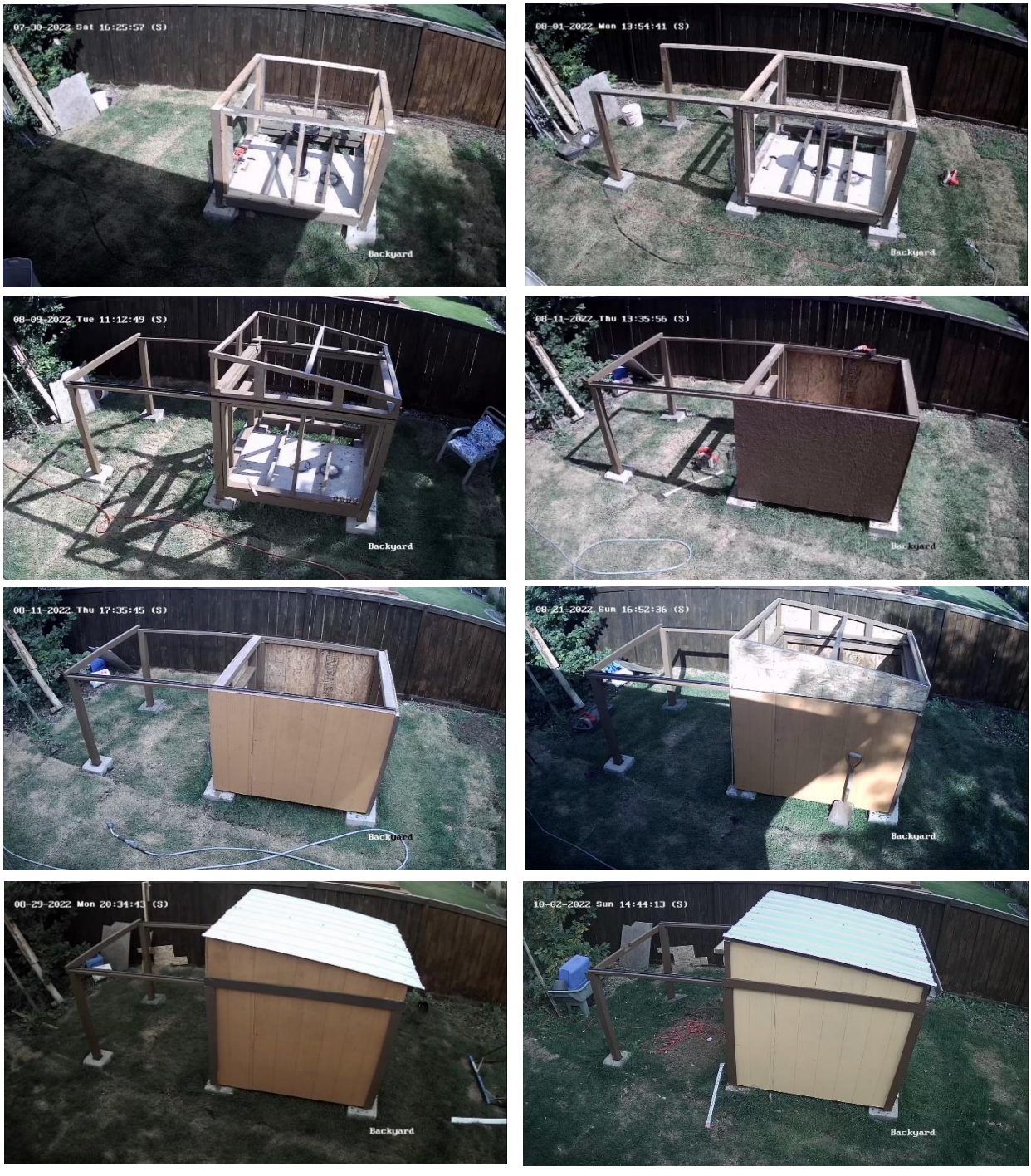
The first phase was to create a framework that could be used to test the telescope movement boundaries. As you can see to the right, this was a deck supporting 4x4 posts sitting in cottage blocks. Once I figured out how tall the walls of the observatory needed to be, I could shorten the posts as well as my pier to minimize the size of the building. I left some room for a potential larger telescope as well, since with ultralight weight meniscus mirrors along with carbon fibre structures, the 10" 14.38 kg tube can be replaced with something larger that weighs the same or less. I left room for a tube the same length but as large as 18" for a 16" F/3 ultralight optical tube assembly that should be doable within the 18kg limits of the NEQ6 mount.

I initially used my tripod and pier extender to get an idea how low I could mount the telescope in the building. The telescope never got less than 9" from the ground so I subtracted another 8" resulting in a pier height of 25". My son Liam (who uses tools I'm terrified of all day at work and has the equipment to do it safely) cut the existing brake rotor mounting plate off of the pier and shortened it to 20", then re-welded the rotor to the pier. Since a second rotor is bolted to the first with three bolts, I have a little bit of adjustment in height. The telescope mount is bolted to an Altair Pier Adapter bolted to the upper rotor since the hole in the rotor was too small for the NEQ6 (although it worked well for my previous HEQ5). Before welding the bottom rotor I did a polar alignment test using my Orion Polar Alignment Camera to make sure the north pin was close to the right spot. Even in cramped quarters inside the micro-observatory the camera makes it super easy to polar align.

Once I had the size of the building nailed down, the actual build of the micro-observatory proceeded throughout late July into September, particularly during my summer holidays, despite the long run of 30^{o}+ high humidity days. Panels were created that were screwed to the corner posts, allowing easy removed in future. These panels were clad in chipboard that was stained with leftover deck/fence stain

Building A Micro-Observatory Pt. 2 (cont.)

so I don't experience the same rotting issues I ran into with the original observatory. The panels are finished with the siding that came with my original shed. A lot of wood from the previous structure required trimming off rotten sections of the old shed. However I was able to recover more than enough materials for the new structure. The siding was re-stained to freshen it up.



Sequence of images from a security camera showing the build as it progressed throughout the summer and fall 2022 (completed in early October)

Building A Micro-Observatory Pt. 2 (cont.)

The runoffs for the roof were screwed to the panels and end posts, extending out from the building to allow the roof to be completely run off. The roof is angled at a 30 degree angle to allow water to run off, with the peak on the North side to facilitate mounting solar panels on the roof. Optimally, you want the mounting angle of solar panels to be equal to your latitude. Here in Winnipeg, solar panels should be tilted at about a 49 degree angle but there are mounting options to make up the additional 19 degree angle.

The roof of the shed is mounted on four V groove wheels per side. The angle iron track for these wheels sits inside a garage door track. Originally one side of this angle iron was to be tack welded or painted to the garage track while the other side floats free, which should prevent binding as the building shape changes with settling etc. However, leaving both sides floating seems to work well also so I left it as is. Needless to say, this much lighter roof is extremely easy to move on the 8 wheels than my previous 600lb roof on 6 wheels!

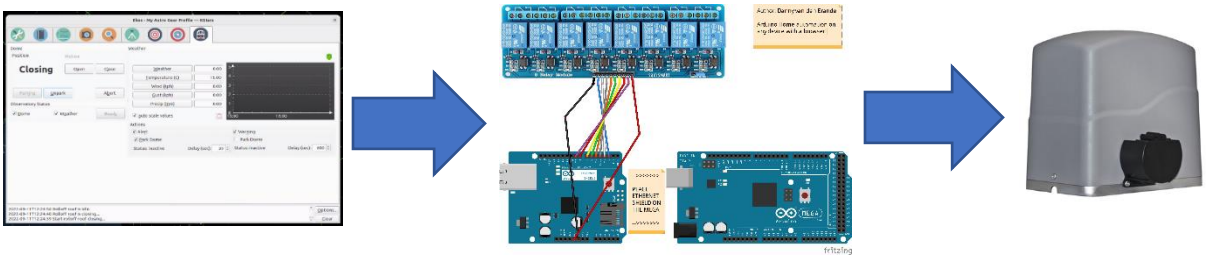
The roof material is 2x4 framing and steel roofing from Home Depot. These galvanized steel panels are durable and very light. One 12' x 36" panel ($79) was enough to cover the roof with a 2" overhang. Since this panel was left with it's original silver finish, I hope they will keep heating inside the building to a minimum to facilitate cooling the scope before observing. To finish off the roof a 10' length of brown rain gutter cost $11 – this will prevent water and snow from running down the roof into the shed when it is rolled back.

The roof retraction mechanism is an Aleko AR1550 Sliding Gate Opener bought on sale from Aleko for $350. Mounted on the N side of the building with the gear facing upward allowed me to mount the steel core nylon rack to a 1x4 board spanning the centre of the MO. Magnetic limit markers allow the unit to determine when to stop and start.

The Aleko unit comes with a pair of remotes but I wanted to have the unit be computer controlled. Fortunately, this is easy to accomplish just by attaching a computer controlled relay attached to the Aleko unit's inputs for a hard wired button. At this point I discovered a shortcut of sorts – the user "Wotalota" on the INDI forums has already built a rolloff roof driver for INDI with attendant code for Arduino, so I decided to abandon use of the OCS software in favour of the existing Rolloffino INDI driver, so I could be up and running right away and add the few missing functions I needed from OCS later. As you might recall, INDI is a network based standard similar to ASCOM on Windows. The architecture looks like below – my KStars / EKOS client on a PC (either the one in the observatory or my desktop computer in the house) talks to the RPi INDI server attached via USB to the Arduino Mega2560 board running the Rolloffino code to control everything related to the observatory.

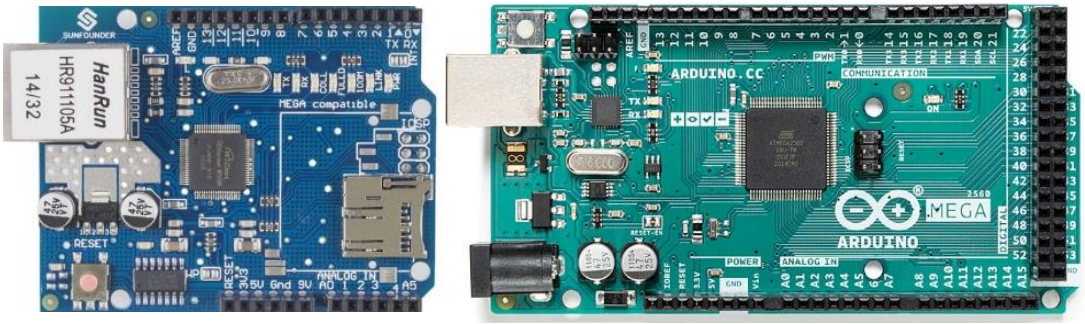
Building A Micro-Observatory Pt. 2 (cont.)

As well, the observatory RPi can talk to the telescope RPi to determine the park status of the telescope so the roof can't close until the telescope is parked.



Why use a microcontroller? These devices are inexpensive, and very flexible with innumerable pre-built libraries of code that can be used to perform every imaginable task and communicate with many different devices very efficiently. Because these are "real time" devices instead of something like a Windows / Mac / Raspberry Pi that are multitasking a graphical user interface, accepting user input, and communicating with the network, a microcontroller has a very simple program that performs simple tasks without the risk of the task being delayed to deal with some other input, and by keeping things simple, is very reliable. Cheap microcontrollers are embedded in virtually every appliance, car, etc. you can think of, including things like air fresheners that are able to warn you when their supply of fragrance is empty!

The Mega2560 is an 8-bit microcontroller board based on the Atmel ATmega2560 chip that features 54 digital input/outputs (true/false) and 16 analog inputs (levels of 0-255 like voltage) for things like position switches, battery voltage detection, and a rain detector. It contains everything needed; simply connect it to a computer (in this case observatory Raspberry Pi) with a USB plug, load the INDI-Rolloffino code into it with the Arduino integrated development environment and it immediately begins running that code, ready to accept commands over the USB cable. The board can have an ethernet "shield" added to allow it to be networked, which I added for future use. The Mega2560 is $50 plus a $30 for the ethernet shield so a very inexpensive way to add a dedicated computer for the observatory operation.



Attached to this device is a board with 8 relays on it that are essentially switches that can be turned on and off by causing a port on the Arduino to be on or off. One of these relays is connected to the Aleko gate opener "manual switch" ports so the relay can act like a manual switch to activate the opener to roll the roof open / closed. Also attached are two limit switches, one closed when the roof is fully open and one closed when the roof is fully closed to confirm where the roof is. Another pair of

Building A Micro-Observatory Pt. 2 (cont.)

switches for the telescope mount will be Hall Effect switches, where a sensor is paired with a magnet so when the magnet is near the switch it closes. Placed strategically on the mount to only both be closed when the mount is parked in it's stowed position allows me to prohibit any movement of the roof unless both switches are closed - in other words, the mount is for sure parked and won't be hit by the roof.

After likely a few years of research and development in my back yard to make it completely autonomous and off-grid, my aim is to move the entire building out to somewhere very, very dark, so it can capture data any time the sky is clear 24/7/365.

For updates and complete details please see my web site at www.gordtulloch.com.

First light for the new micro-observatory (astronomer for scale!)

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

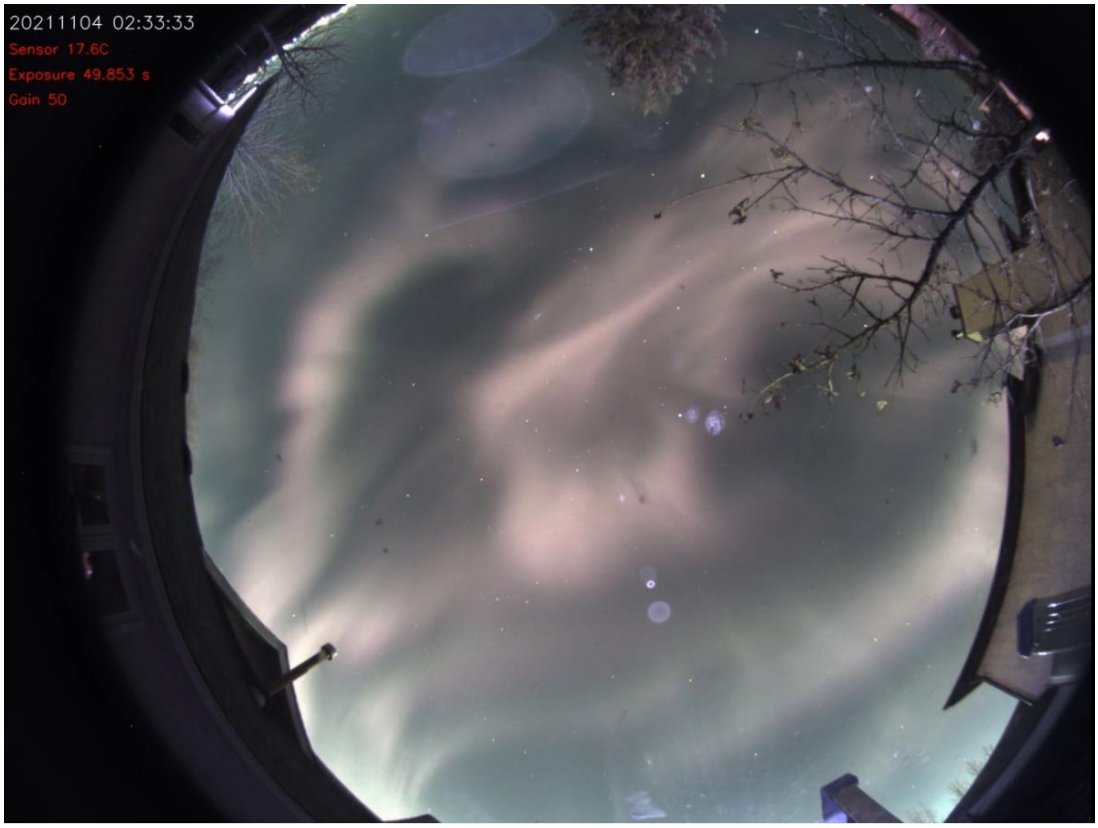
13 December 2019 (Expires 12 December 2022)

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

A New Allsky Camera Application

By Gord Tulloch, RASC Winnipeg

Over the last few years I have been using the Thomas Jaquin (TJ) allsky camera software with great success, as have several other members of the club. This software[1] allows you to set up a Raspberry Pi computer and either a ZWO or Raspberry Pi HQ camera and take awesome pictures of the night sky, like below. My only wish is for a very dark place to put the camera so I can get better images without the light pollution! While my main use of my allskycam with it's ZWO ASI224MC camera is to view sky conditions for remote observing and to record aurora footage, other members use these cameras to watch for meteors and use multiple cameras including mine to triangulate where they may have fallen.



Aurora footage from my Allsky camera for the amazing Nov 4 2021 display using the TJ software

However the TJ allsky software has not evolved much in the last few years and in particular, still only supports a limited range of cameras. So, if you don't have a ZWO or PiHQ camera you're left with other options generally requiring a PC running Windows and long USB cables.

Recently Aaron Morris (AM) announced on CloudyNights[2] that he had developed a new allskycam software package that was compatible with the INDI protocol that would allow any INDI-compatible

[1] https://github.com/thomasjacquin/allsky
[2] https://www.cloudynights.com/topic/785514-new-all-sky-camera-management-software-indi-allsky/

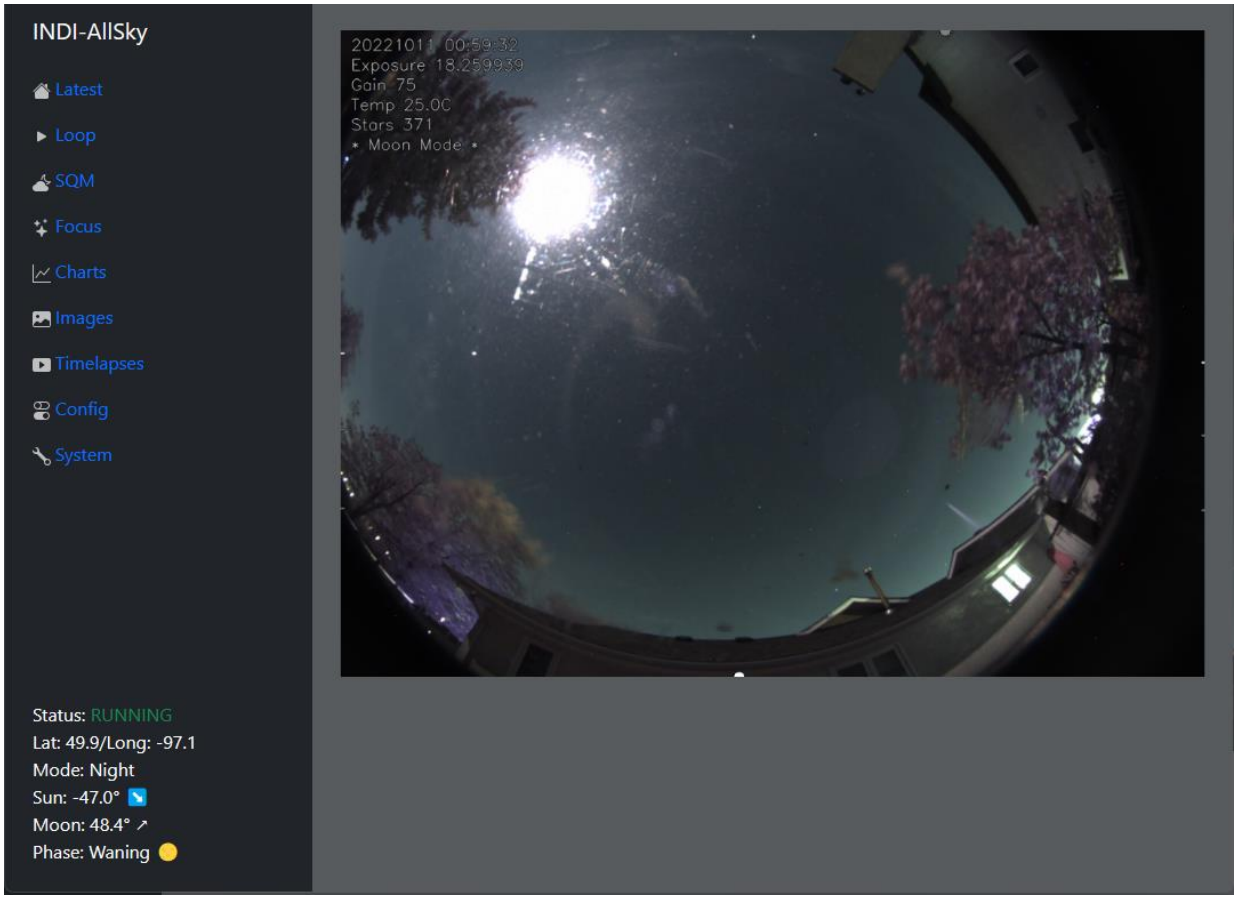
A New Allsky Camera Application (cont.)

camera to be used with an allsky camera setup like the TJ software. The software released by Aaron was called INDI-Allsky. Since then, Aaron has been busily adopting new features for the software, which we will discuss in this article. This means pretty much any popular camera can now be used for an allsky camera. INDI is an analog for Linux/Raspberry Pi/Mac for ASCOM on Windows PCs.

Installing INDI-Allsky [3]is pretty much the same as installing the TJ software, where you open up a command line (scary I know!) and copy in the following commands:

```
apt-get install git
git clone https://github.com/aaronwmorris/indi-allsky.git
cd indi-allsky/
./setup.sh
systemctl --user start indiserver
systemctl --user start indi-allsky
```

I imagine most users can cut and paste these commands! The end result of this operation is a completely installed and functional allskycam with a web based user interface that looks like this:



INDI-Allsky Control Console Webpage (with full moon)

[3] Complete instructions at https://github.com/aaronwmorris/indi-allsky/

A New Allsky Camera Application (cont.)

One of the things I liked most about the TJ software was an integrated web site template you could upload to a web server host, where the camera could upload its nightly data so anyone on the internet could see your data. Thankfully, INDI-allsky supports uploading its data in the same way so you can use the TJ website software to display your images. This is doubly convenient when you're transitioning from the TJ software, since your allskycam data are all continued without a break in the coverage.

Some features of the new software include:

- Everything included in the TJ software – nightly timelapse videos, a startrail image for the night, keeograms (the nightly images at the meridian in a single image) as well as individual images
- A Loop mode that will create videos of your current sky over 15 minutes (up to 4 hours) so you can see a video of your sky immediately rather than waiting on the software to generate a nightly timelapse video
- An SQM monitor that estimates the SQM reading for your sky
- A moon mode that reduces exposures during moonlit nights
- Meteor detection and annotation of images with trails
- Star detection that uses machine vision pattern matching to detect and count the number of stars in an image (less stars means more cloud!)
- A sorely needed Focus mode that generates images more often and implements a Variance of Laplacian scoring algorithm on the image to assist with focusing the camera
- Real time charts for SQM, exposure, and star data
- Enhanced functions for selecting and viewing images (filter by time/date etc.)
- Enhanced system monitoring and control

Since my observatory is run on a Raspberry Pi it was a natural fit to install the INDI-Allsky software on it. Previously I had to have an additional Raspberry Pi mounting inside the camera case but since the camera was being mounted on the observatory is was easy to run a USB cable to the computer inside the observatory. This makes for a small package indeed which is now remounted on a pole on my micro-observatory. I have also run a 12v cable to a relay on my observatory controller to allow me to turn the dew heater inside the dome of the camera on and off (although honestly over the last two years I've never had to do so!

Point of interest – security cameras with infrared illumination are REALLY BRIGHT light sources to infrared sensitive cameras like the ASI224MC! I had to turn off the camera I had pointed at the observatory until I can replace it with a non-IR illuminating version.

A New Allsky Camera Application (cont.)

So far the software is very reliable, so I'm looking forward to some great images this winter. And, since I now have access to a star counter, I can use the data from the camera to help determine if my micro-observatory roof should be open or closed for business. New software under development will use AI techniques to learn what a cloudy sky looks like and provide very accurate cloud information.
If you don't yet have a Allsky Camera or wish to update your TJ installation, INDI-Allsky is highly recommended! You can see my results at www.gordtulloch.com/allsky.

Gord Tulloch – M31 in Andromeda - three 20x60s panel mosaic with ES102mm refractor and ZWO ASI294MC processed in mosaic mode in AstroPixelProcessor. An amazing piece of software!

Upcoming Meetings

November 18 2022 Meeting

- Gord Tulloch, Beginner's Session
- Bryan Stach, RASC Winnipeg Centre "Whats Up?"
- Dr. Michelle Boyce, University of Manitoba "What's New?"
- Main Speaker: Roger Venable from the Association of Lunar and Planetary Observers – The Current apparition of Mars

December 9, 2022 Meeting

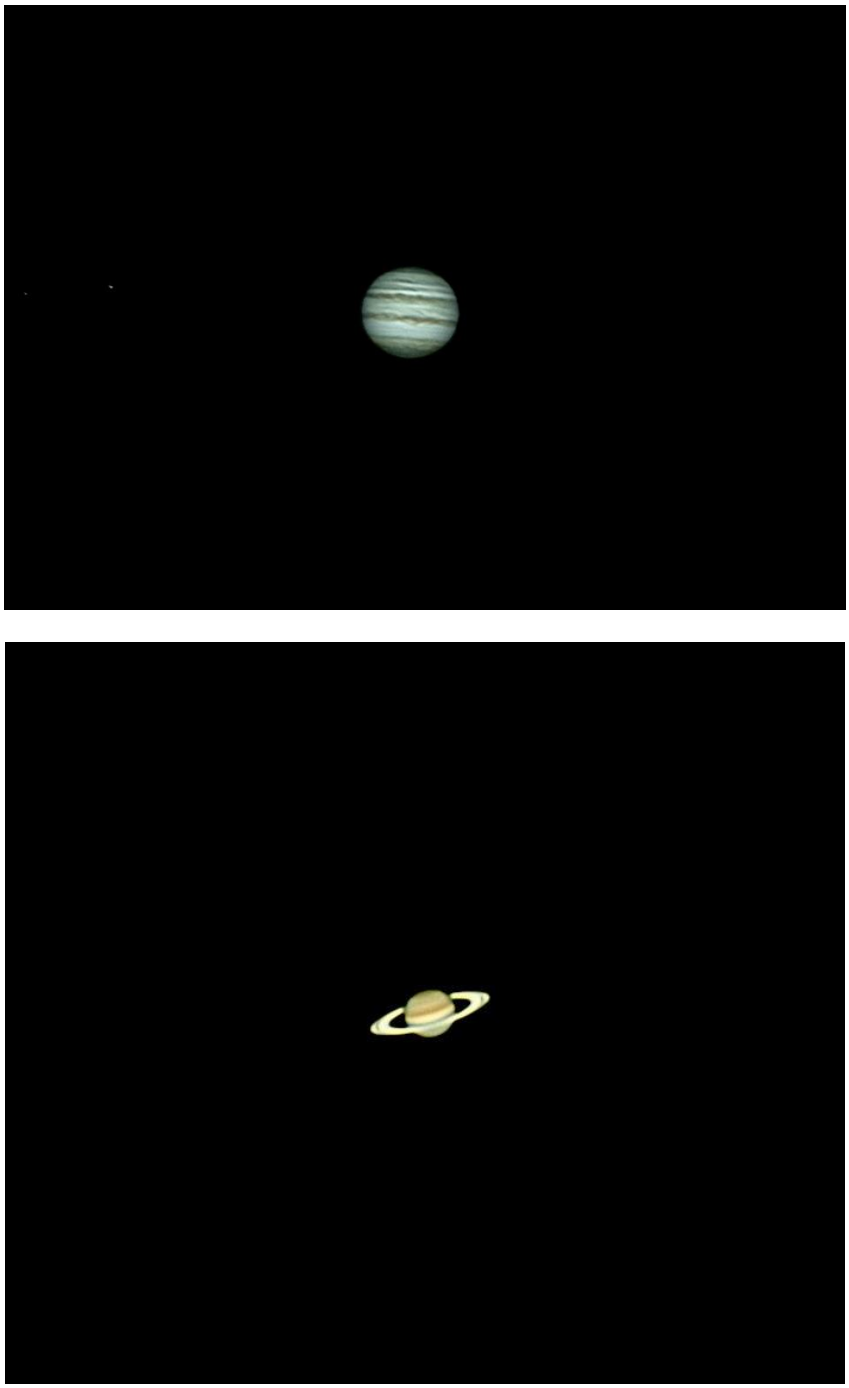
- gAIL Wise, Beginner's Session
- Bryan Stach, RASC Winnipeg Centre "Whats Up?"
- Dr. Danielle, University of Manitoba "What's New?"
- Main Speaker: TBA

Member's Photo Gallery

Mike Karakas - Jupiter taken on October 18th, under very good seeing conditions. C11 at F21, ASI 224MC, UV-IR cut filter, ADC. Five videos derotated with Winjupos, then processed with Autostakkert, Registax and PS.

Jon Goodbrandson – The Moon taken with a Canon Rebel T2i and Nexstar 8SE telescope, 1/400 of a second exposure. Processed on an iPhone.

Member's Photo Gallery (cont.)

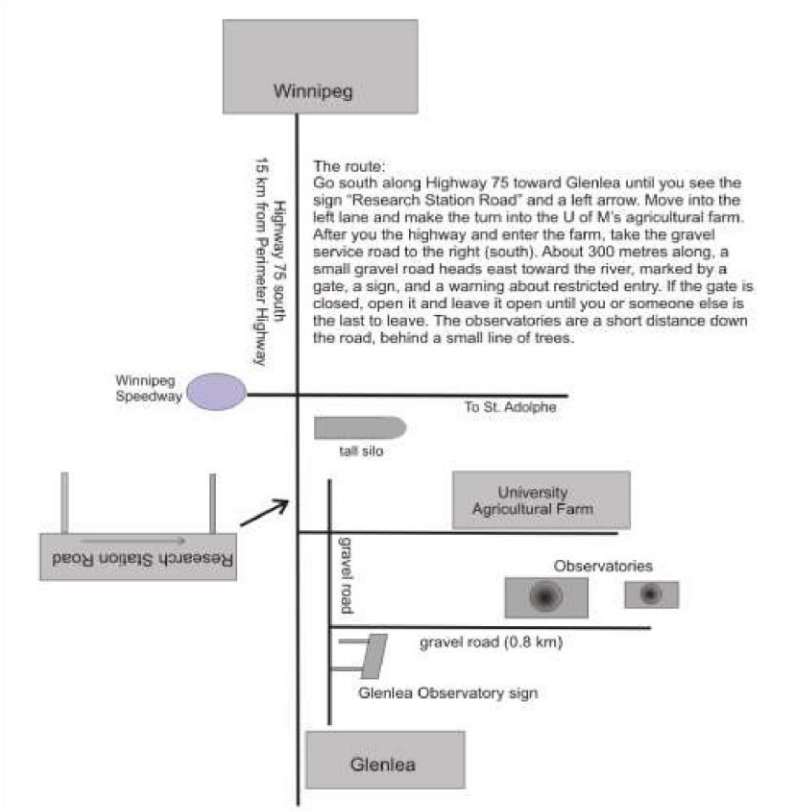


Jon Goodbrandson – Jupiter and Saturn taken with a Nexstar 8SE and ZWO ASI224MC, stacking and processing in ASI Software Studio

Member's Photo Gallery (cont.)

Gord Tulloch – This is the first light image from the new micro-observatory! The Double Cluster in Perseus (NGC 869/884) with an ES102mm F/6.5 refractor 26x60s RGB ZWO ASI294MC unguided

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!