

Regulus

2021 September

Newsletter of The Royal Astronomical Society of Canada - Kingston Centre
Celebrating our 60th anniversary 1961-2021 kingston.rasc.ca



American astronomer and a co-discoverer of Comet Shoemaker-Levy 9, Carolyn Shoemaker passed away on August 13th, 2021 at the age of 92. She was a lifelong close friend of our the RASC-KC Honourary President David Levy and was the Northcott Lecturer at the 1995 RASC GA (Windsor) speaking on Comet Impact - Lessons Learned (<http://articles.adsabs.harvard.edu/full/1996JRASC..90...18S>). Her Husband Gene was the Northcott Lecturer at the 1997 RASC GA (Kingston), and who passed away a month later in Australia.



You can find more articles here:

<https://www.knau.org/post/remembering-carolyn-shoemaker-comet-hunter-1929-2021?fbclid=IwAR07O2bgrps5p4QnsxjSdPZsS6-2lExucT6CYFNXvkxuRSnKPPYmZJYkHEY>

https://en.wikipedia.org/wiki/Carolyn_S._Shoemaker from Wikipedia

<https://usdaynews.com/news/carolyn-shoemaker-death/>

https://azdailysun.com/opinion/columnists/view-from-mars-hill-in-remembrance-of-carolyn-shoemaker/article_2a329f0d-7e3a-522c-bef3-a52e4e2ac08f.html

2021 Fall'n'Stars Fri-Sun September 10-12

Susan Gagnon, Kingston Centre FNS Contact

Johnson's RV Park : 3235 County Road 13, RR#3 Picton (South Bay), On K0K 2T0 (43 degrees 56' 20" N and 77 degrees 00' 56" W)

With any luck we will be able to meet for our starparty this fall. Belleville Centre has the lead this year and planning continues under the assumption that Covid-19 measures will remain at the Stage 3 level reopening plan. In case you have been on Mars, here is the basic run down.

Take attendance and keep the records for a month

Screen folks as they enter the park

Indoor meetings are OK with 50% of the posted capacity, maintain 2 meter spacing, wear face masks (except when eating and drinking).

Outdoor gatherings at 75% of posted capacity, 2 meter spacing or face masks (except eating and drinking)

Common indoor areas (e.g. washrooms) need to be regularly cleaned

Of course there are issues that we must deal with regarding potential equipment sharing, meal logistics etc. Our Saturday pizza dinner is on the table as is the offer of a Saturday winery tour within walking distance for a fee, and a possible pot luck style chile dinner Friday pm. If you can register before the date that would be great. New planning challenges will be easier to work around if we have numbers ahead of time.

For updates and registration see the website at...
<http://rascbelleville.ca/fallnstars/>

MEETINGS

RASC-KC Wednesday Weekly Social videoconference. 7pm Eastern all weeks except the 2nd Wednesday of the month. For members and their guests. Email list subscribers receive the link weekly 1 or 2 days beforehand. ****Note**** it is the same link for 2021 Sept-Dec!
Next Social: Wed 2021 Sept 15

RASC-KC Regular Monthly Meeting -

We do not hold Meetings in July and August. We will start back on Wed September 8th with a virtual Zoom meeting at 19:00 with guest speaker Murray Paulson from the RASC Edmonton Centre. Members will be emailed a zoom registration link, others may watch on our youtube channel.

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President's Tidbits for September 2021- Kim Hay



Welcome back to the RASC KC regular Meetings. We will be hosting our September Meeting via ZOOM, and we have a wonderful line-up.

Our Guest Speaker will be Murray Paulson from the RASC Edmonton Centre, and he will be presenting on the Buzzard Collie and Whitecourt Meteorites. We will have our Poetry introduction by David Levy, Hank's Sunspot, Rick Wagner's What's up in the Sky, and Kevin Kell presenting on the Centre's Meteorite collection.

Fall N Stars is on Sept 10-12th, being held at South Bay Campground, in Prince Edward County, and it will be a Covid protocol weekend, but we will have a great time. A time to see old friends and share the night sky.

Our Executive is looking for your input on upcoming meeting topics and speakers, please drop us a note at kingston@rasc.ca

Elections will be coming up in Canada, as well as the RASC Kingston Centre. The Centre's Election is on November 10th. Positions that are up this year are: President, Vice President, Treasurer. These positions are currently set up for two year terms. Our current Secretary has tendered his resignation, as he will be getting married, and moving away from Kingston. We all wish you the best Asser, Congratulations!

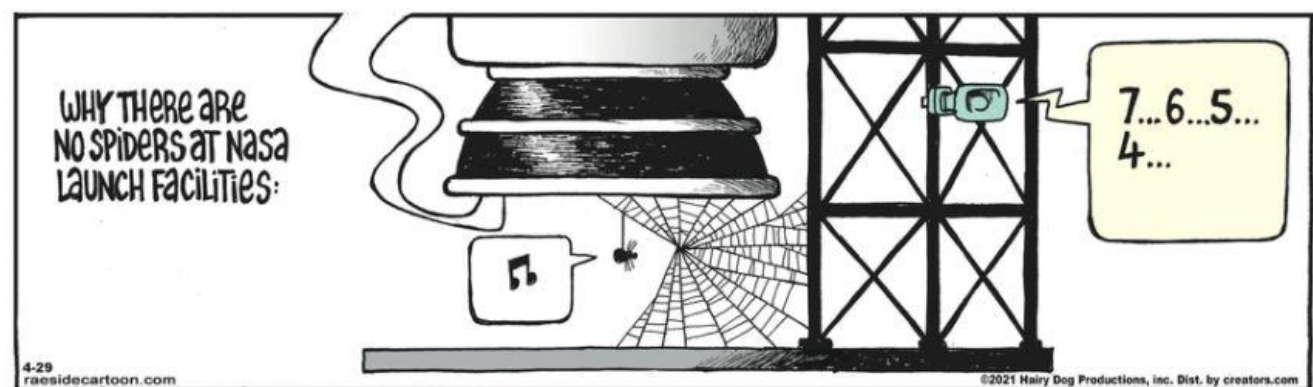


This means that the Secretary position will need to be filled for a term of one year.

This is a great opportunity for anyone who wishes to learn how the Executive and Centre functions work. Become part of the team to help the Centre's future.

All these positions job descriptions are available in this issue and on the kingston.rasc.ca website.

The Other Coast by Adrian Raeside for April 29, 2021



NOTICE: Annual General Meeting Wednesday 2021 November 10th, 7pm EST via Zoom videoconference

Register in advance for this meeting: (to be published in the October issue and by email to each member). After registering, you will receive a confirmation email containing information about joining the meeting. Voting will be done within the zoom environment.

AGENDA

1. Welcome. Notes on videoconferencing and voting procedures (rasckc members only, show of hands in video or participation windows)
2. Approval of Agenda
3. Approval of 2020 AGM minutes
4. Approval of Secretaries Annual Report
5. Approval of Treasurers Annual Report (including auditors report)
6. Centre Elections:
 - President
 - Vice-President
 - Treasurer
 - Secretary (one year term)
7. Election of Auditor
8. Questions regarding other published reports: President, Vice President, Librarian, Editor, NC Rep, Webmaster, Equipment Loan,
9. Adjourn with thanks

The Board structure consists of seven positions of two year terms. The terms are staggered with the President, Vice President and Treasurer's terms being up in odd numbered years and the Secretary, Librarian, Editor and National Council Rep being up in even numbered years. Source: RASC-KC Bylaws (2006)

DUTIES OF THE PRESIDENT:

- 8.9 Duties Of The President
- 8.9.1 The President shall
- 8.9.1.1 * preside at all meetings of the Centre and the Council as provided by Articles 10.4 and 7.2.4,
- 8.9.1.2 represent and speak for the Centre when appropriate,
- 8.9.1.3 preside at all meetings of the Executive Committee referred to in Article 9.7, and
- 8.9.1.4 have such other duties as may be prescribed by the Council.
- 8.9.2 The President is a member of all committees of the Council, as prescribed in Article 9.3.**

DUTIES OF THE VICE-PRESIDENT:

- 8.10 Duties Of The Vice-President
- 8.10.1 The Vice-President shall assist the President in the discharge of his or her duties, shall preside at meetings of the Council and of the Centre in the circumstances prescribed in Articles 7.2.4 and 10.4, and shall have such other duties as may be prescribed by the Council.

- 8.10.2 The Vice-President shall be a member of the Executive Committee as prescribed in **Article 9.7.**

DUTIES OF THE TREASURER:

- 8.12 Duties Of The Treasurer
- 8.12.1 The Treasurer shall
- 8.12.1.1 * prepare the annual financial statements of the Centre as specified by Article 11.2, present them to the Council for approval at a meeting prior to the next annual meeting of the Centre, and present the approved annual financial statements for adoption by the annual meeting of the Centre as prescribed in Article 10.1.3.3,
- 8.12.1.2 * submit the financial statements referred to in clause (a) to the Treasurer of the Society by January 15th in each membership year,
- 8.12.1.3 prepare and keep complete financial records of the business of the Centre, including books of receipts, disbursements, assets and liabilities,
- 8.12.1.4 receive and supervise the deposit of receipts,
- 8.12.1.5 supervise the disbursement of Centre funds,
- 8.12.1.6 supervise the safekeeping of the Centre's securities and other monetary assets,
- 8.12.1.7 in general conduct the financial business of the Centre in accordance with the direction of the Council, and
- 8.12.1.8 have such other duties as may be prescribed by the Council.
- 8.12.2 The Treasurer shall be a member of the Executive Committee as prescribed in Article 9.7.**

DUTIES OF THE SECRETARY:

- 8.11 Duties Of The Secretary
- 8.11.1 The Secretary shall
- 8.11.1.1 * submit for adoption at the annual meeting of the Centre a report on the number of members in each class of membership at the end of the previous membership year,
- 8.11.1.2 * submit to the Secretary of the Society by January 15th in each membership year the report referred to in clause (a), a list of the current officers, National Council Representatives, and Centre Council members of the Centre, with addresses for the officers and National Council Representatives, and a brief report on the activities and meetings of the Centre during the past calendar year,
- 8.11.1.3 conduct the correspondence of the Centre and report thereon to Council,
- 8.11.1.4 have custody of the seal and the current minutes and documents of the Centre,
- 8.11.1.5 discharge the duty prescribed in Article 10.1.2,
- 8.11.1.6 be responsible for the preparation and submission of accurate minutes of all meetings of the Council,
- 8.11.1.7 send to all members of the Council the minutes of all Council meetings referred to in clause 8.11.1.6, and
- 8.11.1.8 have such other duties as may be prescribed by the Council.
- 8.11.2 The Secretary shall be a member of the Executive Committee as prescribed in Article 9.7.

- Take minutes of Regular Monthly Meetings and send to the Editor for inclusion in the newsletter.
- Take minutes at Executive Board Meetings (minimum of three executive meetings a year)
- Send out "Thank You" letters to guest speakers

DUTIES OF THE AUDITOR

- 11.1.1 At every annual meeting the Centre shall elect an auditor to hold office until the end of the next annual meeting. The auditor shall conduct an audit of the Centre's financial records and shall express an opinion on the annual financial statements to the members of the Centre. The auditor shall not be a member of the Council.

Skyward for August 2021 by David H. Levy

Rebirth of an Observatory.



"How would you like to go to prison?" was one of the first things that Frank Lopez asked me. My stunned expression prompted Frank to

clarify: "The Federal prison off Wilmot Road has an astronomy club." That was enough: we enjoyed two wonderful evenings down there, and even showed Orion to the group using one of my favorite telescopes.

I dealt with Frank once again in the last few months, as our Jarnac Observatory's Shaar house, the major observatory building in my back yard, threatened to collapse earlier this year. The Shaar name is from the Hebrew word for "gate" or "opening" and I use the name because the structure resembles a miniature version of our Shaar Hashomayim synagogue in Montreal. The observatory is as much a temple for me as the Shaar was.

Frank brings a lifetime of experience to the observatories he builds and repairs. He came up with a plan that would restore my building with a brand new sliding roof. Working occasionally with assistants but mostly alone, the construction took several months, virtually all last winter and spring. (Actually my sliding roof is the entire top half of the building.) During this time I learned a lot about Frank's work ethic. He does not rush things. He takes his time and works steadily for three days a week with construction and maintenance; the rest of his time he manages his "Stellar Vision" astronomy store in Tucson. I learned that he built most of the observatory complex for Dr. Tim Hunter's Grasslands observatory southeast of Tucson near Sonoita, and a large observatory structure for David Rosseter's 25-inch Dobsonian northeast of the city center.

Throughout most of southern Arizona, Frank's Stellar Vision observatory business is really the best game in town. He knows what he is doing and brings his decades



of experience to each project. Frank builds observatories with energy, strength, and even humor. (<https://stellarvisiontucson.com>) These structures do a lot more than house telescopes over many years. They store the memories of a thousand and one nights under the stars. They offer stories of terrible nights when a telescope fell off its mount, of only slightly less frustrating nights when cameras failed to work. They protect their telescopes from the winds and the rains that Arizona occasionally goes through. But mostly they protect memories of precious nights under the stars. Finally, I like to imagine that long after I have closed up and gone to bed, the telescopes talk to one another about what they have seen, and what they have yet to see.

One recent evening after a big monsoon storm after the Shaar was finally completed, I went out and discovered that the telescopes inside were safe and dry. On a drier night I went out, opened its big roof, and stared at the stars. I felt as though I was starting my love of the night sky all over again.

Making My Telescope More Portable - Gerald Noordhof

At last I was finally able to afford a nice GO-TO telescope, and I decided upon the Celestron Nexstar 6. It's a good, relatively easy to use scope that's not too big or heavy, and still with enough aperture to get reasonable results even in an urban setting.



Combined with the accompanying tripod and mount, the whole package weighs only 45 lbs, but I was still faced with the issue of transport to locations other than my apartment balcony. Carrying the scope, tripod and other gear individually posed several logistical problems, and I wanted a better solution. Ultimately needed was a method by which I could transport everything easily, and all at the same time.

Struggling to find an answer, I luckily learned of a fellow astronomer with the same type of telescope and who had developed a clever approach: utilize a large, rolling toll box, often



used by construction workers.

I decided to reach out to this kindred spirit, and he generously informed me how he had made his own portable kit. Key was the use of thick slabs of rigid packaging foam. Evidently, he was able to obtain this free of charge from his employer, as it

was simply discarded material. I also understand that this type of foam is also commonly available at various arts and crafts retailers.

Measuring approximately 20 inches long, 14 inches wide and five inches thick, this particular piece of foam was actually comprised of five separate layers, each one inch thick, and all laminated together. A picture of my sample is shown below.

By using a long bread knife, it was a simple matter to separate layers as required by cutting horizontally through the laminate glue used to keep the whole stack held together.

The next challenge was to obtain a relatively inexpensive rolling tool box with the appropriate internal dimensions to safely hold my telescope. After a bit of searching, I decided upon a unit sold by Canadian Tire for approximately \$80.00. A picture of the tool box and its dimensions is shown below.



Over the course of an afternoon, and after some trial and error, I was able to carve out and shape several layers of rigid foam to adequately fit the main body of my telescope within the tool box. An image of the final result is shown below.

What follows are two images demonstrating how the carved foam and my telescope snugly fits within the rolling tool box.

Next are photos showing how I've used individual layers of foam to further insulate the telescope and accompanying gear.



And lastly, the complete mobile kit is shown below. With a single bungee cord, I can also strap a supplementary brief case and folding chair onto the handle of the unit for easy one-person



transport.

Thanks to this handy set up, in minutes I'm now able to easily organize and pack everything I need for an evening of pleasant nighttime viewing. Clear skies!

In the September Sky- Rick Wagner

1 – 15 Sep – look for the zodiacal light in the eastern sky during morning twilight. If you're under very dark transparent skies at midnight you can try to see the even fainter gegenschein – the backscatter of sunlight from dust particles in the plane of the solar system. It will appear as an extremely faint glow about 10° across centred near Neptune about 12° south of the circlet of Pisces. If you don't see either of them you'll have another good opportunity in early October.

06 Sep – look for an extremely old (only 14 hours before new) extremely thin crescent Moon just slightly above the eastern horizon shortly before sunrise. This will be an extremely challenging, near world-record observation.

07 Sep – New Moon, 20:51EDT

08 Sep – the crescent Moon is 6 degrees to the upper left of Mercury (mag 0) very low above the western horizon shortly after sunset; much brighter Venus (mag -4.1) is 16° left of the Moon. See if you can see Spica (mag 1) 4° to the lower right of the Moon.

09 Sep – the crescent Moon has waxed to a slightly chubbier crescent and is now 4° to the upper right of Venus, forming a nearly equilateral triangle with Venus and Spica.

10 Sep – minor planet (2) Pallas is at opposition southwest of the circlet of Pisces.

13 Sep – First Quarter Moon

14 Sep – Neptune reaches opposition. If you have a telescope of 20cm or (preferably) larger aperture this is the season to try to spot Neptune's largest moon Triton. It is about mag 13.5 and varies from 10-17 arcsec from the mag 8 planet. It is most distant from Neptune and easiest to see every ~3 days. If you watch it from night to night you can watch its retrograde movement – the only major moon in the solar system that orbits backwards. You can get a chart for your chosen observing time at

https://skyandtelescope.org/wp-content/plugins/observing-tools/neptune_moons/neptune.html.

14 Sep – Mercury is at greatest elongation east, visible in the evening sky. But not a favourable apparition as the ecliptic lies close to the horizon at sunset and so Mercury will remain low and set soon after sunset.

20 Sep – Full Moon, 19:54EDT

22 Sep – autumnal equinox – astronomical autumn begins in the northern hemisphere; 15:21EDT

29 Sep – Last Quarter Moon

Membership Renewals, Calling all Members!

In years past when a renewal was due there would be a series of 3 notices sent to the member by National Office. The 3rd notice would actually arrive a month after fees were due. For the time being this practice has gone by the wayside, most likely temporarily. Also for the last year there has been a policy to keep all pre-pandemic members on the membership roll in case circumstances had created financial hardship.

At this point your executive would like all members to check the status of their membership and renew if possible/indicated. To check, log into the National site and click on 'Renew Membership'. On this page, under 'Useful Links' select 'My Account' to see when you last paid. If you wish to renew now, click the header tab 'Member Area' to return to the Useful Links list and hit 'Renew' and fill out your order with any extras and of course add yourself to the Kingston Chat list if you have never tried it out!

Susan Gagnon, Treasurer RASC-KC

Skyward for September 2021 by David H. Levy



During the last almost two years I have been busier than ever, meeting many new people, giving lectures, quoting poetry, and advocating observing the night sky.

And Wendee and I have barely left home. Obviously, I have not been able to give lectures in person since the Covid 19 pandemic began. On the home front for me, our local Tucson Amateur Astronomy Association meets the first Friday of every month online over the Zoom cloud. (see www.tucsonastronomy.org) But almost every day, I reconnect with friends in astronomy clubs around the world. On Tuesdays, I am a part of Scott Roberts' weekly Global Star Party. (For more about this, visit <https://explorescientificusa.com/products/explore-alliance-global-star-party>) Scott has now had more than 60 of these wonderful events, and I enjoy each one. On Wednesdays and Saturdays, I am part of the Montreal Centre of the Royal Astronomical Society of Canada, where I meet people I've known for years, especially Carl, one of my best friends since we were teenagers in 1964. As a graduate student at Queen's University in the 1970s, I also was active with the RASC's Kingston Centre. I have also reconnected with the Denver Astronomical Society, a group I joined in 1963 when I was a patient at the Jewish National Home for Asthmatic Children. That experience was precious back then, and it is even more delightful now!

One of the groups, the Warren Astronomical Society in Michigan, does not use Zoom. Instead, they have WebEx, which is just as simple to use. I have even participated in sessions sponsored by Kansas City's Linda Hall Library, one of the largest science libraries in the world.

Not all of the online sessions are related to astronomy. Our local synagogue has a weekly Torah study session, and Wendee and I are regulars

there. They also graciously listen to my poetry quotations, which range from Shakespeare to Chaucer, to this ancient one (from 1556) from Robert Recorde's *The Castle of Knowledge*:

*If Reasons reach transcend the Skie,
Why should it then to earth be bound?
The wit is wronged and led awrie,
If mind be married to the ground.*

When the sessions drag on, as they sometimes do, I can get fatigued since I am not as young as I was in 1963 or 1979. But it is worth the effort, and I sincerely hope that the Zoom/WebEx experience will outlive the pandemic when it finally ends. Seeing friends so often like this is wonderful. And on some occasions, I have joined online meetings from a remote site in southeastern Arizona.

Sometimes, my quote tradition is something from scripture, like this gem from the Book of Isaiah: Thou stretchest out the heavens as a curtain, And spreadeth them out as a tent to dwell in.

My goodness—I never realized how a few words from the Bible could affect me as much as these do. They describe my experience perfectly—outside, I am peering at the curtain of the night sky. Moreover, the observatory out of which I look at the sky, or the observing pad upon which I stand, is the cosmic tent in which I dwell.

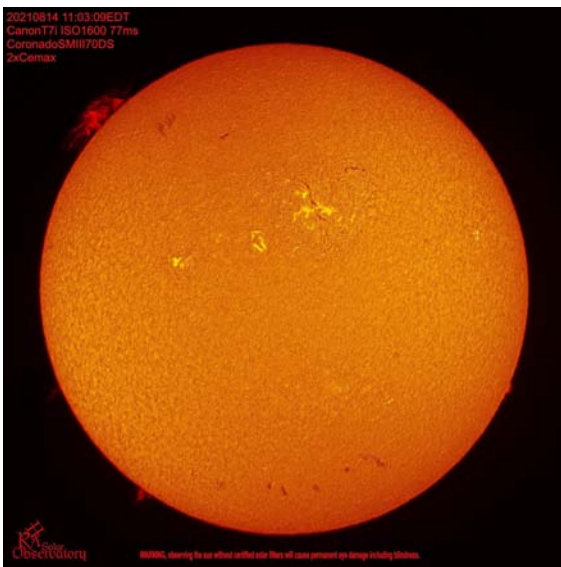


Doveed, and his laptop named Ridley, at the Shaar building of Jarnac Observatory.

RASC-KC Solar Cycle 25 Monthly Review – Hank Bartlett

A review of solar activity and images during the past month
by RASC-KC solar observers.

Here are a few highlights of the month for solar observers. There was very little activity in the first half of August but that was made up for in the second half. Active regions seem to be getting larger but not yet producing the larger spots that can go with this like AR12860.

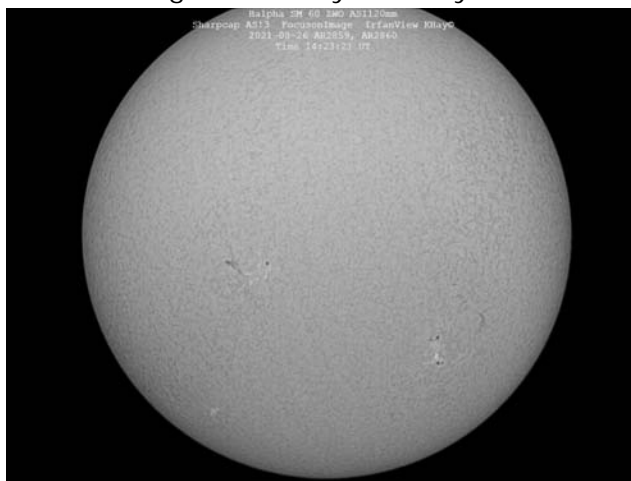


To recap July (by deadline of the last day of the month) the sun produced "O" X class solar flares, "1" M class solar flares and "42" C class solar flares, these were mostly produced by the 13 sunspot active regions numbered AR12850 – 862. The x-ray output reached a maximum level of M4.7 (~ 10-4.3) is currently base lined between 10-6 to 10-7 range. As another



month of cycle 25 closes I have had 19 observing/imaging sessions out of 31 days.

Member images... both by Kim Hay



If you have any solar images during the month to contribute to RASC-KC Solar Cycle 25 Monthly Review forward it to rhaobs (at) gmail (dot) com along with exif and any other documentation about your observing session. Note that images may be cropped to specific content or for spacing.

The Serenity II mini-observatory at SCGO - Kevin Kell

<https://starlightcascade.ca/blog/2021/08/scgo-serenity-observatory-renovation-2021/>



This is the original Serenity Observatory at SCGO circa 2020 January. It is located out in the back lowlands

which often are quite wet. We have been adding an earth berm over time to be able to walk out there without getting sopping wet feet. It was a stationary building with a flip-open roof.



All of the walls and roof were made with 5/8" OSB and it did not weather well in the wet with only paint protection. So, plastic was added to the roof and building wrap to the walls and doors.

This is the 102mm Meade Schmidt Cass telescope "Blue" on tripod that was inside the observatory on a Meade LXD55 mount. The observatory was designed with remote imaging in mind, not visual.



Having said that, I would have to get inside the 4'x4' box to fix, align, adjust, etc. It was difficult! To say the least.

Then, after 20 years of looking and saving, a new telescope and mount came my way. The Skywatcher AZ-EQ6GT mount and the Vixen VC200L 200mm f9 scope were immediately installed and ... they were too big! There was even less room than before to get inside to adjust and fiddle.

So the decision was made to build a new observatory for the new equipment. We wanted to build a huge observatory for two, say 8'x14' or so, but then the price of lumber quadrupled! So that was outside of the budget. In addition we wanted to go with a pier and a "miniobservatory design". We've had a microobservatory before, which was just a small box on a pier over the scope.

Here with the mini observatory we wanted to reuse the existing 4x4 structure in a roll off building and allow it to be used as a warm control room. Once everything is setup, then it can be used remotely.

This is the end result.



<https://starlightcascade.ca/blog/2021/08/scgo-serenity-observatory-renovation-2021-part1-pier/>



We had have piers made from 2x6 wood in a box format, anchored in concrete and filled with sand. They rotted in about 10 years and

were never really stable! So this time we were going for full on concrete. Since our soils is about 3-5" of peat then into solid fractured rock, we opted to get a bigfoot concrete form and then a sonotube to extend it upward to the height we wanted.



Height was a very difficult thing to calculate as there were many variables with unknown error bars: an uncertain depth of

hole, our sonotube was 8.5" and would fit inside the bigfoot after it was filled and it was uncertain if the sonotube could go all the way down. The deck would be raise quite a ways up off the rock but it also had crushed gravel, a patio stone and then two stacked deck blocks. So we tried to design with a lot of give/slack/room for errors.



So the BF28 bigfoot went into the ground. It was weighed down with deck blocks to make

sure it did not float away.

7 bags of concrete (just add water) 30kg each were mixed one at a time in this tray.

It was tiring work and about 1 hour of time. We had prepared three threaded rods with a wooden adapter and nuts and bolts to and placed them inside the concrete and placed a 2x4 across the top to hold it in place.



This was the end result of the pier (ignore the deck.. that is described in the next part)

To be continued (Part 2) in the next issue.

News from the RASC-KC National Council Rep – John Hurley

Hello all, I hope the summer has been good to everyone, not too much longer we will be enjoying early dark skies with clear bright stars and freezing our fingers at our focusing controls. This past summer National Office hosted the GA online and they had a very good turn out. There were some very good speakers and some catching up with other members during the social times. The National Council is having a discussion about the future of the GA and are looking for feedback from their members.

I would love to hear from you all about what you liked at the GA, and what you would like to see at future GAs. Things like, do you want this to stay online or would you like to travel somewhere in Canada to attend or what kinds of talks would you like to hear, any feedback at all would be of help.

I would really like to hear from those of you that did not attend the GA about why you did not attend and what would it take to interest you to attend. I am also looking for feedback about the Annual General Meeting, again what would you like to see from National in how they account to you the Members, this is your chance to have an impact at the National level and have your voice heard.

Please send your insights to: [kingston \(at\) rasc \(dot\) ca](mailto:kingston@rasc.ca). Clear Skies, John Hurley Kingston Centre, National Council Rep



Steve Craig's Galaxy of the Day for August

Day 129 NGC3338 is a spiral galaxy about 59 million light years away in the constellation Leo. It was discovered on March 19, 1784 by William Herschel.

Day 130 NGC3344 is a beautiful spiral galaxy about 20 million light years away in Leo Minor. It is part of the group known as the Leo Spur, which is part of the Virgo Supercluster. It is a weakly barred spiral galaxy that exhibits rings and moderate to loosely wound spiral arms. There is both an inner and outer ring, with the prominent arms radiating outward from the inner ring and the slightly elliptical bar being situated inside. NGC3344 was discovered on April 6, 1785 by William Herschel.

Day 131 NGC3359 is a barred spiral galaxy about 59 million light years away in the constellation Ursa Major. It was discovered on November 28, 1793 by William Herschel.

Day 132 NGC3370 is a spiral galaxy about 98 million light years away in the constellation of Leo. It was discovered on March 21, 1784 by William Herschel.

Day 133 NGC3395 (top) and NGC3396 (bottom) are a pair of interacting galaxies about 74 million light years away in the constellation Leo Minor. They were discovered on May 13, 1896 by Stephane Javelle. They are catalogued as #270 in the Arp Atlas of Peculiar Galaxies.

Day 134 NGC3403 is a barred spiral galaxy about 57 million light years away in the constellation Draco. It was discovered on April 3, 1785 by William Herschel.

Day 135 NGC3430 (top right) is a barred spiral galaxy about 72 million light years away in the constellation Leo Minor. NGC3424 (middle) is a barred spiral galaxy about 68 million light years away. NGC3413 (bottom left) is a lenticular galaxy about 29 million light years away. They were all discovered on December 7, 1785 by William Herschel.

Day 136 NGC3433 is a spiral galaxy about 124 million light years away in the constellation of Leo. It has several background galaxies in the field of view but I couldn't identify them. It was discovered on March 11, 1784 by William Herschel.

Day 137 NGC3440 (bottom right) is a barred spiral galaxy about 87 million light years away in the constellation of Ursa Major. NGC3445 (upper left) is a distorted spiral galaxy about 93 million light years away. It is catalogued as #24 in the Arp Atlas of Peculiar Galaxies, noted as having a single arm.

Both galaxies were discovered on April 8, 1793 by William Herschel.

Day 138 NGC3447 is a distorted spiral galaxy about 48 million light years away in the constellation of Leo. Just above it is NGC3447A with which it is interacting. It was discovered on March 18, 1836 by John Herschel.

Day 139 NGC3448 is a distorted spiral galaxy about 61 million light years away in the constellation of Ursa Major. It's interacting companion, UGC6016 is visible as a smudge below it in this image. NGC3448 was discovered on April 17, 1789 By William Herschel. It is catalogued as #205 in the Arp Atlas of Peculiar Galaxies. Noted as having material ejected from it's core.

Day 140 NGC3486 is a weakly barred spiral galaxy about 27 million light years away in the constellation of Leo Minor. It is noted as having an inner ring and loose spiral arms. It was discovered on April 11, 1785 by William Herschel.

Day 141 NGC3501 is an edge on spiral galaxy about 80 million light years away in the constellation of Leo. It is a close neighbour of tomorrow's galaxy NGC3507 just out of the field of view. NGC3501 was discovered on April 23, 1881 by Edouard Stephan.

Day 142 NGC3507 is a barred spiral galaxy about 45 million light years away in the constellation of Leo. Yesterday's galaxy NGC3501 is just outside of the field of view. NGC3507 was discovered on March 14, 1784 by William Herschel.

Day 143 NGC3509 is a very interesting spiral galaxy about 351 million light years away in the constellation Leo. It was discovered on December 30, 1786 by William Herschel. It is catalogued as #335 in the Arp Atlas of Peculiar Galaxies.

Day 144 NGC3521 is a flocculent spiral galaxy about 26 million light years away in the constellation Leo. Flocculent refers to it looking like tufts of wool. It was discovered by William Herschel in 1784, the same year Charles Messier completed his catalogue.

Day 145 NGC3549 is a spiral galaxy about 130 million light years away in Ursa Major. It was discovered on April 12, 1789 by William Herschel.

Day 146 NGC3561 is a pair of interacting galaxies about 412 million light years away in the constellation Ursa Major. Also known as the Guitar galaxy it is part of the galaxy cluster Abell1185. It is also catalogued as #105 in the Arp atlas of Peculiar Galaxies. NGC3561 was discovered on March 30, 1827 by John Herschel.

Day 147 NGC3593 is a lenticular galaxy about 29 million light years away in the constellation of Leo. It is frequently but not consistently identified as a member of the Leo Triplet group. It was discovered in 1784 by William Herschel.

Day 148 NGC3596 is a face on spiral galaxy about 50 million light years away in the constellation Leo. It was discovered on April 8, 1784 by William Herschel.

Day 149 NGC3600 is a nearly edge on spiral galaxy about 53 million light years away in the constellation Ursa Major. It was discovered on January 14, 1788 by William Herschel.

Day 150 NGC3607 (middle) is a spiral galaxy about 70 million light years away in the constellation of Leo. It has a bright core and faint tightly wound spiral arms. Also in this image is NGC3608 (top) an elliptical galaxy 58 million light years away and NGC3605 (bottom) an elliptical galaxy 66 million light years away. The group was discovered on March 14, 1784 by William Herschel.

Day 151 NGC3631 is a beautiful spiral galaxy about 35 million light years away in Ursa Major. Given it's apparent size it is 60 thousand light years in diameter. It was discovered on April 14, 1798 by William Herschel. It is catalogued as #27 in the Arp Atlas of Peculiar Galaxies. Noted as having a heavy arm.

Day 152 NGC3646 is an interesting spiral galaxy about 193 million light years away in Leo. Somehow the rotation rates between the inner ring and the outer arms become disjointed. Probably a galactic merger in the past. It was discovered on February 15, 1784 by William Herschel.

Day 153 NGC3666 is an almost edge on spiral galaxy about 50 million light years away in Leo. It was discovered on March 15, 1784 by William Herschel.

Day 154 NGC3675 is a nice spiral galaxy about 50 million light years away in Ursa Major. Given it's apparent size it is 100 thousand light years in diameter. It was discovered on January 14, 1788 by William Herschel.

Day 155 NGC3684 is a nice little spiral galaxy about 53 million light years away in Leo. It has a diameter of about 50 thousand light years. Which is less than half the size of the Milky Way. It was discovered on April 17, 1784 by William Herschel.

Day 156 NGC3686 is another nice spiral galaxy 43 million light years away in Leo. It is a close companion of yesterday's NGC3684. It was discovered on March 14, 1784 by William Herschel.

Day 157 NGC3690 is a pair of interacting galaxies about 150 million light years away in Ursa Major. It is catalogued as #299 in the Arp Atlas of Peculiar galaxies, noted as being galaxy pair. NGC3690 was discovered on March 18, 1790 by William Herschel.

Day 158 NGC3692 is an edge on spiral galaxy about 78 million light years away in Leo. It was discovered on April 15, 1784 by William Herschel.

Day 159 NGC3718 is a peculiar galaxy about 52 million light years away in Ursa Major. It is interacting with tomorrow's galaxy, NGC3729, just outside the field of view. To the right the small cluster of galaxies is Hickson's Compact Group #56. NGC3718 was discovered on April 12, 1789 by William Herschel. It is catalogued as #214 in the Arp Atlas of Peculiar Galaxies.

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