Regulus 2021 July

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

M 27 Dumbell planetary nebula 8s exposures for a total of 20 frames. Taken on May 28 2021. - Mark DesLauriers

M 52 and NGC 7635 Bubble Nebula including Nova v1405 TAKEN ON June 4 2021. 8 s exposures for 120 seconds. - Mark DesLauriers

Both Pics taken with a Celetron 6SE 0.63 reducer and using a ZWO ASI 294 colour uncooled camera. Basic Affinity processing.

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 Jan-June!
Next Social:: Wed 2021 July 7

RASC-KC Regular Monthly Meeting -
We do not hold Meetings in July and August. Check back in September!

In This Issue

President's Tidbits for July 2021- Kim Hay

Welcome to July that means we are into summer and Happy Canada Day and Happy 4th of July to our American members! We are getting closer to in person gatherings with the increase of the Covid vaccines being received and the provinces lifting of restriction. There is a light at the end of the tunnel.

The RASC General Assembly has happened and what a great time. It ran virtually from June 25-28th 2021 hosted by the National office. This year on Friday June 25 the RASC Next Gen presented speakers all day with two award prizes totalling $1500 for projects . Also it was announced by the Education Committee that they have created "Creation Station".

"To celebrate International Astronomy Day, the RASC (Royal Astronomical Society of Canada) invites kids ages 5-12 to share their short stories, drawings, poems and comics about Astronomy and Space. These wonderful creations will be shared on our website for all to enjoy.

Between May 15th-June 13th extended to July 31, submit your creation with your parents' help and become the first contributors to Creation Station. Every child who participates will receive a certificate of participation, and a few chosen entries will be invited to share their creation at the RASC National General Assembly. Several stories will also be included in the Sept/Oct edition of Sky News magazine to celebrate Science Literacy Week. Some kids may be invited to share their creations at their closest RASC Centre: rasc.ca/creationstation

If you know of any children at home or in the neighbourhood that would like to check this out, I encourage you to do so. Even check it out yourself it is a great idea.

The NOVA course is being updated, and if you would like to contribute to a section please contact outreach+nova at rasc.ca to volunteer for a section.

Rick Wagner has produced what is up for July but here is a small list of meteor showers coming up.

South delta Aquariids July 12-Aug 23
Peak July 28/29 moon 74% full

Alpha Capricornids July 3-Aug 15
Peak July 28/29 moon 74% full

Perseids July 17- Aug 26 Peak Aug 11/12 moon 13% full - Great time to observe https://www.amsmeteors.org/meteor-showers/meteor-shower-calendar/ or page 254 in the Observer's Handbook 2021

We will not be having meetings for July and August but members will meet for Social time on Wednesday night's at 7:00 pm. The ZOOM link will be sent out to all members via a mailing. Hope to see you there. Our next regular meeting will be September 8, 2021 at 7:00 p.m. At this time it will be virtual ZOOM meeting.

Enjoy the summer months with family and friends (at the recommended Health standards) and enjoy the view. Stay safe !

In the July Sky- Rick Wagner

01 Jul - Last Quarter Moon

04 Jul - Mercury (mag 0.4) is at Greatest Elongation West, low in the NE sky shortly before sunrise. You may need binoculars to find it. Look for Aldebaran (mag 0) 11º to its upper right. Mercury will continue to get brighter and higher above the horizon for the next several days.

05 Jul - Earth at aphelion - furthest distance from the Sun, 152 100 527km

09 Jul - very old crescent Moon very low in the NE just before sunrise.

10 Jul - New Moon 21:16 EDT.

11 Jul - very young and very thin crescent Moon (~23.5hrs old) low in WNW just after sunset.

11&12 Jul - Venus (mag -3.9) very close to much fainter (200 times fainter) Mars (mag 1.84) in the NW sky shortly after sunset. The very thin crescent Moon will be 6º to their right on the 11th and a slightly fatter crescent 7º to their upper left on the 12th.

17 Jul - First Quarter Moon
- Pluto (mag 14.3) at opposition

18 Jul - minor planet 6 Hebe at opposition (mag 8.4)

24 Jul - Full Moon 22:37 EDT

29 Jul - South δ Aquariid meteor shower peaks - this shower is much more favourable in the southern hemisphere and is also heavily affected by a waning crescent Moon.
- minor planet 12 Victoria at opposition (mag 8.7

31 Jul - Last Quarter Moon.

Skyward for July 2021 By David H. Levy.

"Nature had spoken to him." David H. Levy with Roy L. Bishop.

Gravity is one of the most fundamental things in physics. Everything and everyone has gravity. The more massive something is, the more gravity it has. When you jump into the air, Earth's gravity brings you back down. What you cannot see while you are in the air is that your gravity brings Earth towards you just a wee little bit, off-setting the extra push away from you that your feet gave Earth when you jumped.

Isaac Newton presented the first ever mathematical description of gravity in 1687. I admit that I know nothing about gravitation, except that it is all around me. I do recall the myth that Newton was sitting under a tree when an apple fell on his head. Supposedly, he then formulated his law of gravity. Did the apple actually fall on his head? I doubt it. But at his childhood home in the village of Woolsthorpe, England, he probably did witness an apple fall from a tree.

During the last half of the nineteenth century physicists realized that Newton's theory of gravity did not accurately describe the orbit of Mercury, the planet closest to the Sun. Mercury's elongated orbit precesses slightly faster than Newton's theory predicts. Several unsuccessful attempts were made to account for this discrepancy.

Newton's theory, which assumes that gravity is a force, held sway for more than two centuries, until superseded by Albert Einstein's General Theory of Relativity in 1915. A decade earlier, Einstein realized that mass and energy are two aspects of one thing, and that space and time are interrelated, a blended spacetime. With General Relativity, Einstein treated gravity not as a force, but as the geometry of spacetime. The geometry of spacetime is curved by the mass-energy of matter, and the curvature instructs matter how to move.

Now comes the hard part. When Roy Bishop, emeritus professor of Physics at Acadia University, pointed out to me that gravitation is geometry, and not a force at all, I didn't believe him at first. But Dr. Bishop is the most brilliant person I have even had the privilege of knowing. Recently he described gravity this way, and he is right:

> "Einstein spent several years in an eventual successful attempt to include gravity in a modified description of spacetime. Early in his progress toward that goal Einstein had what he called the happiest thought of his life — that if a person were to fall off the roof of a house, while falling she would not feel a force of gravity. Before she falls, she feels the force of the roof supporting her. When her fall comes to its abrupt halt she feels the ground pushing against her. If she cannot feel a force of gravity while she is falling, why pretend that she felt a force of gravity when the roof supported her before she fell, or that she feels a force of gravity when she is lying on the ground?
>
> "When thinking about the falling lady, Einstein had the fantastic insight that perhaps gravity never was a force. By late in 1915 he had that insight in elegant mathematical form such that the resulting theory, General Relativity, can be used to make precise predictions concerning gravitation."

Einstein was elated when, on November 18, 1915, he found that his General Theory of Relativity predicted the measured precession of Mercury's orbit. According to his friend and biographer Abraham Pais: "This discovery was, I believe, by far the strongest emotional experience in Einstein's scientific life, perhaps in all his life." Pais then continues with five words that crystallize that profound experience: "Nature had spoken to him." After several years of work, on that day Einstein knew that he was the only person on Earth who understood gravity!

Today, there are thousands of people who understand gravity. Roy is one of them. Most of us, including me, are not one of them. But reading it described so well is one of the pleasures we can feel as we try to appreciate the wonderful cosmos in which we live. Not only does General Relativity correctly predict the precession of Mercury's orbit, but it is essential to the programs used in the GPS navigation system, and it describes the gravitational waves (ripples in the geometry of spacetime) generated by two coalescing black holes, directly detected 100 years after 1915 by LIGO, the Laser Interferometer Gravitational-Wave Observatory.

Woolsthrope-Roy Bishop

Minutes of The RASC-KC Regular Monthly Meeting (via zoom) of Wednesday May 12th 2021

The twelfth Regular Meeting since the onset of the COVID-19 pandemic, was held remotely with Zoom video conferencing software and started at 19:00EDT
32 people were in virtual attendance

Kim Hay Started the meeting at 19:00 EDT and welcomed everyone. The YouTube live stream and session recording were started. All participants were muted so that the presenters could be heard without interruption.

Kim introduced herself and the executive team members

Kim presented the agenda for tonight's meeting

Kim announced the following:

- This year the Kingston centre is celebrating 60th anniversary
- National Membership Database up and running
- Moon at Noon, on May 12th
- Fall'N'Stars is scheduled for Sept 10-12th 2021
- RASC General Assembly scheduled to June 25-27th
- Virtual Field trip on June 28th to university of Alberta meteorite lab

David Levy welcomed everyone to the meeting and expressed his joy to join. David gave an excerpt from The Cremation of Sam McGee poem

Mark Coady presented "Peterborough Light Pollution Abatement Progress Report"

- Applied light pollution bylaws
- 2008 and 2019 photo comparison
- Conclusions
- Q&A session

Hank Bartlett presented Hank's Sun Spot

- April 15 - May 12 solar activity
- Solar eruption graph
- Active regions and sun spots
- Q&A session

Rick Wagner presented What's up in the sky?

Ground events

- 14 May - BAA Radio Astronomy Section
- 22May - AAVSO Webinar - Red Supergiants & Faint Galaxies
- 26 May- BAA George Alcock Memorial Lecture
- 28 May- BAA Astronomy Section
- 05 Jun - AAVSO Webinar - Your First Observatory
- 09 Jun - BAA Sketching Deep Sky Objects webinar
- QUO - Fast Radio Burst Podcasts

Dark Sky viewing areas are closed

Sky Events:

- 12 May - Venus near crescent Moon
- 19 May - Mercury near crescent Moon
- 12 May - Moon First Quarter
- 26 May - Full Moon
- 28 May - Mercury and Venus 0.4 deg apart
- 02 Jun - Last Quarter
- 03 Jun - 63 Ausinia at opposition
- 10 Jun - Partial solar eclipse

Galilean Moons Mutual Events

RASC-KC Contact Information:

The RASC-Kingston Centre
c/o 76 Colebrook Road, RR#1,
Yarker On K0K3N0

email: kingston@rasc.ca
website: kingston.rasc.ca
Twitter: https://twitter.com/astrokingston
Youtube:youtube.com search for RASC Kingston
Facebook Page: facebook.com/rasckingston
Facebook Group:
facebook.com/groups/681409686039729/

Asteroids this Month

- 30 May - 184 Dejopeja occultation
- 09 Jun - 1529 Oterma occultation

Rick presented his observatory in-depth details

- Telescope backstory
- OTA specifications
- Mount specifications
- Telescope in-depth details
- Q&A

Kevin Kell presented his new allsky lens to capture aurora

Kim announced the upcoming regular meeting sessions schedule and speakers. Kim stopped the meeting at 20:36

Meeting minutes prepared by Asser ElGindy 2021-06-09

Minutes of The RASC-KC Regular Monthly Meeting (via zoom) of Wednesday June 9th 2021

The thirteenth Regular Meeting since the onset of the COVID-19 pandemic, was held remotely with Zoom video conferencing software and started at 19:00EDT
30 people were in virtual attendance

Kim Hay Started the meeting at 19:00 EDT and welcomed everyone. The YouTube live stream and session recording were started. All participants were muted so that the presenters could be heard without interruption.

Kim introduced herself and the executive team members

Kim presented the agenda for tonight's meeting

Kim announced the following:

- This year the Kingston centre is celebrating 60th anniversary
- National Membership Database up and running
- Moon at Noon, on June 10th

David Levy welcomed everyone to the meeting and expressed his joy to join. David gave an excerpt from King Lear by William Shakespear

Rick Wagner introduced the guest speaker Dr. Doug Johnstone

Dr. Johnstone presented "Life at the Summit of Maunakea"

- Act 1: Scene 1 - The Great Idea
- Act 1: Scene 2 - First Proposal, To Boldly
- Act 1: Scene 3 - Second Proposal, Up In
- Act 2: Scene 1 - Rethinking our Ideas
- Act 2: Scene 2 - Third Proposal, Up All Night
- Act 2: Scene 3 - EC53, An Early Surprise
- Act 2: Scene 4 - JW566, Another Surprise
- Act 3: Scene 1 - Contemplations
- Act 3: Scene 2 - A Flurry of Activity in Halpha
- Act 3: Scene 3 - 50 Eyes are Better Than One
- Act 4: Scene 1 - To Infinity and Beyond
- Act 4: Scene 2 - Final Thoughts
- Q&A session

Robert Bates presented Globular Clusters Astrophotography

- Equipment
- Globular Cluster Overview
- M72, M71, Harvard 20, NGC 6749, NGC 6760, M53, M15, M3, M5, M12, M92, M13
- Q&A session

Hank Bartlett presented Hank's Sun Spot

- May 13 - June 9 solar activity
- Active regions and sun spots
- Solar eclipse coming up
- ISS transit
- Venus transit
- Spectacular solar prominence on June 9th
- Q&A session

Rick Wagner presented What's up in the sky?

- Ground events
- Dark Sky viewing areas are closed
- Sky Events
- Galilean Moons Mutual Events
- Asteroids this Month
- July and August highlights

John Hurley gave a demo for how to sign up for the RASC National General Assembly event for free.

Rick Wagner presented his imaging session of Jupiter's moon's Io eclipse

Kim announced the upcoming regular meeting sessions schedule and speakers

Kim stopped the meeting at 20:51

Meeting minutes prepared by Asser ElGindy 2021-06-21

"Last Night" by Malcolm Park

I spent a few hours puttering around last night and had some success. Despite the full moon, it was actually a good time to work on a few things. Earlier in the day, I decided to switch out my refractor for my RC. The RC with camera, focuser and filter wheel, cables, Pegasus Power Box, and guide scope easily exceeds the mount listed capacity (AP Mach-1) of 50lbs. But I had read that the Mach-1 was conservatively rated and could handle more. I put this to the test before I left the County and it seemed to be ok. The main difference now, is I have applied sound cable management to the setup, with cables running up through the mount.

No more cable drag. Also, I learned from experience that if I change the order in which I mount the counterweights I can get better balance. Previously I followed best practices and put the heaviest weights on first (I have three different weighted weights). 8 in total, I think. I found back then that I was just slightly out of balance and unable to correct it without completely re-ordering the weights. This time, I alternated heavy, lighter all the way down the shaft. This brought me much closer to balance but keeping as much weight up close to the top as possible. Once it was dark enough, I started to work on Polar alignment.

I used the PHD2 Polar Drift Align tool. It got me to within 1.4 arc minutes. That seems pretty good, but I was wondering if any of you would try to improve on that or if I should be satisfied. My focal length is effectively 1700mm with the reducer/flattener so about .5 degrees FOV. Next task was to find focus, as after putting these parts all together focus was sure to be off. And of course, I couldn't control where I was pointing because I hadn't plate solved yet, being out of focus. So I pointed at the moon first and centred the out of focus image and synced on the moon.

Then I selected Arcturus and did a go-to to see if I could reach focus without changing the spacer configuration. Fortunately, I didn't have to add or remove a spacer, and I found focus well inside the step range of my focuser. Figuring out the step size was the next requirement. The focuser has 7000 step range, but how many steps per move to do a v-curve?This was achieved with a little trial and error, and I settled on 100 steps. Once the software (SGP) knows the number of steps per move, and I tell it how many data points to use (I am using 9) and how long to expose a focus frame for, its good to go.

Focusing was the big success story of my night. Following that, I tried plate solving and was having a lot of difficulty. Plate Solve 2 (PS2) would not solve, but Astrometry.net would. Something was wrong with my settings, but I couldn't figure it out. I went back in to have a look at my settings this morning (it was 1am when I packed it in, too tired to continue). I found that my image scale in the SGP camera settings dialog box was set to 1.1"/px.

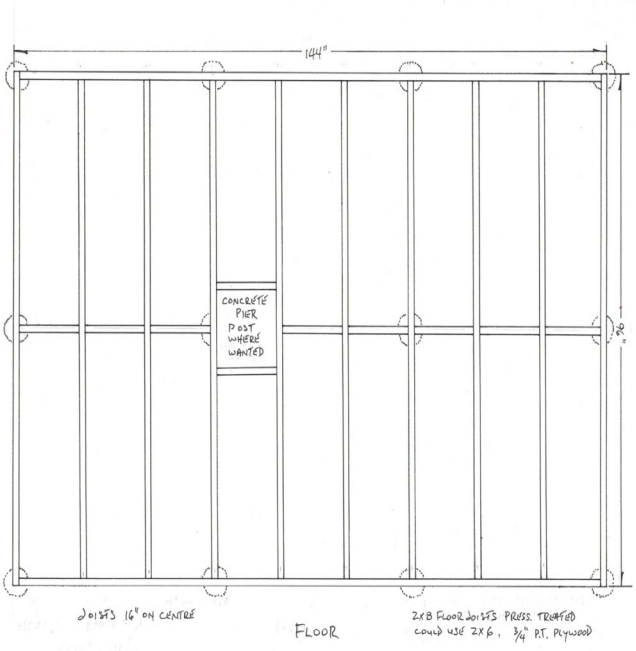
This seemed high, and then it hit me. I had used 4x4 binning to generate a quick test frame after focusing, and I had solved that image and used its image scale in my settings. Doh! So another problem solved (so to speak), and I will do another plate solve next time for a 1x1 binned image to confirm the image scale, and all should work then. I also found a couple of little things in settings, Like I had the wrong controller set in the AP driver, so I fixed that. I changed some minor settings in PS2 also that might give me better results.I increased the exposure time, and I increased the Max Star Size sigma value by 30% hoping sensitivity will improve.

Near the end of the night, I ran the PHD2 guiding assistant to measure all parameters and change settings where advised. PHD2 makes recommendations for guiding algorithms such as minimum move in either RA or DEC, and so I went with the recommended values. All seemed to go well. Next chance I get I will re-run PEMPRO / PEC and that should have the mount ready for some deep sky, long focal length imaging runs.

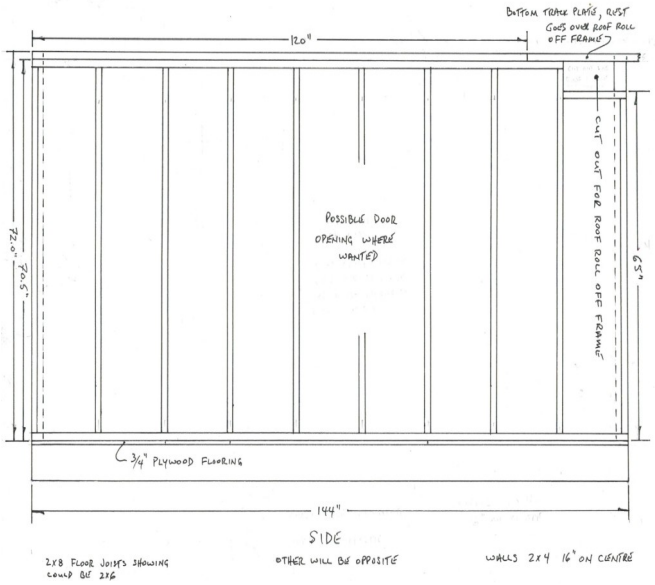
The Broderick Memorial Observatory (BMO)

Keith Neumark

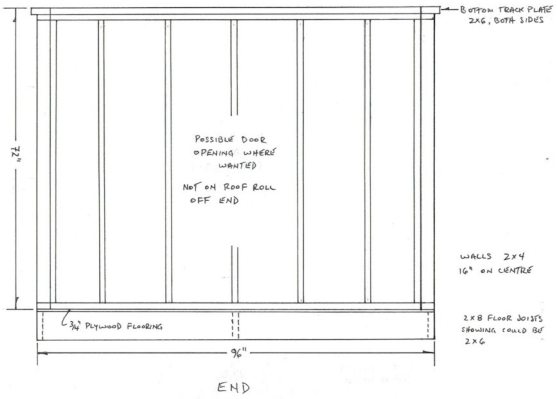
Bill Broderick was my mentor for this hobby and Bill gave me the 11 inch, he was to help me get up and running but he passed away before he had a chance to guide me, so it was a go alone from there and because of this, I decided to honour Bill by calling my observatory the Broderick Memorial Observatory (BMO) but as you know it is often referred to as the Visibility Nil Observatory due to the lossy weather conditions here.



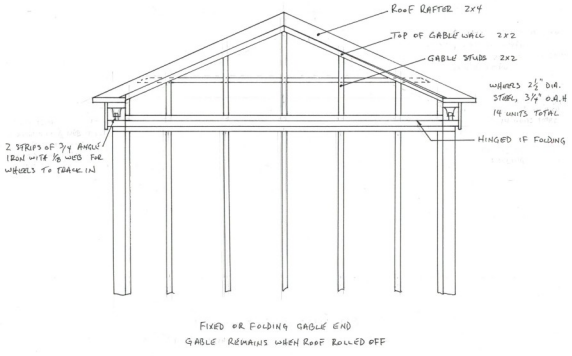
Plan1 - floor



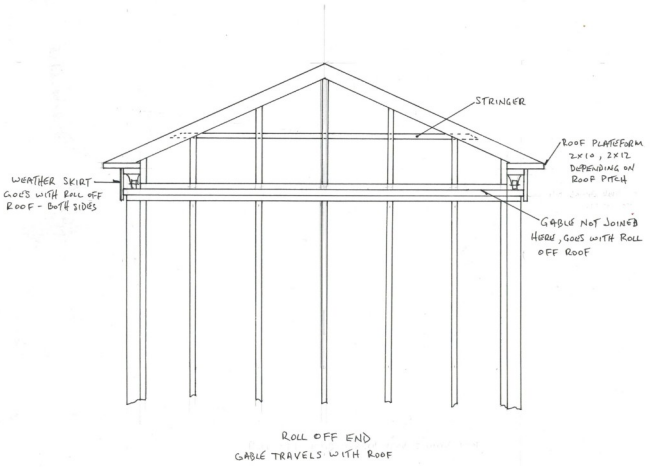
Plan2 - Side



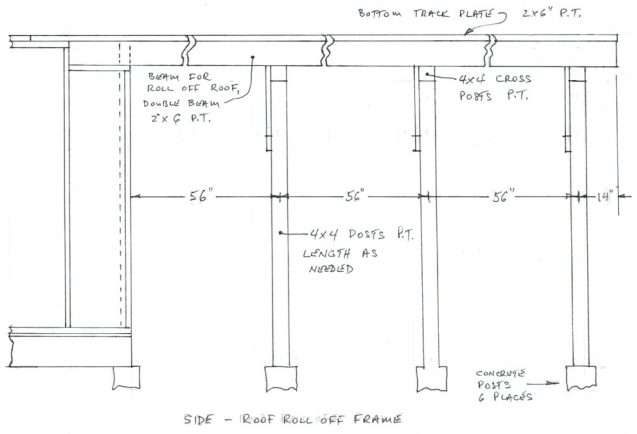
Plan3 - end



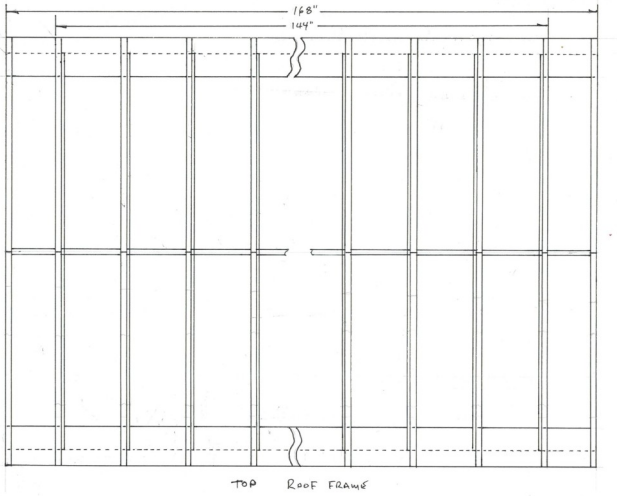
Plan4 - Gable End



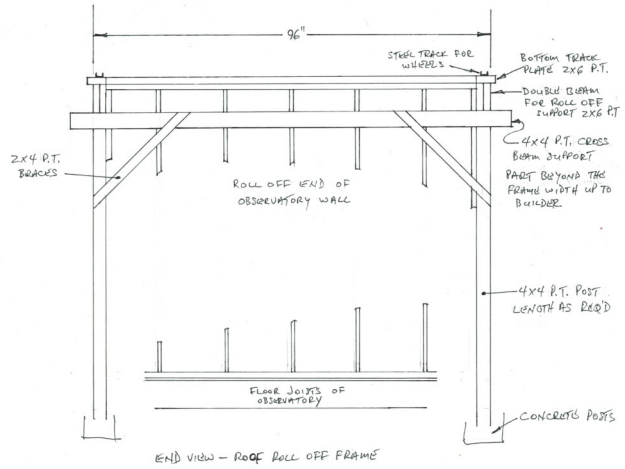
Plan5 - Roll Off End



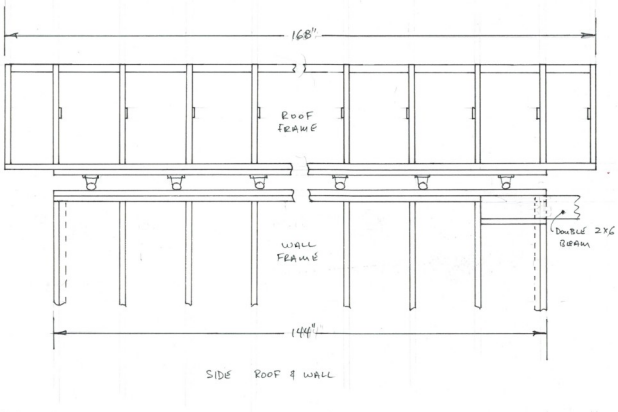
Plan8 - rolloff roof frame



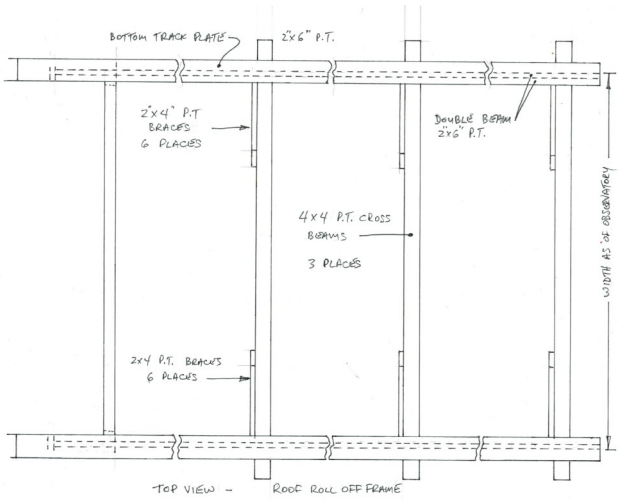
Plan6 - Roof Frame



Plan9 - Rolloff roof frame end



Plan7 - side roof and wall



Plan10 - rolloff roof frame top

RASC-KC Solar Cycle 25 Monthly Review by Hank Bartlett

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

The first week of June brought no surprises which was okay with most solar astronomers as they were in early preparation for June 10 annular solar eclipse (certainly there will be an eclipse story with images). A dawn eclipse did not make this observer's list as I DO NOT rise that early unless it is to catch a flight to somewhere hot. Several RASC-KC members did make it up and out for the event many images are available in the chat email or on the RASC Kingston Face Book page.

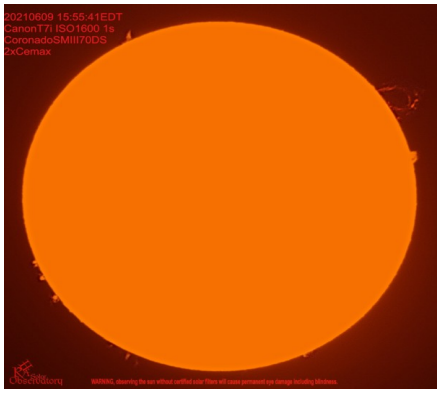
Most of the month was humdrum except for the above mentioned eclipse and an eruption I witnessed on June 9. Here are just a few of the over 300 images I took in approximately 30 minutes as magnetic forces caused a small arcing ring to swell (pre my images) and brake free of the solar surface blasting the prominence into the sun's upper atmosphere and then collapsing it back to the surface where it eventually flattened back out. The entire event was less than 2 hours long and very exciting to watch.

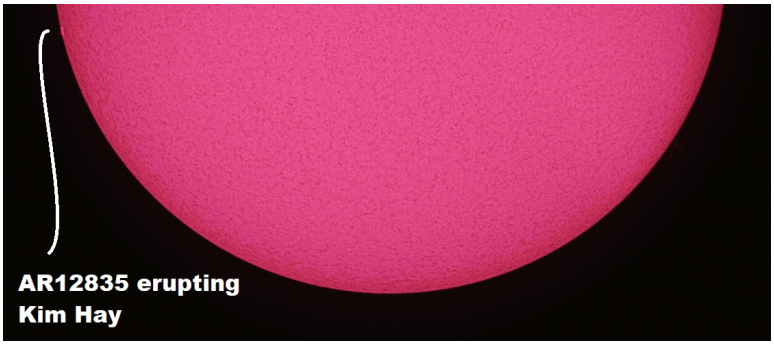
To recap June we had 0 M class solar flares and 12 C class solar flares, flare activity has dropped dramatically due to rather inactive regions. 11 sunspot/active regions showed up this month numbered AR12827 - 837 some of which were very short lived while others crossed the solar disc but barely changed in shape or activity as the sun appears to be napping in preparation for something exciting! Today June 26 AR12836 is starting to crackle with C class activity. The x-ray baseline dropped briefly back to below the 10-7 range during the 3rd week despite there being an adequate sunspot at that time. Weather reduced the RHA Obs to only 16 observing days for the month.

Member images… (following page)

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.

Hank Bartlett





The Fine Print:

RASC-Kingston Center Board of Directors

President: Kim Hay
Vice-President: Laurie Graham
Secretary: Asser ElGindy
Treasurer: Susan Ganon
Librarian: Francesco Ambrogi
Editor: Kevin Kell
National Council Rep: John Hurley

Executive:
Past President: Rick Wagner
Webmaster: Walter MacDonald
Equipment: Kevin Kell

The Moon, Mercury and Venus – Bruce Elliott

From https://rasc.ca/alice-douglas

1894-1988) Professor of Astronomy and Dean of Women at Queen's University (1939-63). She studied Physics under Sir Arthur Eddington and later wrote his biography. President of the Society (1943-44) and founder of the RASC Kingston Centre in 1961.

ALLIE VIBERT DOUGLAS (1894-1988) was the first woman to be President of the RASC (1943-44), but this was only one of many distinctions she held. She was made a Member of the British Empire in 1918 for her work with the War Office in London, England, received honorary degrees from Queen's University in Kingston, Ontario, and from the University of Queensland, Australia, was President of the International Federation of University Women, and was selected in 1967 by the National Council of Jewish Women as the "Woman of the Century" for Ontario.

Allie Douglas (as she was known in her youth and to her closest friends) began her illustrious career in Montreal. She received her B.A. and M.Sc. degrees from McGill and in 1921 went to Cambridge, where she studied Physics under Sir Arthur Eddington. (Many years later she wrote his biography.) She then returned to McGill where she lectured in Physics and Astrophysics and earned her Ph.D. in 1925. In 1939 she was appointed Dean of Women at Queen's University, a position she held for twenty years. For much of this time, and until 1963, Dr. Douglas was also Professor of Astronomy at Queen's and published many papers in international scientific journals and general periodicals.

NGC1090

NGC1507

NGC1560

NGC1569

NGC1589

NGC1961

NGC2146

NGC2207

NGC2268

NGC2273

NGC2276

NGC2336

NGC2357

NGC2366

NGC2403

NGC2424

NGC2444

NGC2523

NGC2535

NGC2537

NGC2541

NGC2552

NGC2591

NGC2595

NGC2608

NGC2623

NGC2648

NGC2683