



Want to see some of the best work from Members across Canada? Visit

<https://rascastroimaging.zenfolio.com/> to see the results from the RASC Astroimaging Certificate for Wide Field, Solar System and Deep Sky.

The latest certificate awarded was to Rick Wagner, with the Solar System Certificate.



Kingston.rasc.ca/join

Join the largest, most active astronomy group in Canada.

Membership in the RASC is open to everyone interested in astronomy. You may join through one of 30 RASC Centres or as a National member. Membership terms run 12 months from the time of joining.

Membership entitles you to the following benefits:

A copy of the annual Observer's Handbook;
Six issues of SkyNews magazine - the Canadian Magazine of Astronomy and Stargazing;

Six issues of the Journal, the RASC's official publication (in electronic format - print subscription also available);

Member discounts on other RASC publications such as The Observer's Calendar;

In addition, members who are attached to a local RASC Centre can enjoy additional benefits:

Regular meetings and social events sponsored by Centres;
Access to Centre facilities and services such as observatories, libraries, and telescope rentals (where applicable);
Centre newsletters highlighting local astronomy events and activities

Discounted membership fees are available for Youth members (under age 21; under 25 if enrolled in post-secondary facilities).

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.

Next Social:

Wed 2022 February 16

RASC-KC Regular Monthly Meeting - Wednesday 2022 February 09 a virtual Zoom meeting at 19:00 EST the Regular Meeting.

Dr. Jennifer West (Dunlap Institute)
Topic: Inside the Galactic tunnel in the sky

Members will be emailed a zoom registration link, others may watch on our youtube channel.

In the February Issue

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- * **The 7 greatest Sunspot Groups - Kim Hay**
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- * **Planetary Lineup- Bruce Elliott**
- * **M33 – Stephen Craig**
- * **Stephen Craig's Galaxy of the Day**

Editor: Kevin Kell



The President's Nook - Kim Hay

We have had quite the run of cold clear weather in January, and some of our members have taken advantage of this time for some deep sky observing and image taking. For the images from our members Deep sky objects, join the Centre chat list, or visit the Centre's Facebook group. The Editor should be posting some images in this month's issue of Regulus.

While some of members do night time observing, others are doing daytime Solar observing. On that note, sunspot group AR2936 in the Northern hemisphere has grown, and it is reported to be 740 MSH (Millionths of a solar hemisphere), which means this group is growing and is reported at naked eye viewing with Solar eclipse glasses or a solar filter. It has produced many C and M class flares.

Our February meeting will be on Wednesday February 9th at 7:00 pm via ZOOM. Our guest speaker will be Dr. Jennifer West and she will be speaking on "Inside the Galactic tunnel in the sky". Dr. West is a Research Associate at the Dunlop Institute for Astronomy and Astrophysics. This will be a very interesting topic.

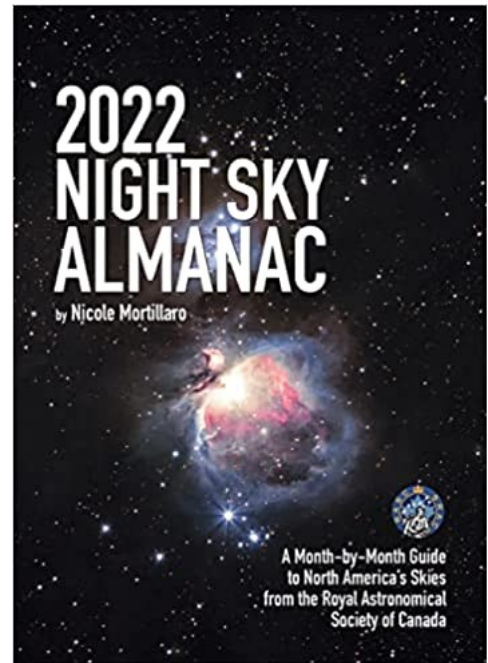
On our website we now have a link for the IAU Astronomy Outreach Newsletter which is received, and has great topics for Outreach.

On the Library front (Librarian's hat now) we have a copy of the 2022 Night Sky Almanac by Nicole Mortillaro, for loan. Please contact me at kingston@rasc.ca if interested in borrowing. In the book are 11 photo credits from Malcolm Park. Congratulations Malcolm!

Reminder that we have our Social on the first, third and fourth Wednesday nights of the month. The link is sent out via our chat list.

Our March meeting we will have Marcus Leech (RASC Ottawa) "Hunting FRBs on a budget: The SIFT telescope". We also have our involvement with the FLASF on March 28th. Dr. Bruce Elliot is heading up the RASC Kingston Centres involvement. Bruce is looking for some help with judges, please let him know if you can assist.

Till next time, clear skies and Keep looking Up!



Upcoming Meetings

Wednesday, February 9, 2022 – 19:00 Regular Monthly Meeting-ZOOM videoconference
 Guest Speaker: Dr. Jennifer West (Dunpal Institute) Topic: Inside the Galactic tunnel in the sky

Wednesday, March 9, 2022 – 19:00 Regular Monthly Meeting-ZOOM videoconference
 Guest Speaker: Marcus Leech (RASC Ottawa) "Hunting FRBs on a budget: The SIFT telescope"

Wednesday, April 13, 2022 – 19:00 Regular Monthly Meeting-ZOOM videoconference
 Guest Speaker: Peter Pekurar (RASC Sudbury) Topic: TBA

Wednesday, May 11, 2022 – 19:00 Regular Monthly Meeting-ZOOM videoconference
 Guest Speaker: Richard Schmude (RASC Kingston) Topic: TBA

Wednesday, June 08, 2022 – 19:00 Regular Monthly Meeting-ZOOM videoconference
 Guest Speaker: TBA

July, August – summer hiatus – no regular monthly meetings



All Things Astro – by Kevin Kell

We are trying out a new feature... a shared google calendar that has all things astro in one place:

<https://calendar.google.com/calendar/u/0?cid=YXN0cm9raW5nc3RvbjE5NjFAZ21haWwuY29t>

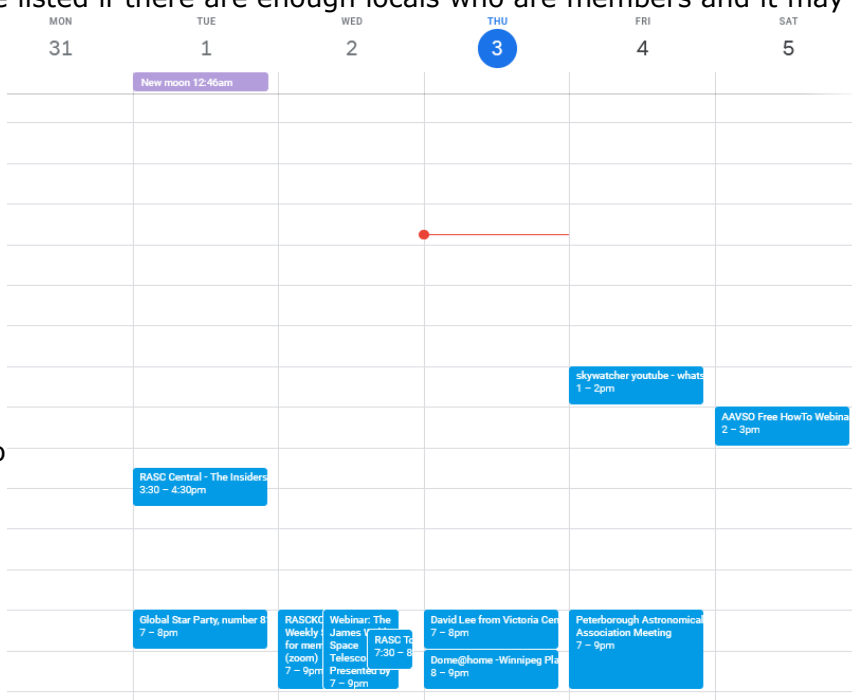
We hope to have all local meetings, astronomical whats up events, and relevant online webinars, etc on the calendar. Since this is a public access calendar, we cannot include private zoom links for events, but we can point people to registration links, etc.

In addition, some private events are listed if there are enough locals who are members and it may be applicable, ie Saturday Jan 22 AAVSO Members only webinar with Dr. Jill Tarter. There are at least a half dozen AAVSO members within the ranks of RASC-KC.

If you already have an existing calendar, the link above will enable you to add the astro calendar to yours in a readonly fashion.

We're not saying this is the end all, be all solution... just something to try out in hopes it will be of value to you.

If ***you*** know of any event not listed that may be of interest. Please contact any one of the board members, who have the ability to add items to the calendar.



Skyward February 2022
By David H. Levy

Go Webb!

We all got a special and thoroughly delightful present early on Christmas morning. Although I did not set my alarm, Wendee did get up around 5 am. I turned on our television set, and what I saw 15 minutes later was the most thrilling space view since 1969, when



Armstrong and Aldrin walked on the Moon. It was the spectacular, flawless launch of the James Webb Space telescope, THE start of a mission so perfect and smooth that if Webb could speak, it would have told us that it did not feel any motion whatsoever as it soared away. Even the countdown was unique; it was in French: "Dix, neuf, huit..." I did notice a possible hiccup. About ten minutes later, the metal covers designed to protect the telescope during launch fell away while the vehicle was still in powered flight. But a second later, I understood that this was not a hiccup; it was supposed to fall away. The telescope was already out of Earth's atmosphere, and with no air to bother it, the protective cover was no longer needed.

As lovely as this experience was for me, the launch was not the most memorable part. That came an hour or so later, when NASA administrator Bill Nelson gave a speech in which he thanked the many people involved in the process of getting the telescope into space. At the end of his speech Nelson mentioned a young shepherd boy, sitting out under the stars, looking toward the night sky, and writing a poem about it. That shepherd boy, the Administrator went on, went on to become King of Israel.

The poem to which he referred is undoubtedly the 19th psalm, the opening 4 lines of which I quote here, plus an additional one added by nova discoverer Peter Collins, an old friend.

The heavens declare the glory of God.
And the firmament showeth his handiwork.
Day unto day uttereth speech,
And night unto night revealeth knowledge,
So long as the sky is clear.

The telescope has now been fully deployed and it is ready for its final adjustments. Unlike for the shepherd boy, and for all of us on Earth, the sky will always be clear and dark at the Lagrange 2 point (named after Italian mathematician Joseph-Louis Lagrange) in space where the telescope will live. The James Webb is there to teach us about the Universe of which we are a part, and I suspect that it will also inspire us to set aside the cares and the news of each day, head out into our back yards, and look up at the night sky.

The picture shows the Webb telescope in orbit about the Earth. Credit to NASA(ESA/CSA).

The Sky This Month 2022 February- By Rick Wagner

01 Feb - New Moon 00:46EST

Look for the extremely thin ~17 hour old crescent Moon very low in the southwestern sky shortly after sunset.

05 Feb – Mars (mag 1.3), Venus (mag -4.8), and Mercury (mag 0.4) form an attractive though rather large triangle in the southeastern dawn sky; the real challenge might be to try to see the large globular cluster M22 just 12 arcmin to the lower right of Mars - binoculars or a telescope absolutely required.

Minor planet (20) Massalia at opposition (mag 8.5)

07 Feb – the Moon will be near Uranus in the evening sky

08 Feb - First Quarter Moon

Look for the face profile in the shadows on the floor of crater Albatagnius

09 Feb – Look for the eyes in the crater Clavius on the Moon during the evening; and check out Rupes Recta – the Straight Wall

Mercury should be visible very low in the southeaster dawn sky for the coming week.

Today it is highest above the horizon as twilight begins

11 Feb - Algol will be decreasing in brightness through the late evening

12 Feb – Venus at greatest illuminated extent and its greatest brightness, very bright in the eastern sky before sunrise.

13 Feb – Venus (mag -4.9!!) will be 7° north of the 330 times fainter Mars (mag 1.4)

14 Feb – Algol at minimum about 8PM.

16 Feb - Full Moon 11:56EST

Mercury (mag 0.0) at greatest elongation west, visible low in the southeastern sky before sunrise.

23 Feb - Last Quarter Moon

Watch for the zodiacal light as a broad cone of faint light stretching up and to the left from the western horizon shortly after sunset each evening for the remainder of the month.

26 Feb - Minor planet (4) Vesta (mag 7.8) is exactly on a straight line between Venus and Mars this morning, about 2/3 of the way from Venus to Mars

27&28 Feb – a thin crescent Moon, Saturn, Mercury, Mars and Venus gather in the southeastern sky before sunrise - binoculars will help pull very low Saturn (4° left and slightly lower than Mercury) and the very low Moon out of the twilight.



Philately- The Collection and Study of postage stamps - Kim Hay



On January 18, 2022 I attended an online ZOOM talk from the Royal Astronomical Society (RAS). It was an Eventbrite talk by Katrin Roaynor-Evans speaking on " Exploring Astronomy and Space through Philately- A Brief Introduction.

It was a very interesting talk on Space and Astronomy stamps, their history and collection of stamps.

Now just some history . The first Astronomy stamp was produced by Brazil in 1887. Brazil produced several Astronomy stamps up to 1898. Moving forward in time, other countries also produced stamps, depending on the event at the time.

There were stamps of Observer's such as Copernicus, Tycho Brahe, Johannes Kepler, Galileo, Newton and Sir William Hershel. Observations of events of Enceladus Moon, Black Holes, Comet 67P, Cygnus A, Gravitational Lensing, Cat's Eye Nebula, Pulsars and Jupiter's Aurora's.

Solar System objects , Sun, Ariel 1, Mars, Venus, Earth, Total Solar Eclipse 's, Comets such as Comet West 1976 and Comet Ikeya-Seki 1965. Halley's Comet 1986, There were also stamps produced from República Dominicana of Hale-Bopp and NEOWISE.



Observational equipment such as Stonehenge, Nebra Sky disk, Astrolabe, Armillary Sphere, and telescopes. Of course also the locations of Observatories such as Central Lithuania 1911 Poczobutt Observatory , Palomar with the Hale Telescope.

In 1957-1958 was the International Geophysical Year there was a stamp commemorating the Solar Cycle 19. In 1957 Sputnik , the dog in space, and Yuri Gagarin who was the first man in space and to orbit the earth.

Not to be outdone there were the stamps of 1969 of the 1st man on the moon. It was a single stamp which was produced by Paul Calle and Chris Calle of the Eagle has landed. There have been many stamps produced since then with images from Hubble Space Telescope. We received our copy from United States Postal Service. And there was the Poster and 33 cent stamp of the Eagle Nebula which was just breathtaking.



Of course there is also first day covers , envelopes, cancelled stamps, the list goes on, and not just for Space stamps but all topics.

A bit of background of this subject in my respects. I always had an interest in stamps perhaps nudged by my father who was a Postal Employee for many years. In those days, our church used to collect stamps and send them away to third world countries, so I would look at all the stamps from all over the world.

Any special cancelled stamps my father would bring home and they would be looked at and saved. Over the years, I would tear off the stamps from letters and cards, keeping the cancellation stamp. As time went on, and when Astronomy came more a hobby , the astronomy stamps also intrigued my interest.

Astronomical Stamps were purchased from Canada Post , Guernsey Philatelic Bureau, and even driven to the US to pick up the 2017 Total Solar Eclipse stamps at the Devil's Tower Post Office(this one is very special). This Stamp was an image from Fred Espenak from the 2006 Libya Eclipse as these were available before the Eclipse, and released on June 20, 2017.

Checking International websites for other Astronomy Stamps is about the only way to know they exist. There are Stamp clubs such as the Astro Space Stamp Society , which I just found out while attending this talk.

I know the RASC has several members that are Astronomy Stamp Collectors. Our most recent acquisition are First day of Issue Sun Science



envelopes with the Coronal Hole, Sunspots, Coronal Loops Solar Flare and Plasma Blast from a friend-very much appreciate. We were also very lucky to get cancelled envelopes of the Apollo 11 manned lunar landing from MaxSold. Our collection is growing and also has Canadian Astronauts 1st day Issue stamps on envelopes. One of Roberta Bondar who just celebrated her 30th year of launching into Space, Mars Pathfinder July 4, 1997 , Constellations and more.

As per Katrin Stamp Collecting is now making a resurgence due to Social media, and it is a community with regard to research and learning.

Perhaps you will get the nudge to collect.

Links

Eventbrite Talk <https://ras.ac.uk/events-and-meetings/ras-public-lectures-and-events/exploring-astronomy-and-space-through-philately>

Yuri Gagarin (Russian Cosmonaut) https://en.wikipedia.org/wiki/Yuri_Gagarin
www.astropacestampsociety.com

Spitzer Telescope Image Post Bleed <https://www.postbeeld.com/stap30906-space-exploration-4v-m-s-spitzer-telescope>

2017 Solar Eclipse release https://en.wikipedia.org/wiki/2017_Total_Solar_Eclipse_stamp
United States Postal Service https://about.usps.com/news/national-releases/2017/pr17_020.htm

Central Lithuania 1921 <https://sites.astro.caltech.edu/palomar/homepage.html>

Palomar Observatory <https://sites.astro.caltech.edu/palomar/homepage.html>



The Frontenac Lennox & Addington Science Fair – Kevin Kell

I was curious how long we had been supporting the FLASF with prizes... it looks like we actually had a web page, located here: <https://kingston.rasc.ca/node/25>
That tells us the first prize was in 2004. Since then, every year, we have offered a cash prize and an astronomical book.



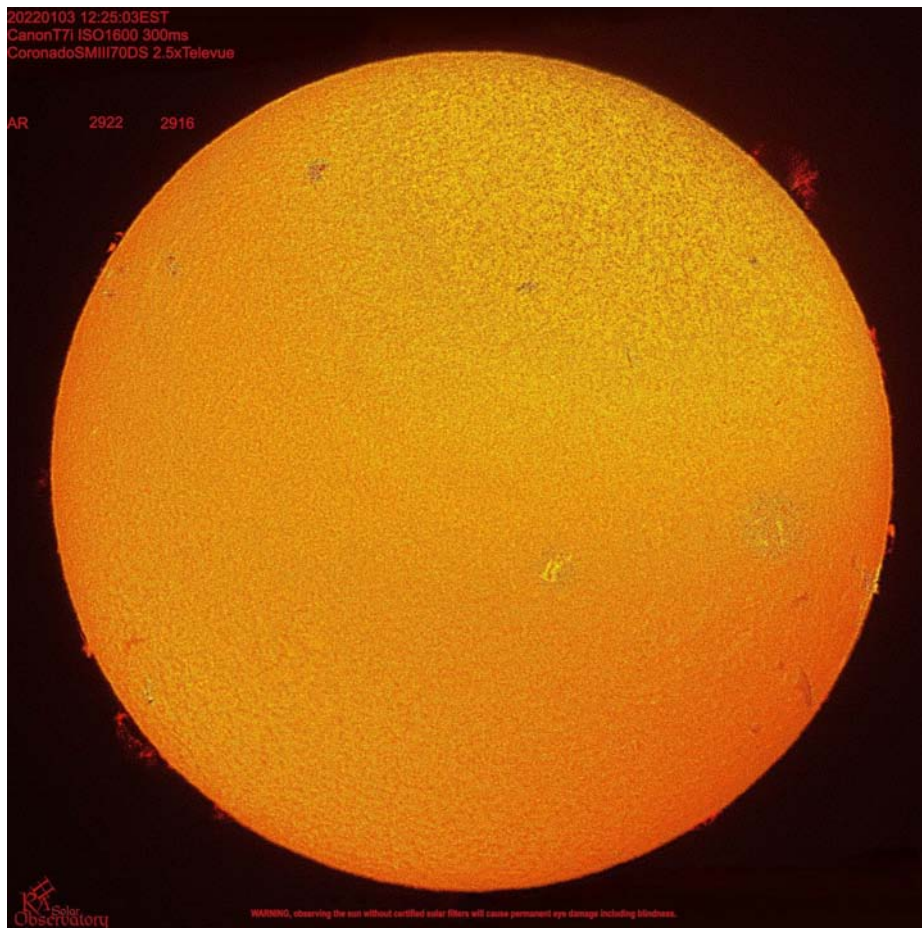
RASC-KC Solar Cycle 25 **Monthly Review**

A review of solar activity and images during the past month by RASC-KC solar observers for January 2022

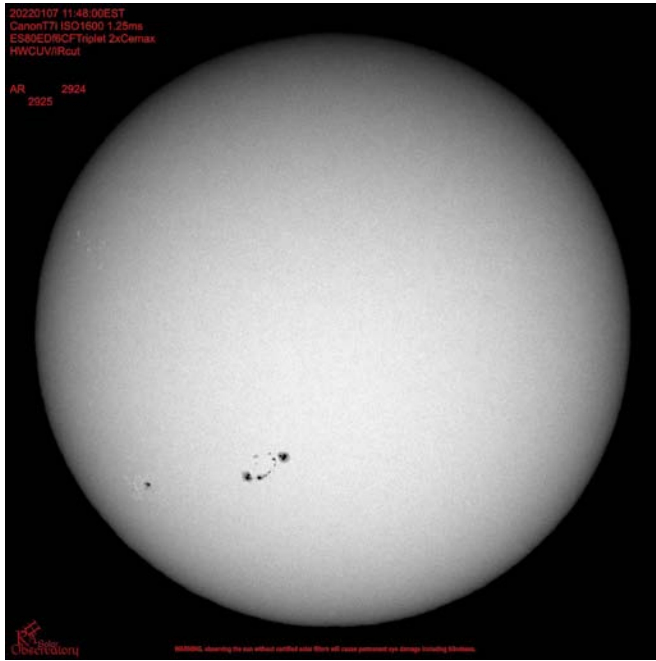


The first month of 2022 has gone by and it has been a COLD! One and has continued to stay so. Cold usually brings clear sky and for the most part it did but it also brought BAD SEEING! Bad seeing means faster exposures and more of them in hopes of catching a few steady solar milliseconds in time. Higher ISO and faster exposures did not reap the rewards I hoped for so image success was minimal the first two weeks of the month.

AR2918 launched M1.1 and C2.3 flares on a cloudy Jan 1st as it heading to disappear over the NW limb in the following 2 days. Unfortunately the flare was not earth directed. On the 3rd I had my first imaging/observing session. This bad seeing day prompted me to add some grain to the image in processing and I also had some colour & shading difficulties, I will work on this problem in future images. There were a couple of nice prominences in the SE & NW which I highlighted below with a little extra dodging, they made the session worth while.



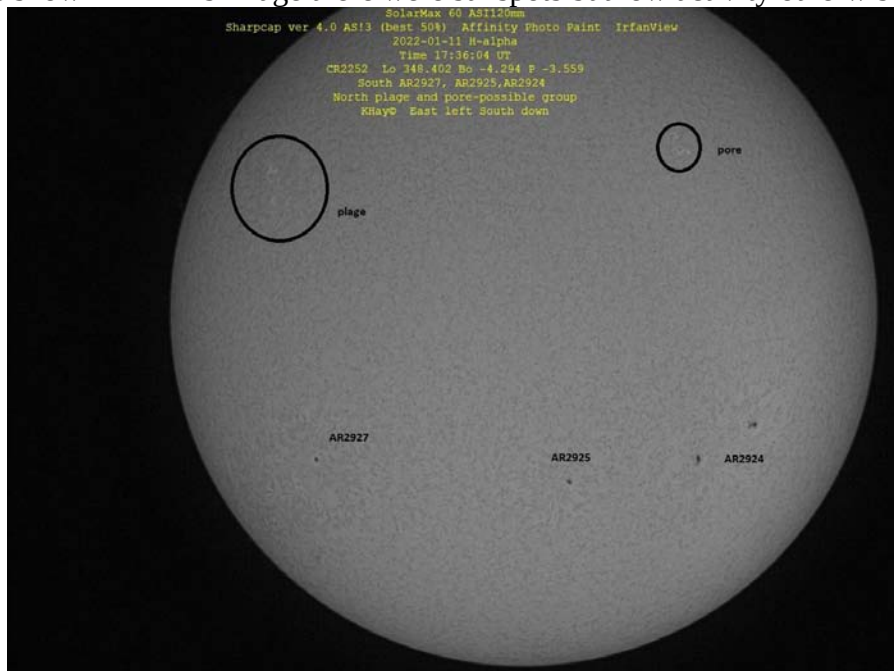
Imaging AR2924 on the 7th brought a smile not only to my face but literally to the sun's as well. This lovely sunspot group although active looking in both white light and H-alpha only spawned 4 C class eruptions before it went around the limb on the night of the 16th.



Celestron C80ED-R apochromatic refractor ASI120mm
Sharpcap ver 4.0 AS!3 (best 50%) Paint IrfanView
2022-01-07 White light Continuum Filter
Time 16:35 UT
CR2252 Lo 54.7934.Bo -3.755 Po-1.1513
East left South down
South AR2925, AR2924
KHay©

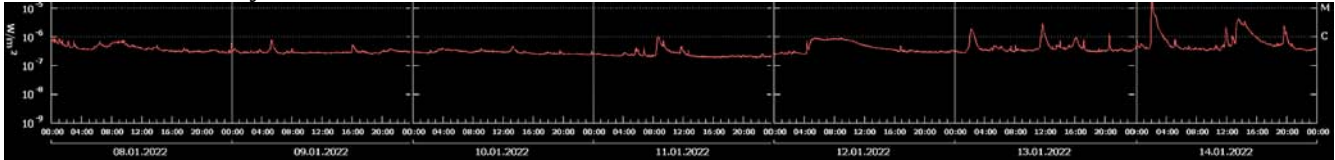
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The second week of January was a poor week with only 3 sessions for myself on Jan 8, 11 and 14. As shown in Kim's image there were sunspots but low activity otherwise.





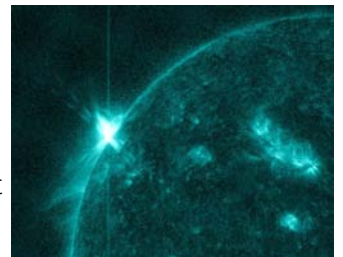
In the early hours of the 14<sup>th</sup> an M1.8 flare erupted from an unknown source on the back side of the NE solar limb. It was expected that a sizable active region would be rotating into view but it failed to materialize. This graph shows the 2<sup>nd</sup> week's lack of activity even with a good baseline of x-ray around  $10^{-6.5}$  until it began picking up on the 13<sup>th</sup> with the 14<sup>th</sup> showing the M flare followed by 4 C flares.



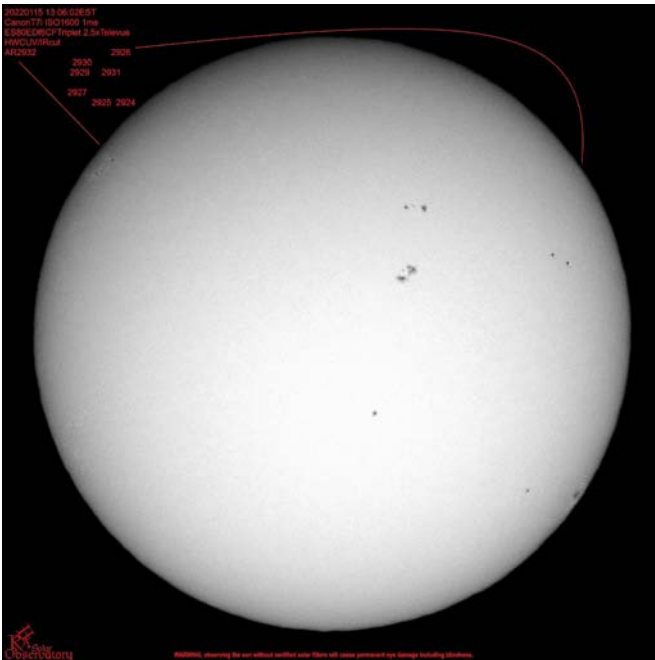
[https://tesis.lebedev.ru/en/sun\\_flares.html](https://tesis.lebedev.ru/en/sun_flares.html)

**SOMETHING FLARE-Y THIS WAY COMES:** Earth-orbiting satellites detected an M2-class solar flare on Jan. 14th (0234 UT). The explosion was even bigger than it seemed. The actual blast may have been an X-class event, partially eclipsed by the edge of the sun. This is the latest in a series of far side explosions which began earlier this week. The blast site is just behind the sun's northeastern limb, probably an unstable sunspot group. It has been hurling debris [over the edge of the sun](#) all week long.

spaceweather.com



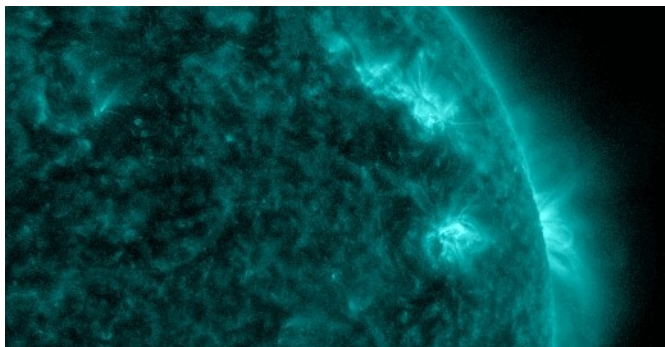
Week 3 got somewhat better weather-wise and I had 5 imaging/observing sessions which made the grumpy old man a little easier to live with I suspect. On the 15<sup>th</sup> there were 8 sunspot groups present, one in the NE and 7 in the western hemisphere of Old Sol. What a beautiful sight.



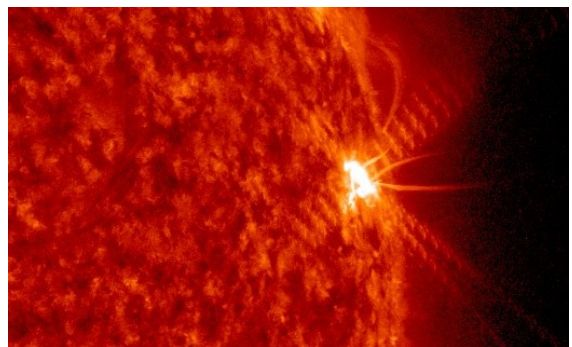
As the week went on activity got better with AR2929 erupting with two M class flares in two days, unfortunately I was not available to observe at the time of the M1.5 and the M5.5 on the 20<sup>th</sup> sadly occurred at 1:01EST. This second eruption seemed to have been a release valve on activity as the x-ray level dropped near the 10<sup>-7</sup> in the days following, there were no C or above flares until the 24<sup>th</sup>.

**SOLAR FLARE AND RADIO BLACKOUT:**

Sunspot AR2929 erupted on Jan. 18th (1744 UT) producing an [M1.5-class](#) solar flare. The movie, below, was recorded by NASA's Solar Dynamics Observatory. Note how a glowing current snakes away from AR2929 near the end of the explosion and seems to ignite a smaller flare in neighboring sunspot AR2930:



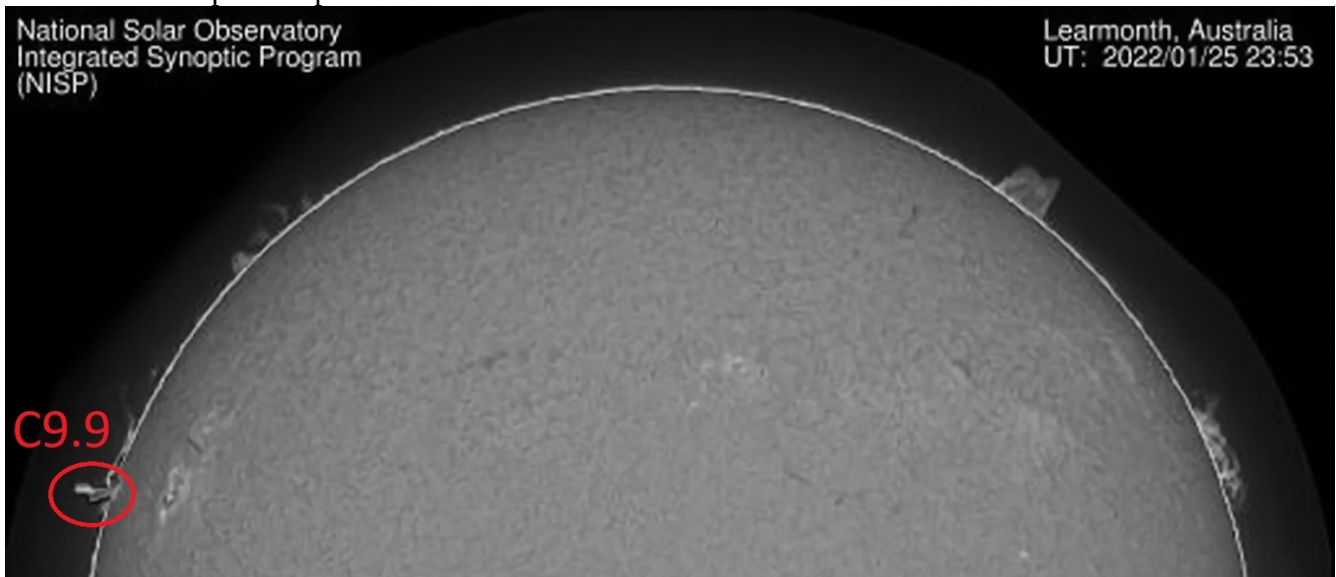
**BIG SOLAR FLARE:** Sunspot AR2929 erupted again on Jan. 20th (0601 UT), producing a powerful [M5.5-class](#) solar flare. NASA's Solar Dynamics Observatory recorded the extreme ultraviolet flash:



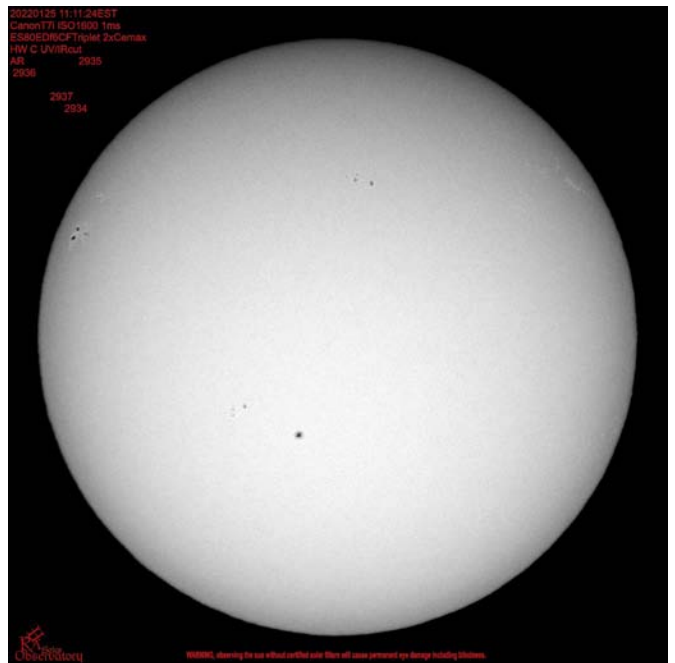
(spaceweather.com)

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During the period from the 22nd through the 24th activity was low plus the weather did not cooperate therefore I had no imaging/observing sessions. By the end of day on the 25th there was a C9.9 eruption in the solar NE which appears to have originated from the then unnumbered AR 2936. The eruption was captured by the GONG H-Alpha network in Learmonth Australia just a few minutes prior to peak.



Later on the 25th at the RHA Observatory in Newburgh Ontario I was fortunate enough to have clear sky enabling me to image some beautiful prominences and sunspots shown next including the advancing AR2936.



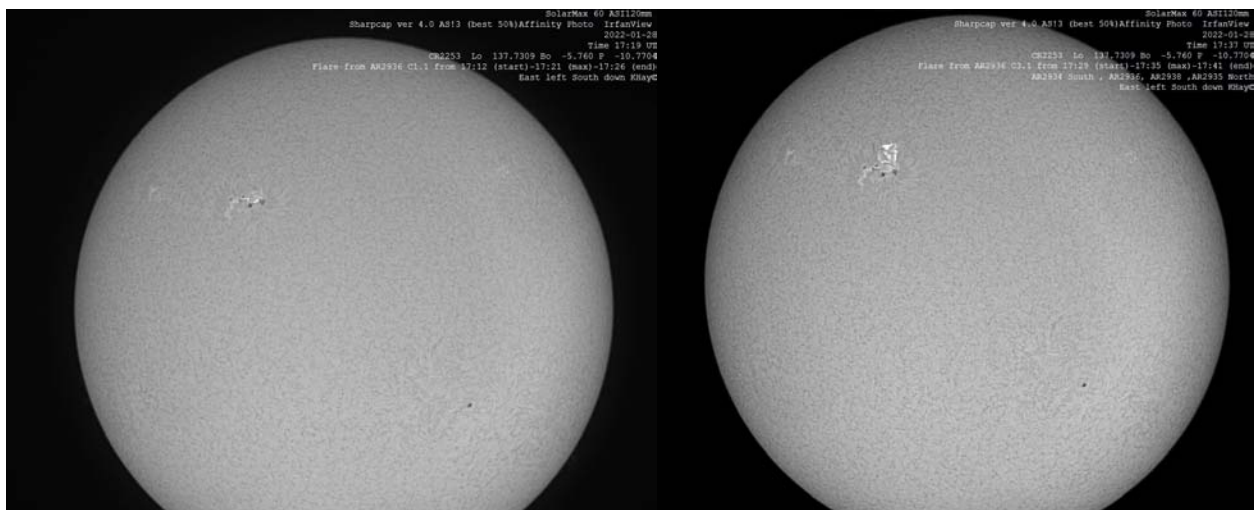
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Kim H, 20220128 :

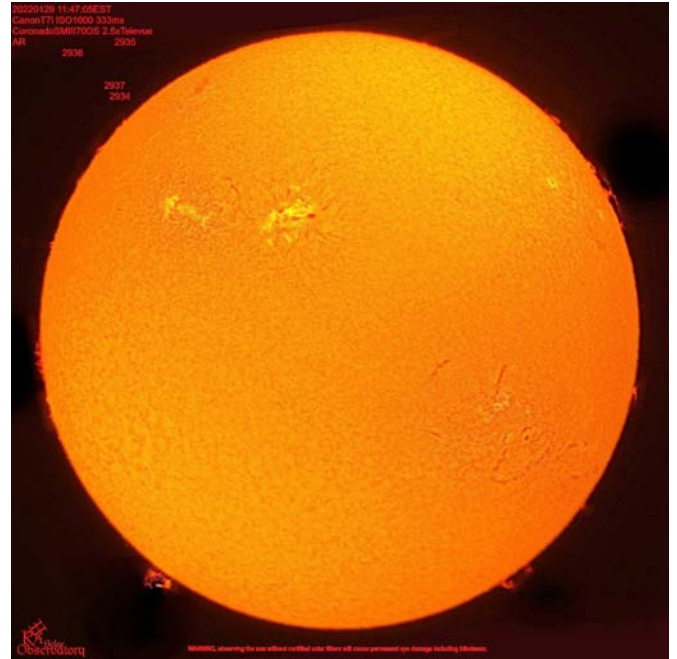
It was clear and cold (-12C) today with a cold north wind, but while out doing solar observing, I managed to catch two of the C flares that happened from AR2936 which is in the Northern Hemisphere. I am quite pleased to be able to see these flares, though one early, and one a bit after the max.

1st one was a C1.1 from 17:12 (start)-17:21 (max)-17:26 (end)

2nd one was a C 3.1 from 17:29 (start) 17:35 (max) 17:41 (end)

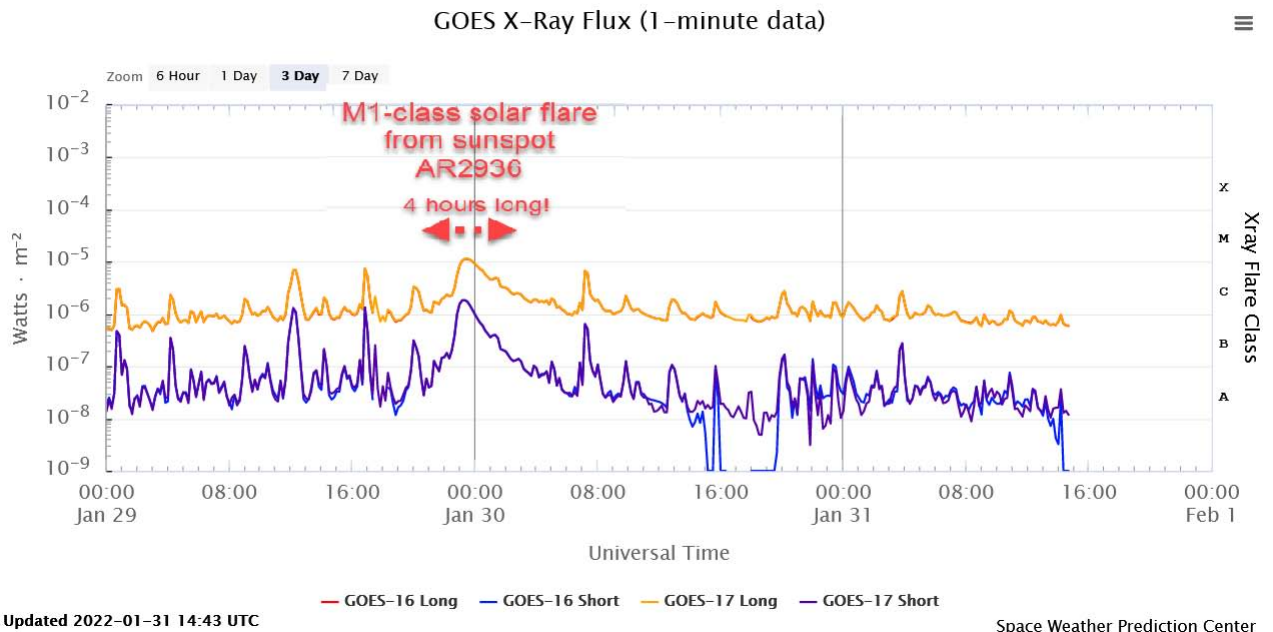


## RHA Observatory



Jan 29, the x-ray baseline has reached  $10^{-6}$  due to the activity of AR2936. This is the baseline we want and this active region is moving toward the solar meridian prime positioned for the next few days to send CMEs our way. Any such eruptions could bring us AURORA this is the time for an earth directed X FLARE!

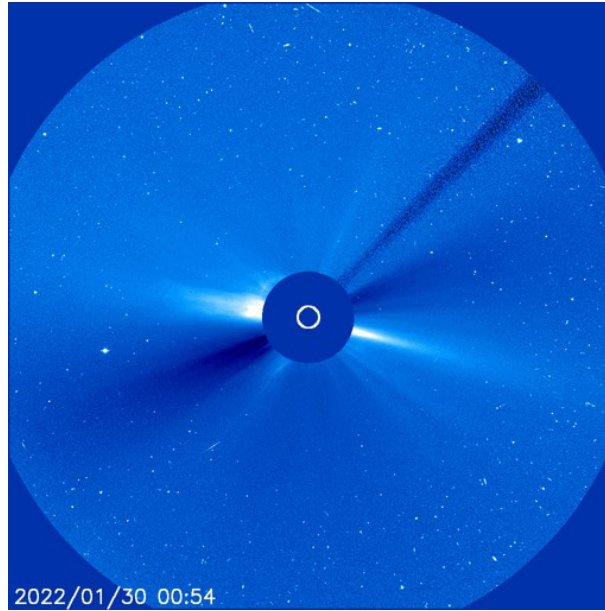
OK, I will settle for the long duration M, if I have to.



**EARTH-DIRECTED SOLAR FLARE AND CME:** A coronal mass ejection CME is heading for Earth. It was hurled into space during the early hours of Jan. 30th by big sunspot AR2936.

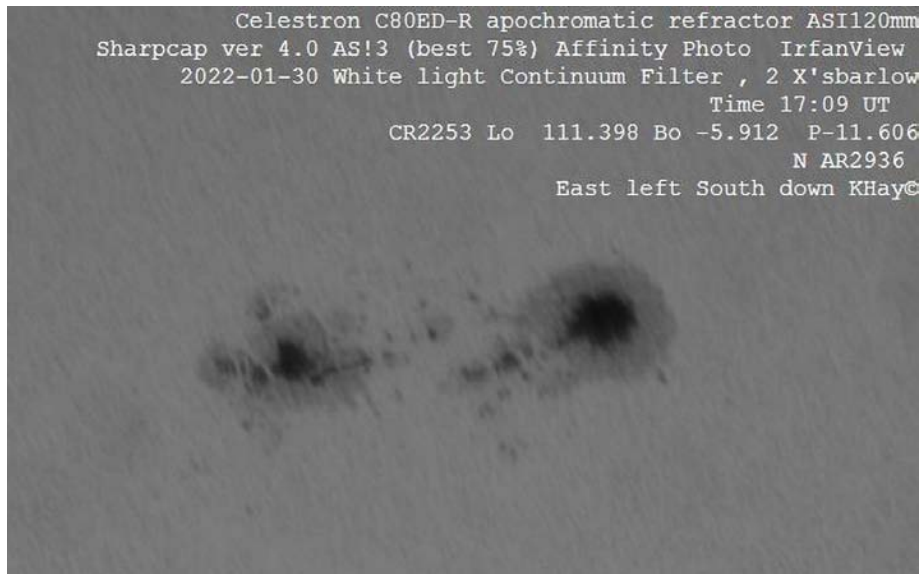
The underlying explosion was a [long duration M1-class](#) solar flare, which produced an asymmetric halo CME. [Watch the movie](#). The CME will probably arrive on Feb. 1-2. Stay tuned

for a more refined forecast. **Aurora alerts:** [SMS Text](#). (spaceweather.com)



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As the month is ending it appears by the weather today that Kim got the last image of the month with this capture of AR 2936 on the 30th. The end two weeks had over 78% of the month's flares and made for exciting imaging possibilities depending on location and weather.



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Solar count for the month:  
23 - Active regions AR2918 - 2940  
0 - X Flares  
5 - M Flares  
88 - C Flares  
14 - RHA Obs observing sessions

## The 7 greatest Sunspot Groups (the Magnificent Seven) as per Peter Meadows -January 24,2022- British Astronomical Association Report by Kim Hay

We had attended the BAA Meeting online January 22, 2022, which was streaming live on YouTube. I just wanted to share this with you as this was very interesting.

Peter Meadows is a member of the BAA Solar Section. His presentation was in the second half of the meeting, and his talk was very interesting which was on the Greatest Sunspot Groups (the magnificent Seven) .

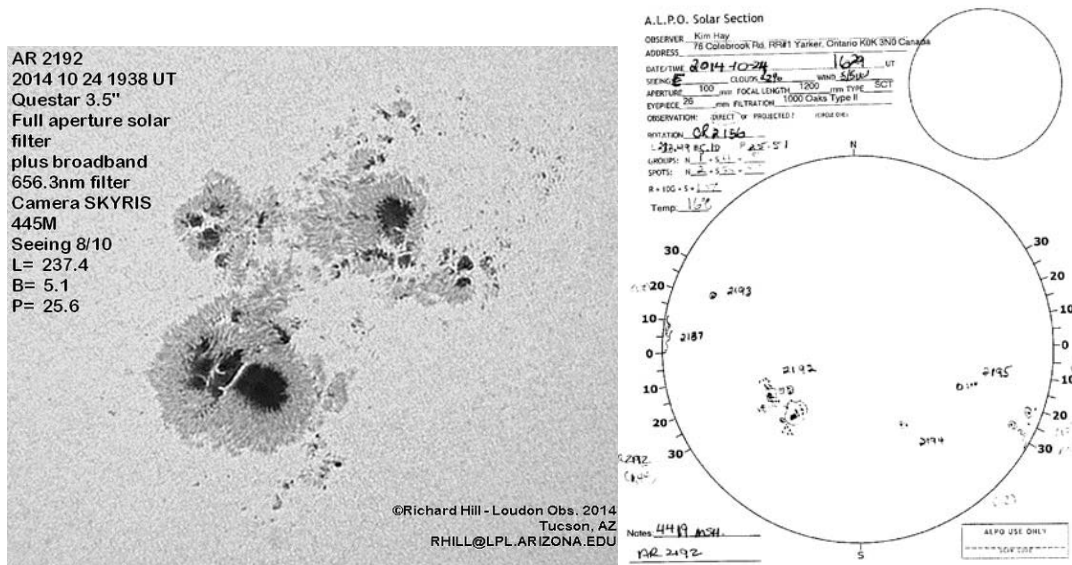
Since Cycle 25 is out performing NOAA predictions, this is a very interesting topic at this time as we have had some great activity in the recent Carrington Rotation (CR2252). Will this Cycle produce another great group?

Below is the chart of largest recorded Sunspot groups that Peter Meadow's presented.

| Active Area                                                     | Date            | Maximum Area (MSH) | Carrington Rotation* |
|-----------------------------------------------------------------|-----------------|--------------------|----------------------|
| 14886                                                           | April 8, 1947   | 6132               | CR1251               |
| 14417                                                           | Feb 7, 1946     | 5202               | CR1236               |
| 16763                                                           | May 19, 1951    | 4865               | CR1306               |
| 14585                                                           | July 29, 1946   | 4720               | CR1242               |
| 14851                                                           | March 12,1947   | 4554               | CR1250               |
| 12192                                                           | October 24,2014 | 4419               | CR2156               |
| 5395 - CME Caused the 1989 blackout in Quebec*- Northern region | March 14, 1989  | 4201               | CR1813               |

MSH=Millionths of Solar Area \* Notes added by KH

Below is an image from the ALPO Solar Gallery in CR2156 by Rick Hill for Oct. 24, 2014. Please view the Solar Gallery for the rest of the images for CR2156. Also attached is my sketch of the Sun on Oct 24, 2014.



Please take a few moments to watch the YouTube video on Peter Meadow's talk. He also talked about these groups that came back for the second and third time , which of source are

renumbered.

### Links for Viewing (copy and paste in your browser)

<https://www.youtube.com/watch?v=ME-vtmVsn2k> BAA Meeting January 22, 2022 about 1:05:24 in to the recording.

<https://solarwww.mtk.nao.ac.jp/en/bigspots.html> Solar Science Observatory (NAOJ, Mitaka)  
Of course researching information on the 1989 group AR5395 then led down the rabbit hole to Wikipedia, a PDF paper "The Major Magnetic Storm of March 13-14, 1989 and Associated Ionosphere Effects" in the Canadian Journal of Physics, June 1993 by Frederick Rich and William Denning, Sky & Telescope back issue of May 1989, the AAVSO Solar Section Solar Report AAVSO\_SB\_1989\_03.pdf. Of course researching the ALPO past listings of Carrington Rotations and The Strolling Astronomer (Volume 34 Issue 2 April 1990 Pg 93-98).  
Enjoy the YouTube video!



### Notes from Members

How many astronomers does it take to change a lightbulb?

None: we prefer standard candles.

I was really disappointed when I came last in the astronomy competition, but they still gave me a map of the stars just for participating. It was a constellation prize

A man asks the worker at the astronomy museum how old the universe is. He responds 13.7 billion and 7 years old.

The man is puzzled how the worker knew the age to such precision. The worker answered, When I got this job, the person who hired me told me that the universe is 13.7 billion years

old, and I've worked here for seven years.

I lost my astronomy job at the observatory No matter how hard I tried I just couldn't stay focused

How do astronomers organize a party?  
They Planet!

Astronomers got tired after watching the moon go around the earth for 24 hours So they called it a day

What is a Mexican astronomer's favorite food?  
A Quasar-dilla.

### Solar System Walk – Cathy Hall

Discussion on the email chat list led to this flood of Solar System Walk information:

[https://en.wikipedia.org/wiki/Solar\\_System\\_model](https://en.wikipedia.org/wiki/Solar_System_model)

I see that the planet walk at Saint-Louis-du-Ha! Ha! in Quebec has been dismantled... it was great to visit it on the way to the GA years back...

I've been to the Sagan Planet Walk in downtown Ithaca, it's pretty neat:

[https://en.wikipedia.org/wiki/Sagan\\_Planet\\_Walk](https://en.wikipedia.org/wiki/Sagan_Planet_Walk)

Lots of others on the list... different ways of representing and construction...

And of course... just searching on 'solar system walk'... brings up all kinds of neat stuff... oh, here's one in Yorkshire UK where they show the construction for both a solar walk and handmade planetarium:

<https://www.limetreefarm.org/solar-system-walk>

and University of Alaska planet walk, skip through and see basic construction:

<https://www.youtube.com/watch?v=A1jiKWpZyu0>

Forgot one I was going to mention... solar system by bicycle!

[https://www.youtube.com/watch?v=ry122Jqpxu4&list=RDCMUCG1HLA8IEqZ09\\_C\\_7u5tUjQ&start\\_radio=1&rv=ry122Jqpxu4&t=0](https://www.youtube.com/watch?v=ry122Jqpxu4&list=RDCMUCG1HLA8IEqZ09_C_7u5tUjQ&start_radio=1&rv=ry122Jqpxu4&t=0)

v=ry122Jqpxu4&list=RDCMUCG1HLA8IEqZ09\_C\_7u5tUjQ&start\_radio=1&rv=ry122Jqpxu4&t=0



### **Planetary Lineup: Jupiter, Saturn and Mercury - January 8th, 2022. - Bruce Elliott**

Over the past few weeks, I've been following the line dancing of planets visible by naked eye from Lake Ontario Park looking SW. On this clear night at dusk, I was able to see Jupiter, Saturn and Mercury in a perfect diagonal line. I recently acquired a Canon EOS M5 mirrorless camera, and was excited to try it out. The exposure time was only 2

seconds, a much shorter duration than required with my DSLR camera. Now I am excited to try the mirrorless camera out on other sky objects. Technical: 24mm, ISO 400, f/4, 2s.

### **M33 – Stephen Craig**

I spent most of my time in 2021 imaging galaxies. So I think it is only fitting that my best is a galaxy. I have imaged M33 many times before but I was never quite satisfied with the outcome. With this effort I tried a new technique, HDR (High Dynamic Range) imaging. I was thrilled with the result. The detail and colour is outstanding.

To make this image I stacked 5 exposures each of 5, 10, 15 and 20 minutes. My equipment is my Celestron 11 inch f/10 Schmidt-Cassegrain telescope. Mallincam

Universe II CCD Camera, Innovations Foresight on axis guider with an Starlight Express Ultra Star guide camera. I guided with PHD2, stacked with Deep Sky Stacker and enhanced with Photoshop.



M33-Final.jpg 4.5 MB

## Steve Craig's Galaxy of the Day for January 2022



Day 277 NGC5678 is a spiral galaxy about 88 million light years away in Draco. It was discovered on April 17, 1789 by William Herschel.

Day 278 NGC5689 (lower) is a lenticular galaxy about 98 million light years away in Bootes. NGC5682 (upper) is a spiral galaxy about 104 million light years away. NGC5689 was discovered on May 12, 1787 by William Herschel. NGC5682 was discovered on April 15, 1850 by William Parsons.

Day 279 NGC5690 is a spiral galaxy about 80 million light years away in Virgo. It was discovered on April 30, 1786 by William Herschel.

Day 280 NGC5713 is an asymmetric spiral galaxy about 95 million light years away in Virgo. It noticeably has one prominent spiral arm, probably due to a recent interaction with nearby NGC5719. It was discovered on April 11, 1787 by William Herschel.

Day 281 NGC5719 is a spiral galaxy about 95 million light years away in Virgo. It is a close companion of yesterday's NGC5713. It was discovered on April 11, 1787 by William Herschel.

Day 282 NGC5714 is an edge on spiral galaxy about 130 million light years away in Bootes. It was discovered on May 12, 1787 by William Herschel.

Day 283 NGC5728 is a barred spiral galaxy about 146 million light years away in Libra. It was discovered on May 7, 1787 by William Herschel.

Day 284 NGC5740 is a flocculent spiral galaxy about 71 million light years away in Virgo. It was discovered on February 24, 1786 by William Herschel.

Day 285 NGC 5746 is an edge on spiral galaxy about 95 million light years away in

Virgo. It was discovered on February 24, 1786 by William Herschel.

Day 286 NGC5752 (lower) and NGC5754 (upper) are a pair of interacting galaxies about 206 million light years away in Bootes. Together they are catalogued as #297 in the Arp Atlas of Peculiar Galaxies. They were discovered on April 1, 1878 by Lawrence Parsons.

Day 287 NGC5774 (upper) is a spiral galaxy about 71 million light years away in Virgo. It was discovered on April 28, 1851 by Bindon Stoney, NGC5775 (lower) is an edge on spiral galaxy about 70 million light years away. It was discovered on September 20, 1786 by William Herschel. They are in the beginning stages of a merger.

Day 288 NGC5777 is an edge on spiral galaxy about 99 million light years away in Draco. It was discovered on April 17, 1789 by William Herschel.

Day 289 NGC5806 is a spiral galaxy about 70 million light years away in Virgo. It was discovered on February 24, 1786 by John Herschel.

Day 290 NGC5820 (upper) and NGC5821 (lower) are a pair of possibly interacting galaxies about 168 million light years away in Bootes. NGC5820 is catalogued as #136 in the Arp Atlas of Peculiar Galaxies. They were discovered on May 5, 1788 by William Herschel.

Day 291 NGC5829 is a spiral galaxy about 147 million light years away in Bootes. It is interacting with IC4526 a little lower to the right in this image. NGC5829 is catalogued as #42 in the Arp Atlas of Peculiar Galaxies. It was discovered on May 11, 1882 by Eduard Stephan.

Day 292 NGC5832 is a very low surface brightness spiral galaxy about 41 million light years away in Ursa Major. It was discovered on March 16, 1785 by William Herschel.

Day 293 NGC5850 is a barred spiral galaxy about 93 million light years away in Virgo. It has a prominent ring and faint spiral arms. It was discovered on February 24, 1786 by William Herschel.

Day 294 NGC5899 (left) and NGC5900 (right) are a pair of spiral galaxies about 127 million light years away in Bootes that may have interacted in the recent past. They were discovered on March 19, 1787 by William Herschel.

Day 295 NGC5905 is an intriguing barred spiral galaxy about 140 million light years away in Draco. It was discovered on May 5, 1788 by William Herschel.

Day 296 NGC5907 is a beautiful edge on spiral galaxy about 50 million light years away in Draco. It is also known as the Splinter Galaxy. For some reason it has two NGC designations. NGC5906 refers to its southern (lower) edge below the dark dust lane.

NGC5907 discovered on May 5, 1788 by William Herschel. NGC5906 was noted on April 13, 1850 by George Stoney.

Day 297 NGC5908 is another nice edge on spiral galaxy. This one is about 140 million light years away in Draco. It was discovered on May 5, 1788 by William Herschel.

Day 298 NGC5929 and 5930 are pair of interacting galaxies in Bootes. 5929 is the lower one. They are catalogued as #90 in the Arp Atlas of Peculiar Galaxies. They were discovered on May 13, 1828 by John Herschel.

Day 299 NGC5951 is an almost edge on spiral galaxy about 120 million light years away in Serpens Caput. It was discovered on March 19, 1787 by William Herschel.

Day 300 NGC5953 (upper) and NGC5954 (Lower) are a pair of interacting spiral galaxies about 90 million light years away in Serpens Caput. They are catalogued as #91 in the Arp Atlas of Peculiar Galaxies. They were discovered on April 17, 1784 by William Herschel.

Day 301 NGC5962 is a spiral galaxy about 120 million light years away in Serpens Caput. It was discovered on March 21, 1784 by William Herschel.

Day 302 NGC5963 (upper) is a small spiral galaxy about 40 million light years away in Draco. NGC5965 (lower) is a large edge on spiral galaxy about 150 million light years away. It was discovered on May 15, 1788 by William Herschel.

Day 303 NGC5964 is a barred spiral galaxy about 75 million light years away in Serpens Caput. It was discovered on April 24, 1830 by John Herschel.

Day 304 NGC5981 (right) is an edge on spiral galaxy about 125 million light years away in Draco. NGC5982 (middle) is an elliptical galaxy about 130 million light years away. NGC5985 (left) is a spiral galaxy about 140 million light years away. They were discovered on May 25, 1788 by William Herschel.

# Stephen Craig's Galaxy Image of the Day



NGC5678



NGC5689



NGC5690



NGC5713



NGC5714



NGC5719



NGC5728



NGC5740



NGC5746



NGC5752



NGC5774



NGC5777



NGC5806



NGC5820



NGC5829



NGC5832



NGC5850



NGC5899



NGC5905



NGC5907



NGC5908



NGC5929



NGC5951



NGC5953



NGC5962



NGC5963



NGC5964



NGC5981-85\_stitch