Regulus 2021 December

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

The RASC-Kingston Centre A.V. Douglas Award

The major award of the RASC Kingston Centre is The A. Vibert Douglas Award, named after the founder of the Kingston Centre, its most outstanding member. The award may be presented annually to honor the contribution or achievement of a member of the Kingston Centre, although it need not necessarily be presented every year.

The award will be presented for: Service (including longstanding dedication, or a recent contribution or contributions to the Centre or the Society) and/or an astronomical achievement (including a discovery, invention, literary presentation, or related achievement, any of which may be a recent and one-time matter or an achievement over many years).

It is intended that the award be presented to recognize contribution and/or achievement by a member of the Centre who may not necessarily receive the recognition which is his/her due, and that it not necessarily be given to a member of the Centre who is already receiving Centre and or National recognition for another reason such as because of a position held in the Centre or on National Council.

This year's awards go to:

Dr. Laurie Graham

Since joining the Kingston Centre, Dr Graham has been an enthusiastic participant in all aspects of club life. As a supporter of Astronomy outreach, Laurie has routinely taken part in events we share with Queen's University and the Royal Military College. These include the monthly open house at Queen's Observatory, Science

MEETINGS

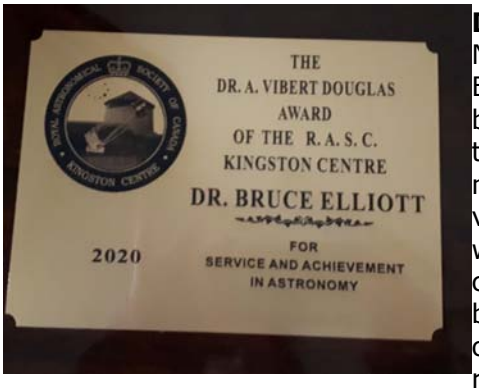
RASC-KC Wednesday Weekly Social videoconference. 7pm Eastern all weeks except the 2nd Wednesday of the month. For members and their guests. Email list subscribers receive the link weekly 1 or 2 days beforehand. Next Social: Wed 2021 December 15

RASC-KC Regular Monthly Meeting - Wednesday 2021 December 08 a virtual Zoom meeting at 19:00 EST the Regular Meeting. Sudbury RASC President – Alan Ward **"Testing of Astronomical Optics in the Computer Age"**

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

In the December Issue

Rendezvous and Astronomy Day. Her patience and teaching skills have also proven invaluable in bringing Astronomy to Guide groups. In talks to the Centre, Laurie has shared her interest in Geology as it applies to the planets of the solar system, reminding us that there is still plenty to explore in our own backyard. As often happens in Centre's with a small active core, Laurie has found herself on the local executive committee as Vice President and that has been greatly appreciated. Thank you Laurie!



Dr. Bruce Elliott

New to Astronomy when he joined the Kingston Centre, Bruce Elliott wasted no time in volunteering for outreach events. He began with Guide events and Science Rendezvous, eventually taking the lead for the Centre in the KFLA Science Fair. Most notably during the Covid-19 pandemic he lead a group of volunteers in our first elementary outreach via Zoom. This was well received and has provided an experience that the Centre could build on in the future. New volunteers with new approaches bring a breath of fresh air to the Centre and lightens the load of outreach which is an important part of our club mandate and a rewarding endeavour. We hope Bruce's fresh enthusiasm for Astronomy never diminishes. Thank you Bruce!

We created another award for contributions to the centre, by someone who may not be a member. The next award winner for "**Friends of the RASC Kingston Centre**" is:

Devin Graham-Ancsin

Devin joined the Kingston Centre as a youth in a family membership. From the start he was an engaged member, attending meetings, helping as a regular in monthly Queen's University Observatory Open House nights, Guide events and taking part in Science Rendezvous, often carrying a very heavy telescope! It has been very encouraging for long time members to have younger representatives showing up and taking part. Whether it is participating in Q and A with guest speakers or competing in a rocket design challenge at Fall'n'Stars, bringing young people into the mix benefits us all. We hope that Astronomy will always be part of Devin's life, providing a hobby that continues to feed his curiosity of science. Thank you Devin!

Minor Planet Names

From: https://www.iau.org/static/publications/wgsbn-bulletins/wgsbn-bulletin-2111.pdf

(10062) Kimhay = 1988 RV4 Discovery: 1988-09-01 / H. Debehogne / La Silla / 809
Kimberley Dawn Hay (b. 1959) is an enthusiastic observer, sunspot and meteor recorder, and sketch artist, who has contributed to the American Meteor Society, AAVSO, American Lunar and Planetary Observers, and the RASC. She has won the RASC Service Award and the RASC Chilton Prize

(10076) Rogerhill = 1989 PK Discovery: 1989-08-09 / E. F. Helin / Palomar / 675
Roger Hill (b. 1955) has been a member of the Royal Astronomical Society of Canada, Hamilton Centre, for decades and served on the Board for most of that time, including as President. He edited the monthly newsletter Orbit for decades and has been involved with a plethora of outreach activities, including a course for new observers in visual astronomy.

Congratulations! For a complete listing of minor planets associated with the RASC Kingston Centre, Queen's University, The Royal Military College and the Kingston Region, see later in this issue.

https://www.cbc.ca/news/canada/ottawa/ottawa-astronomers-asteroid-named-for-them-1.6250307

Presidents Tidbits - Kim Hay

The winter Solstice is slowly creeping its way into our neighbourhood. Early observing and long nights are in store for us, but when the Solstice happens our Earth will start its tilt so the Northern hemisphere will be pointing towards the sun. Enjoy these nights for observing. We have been lucky that the temperatures have not been too bad. A few snow blankets here and there, but not metres worth of snow.

Our December meeting guest speaker, Al Ward , President of RASC Sudbury and Moonward Coatings, will present on " **Testing of Astronomical Optics in the Computer Age".**

We have a great line up for the next three months into the New Year, but we are looking for talks from our members. It does not need to be a long talk, 20-40 minutes depending on your topic. If interested please drop us a note at kingston@rasc.ca

For now, we are still in ZOOM mode. Queen's University still has not opened up to the public groups, so we await the word.

We have two award winners for the A.V.Douglas award for 2020. Dr. Bruce Elliott and Dr. Laurie Graham.

Also the first award winner of the Kingston Centre's newest Award, Friends of the RASC Kingston Centre goes to Devin Graham-Ancsin. The citations for these awards are on the Kingston Centre website. Congratulations to all.

I personally would like to thank everyone who has helped make the Centre run, sparkle and shine and participated in any way for outreach during 2021. It has not been the easiest year, though we did get one outing with Fall 'N' Stars 2021.

The Executive wishes **Everyone** have a very safe and Happy Holiday Season, and may you get some astronomical goodie under the tree. If not then console yourself with a treat from the Commemorative 60th Anniversary Recipe selection found later in the newsletter.

Skyward December 2021
By David H. Levy

Daffy Duck

Agreed, this seems like an awfully daffy title for an astronomy article. But there is method to the madness, and there is a story. During the late summer of 2019 there was a star party in southeast Arizona that featured a dark sky and five perfect back-to-back nights As I spent hour after hour hunting for comets, I came across the sprawling North America Nebula in the northern sky constellation of Cygnus the swan. But this time something different appeared. It was a strange structure, the outline of a dark nebula bordered by a slightly brighter cloud. The whole feature was rather subtle, so that sometimes it was there, and then it faded so that sometimes it wasn't. I spent some time trying to determine a name for it. It looked like the head of a duck. I couldn't call it the wild duck nebula, as there is a cluster with that name. And Donald Duck is a bit confusing. So how about calling it the Daffy Duck nebula?

Thus, the structure is named after Daffy Duck. It is No. 403 in my catalog of interesting things found during my more than 56 years of comet hunting. I believe it is a small dark construction at the northern tip of the North America Nebula, about where Hudson Bay is not accurately located. It could have been where the Gulf of Mexico is, but that area is virtually impossible to spot visually, even under a dark sky. Like the Horsehead Nebula in Orion, it is very difficult to spot and it is best viewed only in a photograph. The accompanying picture shows it at its top, a little to the left of center. The accompanying photograph was taken using the Hubble Space Telescope.

There are more than four hundred other celestial objects that have come my way over the years. Beginning with NGC 1931 which I spotted in January 1966, many of these are already well-known deep sky objects in the night. But a few are interesting groupings of stars, called asterisms, that no one has pointed out before. One of my favorites is a structure of faint stars I call "Wendee's Ring."

These always welcome objects in the sky are fun to observe and they enhance my enjoyment of my hours under the stars. When I can see Daffy Duck, it reminds me of the happy hours I spent as a child at Beaver Lake, an artificial pond near the top of Mt. Royal in Montreal, that hosts dozens of mallard ducks. On clear, moonless nights now, I offer a cosmic hello to Daffy Duck and the many objects in the night sky I have come to treasure as good friends.

The Sky This Month 2021 December by Rick Wagner

03 Dec - very thin crescent Moon (about 20hrs before new) just above SErn horizon shortly before sunrise.
03 Dec – Venus at its greatest illuminated extent and brightest -4.9 mag
03 Dec – Comet Leonard (perhaps mag 6.5?) passes by M3 (mag 6.3) for a great photo opportunity. Watch Leonard through the month as it moves from Canes Venatici, races across Bootes and Serpens Caput to disappear in the morning twilight.
04 Dec – New Moon 02:43EST
05 Dec – all month Venus, Saturn, and Jupiter form a lovely line along the ecliptic. This evening a thin crescent Moon joins them below and right of Venus just after sunset.
06 Dec - crescent Moon below Venus in the SW after sunset
07 Dec – crescent Moon below Saturn in the SW after sunset
08 Dec – crescent Moon below Jupiter in the SW after sunset
08 Dec - Algol at minimum for about 2 hours around 00:20EST
09 Dec – nearly first quarter Moon left of Jupiter in the SSW after sunset
10 Dec - double shadow transit on Jupiter: the shadow of Europa moves onto the SW edge of Jupiter's disk as Callisto's shadow moves off the SE limb; meanwhile Europa itself is transiting across the disk. 17:15EST
10 Dec - Algol at minimum for about 2 hours around 21:10EST
10 Dec – minor planet (44) Nysa at opposition (mag 9.1)
14 Dec - Geminid meteor shower peaks in the early morning - best observing will be after the Moon sets at about 3AM
15 Dec – Comet Leonard reappears in the evening sky shortly after sunset but it will stay low for the rest of the month, setting in twilight
18 Dec - Full Moon - near solstice so it is at its highest in the sky, also the smallest full moon of the year
18 Dec – will the James Webb Space Telescope finally launch!?
21 Dec – winter solstice – astronomical winter begins 10:59EST
22 Dec – Ursid meteor shower peaks, best viewing before dawn; very minor shower badly affected by a gibbous Moon
27 Dec – Last Quarter Moon
29 Dec – Mercury (mag -0.7) is 4.5º to the lower left of brilliant Venus (mag -4.4) in the SW sky shortly after sunset. Binoculars may help to see it. Pluto is less than 1º to Mercury's upper left but at mag 14.4 you won't see it in the twilight.
30 Dec - Mercury is 5.3º left of Venus in the SW sky shortly after sunset.
31 Dec – Mars and a thin crescent Moon form a triangle with Antares in the SE sky shortly before sunrise. Compare the colour of Mars and Antares which means 'rival of Mars' (Ares is the Greek Mars.)

Request for Submissions: RASCKC Annual Report - Year in Review Member images 2021

As a follow up to last year's tremendously successful RASCKC Annual Report - Year in Review Member Images 2020, I am putting the call out to members to submit their single best image of the calendar year (2021) for inclusion into an annual Year in Review compilation.

The idea is to record in history some of the activity and talent of our members into a permanent history. So far the idea is to put this into an electronic document (PDF) and make it available on our website. Layout will be one image per page with a couple of paragraphs of text.

Resolution should be a large as possible (ie do not shrink it down) and preferably in lossless .png or .jpg format.

Please include a paragraph of technical details and a paragraph as to why you selected this particular image (ie any special meaning, etc).

Send your submission to me at kevin@starlightcascade.ca

AFTER December 6th (ie I need to get the December Regulus newsletter out first) but BEFORE or at noon Wednesday 2022 January 5th

The inspiration comes from The British Astronomical Association Annual Meeting, and the desire to keep more current activities/events in a recorded history.

You can see the 2020 publication here: https://kingston.rasc.ca/kc-gallery-2020

I am hoping for MORE submissions this year!

Thanks!

November 10, 2021 Regular Meeting Minutes

Prepared by Kim Hay

The RASC Kingston Centre Annual meeting was held first on ZOOM for members only. When concluded at 7:44 pm. The regular meeting was started and YouTube was turned on for live streaming. There were 23 people on the ZOOM call.

Susan Gagnon read a notice from the IAU -The Working Group on Small Bodied Nomenclature, that it was announced that President Kim Hay have an asteroid designation of 10062 Kimhay. Listed below are the citations for all designations ,Roger Hill 10076 Rogerhill (Hamilton, Kingston), Greg Lisk 10065 Greglisk (Belleville), Kim Hay 10062 Kimhay(Kingston)

(10062) Kimhay = 1988 RV4 Discovery: 1988-09-01 / H. Debehogne / La Silla / 809 Kimberley Dawn Hay (b. 1959) is an enthusiastic observer, sunspot and meteor recorder, and sketch artist, who has contributed to the American Meteor Society, AAVSO, American Lunar and Planetary Observers, and the RASC. She has won the RASC Service Award and the RASC Chilton Prize.

(10065) Greglisk = 1988 XKDiscovery: 1988-12-03 / Y. Oshima / Gekko / 888
Greg Lisk (b. 1963) has served as president of the Royal Astronomical Society of Canada, Belleville Centre, where he organized field trips, designed award programs, judged local science fair entries, prepared displays, arranged star parties and gave presentations at outreach events, both indoor and outdoor. He won the RASC Service Award in 2014.

(10076) Rogerhill = 1989 PKDiscovery: 1989-08-09 / E. F. Helin / Palomar / 675
Roger Hill (b. 1955) has been a member of the Royal Astronomical Society of Canada, Hamilton Centre, for decades and served on the Board for most of that time, including as President. He edited the monthly newsletter Orbit for decades and has been involved with a plethora of outreach activities, including a course for new observers in visual astronomy.

Next up was Rick Wagner who's talk was titled IMAGE NOISE. This was based on his submission to the November 2021 edition too Regulus. He talked on the Bias and Darks noise which images

need to overcome along with the sky's issues in order to achieve an image that is clear and do photometry. Questions on how to do Bias dark, and flat frames were discussed . Dark frames should be taken at the same temperature as your light images. Rick will come up with a talk on how to balance the noise. Key is to spread the noise around.

Hank's Sunspot by Hank Bartlett was next where Hank presented the activity of the Sun since October 14, 2021. Solar is picking up, with the Sun gave off two M class flares M1.4 Oct 28 and another M2.2, images from Cerro Tololo Chile. Also see H-alpha , Aurora was very low in Newburgh on November 3rd, and the rest of Canada seemed to get a fantastic display. There were a H-alpha images from the M class solar flare from exiting sunspot AR2891 from Cerro Tololo Chile. Overall 1 X class, 8 M class and 76 C class flares since Oct 14, 2021to November 10, 2021.

Rick Wagner also reported on the November and early December skies with What's up on the sky and happenings.

Events:

Nov 12- RASC Sunshine Coast- ZOOM meeting Margaret Ikape-Probing the Epoch of Reionization with the Simons Observatory (22EST)
Nov 19- Larry Widrow-In the Balance: Statis is Disequilibrium in the Milky Way Queen's U.
Nov 20- Roberto Abraham (1930 EST) Mississauga Centre -Online
QUO- Fast Radio Burst podcasts- Dangerous Universe: Star Slaying
http://observatory.phy.queensu.ca/

BAA Events
Nov 17-The Fall, Recovery, and Initial Analysis of the Winchcombe meteorite (14:00 EST)
Dec 3-Radio Astronomy Section- SARA presents (14:15 EST)
Dec 4-BAA Christmas Meeting (0900EST)

AAVSO Webinars
Nov 13 David Turner- St. Mary's University- The Importance of Visual Observing , John Thorstensen -Dartmouth - Cataclysmic Variables in the Age of Surveys; What can we do?
Nov 27- Kristine Larsen- Seeing Spots (Safely): Getting Started in Solar Observing and Gabriel Murawski TBA
Dec 4- Chris Colvin-AAVSO Slooh

More night time observing 11+ hours after nautical twig light. Lunar calendar .
Sky events were listed :
Nov 11-1st Quarter Moon
Nov 12-North Taurid meteor shower
Nov 15- Algol at minimum for 2 hours (02:50EST)
Nov 17-Leonid meteor shower
Nov 17- Algol at minimum for 2 hours(10:40EST)
Nov 19 -Full Moon
Nov 19- Nearly total lunar eclipse (02:18- 05:47 EST) between the Pleiades and Hyades(98%)
Nov 27- Last Quarter Moon
Dec 3- thin crescent Moon before sunrise
Dec 4- New Moon
Dec 4-Venus at greatest illumination
Dec 5-09- Moon, Venus, Saturn and Jupiter
Dec 8- Algol at minimum 2 hours 00:20 EST

Comet Leonard showing promise- early morning in between galaxies- Great photo opportunity.

Asteroids- Ceres Nov 27 at opposition (mag 7.0)

Nov 20- 2407 Haug Occultation 2 hours later 2826 Ahti Occult watcher program for maps or tonight's Video.

The Observer's Handbook 2022 are out.

Bankruptcy sale for Focus Scientific- but items moved to Toronto, and Service charge and taxes.

Next meeting December 8th, 2021 Live on ZOOM, weekly Social on Wednesday night. YouTube signed off and time for chat locally. Meeting finished at 21:01:13 EST.

View the full meeting on the RASC Kingston Centre Channel .

RASC-KC Solar Cycle 25 Monthly Review

A review of solar activity and images during the past month

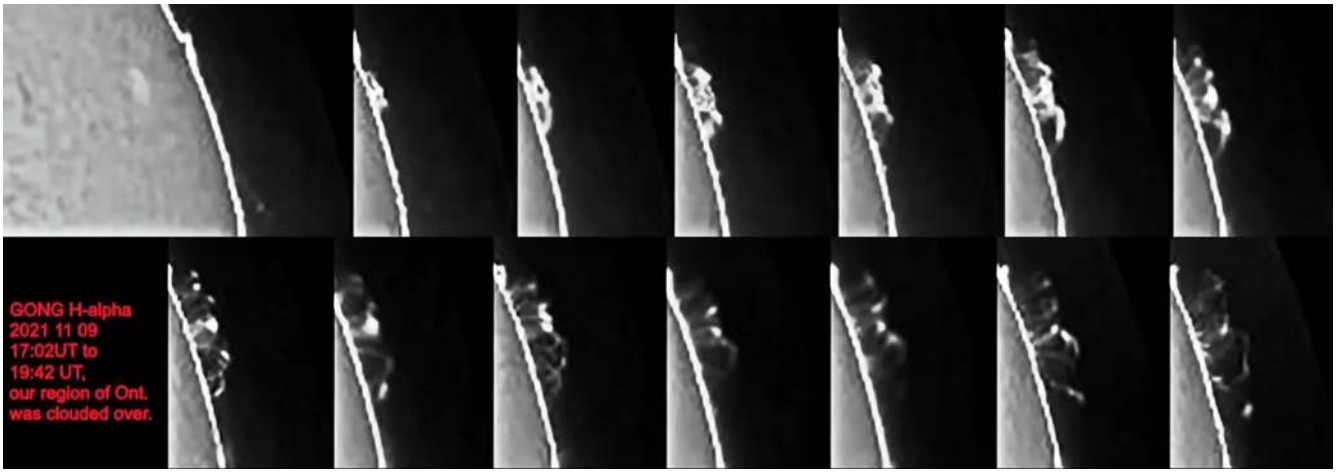
by RASC-KC solar observers for November 2021

After a summer of clarity these cloudy fall days are bringing less opportunity for reasonable imaging/observing, as well the sun dropping lower to the southern horizon makes it that time of year when the drop sides on the observatory must be lowered and "high noon shoot outs" are more desired. The amount of sunspots has been increasing as per and even above the prediction but magnetic activity itself is sometimes very low even with multiple sunspots visible, in fact these past 4 days (19th to 22nd) have been a very calm with sub 10-7 readings.

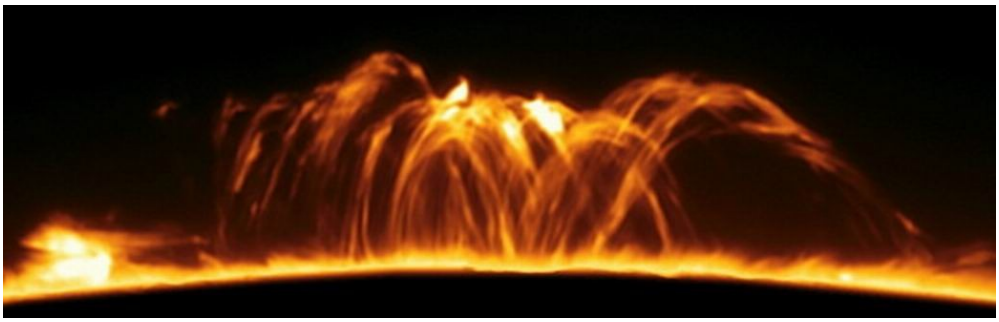
The first week of November looked very promising with two M class solar eruptions, an M1.5 from AR12887 at 1:45UT on the 1st and an M1.7 from AR12891 at 3:01UT on the 2nd. Unfortunately the curse of the October aurora prevailed into November and Ontario was once again left with just glowing northern horizon while the "Cannibal CME" caused a 20hr aurora storm with solar wind reaching near 800kps covering the rest of Canada and reaching into California, woe was us. During the week I tested the M43/T-2 T-Adapter ring I bought to attach my dsrl directly to my Baader Hyperion 8-24 zoom. I am pleased with this preliminary image compared to using a Barlow and normal T2 adapter. There is work to do (I may have used too much sharpen) so I will try again once some larger sunspots come along but for now this cropped image at 8mm looks promising.

For week 2, Nov 9th an "unseen" active region surprised us with an M2 solar flare from over the NW limb, on the 10th this flare caused short wave blackouts to South America but as stated in spaceweather.com the CME did not strike earth. It did however provide observers/imagers (clouded out

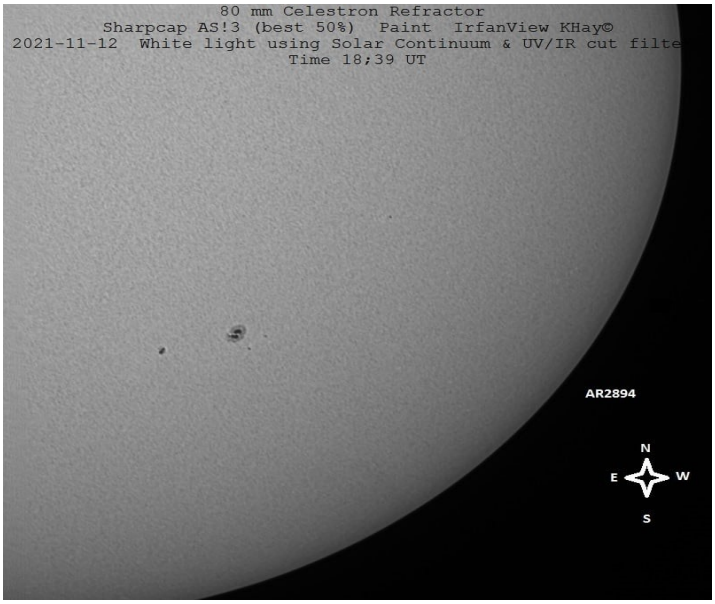
here) with hours of beautiful solar arches as seen in these images cropped from GONG H-alpha...

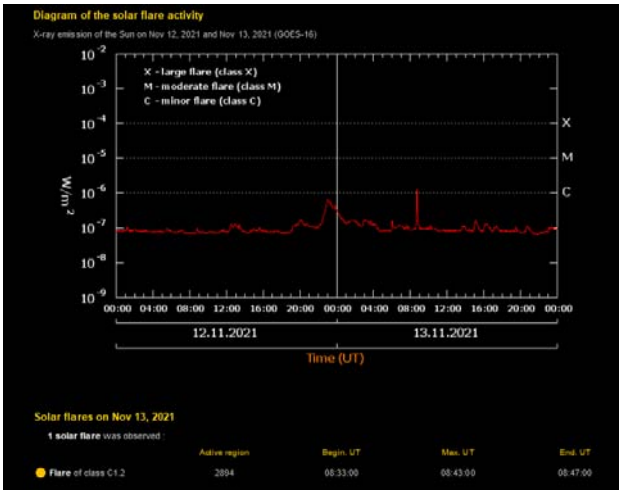


For info about this beautiful colour image of this eruption by Mike Wenz of Felton, Pennsylvania go to the Nov. 10 2021 page of spaceweather.com



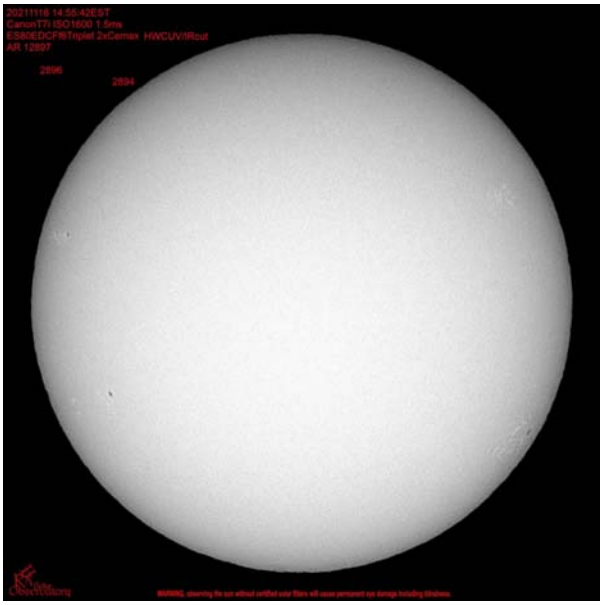
The following few days remained rather quiet on the earth side of the sun with 3 stable sunspot groups, 12893 - 95 visible. AR12894 imaged by Kim Hay tried to rumble up some action but as seen in the graph below the image it only reached C1.2 on the 13th, very nice image but very quiet sun.

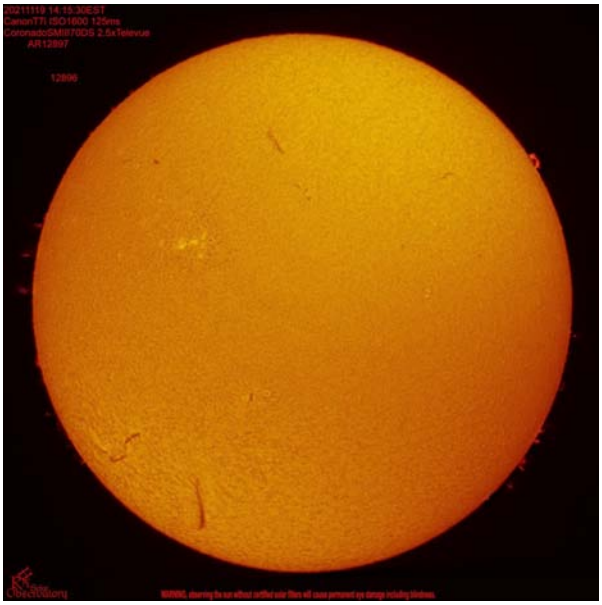




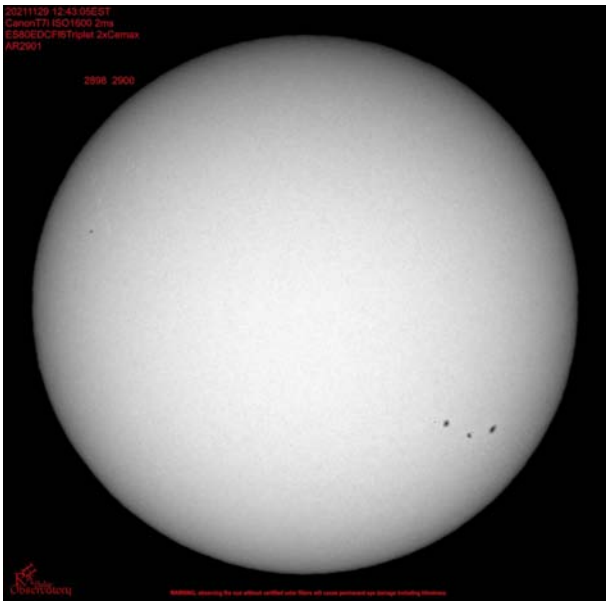
https://tesis.lebedev.ru/en/sun_flares.htmlm=11&d=13&y=2021

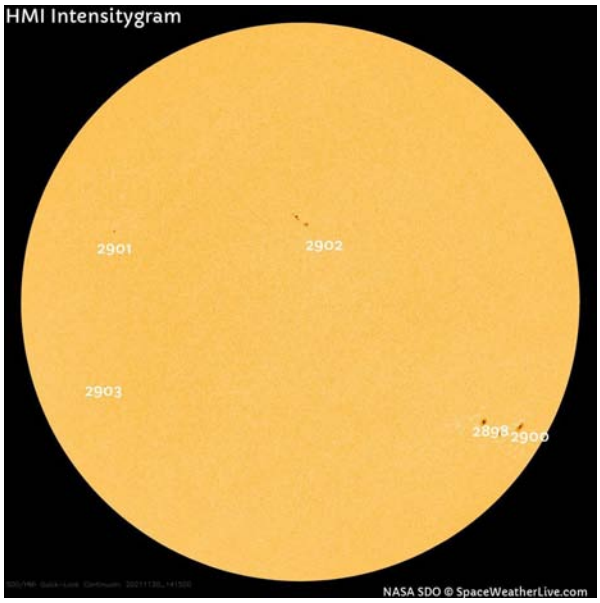
November 15th to 21st. This 3rd week of the month saw high solar winds up to 600km/s but little auroral activity. The weather cooperated even less with only 3 observing/imaging sessions in the week. AR2897 & 2896 were a decent pair of spots to watch and there has been more filaments lately so all is not lost.





This brings us to the last 9 days of the month and solar activity still is running smooth and low with no solar flare activity above the C class level. The lack of activity is a little surprising, as of the 29th there are 5 sunspot groups on the earth side face of the sun, oh did I mention it is cloudy? Thank you spaceweatherlive for this colour image, it appears from my monochrome image that 2902 & 2903 popped up overnight...





Summing up this month it started well with 3 M flares and 17 C flares during the first two weeks but that was it for activity. There has not been any flares in the last half of November. Hopefully something is brewing for an exciting December.

RASC-Kingston Center Member Minor Planet List (8)

The following RASC-KC members and past members who have had Minor Planets named after them for their contributions to astronomy.

Page Created: 2021 November 11 By Kevin Kell
Page Updated: 2021 November 13

Minor Planet (3269) Vibert-Douglas

- (3269) Vibert-Douglas = 1969 RG = 1969 RR1 = 1979 YH1 = 1981 EX16
- Discovered at Siding Spring on 1981-03-06 by S. J. Bus.
- (3269) Vibert-Douglas = 1981 EX16 Named in memory of Alice Vibert Douglas (1894-1988), the pioneer in the teaching of astronomy at McGill University and later dean of women at Queen's University. Her research interests included spectroscopic absolute magnitudes of stars and the Stark effect in stellar atmospheres. An authority on historical astronomy, she was the biographer of Eddington, as well as an early advocate of an increased role for women in science. She was made an Officer of the Order of Canada. Name suggested and citation prepared by C. J. Cunningham, endorsed by P. M. Millman. [Ref: Minor Planet Circ. 13481]
- https://minorplanetcenter.net/db_search/show_object?object_id=3269
- Founder of the RASC Kingston Center 1961

Minor Planet (3673) Levy

- (3673) Levy = 1969 ER = 1978 SW5 = 1978 WN = 1985 QS
- Discovered at Anderson Mesa on 1985-08-22 by E. Bowell.
- (3673) Levy = 1985 QS Named in honor of David H. Levy, comet discoverer and observer, recognized for his perseverance in observing comets using both the oldest visual and the newest electronic techniques. Author of several books and articles, he is known for his biographies of astronomers. As an educator Levy has concentrated on bringing observational astronomy to both amateur astronomers and to children, and he has initiated school and camp programs for this purpose. Citation prepared by S. J. Edberg at the request of the discoverer. [Ref: Minor Planet Circ. 12974]
- https://minorplanetcenter.net/db_search/show_object?object_id=3673
- Honorary President RASC Kingston Centre

Minor Planet (5424) Covington

- (5424) Covington = 1969 OG1 = 1975 EC5 = 1978 EE4 = 1983 TN1 = 1988 CR6
- Discovered at Anderson Mesa on 1983-10-12 by E. Bowell.
- (5424) Covington = 1983 TN1 Named in honor of Arthur Covington (1913-2001) Canada's first radio astronomer. His discovery, during the partial solar eclipse of 1946 Nov. 23, that microwave emission was far more intense from the vicinity of sunspots than elsewhere on the sun, was the first indicator that magnetic fields were important in the generation of nonthermal cosmic radio emission. In 1947 Covington inaugurated at the National Research Council of Canada daily measurements of the solar microwave flux at 10.7 cm. Name suggested and citation prepared by C. J. Cunningham. [Ref: Minor Planet Circ. 23541]
- https://minorplanetcenter.net/db_search/show_object?object_id=5424
- Member RASC Kingston Centre 1986-2001

Minor Planet (9070) Ensab

- (9070) Ensab = 1993 OZ2
- Discovered at Palomar on 1993-07-23 by C. S. Shoemaker and D. H. Levy.

- (9070) Ensab = 1993 OZ2
  Leo Enright (b. 1943) and Denise Sabatini (b. 1950) of Ontario are one of the foremost couples in Canadian amateur astronomy. Leo is an accomplished solar and auroral observer and has written the Beginner's Observing Guide. Denise's interests center on archeoastronomy and in providing access to astronomy for the disabled. [Ref: Minor Planet Circ. 36947]
- https://minorplanetcenter.net/db_search/show_object?object_id=9070

Minor Planet (10062) Kimhay

- (10062) Kimhay = 1988 RV4 = 1997 UY24
- Discovered at La Silla on 1988-09-01 by H. Debehogne.
- (10062) Kimhay
  Kimberley Dawn Hay (b. 1959) is an enthusiastic observer, sunspot and meteor recorder, and sketch artist, who has contributed to the American Meteor Society, AAVSO, American Lunar and Planetary Observers, and the RASC. She has won the RASC Service Award and the RASC Chilton Prize. [Ref: WGSBN Bull. 1, #11, 5]
- https://minorplanetcenter.net/db_search/show_object?object_id=10062
- Member RASC Kingston Centre 1988-

Minor Planet (10065) Greglisk

- (10065) Greglisk = 1988 XK = 1953 XL = 1978 WJ15 = 1990 HS3
- Discovered at Gekko on 1988-12-03 by Y. Oshima.
- (10065) Greglisk
  Greg Lisk (b. 1963) has served as president of the Royal Astronomical Society of Canada, Belleville Centre, where he organized field trips, designed award programs, judged local science fair entries, prepared displays, arranged star parties and gave presentations at outreach events, both indoor and outdoor. He won the RASC Service Award in 2014. [Ref: WGSBN Bull. 1, #11, 5]
- https://minorplanetcenter.net/db_search/show_object?object_id=10065 Member RASC Kingston Centre -2003

Minor Planet (10076) Rogerhill

- (10076) Rogerhill = 1989 PK = 1993 QQ
- Discovered at Palomar on 1989-08-09 by E. F. Helin.
- (10076) Rogerhill
  Roger Hill (b. 1955) has been a member of the Royal Astronomical Society of Canada, Hamilton Centre, for decades and served on the Board for most of that time, including as President. He edited the monthly newsletter Orbit for decades and has been involved with a plethora of outreach activities, including a course for new observers in visual astronomy. [Ref: WGSBN Bull. 1, #11, 6]
- https://minorplanetcenter.net/db_search/show_object?object_id=10076
- Member RASC Kingston Centre 2020-

Minor Planet (22426) Mikehanes

- (22426) Mikehanes = 1992 JF1 = 1996 AH9
- Discovered at Kitt Peak on 1996-01-13 by Spacewatch.
- (22426) Mikehanes = 1996 AH9
  Michael Francis Hanes (b. 1959) was a pilot for Air Canada, an amateur astronomer and telescope maker with the Royal Astronomical Society of Canada, London Centre. Name suggested by R. and P. Jedicke. [Ref: Minor Planet Circ. 103968]
- https://minorplanetcenter.net/db_search/show_object?object_id=22426
- Member RASC Kingston Centre

- Kevin Fetter Minor Planet 2005 XZ7 discovery. Kingston Center member. https://www.minorplanetcenter.

net/db_search/show_object?object_id=2005%20XZ7
https://spacewatch.lpl.arizona.edu/mpec/2005
MPEC 2005-X39. Descour, A. S., K. R. Fetter, and T. H. Bressi. 2005. Discovery and Followup Observations of Small, Fast-moving Aten Asteroid 2005 XZ7. In MPEC 2005-X39.

- David H. Levy Minor Planet discoveries: 65

Minor Planets with Links to Kingston Ontario region, Queen's University and Royal Military College (4)

- **(5272) Dickinson** = 1971 OZ = 1971 QG2 = 1981 QH2 Discovered at Anderson Mesa on 1981-08-30 by E. Bowell. (5272) Dickinson = 1981 QH2 Named in honor of Terence Dickinson (1943-), Canada's foremost popularizer of astronomy. Dickinson is the author of several books, notably NightWatch, The Universe and Beyond, Exploring the Sky by Day and Exploring the Night Sky, the last of which received the New York Academy of Sciences Children's Science Book Award in 1988. He reaches a wide Canadian audience every week with his astronomy column in The Toronto Star newspaper and on Canadian Broadcasting Corporation programs. From 1973 to 1975 he was editor of Astronomy magazine, and he has held scientific positions with the Ontario Science Centre in Toronto, the Strasenburgh Planetarium in Rochester and the McLaughlin Planetarium in Toronto. Dickinson teaches astronomy at St. Lawrence College in Kingston, Ontario. Name suggested and citation provided by C. J. Cunningham. [Ref: Minor Planet Circ. 23138] Orbit type: Main Belt

- **(5457) Queen's** = 1980 TW5 = 1988 BL4 Discovered at Palomar on 1980-10-09 by C. S. Shoemaker. (5457) Queen's = 1980 TW5 Named in honor of Queen's University at Kingston, Ontario. Founded by Royal Charter in 1841, its first classes were held the following spring. In more than 150 years Queen's has evolved to become one of Canada's strongest universities in many fields. The home of A. Vibert Douglas, one of Canada's pioneering astronomers, Queen's has had a long tradition of support to professional and amateur astronomical groups. Name proposed and citation prepared by D. H. Levy. [Ref: Minor Planet Circ. 24917]
https://minorplanetcenter.net/db_search/show_object?object_id=5457

- (**6115) Martinduncan** = 1984 SR2 = 1989 CF8 Discovered at Anderson Mesa on 1984-09-25 by B. A. Skiff. (6115) Martinduncan = 1984 SR2 Named in honor of Martin J. Duncan (b. 1950) of Queen's University, Kingston, Ontario. Duncan has made several important contributions to the understanding of the origin and dynamical evolution of small bodies in the solar system, particularly comets and the likelihood that they originated in the Kuiper Belt. He has been involved in the development of two important numerical algorithms that have led to orbital integrations of unprecedented duration. Citation provided by H. Levison. [Ref: Minor Planet Circ. 27461]
https://minorplanetcenter.net/db_search/show_object?object_id=6115

- **(273987) Greggwade** = 2007 LQ30 = 2008 UO69 Discovered at Mauna Kea on 2007-06-11 by D. D. Balam. (273987) Greggwade = 2007 LQ30 Gregg Wade (b. 1971) is a Canadian astrophysicist recognized as a leading expert in the study of magnetic fields in medium and high-mass early-type stars. He is a professor of physics at the Royal Military College (Kingston) and adjunct professor of physics at Queens University. [Ref: Minor Planet Circ. 85915]
https://minorplanetcenter.net/db_search/show_object?object_id=273987

Commemorative RASC – Kingston Centre 60th Anniversary Recipes- Kim Hay

In the early part of 2021 I had asked members for recipes to commemorate our 60th Anniversary (1961-2021). Since we could not do any gatherings, meetings, dinners or outside events, and we were in a lock down situation, why not bake and have some recipes that might warm our tummies, and we could share with our Astro-buddies.

Thank you to those individuals who submitted recipes. Please give them a try. We even have some GA Cookies recipes from a past member Laura Gagne from 1997. Thank you Cathy Hall for the note.

*****

Sourdough Crumpets
Submitted by Mark Kaye

1/8 cup 10% cream
3/8 cup 1% milk
1 tsp quick yeast
1 cup sourdough starter (see below)
1 egg
35g butter
3 Tbsp white sugar
3/4 tsp salt
1 1/8 cup white bread flour
1 tsp baking soda

Heat the milk and cream to 110F (43C) put in a large bowl and add quick yeast, once it starts to fluff up, add in all the rest of the ingredients, save the soda and blend well. Cover and let stand for at least one hour. Best if this is in a proofing oven, but any warm place in the kitchen will do.

If the ingredients are all happy, the batter will have grown considerably in the bowl to about double the size it was an hour ago.

Heat your griddle, grease as many crumpet rings as you can fit on the griddle taking in mind that you need to be able to cover them all with a lid. (I use a glass lid from a large skillet.) On my stove top, I use number the three setting.

Beat in the soda. Pour 1/4C of batter into each ring and cover with the lid. Cook for about 3:30 minutes or until the batter is not liquid on top. It will be full of bubbles. Remove the rings, flip and cook for an additional 30 seconds. If your skillet is too hot, they will burn before they are ready to flip. Use your nose, you will smell them beginning to burn. Immediately flip and turn down the heat a bit before doing the next batch. Unless they are really burnt, i.e. black, they will not suffer from being over heated on the bottom too much.

The cooking part is what has taken me the longest time to perfect. Your kitchen will be different. This method gives the classic crumpet look of a cooked bottom and a doughy top. I have just cooked the batter in the rings for two minutes, removed the rings and flipped and cooked for another two minutes. They taste pretty much the same, but they do not look like crumpets nor do

they soak up your butter and marmalade in quiet the same fashion.

I suppose if you do not have rings, you could just cook them like pancakes. They probably will not rise as much.

This is a recipe that I have created on my own. You could use 1/2 cup whole milk instead of the blend that I use. I just wanted a thicker milk than nearly skim.

Sourdough Starter

There are many ways to make your own sourdough starter. The method I use is quite simple. I take a very clean two litre jar with a lid. Drill tiny holes in the lid or use cheese cloth. If you do not, once fruit fly season starts, you will have both a sourdough starter and an excellent fruit fly trap. Take one cup of whole wheat bread flour and one cup of water. Whisk together. Let stand in a clean out of the way place that does not get cold. Every morning and evening, whisk in 1/8C of WW flour and 1/8C water. After seven days, your starter is ready to use. I use enough starter that I feed it every day and it does not fill the two litre container. But if your container gets more than about 3/4 full, compost the excess and feed it again. I generally use two cups of starter for bread, one cup for crumpets, waffles or rolls for four people. For Linda and I, 1/2C of starter is good for a batch of waffles.

Lunar Lemon Tart
Submitted by - Jeanette Wagner

Crust

1 cup all purpose flour
1/4 cup brown sugar
3 tbsp icing sugar
1/2 cup butter, room temperature

Filling

1/3 cup fresh squeezed lemon juice
1/2 tsp lemon zest
2 tbsp cornstarch
2/3 cup granulated sugar
1/2 cup butter
125 grams (I/2 box) softened cream cheese - optional
2 eggs
2 egg yolks

Crust: Preheat oven to 350F. In a bowl combine flour, butter, sugar until mixture resembles coarse crumbs. Turn into an 8" spring form pan or tart pan. Pat and work dough evenly part way up the edges of the pan. Bake for approximately 15 minutes or until golden brown. Cool.

Filling: In medium sauce pan whisk the lemon juice, zest, sugar and cornstarch until smooth. Add butter and heat mixture until the butter has melted. Whisk eggs and egg yolks in a large non reactive bowl (glass or stainless steel). While whisking, slowly pour a ladleful of the lemon mixture into the eggs, then slowly whisk in the remaining lemon mixture. Transfer mixture back into the saucepan and stir constantly over medium heat until it thickens. Do not let the mixture boil. Remove from heat. Optional for a rich creamy texture - whip in softened cream cheese with electric beater.

Tart: Pour the lemon filling into the baked crust. Let the tart cool completely. Chill. Serve topped with a dusting of icing sugar/sugared fresh raspberries.

Peanut Butter Date Balls
Submitted by Kim Hay- Original recipe from Laura Stec (www.LauraStec.com)

makes 25 cookies

1 cup medjool dates, pitted and coarse chopped
1 cup crunchy peanut butter (I use regular PB, or use any nut butter, or try tahini or chickpea sunseed butter if you have nut allergies.)
1 Tbsp flax seeds, ground
3 Tbsp water
1/2 tsp baking soda
1 tsp apple cider vinegar
course sea salt (for toping-optional)

Preheat oven to 350F . Line baking sheet with silicon baking sheet or parchment.
In a food processor, add the dates and whirl to mix (ball may form-its ok) Add peanut butter and all ingredients , except the sea salt. Combine but to not over mix. Form batter into balls, place on baking sheet, 1 inch apart. Sprinkle the sea salt (optional). Bake 15 minutes or until preferred texture. Less time will be a softer center. These cookies freeze well, so you can have a cookie anytime .

Comets and Galaxies (same recipe, just cut stars from white
dough, and tails from chocolate instead of rolling them up)
From Laura Gagne: Regulus - Kingston Center Issue 97-05 September/October 1997

2 cups all purpose flour
1 teaspoon baking powder
1/2 teaspoon salt
2/3 cup butter or margarine
1 cup sugar
1 egg
1 teaspoon vanilla
2 squares unsweetened baker's chocolate, melted

Mix flour, baking powder and salt. Cream butter. Gradually add sugar and continue beating until light and fluffy. Add egg and vanilla; beat well. Gradually add flour mixture, mixing well after each addition. Divide dough in half; blend chocolate into one half**.**
Galaxies: Roll chocolate and vanilla dough's separately between sheets of waxed paper into 12 x 8 -inch rectangles. Remove top sheets of paper and invert vanilla dough onto chocolate dough. Remove remaining papers. Roll up as for jelly roll (so that the roll is as long as possible, or else the cookies come out too big); then wrap in waxed paper. Chill until firm, at least 3 hours (or freeze 1 hour). Cut into 1/4 inch slices and place on baking sheets. Bake at 375 degrees about 10 minutes or until cookies just begin to brown around edges. Cool on
racks. Makes about 4 1/2 dozen.

Comets: Roll the dough's separately as for galaxies, but use a cookie cutter or make a template with cardboard to cut out desired shapes. I drew the shapes on cardboard first then cut them out with a sharp knife. Place the tail on the cookie sheet first, then arrange the star on top so that about 1/4 to1/2 inch of the narrow end of the tail is tucked under the star. Press firmly in place. Bake the same as for galaxies, but watch the time since they might cook a little faster if you roll the dough out thinly.

Asteroids:
1 cup semisweet chocolate pieces
2 tablespoons butter or margarine
1 egg
1 cup sifted powdered sugar
1/2 teaspoon vanilla
dash salt
1/2 cup flaked coconut
1/2 cup chopped nuts (I used walnuts)
1/2 cup mini chocolate chips

In a medium saucepan melt semisweet chocolate pieces and butter or margarine over low heat, stirring frequently.

Remove pan from heat; cool to lukewarm. Beat in egg till smooth and glossy. Add sifted powdered sugar, vanilla, and salt; mix well. Stir in the 1/2 cup flaked coconut, walnuts and mini chocolate chips. Chill about 1 hour. Form into 1-inch balls. Arrange on a baking sheet.

Chill at least 3 hours or till firm. Makes about 2 1/2 dozen balls.

Impact Craters
1 1/2 cups all-purpose flour
1/4 teaspoon salt
2/3 cup butter or margarine
1/3 cup sugar
2 egg yolks
1 teaspoon vanilla
2 slightly beaten egg whites
1 cup coconut
1/3 cup cherry or strawberry preserves

Preheat oven to 350 degrees
Stir together flour and salt. Beat butter for 30 seconds; add sugar and beat till fluffy. add egg yolks and vanilla; beat well. Add dry ingredients to beaten mixture, beating till well combined. Cover and chill 1 hour. Shape

into 1 inch balls; roll in egg whites, then in coconut. Place 1 inch apart on an ungreased cookie sheet. Press down on centres with thumb. Bake in 350 degree oven for 15 to 17 minutes. Cool on a wire rack. Just before serving, fill centres with preserves. Makes 36.

Kuiper Melts:

1 cup All purpose flour
2 tablespoons cornstarch
1/2 cup unsifted confectioners' sugar
1 cup butter or margarine, softened
1 1/3 cups (about) flaked coconut
cocoa powder (they are dirty snowballs, remember)

Mix flour with cornstarch and sugar in a bowl. Blend in butter to form a soft dough. Cover and chill, if necessary,
until dough is firm enough to handle. Shape into small balls, about 3/4 inch in diameter. Roll in coconut, dust with
cocoa powder, and place on ungreased baking sheets, about 1 1/2 inches apart. Bake at 300 degrees for 20 to 25 minutes, or until lightly browned. Makes about 3 dozen.

Black Holes

5 tablespoons unsalted butter
1 egg yolk
2/3 cup sifted confectioner's sugar
3 squares semi-sweet baking chocolate, melted and cooled
1 teaspoon vanilla
Instant coffee to taste (about 1 teaspoon), added to melting chocolate

Cream butter with egg yolk; gradually add sugar, blending well. Stir in chocolate and vanilla. Chill until firm enough to handle. Shape into 1-inch balls. Roll in nuts. Chill until set. Store in refrigerator. Makes about 30. (note: use clean egg with no cracks in the shell)

Kim with a 3D printed model of the minor planet Bennu (101955 Bennu is a carbonaceous asteroid in the Apollo group discovered by the LINEAR Project on 11 September 1999), a stand in for her own asteroid 10062 kimhay.

10062

[H] absolute magnitude		14.01
diameter	4.016	km
rotation period	3.545	h
geometric albedo	0.209	

Messages from Members

From Cathy Hall
Asteroids Size Comparison, short video (2.40) by MetaBall:
https://www.youtube.com/watch?v=bSkPNMjRRio
and short video (2.45), part 2, includes comets:
https://www.youtube.com/watch?v=Y4iGdyni_8g

From Kevin Kell
We have always been looking for some kind of reference for planetary features.. so you can attempt to match up what you image with what is reality.

Here are some good resources:

* website for predictions of planetary surface features
https://shallowsky.com/marsmap/
https://shallowsky.com/jupiter/
https://shallowsky.com/satsat/

Remember for Jupiter at least... is it real space time or Jupiter time? Jupiter can be around 40 lightminutes away! So if the prediction is Jupiter time, add 40 minutes here (just like time zones!).

From Laurie Graham

I am looking for a nice picture of the aurora to include on a poster about the sun to be made for Science Rendezvous. An attribution will be included, something like "John Doe, Kingston RASC", or whatever the contributor prefers. This poster will also be used at other outreach events. So, if you are willing to share an auroral image, please contact Laurie Graham at grahamla61@gmail.com.
Cheers Laurie

From John Hurley
I can answer this one, right here, but also plan to send a message, and apology, to Centre Executives. As you know we've been doing without a few core office staff for several months now. I'm pleased to announce that we are replacing them within the next 2-4 weeks. We are hiring two, full-time, permanent, positions: An Office Manager, and an Office & Membership Coordinator. Once they are hired, and we are settled in our new office space (December 15 move date) you will notice a marked improvement in the ability to communicate with, and receive prompt attention from, the national office.
Excelsior!
Phil Groff

From Walter MacDonald
Website Report 2021

The pandemic has wreaked havoc with my sense of time, so it is only recently that I realized that it was THIS year and not LAST year that major work was done on the Centre's website. The project at hand was migrating from Drupal 7 to Drupal 9 which was completed in March of this year (2021!). Just to add some excitement, our web host decided to make a bunch of changes at the same time--but everything worked out.

(Incidentally, one side-effect of the pandemic was to extend Drupal 7's end-of-life from November 2021 to November 2022 because so many websites are still using it and people might be too busy with other things to get around to migrating this year. So for once we are "early.")

With the migration complete (that is, a separate new site built in D9), Kevin and I had some adventures moving the new site into the same place occupied by the old site and then getting it all to work properly. In retrospect we may have been overthinking the problem early on, but all's well that ends well.

Drupal is promising that future major-version upgrades will be much easier than in the past. I hope that is true, though several decades of computer industry history would seem to suggest this is unlikely.

One notable new feature is an e-book repository that has been added for members to enjoy. Special thanks are due to Malcolm, who supplied the very nice banner images that appear on the front page of the site. Finally, thanks go to Kevin for doing backups and installing the continuing stream of software updates as they arrive.

Upcoming Meetings

Dec 2021 Regular Monthly Meeting-zoom videoconference
Wednesday, December 8, 2021 - 19:00
Guest Speaker: Sudbury RASC President – Alan Ward ″**Testing of Astronomical Optics in the Computer Age"**

Jan 2022 Regular Monthly Meeting-zoom videoconference
Wednesday, January 12, 2022 - 19:00
Guest Speaker: Andrew Godefroy (RASC-KC) "Upper Atmospheric Research and the Origins of Canada's Space Program'

Feb 2022 Regular Monthly Meeting-zoom videoconference
Wednesday, February 9, 2022 - 19:00
Guest Speaker: Dr. Jennifer West Topic TBA

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

Steve Craig's Galaxy of the Day for November 2021

Day 215 NGC4388 is a spiral galaxy about 65 million light years away in Virgo.
It was discovered on April 17, 1784 by William Herschel.

Day 216 NGC4393 is a barred spiral galaxy about 34 million light years away in Coma Berenices. It was discovered on April 11, 1785 by William Herschel.

Day 217 NGC4394 (lower) is a barred spiral galaxy about 35 million light years away in Coma Berenices. It was discovered on March 14, 1784 by William Herschel.
M85 (upper) is an elliptical galaxy about 60 million light years away. It was discovered by Pierre Mechain on March 4, 1781.

Day 218 NGC4395 is a spiral galaxy about 14 million light years away in Canes Venatici. It has a very low surface brightness but many knots of star formation in it's arms. It was discovered on Jan 2, 1786 by William Herschel.

Day 219 NGC4396 is a barred spiral galaxy about 39 million light years away in Coma Berenices. It was discovered on April 20, 1865 by Heinrich d'Arrest.

Day 220 NGC4414 is a flocculent spiral galaxy about 62 million light years away in Coma Berenices. It was discovered on March 13, 1785 by William Herschel.

Day 221 NGC4440 (lower) is a barred spiral galaxy about 55 million light years away in Virgo. NGC4436 (upper) is a dwarf elliptical galaxy about 66 million light years away. The were discovered on March 17, 1789 by William Herschel.

Day 222 NGC4449 is an irregular Magellanic galaxy about 12 million light years away in Canes Venatici. It was discovered on April 27, 1788 by William Herschel.

Day 223 NGC4490 Is a barred spiral galaxy, also known as the Cocoon Galaxy. It is 25 million light years away in Canes Venatici. It is interacting with it's smaller companion, NGC4485. They were discovered on January 14, 1788 by William Herschel.

Day 224 NGC4519 is a barred spiral galaxy about 70 million light years away in Virgo. It was discovered on April 15, 1784 by William Herschel.

Day 225 NGC4559 is a spiral galaxy about 29 million light years away in Coma Berenices. It was discovered on April 11, 1785 By William Herschel.

Day 226 NGC4565 Is a superb edge on spiral galaxy, also known as the Needle Galaxy. It is about 38 million light years away in Coma Berenices. It was discovered on April 6, 1785 by William Herschel.

Day 227 NGC4567 (right) and NGC4568 (left) are interacting spiral galaxies about 60 million light years away in Virgo. They were discovered on March 15, 1784 by William Herschel. Super Nova SN2020fqv was discovered a few days before this image was taken.

Day 228 NGC4571 is another flocculent type spiral galaxy. It is about 58 million light years away in Coma Berenice. It was discovered in 1787 by William Herschel who at first mistook it for #91 in Charles Messier's catalogue.

Day 229 NGC4605 is a dwarf barred spiral galaxy about 18 million light years away in Ursa Major. It was discovered on March 19, 1790 by William Herschel.

Day 230 NGC4617 is an edge on spiral galaxy about 212 million light years away in Canes Venatici. It was discovered on February 9, 1788 by William Herschel.

Day 231 NGC4618 (right) and NGC4625 (left) are interacting dwarf spiral galaxies about 21 million light years away in Canes Venatici. It is notable that they each have only one spiral arm and are listed as #23 in the Arp

Catalogue of Peculiar Galaxies. They were discovered on April 9, 1787 by William Herschel.

Day 232 NGC4631 is a magnificent edge on spiral galaxy about 30 million light years away in Canes Venatici. Also known as The Whale Galaxy it is listed as #281 in the Arp Atlas of Peculiar Galaxies. Just above it in this image is a NGC4627, a dwarf elliptical galaxy known as The Pup. They were discovered on April 20, 1787 by William Herschel.

Day 233 NGC4656 is a highly warped spiral galaxy about 30 million light years away in Canes Venatici. It is thought that its disturbed condition is due to a recent encounter with yesterday's galaxy NGC4631 It was discovered on March 20, 1787 by William Herschel.

Day 234 NGC4651 is a spiral galaxy about 62 million light years away in Coma Berenices. It was discovered on December 30, 1783 by William Herschel.

Day 235 NGC4676 is a pair of interacting galaxies about 290 million light years away in Coma Berenices. Also known as The Mice because of their long tidal tails, they are catalogued as #242 in the Arp Atlas of Peculiar Galaxies. They were discovered on March 13, 1785 by William Herschel.

Day 236 NGC4725 is a barred spiral galaxy about 40 million light years away is Coma Berenices. It has a bright core and a prominent ring structure. It was discovered on April 6, 1785 by William Herschel.

Day 237 NGC5005 Is a spiral galaxy about 65 million light years away in Canes Venatici. It was discovered on May 1, 1785 by William Herschel.

Day 238 NGC5033 is a spiral galaxy about 40 million light years away in Canes Venatici. It has a bright core and faint but well defined spiral arms. It was discovered on May 1, 1785 by William Herschel.

Day 239 NGC5112 is a barred spiral galaxy about 62 million light years away in Canes Venatici. It was discovered on March 17, 1787 by William Hershel.

Day 240 NGC5205 is a spiral galaxy about 80 million light years away in Ursa Major. It was discovered on March 18, 1887 by Lewis Swift.

Day 241 NGC5216 (right) and NGC5218 (left) are a pair of interacting galaxies about 130 million light years away in Ursa Major. NGC5216 is a distorted spiral galaxy and NGC5218 is a dwarf elliptical galaxy. They were discovered on March 19, 1790 by William Herschel.

Day 242 NGC5248 is a spiral galaxy about 59 million light years away in Bootes. It was discovered on April 15, 1784 by William Herschel.

Day 243 NGC5278 and 5279 are a pair of interacting galaxies about 350 million light years away in Ursa Major. They are catalogued as #239 in the Arp Atlas of Peculiar Galaxies. They were discovered on April 14, 1789 by William Herschel.

Day 244 NGC5290 is an edge on spiral galaxy about 116 million light years away in Canes Venatici. It was discovered on March 18, 1787 by William Herschel.

Day 245 NGC5297 Is a spiral galaxy about 112 million light years away in Canes Venatici. It is interacting with NGC5296, a dwarf Lenticular Galaxy, just above in this image. They were discovered on April 9, 1787 by William Herschel.

Day 246 NGC5300 is a very faint spiral galaxy about 59 million light years away in Virgo. It was discovered on May 13, 1793 by William Herschel.

Day 247 NGC5301 is an almost edge on spiral galaxy about 70 million light years away in Canes Venatici. It was discovered on May 11, 1787 by William Herschel.

Stephen Craig's Galaxy Image of the Day


NGC3501


NGC4088


NGC4388


NGC4393


NGC4394


NGC4395


NGC4396


NGC4414


NGC4440

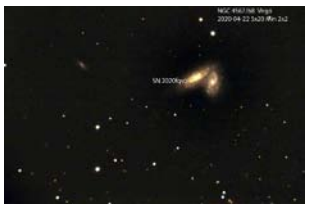

NGC4449


NGC4490


NGC4519


NGC4559


NGC4565


NGC4568


NGC4571


NGC4605


NGC4617


NGC4618


NGC4631Px


NGC4651


NGC4656PX


NGC4676


NGC4725


NGC5005


NGC5033


NGC5112


NGC5205


NGC5216


NGC5248


NGC5278


NGC5290