Regulus

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

Brighter Geminid Meteor - See David Levy's column in this issue

Astronomy Podcasts

Fast Radio Burst - from Connor and Nik at the Queen's Observatory
http://observatory.phy.queensu.ca/

Check out these low bandwidth friendly audio only podcasts about astronomy.

Percy goes to Mars: Pt. 2 33:55
Percy goes to Mars: Pt.1 31:20
The CFH Telescope on Maunakea 1:12:04
E07: Arecibo, a Tribute 47:40
E06: Ultra Diffuse Galaxies 59:06
E05: The Dimming Stellar Giant 45:29
E04: Dark Matter, Destroyer of Worlds 59:57
E03: Record Breaking Black Hole Collision 1:00:00
E02: Crab Pulsar 49:44
E01: Phosphine on Venus, could it be life? 37:27
E00: Welcome to Fast Radio Bursts 22:48

MEETINGS

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:: Wed 2021Feb17

Regular Monthly Meeting -
2nd Wednesday of the month 7pm Eastern.
Zoom for members and youtube live stream for the public.
Members receive email registration link about 1 week beforehand. For youtube.com search for RASC Kingston.

Next: Wed 2021Feb10

IN THIS ISSUE

President's Tidbits - Kim Hay

Wow, that Arctic cold has certainly reached us today as I write this. It's the wind more than the temperature that will remind you we are still in our winter season. We have had a few nights of clearish sky despite the moon and some of our members have taken advantage to do their astronomy. They and we have been rewarded with images by Stephen C. Mark D. and Solar by Hank B. Others have done some variable observing Susan G., Photometry Rick W, while others do DSLR planetary movement Kevin K, and others just tinkering in other Astronomy avenues. Our email list has been active with lots of Astronomy, it would be good if you could join.

There certainly has been a plethora of Astronomy ZOOM and Youtube events to watch. The RASC Insider's Guide to the Galaxy, Kalamazoo Astronomical Society, Don Machholtz (ALPO) Comet Discover at the Fernbank Centre Meeting. AAVSO How to Hour on the first Saturday of the month, plus other topics every second week (see aavso.org for more info). Queen's University Astronomy has their Podcast (audio Only). The big story right now is Mars and the Perseverance Lander on February 18th. Queen's Astronomy will be holding a Mars party , or you can watch on NASA TV.

To get us into the Astronomy viewing excitement will be Judy Black (President of RASC Halifax) on February 10th talking on various RASC Observing and Astro-imaging programs. On March 10th we will have Dave Lane speaking to us on Robotic Telescopes. After our guest speakers will will have our What's up in the Sky and members presentations and open discussions.

This will segue us to get ready to observe as the Messier season approaches.

We can still do observing via binocular, telescope or camera, despite our stay at home orders and lock downs from Covid 19. Our Social chats on ZOOM are a great boost as well.

We are celebrating our 60th Anniversay this year. The Centre joined the RASC in 1961 by Dr. A.V. Douglas which came from a small astronomy group . Throughout the year we will be posting snip-its of History in the Newsletter. We have the 10" Dobsonian Douglas telescope that is part of the Loan Program (Great Optics- quite the story on the making of this).

Our Executive will be holding their business meeting soon and if you have anything that you would like too bring up, please do, send it to kingston@rasc.ca

Clear Skies and Keep Looking Up!

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Skyward for February 2021 By David H. Levy.
Orion in Winter.

As twilight deepens these evenings, Orion is just clearing the eastern horizon. Robert Frost wrote eloquently in his famous poem "The Star Splitter"

"You know Orion always comes up sideways,
Throwing a leg up over our fence of mountains."

Whenever I see Orion rising, which is almost every night from fall to midwinter, I am reminded of how poets like Robert Frost saw the mighty hunter as it entered the sky to take command of winter. Even if you have difficulty finding some constellations, the three stars in a row that form Orion's belt are a giveaway. And if you have a telescope, as Frost did, the view is even better. Just below the belt lies a fainter set of three stars. Surrounding the middle one is a gigantic cloud of hydrogen gas which is the Great Nebula in Orion. It is one of the richest star forming regions in our whole galaxy.

During that first winter I enjoyed watching lots of the fainter stars within the nebula change their brightness over time scales of days, hours, or in one case, minutes. According to Janet Mattei, the late director of the American Association of Variable Star Observers, these variable stars can "flicker" as they go through their carefree cycles of stellar youth.

Near the top of Orion, marking his left shoulder, is a much older, grandfather star. Named Betelgeuse, this star is at the other end of the stellar life cycle. An old, very large and massive sun, Betelgeuse varies lazily from being almost as bright as Rigel, the star marking Orion's lower right knee, to not much brighter than Bellatrix, the star marking Orion's right shoulder.

Last winter Betelgeuse faded more than usual, and throughout 2020 it was setting off alarms that it was about to explode as a supernova. Probably not now, though it will likely happen within the next hundred thousand years or so. In the spring Betelgeuse began to brighten again, but when I saw it rising above the eastern horizon in late August, it had faded once more. Around that same time, the Hubble Space Telescope, observing in ultraviolet light, provided data that suggested that the unusual dimming was caused by an ejection of some very high temperature gas from within the star into space.

When Betelgeuse is finally done being the star we love, its core will collapse almost instantaneously, within a few seconds. Betelgeuse will increase exponentially in brightness. It will shine as brightly as the first quarter Moon and will be easily visible in daylight for three months or more. It will be brighter than Tycho's great exploding star of 1572, and brighter even than the brilliant supernova of 1006. As large as it is, Betelgeuse is probably not massive enough that its core will shrink to a black hole. Instead, it will probably form a new neutron star, small, dark, very dense, and cold.

Stars are people too. They age just as we do. They enjoy the carefree times of youth, go through a long middle age like our Sun, and then get strange again as they grow old. Please go out and enjoy Orion rising over the eastern horizon these evenings. It is time to settle back and enjoy this magnificent king of the winter sky. As you look, imagine how young stars like those in the nebula, and old ones like Betelgeuse, tell their beautiful story of the life cycle of distant suns.

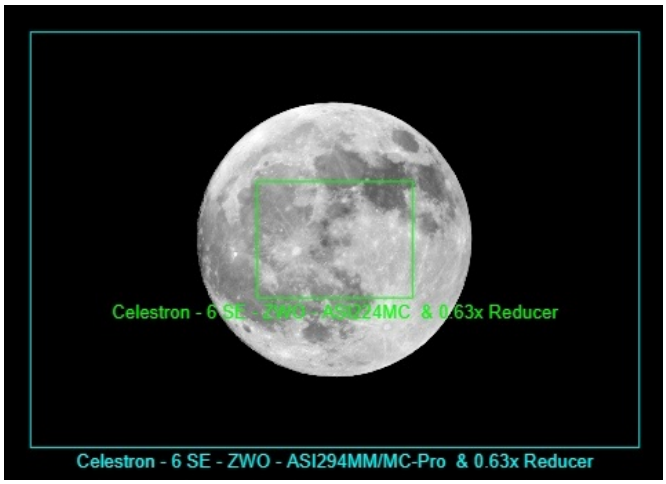
In the Sky This Month - February 2021 - Rick Wagner

02 Feb – asteroid 18 Melpomene (mag 9.4) at opposition
04 Feb – Last quarter Moon
06 Feb – Saturn 0.4ºabove Venus very low in the SErn sky just before sunrise
.
11 Feb – Jupiter 0.5º N of Venus very low in the SErn sky just before sunrise.
11 Feb – New Moon 14:05EST
19 Feb - First quarter Moon

22 Feb – asteroid 29 Amphitrite (mag 9.1) at opposition
25 Feb – Jupiter, Saturn, Mercury together in ESE before sunrise for the next few days.
27 Feb - Full Moon 03:17EST
28 Feb – bright Mars passes several degrees south of the Pleiades star cluster. Mars makes a very photogenic pass between the Pleiades and the Hyades clusters over the ~10 days.

Blast from the Past: 1977 January Regulus

As voted on last meeting by members of the R.A.S.C., Paul Brown will present the following to a meeting of the National Council of the R.A.S.C. on January 29, 1977:"On January 18, 1977, the Kingston Centre, of the R.A.S.C. passed the following motion That a committee be set up to formulate, by March 15, 1977, a detailed proposal to build or acquire a telescope and observing siteof suitable quality for the members of this club to work on worthwhile projects and that the proposal be submitted to the National Council of the R.A.S.C. with the suggestion that the club be given financial aid." This was partly done for the purpose of getting our feet in on the ground floor early, in case some of the money from the sale of the old National Centre Office is to be divided up among deserving Centres



https://astronomy.tools/calculators/field_of_view/ is a great resource to calculate a visual reference of field of view with various telescopes and cameras. This one demonstrates Mark DesLauriers' ASI224 and ASI294 with a 0.63x reducer in place.

Marks First Light with his ZWO ASI 294MC camera of the Horsehead Nebula 19x10sec

And Mark's Flame Nebula 21x8sec ZWO ASI294MC

Astrotips - Visual

From https://skyandtelescope.org/observing/secrets-of-deep-sky-observing/

Dark Adaptation

The human eye takes time to adjust to the dark. Your eyes' pupils expand to nearly their full nighttime size within seconds whenever you step out into the dark. But the most important part of dark adaptation involves chemical changes in the retina, and these require many minutes.

After spending 15 minutes in darkness you might think your night vision is fully developed. But in fact your eyes gain as much as another two magnitudes of sensitivity — a factor of six — during the next 15 minutes. Thereafter, dark adaptation improves very slightly for 90 minutes more. So don't expect to see faint objects at their best until a half hour or more into an observing session.

Astrotips - Imaging

From https://astrobackyard.com/7-astrophotography-tips/

What settings do you use for DSLR astrophotography?

* Use manual or bulb mode
* Use a “fast” aperture of F/2.8 – F/4
* Set your white balance setting to daylight or auto
* Set your exposure length to 15-30-seconds
* Shoot in RAW image format
* Use Manual Focus
* Use an ISO of 400-1600 (or more)

Cathy Hall caught this sundog halo over Ottawa with a Samsung cell phone camera (2021Jan29)

.Hank Bartlett returned to clear skies and clear Sol... no sunspots today (2021Jan31)

This is the cardboard filter for my SN10" which I made back in the early 2000s, I modified later it so it flips over and fits the C925 as well. The filter attaches by 3 velcro pads to the inside of the corrector plate housing of the SN10.

RASCKC Equipment Loan Program Spotlight

A section where we spotlight one of the pieces of Equipment Loan Program equipment that the RASCKC owns.

Last month: 25cm Douglas Dobsonian

Item #6 Telescope 20cm Fitzgerald Telescope (1998) Accessories: 15mm Meade plossl eyepiece, 28mm Edmund RKE eyepiece, 40mm Meade MA eyepiece, x2 Meade barlow, all 1.25", moon filter 3 stop 1.25", equipment bag, telrad finder, History: The centre was contacted by the widow of an amateur ATM astronomer with a donation of ATM parts in 1998. This kickstarted the ATM group within the Centre which put out no less than 10 telescopes in the years after.

DIY Solar Filter - Rose-Marie Burke

I made a solar filter from photo matte board and insulation styrofoam for my little spotting scope. I used this to photograph the transit of Venus. The elastic bands are for extra security, I was worried that a sudden breeze might yank the thing off when I was peering at the sun and didn't want my eyeball fried.

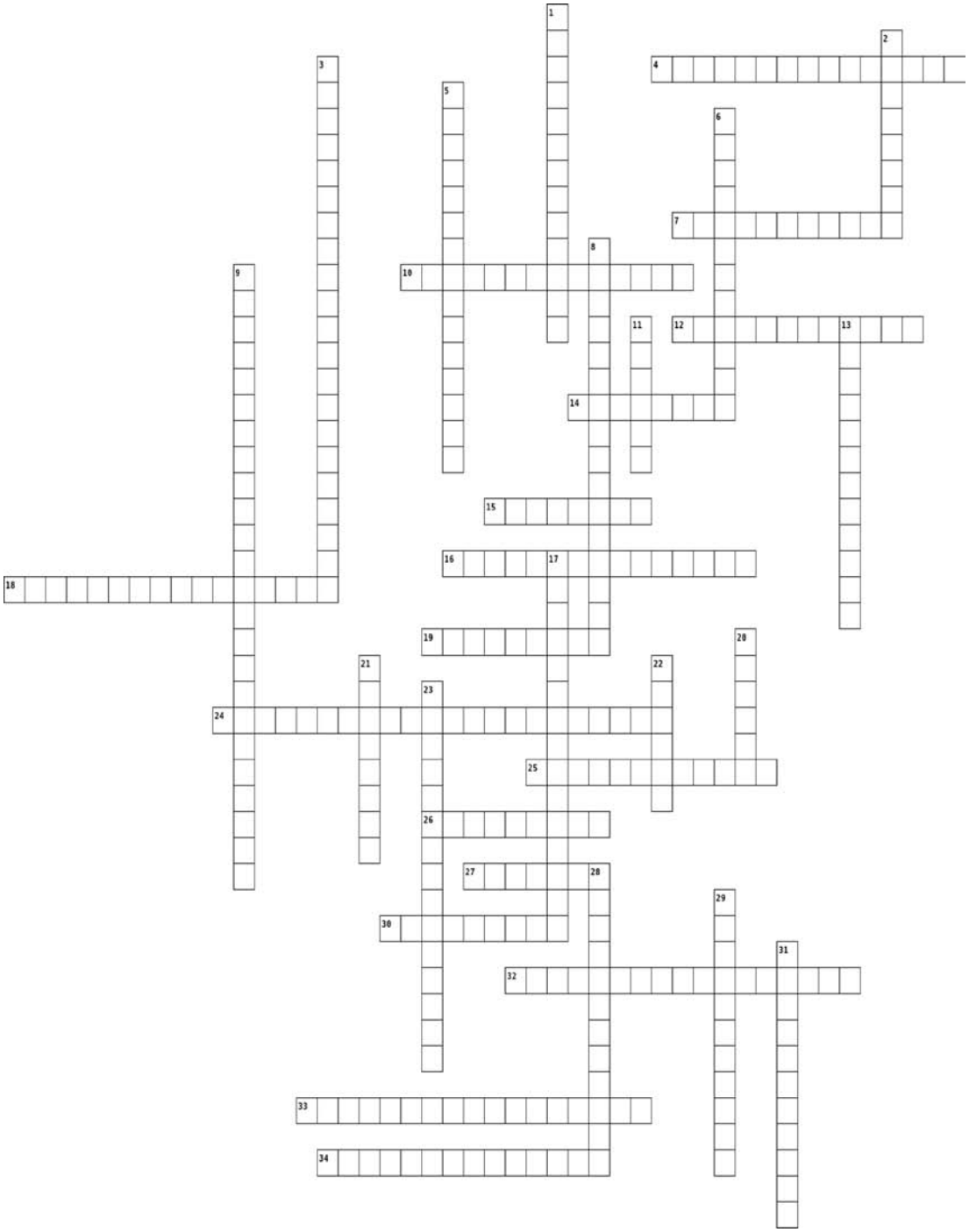
Uranus - Kevin Kell

This is an annotated image of the planet Mars and the planet Uranus on the COLD! evening (-16C) . Mars (top of image) was placed nicely overhead and was Magnitude 0.3 and Uranus (bottom of image) was Magnitude 5.7. They were approximately 2 degrees 41 minutes apart at the time of this photo.

Uranus being out of focus, made it much easier to positively identify, what with the telltale colour of a bluish green, totally unlike any star. As was the 30 second exposure, to have the colour trail out behind each of the planets.

This was taken with a Canon T7i DSLR camera on a tripod with a 30 second exposure at ISO 800, f5.6 with a Canon variable zoom lens 75-300mm.

Graeme's AstroCross for February 2021 - AstroCross (Meteor Showers)



Title: Major, Minor and Variable Meteor Showers

Across

4. ACE
7. / QUA
10. LMI
12. MON
14. GEM
15. AUR
16. NTA
18. PAU
19. PPU
24. DLM
25. BHY
26. ELY
27. LEO
30. GIA
32. AMO
33. CAP
34. COM

Down

1. PHO
2. ORI
3. SDA
5. ANT
6. KCG
8. NOO
9. SPE
11. LYR
13. TAH
17. EGE
20. PUP
21. PER
22. URS
23. STA
28. HYD
29. JBO
31. ETA

Newsletter News from other Centres

From the latest issue of the RASC Halifax Centre "Nova Notes"
https://halifax.rasc.ca/images/documents/novanotes/nn5105.pdf

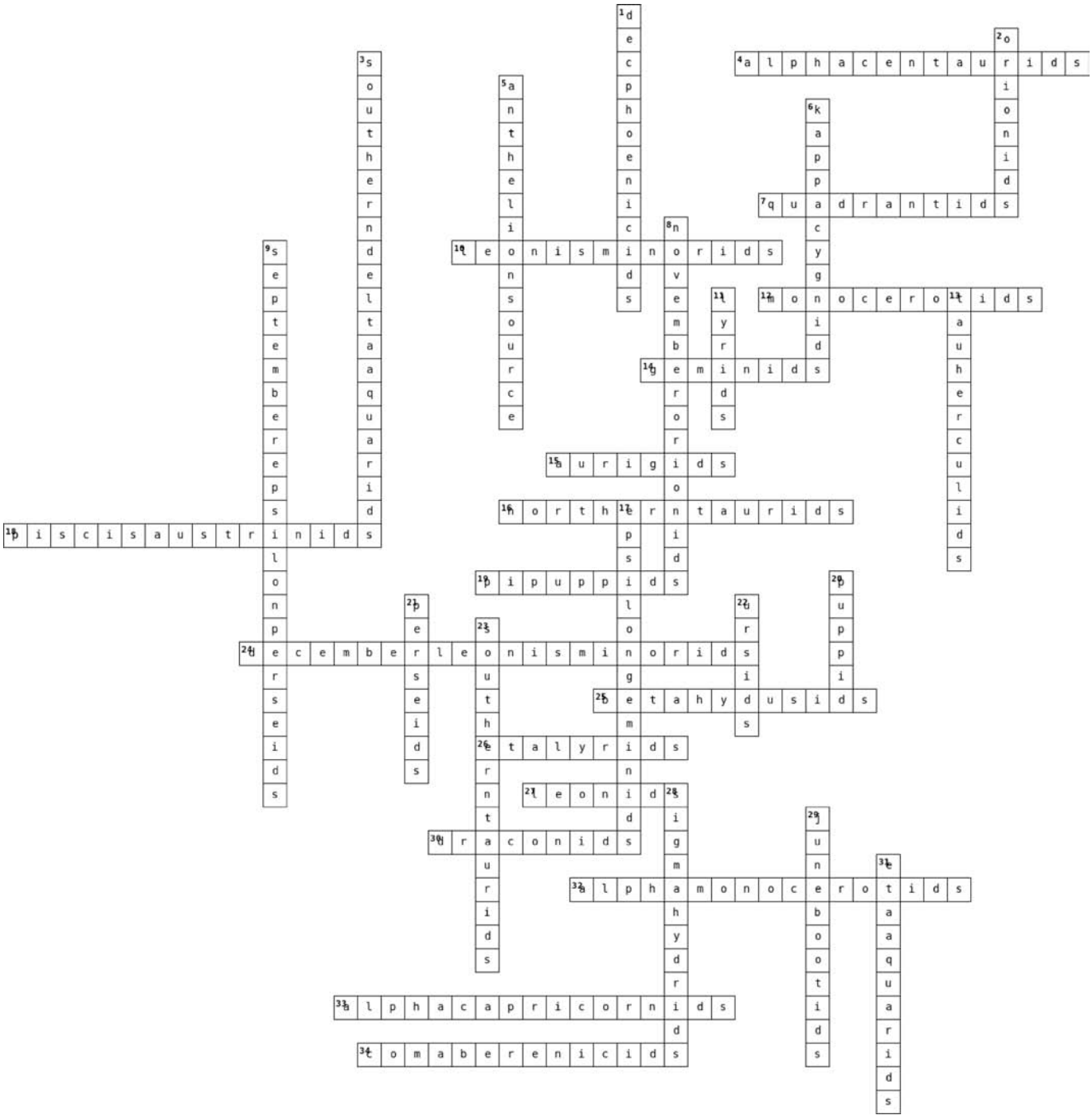
Special Presentation: Paul Gray The RASC Calendar –Front to Back and Back to FrontThe purpose of his presentation was to inform members of how to read the calendar and what it takes to put one together. He extended thanks to all the volunteers involved and extended a special thanks to Michael Gatto for his expertise and time spent on the production of the calendar. He noted the calendar is geared to North American observers.Front to Back:Before using the calendar, he invited members to look at the third last page that describes "how to use the calendar". Adjustments to locations are only critical when you consider how far west of the meridian you are located. For trip and event planning purposes, dates of the New Moon in 2021 and 2022 are highlighted in blue.

From the latest issue of the RASC St. Johns Centre
http://www.stjohnsrasc.ca/newsletter/ABS-June2020.pdf

Astronomy Stamp Collecting- Mike Morrow There are useful things to do when it isn't nice enough to observe (modifying equipment, processing images, learning things, etc.) but I sometimes occupy myself doing astronomy related activity that isn't very useful at all. Here is a page, from my astronomy collection, of postage stamps showing observatories or telescopes. Beside each stamp is a small tag listing year, country, and the depicted observatory. From top left to bottom right, the years run from 1948 to 1989, Countries represented on this page include the U.S., Japan, the U. K., France, Chile, Germany, Brazil, Egypt, Spain, Yugoslavia, and the former U.S.S.R. If you look closely, you might pick out the Mount Palomar Observatory, the Jodrell Bank Observatory, and the Ef?esberg Radio Telescope. The stamp that doesn't look like an observatory shows an "Astronomische Stutzuhr" which is apparently an astronomical clock from 1560.

From the latest issue of the RASC New Brunswick Centre
https://rascnb.ca/wp-content/uploads/horizon-vol_21-no_01.pdf

Telescope Buggy by Éloi Lanteigne Photos by Jean Sébastien Lanteigne
A few years ago, 30 to be more precise, my grandfather discovered the wonders of astronomy and bought a telescope: a 10-inch Meade LX200. It was a bulky thing, with an even bulkier tripod that got even bulkier when he upgraded to a 12-inch model. Being a highly skilled welder, he found a solution to this problem by designing and building a custom buggy for his telescope so he could safely store it in his garage when not in use, and simply roll it outside whenever he wanted to stargaze.
The buggy has proven to be extreme-ly solid, withstanding 30 years of harsh New Brunswick weather. It can be easily moved on asphalt, grass and even snow, as can be seen in the pictures, and the three screws attached near the wheels allowed him to easily keep his telescope levelled.



The Fine Print: Members of the Kingston Centre receive Regulus as a benefit of membership. Regulus is published up to 10 issues each year. Non-commercial advertisements are free to members of the Centre. Paid commercial advertising is also welcome and should be in electronic format. Submitted material may be edited for brevity or clarity. The opinions expressed herein are not necessarily those of the Kingston Centre.

FLASF Science Fair 2021

Attention Young Astronomers!

Are you thinking of entering the

FLASF 2021 Science Fair?

(March 22nd-26th)

The Kingston Astronomy Club is offering the

Leo Enright Award

for the best project in

Astronomy and related sciences

The awardee will receive **$100**

and an *Explore the Universe Guide*

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For starter ideas
please check out the next pages!

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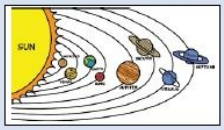
Some Suggestions To Get You Started!

1) Try observing by naked eye at night:



The Solar system:

- Check out the sun, moon and planets rising and setting times in your area. Saturn, Jupiter, Mars, Venus and Mercury will be visible by naked eye.
  https://www.timeanddate.com/astronomy/night/canada/kingston

- Identify the **planets** visible each night or at dawn. Note that some appear to come very closely together - called a conjunction. For example: Jupiter, Saturn and Mercury at dusk in January; Jupiter and Venus at dawn in February; and Mars and the Pleiades cluster in early March. Check out the Internet to see what's visible each night: *https://earthsky.org/tonight*.

- Explore the **Moon**: Observe and record the phases of the Moon. Do you know why they occur? Here's a video to show you: *https://www.youtube.com/watch?v=wz01pTvuMa0*
  Can you see and draw the shaded areas on the Moon? They are called **Mares**. How were they formed? -Which is the largest? – Can we tell their age? Here's a link to an observer's guide for the **Moon**: *https://www.rasc.ca/sites/default/files/EtM_Binoculars_V3.pdf*

Constellations and Bright stars:

- Learn to use a sky chart to help you look for constellations. Well-known examples are Ursa Major and Minor, Cassiopeia, Taurus (Hyades), Pleiades, Orion and more!
  Here is a link to one that you can print, cut out, and glue onto thin cardboard:
  https://www.uaf.edu/museum/education/educators/heliophysics-aurora-outre/activities/pdfs/Create-A-Star-Wheel-Activity.pdf

- Find out what ***double stars*** are, and whether any of your constellations have them:
  https://www.astropix.com/html/observing/20_fun_naked_eye_doubles.html
  What colours are they? – Why are they different colours? – Why are they different sizes? – How do they differ using binoculars*?

**Choosing binoculars: Any simple pair of binoculars (e.g. 7x or larger) would be fine.*

2) Try observing "Deep Sky" objects using binoculars:

Some "Deep sky" objects are visible through binoculars on a dark clear night, such as the "Nebula" in Orion's dagger, or Andromeda (closest galaxy to us). Using the internet and a sky chart, can you locate these favorite targets, and research further what they are, and how they were formed? Here is a sky chart including the location of some Deep Sky objects during the month of January 2021: *http://www.skymaps.com/skymaps/tesmn2101.pdf*.
Charts for following months will appear at similar links (...2102.pdf or ...2103.pdf, etc.).

3) Explore the moons of Jupiter with a small telescope:

There are four moons visible on Jupiter using a small telescope. Each day they change their position and sometimes go behind or in front of the planet. Try observing each night over several days/weeks and record their movement. Check the internet to confirm what you see:
https://skyandtelescope.org/wp-content/plugins/observing-tools/jupiter_moons/jupiter.html

4) Track the International Space Station (ISS)!

Here is a link how to find when and from where the ISS can be seen:
https://spotthestation.nasa.gov/sightings/index.cfm
Can you name any Canadian astronauts who have served on the ISS? What are some of the experiments that have been done and what have they discovered? How may times doe the ISS orbit the earth per day, and how high is it? Draw a star map of where you saw it and what planets or constellations it passed.

5) Additional Resources:

- **Observer's Work sheets**: *https://www.rasc.ca/sites/default/files/LogBookPageRight_3.pdf*
- **Explore the Universe program:**
  https://rasc.ca/sites/default/files/ExploreTheUniverse6a.pdf
- ***Stellarium***: A software planetarium that generates an interactive display of the night sky:
  https://stellarium-web.org/

- **The Cosmic Club**: An online series on the latest Astro News for space-loving youth in grades 8-12. Organized by the **Institute for Research on Exoplanets** and **Plateau Astro** (Saturdays 11am starting January 23rd). YouTube link:
  https://www.youtube.com/watch?v=6HNBuq_G50Y&pbjreload=101