NOVA
NEWSLETTER OF THE VANCOUVER CENTRE RASC
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Inaugural Star Party a Success!

by Marla Daskis

RASC Vancouver Centre held its first star party at the Washtock Family Campground in the beautiful Nahatlatch Valley from August 25 to 28, 2025.

The weather was perfect for the first two days—clear skies all night. The forecast for both Wednesday and Thursday showed 100% cloud, but this is where the surprise came in: the microclimate around the campsite gave us several hours of good viewing on each of those final two nights! It wasn't horizon to horizon each time but more than 50% of the sky was clear on each night so those who remained were able to get in some viewing.

The weather was quite hot during the day, and as we were on a field, there was no shade except at the very edges. The sun went behind the mountain at 6pm which allowed everyone to cool down and start setting up for the evening.

We had a good turnout given that this was our first star party—over 60 people registered and over 40 attended. Smoke from a fire in the Fraser Canyon was a concern for some registrants, however we found that there was no noticeable smoke in the valley from either the Spuzzum or Lytton fires. Wind patterns in the area seemed to keep the smoke out. While there were a few bugs, they were not overwhelming. The crickets were a nice accompaniment to the night's observing.

The organizing committee will be getting feedback for improvements from participants and working on 2026 dates. ✸

SEPTEMBER 19 HRMSC	OCTOBER 9 SFU	NOVEMBER 13 SFU
Brett Gladman of UBC Astronomy: Bringing the Night Sky to Life: The Vera Rubin Observatory. At the HR MacMillan Space Centre.	Speaker TBD. Watch Meetup for updates. SFU	Speaker TBD. Watch Meetup for updates. SFU

2025 Nahatlatch Valley Star Party

Images by Marla Daskis and Leigh Cummings

President's Message

by Robert Conrad

Reducing Light Pollution: Strategies for Observational Astronomers

Light pollution is one of the most pressing issues facing observational astronomers today. The increasing spread of artificial light across urban and suburban areas is significantly hindering the ability to observe celestial bodies with the clarity that once defined astronomical observation. Whether it's stargazing enthusiasts, professional astronomers, or even researchers using telescopes for deep space exploration, the challenges presented by light pollution are undeniable. Fortunately, there are several strategies that can be employed to mitigate its effects, making it possible to once again observe the universe in all its wonder.

Understanding Light Pollution

Light pollution refers to the excessive and misdirected artificial light that interferes with natural night environments, disrupting the view of the stars and planets. It is caused by both the overuse of

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About RASC

The RASC Vancouver Centre meets at 7:30 PM on the second Thursday of every month at SFU's Burnaby campus (see map on page 4). Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently $104.00 per year ($61.10 for persons under 21 years of age; family memberships also available) and can be obtained online, at a meeting, or by writing to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

For more information regarding the Centre and its activities, please contact our P.R. Director.

NOVA, the newsletter of the Vancouver Centre, RASC, is published on odd-numbered months. Opinions expressed herein are not necessarily those of the Vancouver Centre.

Material on any aspect of astronomy should be e-mailed to the editor or mailed to the address below.

Remember, you are always welcome to attend meetings of Council, held on the first Thursday of every month at 7:30pm in the Trottier Studio in the Chemistry wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

2025 Vancouver Centre Officers

President	Robert Conrad president@rasc-vancouver.com
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At Large	Michael Levy, Gordon Baush, Norry Dogan, Chandan Prashar, J. Karl Miller

Library

The centre has a large library of books, magazines and old NOVAs for your enjoyment. Please take advantage of this club service and visit often to check out the new purchases. Suggestions for future library acquisitions are appreciated.

On the Internet

rasc-vancouver.com
astronomy.meetup.com/131/
www.facebook.com/RASC.Van
www.instagram.com/rascvancouver/
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RASC Vancouver Centre
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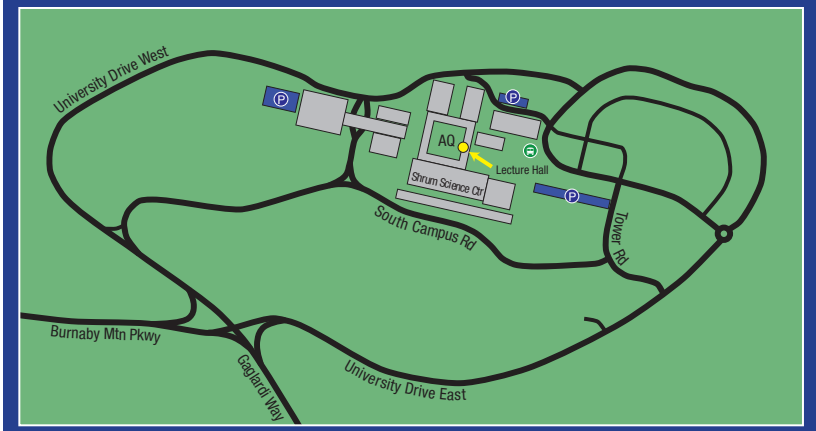
Map to Meeting Site



Our October meeting will be in room AQ 3149 of the Academic Quadrangle, along the east concourse near the cafeteria, as indicated by the arrow on the map.

Pay parking is available at several locations located around campus (indicated as "P" on the map).

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artificial lighting and poor lighting design. Light pollution can be categorized into several types:

1. **Skyglow:** The brightening of the night sky over populated areas due to the scattering of artificial light by particles in the atmosphere.
2. **Glare:** The excessive brightness that causes discomfort or visual impairment, typically caused by poorly shielded lights.
3. **Light Trespass:** When light spills over from one area to another, such as streetlights lighting up a nearby observatory.
4. **Clutter:** The overly bright, confusing, and excessive lighting in urban areas, often characterized by illuminated signage, streetlights, and billboards.

Each of these types can interfere with astronomical observations, obscuring the faint light from distant stars, galaxies, and nebulae.

Strategies to Reduce Light Pollution

1. Advocate for Dark Sky Preserves and Reserves

One of the most effective long-term strategies is the establishment of Dark Sky Preserves (DSPs) and Dark Sky Reserves (DSRs). These areas are designated as places with minimal artificial light interference, where astronomy enthusiasts and professionals can conduct research without the hindrance of light pollution. Organizations such as the International Dark-Sky Association (IDA) have been instrumental in promoting the establishment of these preserves, especially in rural areas or national parks.

Astronomers can work with local governments to push for these designations. In these spaces, strict lighting ordinances are enforced to ensure minimal light pollution and the protection of the night sky for future generations.

2. Use of Shielded Lighting

Improperly-directed lighting is a significant contributor to light pollution. Many streetlights, floodlights, and outdoor lamps cast light in all directions, much of it directed upwards toward the sky. Shielding lights and using full-cutoff fixtures that direct light downwards can dramatically reduce the amount of light escaping into the atmosphere.

Astronomers can advocate for the installation of these energy-efficient, downward-facing lights in their communities. Additionally, cities and towns can be encouraged to retrofit older lighting systems with shielded alternatives that reduce spillover into the night sky.

3. Promote the Use of Warm LED Lights

While LED lights are energy-efficient and cost-effective, their blue-rich light spectrum con-

tributes significantly to skyglow. The human eye is more sensitive to the blue wavelengths, which is why these lights often have such a pronounced effect on the night sky. By promoting the use of warm LEDs or amber lights, which emit less blue light, astronomers can help reduce the overall impact of artificial lighting.

Advocating for warmer-coloured lights in streetlamps, signage, and commercial spaces can help minimize the scatter of artificial light into the sky. In fact, some studies suggest that replacing harsh, cool-coloured lights with warmer options can reduce light pollution by as much as 50%.

4. Public Education and Awareness Campaigns

One of the key strategies is education. Many members of the public may not even realize that light pollution is a problem, let alone that it affects their ability to enjoy natural nightscapes or stargaze. Public education campaigns can raise awareness about the impact of light pollution on both astronomy and the environment.

Astronomers can give talks at schools, community centres, and planetariums to teach the public about the importance of preserving the natural night sky. They can also encourage local authorities and citizens to adopt "lights out" initiatives, where non-essential lighting is turned off during certain hours to minimize energy consumption and reduce the impact on wildlife and stargazers alike.

5. Use of Technology to Mitigate Light Pollution

With modern advancements in technology, astronomers can use specialized equipment to minimize the effects of light pollution. These include **light pollution filters** that are designed to block specific wavelengths of light that contribute to skyglow. Filters such as narrowband and broadband types are used to allow only certain wavelengths of light through, enabling astronomers to focus on particular features of celestial objects.

Another technology-based solution is the use of **adaptive optics**, which corrects distortions in the images caused by atmospheric turbulence. While adaptive optics doesn't directly address light pollution, it does make astronomical observations more precise by compensating for the distortion caused by both the atmosphere and artificial light scattering.

6. Implementing Smart Lighting Solutions

Smart lighting technology provides an excellent opportunity to reduce unnecessary light pollution. These systems use sensors to adjust the brightness of lights based on real-time needs, such as dimming lights in the absence of

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Membership has its Privileges!

Are you tired of looking at the same objects again and again (planets, moon, etc.)? Is your telescope collecting dust because it's hard to locate deep sky objects? Would you like to bring your observing to a stellar level? Robert Conrad, our observing director, leads the Vancouver RASC observing group and invites you to join by sending him an email at observing@rasc-vancouver.com. Some of the benefits of belonging to this group include:

- Hands on training on how to operate the SFU Trottier observatory
- Weekly observing sessions at the observatory or at dark sky locations
- One-one-one coaching on how to locate thousands of objects in the night sky
- Attend small interactive seminars delivered by Robert on a range of topics including failsafe star-hopping, charting challenging objects and understanding the motions of the cosmos
- Learn to make your telescope dance by locating objects such as asteroids, nova, and supernovae
- Spectroscopy and imaging training from Howard Trottier and an opportunity to collaborate on observatory research projects
- Updates on observable sky events happening during the week like asteroid/comet/deep sky conjunctions
- Access to observing guides and lists that Robert created that took hundreds of hours to create and will help with planning observing sessions
- Knowledge and expertise from other observing group members
- Learn how to quickly and efficiently find and star-hop to deep sky objects using a range of binoculars and telescopes

Upcoming Events

December
11 – AGM

Canada Day at Maple Ridge with RASC-Van

by Norry Dogan

The Royal Astronomical Society of Canada (RASC) Vancouver Centre participated in the July 1, 2025 Canada Day celebrations at Memorial Peace Park in Maple Ridge, BC by hosting a free public solar observation event on a bright, sunny day. RASC Vancouver's participation, as in past Maple Ridge Canada Day celebrations, followed the same format, emphasizing safe solar observing and public engagement in astronomy.

The event was part of the city's annual Canada Day festivities, which featured multiple stages of live entertainment, diverse food trucks, and interactive family activities from noon to 5 pm. RASC Vancouver volunteers were present to guide attendees, answer questions about solar phenomena, and explain safe solar viewing practices using certified telescope filters.

RASC had a spectrum of various instruments to allow safe solar viewing including a Simple Sunspotter (below left), and two telescopes showing filtered, real-time views (below) and a Lunt hydrogen-alpha (Ha) solar telescope (below right).

Sunspotter is a simple tool that allows people to track sunspots as they appear, move, and vanish. A bright, 3" solar image of the Sun, by using a series of mirrors, is projected onto a white viewing screen.

The two telescopes had different filters enabling viewers to see the Sunspots more clearly.

Through a Lunt hydrogen-alpha (Ha) solar telescope that blocks all but a narrow, red wavelength, attendees safely viewed solar features such as prominences, flares, and sunspots, allowing direct observation of the Sun's dynamic surface in real time. In hydrogen alpha, the Sun transforms into a vibrant, red orb with intricate prominences and chromospheric detail—as captured in the Image 6 below.

This RASC event was designed to be family-friendly and accessible to participants of all ages, requiring no prior astronomy experience, and hopefully to entice them to learn more. ✸

Imaging Group News

by Marla Daskis

Meetings and Presentations

The imaging group has been meeting on the first and third Tuesdays of each month; the first meeting is a general chat and the third week we have been trying to organize presentations.

Trottier Telescope Access

We have been clouded out several times for Tuesday night sessions. On one of our clear nights, we elected to try and configure N.I.N.A. Despite a number of tries, we could not get the dome to work with the software. We also had another opportunity to image at the end of August but did not have enough qualified operators to take advantage.

Two qualified operators (RASC council members) are required for running the telescope safely, and we are always interested in having more qualified members. If you are interested in becoming a qualified operator, then please contact the imaging group. Training is done under supervision, and qualification is done onsite by RASC

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Imaging Group Meetings:

- 1st and 3rd Tuesdays every month
- Quarterly In-Person at SFU
- Contact Imaging@rasc-vancouver.com to be added to email list for invites.

Benefits:

- Like-minded people to share with
- Range of skills from beginner to expert
- Access to world class imaging equipment
- Member viewing at VRO

Please note: You must be a RASC Vancouver member to join the imaging group.

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pedestrians or vehicles. Astronomers can work with local municipalities to implement smart lighting systems in public spaces, ensuring that lights are only as bright as necessary while also conserving energy.

For example, smart streetlights can be programmed to automatically adjust their brightness levels based on the time of night or traffic conditions. This reduces the amount of wasted light and its subsequent impact on the night sky.

7. Nighttime Observing and Observation Schedules

For astronomers who work in areas where light pollution is unavoidable, altering observation schedules can help. Opting for late-night or early-morning observation times, when there is less ambient light and fewer human activities, can help reduce the effects of light pollution.

Additionally, working in remote locations that are far from urban centres can greatly improve the quality of observations. Many observatories and research centres are built in such locations specifically to avoid the problems posed by light pollution.

Collaboration and Global Efforts

Finally, reducing light pollution will require collaboration between scientists, city planners, policymakers, and the public. The IDA and other organizations have launched initiatives that aim to raise awareness, promote better lighting practices, and lobby for legislation that protects the night sky. By encouraging global collaboration, astronomical societies and environmental groups can join forces to advocate for stronger regulations on lighting, as well as better urban planning to mitigate the growing problem of light pollution.

Conclusion

Light pollution may be a significant obstacle for observational astronomers, but through a combination of technological solutions, community advocacy, education, and proper planning, much can be done to reduce its impact. As urbanization continues to spread, preserving the integrity of our night skies will be essential, not only for scientific research but also for future generations who deserve to experience the awe of the cosmos. Through these concerted efforts, astronomers can ensure that we continue to look up at the stars with clarity, wonder, and understanding. ✸

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members who are already qualified.

Project nearing completion – enabling Remote Access to Vancouver RASC Observatory (VRO)

After several work parties, the project to enable remote access to the Vancouver RASC Observatory (VRO) is nearing completion. Solar power has been configured to the telescope and is working well. Cellular modem connectivity is in place and the final configuration for computer and modem components is underway. Remaining tasks include developing a mechanism to reserve time on the telescope for interested imaging group members.

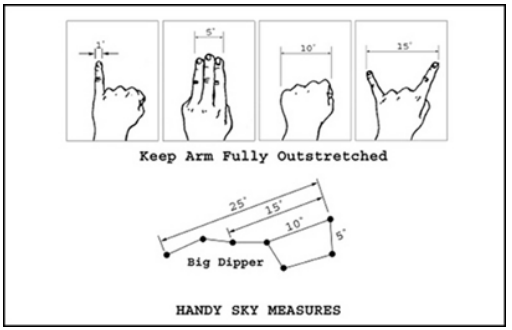
In addition to the technical work, groundskeeping tasks were also done to reduce grass and weeds, and the portable toilet was moved away from the observing pad. ✸

Observational Astronomy Book Excerpt 6

by Robert Conrad & Andrew Krysa

Measuring Angles and Distances in the Sky

An important prerequisite to observational astronomy and, more importantly, to star hopping is being able to estimate in degrees how far apart stars and objects are in the night sky. Everyone should be familiar with this. You don't even need any fancy tools or instruments to measure these distances. You only need your hand. The diagram above represents your hand held at arm's length and how many degrees the different hand configurations represent in the sky.



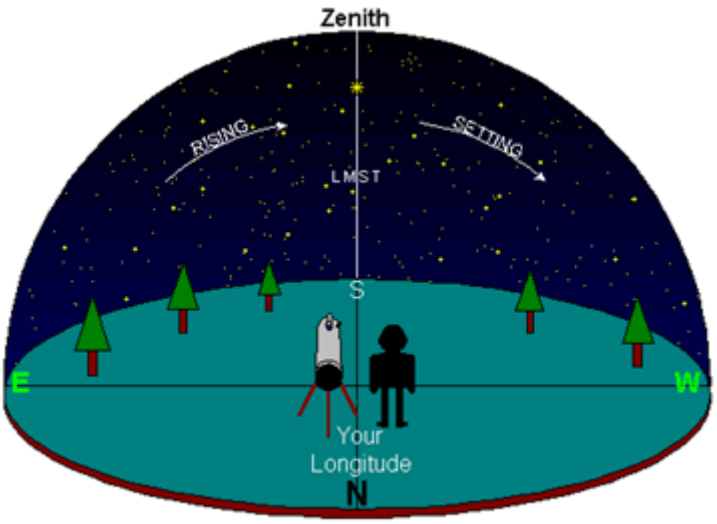
So as a circle or a circle section of a sphere has 360 degrees, a half circle has 180 degrees and, as we see only half the celestial sphere from anywhere on Earth, a straight line drawn from any point on the horizon to the exact opposite point on the other side of the horizon through the zenith (the highest point overhead) is 180 degrees long.

For some reference, the Big Dipper asterism is 25 degrees across its furthest length and the moon is half a degree across or half your pinkie finger outstretched at arm's length. To put this into some context, a wide-angle telescope eyepiece provides a view of approximately between 1 and 2 degrees (so you would be able to fit 2 to 4 full moons within the field of view of the eyepiece). When you are star hopping, knowing how many degrees away something is from where you are starting facilitates accurately locating your object. Angle measures are also a valuable tool when considering other things such as your topography/landscape. For example, you may be excited to view the Orion nebula from your balcony after dinner only to realize that there are tall trees in your way. As we learned earlier, constellations move westward in a parabola 15 degrees each hour so if you can look at the trees and estimate using your fingers how many degrees it is between the Orion nebula and where the Orion nebula will clear the trees along its parabolic path, you can calculate how much time you will have to wait before you will see the nebula. If it has about 30 degrees to go to clear the trees, you will need to wait 2 hours before the nebula will be visible. Later, we will learn how to calculate the angular view of any given eyepiece for your telescope. This angular view becomes even easier when looking through a pair of binoculars. Binoculars are usually marked with a label which will tell you what the angular view of the binoculars is in degrees. An example is the Celestron 8X56 DX which has an angular field of view of 5.8 degrees or the distance three fingers looks to you on your outstretched hands, which means you could see almost 6 full moons in the field of view.

Star Magnitudes

The ancient Greeks took great pleasure in looking at the night

sky. One Greek astronomer named Hipparchus, around 129 BC, came up with a method of measuring the brightness of stars as they appeared to the human eye. He assigned magnitudes to the brightness of the stars and gave the brightest stars a magnitude of one and the faintest stars a magnitude of six. We have kept this scale ever since and a few confusing facts come out of this convention. The first confusing point is that smaller number magnitudes like one are actually brighter than larger number magnitudes like six. This scale was originally defined by Hipparchus' eye and the human eye is a bad brightness detector especially as things get fainter. So, because of this, the second confusing point is that a star that is two numbers brighter than another star is not actually twice as bright as the fainter star but 6 times brighter. Magnitude is calculated on a logarithmic scale. This means there is a linear ratio of brightness as we go up or down between magnitudes. The difference in brightness between a 5th magnitude star and a fourth magnitude star is the same ratio as the difference between a third and a second magnitude star. The difference in brightness between one magnitude and the next one is 2.5 times the brightness and a difference of 5 magnitudes is equal to a factor of 100 in brightness. Because we have chosen to keep this antiquated star brightness measuring scale, we have had to adapt it for more modern purposes. There are objects and stars much brighter than magnitude one which Hipparchus just lumped all into magnitude one. So, this leads us to a third confusing point about star magnitudes. Objects and stars brighter than magnitude one are actually assigned negative numbers. So, the brightest star in the sky, Sirius, is actually magnitude negative 1.5 in brightness and Venus when it is at its greatest western or eastern elongation and at its brightest is at magnitude minus 4. The full moon is magnitude minus twelve in brightness and the Sun is almost minus 27 magnitude brightness. Using the logarithmic scale, the Sun appears to be an astonishing 13 billion times brighter in the sky to us than Sirius. Going the other way, a good amateur 8-inch telescope can see stars and objects to about magnitude 12 in brightness and the dimmest galaxy yet observed by scientists is magnitude 29.



Your LMST - Local Mean Siderial Time - on your Meridian.

The practical side of the magnitude scale as it applies to the observational astronomer is knowing what the naked eye limit is and being able to look at any given star or object in the sky and being able to know what magnitude it is. To some extent, this magnitude limit is impacted by the amount of light pollution in the sky. Generally speaking, the naked eye limit in a dark sky location away from city lights is between six and seven, depending on how dark the location is, how good one's eyes are and how well their eyes are adjusted to the darkness, which can take up to an hour. If the Moon is full, there will be little chance to identify a six or seven magnitude star especially if the stars which you are trying to identify are in the vicinity of the full moon. This is why it is critical to protect your night vision at all costs. Using a dim red or green LED light when reading star charts out in the field is one good way to retain your adapted night vision. All

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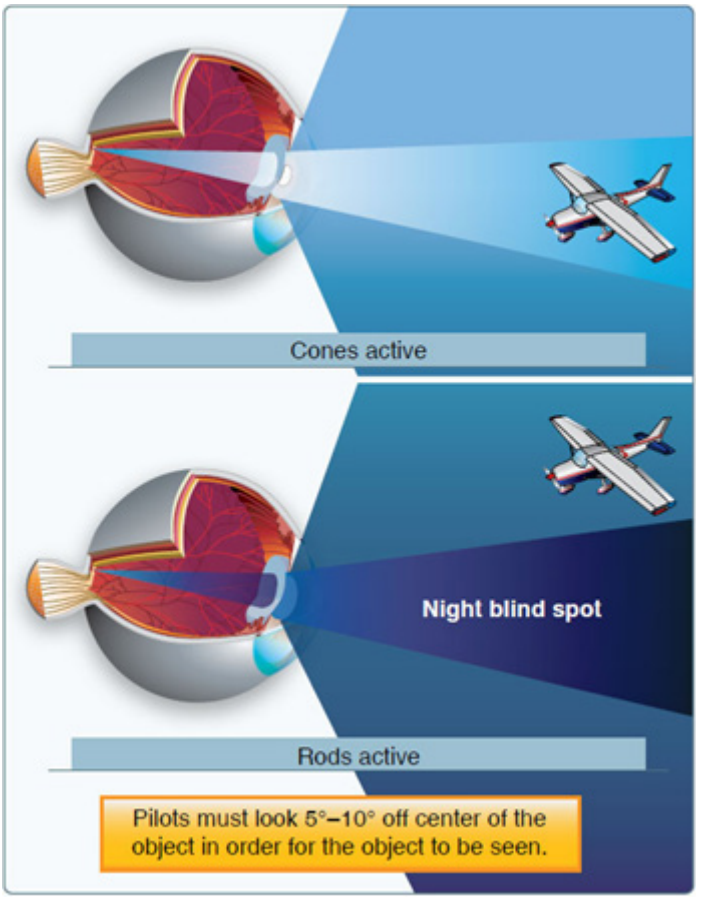
good star charts will have a legend showing the star magnitudes usually from negative 1.5 to 13 represented by black circles. The bigger the circle, the brighter the star. After much practice of observing and comparing what is seen in a star atlas, a good amateur astronomer should be able to look at a star and be able to come up with a fairly good approximation of the star's visual magnitude.

If you look in your telescope instruction manual, there should be a section outlining its specifications. One of those specifications is the visual/apparent magnitude limit of your telescope. This value assumes the darkest location and a very clean mirror. I find this value to be overly optimistic by about one magnitude. That's why it is imperative to ensure that you clean your optics regularly and observe in the darkest location feasible to get the most of your experience. Even with just a good pair of binoculars, you can increase the number of stars in the sky from a visible naked eye limit of 2000 in your hemisphere to over 100,000. With a telescope that number increases to a few million stars.

To see a magnitude naked eye limit of seven, you will most likely need to use what's known as averted vision. This means looking not directly at the magnitude seven star but looking slightly away from it so that it comes into view in your eye. Pilots who fly at night are very experienced at using averted vision. Averted vision is approximately 15 degrees off centre vision or straight ahead vision and the sweet spot is a little different for everybody. The human retina is covered with rods and cones which are sensitive to light. Cones are more effective during daytime vision and rods are more efficient during dimmer times and nighttime. Cones are more concentrated in the centre of your retina and rods are more prevalent further out from the centre of your retina, hence the reason for being able to see fainter, darker objects better when not looking directly at them but a little off centre. Rods are also less sensitive to colour which is why things look more black and white at night and why we can't distinguish star colours in the sky so well. Were our rods more sensitive to colour, we would see a myriad of different colours in the stars we see at night.



Star limit magnitudes are critical when choosing a starting star during star hopping. The more stars you can identify in the sky and view, perhaps even using averted vision, will reduce the distance that you need to star hop. In other words, you want to find the closest star to your destination object.

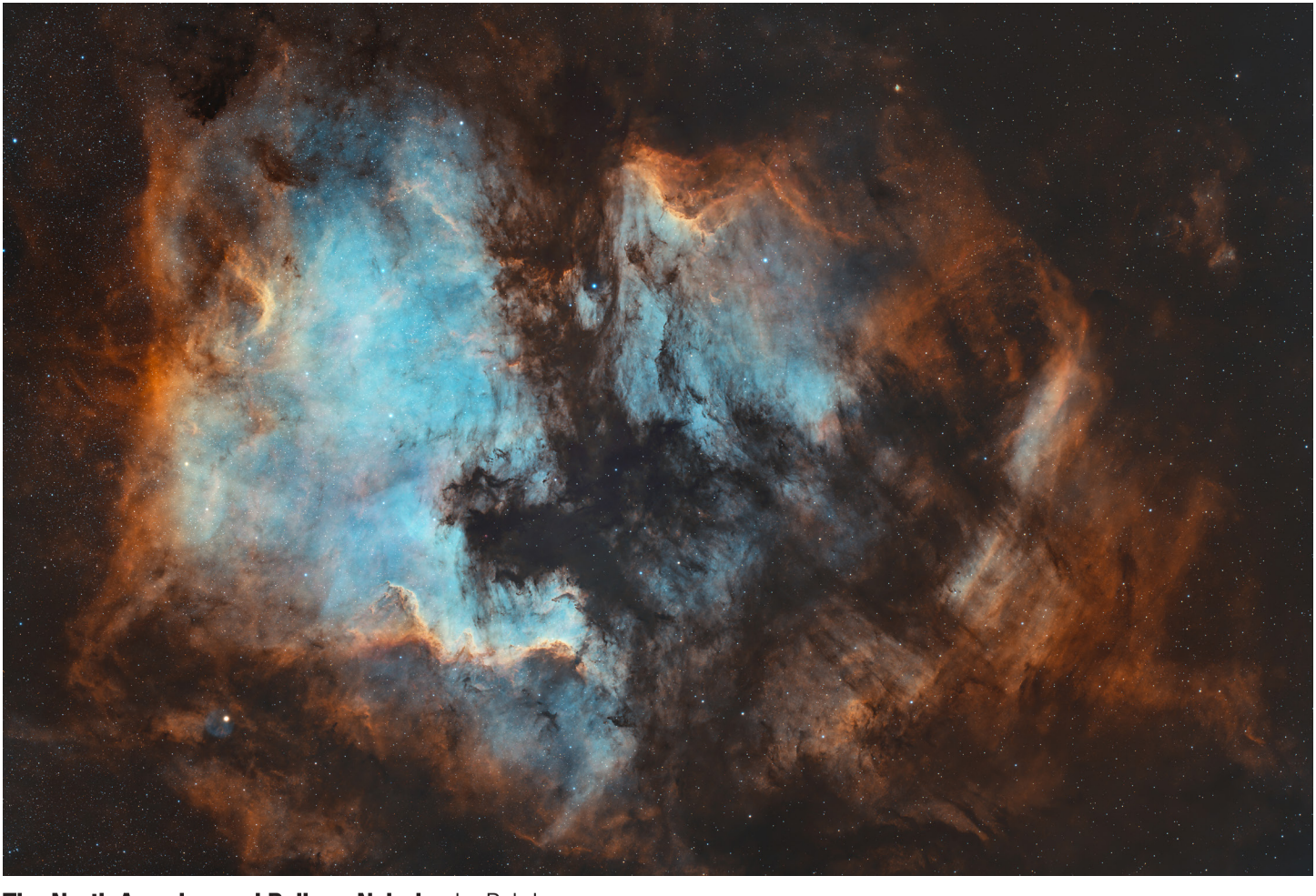
A little bit further on, we will be spending a great deal of time learning how to create custom star charts

for objects like asteroids and comets. The reason we do this is because often times, in the case of an asteroid, there will be many stars in the same field of view with a very similar magnitude to the asteroid. Creating a custom chart will help distinguish between the asteroid and the other stars. For comets, which tend to move relatively quickly through a field of view (especially when near perihelion), it helps us ensure we are looking in the exact location at the proper time to be able to identify the comet in the field of view. When generating the custom chart, it allows you to select the limiting magnitude and will then only plot the stars up to that magnitude. What is important here is for you to know what the limiting magnitude of your telescope is but also what the limiting magnitude of what is visible based on environmental conditions where you are observing, such as light pollution, moon, atmospheric transparency, etc. To some extent, even the altitude at which you are viewing can affect the magnitude limit. For example, if you are viewing right at or near the horizon, don't expect to see the upper limit of the limiting magnitude of your telescope.

One important thing that we need to discuss is the magnitude limit referred to in astronomy literature is in reference to a single point of light. Another concept that you will need to become familiar with is something called surface brightness. This is a term often used to describe the brightness of not stars but diffuse objects such as galaxies and nebulae. Light from these objects appears to come from an extended surface rather than just from a point, so they are called extended objects. Since the light from these objects is spread out over a small area of the sky, astronomers measure their surface brightness. The surface brightness is a measure of *brightness per area* on the sky. You may be able to see a thirteen magnitude star without any difficulty in your telescope however trying to view a 13 magnitude galaxy is a completely different challenge. The same can be said for comets that are often described by their surface brightness since comets compared to stars and asteroids tend to be more diffuse. The reason I mention this is because often when a comet is worthy of media news, a false picture is usually painted with a magnitude brightness that doesn't take into account its surface brightness and so the comet does not appear as spectacular as touted. The Triangulum galaxy M33 at magnitude 5.7 is the fifth-brightest galaxy in the night sky in terms of visual magnitude after the Milky Way, the large and small Megaellenic Clouds and Andromeda. However, it is referred to as a faint galaxy because its brightness is spread over a huge area, nearly a square degree.

Earlier we mentioned that you can see many more stars through a pair of binoculars and many more still through a telescope up to magnitude 13 or 14 depending on the size of your telescope. However, when doing astrophotography and taking long exposures of the night sky, you can see stars near 20 magnitude. This is why it can be difficult at times to compare a visual star chart to an astrophotograph of the same area of the sky. ✸

Sharon K. of Coquitlam (with husband Chris) was the winner of the grand prize draw at the 2025 Nahatlatch Valley Star Party. Thanks to All-Star Telescope for their generous donation of an 18 mm Celestron eyepiece.



The North America and Pelican Nebulae by Rob Lyons

Here is a recent image of the North America and Pelican Nebulae in Cygnus. I made this image with my William Optics Redcat 51 telescope, ASI2600MC Pro camera, and an Optolong L-Ultimate filter. This is a total of 16 hours of 5-minute exposures taken from the Kitsilano Observatory.