

# NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC  
VOLUME 2012 ISSUE 6 NOVEMBER DECEMBER 2012



## Pegasus

by Bill Burnyeat

When I think of the constellation of Pegasus, I always remember an evening up Whistler Mountain and a crowd of people coming to look through the telescope. The comet hunter David Levy was there and we took turns moving the telescope while visitors filed up, had a peek and surrendered their place to the next in line. Then, Jupiter set behind the mountain which is most inconveniently placed, in my opinion.

Worse came as cloud emerged from the white tops of the peaks and sailed across the sky. Soon most of the celestial sphere was bathed in dark cloud and only a

small amount of the sky remained clear. David shrugged and smiled. Some of the guests seemed ready to return down in the gondola.

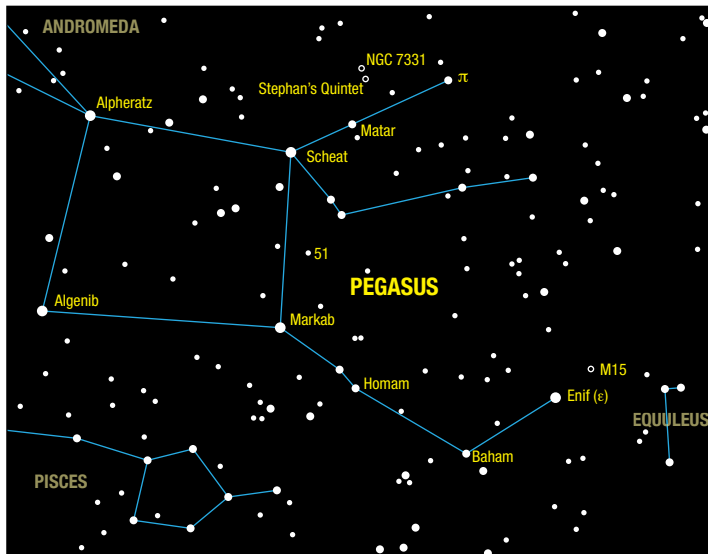
upon the star called  $\pi$ . This is a wide double but not mentioned in most lists. It's too easy. One star seemed yellow; the other a very pale purple, which might be called lilac. It was the only object visible. Yet the people coming singly or in families were not disappointed.

Most had no idea stars could come in pairs and the sight astonished them. Of course some may have wanted to be astonished since they had stayed up past their bedtime and

were standing in the dark and cold on a mountain top.

Most were genuinely amazed that stars would orbit each other

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Looking into the clear patch, I noticed it was the north and west part of Pegasus and staring through the finder scope for something else to show I came

**FRIDAY NOV. 16 SFU WOODWARD'S**  
Dr. Sara Seager, Professor of Planetary Science & Physics at MIT. **NOTE DATE CHANGE!** Cinema 3200, Goldcorp Centre for the Arts. **SFU**

**DECEMBER 13 DOUGLAS COLLEGE**  
AGM. Room 2201, North Building, New Westminster Campus.

**DOUGLAS**

**JANUARY 10 UBC**  
Jaymie Matthews of UBC: The extended Kepler mission to find exoplanets: To know the planets, you must know the stars. **UBC**

# Never Leave Home Without It

by Leigh Cummings

This last August, I received an invitation (request) from my Aunt Mary to travel up to her place on Kootenay Lake to take part in a family and community event. I did not want to disappoint her as I certainly owed her a visit. Because my wife and son were not able to accompany me, I was faced with a long drive on my own. In my younger days, I would have thought nothing of it, but age brings about worries that youth cannot imagine so I had to think of how to break up the trip.

One idea that came to mind was to email Howard and ask if I could spend a night at his “Cabin in the Sky” near Osoyoos in the south Okanagan. Howard quickly replied in his usual generous manner that not only was I welcome, but that he insisted that I spend the night with his family. He also hoped I could make it in time for dinner as well as staying for breakfast the next morning. This was a big relief to both Diane and myself. I took some extra days off work in anticipation of the six-day trip.

On August 16<sup>th</sup>, I loaded up my Mini Cooper with my HEQ5, 150mm Maksutov telescope, camera tripod, 15X70 binoculars and tub of misc astronomical gear and books. That still left room for a shirt and small bag of clothes and shoes. I was going for a special occasion after all. One question I often get asked at public viewing events is what telescope to buy? It is a very difficult question to answer in such generalities, not knowing the person

you are speaking to. One thing I always suggest is at least one travel-able scope. What describes a travel-able scope is defined by how one travels. My Mini Cooper defines the 150mm Mak and equatorial mount as the upper limit if you want to have room for anything else in the car. If you fly, then a small refractor might be a better fit. If you take transit... well you get the drift.

I didn't know if I would find any time to actually use the telescope but knowing that I was travelling into dark sky country for the first time in a year, and after the dismal winter and spring weather we had, I didn't want to miss a potential chance for some quality viewing.

I got away that Thursday morning with a promise to my wife to set the cruise control on the speed limit and to have a safe and enjoyable drive through the country. The sky was sunny and warm and well-suited for sunroof and open-window travel. Only after travelling past Hope did I remember that I left the directions to Howard's Cabin in the Sky on my desk at home. Luckily, Howard had emailed me a photo that he had taken showing the turn off Highway 3. I had it embedded in my memory quite well, as it turned out.

After a very casual drive through Manning Park, the Similkameen Valley, and past Mount Kobau, I arrived at Osoyoos. I had stopped at the “Blow Down” picnic spot in Manning Park to have a coffee break and now I needed another. I also had made very good time and was able to enjoy more breaks

than I had planned. I then jumped back into the Mini and started our romp up the big climb to Anarchist Summit. Needless to say, cruise control was not used as the Mini got to exercise her mountain-climbing pedigree on the twisty mountain highway. Howard's photo helped me recognize the turn off before I blew past it, forcing me to do a U-turn and retrace my route.

Going by memory of his instructions alone, I was able to get onto Howard's road with only one unnecessary side trip. I couldn't remember his lot number, however I spotted the unmistakable profile of a roll-off roof observatory just below the road I was on. I drove down the gravel driveway to the greeting of Howard and Loula's newest addition to the family, a very cute furry addition named Cali. He is a rescued border collie pup that was very welcoming. I do not know what blew me away more, the gorgeous “cabin” or the equally gorgeous setting near the peak of the Anarchist Summit overlooking the Okanagan valley to the west.

Howard and Loula gave me a very warm welcome and introduction to Cali, after which Howard gave me the royal tour of his “cabin.” Loula has decorated the inside of the cabin with astronomy in mind. Everywhere there are stars and crescent moons incorporated into the everyday items that make up a home. There are also works of astronomy-themed art throughout the home. I still salivate when I look at the photos

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# President's Message

This edition of NOVA rounds out our series for 2012, and also rounds out my two-year stint as President of Vancouver Centre, and my fourth year on the Council executive. Your council is made up of centre members who have chosen to volunteer their time, energy, and ideas to improving the quality of our service to membership, and to expanding and enriching the programs that

our society provides to the public. If you are reading this NOVA, then chances are that you share the same passion for astronomy that has led other members to volunteer, and I heartily encourage you to do the same, whether by participating in events of particular interest to you, or by getting involved more deeply as a council member. With your help, the skies at Vancouver Centre

will be unlimited!

My last president's message presents a natural forum in which to take a look back on the last two years of astronomy at Vancouver Centre, and to take a peek ahead at a new opportunity coming our way in 2013, one that I think has the potential to transform what we do at Vancouver Centre, and how we

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## About RASC

The RASC Vancouver Centre meets at 7:30 PM on the second Thursday of every month at various locations in Metro Vancouver (see page 1 for meeting locations and page 4 for maps). Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$73.00 per year (\$41.00 for persons under 21 years of age) and can be obtained by writing to

the Treasurer at the address on page 5. 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 room P8445.2 of the Physics wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

## 2012 Vancouver Centre Officers

**President** Howard Trottier  
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**Treasurer/Telescopes** Steve Coleopy  
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**Councillor** Jim Ronback  
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**Honorary President** Dr. John Macdonald  
**Trustees** Sally Baker & Ron Jerome

## 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

<http://rasc-vancouver.com> or  
<http://www.rasc.ca/vancouver>  
<http://astronomy.meetup.com/131/>

 @RASCvancouver

## Mailing Address

RASC Vancouver Centre  
PO Box 19115  
2302 West 4th Ave.  
Vancouver, B.C.  
V6K 4R8

## Maps to Meeting Sites



### UBC

Our UBC meeting site is in room 201 of the Hennings Building. The main entrance is off Agricultural Rd. (indicated by the arrow on the map at left). Room 201 is up the stairs and on the left.

Pay parking is available at several parkades located around campus (indicated as “P” on the map).

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do it!

Before I start, two caveats. First, in picking a few events to illustrate the goings-on at Vancouver Centre over the past two years, I’ve been limited to mentioning the specific contributions of only a few members of council—but it’s been an inspiration and a pleasure to work with everyone on council, and with the many members at large who have contributed to so many of our events. The second caveat is that bragging rights for the successful programs and events described here go elsewhere: to the council and centre members who individually and collectively made them happen ;).

When I look back over the past two years at Vancouver Centre, the first thing that comes to mind is our speaker program. Vancouver Centre hosted a parade of speakers of truly outstanding quality during this period, and we were graced

with inspiring, informative, and entertaining lectures on a wide array of topics in astronomy and space science. I can’t overstate my admiration for our long-time speaker coordinator, Barry Shanko, who I think bested his already impressive track record of many years with the string of lectures that he’s helped to coordinate these past two years. Highlights? Well, in January 2011 (coincidentally my first month on the job as president), Barry brought us Dr. John Mather of the Goddard Space Flight Centre, co-recipient of the 2006 Nobel Prize in physics, for a talk on the James Webb Space Telescope, delivered at the Space Centre to a standing-room-only crowd of more than 200. Another high water mark that year was our annual Paul Sykes lecture, held that October at SFU, where we hosted Jon Lomberg, astronomy artist and long-time collaborator with Carl Sagan. Incidentally, here’s a little-known fact about Lomberg’s

visit: he and his wife Sharona were invited to SFU for discussions on how a certain capital project might benefit from Jon’s artistic vision ;) —don’t be surprised if Lomberg’s name again comes up in connection with SFU in the next few months!

Among the highlights of our speaker program in 2012 was a February lecture given by Dr. Ed Krupp of the Los Angeles Griffith Observatory to a capacity crowd at the Space Centre’s Star Theatre. Dr. Krupp is an internationally-recognized astronomy educator and author, and he regaled us with a detailed account of the actual history and astronomy associated with the Mayan calendar. And with the world ending just about one month after this edition of NOVA goes to press (kidding), our final lecture for 2012 (or is that for all eternity?)—OK, kidding again) will be an “astronomical happening”, to be held on Friday November

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in the way the moon orbits the earth. In this I detected a residual Aristotelian notion that the stars above have special ways and are immune from the laws of nature that affect us here on earth. This was once thought common sense and it was only as late as 1803 when Herschel announced stars orbited one another and the laws of Newton were not limited to our solar system. People are conservative; most have still not heard the news. I always think of that night when I watch Pegasus.

Pegasus is the flying horse, a well-wrought fall constellation not resembling a steed at all but framed, most unexpectedly, in a fairly exact square; a form avoided in nature which, as the Greeks taught, overwhelmingly endorses the circle.

The square sits on the meridian on frosty November nights and the two west-side stars which are north and south aligned have invisibly running through them the 23<sup>rd</sup> great circle of right ascension while to the east the other pair in the square entertain the 24<sup>th</sup> hour of RA. This is the prime meridian of the sky system

of celestial addresses; the stars may be thought of as having postal codes, but here meteors and frightful comets have their passage, not merely a mail truck bearing flyers and credit card bills.

Like the Big Dipper, our square is an asterism that attracts the eye, focuses the mind and sets the viewer ruminating on the possibilities that stars' random settings accidentally form patterns which ought to be on the blackboard and not peering down from heaven. This suggests the idea that the cosmos itself anticipates all our devices, philosophy and speculation with analogies, but why? And the answer always is silence.

Coming down to earth, we can use the square less poetically but more practically. The numbers of stars seen within the square is a fairly good indication of the sky clarity and the limiting magnitude available.

Suppose you can see all four stars of the square but its interior is vacant. Then your naked eye limit is no better than magnitude 4.5. If you can see four stars sitting inside the square you now can see to magnitude 5.0. Suppose you

can count 10 to 12 stars within the box. Now the limit is 6.0. If the box holds 30 stars, then it is a fine night and the limit is 6.5. According to star charts, about 40-50 stars within are brighter than 7.0.

Sometimes, when observers are asked to count the stars inside the box with only the unaided eye, one can receive answers that seem much too high for the state of the sky. This is the tendency to include stars sitting just outside the box, lumping those in with the true insiders. Some watchers seem to believe the point of the exercise is to beat some record or that the star count is a kind of competition and they perhaps unconsciously wish to claim one more star viewed than their neighbour.

One such poor star pressed unfairly into the game is of the fifth magnitude and sits on the west side of the square but, emphatically outside a line connecting alpha and beta Pegasus. This is the star called 51 Pegasus. It may be that this star's main attraction was to add improperly another member to the club of those within the square but it once briefly became

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## Membership has its Privileges!

New members, did you know? The Vancouver Centre has 8 telescopes available for loan free of charge! We have telescopes ranging from 60mm to 10" diameter. For more information see the Director of Telescopes after the members meeting. The loaner period is for one month, to be returned after the next meeting. Telescopes are not allowed to circulate outside of these meetings. You

can now reserve two different telescopes per year and use what is left at the end of the meeting anytime.

Your greatest opportunity as a member of the RASC is to take advantage of the company of other enthusiasts to increase your knowledge, enjoyment and skill in astronomy.

The best thing you can do to gain the most from your membership is to get ac-

tive! Take in the club meetings; engage other members with questions; come out to observing sessions (also known as "star parties"), and, by all means, volunteer to take part in our many public events.

For the usual observing sites and times, visit our website at <http://rasc-vancouver.com/observing-sites/> or contact the Observing Chair at [observing.rascvancouver@gmail.com](mailto:observing.rascvancouver@gmail.com).

# Upcoming Events

## November

17 – The End of the World, Part II: Remainder Samra presents “It’s the End of the Universe and I Feel Fine.” At the HR Macmillan Space Centre at 8pm. More details at <http://www.spacecentre.ca/the-end-of-the-world>

## December

8 – AGM  
21 – The End of the World, Part III: A screening of the movie, **2012**, in the Planetarium at 8pm. More details at <http://www.spacecentre.ca/the-end-of-the-world>

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famous for another reason. In 1995, the first set of planets found around an other star was detected here. Astronomers had long suspected planets went around other suns but had been unable to prove this until 51 Pegasus furnished the first example.

In the square itself we find a house divided for only three of the four stars are assigned to the horse. Alpheratz, on the north east corner, is assigned to the chained lady Andromeda, connected to Pegasus in myth but segregated by today’s notion of nomenclature. Opposite this star, or across a diagonal from the Andromeda side, is the star Markab, Pegasus’ alpha star.

This is a whitish star that attracted the attention of astrologers as holding influence over danger from cuts and fires. Those working in the circus as a sword swallower or flaming torch

juggler live in fear of the evil influence of this star.

Beta of the horse is the star Scheat on the northwest side of the square. This star is noticeably coloured to the most casual inspection. It appears yellowish



orange or pale pink. This is one of the red giant stars and, like many in this tribe, Scheat is a variable. It usually rests at about 2.5 but can range between 2.1 down to magnitude 3.0. Thus it is possible for Scheat to be the brightest or the faintest of the square’s stars. Lately, however, it seems content to sit in the middle of its possible

range and does not appear to differ greatly in this writer’s experience. Yet, as an irregular variable this could all change tomorrow.

Pegasus—being a large, rambling constellation—has many stars of note and the Great Square forms only a small part of the horsey extent. Far to the west, set off by itself, is the star Enif. This second-magnitude star is an easy double with an 8.5 magnitude star about two arc minutes away. The pair can be shown in a 60 mm refractor, and even smaller scopes will succeed. This pair (which,

although charming, may seem unremarkable) has a curious history of observation. John Herschel, son of the planet-discoverer William, claimed the pair shows a peculiar pendulum like oscillation of the fainter member when the telescope is rocked from side to side. This is

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the Pulfrich effect, and is caused by a delay in the human retina in acknowledging the change in motion of the fainter of two objects causing the motion to be retarded compared to the brighter member of a pair. The effect can be induced experimentally by placing a dark filter over one eye. Thus, looking at a swinging pendulum the observer seems to see the fixed perpendicular rotating about its central axis although no such motion is taking place.

The younger Herschel was interested in this and other issues of cognition since, in the 19<sup>th</sup> century, most astronomical information was gathered through the eye. The personal equation mentioned by Sir Arthur Conan Doyle in his Sherlock Holmes stories sought to quantify human capabilities as scientifically as could be described. Herschel invented photometers to be used by observers for accurate naked-eye judgements. Some of these ingenious devices used a small telescope equipped with a prism which could move and direct the light of Jupiter into the field of a star and compare brightnesses.

By dimming the light of Jupiter in some way, a measured equality with its dimmed image and the star could be found. The advent of electrical devices put an end to all this but the increased accuracy

M15 was discovered in 1746 by Maraldi while he was seeking a comet in that year. The comet is long gone but M15 remains as one of the show piece objects of the Pegasus/Andromeda areas. In

large telescopes, a faint and small planetary nebula can be glimpsed within M15. Good seeing and at least a 250 mm telescope are required to spot the elusive cloud around a star. It is the sole M object in Pegasus.

NGC 7331 is a bright and attractive galaxy also within Pegasus. It makes a triangle with

the stars Pi and Eta with the galaxy being in the direction of Andromeda. It's a bright and easily explored galaxy in a 60 mm telescope. This is a spiral galaxy and is sometimes cited as an example of what our own system would look like from the outside. In small instruments, it's elliptical in shape but a 150 mm shows the grainy texture of the dusty lanes. Photos show the familiar arms looping about the bright core.

Right next to 7331 are five small, dim objects that form a galaxy cluster and are called Stephan's Quintet. Four of the galaxies can be seen with a 250 mm telescope. The fifth requires at least a 300 mm instrument. \*



the new techniques showed was won at the cost of alienating the human being from the process. We see some hint of this in those ads for GPS telescopes in which it's assumed the buyer will not need and does not want to know the name of even one star in the sky.

M15 is a magnificent globular star cluster at the western side of Pegasus, the celestial flying horse. The cluster is found by starting near Epsilon Pegasus, a naked-eye star about 4 degrees south. Sweep north to find M15. In binoculars, the cluster is seen as a tiny grey dot. Small telescopes easily show some of the starry marvels of this large star cluster.

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16. That is when SFU and RASC Vancouver will co-host Dr. Sara Seager, MIT Professor of Physics and Planetary Science, at SFU's downtown Goldcorp Centre, for a lecture on one of the hottest topics in astronomy: "Exoplanets and the search for habitable worlds." Dr. Seager is one of the world's leading researchers in the theory, detection, and characterization of exoplanets—and she is Canadian to boot! Perhaps you picked up this edition of NOVA while getting seated for Dr. Seager's lecture? If so, then while you wait for the start of the lecture (or whenever you get to read this NOVA), consider the following excerpt from Dr. Seager's biography, lifted from her MIT website: "Professor Seager was born and grew up in Toronto, Canada. Among her first memories is a trip to a 'star party' with her father, to see the moon through a telescope—spectacular!" Spectacular indeed! Sounds like the RASC might have played a small part in turning Dr. Seager into one of the world's leading astrophysicists ;). As of writing, all 350 seats at the Goldcorp Centre's Cinema 3200 had long since been reserved, and the waiting list had topped 100!

Now Vancouver Centre is not just about great lectures—far from it! We're just as much about the science and art of observing celestial treasures, and about bringing this wonderful pastime to the public through a wide variety of community events big and small. Our public events are made possible by the collective efforts of many

volunteers, from both council and the membership at large. Two years ago, at the urging of Suzanna Nagy, council created the position of Events Coordinator; Suzanna had recognized that our events had increased in number and scale to the point where sustained coordination and volunteer recruitment had become essential, and she also stepped forward to take on this important role. As our first Events Coordinator, Suzanna Nagy deserves special recognition for her creative and tireless work over the past two years!

Over the years, Vancouver Centre has worked to develop strong partnerships with a number of like-minded community groups, and over the past two years we have continued to strengthen these ties. Our partners in public outreach include Metro-Vancouver Parks, Simon Fraser University, the International Lunar Observatory Association, the NRC/Herzberg Institute of Astrophysics, and our long-time sponsor, the Vancouver Telescope Centre. We also established a new and very successful partnership with Canadian Telescopes, with which we developed a number of creative and exciting approaches to sponsorship. Among our partners, Metro-Parks deserves special mention for the multiple annual events that we've held together in locations all across the greater Vancouver area, from Pacific Spirit Park on the west side, through Deas Island Park in Delta, and out east to Aldergrove Lake Regional Park. All of these collaborative efforts have been in addition to our own

very active program of community-based outreach, which have included multiple presentations at the Roundhouse in Yaletown, at the Maple Ridge Public Library, at SFU, and at malls, schools and community centres across town.

One of my fondest experiences at our public events over the past two years was in March 2011, when I participated for the first time in Metro Parks annual "Night Quest" at Pacific Spirit Regional Park. More than 1600 people turned out that year, and about half that number paid a visit to the RASC Vancouver station, which was located at a very prominent spot designated especially for us. In addition to the joy of interacting under the stars with so many kids of all ages, and alongside fellow Centre members Suzanna Nagy, Harvey Dueck, Doug Montgomery, and Bill Burnyeat, I took a little time off from our station, during a lull between surges of guests, for my first-ever walk along the "Night Quest" trail. The trail was illuminated by lanterns and featured a series of inspiring and thought-provoking quotes from naturalists, scientists, and other writers, posted on trees all along the way, along with many volunteers dressed up as nocturnal animals. It was magical! As things would have it, this was the first Vancouver Centre public event where our volunteers sported "RASC Volunteer" red bibs. These eye-catching pullovers can be worn even over bulky winter coats and jackets, and were one of the first fruits of Suzanna Nagy's imagination as Events Coordinator.

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The red bibs have since paid highly visible dividends over and over again at many of our outdoor events, and certainly had the desired effect on this first tryout, most tellingly demonstrated as I walked along the Night Quest trail, when I overheard comments from numerous passersby who noticed my bib, despite the darkness of the trail: "Oh, there goes an Astronomy volunteer!"

One of our most exciting recent initiatives has been to revive the monthly observing night at Boundary Bay, at the behest of this year's Observing Chair, Oleg Mazurenko. The plan was to go on the last Saturday of each month, weather permitting. We had a particularly good run of nights this summer, thanks especially to council members Scott McGillivray, Harvey Dueck, Suzanna Nagy, and Jim Ronback, who were repeatedly on site. And the observing nights dovetailed very nicely with our expanded use of social media, in

particular through the use of a new Twitter feed @RASC Vancouver, which was instituted this past year thanks to PR Chair Scott McGillivray. Twitter is a very effective means of keeping membership informed of events "as they happen", and could not be more useful than on those weather-sensitive attempts at observing!

RASC Vancouver also faced an important new challenge in 2012, when the host of our public lectures for the past 40 years, the HR MacMillan Space Centre, was forced to begin charging our Centre for rental of space, having entered a period of significant financial constraints. Although the Space Centre offered its standard rate for nonprofit organizations, council unanimously agreed that we could not afford this fee without serious compromise to the rest of our programming. Hence 2012 became a year in which Vancouver Centre went on a kind of road show. Fortunately, we have been able to

rely on partners in astronomy education at UBC, SFU, and BCIT for more economical arrangements (above all, free use of a high-quality auditorium at the UBC Hennings Physics Building, thanks to Dr. Jaymie Matthews!). The Space Centre also partnered with us for one high-profile lecture this year, and has pledged to revisit our relationship

once they return to fiscal health. Our lectures at BCIT emphasized practical astronomy for beginners, and featured inspiring talks by our Education Chair, Bill Burnyeat, and an especially successful "Show and Telescope". Heading into 2013, we continue to work towards a longer-term solution for lecture space, and those efforts should happily begin to yield tangible results very soon!

And that brings me to the promised peek ahead to 2013, which I'll use to close out this column. Earlier today I finished reviewing SFU's formal proposal for construction of its long-planned observatory and science outreach centre, and that proposal is now in the hands of the lead donor. What else can I say? The concept is astronomically exciting! These new state-of-the-art facilities will be used to create opportunities for new, innovative astronomy programming for a wide variety of groups: for SFU students, for grade-school age kids throughout the province, for the general public, and for dedicated local amateur astronomers. And lastly, a key component of this initiative is a continuing collaboration between SFU and RASC Vancouver ;).

Watch for an official announcement, coming soon!

In the meantime, please: "Keep looking up!" (\*\*)

Dr. Howard Trottier  
President, RASC-Van  
Professor of Physics, SFU

(\*\*) Jack Horkheimer, the greatest of Star Gazers.

cartoon by Dan Collier



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I took. His cabin is a lovely blend of natural wood with very modern electronics and appliances. Every room has a different pattern of wood to add to the uniqueness. The open floor plan was both warm yet airy with a fabulous view of the valleys and mountains to the west. The tour concluded with a tour of his observatory.

Howard has described his equipment in earlier issues of NOVA so I won't go into detail. I will say that the observatory is well laid out with his cozy little office in one corner and a very well organized cabling & power supply system. It is also part of his home network system which enables Howard to monitor his equipment from the loft in his cabin. When he is able to spend more time observing the winter sky, he will really appreciate the effort he has put into this feature.

Howard asked me if I brought a telescope with me as apparently he had left his in Vancouver. His observatory telescope was all set up for photography so he had been limited to viewing with his binoculars only. I told him I had my Mak and in fact, at the last moment, I had also put in the RASC solar telescope. We promptly set up my mount next to his swimming pool and set the solar telescope upon it. I have to admit my mind drifted to my fellow astronomers up on Mount Kobau on this same day and what they would think of me viewing the sun while lounging next to a swimming pool. I felt a twinge of guilt that I quickly suppressed after my first look at the sun, which

did not disappoint as there were lots of active prominences and a couple of sunspots to see.

Howard and Loula then treated me to a lovely supper. We were joined by Loula's mother, Georgia, who was visiting with them as well. I hadn't seen her earlier as she had been occupying her time pulling weeds from around the fence line of their property. Howard had introduced us by calling out through the brush between us. Our parents generation's idea of recreation always seems to look more like work to me than rest. Howard did his duty on the BBQ while Loula worked wonders in the kitchen using local produce and fruit to put together a fantastic table. We all broke bread together on their front balcony as the sun set over the west coast mountains. Wow!

I had run my battery down so I needed power from Howard's pool shed to run the mount. After moving my mount to the other side of the pool and getting an extension cord from Howard, I set the Mak upon it. While awaiting astronomical dark Howard opened up his observatory and let me operate his pride and joy from the observatory office. I felt like I had been given the keys to a Ferrari when all I have driven is the family car. What a magnificent instrument! Now all I have to do is talk to the wife. Oh yeah, Diane already had that talk about not getting any ideas. Oh well, a guy can dream. Once Howard got his telescope programmed for the night's imaging, we proceeded poolside for an evening of observing through my telescope.

Howard also brought out his stabilized binoculars. This was the first time I had ever used a pair of stabilizing binoculars and I have to say I was very impressed. It certainly makes a huge difference if you have to hand-hold your binoculars while searching for a target overhead.

The clear, dry, dark sky at that altitude is spectacular to say the least. Looking for nebulas through the binoculars as well as the telescope was a real thrill. Writing this article this long after that night would tax my memory of individual objects but some things still stand out. Viewing M31 through Howard's binoculars was a real treat. Also looking for dark nebulas in Cygnus was new for me. I didn't keep notes as it was just a truly fun night and I was in "star shock" having just driven up from the coast. So many stars overwhelms your senses after a winter in our light-polluted and mostly cloudy sky. What a treat it was.

I had to call it quits earlier than I wanted as I still had a fair drive ahead of me the next day. I managed to get up fairly early in the morning to a lovely breakfast that Loula prepared for me. Cali also kept me company until she decided it was time for Howard to get up and see me off. Cali will learn that we astronomers are night creatures when the sky is clear. I was loaded and away by 10 so I was able to drive at a nice casual pace to Kootenay Lake. The traffic was heavier than the first leg of my trip but it was very enjoyable. It had been a long time since I had crossed the Kootenay Lake ferry and

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I wanted to soak in the feeling and remember my many summers spent on the lake.

When I arrived at my aunt's, she wasn't home. I wandered around the resort to soak in all the changes that the new owners had made to the old family homestead. I was also scouting out a good location to set up my telescope for some public viewing for the resort guests. I found my aunt visiting at one of the cabins and after a round of introductions (some names I remembered from my younger days), I walked my aunt back to the house.

Before I could ask about setting up my telescope, she asked me if I brought one and would I set it up for her. I told her I would love to. She set me up in a spare bedroom on the main floor of the old log house that I knew so well and then walked down to the beach with me to find a good spot to set up. She suggested an old cement pad where a travel trailer used to sit. It worked for me and before long I had the mount set up and the solar scope set on it.

As you could predict, I soon had a gathering of the younger kids around me wanting to look through the telescope. I was amazed at how fast word spread around "camp" and soon I had at least 25 adults and kids asking questions and taking

turns. My aunt finally had to haul me away to have supper and some time to catch up on family news. First though, I had to stop and pick raspberries on the way back to the house. My aunt wanted them for desert.

After supper and a visit 'til dark, my aunt insisted I get down to the beach and set up my Mak for some night viewing. I set the telescope



on the mount and fine-tuned my polar alignment. I then did a three-star alignment and I was set for a night of viewing. I soon had lots of company including the new owners who still required an introduction.

I started the night out with a quick twilight view of Saturn just before it set behind the mountains on the west side of the lake. I then shifted to Alberio, which was great fun for the youngsters. They were full of questions about star colour and size as well as double stars in general. I then swung over to Mizar so they could see the difference between an optical double and a true double. They caught on very

quick. I then went on to viewing M13 and explained globular star clusters. For most of the people in attendance, this was their first view of a globular. I then shifted to the double cluster in Perseus and put my lowest power eyepiece in so they could get as pretty a view as possible. Sometime while I was doing all this, my aunt had walked back down and surprised me when she asked

from behind me if she could have a look. I was only surprised because of how late it was getting and I had not realized how eager she was to stay up and see the night sky. I think my Aunt Mary would have made an enthusiastic astronomer if given the chance. She peppered me with

challenging questions. I had to pull out my Observer's Handbook more than once. The kids also came up with some very good questions, some of which I had to suggest their parents check out RASC websites as a starting point in their quest for answers.

With the knowledge that my aunt and I had a big day lined up for the next day, we had to call it quits by about 1am. I promised the kids that I would be around the next afternoon and that I was hoping to view Venus in the daylight as well as remount the solar scope.

I will continue my story in the next issue of NOVA. ✨

# In Praise of Refractors

by David A. Rodger

My first telescope was a refractor. It was a classic 19<sup>th</sup> century spyglass used by an ancestor in Halifax (so the story goes) to watch for the safe return of the cargo ships his company had insured. It was given to me by my grandparents when my astronomy interest was starting to bud in my teens. I still have that telescope, although it needs restoration.

My second telescope was also a refractor—a 60mm item purchased from a department store catalogue. I enjoyed looking at the moon and planets with it, but its mount jiggled continuously. Sound familiar?

While living and working in Saskatoon in the early 1960s, I got to use the University of Saskatchewan Observatory's beautiful six-inch refractor. I still have the sketches of M27, M29 and NGC 457 I made with this superb instrument while reclining on the observer's folding ladder.

But then, as my passion for astronomy grew during the 1960s and 1970s, I followed the "aperture rules" crowd to Newtonian reflectors and Schmidt-Cassegrains. Refractors, it seems, were doomed as "trash scopes," victims of chromatic aberration (little rainbows around stars and planets) and poor mounts.

Seventeenth Century astronomers wrestled with these problems, too. They subdued chromatic aberration by building instruments of ridiculously long focal lengths. Have you seen woodcuts and paintings of those telescopes? Some were 50 metres in length? Hardly something

you could take to McDonald Park or set up in your backyard.

Now, fast-forward to 2005. I had been reading in the astronomical media about the refractor's re-birth. New models had high-tech apochromatic optics which eliminated chromatic aberration. So, when I saw an Island Eyepiece and Telescope ad for the 100mm Orion apochromatic refractor priced at under \$1,400, I took the plunge. Thus, on February 13 of that year, a whole new world opened up to me. There was Saturn, as clear and sharp as I had ever seen it and the Trapezium in the Orion nebula and Iota Cassiopeiae. And so it went throughout the cold, crisp winter night. I'm sure my townhouse neighbours wondered at my assorted vocalizations, as I marvelled at pinpoint stars in their natural colours and unimpeded magnitudes. The aesthetics of this experience were almost overwhelming.

A few months later, and now fully stung by the "refractor bug," I added a TeleVue 127mm refractor to my collection. In 2009, I welcomed a third refractor—an Orion 120mm EON. I actually had chosen the latter to replace my 100mm one from 2005. But, to no one's surprise, I couldn't bear to part with it. Finally, last spring, I purchased a 60mm Lunt refractor with a special filter for viewing the sun.

Like many of you, I appreciate a wide field of view while observing. Wide fields come from short focal lengths. Until the arrival of apochromatic refractors, wide-field

viewing was almost exclusively the preserve of binoculars and reflectors. That is no longer the case. My TeleVue 127mm refractor has a focal length of just 660mm, which yields a focal length to lens width (F) ratio of only 5.2 (660mm divided by 127mm). This was unheard of before the arrival of the composite material used in modern apochromatic lenses. The lengthy instruments of yore had focal ratios of 12, 15 or more. That's great for magnification, but it's like looking through a keyhole at the sky.

Now I have the best of both worlds. I have a pleasing wide field of view and, if I want it, high magnification. This was readily apparent the first night I used my new Orion 100mm refractor in February 2005. With Saturn in the field of view, I moved through a series of several eyepieces, each with higher magnification, until (with a 3mm one) I reached an astonishing 300X. The planet's image remained sharp and clear.

Each of my three refractors is equipped with a "go-to" system, but not automatic tracking. I discussed how this works and why I like it in a previous article [*Go to – go to, Jan/Feb 2012*]. There I reported on what I've seen, and what you can see in one of these marvelous instruments. \*

*David A. Rodger is the Founding Director of the HR MacMillan Planetarium (1967-1980), and has been an amateur astronomer for nearly 60 years.*

# Merritt Star Quest 2012

by Gordon Farrell

As your NOVA editor for the last decade or so, I am ashamed to admit that I have never attended a star party. Though not enough to disqualify me from the job, it's something I've always wanted to do but (pardon the pun) the stars had never aligned to allow me to make the trip. Kobau tends to happen around the same time as an annual conference in my profession (if I'm not going, I'm holding down the fort) and Merritt just never quite worked out, vacation-wise. That finally changed this past September, so I packed up the 'scope and headed for the gravel pit.

Well, it wasn't quite as easy as that. It's not just that I had never camped out under the stars... The truth is I had never camped. Period. This meant borrowing what I could from friends (and better-equipped fellow council members) and buying the rest. There was also a NOVA to prepare for the meeting I would be missing (and a special thanks to Howard for taking it to the printer in my stead). So, with the car packed up with gear (some of which still had tags attached), I hit the road around noon on Thursday and arrived at the Loon Lake gravel pit around 4:30. There I slowly circled the pit (don't want to kick up dust!) until I found the RASC enclave at the northeast corner of the pit. I found a spot near Suzanna, Leigh, Mark and Doug and started to set up camp.

I had been forewarned that regular tent pegs are no match for gravel (or the wind that can whip up occasionally), and had

purchased beefier pegs for the task. Unfortunately, it seemed my friend's tent wasn't up to the challenge of these pegs (the grommets were too small!) but Leigh came to my rescue with his giant box o' pegs. Even those were no match for the gravel—I only managed to get two in all the way, having to settle for half-depth on the other two (even at ¼" in diameter, they were starting to bend!) and a few rocks in the tent for good measure. Confident my tent wouldn't blow away, I turned my attention to the real reason I was there—my telescope—setting that up in preparation for my first night in a truly dark site.

It's interesting to watch the sun set from somewhere so far from artificial light. Dusk lasts far longer than it does in the city, so long that the stars start coming out while the horizon is still fairly bright. Even the Milky Way appeared before it became properly dark. This made testing out my mount's polar scope a bit unusual, finding Polaris on a field of blue. While setting up, I also discovered I had forgotten my dew shield at home. I was assured this wasn't the blunder it could have been. Merritt is pretty dry, so the chances of dewing up are slim. As it turned out, the shield was not missed.

What was missed was the other item I forgot—my coat! Gloves, boots, toque, sweatpants and sweatshirt: check. Just that one critical item was missing. Fortunately for me, Mark had a spare coat I could borrow (thanks, Mark!) so my views wouldn't be marred by shivering.

Now that I was properly equipped, night fell in all its glory. My first night was more about getting my bearings and seeing what I could see in proper darkness than following any sort of plan. So I got the mount aligned and started punching in targets around Sagittarius. It was great to finally see these southern gems, so difficult to see from Vancouver. Once I had those under my belt, it was on to the clusters. The Wild Duck was particularly impressive, with its central yellow star adding a third dimension (well, not really; see the Pulfrich effect mentioned in Bill Burnyeat's article elsewhere in this issue). From there it was on to galaxies, seeing the tremendous detail that eludes you in the city. The lanes of Andromeda (M31) jump out at you, and the mottled dust lanes of NGC 247 were stunning (thanks to Wayne Lyons for the tip on that one!). When Jupiter finally rose, it was almost blinding—one could almost imagine it damaging your night vision! But the most amazing sight of the night for me was worth saying up until 4:15am. The Orion Nebula (M42) positively popped in my 9.25" telescope. The gossamer ribbons of this fan-shaped stellar nursery were an amazing sight! When not enjoying the views through my own equipment, I wandered about to see what Doug, Suzanna and Leigh were observing (Doug's impressive collection of eyepieces definitely warranted a look).

With that, it was time to turn in. I must say, it's kind of hard to sleep

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in sub-zero temperatures, but I gave it my best try. The real cruelty of a tent, as I discovered, is that once the sun strikes it, it quickly turns from freezer to sauna. Layers were quickly removed until I gave up and emerged into the morning air for some freeze-dried breakfast (the bacon and eggs were surprisingly good). The days at Loon Lake stand in stark contrast to the nights, with everyone seeking shade until the sun finally sets again. Mind you, the days were also an opportunity to get out the solar scopes (and I had brought mine along).

The next night did have a plan. I had brought my DSLR and a 200mm telephoto lens with me, with the intent of doing some piggyback photography. I started off simple, shooting the Milky Way at a wide angle with the standard kit lens. I had improvised a red filter for the camera's screen, taping several layers of red cellophane over top of it. This worked well from a night-



vision standpoint, even if it did make the images a bit blurry. These shots also included Mark's far more impressive setup in the foreground (he was shooting the California Nebula though his Takahashi), along with the silhouette of my own tube (perhaps I should use the forward mounting bracket next time...).

The next shots were a bit more ambitious. I had purchased an illuminated reticle a while back, so now was my chance to put it to good use. First up was M31. The trick here is finding a bright enough star on which to guide. The closest one I found was too far away to get M31 in the frame at 200mm, so I had to back off to lower magnification to get both in the same field of view. After some quick test snaps, I tried a 5-minute exposure. This worked surprisingly well, so I really went for it and did a second exposure at 10 minutes. This was a bit tedious, and the blurred image on the screen made me think I was seeing noise from the long exposure. This later turned out to be many, many dim stars filling the frame (didn't expect that!), but my tracking wasn't as good and the image was slightly streaked. Oh, well. My last target was the Pleiades (M45). This time I backed off to 5 minutes, but the lower altitude was fighting me and it wasn't quite as clear as I had hoped.

By that point, the previous night was catching up with me so I took advantage of that night being warmer than the previous and went to bed.

I had planned to do a third night, but two nights of being stooped over an eyepiece proved too much for my back so I decided to pack things up

and head home. Still, I can't complain and hope to do it again next year (but with my own coat, perhaps an autoguider—and definitely a proper observing chair!). \*



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## M31 (Andromeda)

Gordon Farrell

Manually-guided

5-minute exposure

Canon 40D at ISO 400

EF 70-200mm f/4L USM lens

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