NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC | VOLUME 2009 ISSUE 5 | SEPTEMBER/OCTOBER 2009

THE UNIVERSE YOURS TO DISCOVER

INTERNATIONAL YEAR OF ASTRONOMY 2009

INSIDE

Looking Ahead

Remember, you are always welcome to attend meetings of Council, held on the first Thursday of every month at 7:30pm in the GMSO.

Sept. 10: RASC-VC member Ken Harman recounts his visit to astronomical/space-related sites in Germany.

Paul Sykes Memorial Lecture: Sept. 27 at 3:00pm: Dr. Neil Turok, Director of the Perimeter Institute: What Banged?

Next Issue Deadline

Material for the Novmber Nova should be submitted by Monday, Nov. 2, 2009. Please send submissions to:

Gordon Farrell (gfarrell@shaw.ca)

Title image: Jason Rickerby

Our Trip to Mt. Kobau

by Mike & Val Stevenson

Before we left from our home in Cultus Lake, we had heard reports that the star party might be in jeopardy due to forest fires in the area (shades of 2003 Kelowna!). Also, just before we were to leave, we heard that on the first Friday it had SNOWED on the mountain and even 4-wheel drive vehicles had been turned back, so that concerned us as well. We decided to go anyway.

Painting by Val Stevenson

Our little motor home is elderly so we took our time, stopping for a night at Coldspring in Manning Park and a night with rellies in Keremeos. The next day, we travelled to Mt. Kobau. It always takes over an hour to reach the top as we take our time due to the "relatively" rough road.

When we got to the site, we found many of the larger campsites already occupied but at the very top we found a nice secluded site—beside the massive cell tower. However, we did have a nice view.

Just after we arrived on Wednesday afternoon, we met up with another fellow Vancouver Centre member, Ron Jerome, who was also looking for a spot. We invited him to join us as he only had a tent and there was ample room behind our RV. Lucky for us! He was very helpful with our viewing and we were able to share some comestibles.

Our next order of the day was to attend Lee Johnson's talk on Kobau skies and what to expect to see during the week. Our first night on the mountain was a good experience as we were able to look through Ron's 16" Dobsonian and see some very nice globular clusters, M13 and M15. We also were able to view Jupiter and its four larger moons.

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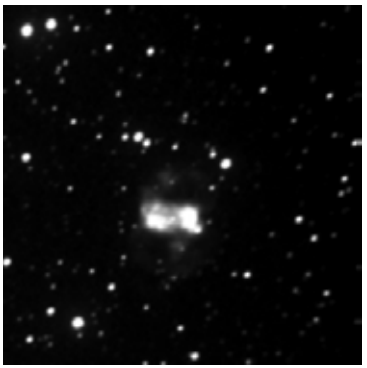
The path only ends where your mind will not wander.

About thirty years ago, I was a member of the Royal Astronomical Society of Canada, Ottawa branch. Back then, as an eager teenager with a big interest in astrophotography, I'd head out with my colleagues in the middle of the cold winter to the Indian River Observatory (IRO). The small, white roll-off roof building situated on a farmer's field housed an amazing 16-inch society-built telescope. These were the days before digital cameras and the



fancy electronic go-to mounts that have become commonplace with today's amateur astronomers. Back in 1981, we used simple 35mm film loaded into manual winding and unpowered 35mm steel SLR camera bodies. During the bitterly cold and long winter nights at IRO in Eastern Ontario, we'd be lucky to manually track and snap one or two keepers. We'd sit motionless, bundled in our parkas with an eye peeking out from behind a ski mask hovering just over the small, frozen, illuminated reticule eyepiece. Poised, staring, and making ever so slight corrections to the RA and DEC of the faint guide star, hoping that the motor control firmly placed in our winter

glove-covered hands would not freeze and seize. We would fight off the cold with a draft of warm cocoa and try to keep the windchill from spoiling our spirits. In the end it would all be worth it. As a reward for our troubles, at the next monthly meeting we'd show off a few simple images, the bounty of our relentless toil. There were always plenty of oohs and aahs as a 10-minute ISO 400 f/8.0 image of say, M45 The Pleiades Cluster, barely showing the beginnings of the faint wisps of blue reflection nebulosity, was displayed. Perhaps a not-so-blurry rendition that offered a glimpse at the trapezium within M42, or a hint of the white dwarf at the centre of the Ring Nebula, or the Dumbbell would be displayed for the members. Any image back in those days was a triumph, a feast for the eyes, awe inspiring for a young amateur astronomer, and a hit with the crowd. The RASC members were always thrilled and impressed that the images were captured with their own society telescope.

As time passed, something began to happen. We started to hear of strange new ways to capture images of the night sky. First it was hypersensitized film, regular 35mm film treated in a bath of mostly nitrogen gas to reduce reciprocity failure—film's tendency to not accumulate any more light after a certain period of time. Then we started to hear about cold cameras, a unique invention based on the fact that it takes longer to expose to a set density level when the ambient temperature is warm than when it is cold. Chilled film holds it's speed better, and the colours are more accurate. 35mm Fugichrome slide film tended to

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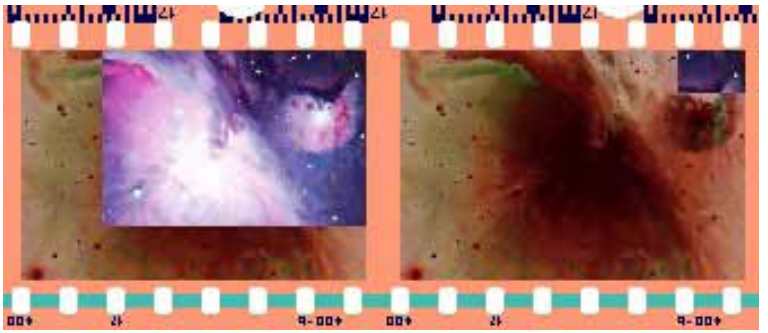

President's Message

As is our wont, my wife and I spend many summer days high on mountain slopes enjoying the flora and fauna and testing our stamina. It is far more satisfying to ascend an ever-rising trail for three hours that to spend a mere twenty minutes on a Stairmaster at the local gym. We do admit to the latter, however, when the damp winter months are upon us and trailheads well nigh inaccessible.

We recently spent a week on the eastern side of the North Cascades in Washington State, just beyond the west coast rain shadow. Our favourite guide book rates the trails we travel from "Wow" to "Don't Bother" and their recommendations have never disappointed us. Anne limits the choices to those with the wow factor. If the trail doesn't offer a view, she is not interested. "Might as well be at the gym" is her standard reply. She dutifully records the mileage and elevation gain of each hike and keeps a cumulative total. Over the twenty years of our adventuring, we have not quite accumulated enough altitude to escape earth's gravitation pull but we are working on it. Should we get there, I am sure we will be treated to some magnificent glimpses of a truly dark sky.

In the evening, after a day's adventure, I often set up a telescope in whatever campground we call home, both for my benefit and to share some of the views with

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About RASC

The Vancouver Centre, RASC meets at 7:30 PM in the auditorium of the H.R. MacMillan Space Centre at 1100 Chestnut St., Vancouver, on the second Thursday of every month. Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently $70.00 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 on page 5.

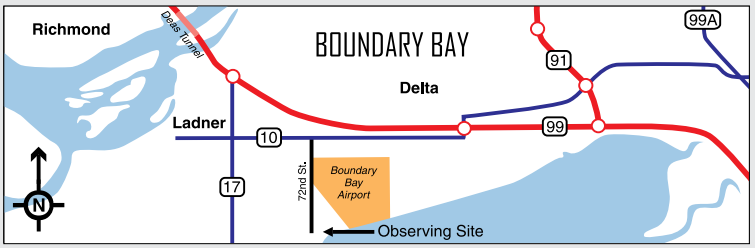
Advertising

Nova encourages free use of its classified ads for members with items for sale or swap. Notify the editor if you wish your ad to run in more than one issue.

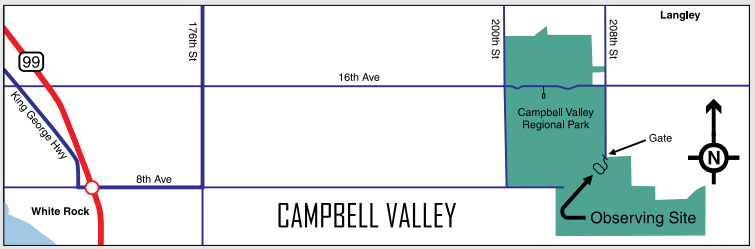
Commerical Rates

1/4 Page: $15.00 per issue
1/2 Page: $25.00 per issue
Full Page: $40.00 per issue
Rates are for electronic or camera-ready files. Payment, by cheque, must accompany ad material. Make cheque payable to:
RASC Vancouver Centre.

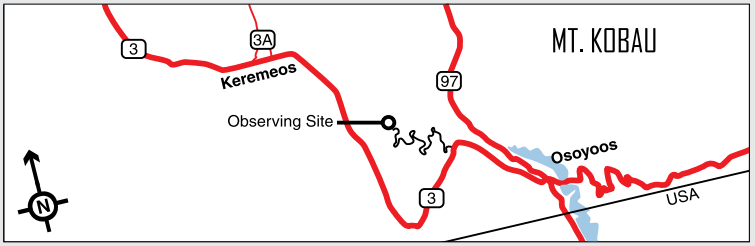
OBSERVING SITES



Site of the regular Saturday night star party. On the dike at the foot of 72nd St.



Our alternate observing site. Contact Bruce MacDonald (604-882-3820) to see if this site is in use.



Site of the annual Mt. Kobau Star Party organized by the Mount Kobau Astronomical Society

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interested folks in the area. With this year's emphasis on iya, there has been an added incentive to promote the joys of the night sky.

On our most recent trip, after returning from a comparatively short hike, I set up my scope behind the picnic table at the back of our campsite. Our location in the foothills of the Cascades restricted the views to many of the targets that are circumpolar or seasonally high. Dinner and dishes were completed around dusk and I opened the door of our trailer, intending to move the equipment to a nearby vacant site with fewer trees. Negotiating the edge of the adjoining forest was a deer, grazing its way in the direction of my telescope. I quickly retreated inside to retrieve my camera. The deer approached the telescope and sidled up close to the eyepiece. Discovering that the lens cover was still on, which spoiled any views, it contented itself with licking the salt off the hand controllers—a minor consolation.

Unfortunately, the low light yielded the less than crisp image below but it documents my efforts to take iya to an audience that I had not foreseen. We may have to consider a new class of members

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For Sale

Celestron C80ED

D = 80mm.
Fl = 600mm
Model # 52280

Comes with a carrying bag and a tripod with a SkyScan 2001 mount.

$1000 obo

Contact Hanns Fellenz
604-266-3772

Call for Nominations

With the 2010 Vancouver Council elections coming up in December, it's time for nominations to be brought forward. Nominations should be brought to Vancouver Centre trustee, Karl Miller via email (jkmiller@direct.ca) or in person.

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in the rasc to accommodate ungulates. Then there is the bear that appeared on the mountain during the Mt. Kobau Star Party…

As you will see elsewhere in this issue, members have been active in a number of public events as well as the Mt. Kobau Star Party. Over the summer, we partnered with nrc's Herzberg Institute of Astrophysics in Richmond, Metro Parks in Delta and West Vancouver Community Arts Council on the North Shore. We expect that these will lead to re-

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LIBRARY

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

RASC-VC on the Internet

http://rasc-vancouver/ or
http://www.rasc.ca/vancouver

Details of upcoming meetings and events can be found at our Meetup group at:
http://astronomy.meetup.com/131/

H.R. MACMILLAN SPACE CENTRE

The Pacific Space Centre Society is a non-profit organization which operates the H.R. MacMillan Space Centre and Gordon M. Southam Observatory. Annual Membership ($30 Individual, $80 Family) includes a newsletter, discounts on Space Camps, special programs and lectures, Vancouver Museum discounts, and free admission to the Space Centre. Admission to the Space Centre includes: Astronomy shows, Motion Simulator rides, multimedia shows in GroundStation Canada, and access to the Cosmic Courtyard Exhibit Gallery. For Membership information, call Mahi Jordao at 604-738-7827, local 237 for information. You can also reach them on the Internet at http://www.hrmacmillanspacecentre.com/

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 Bob Parry, Director of Telescopes in the meeting room of the GMSO *after* the members meeting. All telescopes are to be picked up and returned at the GMSO. 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. Bob can be reached at 604-215-8844.

Your greatest opportunity as a member of the R.A.S.C. 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 active! 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.

Observing takes place at Boundary Bay on the dike at the south end of 72nd St. in Delta (see map on p. 4). We are there most clear Friday/Saturday nights. Contact Jason Rickerby at 604-502-8158.

RASC
1100 Chestnut Street
Vancouver, B.C.
V6J 3J9
604-738-2855

UPCOMING EVENTS

September
12-15 – Merritt Star Quest
26 – Another Starry Heron Night
27 – Paul Sykes Memorial Lecture

October
9-23 – Great World-Wide Star Count
23 – Roundhouse Presentation
24 – Silk Purse Presentation

December
10 – AGM

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peat engagements.

Please check the calendar of events for the coming months and note particularly that our Paul Sykes' Memorial Lecture is scheduled for Sunday afternoon (3:00pm) on September 27th at the H.R. MacMillan Space Centre. Dr. Neil Turok, Director of the Perimeter Institute, is the featured speaker. The Perimeter Institute for Theoretical Physics is an independent, resident-based research institute devoted to foundational issues in theoretical physics and is located in Waterloo. Dr. Turok was recently awarded a prestigious ted Prize (www.ted.com) and you can visit the site to see his presentation. We urge everyone to attend.

As always, we thank the volunteers who give so generously of their time to make all our public events possible. ✸

– Ron Jerome, Acting President

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We were pleasantly surprised with the clarity of the night sky as the forest fire smoke was largely at the horizons, at dusk becoming an eerie red glow in the southern sky.

The next night, it was cloudy and the viewing not as good—even the ever-popular binocular walk was postponed. We ended up going to bed early. Friday was an interesting day. It started out fine with the skies looking good but it slowly became very windy and as night went on it became so blustery that almost everyone went to bed early. On these less-than-perfect nights, some intrepid observers were able to get good viewing by arising again in the wee hours.

The next day brought a nice, clear day and many hoped that we would have a clear night for viewing. This was Saturday, our last day and many things were to happen. It started with the judging contest for those who had home-made scopes or photographs they had taken. At 3:00, we had our closing ceremonies that included thanking those who helped put on the star party and, of course, the judging results. Then came the door prizes and raffles. Many prizes were donated by retailers who also came up the mountain so that winners were able to thank them in person. We all gathered together and had our group picture taken then dispersed until 8:00 when the remainder of us gathered at the flats to listen to our last speaker who talked about the Andromeda Galaxy (including its, and our, ultimate demise two billion years hence, whew!).

Val and Mike Stevenson and Rene from Courtenay

Later on that night, we waited for the skies to get dark and clear up but to no avail. Many stayed up late, got in the best viewing they could, and talked about their experiences on the mountain. Although many nights were not that great for viewing, the talks were excellent and by far seeing other telescopes, meeting other people and exchanging stories were the highlights for most. I know we were happy and look forward to going back. ✸

Richmond Public Library

by Ron Jerome

NRC's Herzberg Institute of Astrophysics hosted an open house at the Richmond Public Library on July 29th. NRC set up several booths with crafts and educational activities. We set up an astrophotography booth and provided a general introduction to astronomy. We also brought telescopes as well as the usual RASC promotional materials. Jason Rickerby provided some of his marvelous astrophotographs and hooked up a camera to his computer so visitors could see how telescopes work as giant telephoto lenses.

Hertzberg also asked if we could provide a speaker to deliver a program in either Mandarin or Cantonese. Kenneth Liu stepped up to the task and together we worked on a presentation which he delivered in Cantonese. It was his first public talk but it went over very well and we have been invited to do the same in Mandarin. About 800 people toured the library's activities over the course of the evening. ✸

Public Events

by Ron Jerome

Silk Purse – Vancouver North Shore

To help raise our profile and attract a new audience, Vancouver Centre contacted West Vancouver Community Arts Council concerning the use of a venue called the Silk Purse Gallery. Our approach was received enthusiastically and for the modest sum of $50 we became member. This gives us access to the facility on the 3rd Friday of every month for the next year. The venue will hold fifty people comfortably and there are two good viewing spots both east and west of the gallery.

Council organized a meeting with members on the North Shore and attracted a dozen interested participants. Spearheaded by Aaron Amberson and Chris Vondruska, the group organized an introductory astronomy talk which was presented August 21st. The initial turnout was small but, according to Aaron, it went very well. The follow-on sidewalk astronomy was a hit as the RASC sandwich board brought several groups over from the adjoining street and the clouds cleared for some Jupiter views. The organizers are looking forward to holding another event.

The Arts Council has also requested our participation the week of November 3-15. They are hosting an exhibit called *Celestial Textiles* with an astronomical theme and would like the RASC to present a talk along with an evening of viewing, if the skies cooperate.

The Silk Purse Gallery is an important cultural centre in West Vancouver with a varied list of activities. The website is ***www.silkpurse.ca***. A map is attached.

1570 Argyle Avenue
West Vancouver
(604) 925-7292

Deas Island Park – Delta

Metro Parks approached us a month ago to participate in an event called *Starry Night*. We were involved with some members of this group at *Night Quest* in the spring at UBC and at Aldergrove Lake earlier this summer in conjunction with the Perseid Meteor Shower, although the latter was clouded out.

We presented a brief look at the contribution of Galileo to the world of telescopes and an overview of how far they have evolved since then. We also talked about what Galileo saw when he turned his instrument toward the heavens. Doug Montgomery, Jason Rickerby (and family) and Jim Ronback all had the opportunity to delight many of the 350 attendees with two of Galileo's targets—the Moon and Jupiter—throughout the evening. It was fun to share a connection that reached back 400 years.

We passed out star finders, along with other IYA materials, and by the end of the evening I was nearly speechless after explaining how to assemble and use those handy tools to a very enthusiastic audience. ✸

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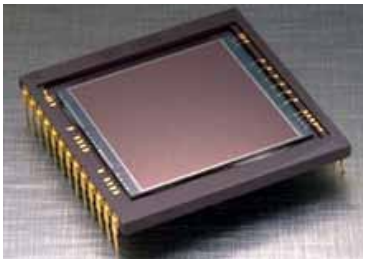
peak in performance around -35 degrees Celsius. The novelty was in building devices to cool the film down to these temperatures. The designs were varied and bizarre, some worked and others were likened to something from Dr. Frankenstein's lair. These cameras actually used dry ice (frozen CO_2 gas) to cool the film down to a range of temperatures that averaged around -35 C. This technique was tricky, fumbling around in the dark with packets of dry ice, cooling film with a dry ice box, dealing with frost and moisture on the film and inside the camera body. Regular camera bodies would rust or become unreliable when running so cold. A stripped down and simplified camera body was typically used, and unique designs were fashioned to keep air from hitting the film. Here is a

reference to a cold camera design if you feel the urge to make one of these devices for yourself using that old Olympus or Ricoh SLR back you have stuffed away in the sock drawer. *Astronomy Magazine February, March 1977 – Cold Cameras part 1&2*.

Then there was light! In the early 1990s, a new device begins to revolutionize astrophotography—Charged Couple Device (CCD) technology. Actually invented in 1969 by Willard Boyle and George E. Smith at AT&T Bell Labs who



were working on the picture phone and on the development of semiconductor bubble memory, Boyle and Smith merged their work and conceived the design for what they termed 'Charged "Bubble" Devices.' The basic principal of the design was the ability to transfer charge along the surface of a semiconductor. The first CCDs were essentially used as memory devices, for one could only "inject" charge into the device at an input register. Further study revealed that a CCD could receive charge via the photoelectric effect and electronic images could be fabricated. By 1969, Bell researchers were able to capture images with simple linear devices; thus the CCD was born. Sony Corporation was the first to mass-produce the CCD technology chip. This ability to convert analog current into digital information resulted in an explosion of CCD chip-based consumer products. The Age of the Camcorder was born. Consumers reached into their pockets and spent billions, seeding a huge multi-faceted industry and stimulating further technological advancements. CCD chips began to show up in many new and wonderful consumer products, such as DSLR cameras, cellphones, and—for the astrophotographer—new highly specialized and ultra-sensitive imaging systems.

Our old pal photographic film, which is still the medium of choice with some astrophotographers (those who still spin vinyl records), seemed to be on the brink of extinction. After all, why keep using a technology that is just a sheet of plastic (polyester, nitrocellulose or cellulose acetate) coated with an emulsion of photon-sensitive silver halide salts (bonded by gelatin) with variable crystal sizes that determine the sensitivity, contrast and resolution of the film? When this emulsion is sufficiently exposed to light, it forms an invisible image which must be extracted and developed using environmentally unfriendly chemicals. Or, should

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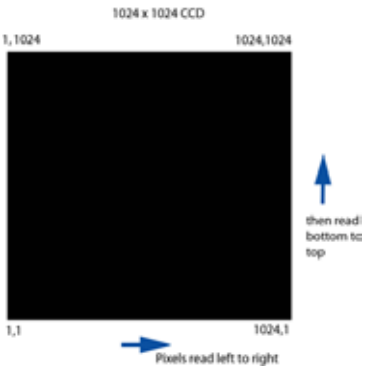

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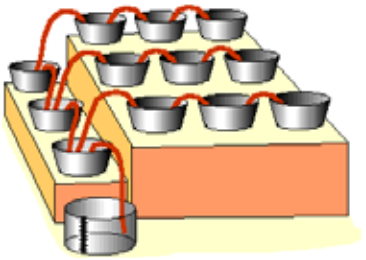
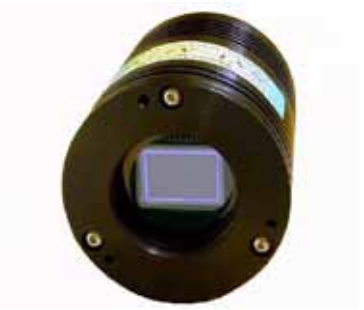
we forge ahead into the new territory offered by CCD technology, which uses a photoactive region (an epitaxial layer of silicon), and a transmission region made out of something called a shift register? With CCD cameras, an image is projected through a lens on to a capacitor array (the photoactive region). Photons hitting the surface cause each capacitor to



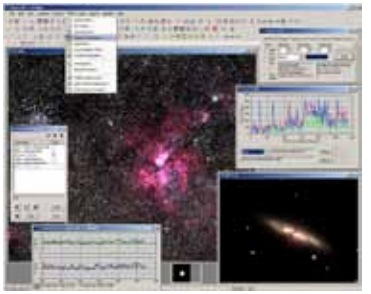
accumulate an electric charge proportional to the photon intensity at that location. CCD cameras are two-dimensional arrays capturing two-dimensional pictures that correspond to the scene projected on to the focal plane of the sensor. Once the array has been exposed to the image, a control circuit causes each capacitor to transfer its contents to its neighbour (operating as a shift register). The last capacitor in the array dumps its charge into a charge amplifier, which converts the charge into a voltage. By repeating this process, the controlling circuit converts the entire semiconductor contents of the array to a sequence of voltages, which it then samples, digitizes and stores in some form of memory. Did you get that? Fun stuff, eh! It's nice to know exactly how your car's engine works too, but do you need to know this in order to drive to work? *Your pathway to knowledge only ends where your mind decides not to wander.*



CCD technology has revolutionized astrophotography. It has taken the backyard astro-imaging buff to new levels and has raised the bar for what research can be accomplished using just basic equipment. At my observatory located in Pitt Meadows, British Columbia, just outside of Vancouver, I routinely hunt for supernovae within galaxies down to magnitude 16, Near Earth Objects, and even enjoy picking through the haystack of stars for the odd undiscovered comet which might still be dabbling about in the outer solar system. The advancements within

modern CCD imaging systems has led to a co-evolution of highly sophisticated telescopes and astrographs. Useful long-exposure astrophotography is only possible when using telescopes attached to highly precise sidereal tracking mounts designed for rock-solid and accurate polar alignments. Manufacturers such as Celestron and their new CGE Pro mount, Meade, Takahashi, Ritchey-Chrétien and others have developed designs that work well with the specialized needs of sensitive CCD cameras. World-class CCD cameras from makers such as SBIG and Starlight Xpress offer the astrophotographer access to systems with supersensitive and very large CCD chips. Starlight Xpress, from the United Kingdom, offers a camera with a 16-megapixel chip in a 36mm by 24mm array. These cameras have extremely low dark-current noise, are USB 2.0 driven and have built-in autoguider CCD ports.

To accompany this revolutionary hardware, specialized software has been developed to get the



most out of the gear. The flagship program is Maxim DL, developed by an Ottawa RASC member, Doug George. Maxim DL, CCDSoft

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from SBIG, and the old standby Adobe Photoshop are just three of many excellent software packages available for the PC that work seamlessly with specialized CCD cameras, and in the case of Maxim DL, with DSLR cameras too! I use Maxim DL and absolutely love it. It's ingenious design makes it easy to hook up to my Celestron CGE 14 telescope, Starlight Xpress SXVF-M25C CCD camera, SX Lodestar autoguider head, microtouch electronic focuser and Canon 5D DSLR. Maxim will even control an observatory dome, if I had one (wish list). Maxim DL has a built-in focusing routine that provides perfect focus every time. Various ASCOM platform-based applications—such as MaxPoint, FocusMax, PoleAlignMax and others—offer unique tools that work with the imaging software to get things working right and with pinpoint accuracy. After a moderate learning curve (and a leaner wallet) these modern, highly efficient CCD cameras, go-to mounts, telescopes, and image processing software packages can offer the backyard astrophotographer a glimpse of the heavens not possible with the same telescope just twenty or so years ago.

If your quest for knowledge takes you down a path with no end, then take the time and invest the bones into the hardware and software that will truly open up the wonders of the Universe to your mind from the comfort of your own backyard.

For those enthusiasts wanting to dwell deeper into the art of CCD astroimaging, I will be teaching an introductory level course at The Vancouver Telescope Centre in late fall 2009. Contact Harout Markarian at (604) 737-4303 or email info@vancouvertelescope.com ✸

Mt. Kobau Gallery: Clouds, smoke, wind and lots of camaraderie

Lee Johnson

Waiting for the awards

Ronan Kerr and his family. He and his sister both won prizes

Grace Verhagen

Photos by Ron Jerome (top) and Wayne Lyons (bottom)