

# SKYNEWS



## Kitt Peak National Observatory

Photo by Charles Banville

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### NEXT MEETING

7:30pm, February 9th 2011  
University of Victoria  
Elliott Bldg. 090  
  
David J. Helfand

[www.victoria.rasc.ca](http://www.victoria.rasc.ca)

## Presidents Report



I would like to wish the best of the season to everyone and hopes for a healthy and happy New Year. As we turn over to 2011 there are thoughts of where we have been and resolutions for where we are going.

Last year was somewhat quieter for our Victoria Centre but besides our regular monthly meetings with some interesting speakers, we also held weekly Astronomy Cafes and participated in many nights up at the Centre's Observatory. I particularly remember some awesome early summer evenings up there with old friends and new members as we perused the skies. Astronomy Day in April was somewhat rained out at Swan Lake but we had a very successful star party at the new site in Metchosin, thanks to the efforts of a great team led by Nelson Walker and Sherry Buttner. School programs flourished but our school star parties were put on hold a number of times as we waited for clearer skies. The new Light Pollution Abatement initiatives got off the ground and are beginning to show some successes.

The highlight that we nearly didn't see at all was the Lunar Eclipse just before Christmas. It was a cold and stormy night out there at Cattle Point as a game number of observers braved the elements to talk to the people who came out to see the Eclipse. We were lucky to be able to have at least the first part somewhat visible but clouds got in the way as totality came on. There were but 3 or 4 cars left in the Cattle Point parking lot by 1 am so it was home we went to get the last views as the full moon rounded back out again. Some members were able to get some nice shots and need to be applauded for their tenacity and patience (and maybe something extra in the hot chocolate to help keep warm!). But isn't that what astronomers are all about?

For 2011 we are looking forward to some thought-provoking and innovative presentations at our meetings, a new Messier observing program, a well developed plan of action for our Light Pollution group, and a continued valuable presence in community involvement as we share our interest in Astronomy to the public. And NASA has declared this year to be "Year of the Solar System" so I hope we will be tuned in to the many different flyby's and landings and launches so that we can better know our nearest neighbours. This is one of my New Year's resolutions.

I hope you will all join in to some or many of the activities this year. Your talents and passion are needed to make 2011 another "astronomical" year for the Victoria Centre.

Hoping for clear skies, Lauri Roche

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## January Meeting

Members Night "A travelogue from Downunder and a bit of an Eclipse"

Michel Michaud will show us an array of his photographs from his travels in South America this past year

John MacDonald and Joe Carr will present some of their work taken from the South Seas and New Zealand this past fall.

Joe Carr has a compilation of some of the photographs and video that were taken by group members last Dec 20/21 for the Lunar Eclipse.

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## February Meeting - David J. Helfand

He is currently involved in a major project to survey our Galaxy with a sensitivity and angular resolution a hundred times greater than currently available. The goal is to obtain a complete picture of birth and death (for stars) in the Milky Way.

## RECENT EVENTS

### December 20th Lunar Eclipse.

In conjunction with a public observing event, Victoria Centre members observed the total lunar eclipse from Cattle Point, starting at 10:32pm up until about midnight, when full cloud cover obscured the Moon. Others observed the event from home, and of course quite a few photos were taken while the weather allowed. Visit the RASC Victoria Centre's Zenfolio Online Gallery to see the images <http://rascvic.zenfolio.com/lunareclipse2010>

## Astronaut Robert Thirsk gives the RASC a present from Space



As part of the IYA2009 activities the national team worked with the Canadian Space Agency to identify appropriate items to recommend be sent into space on the Payette Shuttle and Thirsk ISS

missions. After lengthy discussions of ideas two items were selected. The first was a replica of the first spectrogram taken with the Plaskett 1.8-m telescope on 5 May 1918. This spectrogram was taken on the Space shuttle mission STS-127 with Julie Payette from July 15<sup>th</sup> to 31<sup>st</sup> 2009. The second set of items was an English and a French copy of the children's book, *Mary Lou's New Telescope*. This book was written by Don Kelly, illustrated by Mike Mc Ewing from the RASC Centre in New Brunswick, translated by FAAQ members Remi and Lise Lacasse, printed by the RASC and given out to children, their parents, as well as schools all across Canada throughout IYA. The inspiration for the young girl depicted in the story is actually our very own Mary Lou Whitehorne, our current National President. The books were taken up on a Russian Soyuz spacecraft en route to the International Space Station known as mission Expedition 20/21 by Dr. Robert Thirsk. Beginning on May 29 2009 six astronauts lived for six months on the ISS and performed many experiments, robotic procedures, and space walks. The books have been stamped with the Russian logo for the mission.

While it was natural that Julie Payette return her item to the Observatory and the Centre of the Universe, The Canadian Space Agency also requested that we receive Robert Thirsk's items here in Victoria. Through intense and much appreciated efforts of Eric Chisholm at the Centre of the Universe an arrangement was made on short notice with the IMAX Theatre and Royal British Columbia Museum to have the framed copies returned in front of a nearly full audience of school children prior to one of the last showings of the Hubble film at IMAX on Monday, December 13<sup>th</sup>. On behalf of the national IYA effort, and particularly the RASC's incredible contributions to IYA's success, Dr. Jim Hesser was given the honour of accepting the books from Dr. Thirsk.

After the IMAX presentation of Hubble, Dr. Thirsk ran a video that he had prepared during his months in space and part of this video captured him reading

*Mary Lou's New Telescope*. The students asked many interesting questions after the film and Dr. Thirsk's answers showed his knowledge, humour, and natural talents in communicating with young people. Representatives from the Victoria RASC, John MacDonald, Sid Sidhu and Lauri Roche were invited to participate and, along with Eric Chisholm and Stasia Ferbey from the Centre of the Universe, had a wonderful opportunity to interact with Dr. Thirsk on this very special occasion in which he recognized the national and local successes of IYA and the RASC's roles therein.

Before he left, Dr. Thirsk signed the back of the framed copies for us and it is presently situated at the Centre of the Universe. We will ensure that the copies are sent to the National Office in the coming months, and anticipate that they will arrange to have them shared with other RASC Centres as appropriate opportunities arise. If you are at the Centre, be sure to have a look for at these special "out of this world" books.

Lauri Roche and Jim Hesser

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## ***Ten-year-old New Brunswick Girl Discovers Exploding Star***

**Toronto, Canada (January 3, 2011)** – The Royal Astronomical Society of Canada (RASC) is pleased to announce the discovery of a supernova by a ten-year-old amateur astronomer—the youngest person ever to have made such a discovery.

Ten-year-old Kathryn Aurora Gray of Fredericton, New Brunswick under the watch of astronomers, Paul Gray and David Lane, are pleased to report the discovery of a magnitude 17 supernova in galaxy UGC 3378 in the constellation of Camelopardalis, as reported on IAU Electronic Telegram 2618. The galaxy was imaged on New Year's Eve 2010, and the supernova was discovered on January 2, 2011 by Kathryn Aurora Gray and Paul Gray.

Supernovas are stellar explosions that signal the violent deaths of stars several times more massive than our sun. Supernovas are interesting to astronomers because they manufacture most of the chemical elements that went into making the earth and other planets, and also because distant supernovas can be used to estimate the size and age of our universe. Supernovas are rare events. The last one in our galaxy occurred several hundred years ago, before the invention of the telescope. The odds of discovery can be increased by repeatedly checking many other galaxies. A new supernova reveals itself as a bright point of light that wasn't there the last time the galaxy was checked. Since a supernova can outshine millions of ordinary stars it is easy to spot with a modest telescope, even in a distant galaxy like

UGC 3378 which is about 240 million light-years away. The discovery was soon verified by Illinois-based amateur astronomer Brian Tieman and Arizona-based Canadian amateur astronomer Jack Newton. It was then reported to the International Astronomical Union's [Central Bureau for Astronomical Telegrams](#). This is Mr. Lane's fourth supernova discovery, Mr. Gray's seventh, and Kathryn's first! Details about the discovery, and the observatory from which it was made, can be found here: <http://www.davelane.ca/aro/sn/sn2010ft.html>

## Adventures with Cassiopeia A

by Miles Paul

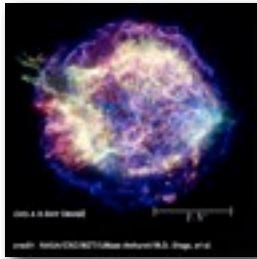


Figure 1

Of the tens of thousands of deep sky objects within the range of amateur observers, there are but a handful of supernova remnants (SNRs). For northern observers, best known and within the range of almost any telescope are the Veil Nebula in Cygnus and M1, the Crab Nebula, in Taurus. IC 443 in Gemini is a bit fainter, but still well within the range of medium

apertures. Beyond these 3, the recently recognized SNR SH2-91 in Cygnus is more of a challenge – indeed, I find it difficult in my 20" Dob except in a very dark and transparent sky and with an OIII filter. More difficult and probably only for observers with large aperture scopes (18" and larger) and pristine skies are the elusive wispy filaments of Abell 85 (Cas) and Simeis 147 (Tau). In the southern sky NGC 2736 and the Vela SNR offer a rather limited choice of SNR targets.



Figure 2

Cassiopeia A (fig. 1) is the remnant of the most recent supernova in the Milky Way Galaxy. Although it is the brightest radio source in the sky, it is very faint at optical wavelengths, having generally been considered beyond the range of all but large professional telescopes. It is on none of the object lists in the RASC Observer's Handbook. Nevertheless,

some intrepid amateurs have been observing CAS A recently with apertures as small as 10".

Dorothy and I first encountered CAS A at the end of the Oregon Star Party (Indian Trail Spring in Central Oregon) in Aug 2010 when Howard Banish invited us to observe with him and a few other friends.

Howard's 28" Dob with tracking (fig 2) is well suited to observing faint objects at high magnification, and all 7 of us were able to see Cas A, which appeared as an arc of several distinct knots of nebulosity several arc minutes long. Part of the challenge was climbing to the eyepiece as Cas A was nearly overhead!

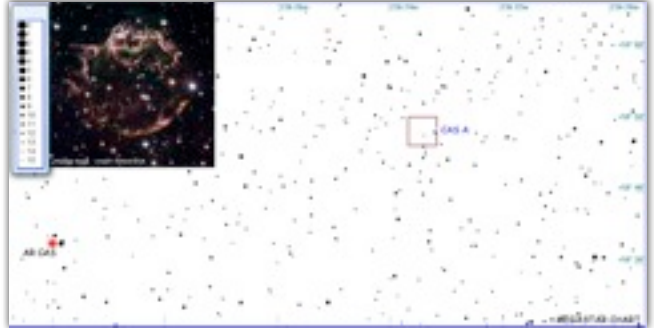


Figure 3. Hubble image of Cas A at optical wavelengths

For me, it was the highlight of a 10 day observing session. I was eager to attempt Cas A with my own telescope. The first opportunity was in September when Dorothy and I were at 8,500 ft elevation in the White Mountains (east-central California). Cas A (23h 23m 24s +58° 48' 54") is 3° south of M52 and an easy star hop 54' WNW (PA 288°) of the variable star AR Cas, which is visible at unit magnification<sup>1</sup>. Using our 21mm Ethos eyepiece (109X), I put AR Cas on the SE edge of the field, which positions Cas A on the W edge. An arc of 4 stars just south Cas A is an excellent "landmark-asterism" (see fig 3).



Figure 4

Even at this low magnification, a faint "smudge" was visible without a filter, although the best views at all magnifications I used were with the OIII filter. We observed Cas A again in November in Eureka Valley (NW of Death Valley N.P.) with both my 20" and Dorothy's Obsession 15"UC (F4.2). Though the

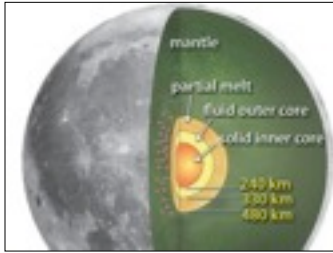
transparency was compromised (limiting mag for me at 1X was only about 6.2) we were able to see Cas A in Dorothy's scope at various magnifications even without a nebula filter (fig 4)

For observers in Canada, Cas A is circumpolar, visible at some time of the night any time of the year. Why not add it to your observing list and give it a try?

<sup>1</sup> Dorothy and I use the term "1X" or "unit magnification" (see: the RASC Observer's Handbook 2011, p.63) to replace the ugly and inaccurate term "naked eye". If I look at the sky "naked eye" all I see is a bunch of fuzzy blobs, and a fair percentage of observers wear corrective lenses as I do. The term "unaided" doesn't work either because corrective lenses constitute optical aid.

## NASA Research Team Reveals Moon Has Earth-Like Core

State-of-the-art seismological techniques applied to Apollo-era data suggest our moon has a core similar to Earth's.



An artist's rendering of the lunar core as identified in new findings by a NASA-led research team. (NASA/MSFC/ Renee Weber)

possesses a solid, iron-rich inner core with a radius of nearly 150 miles and a fluid, primarily liquid-iron outer core with a radius of roughly 205 miles. Where it differs from Earth is a partially molten boundary layer around the core estimated to have a radius of nearly 300 miles. The research indicates the core contains a small percentage of light elements such as sulfur, echoing new seismology research on Earth that suggests the presence of light elements -- such as sulfur and oxygen -- in a layer around our own core.



A close-up view of the Passive Seismic Experiment, a component of the Apollo Lunar Surface Experiments Package (ALSEP) which was deployed on the Moon by the Apollo 14 astronauts during their first extravehicular activity (EVA-1). (NASA/JSC)

direct detection of the moon's core," said Renee Weber, lead researcher and space scientist at

Uncovering details about the lunar core is critical for developing accurate models of the moon's formation. The data sheds light on the evolution of a lunar dynamo -- a natural process by which our moon may have generated and maintained its own strong magnetic field.

The team's findings suggest the moon

The researchers used extensive data gathered during the Apollo-era moon missions. The Apollo Passive Seismic Experiment consisted of four seismometers deployed between 1969 and 1972, which recorded continuous lunar seismic activity until late-1977.

"We applied tried and true methodologies from terrestrial seismology to this legacy data set to present the first-ever

NASA's Marshall Space Flight Center in Huntsville, Ala.

In addition to Weber, the team consisted of scientists from Marshall; Arizona State University; the University of California at Santa Cruz; and the Institut de Physique du Globe de Paris in France. Their findings are published in the online edition of the journal *Science*.

The team also analyzed Apollo lunar seismograms using array processing, techniques that identify and distinguish signal sources of moonquakes and other seismic activity. The researchers identified how and where seismic waves passed through or were reflected by elements of the moon's interior, signifying the composition and state of layer interfaces at varying depths.

Although sophisticated satellite imaging missions to the moon made significant contributions to the study of its history and topography, the deep interior of Earth's sole natural satellite remained a subject of speculation and conjecture since the Apollo era. Researchers previously had inferred the existence of a core, based on indirect estimates of the moon's interior properties, but many disagreed about its radius, state and composition.

A primary limitation to past lunar seismic studies was the wash of "noise" caused by overlapping signals bouncing repeatedly off structures in the moon's fractionated crust. To mitigate this challenge, Weber and the team employed an approach called seismogram stacking, or the digital partitioning of signals. Stacking improved the signal-to-noise ratio and enabled the researchers to more clearly track the path and behavior of each unique signal as it passed through the lunar interior.



Renee Weber. (NASA/MSFC)

"We hope to continue working with the Apollo seismic data to further refine our estimates of core properties and characterize lunar signals as clearly as possible to aid in the interpretation of data returned from future missions," Weber said.

Future NASA missions will help gather more detailed data. The Gravity Recovery and Interior Laboratory, or GRAIL, is a NASA Discovery-class mission set to launch this year. The mission consists of twin spacecraft that will enter tandem orbits around the moon for several months to measure the gravity field in unprecedented detail. The mission also will answer

longstanding questions about Earth's moon and provide scientists a better understanding of the satellite from crust to core, revealing subsurface structures and, indirectly, its thermal history.

NASA and other space agencies have been studying concepts to establish an International Lunar Network -- a robotic set of geophysical monitoring stations on the moon -- as part of efforts to coordinate international missions during the coming decade.

For more information about NASA science exploration missions, visit:

<http://www.nasa.gov/topics/moonmars>

## ASTRONOMY CAFE (EACH MONDAY)



### Fairfield Community Centre

1330 Fairfield Rd. Victoria,  
7:30pm - 11pm

Call Geoff at (250) 592-2264 for directions and information.

New comers are especially encouraged.



### New Observers Group

Hosted by Sid Sidhu  
1642 Davies Road, Highlands. Call  
250.391-0540 for information and directions.



### Email Lists

#### Observer / CU Volunteers / Members

Contact Joe Carr to subscribe  
[webmaster@victoria.rasc.ca](mailto:webmaster@victoria.rasc.ca)

## February 2011 Meeting

Wednesday 9th - 7:30pm - Room 060 Uvic Elliott Building  
David J. Helfand

### RASC Victoria Council for 2010 / 2011

Past President  
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President  
Lauri Roche  
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New Member Liaison  
Vacant

Membership Coordinator  
Vacant

### Members at Large

Bill Almond, Jim Hesser, David Lee, Alex Schmitt