NOVA
NEWSLETTER OF THE VANCOUVER CENTRE RASC
VOLUME 2015 | ISSUE 3 MAY JUNE ASTRONOMY DAY 2015

Trottier Observatory and Science Courtyard at SFU: Wheels Up!

by Howard Trottier

Simon Fraser University's Trottier Observatory and Science Courtyard had its official opening on Friday April 17, with a morning ribbon-cutting presided over by SFU's President, Andrew Petter, and an inaugural public star party that evening which drew almost 2,000 people! This day was also a watershed moment in the long partnership between SFU and the Vancouver Centre of the RASC, which has now entered a new and exciting phase, centred around the exploitation of the observatory for public outreach, for student education, and for use by members of the Centre.

Vancouver Centre's major contributions to SFU's astronomy outreach program over many years, as well the Centre's participation in the development of the observatory and science courtyard, were formally recognized at the official opening in speeches by SFU's President Petter, Vice-President of Advancement Cathy Daminato, and Dean of Science Dr. Claire Cupples. Vancouver Centre's very own Vice President and Events Coordinator Suzanna Nagy also gave an address at the opening in which she highlighted the collaboration between the two institutions, and the exciting possibilities for future joint efforts that will be made possible by the observatory.

Orion, Taurus, and Venus, over the Trottier Observatory at SFU

Image credit: Matthew Cimone

The collaboration between SFU and the Vancouver RASC took off in 2009 with an intense year-long effort that brought the International Year of Astronomy to SFU's Burnaby campus (among the Centre's many other IYA events), where we hosted thousands of kids and their families at nearly a hundred daytime astronomy workshops and evening star parties; with the support of the Vancouver Centre, SFU also donated about 85 small refractors to schools

continued on page 6

MAY 14 SFU	JUNE 11 SFU	JULY 9 SFU
Vancouver Centre's own Ted Stroman: The Formation and Differentitation of the Moon. Room SWH10081 (see Meetup for details). SFU	Tom Field, contributing editor at Sky & Telescope: You Can Almost Touch the Stars, on spectroscopy and how to do it. SWH10081 (see Meetup). SFU	Vancouver Centre's Ian McLennan: What's New Out There... Science Centres and Planetarium Projects in the 21st Century. SWH10081 (see Meetup). SFU

Astronomy Day Lectures at SFU

Room 3150, East Concourse, Academic Quadrangle

11:30	Scott McGillivray	**New Horizons and Our First Visit to Pluto**
12:00	Ed Hanlon	**Northern Lights Slideshow**
12:30	Ed Hanlon	**Northern Lights Slideshow continued**
1:00	Stanley Greenspoon	**Are We Alone? The Search for Extra-Terrestrial Life**
1:30	Kenneth Lui	**The Global Space Community & The Planetary Society**
2:00	Ted Stroman	**The Apollo Missions**
2:30	Scott McGillivray	**The Story of Tycho Brahe**
3:00	Suzanna Nagy	**Galaxies – They are not all Spirals**

Astronomy Day Activities

East Concourse, Academic Quadrangle

11:00am to 4:00pm

- Vancouver Telescope and Canadian Telescopes displays
- Apollo Rockets and Mission display
- Jim Bernath and his hands-on science activities (6 tables of fun)
- Light pollution display
- Solar system and Our Planets display
- Planetary Society display
- Solar telescopes (outside the Trottier Observatory, weather-permitting)
- 3 craft tables for the children including flags of the planets, spaceship portholes, and the Moon with Oreo cookies
- Astronomy Bingo
- Solar System Walk and bag toss

The new Trottier Observatory will also be open for tours throughout the afternoon!

President's Message

by Mark Eburne

Welcome all the visitors to the annual RASC Vancouver Centre Astronomy Day held in conjunction with SFU's Science Rendezvous here at Simon Fraser University.

Every year, the RASC Vancouver Centre and its dedicated volunteers deliver outstanding displays and talks centred on the science of astronomy and the impact it has on everyday life here and around the world. This year is no exception.

You can always find something in the astronomy world to spark an interest in your mind or perhaps your children's minds. Whether it is looking back in time or into the future of space travel, there is something for everyone.

In today's world of high-powered telescopes imaging the depths of time or huge super computers building scenario models of what is going to happen, we can all enjoy the results of the thousands of dedicated astronomers and scientists making it simple for us to understand.

Perhaps you just want to lay down

continued on page 4

About RASC

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

Membership is currently $78.00 per year ($45.00 for persons under 21 years of age; family memberships also available) and can be obtained online, at a meeting, or by writing to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

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

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

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

Remember, you are always welcome to attend meetings of Council, held on the first Thursday of every month at 7:30pm in room P8445.2 of the Physics wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

2015 Vancouver Centre Officers

President/LPA	Mark Eburne president@rasc-vancouver.com	**Past President/Events**	Howard Trottier telescopes@rasc-vancouver.com	**Webmaster**	Rick Vandenberg webmaster@rasc-vancouver.com
Vice-President/Events	Suzanne Nagy vp@rasc-vancouver.com	**Dir. of Telescopes**	Kenneth Lui telescopes@rasc-vancouver.com	**NOVA Editor**	Gordon Farrell novaeditor@rasc-vancouver.com
Secretary/P. R./Observing	Scott McGillivray secretary@rasc-vancouver.com	**Membership**	Muguette Macdonald membership@rasc-vancouver.com	**Speakers**	Barry Shanko speakers@rasc-vancouver.com
Treasurer	Bruce Hutchison treasurer@rasc-vancouver.com	**Education**	Bill Burnyeat education@rasc-vancouver.com	**At Large**	Michael Levy Adrian Mitescu Kyle Dally
National Rep.	Doug Montgomery national@rasc-vancouver.com	**AOMO**	Alan Jones aomo@rasc-vancouver.com	**Honourary President**	Dr. John Macdonald
Librarian	William Fearon library@rasc-vancouver.com	**Merchandise**	Leigh Cummings merchandise@rasc-vancouver.com	**Trustees**	Pomponia Martines J. Karl Miller

Library

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

On the Internet

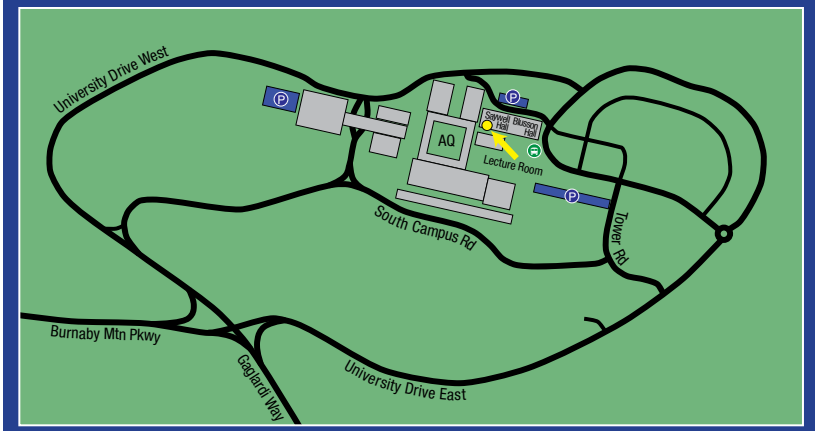
http://rasc-vancouver.com or
http://www.rasc.ca/vancouver
http://astronomy.meetup.com/131/
http://www.facebook.com/RASC.Van

@RASCVancouver

Mailing Address

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

Map to Meeting Site



SFU

Our May, June and July meetings are in room SWH 10081 of Saywell Hall, indicated by the arrow on the map.

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

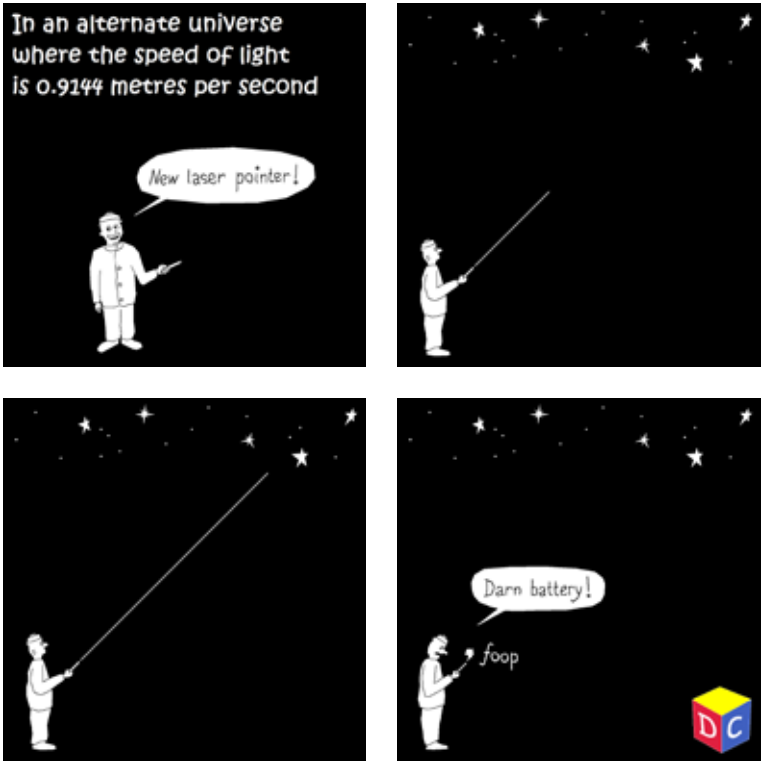
continued from page 3

in a dark area and look up into the night sky and wonder or peer through the eyepiece of a portable 'scope in your back yard. Whatever your astronomy hunger is, you can feed it here at Astronomy Day.

Please take the time to ask questions. All of our RASC members and volunteers here at SFU love talking astronomy. Who knows, you could start yourself on a new course of discovery.

It's all here. Enjoy the journey.

Clear Skies. ✸



cartoon by Dan Collier

For Sale

Like new CELESTRON CG-11 Astronomical Telescope. Made in U.S.A.

Losmandy CG-11-inch Schmidt-Cassegrains Astro-Telescope, complete unit with extra eyepieces and original cases. One complete unit for sale by former member of the RASC Vancouver Centre.

Condition: First-hand factory purchase. Everything in mint and like-new condition.

Never used outdoors. Never moved away from home. Two star-tracking motors built-in.

For sale for less than half of purchase price. Complete with orig. carrying cases and manual.

Enquiries: James at:
computerjohn@shaw.ca
or phone: 604-716-1261.

The Tree Astronomers

by Bill Burnyeat

Letter to the tree in the front yard:

Hi: how's it going? Are you getting enough water these days? My wife put the hose under you for at least 15 minutes last week and she plans to do it again real soon. I hope the wasps that have a nest in your lower branches aren't a bother. But your bark seems real thick so I guess it doesn't matter.

I'll tell you why I'm taking the trouble to write. There's a special event this fall and I need your help. It's the partial eclipse of the Sun. It just so happens to fall on my wedding anniversary, October 23rd, 2014. It's been 17 years. Yes, I know! It's hard to believe that so much time has gone by. We've changed, and so has Michael; he was just entering school when we moved in. You haven't changed, but then, you're a tree.

Back to the eclipse. We are going to have some get-together and it's likely that I'll be unable to set up any equipment for viewing the eclipse that day. It's not that I mind the celebrations—don't get me wrong. It's just that, well, I'll be sitting with a glass of wine inside, we'll have people over, or maybe we'll go out. There just won't be time to fit any eclipse viewing into the schedule.

This is where you come in. I've

Image credit: Sean Freese

noticed that many trees are solar astronomers. It's the intertwining of the leaves and branches, making tiny pinholes that let through the sunlight. You know what I'm talking about. Under your branches I've seen tiny balls of light which are the images of the Sun. Most just walk by, blind to the cosmological display; they are concerned only with the usual yuppie attractants: image and money (don't broadcast this but you know it's true; I heard you say as much to the Douglas fir).

I plan to head out at just the right time, in early evening. I'll make some excuse like I'm taking out empties, but I'll run around the back and under your shade. Try to make your branches still, waving will make the images fade and look out of focus. We'll see Sun pictures with a gouge taken out of the round disk due to the perennial wanderings of the Moon.

So, mark that date down. Oct. 23rd, 2014. Don't let me down.

Bill, your owner, since 2003.

(I was away from home on the big day but I am sure the tree made fruitful observations. I'm still awaiting his written report). ✸

[Editor's note: The next partial eclipse visible from Vancouver will be on Aug. 21, 2017.]

Membership has its Privileges!

New members, did you know? The Vancouver Centre has several telescopes available for loan free of charge! We have telescopes ranging from 60mm to 10" in 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 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.

For the usual observing sites and times, visit our website at http://rasc-vancouver.com/observing-sites/ or contact the Observing Chair at observing@rasc-vancouver.com.

Upcoming Events

May
9 – Astronomy Day at SFU

July
1-5 – RASC General Assembly in Halifax

August
8 - 16 – Mt. Kobau Star Party

September
Sept. 11 - 19 – Merritt Star Quest

December
10 – AGM

continued from page 1

and families that year. In the years since the 2009 IYA, the partnership between SFU and Vancouver Centre has grown ever stronger and our collaborative efforts have diversified considerably. As our members know well, the Centre now routinely hosts our monthly public lecture, as well as our annual Paul Sykes Memorial Lecture, at SFU, with SFU providing meeting space and AV services free of charge. Vancouver Centre also hosts its annual Astronomy Day in concert with SFU's annual Science Rendezvous event, which draws thousands of young families every year.

Photo credit: Diane Mar-Nicolle, SFU

Suzanna Nagy at the opening of the observatory

The new observatory at SFU houses a state-of-the art 0.7m aperture telescope on a fully robotic alt-azimuth mount; this turn-key CDK700 system is built by PlaneWave Instruments, located in Rancho Dominguez, California. The observatory has a 20-foot diameter Ash Dome, with an electronic dome control system built by ACE Instruments. The remarkable optical design of the CDK700 produces razor sharp stars over a huge 70mm imaging circle, and we will take full advantage of this capability with our 16-megapixel high-resolution cooled camera, built by Finger Lakes Instruments, complemented by a complete set of high-quality broad- and narrow-band filters supplied by Astrodon. Eager to assess the imaging potential of this exciting system, I shot this image of the Whirlpool Galaxy at the end of the first full night of operation after the observatory opened—not too shabby, considering that this was only twenty minutes of exposure through a luminance filter, shot through cloud that at times obscured the stars in the handle of the Big Dipper! (Full disclosure: I didn't get around to imaging through the colour filters that night, so I colourized the luminance using the very first—and very crude—image that I took at my own observatory in the Okanagan, which also happened to be of the Whirlpool). Soon to come is a high-resolution echelle spectrograph on order from Shelyak Instruments, in France—with this instrument we will be able to measure the periods of spectroscopic binary stars, produce Hertzprung-Russell diagrams of star clusters, and possibly measure the redshifts of the nearest quasars, among many other applications.

It may come as a surprise that the

continued on page 9

Whirlpool Galaxy, imaged at SFU's Trottier Observatory on April 20

Planet, Star and Constellation Fancies: the "Non Facts" by Bill Burnyeat

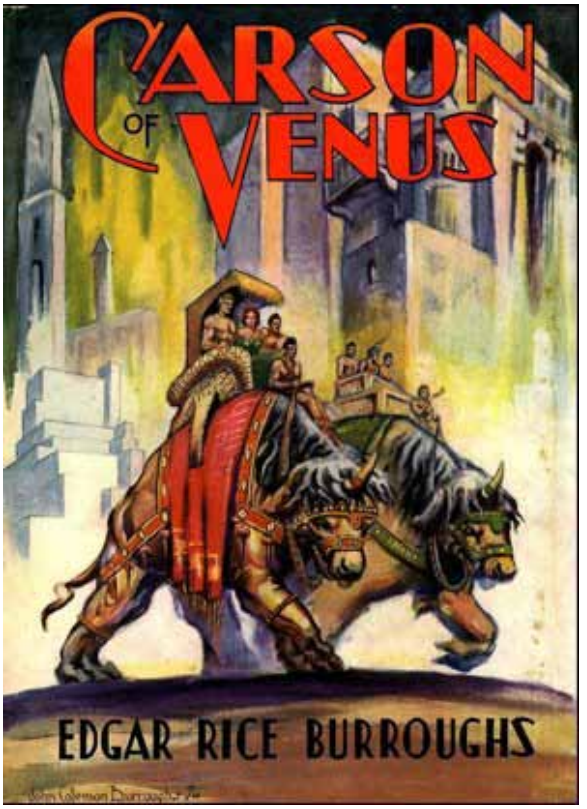
A few weeks ago, visiting Banff BC, I strolled out the front door of the hotel at dusk to see a small clutch of people regarding a very bright light in the west.

Stepping up, I announced they were watching Venus, and, directing their eyes in the other direction, I said that other light is Jupiter coming up in the east over the hotel.

Of course, I make it my business to be able to identify such sky flora and fauna and I have long considered newcomers to the art might benefit from a bit more fun than they get from the usual introductions to sky watching. I had my instant audience eating out of my hands with a few quick "non-facts" about Venus.

I'd like to share some of these with Nova readers.

One of my favourite books is Patrick Moore's *The Planet Venus*.



I like this book because, written in the 1950s, it appears at a time when just about nothing was known about Venus. Moore, the famous host of the long-running TV show *The Sky at Night* set out filling his pages with fun, speculations (mainly wrong) and the kind of inspirational asides that encourages observations.

The Ashen Light is one such arena. As Venus goes about the Sun, we view it from differing situations lighting-wise—the planet goes through phases just like the Moon. Often, it is seen as a narrow crescent like the new moon. And the dark area receives no sunlight and so should be pretty dark. But sometimes a faint glow is seen, very faint, ghost-like within the zone that should be black.

There are several explanations for this of the scientific variety but the best seems to have been put forward by Franz von Paula Gruithuisen (1774-1852), a German astronomer who suggested that the lights are bonfires lit by Venusian patriots after the ascension of a new monarch.

Gruithuisen notes that the appearance of the strange lights does not appear at random but were most noted in 1759 and again in 1806. The 47-year interval works out to 80 Venusian years; this planet's trip around the Sun takes place more quickly. Therefore if a long-lived monarch took the throne as a child, as did France's Louis XIV, then after 80 years, a good long life for the Venusian people as well as the earthling, then we could expect festivities to break out on Venus at the new king or emperor taking the throne. Bonfires seemed a likely outcome of ringing in the new regime.

There's more to Venus. In *The Pirates of Venus* by Edgar Rice Burroughs, Venus is a tropical planet full of adventure. When Carson Napier (the hero) arrives here, under the clouds is a tropical scene. It seems Carson aimed his spaceship at Mars but a math error in his navigation has him landing on Venus instead. Let's hope NASA doesn't fall into the same glitch. He's not to be disappointed, though. There's plenty of action,

continued on page 8

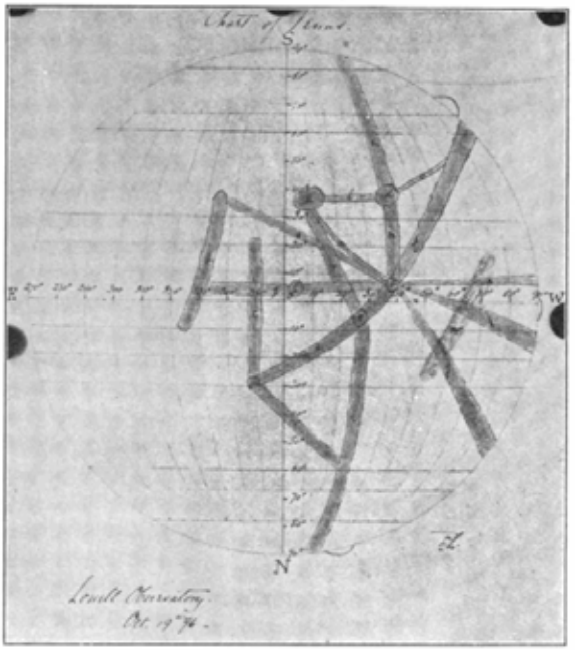
continued from page 7

here. It's a jungle planet equipped with trees full on strange animals, bad guys, monsters and jungle princesses—you know, anything needed for a good story shows up right on cue.

Sometimes, science and wishful thinking can occupy a kind of middle ground where it is hard to pin down into which camp they may lie.

The canals of Venus are an example. Dusty lines were seen across the surface of Venus which, according to 19th century observers at the Lowell Observatory, are faint but permanent marks on the planet's normally featureless disk. The Lowell observers were famous, a century ago, for seeing little lines on Mars, which came to be called "canals" and the director and builder of the Arizona observatory, Percival Lowell (1855-1916), was convinced these canals were engineering feats of the Martian Ministry of Highways and were designed to distribute water around the dry deserts and plain of the red planet. The trouble is nobody else could see these elusive features and they were never photographed. They don't exist. It seems these canals were a combination of observer expectations combined with subtleties in how the brain processes visual information. Venus, too, seemed decked out with lines but here Lowell was a bit more cautious. He suggested they were a natural feature and not purposefully made. Still, it's hard to see how lines could manage to remain permanently amid a cloud-top environment.

Most of the solar system's planets are decked out with that very fashionable accessory: a moon. We have a great Moon—everyone should have a look at the Moon in a telescope. Some planets, like Jupiter and Saturn, have sets of moons that number into the dozens.

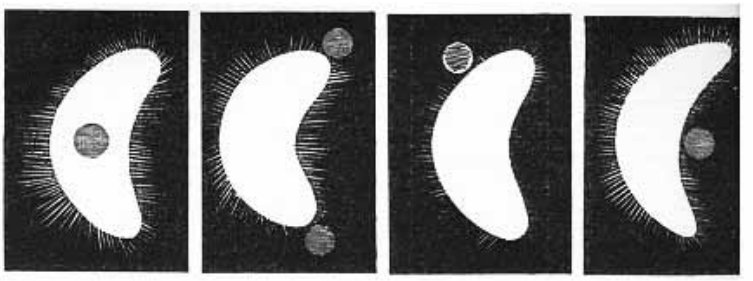


Supposed canals on Venus

Venus has no moon. Except, in Paris in 1686, when it seemed Venus had a moon that appeared then vanished; it's the Phantom Satellite Syndrome (PSS).

Cassini was the famed discoverer of several legit moons of Saturn. He thought he had discovered another when he turned his long-tubed telescope to the Queen of the Night. Right next to Venus appeared a little copy of it, about four times smaller.

He wasn't the only one. The mysterious Moon of Venus was back in 1740 and was once more sporting itself in the telescopes of observers. That's the key: under certain conditions, telescopes suffer from internal reflections, especially when a very bright object is being imaged. The Venus disk is very much more luminous and faint images, the result of reflections, are common. ✸



Francesco Fontana's 1646 drawings of Venus' phantom moons

continued from page 6

largest part of the capital cost of the project was not taken up by the observatory, but by the science courtyard that it anchors. While the project was originally conceived of as a variation on the traditional university teaching observatory (albeit with a large teaching space devoted to science outreach for public schools and home-schooled families), it was transformed into a high-profile public space when the university generously provided an extraordinary site, immediately adjacent to the centrepiece of the Burnaby campus, SFU's iconic Academic Quadrangle, an architectural masterwork by Arthur Erickson. The site is meant to serve a new focal point for campus and community life, and is a very visible statement about the importance of science to society. While the observatory is the most prominent structure on the site, the space is filled with architectural landscape elements, big and small, that represent the science of astronomy, and which allude to the beauty and mystery of the universe as revealed by science. One of the largest and most novel architectural elements is a set of two huge concrete walls that are meant to represent an ancient observatory with a fixed slit view of the heavens, such as existed in Mesoamerica thousands of years ago. The walls are adorned with huge, realistic, seasonal star charts that are illuminated at night.

Photo credit: SFU

Guests at the inaugural star party gaze at the illuminated star charts in the observatory courtyard

The observatory will support and enhance SFU's very successful astronomy outreach program, called Starry Nights @ SFU, and will be used by students from across campus to explore the universe. We will also make telescope time available to schools throughout BC, by inviting them to submit proposals for observing projects—the observatory can be run remotely, and we will give the keys so to speak to schools whose projects are selected for observing time. Finally, as long promised, 20% of the observing time will be reserved for use by members of Vancouver Centre.

As we look ahead to using this exciting new observatory, I'd also like to acknowledge the many other volunteers who have made Starry Nights @ SFU so successful—they come from all parts of SFU's campus community, from the arts to the sciences, and include students, staff, and faculty, along with volunteers from the broader community, including of course the Vancouver RASC. SFU's community outreach program is itself a community effort. Finally, but most importantly, I want to thank my brother Lorne, his wife, and my sister-in law, Louise, and their daughters Claire and Sylvie, for their astounding generosity, without which none of this would be possible. I can only hope that this facility will bring even a small fraction of their passion for science, and their commitment to science outreach, to the communities that we serve. ✸

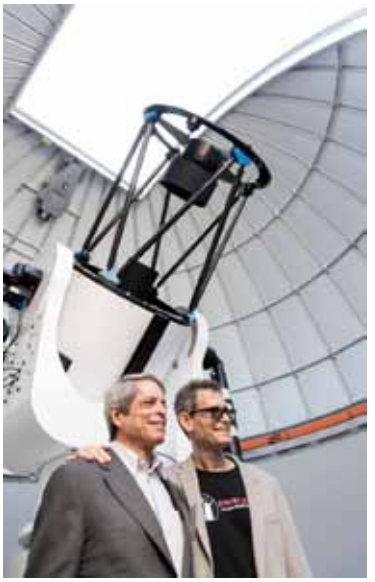
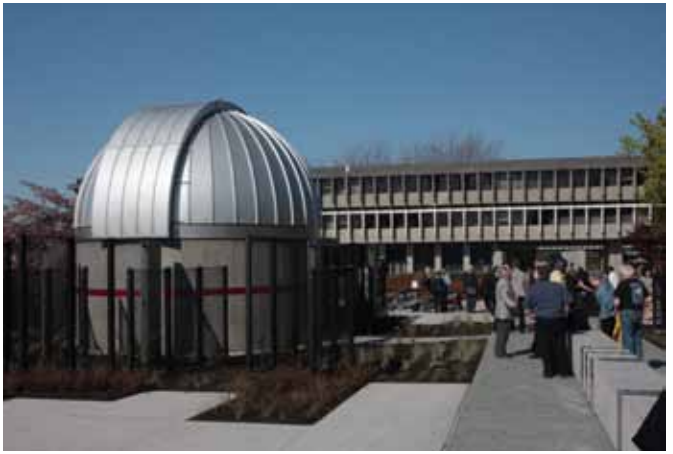


Photo credit: SFU

At the telescope with my brother, Lorne

Trottier Observatory Grand Opening



Facing page, clockwise from upper left: Lorne Trottier speaking at the opening ceremony; Lorne and Howard Trottier; the ribbon cutting; star charts in the Science Courtyard; the plinth with its illuminated markers showing the emission lines of various elements.

This page: The Trottier Observatory and Science Courtyard (above) and a young solar observer at the opening ceremony (right).