Skynews

Royal Astronomical Society of Canada ✦ Victoria Centre

on the cover

M42, The Great Orion Nebula

by Guy Walton

Imaged October 25/08 at Lester B. Pearson College of the Pacific
Optics: SkyWatcher Equinox 120mm f7.5 Apo Refractor.
Mount: SkyWatcher EQ6 autoguided with an Orion SS Autoguider Camera and PHD software.
Camera: Orion SS Pro Color - 6 megapixel.
Exposures: 13 light frames and 5 dark frames at 300 seconds each, acquired with Maxim Essentials, processed with Deep sky Stacker, digitally developed with ImagesPlus, minor correction with Photoshop and filtered with Noise Ninja.

---

this month

First Light, First Stars
by Dr. Kim Venn

December 10th, 2008, 7:30 PM, Elliott Lecture Theatre, Rm 060, UVic

Star struck: Studying the chemistry of distant stars offers tantalizing clues to our origins. **By Jessica Gillies**

University of Victoria astronomer Kim Venn is looking billions of kilometres into space to solve the mysteries of life here on Earth. As the Canada Research Chair in Observational Astrophysics, Venn studies how the universe formed and evolved. All the chemical elements—the building blocks of matter—that exist in the universe had to come from somewhere, and Venn wants to know how and when they were created.

“Our sun formed out of material that was eight billion years in the making,” she says. “Was that special? Did the chemistry in our galaxy have to be just right in order to make the sun, or to make a planet like the Earth inhabitable?”

By studying stars of different ages, Venn can reconstruct the formation of the elements that make up our world and help answer the question of how we came into being.

After the Big Bang that created the universe 13.7 billion years ago, only four basic elements existed: hydrogen, helium, lithium and beryllium. All the elements we know today have evolved since then within stars in individual galaxies.

Some elements can be formed in multiple ways in stars. Astronomers can figure out which processes took place by studying relative amounts of the different elements that formed.

Some of Venn's recent research focuses on stars that formed during the first million years after the Big Bang, called "first stars." Something strange and unknown happened during that time period, she says, because those "first stars" had no metals in them. Furthermore, we don't see any stars like that in the galaxy today, even though we should.

Once astronomers learn more about that time period, they'll be able to fill in a missing piece of the timeline and trace the evolution of elements from the Big Bang to the present.

The future of Venn's research into "first stars" and the chemical evolution in other galaxies depends on development of the 30-metre telescope (TMT), which will allow astronomers to see faint objects more clearly. Objects will look sharper because the light will be more concentrated and the resolution will be higher.

Right now, says Venn, the TMT technology is still in the concept design phase, and the actual telescope is eight to 10 years away. UVic engineers are working on TMT technology, and Venn works with them in a science advisory capacity.

She is also collaborating with researchers in The Netherlands and France, using data from the Very Large Telescope in Chile, to study the

chemistry of stars in nearby dwarf galaxies—galaxies about 1,000 times smaller than our galaxy. Because they're completely isolated systems, their chemicals evolved without any influence from the outside.

Her data for other projects comes from the Hubble Space Telescope and the Keck Telescope in Hawaii. She determines which chemicals are found in stars by analysing their light spectrums.

Venn is fascinated by the serendipitous chemical reactions in the universe that led to our existence. Carbon, for example, is the basis of all life on Earth, but its original creation in the universe was such an unlikely event. In the core of some stars, helium burns in a way that creates an atom called beryllium-8, a very unstable form of beryllium (a rare metal). Because it's so unstable, beryllium-8 usually breaks back down into helium almost instantaneously.

But sometimes, the berylliym-8 atom comes into contact with another helium atom that has just the right energy resonance—the amount of energy an atom needs to combine with other atoms—to form carbon.

"We think it's straightforward to make all the other chemical elements once carbon is made," says Venn. "Life, as we know it, exists because beryllium-8 happens to have an energy resonance of eight mega-electron volts, and the temperatures at the cores of stars happen to give helium atoms an energy resonance of eight mega-electron volts. If they didn't, we wouldn't have made it to carbon, and then we wouldn't exist. "That's so precarious and cool," she says.

Presidents Message

December 2008

There are not many administrative roles that I would want to take on at this stage of my life but I have been so impressed with the Victoria Centre that I consider it a privilege to be asked to be your President. Joe Carr has done an exceptional job in his two

years at the helm and I want to start by acknowledging my debt to him. Working under his leadership has been a great learning experience. Joe set a clear goal – to get an observatory built during his term. Thanks to his vision, a great bunch of donors and some pretty talented volunteers led by Bruno, we are now the proud owners of a truly wonderful facility. I also want to thank Sid, Martin, Li-Ann, Scott and all of the outgoing executive and Council. Working with them has been a pleasure. I also want to say how pleased I am with the new executive and council.

I am a relatively recent recruit to the RASC and had a lot to learn when I joined. Thanks to the help of so many of you, my learning curve was much shorter than it might have been - that is what really distinguishes Victoria Centre. Newcomers are welcomed and given help when they need it. Of course it is fun to help others learn from our experiences so this is a win – win situation. It is also a tradition we need to preserve.

With that in mind, my goal for 2009 is to make our celebration of the International Year of Astronomy something that the people of the Victoria will remember for years to come. IYA represents a fantastic opportunity to enhance our activities and introduce the wonders of the night sky to a wider community. Sid Sidhu has worked up some exciting possibilities for a variety of events and happenings throughout the year and I encourage you to get involved. It is going to take an effort on the part of each one of us to make our IYA a success but if you show the same enthusiasm that you did for the observatory project, we can make it a year to remember. Let's recruit a new generation of astronomy enthusiasts and show the wider community the value of connecting with the universe.

Last but not least, I want to note just some of the many ongoing activities that will give some great opportunities for you to fully enjoy your hobby. Astronomy Café continues to provide a chance to get together Monday evenings at the Fairfield Community Association. The Victoria Centre Observatory wwill be open for Active Observers on a regular basis Friday evenings, weather permitting. Additional openings can be arranged by MICS as needed, the MIC in charge for each opening will send out a message to let you know if it is a go for that night and what the focus will be – observing at the CU or the VCO, special things to see such as occultation's, astrophotography and so on. Observing sessions at Cattle Point, Pearson and elsewhere as well as the fun of volunteering at CU and in the School Program will also continue to be important activities. I am looking forward to a great year and invite you to share in the fun.

John

Astrophotography

NGC 891 - John McDonald

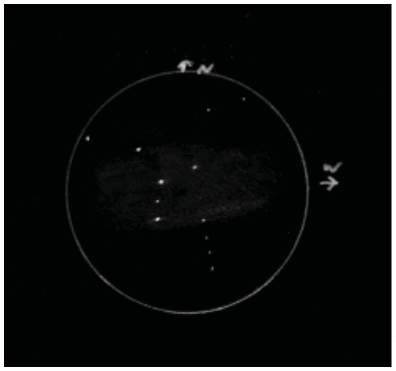
A striking view of a spiral galaxy viewed edge on. The dust lane and central bulge are particularly clearly seen.
Date and Location - 2008-10-25 at Victoria Centre Observatory.
Equipment - Modified Canon 350D on Meade 14" scope.
Exposure - 9 dark and 9 light frames each 248s at ISO 1600.

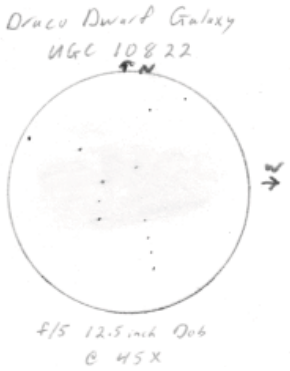
M1 the Crab Nebula - John McDonald

Date and Location - 2008-11-18 VCO.
Equipment: 14" Meade with modified Canon 350D at prime focus.
Exposure: 21 minutes at ISO 1600.

Veil Nebula
Elizabeth & Don van Akker

Location: Springwater Observatory Sept 7, 2008.
Equipment: AP 5" telescope SBIG ST4000 camera self guided
Exposure: 1x10 minutes plus 2x30 minutes
Processed with Registar and Photoshop.





Draco Dwarf Galaxy - Bill Weir

On the evening of September 20/08 while out at Pearson College observing with my 12.5" dob I had the opportunity to observe the Draco Dwarf galaxy UGC 10822. This is member of our Local Group of galaxies. I was first able to notice it as an elongate on the E-W axis, ½ degree very faint glow. This was at 107 X magnification, using a 17mm T4 Nagler. It was really a matter of noticing a very faint difference in background brightness as I panned the scope around. Noticing this subtle difference required using a "Monk's Hood". When I put a 2-inch 40mm eyepiece in for 45X magnification, the area covered by the galaxy appeared to increase. The galaxy was overlaid by a dozen foreground stars, that to my eye appeared as a chain of interlocking triangles.
The attached sketch is how I saw this galaxy with this setup. The field of view is a little over 1 degree.

The Pleiades, M45
Guy Walton

Date: Nov 25, 2008.
Location: RASC VCO
Camera: Orion SS Pro Color. **Optics**: Antares 200mm, f5 Newtonian.
Mount: Sky Watcher EQ6, Orion SS Autoguider camera mounted to an Sky Watcher Equinox 80mm f6.25 ED refractor and PHD.
Exposures: 19 light frames, 5 dark frames at 300 seconds.

What Happened to Comet Holmes?

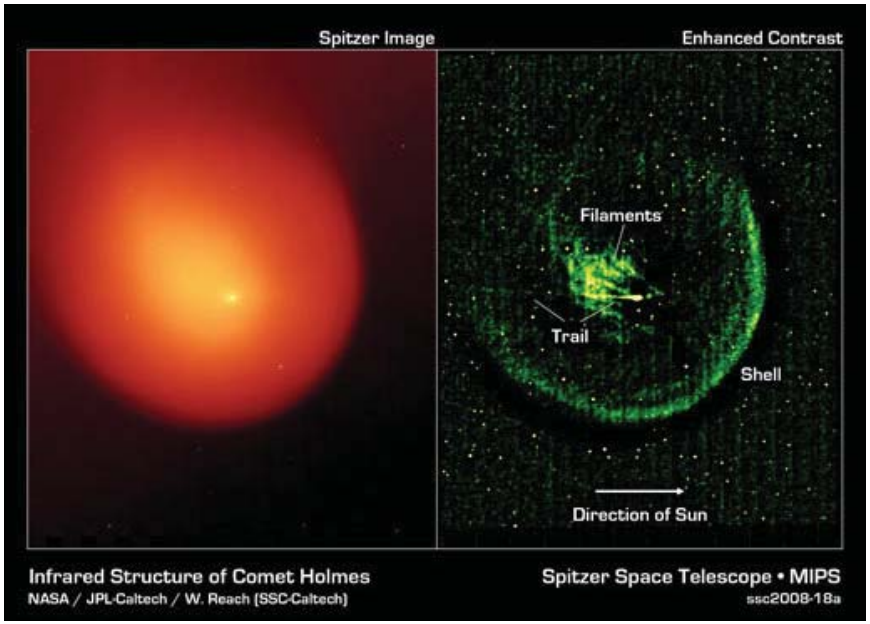
by Dr. Tony Phillips

One year after Comet 17P/Holmes shocked onlookers by exploding in the night sky, researchers are beginning to understand what happened.

"We believe that a cavern full of ice, located as much as 100 meters beneath the crust of the comet's nucleus, underwent a change of phase," says Bill Reach of NASA's Spitzer Science Center at the California Institute of Technology. "Amorphous ice turned into crystalline ice" and, in the transition, released enough heat to cause Holmes to blow its top.

Anyone watching the sky in October 2007 will remember how the comet brightened a million-fold to naked-eye visibility. It looked more like a planet than a comet—strangely spherical and utterly lacking a tail. By November 2007, the expanding dust cloud was larger than Jupiter itself, and people were noticing it from brightly-lit cities.

Knowing that infrared telescopes are particularly sensitive to the warm glow of comet dust, Reach and colleague Jeremie Vaubaillon, also of Caltech, applied for observing time on the Spitzer Space Telescope—



and they got it. "We used Spitzer to observe Comet Holmes in November and again in February and March 2008," says Reach.

The infrared glow of the expanding dust cloud told the investigators how much mass was involved and how fast the material was moving. "The energy of the blast was about 1014 joules and the total mass was of order 1010 kg." In other words, Holmes exploded like 24 kilotons of TNT and ejected 10 million metric tons of dust and gas into space.

These astonishing numbers are best explained by a subterranean cavern of phase-changing ice, Reach believes. "The mass and energy are in the right ballpark," he says, and it also explains why Comet Holmes is a "repeat exploder."

Another explosion was observed in 1892. It was a lesser blast than the 2007 event, but enough to attract the attention of American astronomer Edwin Holmes, who discovered the comet when it suddenly brightened. Two explosions (1892, 2007) would require two caverns. That's no problem because comets are notoriously porous and lumpy. In fact, there are probably more than two caverns, which would mean Comet Holmes is poised to explode again.

When?

"The astronomer who can answer that question will be famous!" laughs Vaubaillon.

"No one knows what triggered the phase change," says Reach. He speculates that maybe a comet-quake sent seismic waves echoing through the comet's caverns, compressing the ice and changing its form. Or a meteoroid might have penetrated the comet's crust and set events in motion that way. "It's still a mystery."

But not as much as it used to be.

See more Spitzer images of comets and other heavenly objects at www.spitzer.caltech.edu. Kids and grownups can challenge their spatial reasoning powers by solving Spitzer infrared "Slyder" puzzles at http://spaceplace.nasa.gov/en/kids/spitzer/slyder.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

AGM

Guest speaker, Dr. Jasper Wall, on "Life at the Top: Tales From Telescope Mountains.

Guy Walton receives award for Outstanding Astrophotography from outgoing president, Joe Carr.

Joe Carr receives the 2008 Newton-Ball Award from '07 recipient, David Lee.

Nelson Walker receives volunteer appreciation award for his work organizing the 2008 RASCal Star Party from Joe Carr.

contact us on-line

Web Site	www.victoria.rasc.ca
New Members	newmembers@victoria.rasc.ca
General Inquiries	info@victoria.rasc.ca

address change? information incorrect

Contact the National Office

Telephone - 416.924.7973 or toll-free in Canada 888.924.RASC
Fax - 416.924.2911
Email - nationaloffice@rasc.ca
Post - RASC, 136 Dupont Street, Toronto, ON M5R 1V2
General enquiries - natonaloffice@rasc.ca

RASC victoria council

President
John McDonald
president@victoria.rasc.ca

First Vice President
Lauri Roche
vp@victoria.rasc.ca

Second Vice President
Sherry Buttnor
vp2@victoria.rasc.ca

Treasurer
Li-Ann Skibo
treasurer@victoria.rasc.ca

Secretary and Recorder
Nelson Walker
secretary@victoria.rasc.ca

Librarian
Charles Banville
librarian@victoria.rasc.ca

Past President/Website Editor/ Email Lists
Joe Carr
web@victoria.rasc.ca

Skynews Editor
Scott Mair
scottmair@gmail.com

Telescopes / Schools / IYA
Sid Sidhu
vp@victoria.rasc.ca

National Representative
Chris Gainor
nationalrep@victoria.rasc.ca

New Member Liaison
Bruno Quennville
newmembers@victoria.rasc.ca

Members at Large
Bill Almond, Sandy Barta, Dave Bennett, Jim Hesser, David Lee, Steve Pacholk, Colin Scarfe, Malcolm Scrimger

this month

monday nights

Astronomy Cafe
Fairfield Community Centre,
1330 Fairfield, Victoria
7:30-11pm

Call John at 250.480.0928 for directions and information. New comers are especially welcome. Come and enjoy!

second wednesday of the month

Monthly Meeting
7:30 PM, Elliott Lecture Theatre, Rm 060, UVic.

as sky and interest dictate

New Observers Group
Hosted by Sid Sidhu.
1642 Davies Road, Highlands.
Call 391-0540 for information and directions.

by email

Observer/CU Volunteers/ Members email lists
Contact Joe Carr to subscribe to these email lists for important, timely, member-related news.