Royal Astronomical Society of Canada
Niagara Centre

January—February 2012

Volume 31, Issue 1

THE NIAGARA WHIRLPOOL

Inside this issue:

Vice - President's Report
By Dr. Brian Pihack

I would like to thank Phil for setting up the "entertainment" for this month's meeting.

Next month if the timing works we should have Rob Godwin come down and give us a talk. You should remember the last talk [if you don't, you should have been there] it was fantastic and it stirred up a lot of conversation.

Things have been progressing very well with the Niagara Parks Commission. We may have some very interesting venues for next year. As well there seems to be a winery that would like to pick up where StoneChurch left off. There will be lots to discuss.

The beginner's groups are going well. A reminder that the next one will be before the next general meeting [45 minutes prior] and A.N. Myer will be the first Thursday in January. We will recap the year, as well as providing a head's up for the coming year as to events. For more info get a hold of Stan or I.

Our yearly tradition of a post meeting Christmas debate at Chatter's continues. This year the price will be $12.00 per person, and Chris will work his magic with the food. Of course, you will be responsible for your own beverages. I will take a head count at the meeting and inform Chris. If you cannot make the meeting but still would like to come, please let me know before the meeting.

That being said, I wish you a Merry Christmas, and the best in the New Year

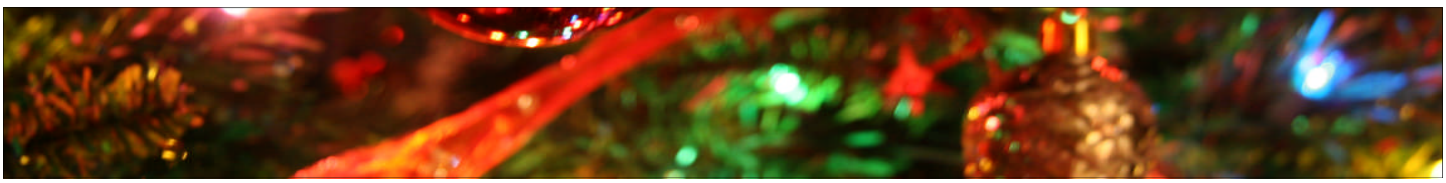
Respectfully submitted

Brian G. Pihack

Merry Christmas and Happy New Year

From the

RASC Niagara Centre



Members Observing Coordinator's Report
By Mark Roberts

As 2011 comes to an end it pains me to report that November's Members Night, our last for the year, was clouded out. Another in a list of many, as this has definitely not been the best year for our group getting together out at the CCCA. With that being said, our Dark Sky Site was still used a fair bit by members pursuing observing opportunities on their own schedule. We also had a few new members showing interest in and using the CCCA this past year.

A bunch of us did get together at the first quarter moon in December for an unscheduled night of observing. Six members showed up to enjoy the very clear but cold night, definitely a record for a quarter moon. Jupiter was offering great views with an Io shadow transit visible. Mars was also observable in the early morning. We also got to observe many deep sky objects and a few members also got some imaging done.

The primary mirror for the 16" scope was removed for recoating and has still not come back. At this point I do not know exactly how long it will take or when the scope will be up and running again. The club has made a bit of progress getting the 12" Meade LX 200 telescope for the new observatory repaired. Hopefully it will be ready by summer. I will try to keep you informed of its progress.

I would like to thank everyone who attended our Niagara Centre Members Nights and Star-B-Q this past year. Your company was much appreciated. My heartfelt thanks also go out to all who helped in getting the new yard equipment and who aided in grounds and observatory maintenance this past year.

I wish you all a Very Merry Christmas and a Happy New Year and am looking forward to a great year of observing in 2012.

M31 Andromeda

Photo by Mark Roberts

Secretary's Report
By Philip Downey

We have had two new members join the club since my last report. Please help me welcome Trevor Jones and Mary Everrett to the club. Our current membership total is 72.

The National website has been completely redone and upgraded. Everything has been reorganized into a new and attractive format. You will need to create and use your own login to access the Journal, renew your membership, shop and so on. Check it out at www.rasc.ca. National also has a twitter feed, @rasc, for those of you who like to follow tweets.

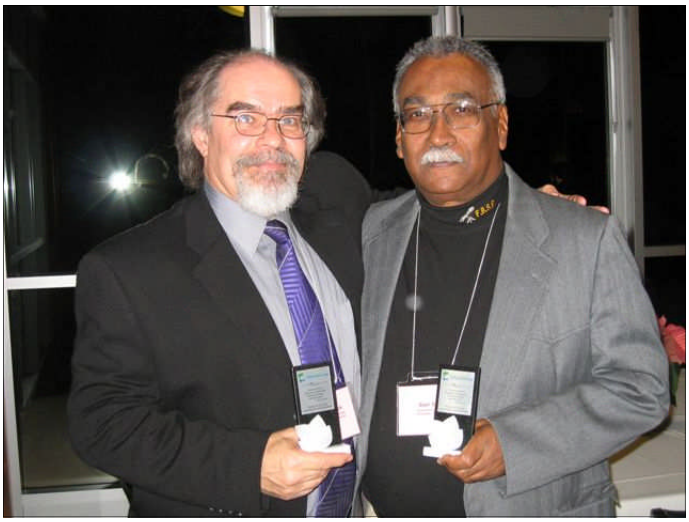
I have begun trying my hand at deep sky astrophotography. Glen Pidsadnick and I have been taking pictures together in his backyard observatory since November. One of my first tries are published in this issue. Glen has been a great help at skipping the steepest part of the learning curve.

Here's to a great year of observing and astrophotography in 2012.

M45

Photo by Philip Downey

Members receive Awards at the Niagara Peninsula Conservation Authority Recognition Banquet



Photos by Bob Lewis

The moon beside the bell tower at the Venetian Hotel, Las Vegas, Nevada

Night Sky slot machine, Featuring the Big Dipper, the Helix Nebula etc.....3 telescopes gets you bonus spins

Photo by Rob Lenz

Photo of Jupiter shot from Rob's backyard in November using a Celestron C8 with a 2.4x Barlow and a Philips toUcam, then processed in Registax 6

Surprises in Victoria
By Richard West

During the summer I contacted the Astronomy department at the University of Victoria (UVic), BC. I spoke with the graduate studies director there and to my surprise found that she had been a teaching assistant in an earlier time and had marked essays I had written when I did my last degree. We had a rewarding conversation but I found myself being urged to call two other people who seemed to be associated with the Mechanical Engineering department and something called HIA. As my real interest was astronomy / astrophysics I wondered if this was not a clever diversionary tactic. But being a diligent sort of person I called the contacts I had been directed to.

Luc Simond of HIA (Herzberg Institute of Astrophysics) was very welcoming and helpful. He outlined the activities of HIA for me. HIA is part of the National Research Council of Canada (NRC) and is located just outside of Victoria a few miles from the University of Victoria. It has about 90 researchers and support staff who specialize in designing and building state of the art instrumentation for the large professional telescopes. The two main areas that HIA specializes in are; Microwave receivers (http://www.nrc-cnrc.gc.ca/eng/programs/hia/millimetre-instrumentation.html) and Adaptive Optics (AO) systems (http://www.nrc-cnrc.gc.ca/eng/programs/hia/adaptive-optics.html). To my surprise HIA has designed and supplied such systems for many of the worlds largest telescopes and is actively working on major new projects such as the TMT (Thirty Meter Telescope). Also, the ESA ALMA telescope in Chile uses a microwave receiver built at HIA.

ALMA - Atacama Large Millimetre Array (http://en.wikipedia.org/wiki/Atacama_Large_Millimeter_Array)

I further learned that the UVic department of Mechanical Engineering specializes in developing AO systems for astronomical telescopes. They have a special laboratory dedicated to AO systems design and development (http://web.uvic.ca/lacir/optics/). This work is not limited to supporting HIA, although much of their activities are centred on HIA's projects. Other organizations also seek their expertise to help them upgrade existing AO systems or build completely new ones for their telescopes. An example of this is the Raven project (http://ao4elt2.lesia.obspm.fr/spip.php?article520), which is the development of a Multi-Object Adaptive Optics system for the Japanese 8.2 m Subaru telescope located on Mauna Kea in Hawaii. This new system is ground breaking technology as it will allow two separate target objects to be focused simultaneously using AO techniques. In future large telescopes will require such systems in order that they can obtain as much benefit from a single viewing window as is possible.

Subaru telescope on Mauna Kea, Hawaii

What is AO and why does a telescope need it?

Firstly care must be taken not to confuse two technologies. Active Optics and Adaptive Optics. Both of these are used on large telescopes but for very different reasons.

Active Optics (http://en.wikipedia.org/wiki/Active_optics) are needed on large telescopes because as the telescope is elevated the effects of gravity on the shape of the mirror changes which distorts the mirror and therefore the final image. Active Optics uses pistons to counteract the mirrors distortion depending upon the angle of elevation of the mirror. Therefore it operates at the same speed as the mirror moves and hence is slow acting. In this manner large telescopes have been able to maintain good optical performance as their sizes have increased.

Surprises in Victoria Continued...

Adaptive Optics (http://en.wikipedia.org/wiki/Adaptive_optics) does not work on the large collecting mirror but on smaller correcting mirrors placed in the light path. AO is designed to dynamically correct the wobble in the image introduced by the varying properties of the upper atmosphere on the light as it passes down from outer space to the earth's surface. Space based telescopes do not need such systems as they do not experience atmospheric distortion that is a limiting seeing problem for terrestrial telescopes. Most major terrestrial telescopes now incorporate AO systems and these are particularly useful in conjunction with spectrographs which analyze the properties of light from distant stars, dust clouds, quasars, proto-planetary discs, etc.

These systems use various reflecting mirrors, tilt-tip mirrors and deformable mirrors coupled to computer controlled actuators which rapidly respond to the wobble in the light sources. The resulting corrections greatly improved image quality. By using Natural Guide Stars or Laser Guide Stars as measuring references, AO systems can adjust the image quality of the targeted object. Today AO systems can approach the image quality of a space based telescope by employing AO techniques.

The collaboration of UVic and HIA has provided a successful and unique partnership in the specialized field of instrumentation for large astronomical telescopes which is respected by the global community. With the ongoing projects and the developing challenges of the TMT this Canadian story will no doubt provide future successes and surprises in the years to come (http://www.nrc-cnrc.gc.ca/eng/projects/hia/30m-telescope.html).

So my trip to Victoria was a delightful surprise as it opened my eyes to how Canadian institutions are quietly but confidently helping to lead the world with exciting new technological developments.

Artist Impression of the TMT (Thirty Metre Telescope)

Clear Skies!

Editor's Report By Darlene Marano

I'd like to take this time to thank so many of you for the contributions made to the Whirlpool this year. I have truly enjoyed the many photos and articles received.

This is a great time of year to reflect on the good times had with our astronomy friends. From the general meetings, public events, members nights, beginners workshops, gatherings at Chatters, StarBQ, Rock Point and Starfest, there are too many good times to count.

I encourage our new members to become involved in the upcoming events in 2012, one of those events being the Venus transit. Please check our website and "The Whirlpool" at www.astronomyniagara.com from time to time, for the events calendar.

I wish you and your family much happiness this Christmas and a very healthy and prosperous New Year.

Darlene

2012 Celestial Events

January 3, 4 - Quadrantids Meteor Shower. The Quadrantids are an above average shower, with up to 40 meteors per hour at their peak. The shower usually peaks on January 3 & 4, but some meteors can be visible from January 1 - 5. The near first quarter moon will set shortly after midnight, leaving dark skies for what should be a good show. Best viewing will be from a dark location after midnight. Look for meteors radiating from the constellation Bootes.

January 9 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 07:30 UTC.

January 23 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 07:39 UTC.

February 7 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 21:54 UTC.

February 21 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 22:35 UTC.

March 3 - Mars at Opposition. The red planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. This is the best time to view and photograph Mars.

March 8 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 09:39 UTC.

March 14 - Conjunction of Venus and Jupiter. The two bright planets will be within 3 degrees of each other in the evening sky.

March 20 - March Equinox. The March equinox occurs at 05:14 UTC. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world. This is also the first day of spring (vernal equinox) in the northern hemisphere and the first day of fall (autumnal equinox) in the southern hemisphere.

March 22 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 14:37 UTC.

April 6 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 19:19 UTC.

April 15 - Saturn at Opposition. The ringed planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. This is the best time to view and photograph Saturn and its moons.

April 21 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 07:18 UTC.

April 21, 22 - Lyrids Meteor Shower. The Lyrids are an average shower, usually producing about 20 meteors per hour at their peak. These meteors can produce bright dust trails that last for several seconds. The shower usually peaks on April 21 & 22, although some meteors can be visible from April 16 - 25. With no moon to get in the way this year, this really should be a good show. Look for meteors radiating from the constellation of Lyra after midnight.

April 28 - Astronomy Day Part 1. Astronomy Day is an annual event intended to provide a means of interaction between the general public and various astronomy enthusiasts, groups and professionals. The theme of Astronomy Day is "Bringing Astronomy to the People," and on this day astronomy and stargazing clubs and other organizations around the world will plan special events. You can find out about special local events by contacting your local astronomy club or planetarium. You can also find more about Astronomy Day by checking the Web site for the Astronomical League.

May 5, 6 - Eta Aquarids Meteor Shower. The Eta Aquarids are a light shower, usually producing about 10 meteors per hour at their peak. The shower's peak usually occurs on May 5 & 6, glare. The radiant point for this shower will be in the constellation Aquarius. Best viewing is usually to the east after midnight, far from city lights.

May 6 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 03:35 UTC.

May 20 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 23:47 UTC.

May 20 - Annular Solar Eclipse. The path of annularity will begin in southern China and move east through Japan, the northern Pacific Ocean, and into the western United States. A partial eclipse will be visible throughout parts of eastern Asia and most of North America. (NASA Map and Eclipse Information)

June 4 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 11:12 UTC.

June 4 - Partial Lunar Eclipse. The eclipse will be visible throughout most of Asia, Australia, the Pacific Ocean, and the Americas. (NASA Map and Eclipse Information)

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2012 Celestial Events ...continued

June 5, 6 - Transit of Venus Across the Sun. This extremely rare event will be entirely visible throughout most of eastern Asia, eastern Australia, and Alaska. A partial transit can be seen in progress at sunrise throughout Europe, western Asia, and eastern Africa. A partial transit can be seen in progress at sunset throughout most of North America, Central America, and western South America. The next transit will not take place until the year 2117. (NASA Transit Information | NASA Transit Map)

June 19 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 15:02 UTC.

June 20 - June Solstice. The June solstice occurs at 23:09 UTC. The North Pole of the earth will be tilted toward the Sun, which will have reached its northernmost position in the sky and will be directly over the Tropic of Cancer at 23.44 degrees north latitude. This is the first day of summer (summer solstice) in the northern hemisphere and the first day of winter (winter solstice) in the southern hemisphere.

July 3 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 18:52 UTC.

July 19 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 04:24 UTC.

July 28, 29 - Southern Delta Aquarids Meteor Shower. The Delta Aquarids can produce about 20 meteors per hour at their peak. The shower usually peaks on July 28 & 29, but some meteors can also be seen from July 18 - August 18. The radiant point for this shower will be in the constellation Aquarius. The near first quarter moon will set shortly after midnight, leaving dark skies for what should be a good show. Best viewing is usually to the east after midnight.

August 2 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 03:27 UTC.

August 6 - Curiosity Rover at Mars. NASA's Mars Science Laboratory (MSL) is scheduled to land on the red planet between August 6 and August 20, 2012. Officially named Curiosity, it is an autonomous rover similar to the Spirit and Opportunity rovers that previously visited Mars. This much larger rover will carry many more instruments and experiments than its previous cousins. Curiosity's high definition color cameras will photograph the Martian surface while a host of instruments will sample the soil and air and search for organic compounds.

August 12, 13 - Perseids Meteor Shower. The Perseids is one of the best meteor showers to observe, producing up to 60 meteors per hour at their peak. The shower's peak usually occurs on August 13 & 14, but you may be able to see some meteors any time from July 23 - August 22. The radiant point for this shower will be in the constellation Perseus. The near last quarter moon will be hanging around for the show, but shouldn't bee too much of a problem for a shower with up to 60 meteors per hour. Find a location far from city lights and look to the northeast after midnight.

August 17 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 15:54 UTC.

August 24 - Neptune at Opposition. The blue planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. This is the best time to view Neptune. Due to its distance, it will only appear as a tiny blue dot in all but the most powerful telescopes.

August 31 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 13:58 UTC. Since this is the second full moon in the same month, it is known as a blue moon. This rare calendar event only happens once every few years, giving rise to the term, "once in a blue moon."

September 16 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 02:11 UTC.

September 22 - September Equinox. The September equinox occurs at 14:49 UTC. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world. This is also the first day of fall (autumnal equinox) in the northern hemisphere and the first day of spring (vernal equinox) in the southern hemisphere.

September 29 - Uranus at Opposition. The blue-green planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. This is the best time to view Uranus. Due to its distance, it will only appear as a tiny blue-green dot in all but the most powerful telescopes.

September 30 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 03:19 UTC.

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2012 Celestial Events ...continued

October 20 - Astronomy Day Part 2. Astronomy Day is an annual event intended to provide a means of interaction between the general public and various astronomy enthusiasts, groups and professionals. The theme of Astronomy Day is "Bringing Astronomy to the People," and on this day astronomy and stargazing clubs and other organizations around the world will plan special events. You can find out about special local events by contacting your local astronomy club or planetarium. You can also find more about Astronomy Day by checking the Web site for the Astronomical League.

October 15 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 12:02 UTC.

October 21, 22 - Orionids Meteor Shower. The Orionids is an average shower producing about 20 meteors per hour at their peak. This shower usually peaks on the 21st, but it is highly irregular. A good show could be experienced on any morning from October 20 - 24, and some meteors may be seen any time from October 17 - 25. The first quarter moon will set by midnight, leaving a dark sky for what should be a good show. Best viewing will be to the east after midnight. Be sure to find a dark location far from city lights.

October 29 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 19:49 UTC.

November 13 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 22:08 UTC.

November 13 - Total Solar Eclipse. The path of totality will only be visible in parts of extreme northern Australia and the southern Pacific Ocean. A partial eclipse will be visible in most parts of eastern Australia and New Zealand. (NASA Map and Eclipse Information)

November 17, 18 - Leonids Meteor Shower. The Leonids is one of the better meteor showers to observe, producing an average of 40 meteors per hour at their peak. The shower itself has a cyclic peak year every 33 years where hundreds of meteors can be seen each hour. The last of these occurred in 2001. The shower usually peaks on November 17 & 18, but you may see some meteors from November 13 - 20. The crescent moon will set early in the evening leaving dark skies for what should be an excellent show. Look for the shower radiating from the constellation Leo after midnight, and be sure to find a dark location for viewing.

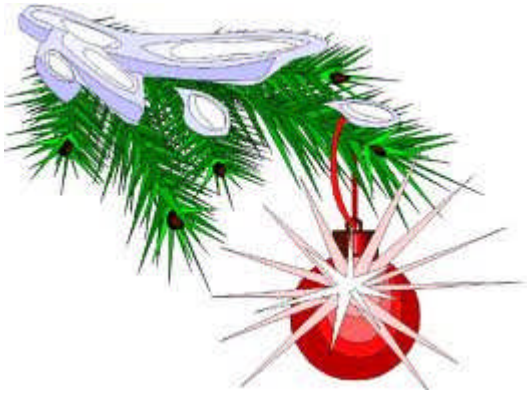
November 27 - Conjunction of Venus and Saturn. These two bright planets will be within 1 degree of each other in the morning sky. Look to the east around sunrise.

November 28 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 14:46 UTC.

November 28 - Penumbral Lunar Eclipse. The eclipse will be visible throughout most of Europe, eastern Africa, Asia, Australia, the Pacific Ocean, and North America. (NASA Map and Eclipse Information)

December 3 - Jupiter at Opposition. The giant planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. This is the best time to view and photograph Jupiter and its moons.

December 13 - New Moon. The Moon will be directly between the Earth and the Sun and will not be visible from Earth. This phase occurs at 08:42 UTC.



December 13, 14 - Geminids Meteor Shower. Considered by many to be the best meteor shower in the heavens, the Geminids are known for producing up to 60 multicolored meteors per hour at their peak. The peak of the shower usually occurs around December 13 & 14, although some meteors should be visible from December 6 - 19. The radiant point for this shower will be in the constellation Gemini. This year the new moon will guarantee a dark sky for what should be an awesome show. Best viewing is usually to the east after midnight from a dark location.

December 21 - December Solstice. The December solstice occurs at 11:12 UTC. The South Pole of the earth will be tilted toward the Sun, which will have reached its northernmost position in the sky and will be directly over the Tropic of Capricorn at 23.44 degrees south latitude. This is the first day of winter (winter solstice) in the northern hemisphere and the first day of summer (summer solstice) in the southern hemisphere.

December 28 - Full Moon. The Moon will be directly opposite the Earth from the Sun and will be fully illuminated as seen from Earth. This phase occurs at 10:21 UTC.

Events Horizon

Thursday, December 15th
Beginners' Astronomy Workshop. 6:45pm to 7:30pm.
General Meeting starts 7:30pm Everyone welcome. No Charge.
Niagara Falls Library at Victoria and Morrison Streets

Thursday, January 12th
Executive meeting at 7:00pm. Members welcome.
Chatters Eatery. Banquet room next to restaurant.

Thursday, January 19th
Beginners' Astronomy Workshop. 6:45pm to 7:30pm.
General Meeting starts 7:30pm Everyone welcome. No Charge.
Niagara Falls Library at Victoria and Morrison Streets

Saturday, January 21st
Members Night
CCCA Observatory

Thursday, February 2nd
Beginners' Astronomy Workshop at AN Myer High School
7:00pm—9:00pm. (**Centre Members Only**)

Thursday, February 9th
Executive meeting at 7:00pm. Members welcome.
Chatters Eatery. Banquet room next to restaurant.

Thursday, February 16th
Beginners' Astronomy Workshop. 6:45pm to 7:30pm.
General Meeting starts 7:30pm Everyone welcome. No Charge.
Niagara Falls Library at Victoria and Morrison Streets

Saturday, February 18th
Members Night
CCCA Observatory

Saturday, February 25th
Public Star Night
Heartland Forest

Thursday, March 1st
Beginners' Astronomy Workshop at AN Myer High School
7:00pm—9:00pm. (**Centre Members Only**)

Thursday, March 8th
Executive meeting at 7:00pm. Members welcome.
Chatters Eatery. Banquet room next to restaurant.

Thursday, March 15th
Beginners' Astronomy Workshop. 6:45pm to 7:30pm.
General Meeting starts 7:30pm Everyone welcome. No Charge.
Niagara Falls Library at Victoria and Morrison Streets

Saturday, March 24th
Members Night
CCCA Observatory

Saturday, March 31st
Public Star Night
Heartland Forest

Christmas Photo

By Darlene Marano

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Moon Phases For January, February and March 2012

New Moon	First Quarter	Full Moon	Last Quarter
Jan 23	Jan 30	Jan 9	Jan 16
Feb 21	Feb 29	Feb 7	Feb 14
Mar 22	Mar 30	Mar 8	Mar 14




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