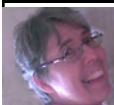




Event Horizon



Volume 18, Number 3
January 2011



From The Editor

Happy New Year!

Santa was listening to me when I asked for clear weather during the lunar eclipse. It was completely clear here in Hamilton while conditions were poor for those who ventured out to Binbrook. My request for lunar eclipse photos was answered by many of our members and the beautiful wide field shot above, taken by our chair, John Gauvreau, is only one of the photos I received. You will find more inside this month's issue as well as a fantastic lunar eclipse video put together by Bob Christmas.

I hope you enjoy this month's newsletter and I wish all of you clear skies for 2011.

Ann Tekatch
Editor@amateurastronomy.org



Chair's Report by John Gauvreau

Over the past two months we have had a chance to meet those members of the HAA that comprise the club's council, an active group of volunteers that help make the club the best it can be. Of course, there are a hundred other people in the club that are just as important and we would like to hear from you too. Members can participate in all aspects of the club, including the general meetings and council meetings. Just look at the many and varied ways that members contributed to the 2011 calendar (deep-sky astrophotos, scenery shots, visits to dark sites, observations from home...). This is such an active group that at any given time there are many observing projects, astrophotographs and other activities going on and I'd love for you to share these experiences with the rest of the club. If you would like to participate in a general meeting just contact me and we can arrange the details.

Speaking of the calendar, congratulations and a debt of gratitude go out to those involved. Over 180 calendars have found their way into homes, which is by far the most we've ever sold! I have heard many complimentary remarks from members and non-members alike. I personally had the great pleasure of explaining to my sis-

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Chair's Report (continued)

ter what terms like apogee, perihelia and opposition meant, as she looked through a copy and read the great amount of detailed astronomical information available within. This is the fourth year we've produced a calendar and each has been a great success.

This past month we were entertained and educated by Dr. Doug Welch, club founder, astronomy professor at McMaster University and McNeil Medal winner, at our monthly general meeting. I couldn't have hoped for a better finale to 2010. We have many more exciting speakers lined up for 2011 and we start with award winning author, Dan Falk, in January and his presentation on 'Time', and follow in February with Dr. Ralph Chou, who will discuss the aging eye and observing.

And since I mentioned how active the club is, I should mention that other than the monthly general meeting there is another monthly meeting. The Book Discussion Group and the Cosmology Discussion Group meet on alternate months to engage in lively but casual discussions that range from subatomic particle creation, to large-scale structure of the universe, favourite movies and books both modern and classic. This past month the discussion that surrounded the book of the month, *From the Earth to the Moon*, was one of the most enjoyable I have attended. If you would like to attend be sure to contact Mario Carr for the Book Club (mariocarr@cogeco.ca) or myself for the Cosmology group.

Many of our club members had a chance to observe the total lunar eclipse last month, and you can see the photographic results elsewhere in this issue. Observing goes on all year, and if you would like to come out to the club's dark sky site please contact the volunteers who keep the site open as often as possible, and watch for email notifications of observing sessions. You don't need a telescope of

your own, but of course you are welcome to bring one (or two!) if you like. They can be reached at keyholders@amateurastronomy.org

One of the greatest observing experiences an amateur astronomer can have is participating in a Messier Marathon. No past experience is needed, only the will to get out and observe as many Messier objects as you can, in one night, or over a season. Any telescope or binocular will do, and you can do this from our observing site, or from your own backyard. The HAA has organized Messier Marathon nights before, and has used them as a much needed fundraiser, and this year we hope to have our best yet! If you would like to participate in any capacity be sure to sign up at the next meeting, or contact me for details. Helping the club is never more fun than this!

The varied things that I have described here, this month, are just some the things that go on every month that help make this such a great astronomy club. Thanks for being a part of it. A Happy New Year to you all, and my wishes that 2011 brings you all good things.

See you out there.

John Gauvreau
chair@amateurastronomy.org

Masthead Photo Credits: This month's featured photo of the December 21st total lunar eclipse is by John Gauvreau. John explains that it "incorporates three exposures (1: the eclipsed moon, 2: the starry sky and 3: the uneclipsed portion of the moon) to try and show how it looked to the eye." The exposures were taken with a camera on a tripod. See inside for more photos of the lunar eclipse by our members.



A Look Inside Saltfleet High School's Observatory by Harvey Garden

In November, Harvey contacted Saltfleet High School (on Upper Centennial Parkway in Hamilton) and arranged to have a look at their rooftop observatory. He took the photos on this page and offers this report on the observatory's current status. - Editor



The observatory is about 20 feet wide and accessible by stairs via an entrance through its floor. The dome's viewing slot is about 30" wide. The observatory has been idle for some time and the school has been using some of the space inside for storage. The telescope, a 16" Meade, is out of commission. The teacher who showed me around said that the telescope will not return to its "home" position so it will be sent to California sometime to be repaired.



The observatory is closed to the public and I was grateful to the school for giving me this opportunity to check it out.



App-stronomy App Of The Month by Jim Wamsley

Last month, Andrew Bruce wrote an excellent article on this topic. I am one of those people he noticed using an iPhone. I picked up my iPhone a few months ago, and have fallen in love with it. I was in the market for a new phone and had heard about the great astronomy apps available on the iPhone, and I have not been disappointed.

I, like Andrew, have my favourite apps. I tend to lean towards the free, or very cheap (\$0.99) apps. If you don't care about the glitzy graphics, and just want the basic info, there is often a 'lite' app that will do the job for free. But sometimes it's all about the show and worth the few bucks for the full blown version. Which-ever you prefer, cheap, or the luxury version, it can be a full time job just looking for them.

So far I have loaded my iPhone with 23 astronomy apps, and every time I go into the app store I find more to try.

One of my favourite is Sky & Telescope's Sky Week. When you start up Sky Week you find a list of the week's major celestial events, just like in the magazine or on the S&T website. The fun starts when you tap the "view" button next to each event. The app takes you either to a map or an animation.

For either view, you can scroll around to other parts of the sky, and advance the view by second, minute, hour, day, month, or year to see how it will change over time. The notes also include links to handy S&T articles or charts, such as how to find comet 103P/Hartley 2, or when Jupiter's Great Red Spot will transit.

The app includes a "night vision" display that turns the text red, so the app can be used in the field, without ruining your hard-earned night vision adaptation. Well worth the \$0.99 cost.

Over the next months I hope to write a short review of some of the astronomy apps I find and use.



December Treasurer's Report by Don Pullen

(Unaudited)

Cash opening Balance (1 Dec 2010)	\$ 4588.48
Expenses	\$ 762.76
Revenue	\$ 1647.00
Closing Balance (31 Dec 2010)	\$ 5472.72

Notes:

1. Major revenue sources included: 50/50 (\$57), Memberships (\$345), Calendars (\$1110)
2. Major expenses included: Calendar printing (\$762.76)



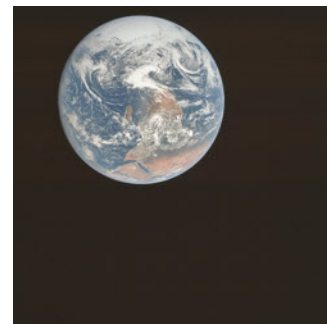
Another Visit to the Blue Marble by John Gauvreau

I never tire of looking at pictures of Earth from space. From the famous Earthrise over the lunar surface taken by the crew of Apollo 8, to the varied and detailed images that continually flow down to us from the International Space Station, they are all fascinating and often beautiful. Of all of these though, one stands out in the collective conscience, having captured the eye of the world for nearly four decades now. On route to the moon for the last manned lunar landing mission, the Apollo 17 crew were just 29,000 km from earth when one of the crew members took two images of the Earth they were leaving behind (NASA credited the images to the entire crew, and it is uncertain which crew member actually took the photo, although the odds favour Jack Schmidt). Since that time it has become one of the most reproduced images in the world and has earned the nickname of "The Blue Marble".

Of course you know this photo (*seen at left*) well, but let's have a good look at it, shall we?



Upon examining the two original images from the NASA database, the one that has been reproduced and become so well known does seem to be slightly sharper than the other (although the other was better centered). Both were taken with a Hasselblad medium format film camera and an 80mm lens (equivalent to a 50mm lens on a 35mm film system). Unlike when we take a picture by actually looking through a viewfinder, or looking at a digital screen to see the image before we press the shutter, Apollo astronauts mostly just pointed the camera without looking. Sometimes this was because there wasn't room to put the camera in front of your face, and sometimes it was because the camera was mounted (like on your spacesuit when walking on the moon). You just aimed in the direction you wanted and hoped for the best. Have a look at the original, untouched image (*right*) (officially known as AS17-148-22727) before we look at some features a little more closely:



First you will notice that south is up and north is down. If you had been on board the Apollo spacecraft at the time and looked out the window at the Earth this is how you would have seen it. Of course, there is no up or down in space, but those space capsules were cramped and there wasn't much room to move around. You pretty much had your orientation fixed and this was the view whether you liked it or not.



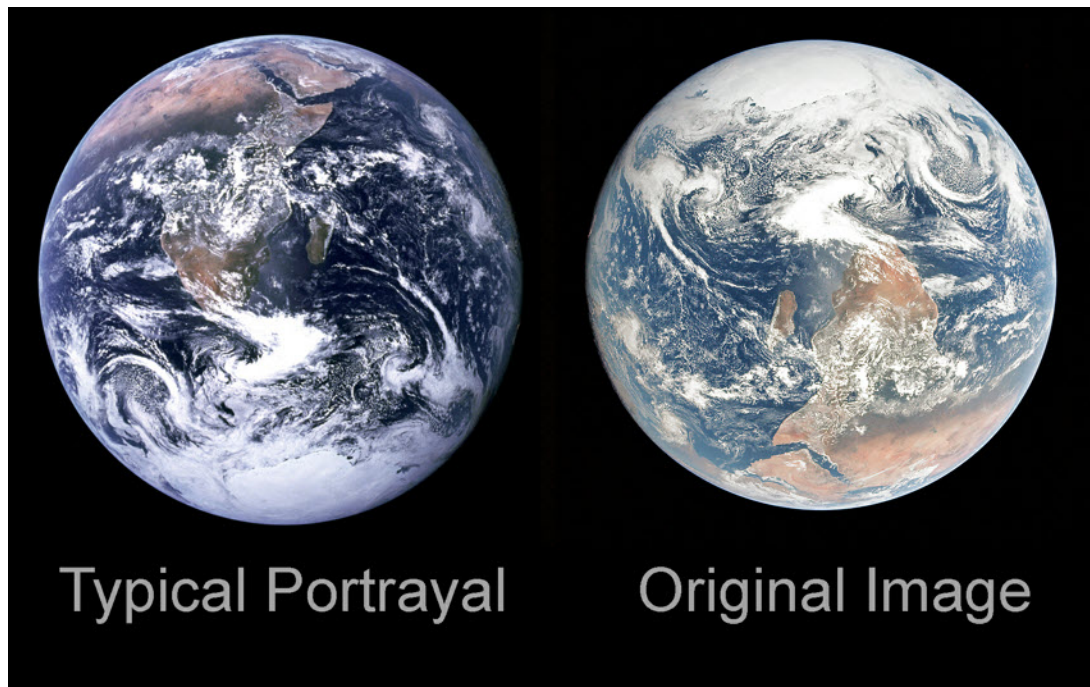
With south up we can see at the top of the globe the continent of Antarctica (*photo at left*). Notice that it is fully illuminated, like the rest of the portion of the Earth that we see here. To have the southern hemisphere so well illuminated indicates that the sun must be over the south, and thus they are experiencing summer. Here in the northern hemisphere we would be experiencing winter, and indeed, Apollo 17 launched in December of 1972. This picture was taken on December 7th of that year, just a couple of weeks before the winter solstice (how northern-centric we are!)

Next you may notice that most times you see this image it has been heavily processed. You may be used to seeing it darker, more contrasty and more heavily colour saturated.

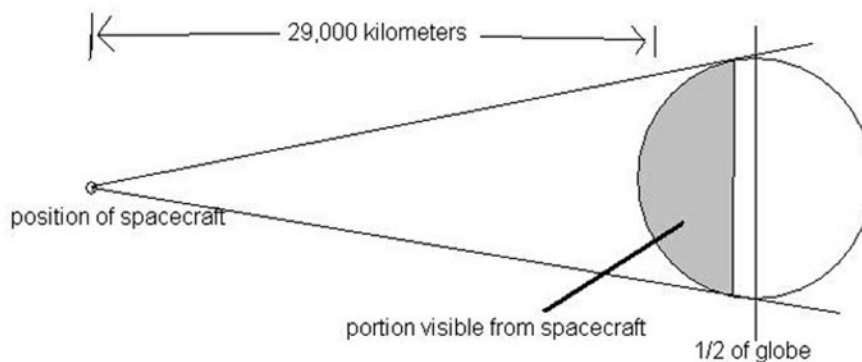
Continued on p. 6

Another Visit to the Blue Marble (continued)

The image as presented here (*below*) is much closer to the original image as taken (I processed this version myself from the original file) and it preserves more detail and better shows what the Earth would have looked like to the eye. It's bright and detailed!



Now let's look at some features of the Earth itself. Many people don't notice that you can't see an entire hemisphere of the Earth. They were still quite close to the planet and although you can see all of Africa and Arabia, most of Antarctica and a part of Asia, foreshortening means that, although the Earth looks completely round, it does not represent half the globe. You would have to be much farther from the surface to see that. (*See figure below*)



Speaking of Africa, see how vivid and clear it is? That is because it is near the center of the image. Around the edge of the globe there is a great loss of detail, colour and contrast, and that is because you are looking through much more atmosphere. This 'atmospheric extinction' is exactly the same as were experience as observer when we try to look at stars or galaxies or nebulae near the horizon. They look dull and washed out because we are

looking through so much air. It is when these celestial objects are closest to overhead that they look their best. In the case of this photo, we are simply looking from the other side of the atmosphere.

One more thing to notice is in the very center of the globe, just off the east coast of southern Africa. There you will notice that the water pales as it loses some of its colour and richness. This is actually a reflection of the sun which is behind the photographer. The light is bouncing off the water and creating

Continued on p.7

Another Visit to the Blue Marble (continued)

a glare of light. This effect can be seen in terrestrial photos as well or sometimes even with the unaided eye. Look for reflective surfaces (like wet pavement or dew covered fields), and look at the spot exactly opposite the sun to see if you can spot the anti-solar point reflection. In the night sky you may also spot the gegenschein, where sunlight bounces off interplanetary dust in the solar system to create a bright spot in the sky at the anti-solar point. Well, not bright; it takes a very dark, moonless night and absolutely no light pollution.

Of course, this image is better appreciated with this understanding of what we're looking at, but in the end it's really all about looking at our beautiful home. Rarely has an image made us look at ourselves in such a way as this one, and its beauty is unquestioned. I can only imagine what it must have been like for any of those who travelled beyond the Earth to look back and see this. But for those of us who remain earthbound, this image will do nicely.

December 21st Total Lunar Eclipse Photos



These are 3 images that I took of the Lunar Eclipse of the early morning of Tuesday, December 21, 2010, taken from the parking lot of my condominium complex in Burlington. Each are 1/2 second exposures through my Tamron 300mm telephoto lens, set at f/3.6, with my Canon Digital Rebel 300D, set at ISO400. Going right-to-left, the image timestamps are 2:55am (just after start of totality), 3:25am (near mid-totality), and 3:50am (just before end of totality). I lucked out with the almost completely-clear skies over Burlington Tuesday morning!

Bob Christmas

December 21st Total Lunar Eclipse Photos



Clockwise from upper left: Dave Gaylor got up at 3:00am to shoot the photos used in this fantastic collage.

Above: Bob Christmas made an animated gif using individual frames taken 5 minutes apart, from 2:50am ET to 4:00am ET Dec. 21, 2010. Each frame is a 1/2 second exposure through a Tamron 300mm lens set at f/3.6; ISO speed 400 on Canon Digital Rebel 300D camera. The animated gif file was converted to an avi file and uploaded to YouTube. You can watch it by clicking on the image.

Below right and left: images taken by Ann Tekatch from their backyard observatory during the lunar eclipse. The image on the left was taken with a point and shoot camera on a tripod from within the shed. Image on the right was taken through 180mm f/9 refractor.





December General Meeting Report by Bob Christmas

HAA Chair, John Gauvreau, opened December's meeting at the Hamilton Spectator auditorium at 7:30 pm by pitching the HAA 2011 Calendars, which have since sold out, by the way. John then gave the floor to HAA Observing Director Steve Germann, who presented The-Sky-This-Month for December.

Steve's constellation focus this time was Taurus, the Bull, a prominent winter-sky sight that contains the bright star Aldebaran, the red eye of the bull, the Crab Nebula supernova remnant, several open clusters, and, of course the Pleiades cluster.

He also gave the club a little exercise in "connecting the dots" for the constellation Canis Major, both online on the HAA Blog and this night on the projector screen, specifically asking if one could recognize the shape of a dog, or, perhaps something else (e.g. Kevin Salwach's interpretation below).

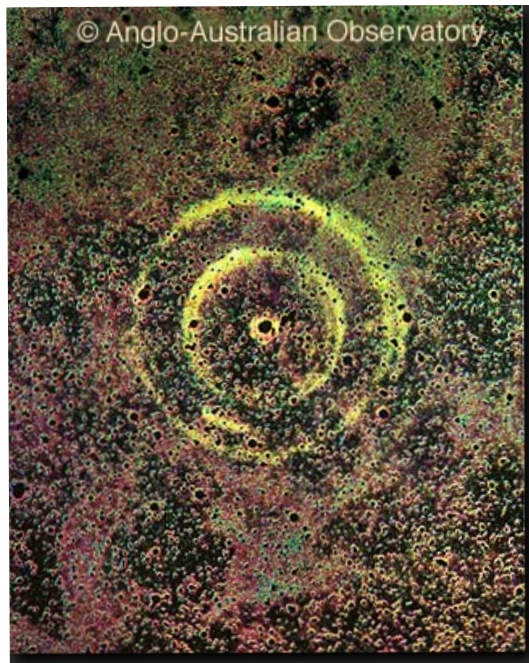
Steve showed several awesome images, including HAA's own Kerry-Ann Lecky Hepburn's images of the aforementioned Pleiades, the "E.T." cluster (NGC 457), and the open cluster M46 in Puppis with planetary nebula NGC 2438, as well as a spectacular image of Comet Hartley 2's nucleus from NASA's Deep Impact probe that was prominently featured on NASA's APOD page, and elsewhere.

Steve's talk was followed by an intermission, which gave the meeting's attendees time to mingle about and converse. After the intermission, Alex Tekatch took to the floor and picked the door prize winners and the 50-50 winner.

Our main speaker of the night was Dr. Doug Welch of the Physics and Astronomy Department of McMaster University. Doug was a co-founder of the HAA in 1993, and is a Past HAA Chair. We always look forward to the time whenever Doug speaks at our club. This time was no different.

Doug's topic was Supernova Light Echoes, and, specifically, the MACHO and SuperMACHO projects. He talked about the deep-sky survey of the Large Magellanic Cloud conducted at Cerro Tololo, Chile, aimed at measuring star brightnesses, gravitational lensing, etc., and how this accidentally led to the discovery of "echoes" from Supernova 1987A in the LMC.

The imaging technique of taking multiple images over time, then subtracting constant objects, was used for detecting arcs and rings of light from SN 1987A as its light passed through and was reflected by clouds and walls of interstellar dust.



Above is an image of the SN 1987A Light Echoes by David Malin, taken at the Anglo-Australian Observatory.

Doug also gave a brief lesson on Type Ia and Type II supernovae, as well as the geometry of Supernova Light Echoes and the detection thereof, the technical details of which I will skip here, but were nevertheless very fascinating. He also mentioned that three other supernovae that occurred in the LMC long ago were detected by resolving their light echoes using these techniques.

He said that searching the Milky Way Galaxy for Supernova Light Echoes is much harder, ironically, because it is so relatively close to us. The search fields per unit area of the sky are therefore much larger, requiring many more images. Nevertheless, light echoes were detected for Cassiopeia "A" and the Tycho Supernova. Wouldn't it be cool to detect a light echo from the supernova responsible for the Crab Nebula?!

Many thanks go to Doug, for an excellent talk on an amazingly interesting topic!

The meeting concluded with a reminder of our next HAA meeting, on January 14, featuring Dan Falk as our main speaker, as well as an interesting result of Steve's "connect-the-dots" poll (see above), from HAA member Kevin Salwach... Canis Major, the reindeer! How appropriate for the holidays!

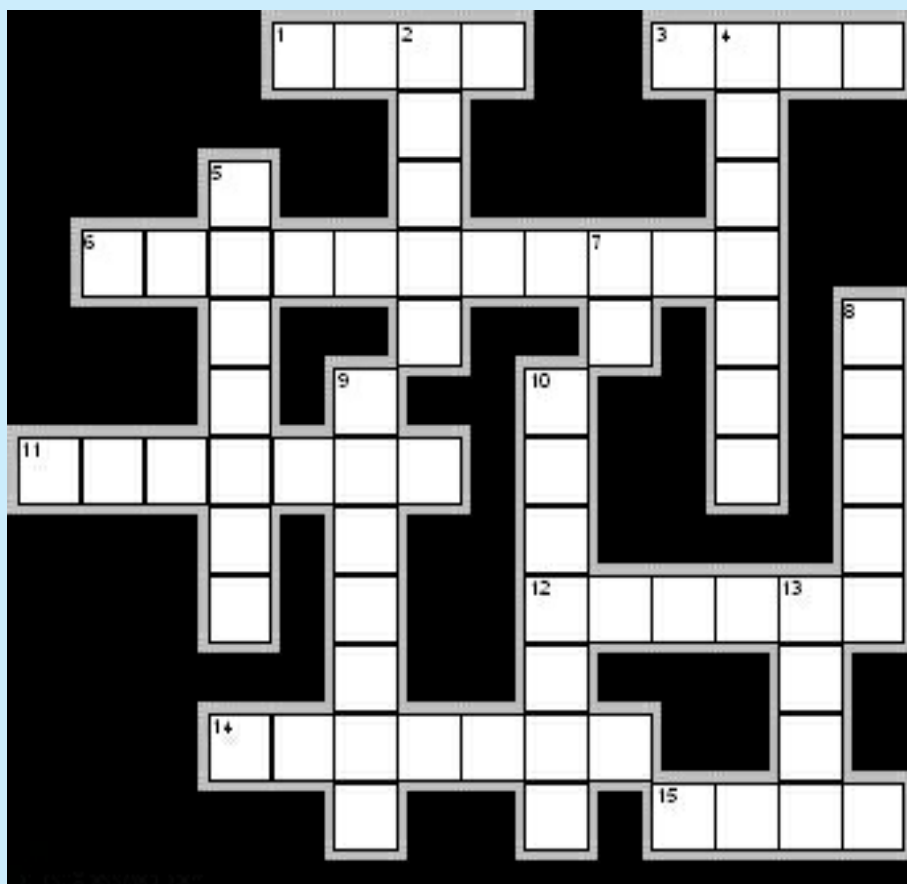
The post-meeting turnout at Crabby Joe's in Hamilton's west end was fantastic. Over 20 of us crammed into tables in the restaurant section for some very fine food and pre-Christmas cheer... this time, minus the karaoke!



Astronomy Crossword by Mario Carr

Across

1. Author of "Astronomy on a T-shirt."
3. The name of the full moon in January.
6. January meteor shower.
11. During Jan. 2011 this planet will set in the west after 10 p.m.
12. During Jan. 2011 this planet will rise in the east after 1 a.m.
14. On Jan. 22, 2011 the moon will be?
15. On Jan. 17, 2011 the moon will be close to this nebula at 6 a.m.



Down

2. The last time this type of eclipse happened during a winter solstice was 372 years ago.
4. The longest-serving spacecraft that has been on Mars for more than 3,340 days.
5. This physicist was born Jan. 8, 1942.
7. Galileo discovered this moon on Jan. 7, 1610.
8. Cassini recently found possible ice volcanoes on this moon.
9. During Jan. 2011 this planet will be low in the morning twilight sky.
10. On Jan. 26, 1760 he discovered his first comet.
13. On Jan. 11, 2011 Cassini is scheduled to encounter this moon of Saturn.

Answers on p.16

HAA Helps Hamilton

To support our community, we will be collecting non-perishable food items and cash for local food banks beginning with our January 14th general meeting.

Please bring a non-perishable food item to the meeting and help us help others in these tough economic times.

If you would like to help or have any questions about this new initiative, please contact Jim Wamsley at 905-627-4323.

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Focal length is 1200 mm, F/ratio is F/6

The scope does not need to be disassembled between uses. It transports as two compact pieces that can be assembled and ready to use in seconds. It is easy to collimate and holds its collimation throughout the evening. It has tension adjustment control on the altitude bearings.

Contact Keith McColl at 905-648-6830 or dkmccoll@cogeco.ca





The Sky This Month: January 2011 by Steve Germann

It's the New Year!

Last month's 'star' was the Moon. Its sunlit orb plunged into the depths of the earth's shadow, lit by the reddish glow of a thousand sunrises and sunsets at the same time. If you were keen to photograph it, as I was, you might have headed for an open area. Unfortunately, the clouds were patchy in southern Ontario that night, and the choice of a location varying by a few km away was a factor.

This year, the Moon is back right away for another disappearance, getting between the Sun and most of continental Europe and Africa including the Sahara Desert. The eclipse will be partial, and the greatest eclipse will be in northern Finland and Norway.

The moon this month is known as the Wolf Moon, or the Ice Moon. That's for January 18th. We will be seeing the moon start anew, after its eclipse, from January 4th onwards. It will be waxing gibbous by the time our monthly HAA meeting rolls around, on the 14th of January. Our public night in Burlington will be on January 15th, at the Appleby Ice Center, on Appleby Line near Mainway in Burlington. Watch the HAA website for details.

This month's constellation is Orion. Last month at our meeting we saw an interesting rendition of Canis Major re-interpreted as Reindeer, courtesy of Kevin Salwach. Canis Major is the fabled companion of Orion the Hunter, following him through the sky every night.

This month we will delve into the celestial features of this region of the sky.

Orion is a great constellation for beginners because its stars are so bright and there's not a lot of distraction in its vicinity. Start by finding Orion's Belt. The 3 equally spaced stars form a line 2.75 degrees long, and are one of the easiest to recognize asterisms in the sky. They are notable for their similarity in appearance, but their distance and true brightness just happen to balance.

The 4 corner stars have names. The most famous is Betelgeuse (alpha Orionis) which is unpretentiously pronounced Beetle-Juice, which is close enough to the correct pronunciation that I am not going to correct anyone. Next in clockwise order (looking at Orion) is Bellatrix (gamma Orionis), then Rigel (beta Orionis), the fictional home star of Captain James T Kirk, and finally, kappa Orionis, also known as Saiph.

The Greek letters associated with stars in the sky were originally assigned by Johann Bayer in 1603, while creating the Uranometria star atlas.

Generally, when brightnesses are close, they are ordered from head to tail within the constellation. This explains why Betelgeuse is alpha (it's closer to the head) and Rigel is beta (further from the head but still one of the brightest stars). Betelgeuse is also a variable star, and it is sometimes brighter than Rigel.

http://en.wikipedia.org/wiki/Bayer_designation

You might want to memorize the names of the 3 belt stars while you are at it, but I find them a bit of a tongue twister. Alnitak and Alnilam and Mintaka. At least they all have 7 letter names.

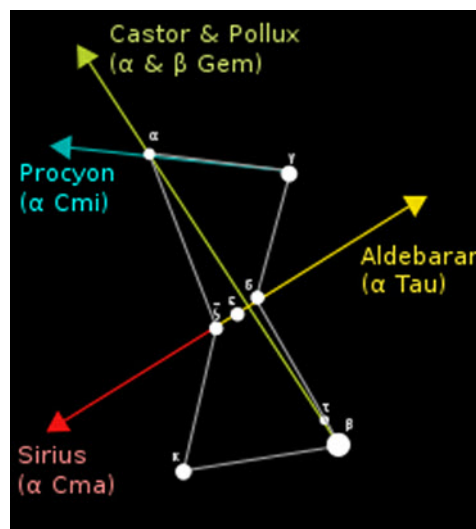
The belt stars of Orion are in line with a very rich star field. It's an excellent place to point your binoculars. You can 'go for a swim' in there and always emerge refreshed.

Orion's stars can be used as pointers to other constellations, as they define a dozen or more directions in the sky, and the scale of the various parts of Orion can be used to determine the distance to travel in various directions.

So, if you can find and see Orion, you can find a lot of other things. I use the top pair and bottom pair of stars to point to M77. They define a pair of lines that converge at M77, allowing me to ensure I have a clear view to M77 before setting up my telescope at the beginning of the Messier Marathon.

By the way, this is one of the best times to scout out M77, since it's high in the sky. If you want to do the Messier Marathon, you will need to be able to reliably find it when the twilight is fading, which is much harder to do.

The figure below shows 4 of the directions from Orion to nearby stars and constellations.



Bringing your binoculars to bear on Orion will reward you in several ways. First, just look in the region of the belt stars. There's a large open cluster there, and you will see many

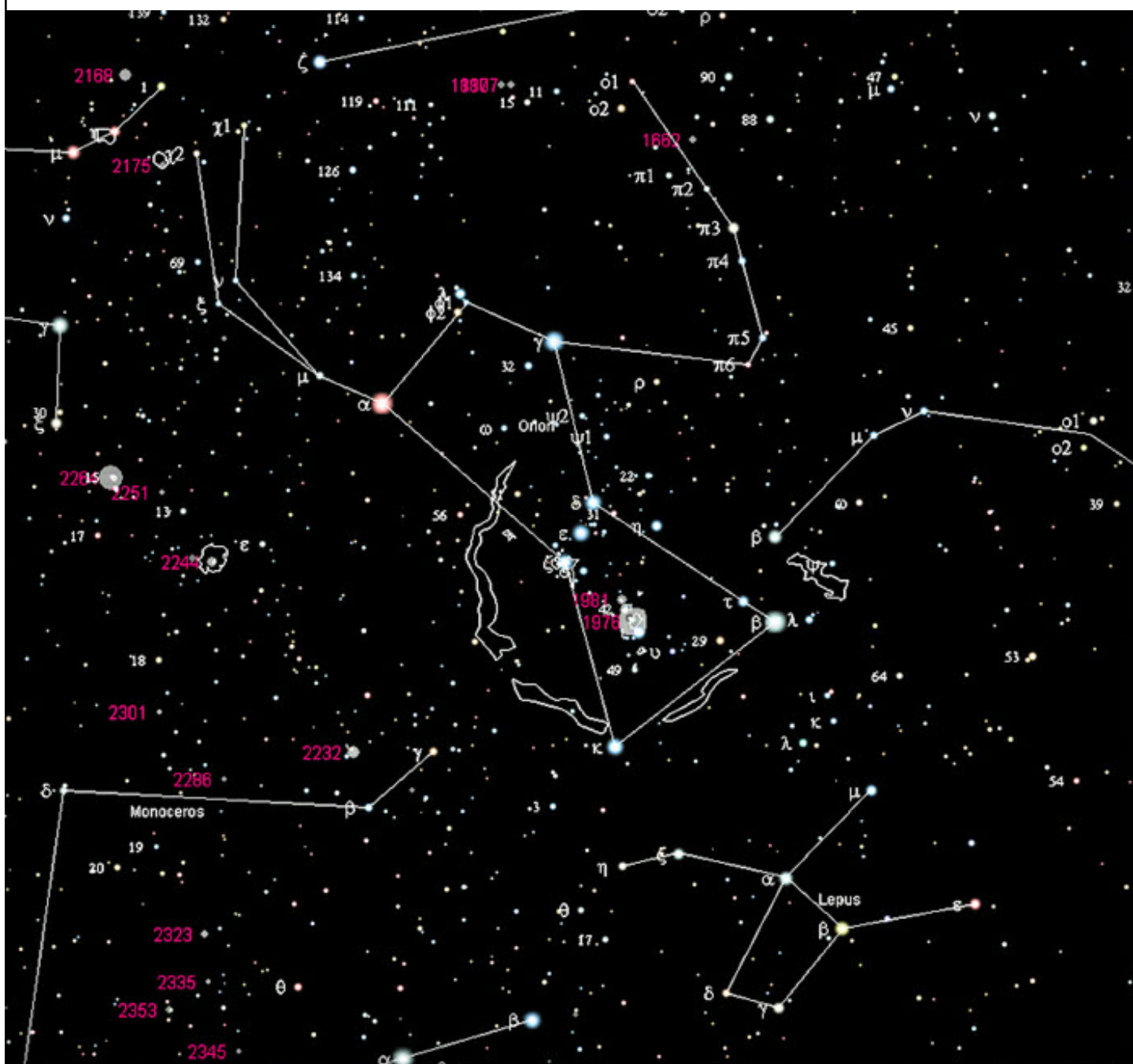
Continued on p.13

The Sky This Month: January 2011 (continued)

stars no matter what equipment you are using.

Even from your front yard, you can admire some double stars in Orion. For instance, Mintaka, the right-most (northernmost) star in Orion's Belt, is actually a double star. It's easy to separate, at 53 arcseconds of separation. Check out the colour contrast between the pure white magnitude 2.2 Mintaka A, compared to Mintaka B, fainter at magnitude 6.3, and deep-blue. It's when the telescope is set up you will get your richest rewards. Direct your attention to the 'Sword' hanging from Orion's belt. Even without a telescope you will see nebulosity in the region of M42, halfway down.

M42 is in the Messier Catalog even though Charles Messier knew full well it would never be mistaken for a comet. It certainly deserves mention as a nebula, and for that, I thank him. It's a lot easier than saying NGC 1976 and NGC 1982 (for M42 and M43 respectively), but now you know their 'other' names, which might help you in a trivia contest sometime.

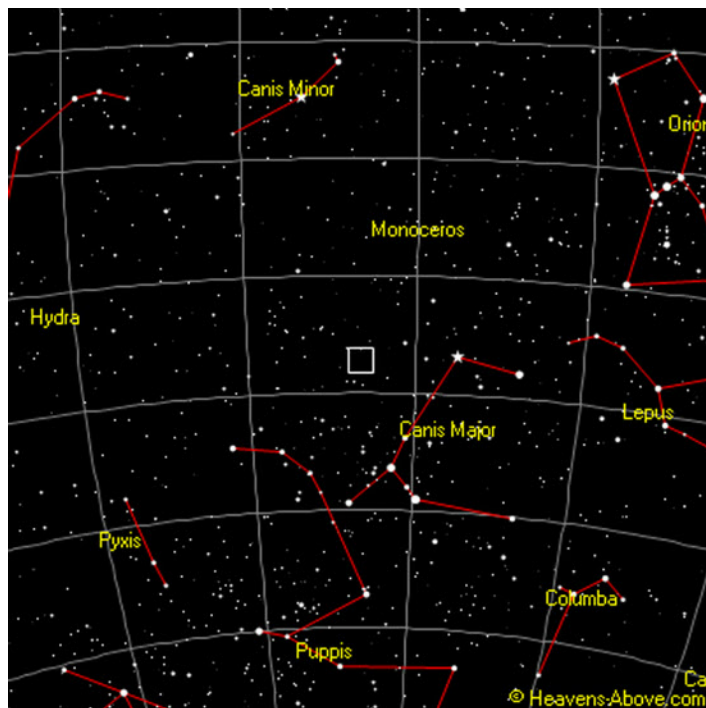


The Sky This Month: January 2011 (continued)

For starters, can you see the Trapezium, 4 bright stars very close together in the center of the knot of the stellar nursery in M42? It's a good test of your telescope optics to explore and try to find up to 4 more faint stars in the same region. All of Orion has been wafted by cosmic breezes from supernovae in the last few million years. The brightest stars in the trapezium are ticking time-bombs... they will burn bright then die hard. Betelgeuse is also a prominent time-bomb. One of these days it will go supernova. Unfortunately, we cannot be sure when. Once it starts 'burning' silicon, it's just one day more until the big blast. Might be today, might be in a million years.

The giant arc of nebulosity in the star chart is known as Barnard's Loop. It's only visible in very dark skies. It's a red Hydrogen Alpha emission nebula, sent outwards by a supernova a million years ago, and believed to be ionized by the bright stars of M42.

Our cometary 'star' is still in the sky, although much faded. Comet 103P Hartley will still be in view, not far from Canis Major. Here's a chart (below) showing where it is now. It's faded to magnitude 9.4, and you will prob-



ably need your camera, or a high power refractor, to see anything other than another point of light. Its orbit around the sun is only 6.46 years, so it will be back. In the meantime as the dust and gas around it dissipates, it will continue to become fainter, until it can only be seen in photographs.

Comet Hartley had the distinction of being recently visited and photographed, in part because it was possible

to accurately track it during its entire orbit, so that the Deep Impact spacecraft could accurately target a flyby, years in advance. We now have very fine images of the comets core, showing the dust and gas coming off it in jets, reflecting the sunlight.

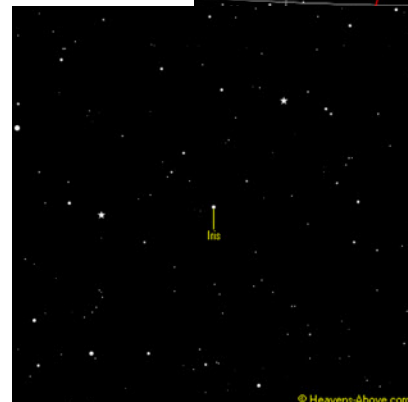
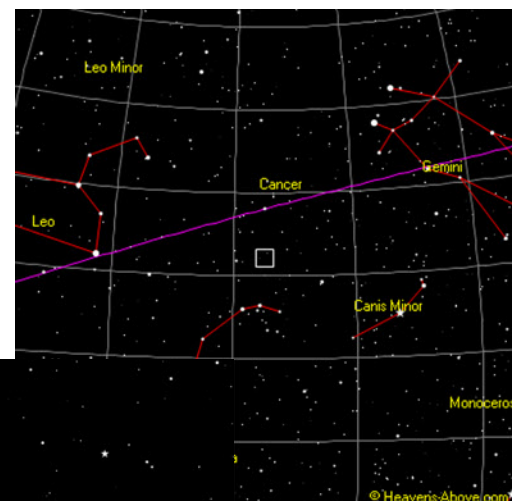
Since I last commented on it, the images have been assembled into a virtual flyby. Here's an excellent link, with some additional commentary: <http://www.wired.com/wiredscience/2010/11/epoxi-comet-flyby/>

Saturn now rises at Midnight; it's still too low to appreciate, but it will be better next month.

Venus is still well separated from the Sun, and it's a morning object about 45 degrees from the Sun. In the daytime, if you can arrange to be in the shadow of a building, 2 hand-spans west of the sun you can discern Venus without optical equipment, in broad daylight. Be sure your face and any binoculars are all in shadow to eliminate glare and any chance of looking at the Sun.

The Earth's position has changed enough that some Minor Planets are back in view. Near magnitude 10, these are challenging objects to find and identify. Over a half-hour you will see them change position relative to their background stars. 7 Iris and 23 Thalia and 16 Psyche are all prominent in the evening sky, and all between 8th and 10th magnitude this month.

For example, here's the brightest of them, weighing in at magnitude 8.2. 7 Iris is near Canis Minor. (See chart below)



Left: Detailed finder chart for 7 Iris.

Continued on p. 15

The Sky This Month: January 2011 (continued)

The website www.heavens-above.com will give you detailed real-time charts for minor planets, anytime, for free.

Stars are shown to Magnitude 12 in the detail shot, so if you can get your telescope pointed at the small box in the large view, you are set to find the wanderer. First thing you will have to do is verify you can see asterisms

from the zoomed in view. Next try to locate 7 Iris near the location shown. It will be brighter than most of the stars in view, but it won't look any bigger than a star in your telescope.

Do you see a difference in colour? Does it twinkle differently? How long did you have to wait before you were sure it was moving against the 'fixed stars'?



Binoculars Are For Everyone by Matthew Mannering

Whenever I talk to someone new to Astronomy I always repeat the mantra "start with a set of 7x50 binoculars and the book 'Nightwatch' ". Quite often that advice seems to be ignored in favour of the big scope. Other times people consider binoculars to be a stepping stone that will no longer be used once they get that scope. This couldn't be further from the truth.

I have been using binoculars from the first day I decided to seriously get into astronomy and will personally never give them up. Currently, I own three pairs of binos: a 7x50, 9x60 and 14x100. Each pair has its place and all of them are used. In my mind, the main concerns when picking a pair of binoculars are:

1. Find a pair you can easily lift and keep at your eyes for at least 10 seconds without significant shaking. The more those stars dance the less you're going to see.
2. Spend a little extra and get a set with good sharpness all the way out to the edge of the field of view.
3. Buy a tripod if you don't have one and an adapter to mount your binoculars (look ma no shaking).
4. Make sure the binoculars you choose have roughly a five-degree field of view.

Now some people will say that sharpness to the edge of the view isn't that important, but I disagree. Usually, a loss of sharpness equates to a 'soft' image for at least some of the field of view. If the binoculars have a soft image, then they may also have poor contrast. In some cases, the whole field will be soft with poor contrast. This is important because a lot of the faint fuzzies you want to find are just that; faint and fuzzy. If the lenses you are looking through are already providing you with a soft image, then the faint fuzzies won't be seen.

Field of view is very important when choosing your binoculars. If the field of view is too narrow (anything less than say four degrees), you will have trouble finding your way around the sky. Both my 7x50 and 9x60 pairs have a five degree field of view. Other than a large field of view the other really good thing about five degrees is that you can use your binoculars to find your way across large spans of sky in multiples of five de-

grees. If you want to move 15 degrees that's three fields of view. If you put your object in the centre of the image, then you have a two and a half degree field all around it. Now you can use your charts to estimate distances from object to object and then just 'count' your way from one to the other.

So why would I want to have two pairs of binos that seem to be very similar? Any time I'm looking for something new that I can supposedly see in my 7x50s, I quite often find that it's just not there. I know I'm in the right place, but where the heck is that little faint fuzzy? Well it turns out (at least in my experience) that especially in the city, 7x50 isn't quite enough to overcome the sky glow. However, now that I know where to look, I can train my 9x60s on that object and there it is. This does wonders for your confidence and gives you a better idea of what these different objects will look like through that finder scope on your big scope. Also, next time you are looking for a similar object you'll find it easier to pick out from the background sky because you've seen it before.

Binoculars also have a very important role in my winter observing. Quite honestly there are lots of times I wouldn't go out if I had to haul my big stuff out of the house. Cool down times for a large scope just get worse as the temperature drops and I don't have a secure yard to go leaving it outside for hours at a time unattended. Mostly, I just take out my binos and within about 10 minutes they have reached equilibrium with the outdoor temperature. In fact you can start using them right away although you will notice some astigmatism and the focus will change continuously until they reach equilibrium. Better yet, when your toes and fingers start to turn blue; which I find seems to happen all of a sudden, tear down time is close to zero.

So I guess the gist of all this is that whenever you go observing, take your binoculars. If you use them properly, they will enhance your experience under the stars and help you become a better observer.

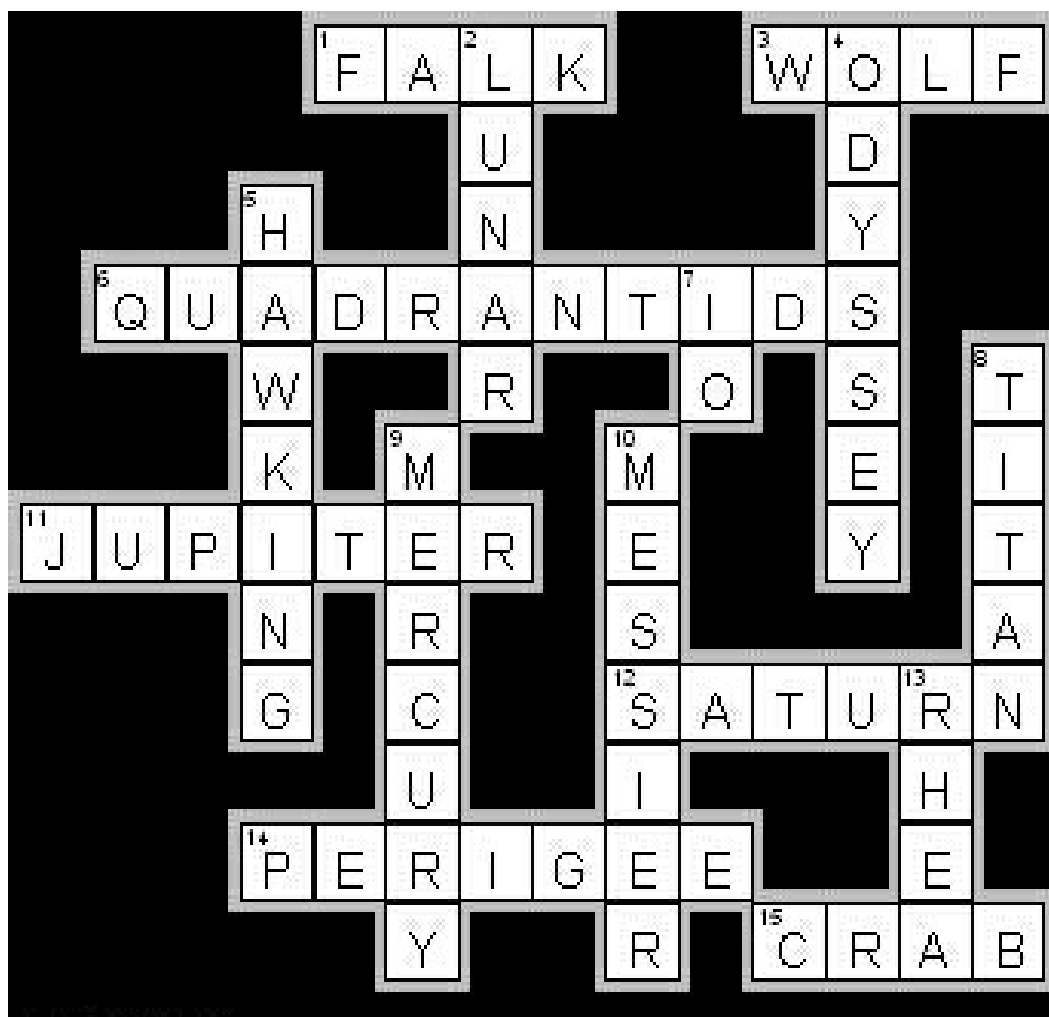


Winter Observing



...5 minutes later

Answers to Astronomy Crossword on Page 10



UPCOMING EVENTS

Friday, January 14 - Hamilton Amateur Astronomers General Meeting, 7:30 pm at the Hamilton Spectator auditorium. Dan Falk will be the main speaker.

Saturday, January 15 - Burlington Public Star Gazing at Appleby Ice Centre, 1201 Appleby Line Burlington, ON, L7L 5H9, 7:00pm-10:00pm.

Saturday, January 22 - Cosmology Discussion Group meeting in Dundas at 7:30 pm. Contact John Gauvreau (chair@amateurastronomy.org) for directions and details. All are welcome!

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