

AURORA

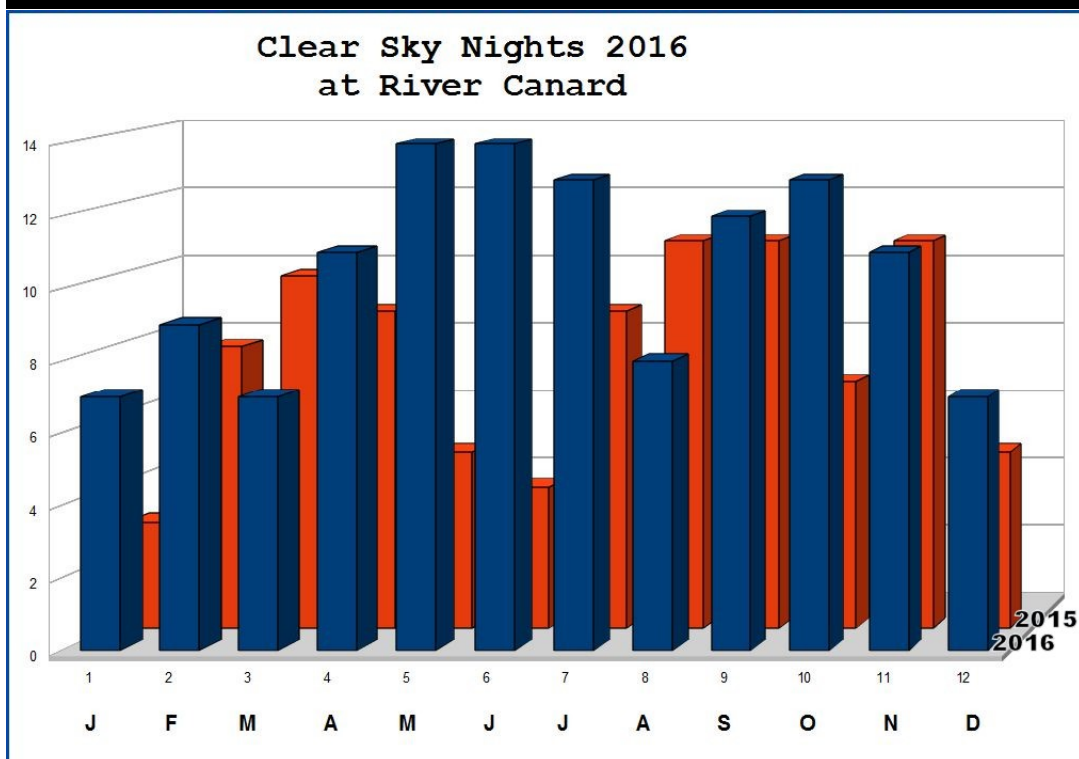


Volume 42, No. 6

The Royal Astronomical Society of Canada - Windsor Centre

March 2017

2016 Clear Sky Nights



Here is my tally of clear night skies for 2016 (blue bars) from my location near River Canard, Ontario. In addition I have included the 2015 counts (red bars) for reference.

This is an unofficial "look out the window" count of all the nights I saw what I considered a "clear sky". Seeing doesn't enter into it. But it gives an idea of what kind of observing year we had this past year. 2016 brought 126 clear nights which is about 35% of the nights for the year. This is up significantly from the 2015 total of 93 clear nights or about 25%. If you thought we had a lot of clear skies in the 2016 you were right. Since I have been keeping records we've experienced a high of 120 clear nights and as low as 83 so 126 is a new high count. 2016 was unusual too in that we experienced our peak months in May, June and July which are typically good months but not in 2015 while still maintaining our typical pattern of September and October being very good if not the best months of the year.

Here is hoping that 2017 will continue the trend from 2016 in particular for all the eclipse chasers heading to the U.S. in August.

Art Rae

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Calendar of Events

Our next meeting...

Tuesday April 18, 2017
7:30 p.m.

at
Ojibway Park Nature Centre
5200 Matchette Road

Main Speaker...

Dr. Susan Sawyer-Beaulieu

Topic...

"Getting Into Solar Imaging"

Activities...

Venus: Is at inferior conjunction on Saturday March 25th and you can carefully look for it pass North of the Sun on that day.

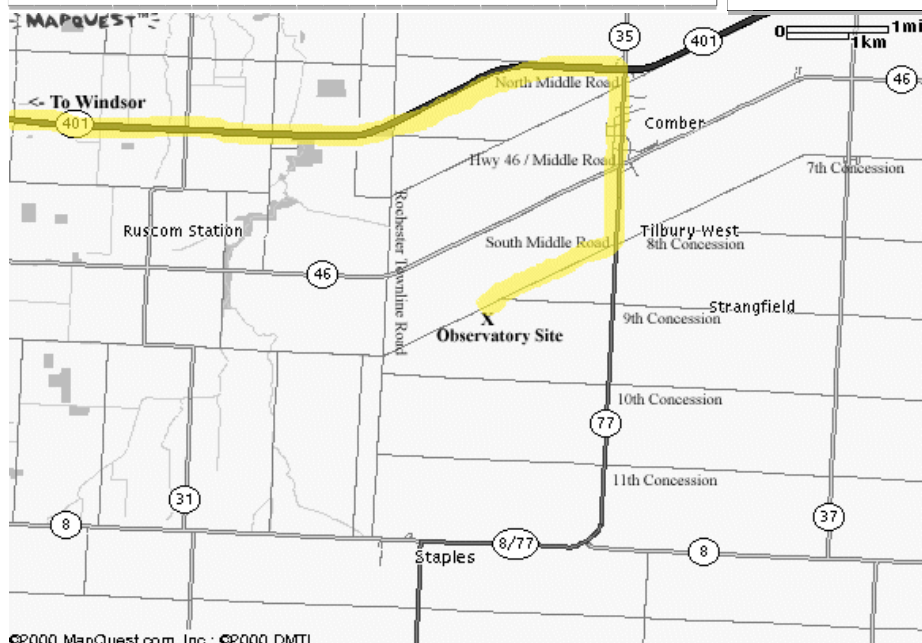
Mercury: Is at greatest elongation on Saturday April 1st and you can look for it in the evening sky.

Moon and Regulus: Are just over 1 degree apart around 1:00 a.m. on Friday April 7th.

Jupiter: Reaches opposition on Friday April 7th and rises as the sun sets.

Moon, Jupiter and Spica: Are in a tight triangle all night on Monday April 10th.

Lyrid Meteors: Peak in the predawn sky of Saturday April 22nd with the Moon in a favourable phase.



Hallam Observatory Site

Directions: The map at left shows the Comber area and it includes the major highways (401, 77, 8 and 46) that are in the area of the observatory.

The most direct route from Windsor is "highlighted" on the map which is to take Highway 401 East to Highway 77 South to South Middle Road. Turn right onto South Middle Road and go about 1 kilometer and just after the point where Concession 9 joins it (it is hard to see this intersection) you will find the observatory site on the South side (left) of the road. 3989 South Middle Road.

If you hit the Rochester Townline Road (you come to a stop sign) you have gone too far.

Submissions

Aurora is published monthly except for July, August and December. The September, October, January, March and May issues are full newsletters (usually 6 pages) with a number of member submitted articles. The November, February, April and June issues are short flyers (2 pages).

Submitted articles can be of any length from a paragraph to multiple pages. I can scan pictures and/or diagrams (both prints and film) to support your article and the originals will be returned to you.

Submission deadline is the 1st of the month.

Editor: Steve Mastellotto Email: mmastellotto@cogeco.ca

Membership

The Windsor Centre of The Royal Astronomical Society of Canada meets on the 3rd Tuesday of every month (except July and August) at the Ojibway Park Nature Centre. In addition to regular meetings the centre hosts a number of observing nights, a picnic and a December social. Members receive a copy of the Observer's Handbook, a subscription to SkyNews magazine and access to the Centre's library and telescopes. Optionally the RASC Journal is available in print form—online version free.

Annual Membership Fees: Please see the RASC website at www.rasc.ca for current rates.

Contact Greg Mockler at (519) 326-7255 or visit our website at: <http://www.rascwindsor.com> for more information.

February 2017 Meeting Minutes by Steve Pellarin

The monthly meeting of the Royal Astronomical Society of Canada - Windsor Center was held at the Ojibway Park Nature Centre on Tuesday February 21, 2017.

Windsor Centre **President, Randy Groundwater**, chaired the meeting and called the meeting to order at 7:29 p.m. and welcomed members and guests to the Ojibway Nature Centre.

Randy invited the members to review the minutes of the January 17, 2017 meeting which were printed in the February newsletter. A motion to accept the minutes was made and the **MOTION CARRIED**.

Randy Groundwater welcomed everyone to the meeting and gave a brief preview of the meeting and noted for this meeting that Mike Mastronardi was standing in for Greg Mockler (Treasurer) and Steve Pellarin would be covering the recording duties for Dan Perisinotti (Recording Secretary).

Randy then went on to discuss the **suspension** of the club's **open house nights** at Hallam Observatory. He explained that the decision made by the Centre council based on a number of concerns expressed by those hosting the events on behalf of the club and by other council members. They included concerns about not having enough manpower to **adequately staff the events**, which of late had drawn extremely large crowds, as well as concerns about **risks of damage to the property, insurance liability** issues for the club and other **safety-related** issues tied to having so many people on the property in the dark with so few members there to manage the event. Randy felt that our outreach to the public through social media had perhaps gotten beyond our control and had been too successful in bringing more people to the open house than we could handle.

Randy went on to explain council's decision to manage the size of guest visits to Hallam Observatory through the use of a new application process available on our Windsor Centre website. **Notification to the public** regarding our change in policy for public visits to Hallam Observatory have been posted on our website, RASC Windsor Centre and Hallam Observatory Facebook pages. Randy noted that our club mandate to bring astronomy to the **public through outreach** will still be met, but now in a different manner - by managing private groups an opportunity to book time to come out and observe with us. He also pointed out that we are still involved with **Pt. Pelee National Park** approximately every other month in offering public observing at their site. They also offer their own star nights to the public as well.

Main Talk

Randy introduced **Susan Sawyer Beaulieu**, a past President and current and long-time council member as our guest speaker for the evening. With the coming of this summer's big total solar eclipse, Susan's timely presentation focused on **"Solar Filters: Ready-made and Homemade"**.

Highlights from Susan's talk included discussion of:

- Common solar filter types: White light (neutral density) and H-alpha
- What does each type of filter allow you to see on the sun? Observing sunspots, prominences, granules, filaments, flares, faculae, plages and spicules are all possible. She went on to explain what each phenomenon is and which

were observable with each filter type.

- She also discussed ready made filters - the manufacturers, materials that they are made of, including a comparison of thin films & glass - coated with either silver, aluminum or some other metal coating.
- Then Susan went on to describe her experiences with making her own solar filter tools: She examined different styles that have been designed, and construction techniques for building them.
- Susan showed how she put a 6" cap-style cell together using common household packaging products (pvc tubing, foam core board, frozen orange juice containers, cardboard peanut containers, velcro tape, etc.) and tools in everyone's garage.
- She also went through a discussion of different materials (recycled from home or purchased new) that could be used in the construction of these devices.
- Susan then provided a list of suggested readings for those that would like to attempt to build their own devices and noted that her presentation would be available for further review as a PDF file to anyone interested in further reviewing these ideas.

At the end of her presentation, a short but active discussion with the membership took place where several important points were raised. First of all, Susan pointed out that using any old Mylar film (particularly that found in places selling "emergency blankets") was not a good idea in that this film was not designed to adequately block out the Sun's harmful rays. Instead, users should order appropriate mylar film from well respected dealers where the film is tested and approved for solar viewing use. Other discussion also pointed out that when putting the metal-coated film in the filter holder, that it should be left loose - builders should not worry about wrinkles in the film. If one tries to stretch the solar-viewing film tight, then when it gets warm, the heat could overstretch the substrate film and ruin its optical properties or possibly even tear it possibly causing permanent eye damage to the observer.

In thanking Susan for her talk, Randy also pointed out that the bottom line was to choose a good quality film from a reputable firm and think about how to maximize the square of film to create several filter discs.

Break and 50/50 Draw: \$ 3.00 went to Al DesRosiers who donated it back to the Centre.

At the break, Susan displayed a large number of solar filters, telescopes and accessories that members were able to come up to the front of the room and handle and ask questions about.

Director of Observing Report

Randy welcomed Steve Mastellotto, who started his presentation with a discussion of activities since the last membership meeting in January (particularly the past weekend of very mild weather with clear skies all weekend). There was a mix of success among the members in viewing the penumbral lunar eclipse on February 10th - it was only visible through breaks in the thick clouds. Randy noted how bright Venus is - looking for his shadow (very bright - like 4% crescent moon). Nancy noted great view of Bode's Galaxy and the Trapezium through Randy's scope. A big group of members ended up out at the observatory

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At The Eyepiece: Climbing Mt. Everest - The NGC Project by Mike Ethier

In the autumn of 2012 I upgraded from my Edmund Scientific 8" reflector to an Orion 12". Needless to say it was a very cloudy Autumn and Winter, and not much observing got done until Spring. On the bright side, I had all winter to come up with an observing plan. And did I ever come up with one!

I wanted a Spring constellation I had never worked in before. I wanted to see all of that constellation's NGC objects, and I wanted one that I could reasonably finish in my lifetime. After some consideration I chose Leo. When ranking northern constellations with the most NGC objects, Leo comes fourth. It is behind Virgo (637 NGC objects), Ursa Major (407), and Cetus (383). Leo has over 360 of them! My plan was to try and view 60 each year, and in six years be done. It was a great plan! The execution of the plan left something to be desired. Spring is a very short observing season, due to the ever increasing light enhancing the westward movement of the stars. Those constellations really fly past!

During the Spring of 2013 I began my Leo project observing from Malden. The South skies were okay, but not great. I didn't observe from Hallam until much later that year. So my first season was rather slow going, and I ended up with less than 40 galaxies observed. Still, it had been the start of a great adventure and I couldn't wait for the next year. In the meantime I had expanded my NGC project to Lyra, then on to Cygnus, Cassiopeia, Cepheus, Cetus, Bootes, Lepus, Monoceros, Sagittarius, Aquila, Delphinus, Equuleus, and others, now all complete except Cetus. I am continuing my work in Leo, as well as in Hercules, Pegasus, and others.

When exactly I decided to go for *all* of the NGC I cannot say, but I likely had a fever at the time. I am not pursuing the IC objects at this moment, but I do drop in on them if nearby, as well as objects from other catalogues. I wanted to take my time seeing each NGC object, recording it in my log (with a sketch if possible) and hopefully remembering many of them with the help of my notes. I did not want this to become merely a checklist, and so far it has not been so.

From 42 degrees North latitude there are approximately 6,400 NGC objects visible, out of a total of 7,800+. I do not usually plan on viewing galaxies if they fall below -30 degrees declina-

tion, but with clusters I can go almost to the horizon. I have seen a few larger and brighter galaxies lower than 30 degrees, but they are not usually very impressive in our South skies from Hallam. In a moment I will tell you how many NGC objects I have seen so far. I do count ones I have seen with the old 8" scope and not yet with the 12", though I have redone many of them with the larger aperture.

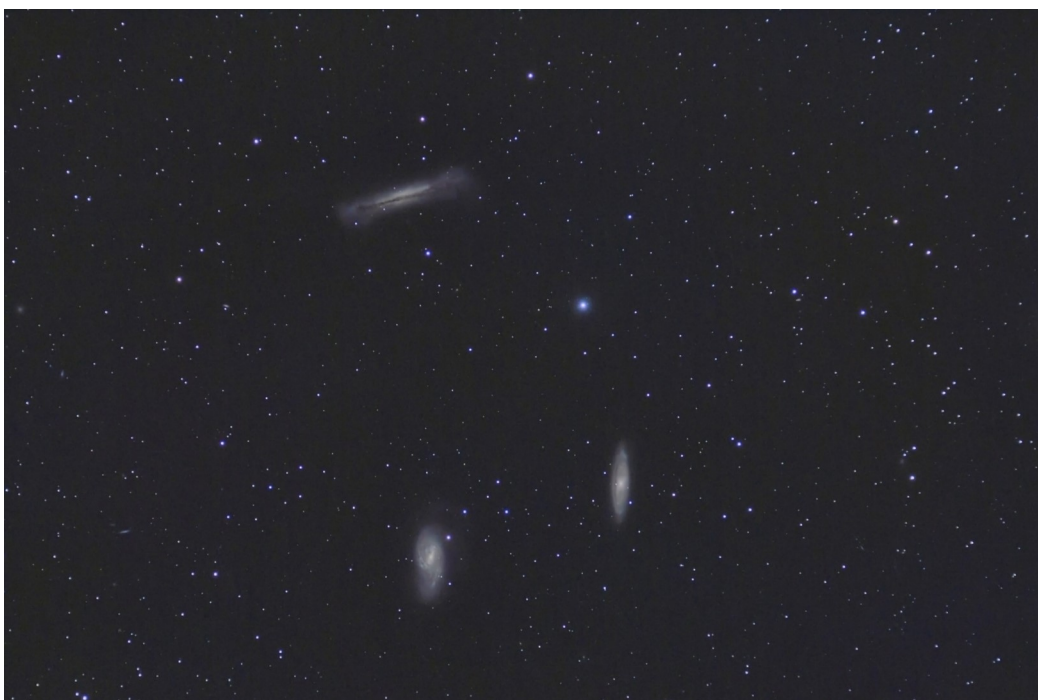
Back to Leo. I have now spent four spring seasons observing galaxies here (all of the Leo NGCs are galaxies). 2017 will be my fifth year exploring this most amazing constellation. Though Leo has its fair share of 14th mag. little troublemakers, there are so many bigger and brighter ones that during each session I can count on at least one gem, if not more. And they often come in twos, threes, fours, and mores. Some sessions I may only log six or seven objects, especially if they are all singles. Other nights I might grab fifteen, especially if there is a quintet. Some of the

galaxies require great finding skills. I generally use my Push-To computer to get into an area, then star hop (actually, galaxy hop) for the session. I may spend more time searching for a faint galaxy than observing it, but the brighter ones get plenty of my observing time. I have now located and recorded 205 of Leo's 363 galaxies. That's a little better than 50 per year on average, not that far from my original goal (last year was my most successful, seeing

around 80!). I even make time to go back and review some of them from time to time, and not just the five Messier objects. Leo is an amazing playground for a 12" scope!

And finally, how many of the 6,400 NGC objects available to me from Hallam have I observed so far? Would you believe 1,668? (as of January 1, 2017) That is a little better than 25% of them! Huzzah! It will be impossible to finish the project in my lifetime, but I like it that way. I will never run out of things to observe. Now you know what I am up to in the parking lot at Hallam on clear, moonless nights. You can follow my progress in more detail at <http://deepskyngc.blogspot.ca/> And don't be shy to stop by and take a peak at what I happen to be observing.

Footnote: For Messier of the Month, please see my March 2015 newsletter article on the Leo Triplet, including M65, M66 and NGC 3628.



Leo Triplet - M65, M66 and NGC 3628 by Pete Barbaro. Nikon D5100, Orion 110ED Refractor on CG5-GT. 39 frames at 150 seconds for a total exposure of 97 minutes, ISO 1600 and LPR filter.

February 2017 Meeting Minutes continued from page 3

last Saturday night. Steve then showed the following photos:

- a fisheye photo made by Mike Mastronardi of the sky over Hallam. Steve pointed out the constellations.
- a photo by Nancy Ng of the Winter constellations and one of Randy Groundwater with the constellation Orion over his scope. Steve Mastellotto showed his own close-up picture of Orion with many of its deep sky objects visible.
- There were also some fine close-up single frame photos by Starr Livingstone of the Horsehead Nebula and the Flame Tree Nebula in Orion taken through the AT111 refractor inside Hallam.
- Steve Mastellotto also had some amazing pictures of the Rosette Nebula and Comet 45P/Honda-Mrkos-Pajdušáková that he captured, stacked and processed right up against two beautiful NGC galaxies (the Whale and Hockey Stick galaxies).
- Starr imaged the penumbral eclipse
- Brian Simpson took some pretty nice images of double clusters in Perseus and the disk/phase of Venus.
- Starr also imaged the Leo Triplet of galaxies (M65, M66 and NGC 3628) with the AT111.
- Mitch Arsenault sent in an image of M82 taken with his 8"SCT.

Steve noted the following upcoming events:

- Spring constellations are starting to rise in the east after sunset
- Mercury will be lost until the end of March
- Venus is a beacon right now high in western sky but will disappear quickly over the next month reaching inferior conjunction on March 25th
- Mars and Uranus will have a conjunction on February 26th (less than ½ degree apart)
- Comet 2P/Encke relatively easy to see - magnitude 7 right now near circle of Pisces (takes 3.3 years to orbit sun). Second comet discovered to have a periodic orbit in 1818 by Johann Franz Encke. The comet was discovered by

Pierre Mechain, then 'rediscovered' by Messier, Caroline Herschel and Louis Pons and is the source of Taurid meteor shower. Best time to see the comet is right now and over the next week to 10 days before it dives into twilight as it is approaching perihelion.

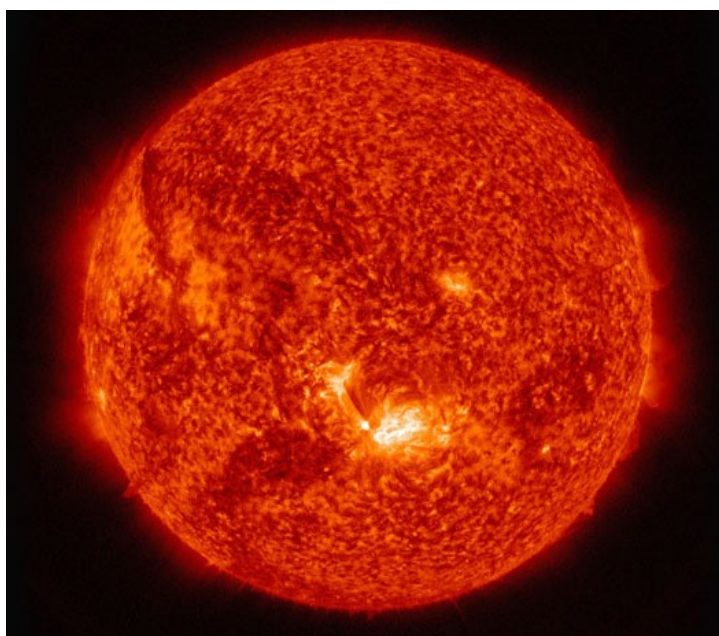
- Graze occultation near us (Toronto) for Aldebaran with the Moon, on Saturday March 4th. Aldebaran will blink on and off as it passes between mountains and craters along the limb of the moon. From Windsor we will see the star completely disappear behind the moon at 11:04 p.m. near the north pole of the moon. It will pop back out at 11:28 p.m..
- Daylight Savings Time begins on Sunday March 12 at 2:00 a.m.
- Spring Equinox will occur on Monday March 20th just before our next meeting

Steve also point out a web page that he uses for predicting when the space station is going to pass overhead or in front of the sun or moon from your location. It is also good for spotting Iridium flares. It provides very accurate time calculations for various sky events as well. The site is called CalSky.com. You need to input your home location to get all this good data.

Finally Steve pointed out that its the time of year to go out and look for Omega Centauri - the largest and brightest globular cluster visible from Earth. Steve went through how to see it and where to find it very low along the southern horizon using a couple of key stars to shown the way. He then showed a couple of images he has taken in the past of the cluster - a fantastic feat given that the object never climbs more than ½ a degree above the horizon.

Randy thanked Steve and mentioned he was glad that Steve brought up Omega Centauri cluster, Randy pointed out that Dan Taylor was the one who started up the whole challenge of hunting it down back in the mid-1980s.

Randy **adjourned the meeting at 9:55 p.m..**



SOLAR SLOWDOWN *The sun's surface rotates more slowly than its inner layers.*

Never underestimate the power of a little sunlight.

Light particles, or photons, emitted from the sun's surface, could explain a long-standing solar mystery — why the sun's outermost layers rotate more slowly than its core.

Because the sun isn't a solid ball, regions at different depths or latitudes rotate at different rates. For decades, scientists have wondered why the outer 5 percent of the sun revolves slower than inner regions. In the February 3rd Physical Review Letters, researchers from Brazil and the United States report that photons released from the sun's outer skin may be tapping the brakes.

Using data from NASA's Solar Dynamics Observatory satellite, scientists measured the rotation in the sun's limb, or outer edge. In a thin, 70-kilometer skin at the surface, the rotation rate drops by 2 percent — a result that could be explained by photons carrying angular momentum away from the sun, slowing it down bit by bit. Angular momentum is a property of a rotating body that keeps an object spinning unless another force acts on it — like a spinning ice skater gradually coming to a stop due to friction. Over time, the surface slowdown could cause the full outer 5 percent of the sun to lag behind, the scientists say.

Member Astrophotos



Top Left: M42 The Orion Nebula by Barbara Arsenault through Mitch's Celestron 8" at F6.3, just 2 x 60 second exposures with a Canon T3ia, ISO 800. Processed using Deep Sky Stacker.

Top Right: The Rosette nebula – NGC 2237 nebula and NGC 2244 the open cluster by Steve Mastellotto taken at Hallam with his Astrotech 65mm f/6.5 telescope - 420mm focal length, Canon 6D at ISO 1600. This is a combination of 40 x 2 minute exposures.

Middle Right: Comet 45P/Honda-Mrkos-Pajdušáková by Steve Mastellotto taken at Hallam with his Astrotech 65mm f/6.5 telescope - 420mm focal length, Canon 6D at ISO 1600. This is a combination of 20 x 1 minute exposures. The brighter galaxy is NGC 4631 and its tiny companion NGC 4627 are known as the Whale and the Calf. The other galaxy next to the comet's nucleus is NGC 4656 and has a bend on the end and is sometimes called the Hockey Stick or Crowbar galaxy.

Bottom Right: The Moon by Brian Simpson was captured from his home in LaSalle using his Nikon camera and 200 - 500 mm Nikon lens.

