

# Event Horizon

**Volume 23, Number 5**  
**March 2016**



## From The Editor

Welcome to another fine edition of the Event Horizon!

As the Spring Equinox approaches, warmer weather is not that far away.

Thanks once again to all who have contributed articles, features and photos.

This is just a reminder that the Event Horizon is *your* newsletter, and all your contributions are greatly appreciated.

Clear Skies!

*Bob Christmas, Editor*

*editor 'AT' [amateurastronomy.org](http://amateurastronomy.org)*



## Chair's Report by Bernie Venasse

So... the skies are finally clearing and you grab your scope and head out to your favorite site, set up, greet all your buddies who have also shown up and then begin to decide what to look at. Chances are that you are going to look at the same beautiful objects that you looked at last time out... and the time before that ... and the time before that too. There is nothing wrong with visiting your favorites. We all do it. Why not change it up a bit and experience the wonder of discovery again by finding and identifying a new-to-you object. But which new object?

There are dozens of viewing lists to choose from coming from dozens of sources. Conquering these lists is the goal but the benefit comes by way of improving your viewing prowess, your recording technique and developing the patience to stay at the eyepiece for 20 minutes even when your target is not visible on the chance that it will 'pop out' of the dark and into view for a fleeting moment.... Long enough to log it in your notebook! You do keep a notebook, don't you?

There are many tools that can be used for planning whether it is the Messier list of objects or an elaborate *(Continued on [page 2](#))*

## IN THIS ISSUE:

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## Chair's Report (continued)

award program. Perhaps your goal is to view all the Herschel objects or all the double stars (2500) listed in the Cambridge Double Star Atlas or the Astronomical League's Lunar program or the challenges set out in the current months issue of your favorite astro magazine.

The Sky this Month by Matthew Mannering is a very good planning tool. It also serves as a challenge to observers. Planning gives you time to appreciate the objects and perhaps do a little sketching or note-taking. I personally plan for 4 or 5 objects then I let the scope wander and enjoy discovering new things! The greatest obvious award is the sense of accomplishment... the hidden award is the knowledge that you acquire.

I invite you to choose a list.

### Quick notes

... The club has several telescopes available for loan. Contact Jim to reserve your choice now!

... The Spring Scope Clinic is being held **Saturday, April 23 running from 1:00 to 6:00 PM** and is also an **OPEN HOUSE**. Interested members are invited to set up an information table to show the public, and other members, what it is that you enjoy about the hobby.

### HAA Helps Hamilton



To support our community, we will be collecting non-perishable food items and cash for local food banks at our general meetings. Please bring a non-perishable food item to the meeting or a donation of cash and help us help others.

Our donations go to [Hamilton Food Share](#), which delivers them to various food banks around the Hamilton area.

If you would like to help or have any questions about this initiative, please contact the H.A.A.

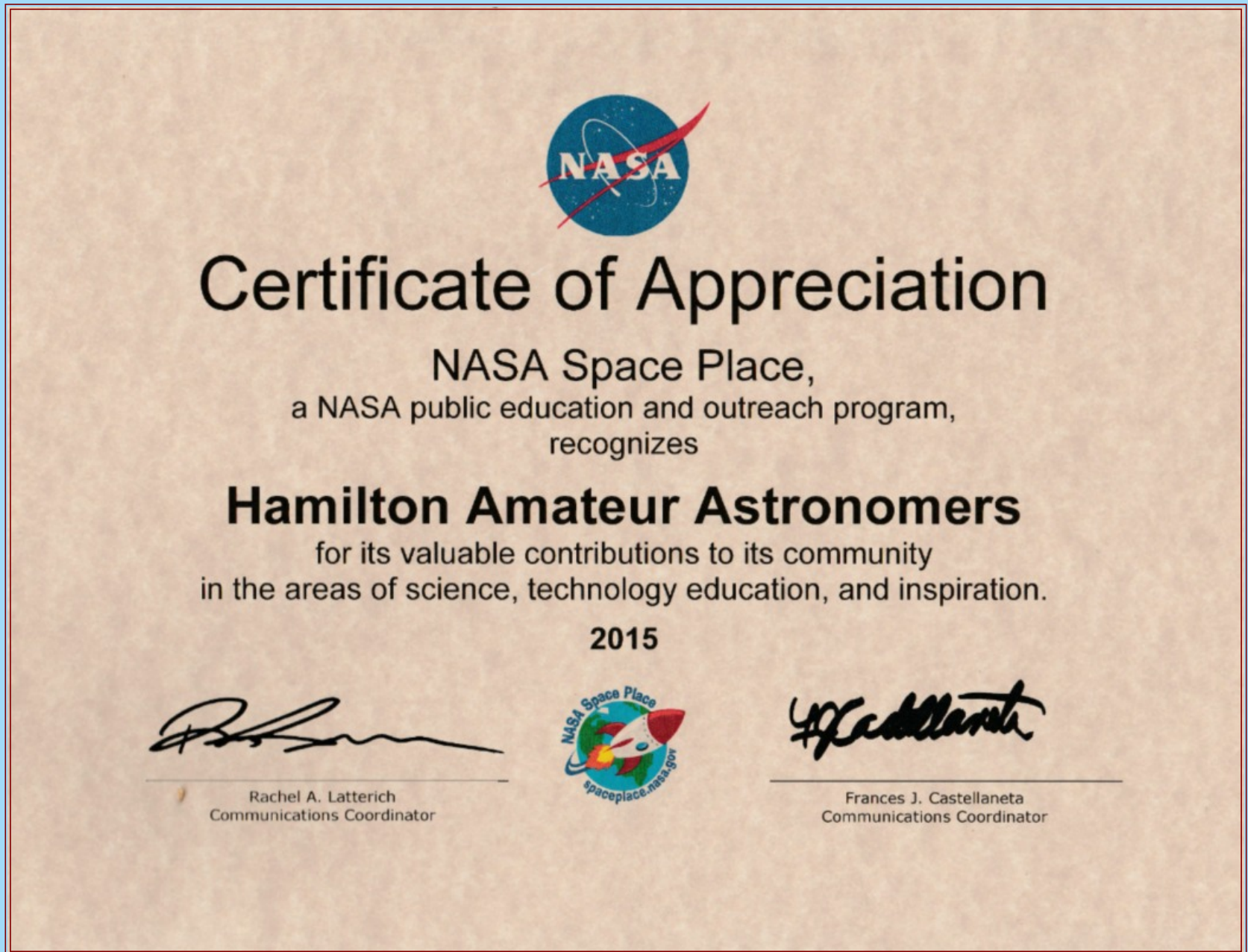
**Masthead Photo:** *The Waxing Gibbous Moon*, from October 2011, by Peter Wolsley.

Taken through an 8" Skywatcher Newtonian Dob with a SONY 12.1Mp compact digital SLR and a 25mm eyepiece. ISO 125 @ 1/125th second.

See Peter's article on beginner's astrophotography on Pages 10 thru 12.



## HAA's Outreach Recognized by NASA Again!



Once again, Hamilton Amateur Astronomers has been recognized by NASA's Space Place team.

Every edition of the Event Horizon includes the most current monthly Space Place column. The HAA is proud to be a continuing NASA Space Place Partner.

See this month's Space Place article on Pages 13 and 14.

You can also check out NASA's Space Place website at <http://spaceplace.nasa.gov/>.



## The Sky This Month for March 2016 by Matthew Mannering

This month looks to be very busy and includes five double shadow transits on Jupiter. Make sure you check out the “Planets” and “Events” sections at the end of the article. Two important days this month are March 13th which marks the beginning of Daylight Saving Time and March 20th the official start of spring.

This past month hasn’t presented many opportunities for observing, however I did manage to get out a couple of times with binoculars. I have been focusing my attention on Carbon Stars and as I mentioned, they are very red. A few weeks ago I got to see Hind’s Crimson star in Lepus and “W” Orionis. I was a little disappointed with Hind’s star as it was very dim, even in my 9x63 binoculars. The beautiful deep red of “W” made up for it though.

On Feb. 20th I was out at 11pm even though the Moon was almost full. It was one of the few clear evenings in weeks that wasn’t too cold. I went out specifically to see Comet Catalina, which was a few degrees from Kemble’s Cascade in the constellation of Camelopardalis. I found Kemble’s Cascade quickly even with the Moon glow. Finding the comet was a little more problematic. Using Sky Safari on my phone, I pinpointed the position of the comet. It was only a couple of degrees from NGC 1502 - the ‘hook’ at the end of the Cascade. Using averted vision allowed me to see the core of the comet but that was all. Considering the Moonlight overhead, I thought that the observation was a success. Catalina is fading now as it leaves the solar system.

March and early April are prime time for doing a **Messier Marathon**. You can download a copy of the Marathon sequence on our website under “Resources”. You’ll see that the Messier objects aren’t in numerical order. Instead, they are in the order you should observe them between nightfall and sunrise. Club members will be out several times during that period to give the Marathon a try. If the idea of doing the Messier objects doesn’t interest you, there are many other ways to do a Marathon. The March issue of *Astronomy* has a wonderful article listing 109 deep sky objects that don’t appear in the Messier or Caldwell lists. You could do a marathon of double stars, globulars, open clusters (see targets for this month) or planetary nebulae. If you are still finding your way around the sky, how about identifying some new constellations or learning the names of the brightest stars as they appear in the east as the night progresses.

A proper Marathon is done without electronics. In other words you need to be able to star hop to each target. People who are used to a computerized ‘GoTo’ scope find star hopping to be a very large obstacle. Consider setting a target of 5 star hop targets in an evening. Once you’ve found them, use your ‘GoTo’ and have some fun. For those with more experience, you can hone your observing skills by concentrating on star hopping to many targets in different constellations.

Another option is to have a Marathon buddy. One of you may be better at reading star charts and finding the constellation in the sky. The other may be better at positioning the scope, selecting the correct eyepiece and achieving focus. Try taking turns reading the charts and using the scope. This way you will see more targets and learn from each other in the process.

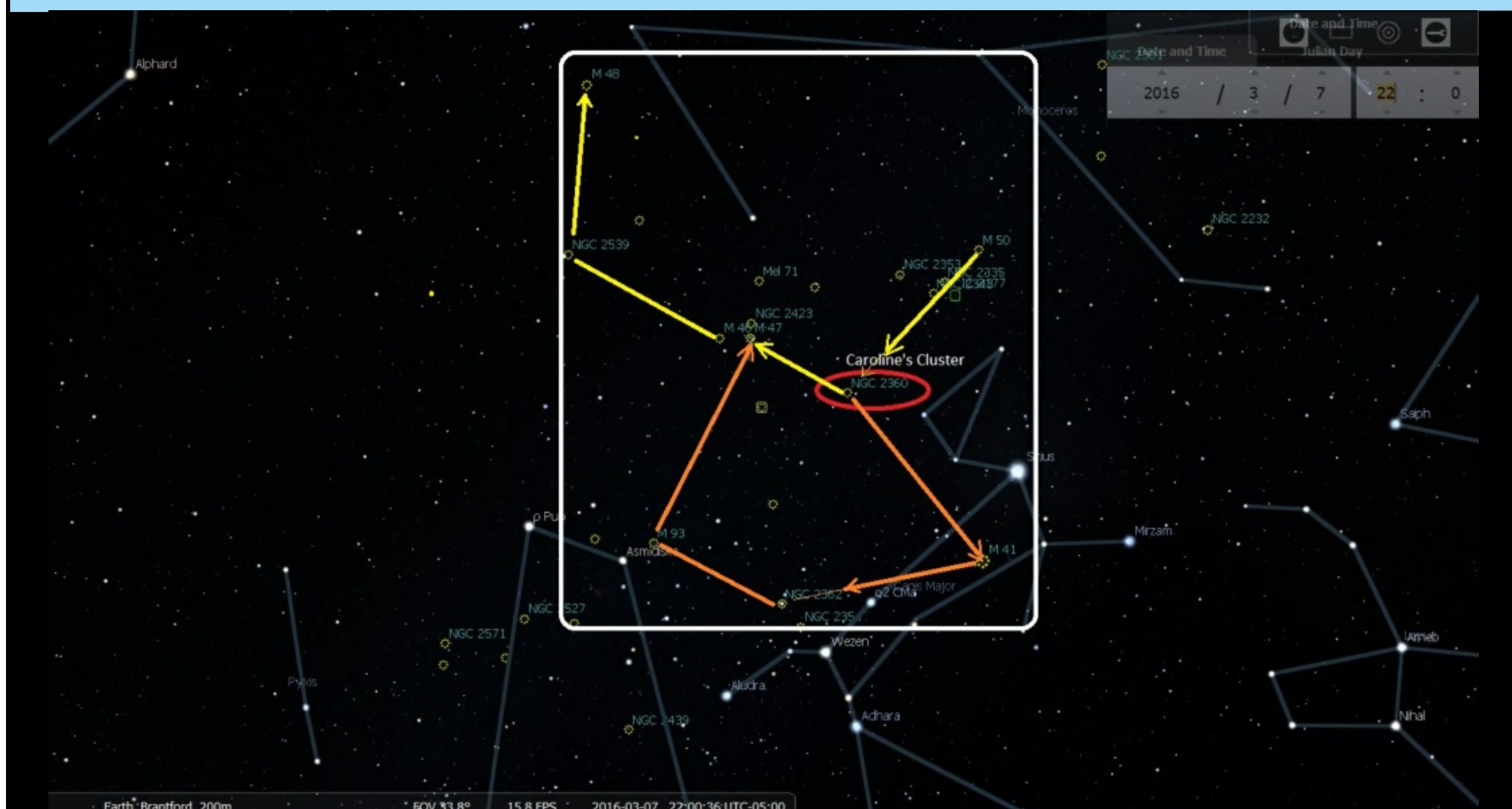
### Targets for March

This month we are going to observe in the area between *Canis Major*, northern *Puppis* and southern *Monoceros*. The targets this month are mostly open clusters with two nebulae and a carbon star thrown in for good measure. At the top of the next page is an overview of the observing area.

(Continued on [page 5](#))



## The Sky This Month (continued)



Hopefully you can see the yellow “northern route” and the orange “southern route” that I have drawn in. The northern route starts at **M50**, and **Caroline’s Cluster** is the jump off point for the southern route. The charts show the angular distance in degrees between targets. You can compare these angles to the field of view of your binoculars which is usually between 5 and 7 degrees. I encourage you to find all of the objects on your own charts. Notice how each open cluster is unique. Look at the patterns within the cluster and the colour of the stars. Older clusters tend to have more old orange/red stars scattered in amongst the younger blue/white stars. Good hunting!

Let’s start with the northern route in order:

(Continued on [page 6](#))

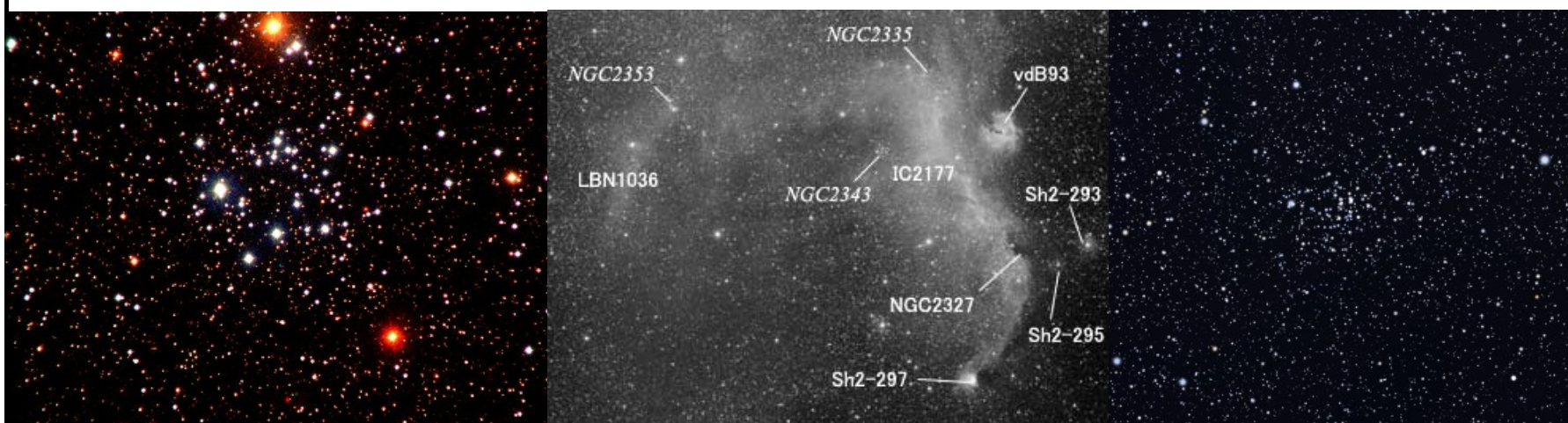




## The Sky This Month (continued)

- Open cluster **M50**.
- The **Seagull Nebula** is a compilation of many smaller objects. **IC 2177** is the ‘wings’ of the seagull. Use a UHC or H-Beta filter to bring out detail.
- **W Canis Majoris** is a very red carbon star.
- **NGC 2360** Caroline’s Cluster.
- Open cluster **M47**.
- Open cluster **M46**. Look for Planetary Nebula **NGC 2438**. Use a UHC or O3 filter.
- Take a right turn at the star 19 Puppis.
- Open cluster **M48**.

These are images of the targets, excluding the carbon star:



*M50 --- credit: Sven Kohle  
and Till Credner*

*IC 2177 --- credit: Naoyuki Kurita*

*NGC 2360, Caroline's Cluster  
credit: Roberto Mura*



*M47  
credit: NOAO-AURA-NSF*

*M46/NGC 2438  
credit: Anglo-Australian Observatory*

*M48  
credit: NOAO-AURA-NSF*

*(Continued on [page 7](#))*



## The Sky This Month (continued)

Now the southern route in order:



- NGC 2360 Caroline's Cluster.
- Open cluster M41.
- Open cluster NGC 2362.
- Open cluster M93.
- Back to open cluster M47.

(Continued on [page 8](#))



*M41*  
*credit: NOAO-AURA-NSF*

*NGC 2362*  
*no credit available*

*M93*  
*credit: NOAO-AURA-NSF*

## The Sky This Month (continued)

### The Moon

Libration this month is as follows: The Northern limb will be most exposed on the 15th, while the Southern limb will be most exposed on the 3rd and 30th. The Eastern limb will be most exposed on the 17th and the Western limb on the 4th.

### The Planets

*(Rise and set times are given for when the planet reaches 5 degrees above the horizon)*

- **Mercury** spends the month in close proximity to the Sun. It will start to appear in the evening sky in the west at the end of the month.
- **Venus** will be very low in the east just before sunrise all month.
- **Mars** rises just after 1am in Libra at the beginning of the month. By month's end it will have moved into Scorpius.
- **Jupiter** reaches opposition on the 8th. This means that it will be visible all night. Look for it to be about 2 degrees from the Moon on the evening of the 21st. The Great Red Spot seems to have regained its redness and should contrast nicely against the south equatorial belt.
- **Saturn** rises at 2:30am at the beginning of the month. On the 2nd, the Moon will be 3 degrees east just when Saturn rises.
- **Uranus** is now low in the west about an hour after sunset. Look for a nice pairing with a 2 day old Moon on the 10th at 8pm only 7 degrees above the horizon. By mid month it will disappear into the evening twilight.
- **Neptune** isn't visible this month.

### Events

- March 1st: — Last Quarter Moon.
- March 2nd: — The Moon and Saturn make a nice pair at 2:30am.
- March 4th: — See the start of a double shadow transit on Jupiter at 6:30am.
- March 7th: — The Moon 3.5% lit and 3 degrees from Venus at 6:30am.  
— Double shadow transit on Jupiter beginning at 7:30pm and ending just before 9pm.
- March 8th: — New Moon.  
— Jupiter at opposition.
- March 10th: — Nice pairing of the Moon and Uranus at 8:00pm.
- March 13th: — Daylight saving time begins.

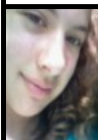
*(Continued on [page 9](#))*



## The Sky This Month (continued)

### Events (continued)

- March 14th: — Double shadow transit on Jupiter beginning at 10:22pm and ending at 00:35am.
- March 15th: — First Quarter Moon.
- March 20th: — Spring begins at 00:30am.
- March 21st: — The Moon and Jupiter make a nice pair in the evening.
- March 22nd: — Double shadow transit on Jupiter beginning at 00:23am and ending at 02:30am.
- March 23rd: — Full Moon.  
— Double shadow transit on Jupiter beginning at 7:37pm and ending at 9:00pm.
- March 25th: — Zodiacal light visible in the west after evening twilight for the next 2 weeks.
- March 29th: — Double shadow transit on Jupiter beginning at 3:00am and ending at 4:25am.
- March 31st: — Last Quarter Moon.



### Cartoon Corner by Alexandra Tekatch



**The Messier Marathon: an amateur astronomer's version of binge-watching**



## Beginner Astrophotography and Home Depot by Peter Wolsley

I bought my first telescope in 2011. It is an 8" Newtonian Dobsonian made by Skywatcher. I have had great fun looking at the Moon and Jupiter and trying my luck at finding a few Messier objects. For me, I quickly developed an irresistible urge to try and get a picture of what I saw. After researching on the Internet I decided that the easiest way to get a picture was to hold up a digital camera to my telescope's eyepiece. I also decided that I could probably invent some form of camera mount to get the job done. My first attempt took a lot of adjustments but did result in some great photos of the Moon. What I soon realized was that there are two important criteria to arriving at a workable solution:

- It needs to be light weight otherwise it messes up the counterbalancing of the telescope.
- It needs to have as few adjustments as possible because you need to be able to put it on and take it off of your telescope quickly and reliably... and in virtually complete darkness!

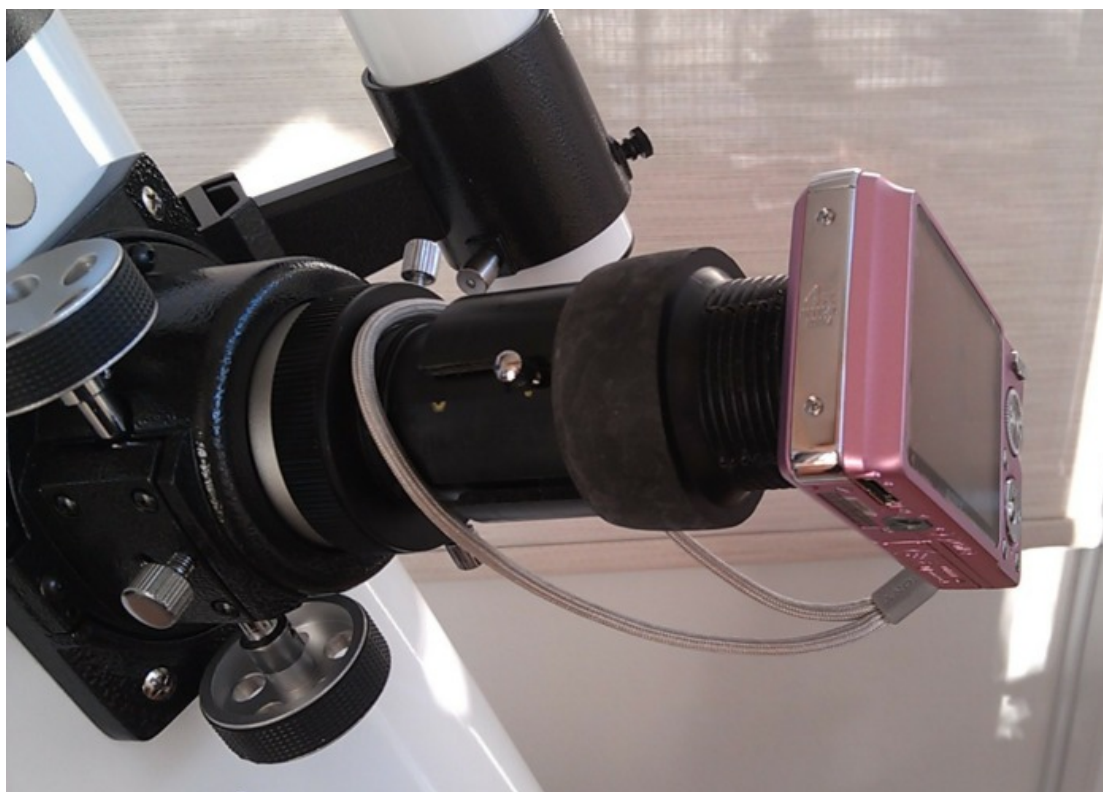
After wandering around my workshop thinking about how to do this, I came upon some plumbing fittings. Specifically some black plastic ABS fittings. I noticed that 1-1/2" ABS piping was remarkable close in inner diameter to the outer diameter of the eyepiece holder on my telescope. I decided to take my eyepiece holder and my compact digital SLR camera to Home Depot to do some "fieldwork". I eventually bought three pieces of black plastic ABS plumbing. A short length of 1-1/2" ABS pipe, a short length of 2" ABS pipe and most importantly a 1-1/2 x 1-1/4 In. ABS Male Adapter H x MIPT (Model: C5804112114 | Store SKU: 1000116189).



My compact SLR is a SONY 12.1Mp (Model DSC W210). The adapter (in the center) has been modified by taking a belt sander to its outer diameter (more on this later)...I also cut slots thru its threaded section to allow it to more easily slide over the camera lens. The small piece of 1-1/2" ABS pipe has also been modified to slide onto my eyepiece holder. The slots are spaced so that they give clearance for the eyepiece fixing screws.

*(Continued on [page 11](#))*





Here is what the assembled camera mount looks like. With some additional sanding of the inside of the threaded part of the adapter I was able to get it to slide onto the lens of my camera. I seat the camera lens fully into the adapter which then aligns the camera squarely with the telescopes optics. I also slip the wriststrap over the focuser tube to minimize accidents. When the camera times out, it will fully retract its lens into its body which will cause the camera to drop to the ground. The cinch is just tight enough to hold the camera firmly but will allow me to rotate the camera to compensate for the image flip inherent in the Newtonian

telescope. This is a great plus when using this set-up for terrestrial photography.

You can also see how the slots in the 1-1/2" pipe fit around the eyepiece fixing screws. I came up with these modifications by first inserting my 25mm eyepiece which is the longest I had. I then figured out how long the pipe needed to be by holding the adapter onto the eyepiece and guessing how far onto the screws I wanted the pipe to extend. Next I wrapped some masking tape around the outside of the pipe where I wanted to cut my slots. Using a pencil I marked where the screws were. I then marked out the slots and cut them out using my bandsaw. A jigsaw could also be used.

The end result is a camera adapter that is quick to assemble on the telescope. When pushed up tight it does a great job of aligning the camera to the telescope. I need to use virtually all of the camera's 4X optical zoom to overcome the vignetting that occurs when using my 10mm eyepiece.

### The next frontier...I bought a Barlow

I decided to add some accessories to my telescope so I bought an Antares 2X Barlow. After using the Barlow I immediately wanted to take photos using it. Luckily, I did not decide to glue together my camera adaptor. Once again I began to look at ABS plumbing fittings and saw that the outside diameter of 2" ABS pipe was virtually the same as the diameter of the eyepiece cinching wheel on my Barlow. I also



noticed that this was also close to the outside diameter of the adapter I was already using. I found that if you cut a short piece of 2" ABS pipe and then cut thru one side so that it becomes a split ring that you can spread it apart a little bit and it won't snap.

Here is what I came up with. I used a 25mm length of 2" ABS pipe and split it as shown in this photo. I found that I could spread the 2" ABS pipe far enough apart that it would fit over the adapter and also fit over the cinching wheel of the Barlow. The adapter was slightly larger in diameter than the Barlow cinching wheel so I came up with a novel way to take advantage of this. I used a belt sand-

*(Continued on [page 12](#))*

er to taper the outside diameter of the adapter. Near the camera end of the adapter I sanded off virtually no plastic. At the Barlow end I sanded until the diameter of the adapter was slightly less than the diameter of the Barlow cinching wheel. When assembled on the telescope the 2" ABS pipe split ring firmly grips the adapter. Because of the adapter's taper, the split ring also grips the Barlow cinching wheel. When pushed together, all of the mating surfaces ensure that the camera is aligned with the optical path of the telescope.

### The astrophotography learning curve and my thoughts so far

I have also been fiddling with using a webcam and it helped me to understand a problem I am having with my digital SLR. It turns out that most webcams and my very simple SONY SLR have an auto-exposure "feature" that must be conquered when trying to take photos of objects other than the moon. The auto-exposure algorithms used in these devices have been designed for terrestrial photography which never includes photos of small bright objects with a totally dark background. My SLR does have a "fireworks" mode but that still doesn't cut it. The end result is that the device dramatically over-exposes the bright object and you get a white blob. There are a few solutions to this problem and all of them result in cutting down the available light reaching the device.

1) Use my aperture cap to cut down the light. My aperture cap has a removable piece that effectively reduces the telescope's aperture from 200mm to 50mm. This initially seems wrong because I thought I wanted as much light gathering ability as I could afford. It turns out that my compact SLR camera has the eyesight of a night owl but not its wisdom when it comes to exposure settings. Artificially reducing the aperture in this way is free and may just solve the problem. Because it is a fixed reduction in aperture it is also a hit-or-miss solution. An aperture reduction of 200mm to 50mm is roughly a 15X reduction in luminance. If you try this you might also want to position the 50mm aperture so that it avoids the spider support for your secondary mirror. Suddenly you'll have a Newtonian telescope that doesn't exhibit diffraction spikes when viewing bright objects.

2) Buy a polarizing filter. I believe the next cheapest option for me is to purchase a polarizing filter. I don't know much about these yet except that they are adjustable from roughly 2X to 100X reduction in luminance. I like the fact that they are adjustable because they should allow me to optimize my camera's abilities to the object being photographed. I am going to look into purchasing a 2" polarizing filter which should cost less than \$100.

3) Use my Barlow lens. Now that I own a Barlow I now understand that a 2X barlow doubles the magnification of my telescope's eyepiece but also cuts down the luminance of the object by 4X. This "Good News-Bad News" scenario turns out to be a good thing for my SLR camera. My APO Barlow cost me roughly \$130Cdn.

4) Buy a better camera. My camera has very few manual settings. I feel that a camera with manual settings for exposure would be ideal for astrophotography. A camera such as this can be had for roughly \$200 to \$300. Who knows... maybe I'll drop and break my camera and have to go to Future Shop.

5) Lots of Magnification. This approach would be great but lots of magnification with a non-goto scope seems to be a recipe for frustration. The object would drift so fast in my field of view that photos would all exhibit motion blur. This approach also pushes against a lot of other limitations such as light pollution, "seeing" conditions and the maximum magnification that the telescope can realistically deliver. The solution here would be to get a goto telescope. That's a pretty expensive option and I think I should concentrate on learning the constellations and Messier objects... and buying the occasional lottery ticket.

*Editor's Note: Peter's moon image featured as this month's Masthead Photo was taken with his setup.*





### The Closest New Stars To Earth

By Ethan Siegel

When you think about the new stars forming in the Milky Way, you probably think of the giant star-forming regions like the Orion Nebula, containing thousands of new stars with light so bright it's visible to the naked eye. At over 400 parsecs (1,300 light years) distant, it's one of the most spectacular sights in the night sky, and the vast majority of the light from galaxies originates from nebulae like this one. But its great luminosity and relative proximity makes it easy to overlook the fact that there are a slew of much closer star-forming regions than the Orion Nebula; they're just much, much fainter.

If you get a collapsing molecular cloud many hundreds of thousands (or more) times the mass of our sun, you'll get a nebula like Orion. But if your cloud is only a few thousand times the sun's mass, it's going to be much fainter. In most instances, the clumps of matter within will grow slowly, the neutral matter will block more light than it reflects or emits, and only a tiny fraction of the stars that form—the most massive, brightest ones—will be visible at all. Between just 400 and 500 light years away are the closest such regions to Earth: the molecular clouds in the constellations of Chamaeleon and Corona Australis. Along with the

(Continued on [page 14](#))



*Image credit: NASA and ESA Hubble Space Telescope. Acknowledgements: Kevin Luhman (Pennsylvania State University), and Judy Schmidt, of the Chamaeleon cloud and a newly-forming star within it—HH 909A—emitting narrow streams of gas from its poles.*

Lupus molecular clouds (about 600 light years distant), these dark, light-blocking patches are virtually unknown to most sky watchers in the northern hemisphere, as they're all southern hemisphere objects.

In visible light, these clouds appear predominantly as dark patches, obscuring and reddening the light of background stars. In the infrared, though, the gas glows brilliantly as it forms new stars inside. Combined near-infrared and visible light observations, such as those taken by the Hubble Space Telescope, can reveal the structure of the clouds as well as the young stars inside. In the Chameleon cloud, for example, there are between 200 and 300 new stars, including over 100 X-ray sources (between the Chamaeleon I and II clouds), approximately 50 T-Tauri stars and just a couple of massive, B-class stars. There's a third dark, molecular cloud (Chamaeleon III) that has not yet formed any stars at all.

While the majority of new stars form in large molecular clouds, the closest new stars form in much smaller, more abundant ones. As we reach out to the most distant quasars and galaxies in the universe, remember that there are still star-forming mysteries to be solved right here in our own backyard.

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

Visit [spaceplace.nasa.gov](http://spaceplace.nasa.gov) to explore space and Earth science!







Full Moon through the Clouds, by Chris White



Solar Halo, by John Gauvreau



## Treasurer's Report by Steve Germann

### Treasurer's Report for February 2016 (unaudited)

Opening balance:	\$9,283.58
Revenue:	\$186.00
Expenses:	\$700.00
Closing Balance:	\$8,769.58

Revenue consisted of \$186, including memberships \$135, and 50/50 for \$51.

Expense this month is BASEF donation \$700 including \$500 bronze sponsorship and \$200 for the Jim Winger Memorial Prize.

Total calendar revenue all in is \$3,275.

## **The Scope Store at Camtech**

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- Public transit available directly to McMaster campus
- Tickets \$7 per person; private group bookings \$150
- Different shows every week
- Upcoming shows include:
  - **Mar 2: Introductory Astronomy for Kids (1<sup>st</sup> Wed of every month)**
  - **Mar 9: The Astrophysics of Everyday Life**
  - **Mar 16: Dammit Jim, I'm an astronomer!**
  - **Mar 23: The Celestial Bear:  
The Six Nations' Night Sky**
  - **Mar 30: Cosmic Corpses: Nebulae,  
Neutron Stars and Black Holes**
- For more details, visit  
[www.physics.mcmaster.ca/planetarium](http://www.physics.mcmaster.ca/planetarium)

## UPCOMING EVENTS

**March 11, 2016 - 7:30 pm** — *HAA Meeting* at the Hamilton Spectator Auditorium.

**March 19, 2016 - 7:30 pm - 11:00 pm** — *Public Stargazing Night* at the Niagara Gateway Tourism Centre, Grimsby, ON.

**April 8, 2016 - 7:30 pm** — *HAA Meeting* at the Hamilton Spectator Auditorium.

### 2015-2016 Council

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Observing site for the HAA provided with the generous support of the

#### **Binbrook Conservation Area**

Come observing with the HAA and see what a great location this is for stargazing, a family day or an outdoor function.

Please consider purchasing a season's pass for \$79 to help support the park.

<http://www.npca.ca/conservation-areas/binbrook/>  
905-692-3228

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