AURORA
The Royal Astronomical Society of Canada - Windsor Centre
Volume 39, No. 2
October 2013

Fireball by Matt McCall

Photo by Angela McClain on September 27, 2013 at Faith Ranch, Jewett, Ohio.

Comets entering the inner Solar System aren't the only objects attracting attention from people gazing skyward. As ISON draws the more dedicated observers who expected a brighter apparition and with a new comet Lovejoy (his fourth) incoming even earlier in November another brighter type of object has been seen passing through the sky.

Meteor showers occur quite frequently and sporadic shooting stars even more so, but it is exceedingly rare when something entering the atmosphere is bright enough to light up the ground at your feet. Yet this is exactly what happened at 11:33 p.m. on September 27, above the heads of thousands of people throughout the north-central Ohio, Indiana and Michigan. Members from our Centre witnessed this event from Hallam Observatory just south of Comber and two of them gave detailed observing reports.

Mike Ethier's: Deb (Ethier) and I were breaking down our scopes. Matt was with us. Matt and Deb were facing north and I was facing south. Very suddenly an extremely fast meteor caught my attention, streaking low through Capricornus, heading to the southwest. Within a second of noting it, it exploded into a green flash brighter than any meteor I have ever seen, much brighter than a full moon. My retina retained the blinding image and streak for about 10 seconds afterwards. Deb and Matt saw the shadow cast by the flash, turning quickly to catch the very end of the meteor. Later, they both said that they thought for a moment that a car had come around the barn behind them with full headlights on!

Pete Barbaro also provided great observations of the fireball: I did see the final stages of the flash, where I saw a green-golden yellow tone brighter than Venus, with white streaks and what appeared as lit-up dust trails or smoke. No sound was heard… approximately fifteen to twenty degrees in length and coming down approximately at a thirty degree angle.

Before writing this article, I learned some unique info from other members who've seen extremely bright meteors in the past. Steve Mastellotto agreed with Mike's initial idea that it may have been space debris/junk, owing to a green colour he also once observed in a meteor. Fireballs have fallen a lot throughout the U.S. in September. It would be intriguing to ascertain whether a fair amount of them have been caused by man-made orbiting satellites and other similar objects. Long-tailed streaks such as this are more common during certain meteor shower peaks, but just one that's bright enough is an excellent way to raise interest in astronomy!

In This Issue

Calendar of Events

Our next meeting…

Tuesday November 19, 2013
7:30 p.m.
at
Ojibway Park Nature Centre
5200 Matchette Road

Main Speaker…

Annual Meeting

Topic…

Short Talk: Tom Sobocan

Activities...

Full Moon/Penumbral Lunar Eclipse: The Hunter's Moon on Friday October 18th will be in a penumbral eclipse as it rises at sunset.

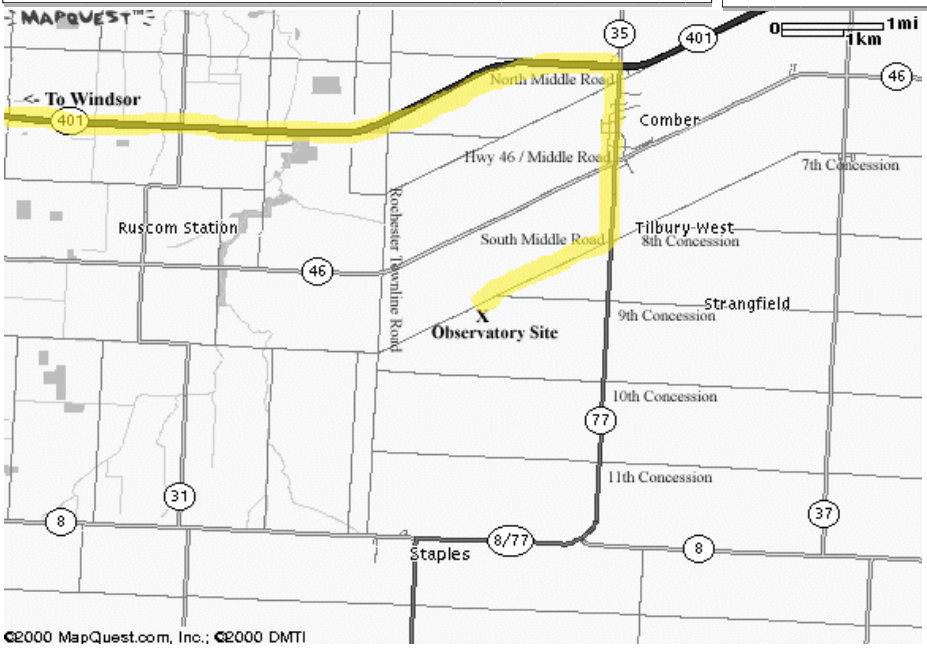
Jupiter Shadow Transit: A double-shadow transit occurs on the morning of **October 19th** from 2:25 - 4:27 a.m.. See the Observer's Handbook for many Jupiter shadow events over the next couple of months.

The ***Orionid Meteor Shower*** peaks in strong moonlight on October 20th. ***Leonids*** peak on November 17th.

Venus is at greatest elongation East (47 deg.) on Friday November 1st.

Daylight Savings Time: Ends on Sunday November 3rd.

Open House Night at Hallam: The next open house night at Hallam is on Saturday November 9th at 7:00 p.m..



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.

September 2013 Meeting Minutes by Matt McCall

The monthly meeting of The Royal Astronomical Society of Canada - Windsor Centre was held at the Ojibway Park Nature Centre on September 17, 2013.

Windsor Centre **President Rick Marion** chaired the Meeting. Rick called the meeting to order at 7:36 p.m. and welcomed members and guests to the Ojibway Nature Centre.

Motion to accept the minutes of the June 2013 meeting was made by Brian Thomas, seconded by Greg Mockler. **MOTION CARRIED.**

Main Speaker

Rick introduced the main speaker for the evening, **Dr. Pierre Boulos**, and his talk: "**How Flattening the Earth Helped Vindicate Newton's Theory"**.

Pierre began by saying he hoped it to be the last in a series of talks he's worked on. He thinks his project's coming to an end after taking him twenty-three years of research. He also quipped how the title may seem a little weird, saying he often tells people that the Earth is flat; because everywhere he walks, in a very real sense, the Earth is flat. He then claimed he'd show everyone how this may go against our intuition we received from Isaac Newton.

He invited the audience to talk amongst themselves – if they would consider if one could determine whether or not the Earth was round – without having the ability to launch a spacecraft and take photographs. How could you prove if it was round? About two full minutes of quiet discussion within the audience followed. Pierre then asked them if they could now provide an answer. Joady Ulrich was the first to respond by saying that you could see the shadow of the Earth on the Moon. An audience member said one can look at shadows of objects on Earth and measure their length, as shadow lengths differ from place to place on Earth. Steve Mastellotto mentioned watching a ship dip below the horizon – with the mast still only just visible as it goes. Pierre remarked that at least that proves the Earth's not flat. Another stated if you sailed a boat all the way around the Earth from one point, you would eventually reach this same spot again – provided you could avoid any obstruction. Pierre added another by saying you could place multiple sticks of the same height miles apart to measure shadow length. Tom Sobocan suggested climbing the highest mountain to obtain the highest view towards the horizon and you could make out the curvature of our planet. With these ideas in mind, Pierre then moved into the heart of his report.

Isaac Newton's most famous book – if not the most important ever written in the history of science – was the 'Principia'. First published in 1687, Edmund Halley put up 500 pounds of his own money to finance it since nobody else would, due to the expense of publishing back then. It underwent two revisions with the final third edition appearing in 1726, just a year before Newton's death. Pierre said he would argue that it is also one of the greatest philosophical works ever, a book of natural philosophy, as well as a scientific one.

Moving on, he spoke of the 'lunar problem' that had caused Newton to claim on his deathbed that the Moon was his biggest failure; having been able to account for only half of its perturbations. In actual fact, there is no heavenly body that sweeps out a full ellipse. The Moon is perturbed as it orbits, as the axis that defines the ellipse, moves. Newton's theory was challenged by Geodesy, Perturbation theory, and the return of Halley's Comet.

Newton argued that the rotation of the Earth about its axis should cause it to bulge at the equator and be flattened at the poles. He claimed that we must look to the measurements of the pendulum to understand. Earth's diameter at the equator is 42.72km more than at the poles, meaning it has an equatorial bulge that's not huge, but it is noticeably there.

His ideal of empirical success as exemplified in his deductions from phenomena informs us of the transition from natural philosophy to natural science. The publishing of the Principia certainly can mark this transition from the former to the latter.

All proofs in Principia are geometry-based, so for the modern reader, it's a nightmare to understand; one of the hardest books one could ever read.

Rick **thanked Pierre for his excellent presentation** and announced the break.

Break and Fifty-fifty draw: Tom Bondy won, donated winnings back to the Centre.

Announcements for upcoming events were made:

- Next Hallam Observatory Open House is Saturday, October 12, opening at 7:30 p.m..
- Next Meeting is on Tuesday, October 15, starting at 7:30p.m.
- Next Council Meeting will be held at Steve Mastellotto's house on Tuesday, October 8. The meeting will begin at 7:30 p.m..

Dave Panton gave a short talk about the things that have been going on out at **Hallam Observatory** over the past few months. Having recently been there in more frequent trips, he's still been able to help take care of various issues that have arisen from time to time, despite no longer being director of Hallam.

We've had a real big problem with mice entering under the screen and steel doors into the warm room. Droppings have been found in various places, with two nests having been located and removed. Susan Sawyer-Beaulieu had a good idea of setting up sonic mouse trap devices that emit a high frequency sound that's inaudible to humans but permanently drives the mice away unless we disconnect it and they choose to one day return in a different season.

The Celestron 14 telescope had been in need of cleaning for quite some time, and this task was also performed by Dave and completed.

(Continued on page 5)

At The Eyepiece: A Large Galaxy and a Rich Star Cluster by Mike Ethier

On the border between Cepheus and Cygnus, way up near 60 degrees north declination and lying in an almost barren part of the heavens for deep sky objects, lie two wondrous sights for the viewer with a large telescope. Although the objects can be located in good skies with a 6" mirror, it will take an 8" to begin to show their secrets. My own recent observations with my 12" scope left me amazed at their beauty and the wealth of detail that they show. This pair of objects would look great in the club's own 14" scope!

NGC 6946 is a large spiral galaxy sitting on the border between the two constellations. It measures a whopping 11'.9 x 9'.8, and has a visual magnitude of 8.8. However, its surface brightness is a challenging mag. 13.8. Now known to be about 22 million light years away, it was once thought to be part of our local group. Nine supernovae have been catalogued in this galaxy, which appears in many lists of finest NGC objects (including the RASC's).

With 6" and low power, a large, indistinct hazy patch can be seen. At 8" it becomes larger and marginally brighter, still seen best using averted vision. However, using 12" of aperture and 60x, the galaxy is bright and becoming very large. It is oval, and several faint stars are overlaid. 83x gave a wonderful view, where the full extent of the spiral galaxy could be seen, including its bright center. Nicknamed the "Fireworks" Galaxy, it takes a photograph to show this aspect, but the telescopic view will not disappoint. This is a showpiece object in a large scope. Over a dozen foreground stars were counted at 125X. This would be an even better object, but a large amount of interstellar dust lies in its path.

Appearing in the same low power field is a real treasure within our own galaxy, an open cluster. Situated firmly within the borders of Cepheus, a very short hop (less than 1 degree) leads to NGC 6939. It's size is 10', with an overall magnitude of 7.8. However, the brightest cluster member is mag. 11.9. In a 6" scope the cluster looks a lot like NGC 6946, especially at low power. Half a dozen stars resolve eventually, but focussing on their dim light makes this a real challenge. At 8" of aperture, low power shows mostly haze with very few stars resolved. Resolution improves over 100x, but the cluster is still a challenge. With 12" things improve dramatically, and the cluster is rich and beautiful beyond words. Over 300 stars are listed as being within the group. At 60x it is already impossible to accurately count them, and views and resolution improve all the way up to 150x.

These two objects can still be seen well into autumn, and are worth the trek. If you haven't been out to the clubhouse to look through our large reflector, this may give you a reason to head out some night soon. Located near Eta Cepheus, any good star map will show their precise location. Seeing such a large galaxy and a rich open cluster in the same field of view makes for a very memorable viewing experience. Next time I'll tell you about some others.

September Meeting Minutes (continued)

(Continued from page 3)

Art Rae then made an announcement regarding a 6-inch coated mirror that's being given away; and a secondary mirror as well, having belonged to a friend who never got around to building his own telescope. He asked the audience to please see him at the end of the meeting if interested.

Derry Ross from the Warren Astronomical Society in Michigan returned to visit our Centre and was given the floor to speak about a small telescope he brought and had set up on display at the side of the room. He'd used it to observe in Cancer, which contains many faint stars. Mr. Ross has been making the most of his astronomy hobby with it in Royal Oak, Michigan, viewing objects through some of the worst skies in the Detroit-Windsor area. In November, he said he would like to ship this telescope up to the RASC Montreal Centre to have it presented to them because he was inspired by the photo on the cover of that Centre's Observer's Handbook.

Director of Observing Report, Matt McCall: The talk began by reviewing a few sky events that transpired recently. Matt showed an image of Nova Delphinus 2013, the nova that appeared in mid-August in the constellation Delphinus.

- Venus is closing within 4° of Saturn low in the west by sunset over the next two nights.
- A very nice pair of double stars – Gamma Delphinus and Struve 2725 should make a good target while trying to view the Nova.
- Sept. 20 - Oct.1 – Comet ISON will pass through Cancer into Leo the Lion, visible during early morning hours.
- Oct. 14 - 17 – ISON will be fairly close above Regulus in Leo. The comet has not brightened to the magnitudes most scientists expected, but Matt predicted that, if it survives perihelion passage – it could likely develop a better tail as many as ten days after, and perhaps even last as a rather faint naked-eye object for weeks through December. One wonders if the nucleus may break in two pieces after passing the Sun – 'would one be called 'Is' and the other fragment 'On'? He also expressed optimism for the latest Comet Lovejoy as it could make another decent addition to the skies before sunrise.
- Oct. 12 – Very rare Galilean moon event: Triple shadow transit on Jupiter begins at 12:32a.m.

The meeting was **adjourned at 9:45 p.m.**.

Hallam Happenings

A reminder that the Hallam Observatory annual access fee of $40 is due on October 1st so please see our Treasurer Greg Mockler at the October meeting. If you no longer wish to use the observatory please turn in your key to Steve Mastellotto.

Proposed 2014 Council of the RASC - Windsor Centre

Elected Officers

President	Rick Marion
1st Vice-President	Brian Thomas
2nd Vice-President	Mike Mastronardi
Secretary	Matt McCall
Treasurer	Greg Mockler
National Council Rep.	Mike Mastronardi

Councilors

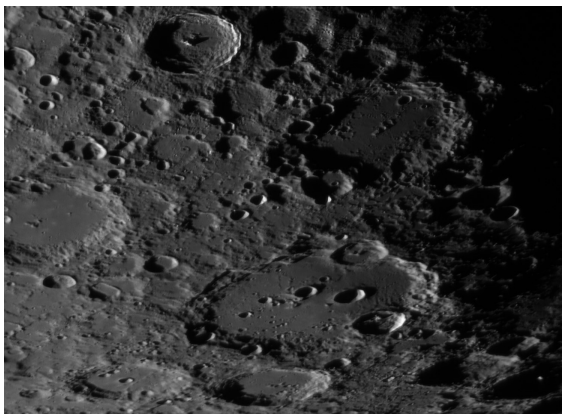
Dr. Pierre Boulos	Randy Groundwater
Steve Mastellotto	Steve Pellarin
Dave Panton	Dr. Susan Sawyer-Beaulieu
Dan Taylor	C. Joady Ulrich

Appointed Officers

Honorary President	Dr. William Baylis
Past-President	Paul Pratt
Librarian	Dr. Pierre Boulos
Recording Secretary	Matt McCall
Public Education Director	Matt McCall
Public Relations Director	Mike Mastronardi
Directors of Observing	Juliana Grigorescu
	Steve Mastellotto
	Steve Pellarin
Light Pollution Abatement Dir.	Dan Taylor
Hallam Observatory Director	**Open Position**
Aurora Editor	Steve Mastellotto
Webmaster	Steve Mastellotto

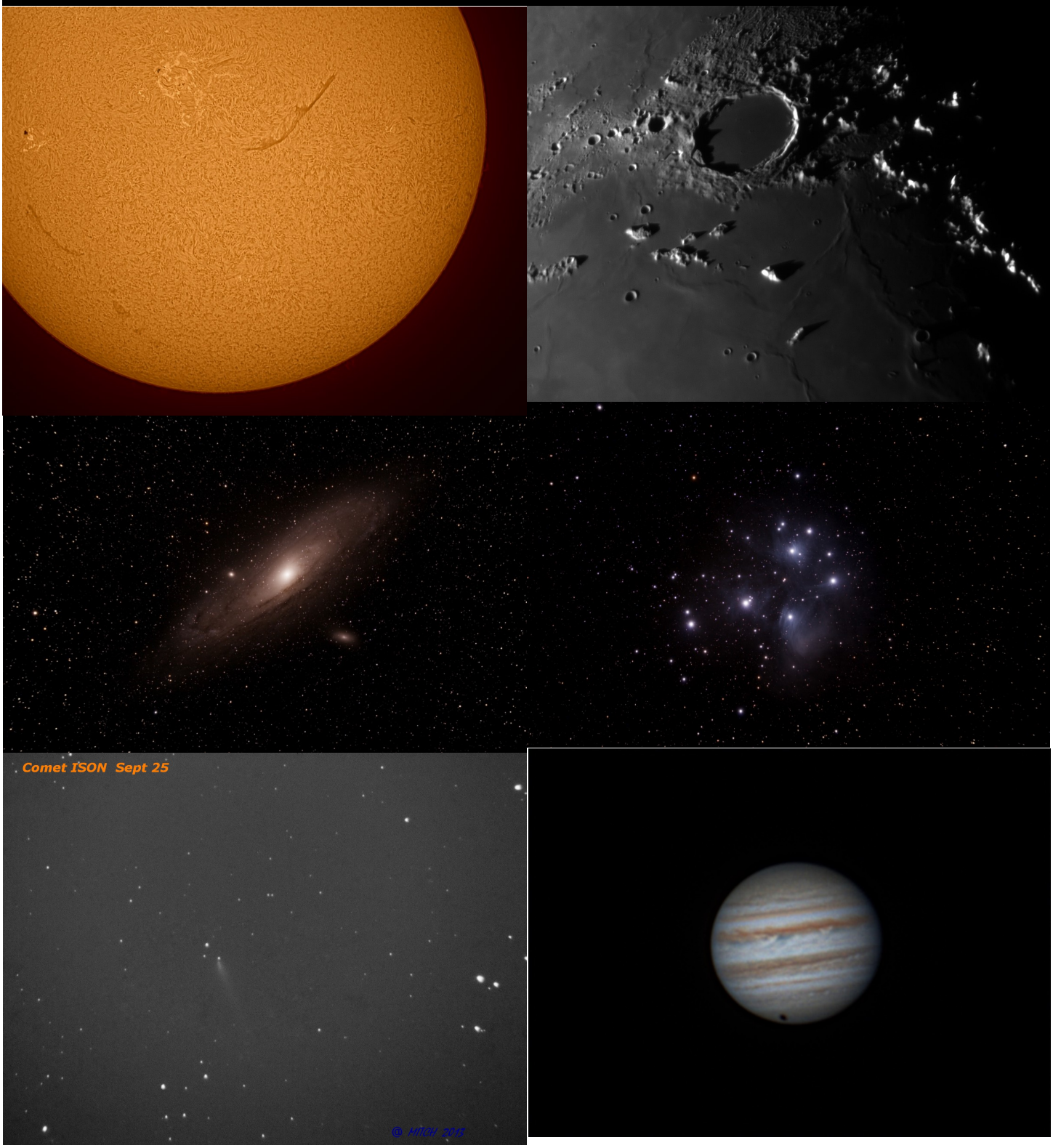
Calendars

Our Treasurer, Greg Mockler is taking orders for the 2014 Calendar. Price will be $17.50 including S&H and HST if gets over 10 orders. Please see Greg at the October meeting.



Clavius by Steve Mastellotto through the C-14 at Hallam using his ZWO ASI 120MM video camera. Best 125 of 1,000 frames.

Member Astrophotos



Clockwise from Top Left: ***Sun in H-alpha*** *light by Steve Mastellotto on September 26 using a Lunt 60 solar scope with ZWO ASI 120MM video camera (best 125 frames of 1,000);* ***Plato*** *by Steve Mastellotto on September 27 using the C-14 at Hallam with ZWO ASI 120MM video camera (best 125 frames of 1,000);* ***Pleiades (M45)*** *by Brian Thomas using his modified Canon 5D on Explore Scientific 80mm APO f/6 and 2" Astro-Tech field flattener, 2 hours total exposure, ISO 800, processed with Images Plus;* ***Jupiter and Callisto's shadow*** *by Pete Parbaro on September 25 using his C-8 and DBK21 video camera;* ***Comet ISON*** *by Mitch Arsenault on September 25 using his C-8 f/6.4 on AVX mount, guided with SSAG,* 8 x 60 second exposures; ***The Andromeda Galaxy (M31)*** *by Brian Thomas using his modified Canon 5D on Explore Scientific 80mm APO f/6 and 2" Astro-Tech field flattener, 2 hours total exposure, ISO 200, processed with Images Plus..*