

AURORA



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The Royal Astronomical Society of Canada - Windsor Centre

September 2011

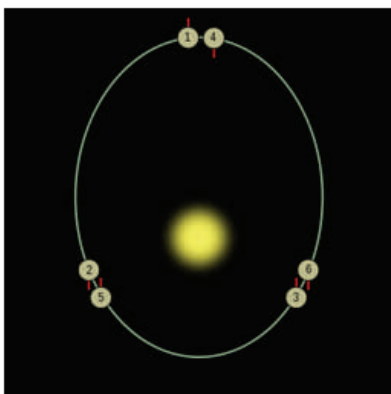
Mercury by Juliana Grigorescu

Mercury is the fastest moving planet in our Solar System and is the nearest planet to the Sun. The average distance is 0.38 AU (1 AU = 150 mil km). Mercury has a very elliptical (oval-shaped) orbit. At perihelion (closest to the Sun) it is about 46 million km from the Sun, but at aphelion (farthest from the Sun) it is 70 million km. The sun's rays are approximately seven times as strong on Mercury as they are on the Earth. The sun also appears about 2 1/2 times larger in Mercury's sky as in the Earth's.

It is only 4,878 km across and is not much larger than our moon. Its surface temperature ranges from -170 degrees Celsius at night to 350 degrees in the day. That difference in temperature should harden the rocks. However the surface still looks very much cratered, witness of an early heavy bombardment. Mercury's surface looks like a wrinkled apple, because of the contraction of the planet. The surface of Mercury consists of cratered terrain, smooth plains and many deep craters similar to those on the moon. The largest feature on Mercury is the Caloris Basin with a diameter of 1,300 km.

Mercury has a large iron core which is most likely at least partially molten and generates a magnetic field about 1% as strong as that of Earth's. On top of the core there is the mantle and on top of the mantle a thin crust. The mantle seems to be very thin compared to the other terrestrial planets, for reasons that are not entirely understood.

Mercury is too small for its gravity to retain any significant atmosphere over long periods of time. The weak atmosphere contains hydrogen, helium, oxygen, sodium, calcium and potassium. Due to the heat of the planet, the very thin atmosphere is blasted off its surface by the solar wind and quickly escapes into space. Mercury's atmosphere is constantly being replenished. Despite the scouring temperature and because of the geometry of the planet some water should still be found at the Poles.



Time to Rotate (sidereal): 58.6 days, time for a complete orbit : 88 days. Mercury is locked in a **3 rot : 2 rev** resonance by the Sun. As a result of the planet's slow rotation on its axis and rapid movement around the sun, a day on Mercury lasts 176 Earth days (interval between one sunrise and the next) - see diagram at left.

After one orbit, Mercury has rotated 1.5 times, so after two complete orbits the same hemisphere is again illuminated.

Mercury was explored in three flybys by the Mariner 10 spacecraft in 1974 and 1975. Only 40% of the planet's surface was imaged by this mission. NASA mission named MESSENGER (Mercury Surface, Space ENvironment, GEOchemistry, and Ranging) reached Mercury in March 2011 and it is supposed to map the whole planet during a period of one Earth year. Keep checking the NASA site for updates!

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Calendar of Events

Our next meeting...

Tuesday October 18, 2011

7:30 p.m.

at

Ojibway Park Nature Centre

5200 Matchette Road

Main Speaker...

G.M. Ross

Warren Astronomical Society

Topic...

"The World of John Philoponos"

Activities...

Autumnal Equinox: Friday September 23rd at 5:05 a.m. EDT.

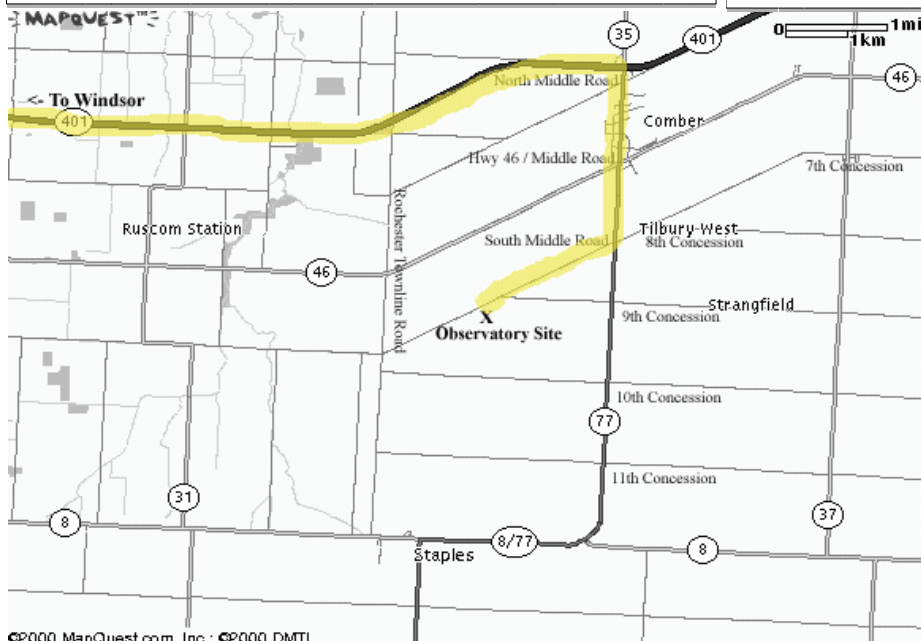
Aleksander Estate Winery Event: Saturday October 1 at 7:30 p.m.. See page 5 for details.

Open House Night at Hallam: The next open house night at Hallam is on Saturday October 1 at 7:30 p.m.. **Mars is within the Beehive cluster** in the morning sky.

Comet Elenin: Friday October 7th is at its best in the morning sky.

Draconid Meteor Shower: Peaks on Saturday October 8th with a possibility of an outburst.

Council Meeting: Tuesday October 11th at 7:30 p.m. at Randy Groundwater's house.



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 Towlane 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 K of C Maidstone Recreation 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. And optionally the RASC Journal 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.

June 2011 Meeting Minutes by Art Rae

The monthly meeting of The Royal Astronomical Society of Canada - Windsor Centre was held at the Maidstone Recreation Centre on June 21, 2011.

Windsor Centre President Paul Pratt chaired the Meeting. Paul called the Meeting to order at 7:35pm and welcomed members and guests.

Motion to accept the Minutes of the meeting of May 17, 2011, moved by Brian Thomas, seconded by Tina Chichkan. MOTION CARRIED.

Business Reports

Newsletter Editor, Steve Mastellotto: Requested reports, photos of any astronomical events attended or books of interest read for publication in the Aurora.

President, Paul Pratt: reported on the successful Windsor Centre annual picnic event held at the Hallam site. Good weather, good hamburgers and a bug free night made for a fine event.

Paul also provided updates for the upcoming Winery event scheduled for Saturday August 6, 2011.

Council Report: Paul Pratt announced a Pelee Island educational event Steve Pellarin will be doing this summer.

Also announced was that this will be the last Windsor Centre monthly meeting here in Maidstone. The meeting place will be moved to a new venue for the September meeting to be in the just completed **Ojibway Park Nature Centre** in Windsor.

Paul introduced the speaker for the night, Randy Groundwater.

40 Years of Highlights in Telescope Building by Randy Groundwater

Randy gave a brief history of his 40 years of telescope making and the different instruments he has constructed over that time period. Starting in 1969 at 14 years of age Randy saw his first view of a local home built astronomical telescope at a demonstration in the Budimir Library by Gary Druin of the Windsor Astronomy Klub, a 6" f8 reflector. After seeing that demonstration he tried to make his first telescope. The second try at it created a successful instrument, a 6" f4.1 reflector, what he considers, "The most satisfying I ever built". In 1974 his next project was a 10" f6 reflector.

The first view of a truss mounted telescope came in 1975 on a visit to the University of Michigan which left him with new ideas for a bigger instrument.

Over the years other local astronomy people helped him along in his hobby including his High School teacher who lived on Martin Lane in the present town of Lasalle offered the Astronomy "Klub" property on which to build a small observatory which was completed over the summer of 1974. Others included John Huschilt who led him to get his 10" primary mirror silvered and Joady Ulrich who had already constructed an 8" f7 reflector. After that Randy made his own observatory in his own South Windsor back yard, now a 12" instrument on an old hand built equatorial mount.

In 1980 a visit to "Mecca" for telescope building, the annual Stellafane starparty of August 8 to 10, gave him bigger ideas. By 1984 the next 10" instrument was created by him in Lasalle and that year he met large size instrument builder gurus like John Dobson. In 1987 Randy took note of the 20" f5 instrument of Dan Taylor. This telescope was the first to break the local big mirror barrier.

By 1993 he created a 10" Dobsonian for Starfest and in 1999 the first big Dob', an 18" F4.5 was finished. 2001 was the birth of the Hallam Observatory.

Randy then described briefly how to polish a telescope primary mirror then went into some details of the construction and materials needed to complete his latest Dobsonian instrument. This included information on the Dob' rocker box, mirror box and completed telescope.

The mathematics for construction were done on a single sheet of paper after consulting the book of Dob' making, "the bible", The Dobsonian Telescope by Kreige and Berry. This is recommended reading for anyone building such an instrument.

Further construction hints were discussed including the types of plywood needed: KYDEX tube matting materials and formica for bearing surface against teflon.

Randy brought along and demonstrated the top section of his telescope to show the construction and installation of the diagonal mount, telrad and finder scope. He anxiously awaits the newly silvered primary mirror within the week.

Randy took questions from the audience and finished with describing the advantages of Supramax primary mirror material for his latest Dobsonian.

Coffee Break and 50/50 draw won by Mike Mastronardi.

Director of Observing Report, Matt McCall: Matt gave a summer report of events to watch out for over the next three months. Events in June include a double shadow transit on Jupiter June 26th, Moon near the Pleiades and Mars June 28, Mercury in line with Castor and Pollux and NGC objects 6742, 6667, 5965 and M5 visible in the constellation Draco.

Asteroid Vesta is in Capricorn and the Dawn spacecraft will each it this year.

Other summer objects of note include M27 the Dumbbell nebula, M8 Lagoon nebula, M11 and M13 clusters and the Snake nebula. On July 10 Uranus is stationary.

The Wii program "My Planetarium" was demonstrated to show the locations of the M5 and M25 objects, the Delta Aquariids meteor shower radiant on July 31 and the path of Vesta in Aquarius.

Centre President Paul Pratt thanked Matt McCall and wished members to come out during the summer open houses at the Hallam Observatory.

The meeting was adjourned at 9:40pm.

Hallam Happenings by Dave Panton

Grass, lush green grass has been the scene all Summer at Hallam. Al DesRosiers was barely able to keep ahead of the heavy growth, a consequence of lots of rain and hot weather. Moe Trepianer cut the larger area with his huge mower while Al managed with some difficulty to keep the smaller areas looking nice. At the June picnic the whole area look almost park like. Those who came enjoyed the ambience of our Hallam site, friends, acquaintances and delicious food.

Since the heavy maintenance reported in last Hallam Happenings news we have had very little difficulty of any kind. The birds

have been blocked out, the dew heater works again and the battery donated by Al to run the dome shutter mechanism works fine as does the new slightly modified dome rotate system. The Bahtinov focus masks for the C14 and AT111 telescopes are used regularly as are the two light boxes to take those mysterious “flats” and “dark flats” needed to do a proper job of astroimaging for later stacking and computer processing. Brian Thomas has been making full use of the facility and obtaining impressive finished astroimages.

In the warm room our club projector has been permanently located on an adjustable bracket built to hang from the ceiling and set to lock it in altitude and azimuth. It will project large images on the screen hanging on the North wall. It is not yet operational, requiring a 110 volt outlet nearby and a long VGA cable to the computer. Al DesRosiers and Steve Mastellotto will handle these items in due course (cooler weather!).

Outside, the grounds have been used on most clear Moonless nights by members and visitors with portable telescopes of all types. On the deck others lounged and enjoyed the night sky simply by gazing up trying to catch a great meteor or with the aid of binoculars and sky maps search out details within the constellations.

Comet Garradd C/2009 P1 has slowly become binocular visible,

first observed in the C14 near the head of Pegasus earlier in the Summer. In September Messier object 101 featured a super nova, visible in the C14 telescope in spite of being located a little low in the Northwest horizon.

Light pollution, both glare and sky glow were a problem from the Genrep yard and the nearby Mortenson construction yard at highway 401 and 77. Cooperation was obtained thanks to efforts by Dave Gillespie and others making contact with both yards and the Town of Lakeshore building authorities. In both yards the lights were simply turned down to face the ground. The effect was im-

mediate and satisfactory in the temporary circumstances of both yards.

The potential for lighting problems from the three nearest wind turbines was solved again with cooperation, in this case by the Brookfield Comber Wind Turbine project people. These three units will remain unlit in the dark. Between these measures we have been fortunate. A letter of appreciation was sent to their Director of Wind Development, Mark Gursoy at their Gatineau Quebec headquarters.

Between Belle River Road, Tilbury, Highway 401 and Highway 8 seventy two wind turbines are under construction. Hallam is near the centre of the project and may be unique as an astronomical observatory in this situation. Our first concern was the observatory, resting in Essex County clay might be disturbed by the nearby (about thirty feet) passages of a very heavy crane. This fear proved

groundless and the telescope pointing accuracy is still excellent after the last of two trips.

Over the Summer “our” local wind turbines have been erected and even though their locations initially seemed to be worrying, their presence on our horizons is not as scary as feared. None are as yet connected to the grid and generating power so we may have more to learn. They are expected to be on line by the end of November.



SOLAR ADVANCE & SCIENCE

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Chatham, Ontario, Canada
Phone Toll Free 1-855-354-9905
Local 519-354-9905



Having just returned from Starfest 2011 in Mount Forrest it's a perfect opportunity to publish something in the newsletters to highlight Solar Advance to the many people we were fortunate enough to meet at the tent and also during some excellent viewing opportunities

Perhaps you've met Ray Cofell and Andy Deane at one of the *RASC* monthly meetings, the Hallam Observatory for an open house night or for some casual viewing on many of the clear nights we've had to enjoy viewing. Ray and Andy have been involved in astronomy for quite some time and about 1 year ago decided to commit to opening a store specializing in astronomy and science related items.

Solar Advance & Science is located in Chatham, a casual 1 hour drive from Windsor, London and Sarnia. For items stocked, it's hard to be beat!

Astro-tech, Baader, Celestron, Coronado, Daystar, Explore Scientific, Farpoint, iOptron, Kendrick, Meade, Orion, Sky Watcher, Vixen, William Optics are all on display with equally as many accessories.

Telescopes and mounts, binoculars, eyepieces, astrophotography equipment, spotting scopes, software, microscopes, metal detecting equipment and accessories.

Finally a local source for those stock items or a resource to get what you need ordered and available for local pickup.

For more insights and information, visit the Solar Advance website at <http://www.solaradvance.ca> and take the time to register so **Solar Advance & Science** can keep you in the loop of what's new and exciting

Solar Advance & Science is growing and endeavours to serve the astronomy market in a new and unique way. The *RASC* is special to Ray and Andy so there is always something special for the *RASC* members and associates.



ALEKSANDER
ESTATE WINERY

with
The Royal Astronomical Society of Canada

DESSERT UNDER THE STARS

Saturday, October 1, 2011
at Aleksander Estate Winery
1542 County Rd 34 (just North of Hwy 34) Ruthven, ON
7:30 PM

Tickets: \$40 plus tax

Start with complimentary wine and cheese, be enthralled with a presentation by Randy Groundwater, sample desserts from the region and maybe a little more wine and then enjoy the Night Sky with Society members.

A variety of telescopes will be set up.

This event is open to the public and tickets are available from the winery (519-326-2024).

The Hallam Observatory will also be open to the public this evening. Please dress warmly and wear comfortable shoes

For Sale

Seldom used **Celestron 9.25" Optical Tube Assembly** on Losmandy dovetail bar. This 2008 model has StarBright XLT Coatings, 6x30 finder, standard visual back and 1.25" star diagonal. Excellent condition. Offering it to Windsor Centre members first at \$900. For more information or pictures please contact Brian Thomas at brithomas@live.ca.

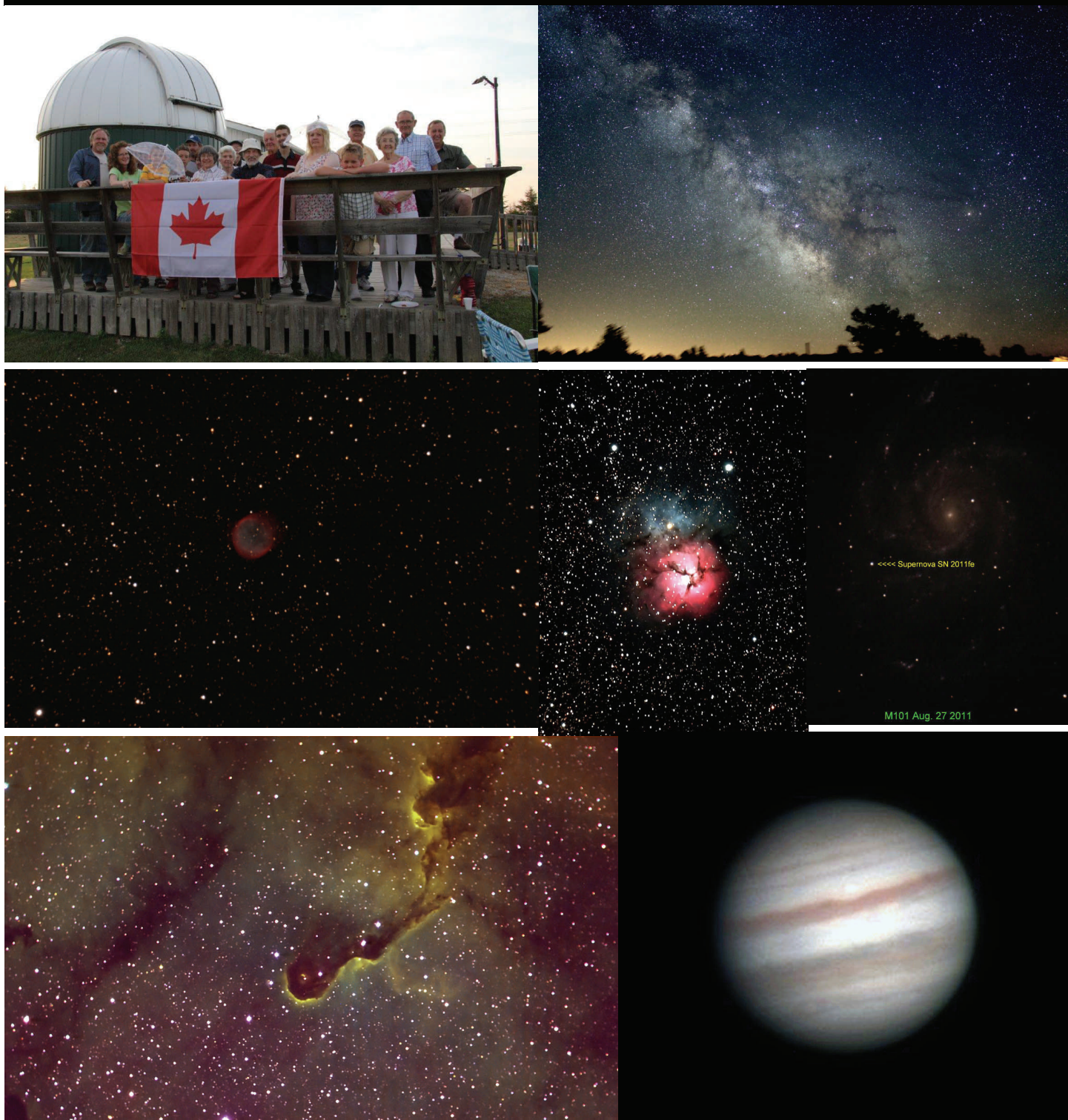
Meade Deep Sky Imager with Autostar Suite. Sony Super HAD Colour CCD sensor, 510 x 492 pixels (9.6 x 7.5 microns), 16-bit, USB 2.0 and 1.1 compatible. Please see Steve Mastellotto (mmastellotto@cogeco.ca) if you are interested in this one-shot colour imager for only \$100.

Astrophotography Group

A reminder that the Windsor Centre has a pretty active astrophotography group and their photos typically grace the back page of each issue of Aurora. The group includes 17 members and if you are interested in joining the group please see Steve Mastellotto (mmastellotto@cogeco.ca).

Over the Summer we created a Zenfolio website to host our photos. You can find it here <http://rascwindsor.zenfolio.com/f24719509>. Not everyone has posted their photos yet but we already have a nice gallery of images. Keep watching this site as members add images to their folders.

Member Photos



Top Left: **Windsor Centre Picnic** by Mike Mastronardi. Top Right: **Summer Milky Way** by Scott Stuckless from the Bruce Peninsula. Middle Left: **NGC 6781** by Brian Thomas on July 26. Canon 5D, Celestron 14, 19x3 minute subs, ISO 400. Middle Centre: **M20 The Trifid Nebula** by Rick Marion on July 4. QHY8 CCD Camera, AT111, 5x10 minute subs. Middle Right: **Supernova 2011fe in M101** by Brian Thomas on August 27. Canon 5D, Celestron 14, 40 minutes total exposure, ISO 400. Bottom Left: **The Elephant Trunk Nebula** by Steve Mastellotto. SBIG ST-110XME, AT111, SII/Ha/OIII narrowband filter image (Hubble Palette), 12x5 minute subs in each colour channel. Bottom Right: **Jupiter** by Pete Barbaro on July 19. This was Pete's first night imaging with a new Imaging Source video camera, a DBK21, Celestron 8, stack of 449 best frames from 898 video frame video sequence and processed in Registax v6.1.0.8.