Aurora
The Royal Astronomical Society of Canada - Windsor Centre
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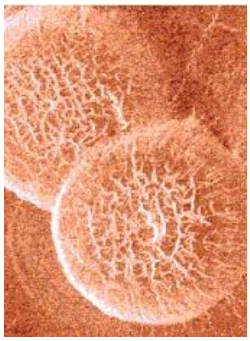
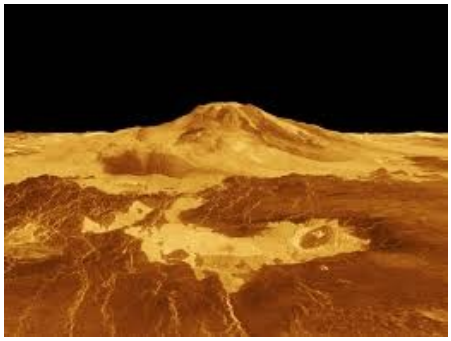
Venus by Juliana Grigorescu

Venus is the second planet from the Sun, orbiting it every 224.7 Earth days, with a rotation rate of 243 days. After the Moon, it is the brightest natural object in the night sky, reaching an apparent magnitude of −4.9, bright enough to cast shadows. It is always seen around the Sun, two or three hours before the Sun rises and two or three hours after the Sun sets. In size and mass it is very similar to the Earth, so it is sometimes called the sister planet of Earth. Most Venusian surface features are named after historical and mythological women (Venus was the goddess of love and beauty in Roman mythology). Exceptions are Maxwell Montes, named after James Clerk Maxwell, and some highland regions.

Venus is perpetually shrouded by an opaque layer of highly reflective clouds of sulfuric acid, preventing its surface from being seen from space in visible light. On the other hand, you cannot see the sky if you were living on Venus! The planet has been visited by two Russian landers: Venera 13 and 14 in the seventies, and a NASA orbiter, Magellan, in the eighties and nineties. No Russians in the landers which only lasted a couple of hours before melting

Venus has the densest atmosphere of the terrestrial planets, consisting of more than 96% carbon dioxide. This is due to what is called “the Runaway Greenhouse Effect”, caused by water boiling off the planet .With no rain, the carbon dioxide cannot be flashed down and locked up in rocks (like here, on our planet), so it keep the heat in the atmosphere . The atmospheric pressure at the planet's surface is 92 times that of Earth's. With a mean surface temperature of 735 K (462 °C; 863 °F), Venus is by far the hottest planet in the Solar System. This temperature is the same (except for the poles) everywhere around the planet. Walking on Venus, we will be crashed by the pressure, poisoned by CO_2 , burned by drops of sulfuric acid and melting at the same time. Not a nice vacation destination…

Venus has been recently (in the last 500 mil years) reshaped by volcanism. About 80% of the Venusian surface is covered by smooth, volcanic plains, consisting of 70% plains with wrinkle ridges and 10% smooth plains. Two highland "continents" make up the rest of its surface area, one lying in the planet's northern hemisphere and the other just south of the equator. The northern continent is called Ishtar Terra, and it is about the size of Australia. Maxwell Montes, the highest mountain on Venus, lies on Ishtar Terra. Its peak is 11 km above the Venusian average surface elevation. The southern continent is called Aphrodite Terra, and is the larger of the two highland regions at roughly the size of South America. Some interesting features are the flat-topped volcanic features called "farra", which look somewhat like pancakes and range in size from 20 to 50 km across, and from 100 to 1,000 m high. Venus is all about volcanism.

Venus is rotating backwards (the Sun rises in the West and sets in the East, if you can see it!). It is believed that the Sun locked the atmosphere of Venus, forcing the ground to move in the opposite direction. The tidal forces are so strong as to make Venus have similar rotation and revolution periods (almost like the Moon).

With no magnetic field to protect the planet against charged particles, and more heat been trapped continuously, expect the temperature on Venus to increase every day. So, I have a better name for this goddess of love and beauty: *HELL.*

In This Issue

Calendar of Events

Our next meeting…

Tuesday June 17, 2014
7:30 p.m.
at
Ojibway Park Nature Centre
5200 Matchette Road

Main Speaker…

Dr. Bill Baylis

Topic…

To Be Announced

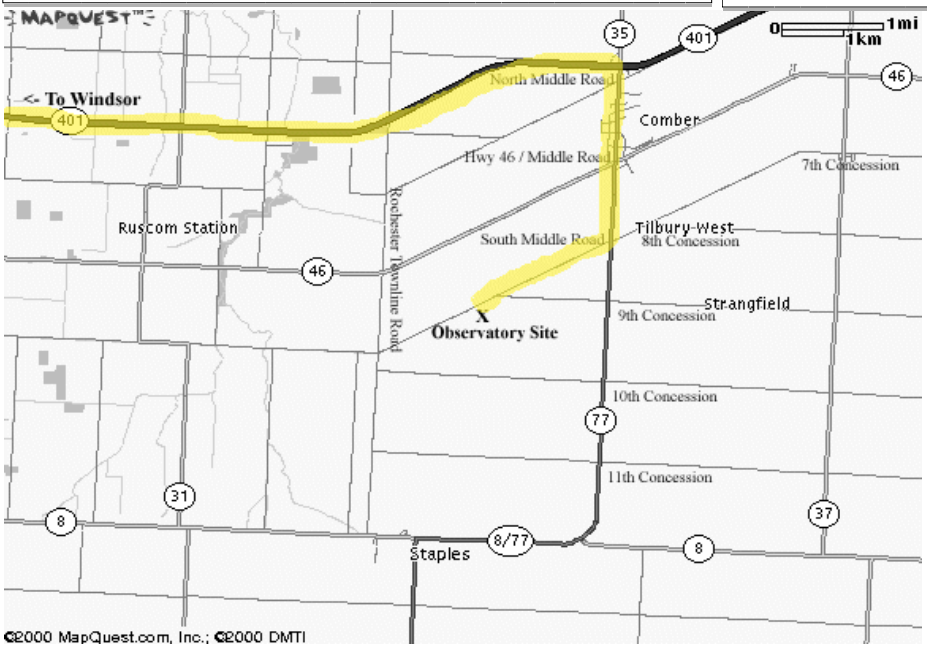
Activities...

Triple Shadow Transit: Jupiter's disk will host 3 shadows from 2:08 - 3:44 p.m. EDT on Tuesday June 3rd. Note that this is a daylight event and will be difficult to observe.

Open House Night at Hallam: The next open house night at Hallam is on Saturday June 7 at 9:30 p.m..

Council Meeting: The next meeting of Council will take place on Tuesday June 10, 2014 starting at 7:30 p.m.. The meeting will be at the home of Dan Taylor.

June Picnic: The Windsor Centre will hold our annual picnic on Saturday June 14 at Hallam Observatory. The picnic will be "Pot Luck" style with the Centre providing BBQ'd hot dogs and hamburgers. We ask that you bring a side dish or dessert and something to drink - reminder alcohol is not permitted at Hallam Observatory.



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.

April 2014 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 April 15, 2014.

Windsor Centre **President Rick Marion** chaired the Meeting. Rick called the meeting to order at 7:44 p.m. and welcomed members and guests to the Ojibway Nature Centre.

A motion to accept the minutes of the March 18, 2014 members meeting was made by Greg Mockler, seconded by Steve Pellarin. **MOTION CARRIED.**

Rick introduced **Dan Taylor** to come up and give his short talk: **An Introduction to Digital SLR Photometry**. Dan began by explaining to the audience that up until recently, variable star observers who filed reports to the AAVSO (American Association of Variable Star Observers) were strictly making estimates of magnitude brightness via visual observations only. But now there is a different method in which direct measurements of variable star magnitudes can be made through photometry (Digital SLR Photometry).

What you need for this type of photometry is a camera that processes images in raw forms, and Dan mentioned that you should be able to manually select shutter speeds easily, as well as at least a basic tripod. A photometric software package - AIPWin was described as being a good, sophisticated program, but slightly glitchy when Dan used it. It was essential for photometry however, despite the problems. An image of Vega & Epsilon Lyrae was shown as an example.

The process of taking photographs of variable stars provided by Dan was to obtain ten images of the target, to be followed by ten dark frames, ten flats and ten dark flats, then to convert all of these images to the TIFF format, followed by conversion to FIT format. After calibrating and stacking them, you toss out composite, red and blue channels. This software measures the green channel - very close to the sensitivity of the human eye.

Rick thanked Dan for giving the short talk and prepared a laptop presentation through **Skype** via live communication with **Robyn Foret, Chair of the Education and Public Outreach Committee for the Canada-Wide Science Fair**. This year various members of the RASC - Windsor Centre will be taking part in the fair as judges of the youth science projects, and also during the annual Science Rendezvous event, both being held at the University of Windsor. Astronomer Colin Haig has been expressing interest in taking part in the fair as well, having been an award winner in the youth science fair himself.

The members in the audience were advised to contact the chief judge - Dr. Edwin Tam - for more specific details on how to sign up for becoming a judge in the contests. As for another event that may happen on **May 10th** - weather-permitting - we will be the setting up of telescopes down at the **Odette Sculpture Garden** at the riverfront for sharing the night sky with the student contestants and the general public later in the day.

Rick announced the **break**, which was followed by the **Fifty-Fifty Draw:** Winner was Greg Mockler, who donated the winnings back to the Centre.

Announcements

- Dr. Bill Baylis announced the **Earth Day Fund Raising Dinner** hosted by Canada South Science City being held at the Caboto Club on Monday, April 21st.
- The next **Dark Sky Night at Point Pelee** National Park is to be held on Saturday, April 26th.
- The next **Hallam Observatory Open House** takes place on Saturday, May 3rd at 9:00 p.m.
- The next regular **members meeting** is to be held on Tuesday, May 20th at 7:30 p.m.
- Susan Sawyer-Beaulieu discussed the upcoming **Astro-CATS** event - an astronomy convention hosted by RASC - Hamilton Centre taking place on May 3rd and 4th at Mohawk College. A number of members are interested in taking a short whirlwind trip up there for the event, which starts at 10:00 a.m. and lasts until 6:00 p.m. on Saturday May 3rd. They plan to stay the day, meeting people and seeing the latest and greatest new telescopes, as well as the technical sessions and guests lecturers. Other members are invited to come along and attend as well.

Director of Observing Report, Steve Mastellotto: Steve started by discussing activity that's occurred since our last meeting. Events featured Jupiter continuing to be very prominent through much of the night, Mars reaching opposition, Saturn now beginning to rise at a much better time for viewing, a lunar eclipse that everyone around our general area unfortunately missed due to heavy clouds and snow.

For daytime solar observers, the number of prominences and sunspots have remained high and there are plenty of things to view on the Sun's surface.

Conjunctions in the sky such as the Moon and Spica, the Moon and Saturn, as well as the Moon with Hyades are some of the other events going on in the sky.

Steve asked the audience if anyone had done any observing recently, to which Randy Groundwater replied that he has been observing Jupiter, such as the double transit of Ganymede and Io over the planet. Ganymede was notable to observe due to its size and colour.

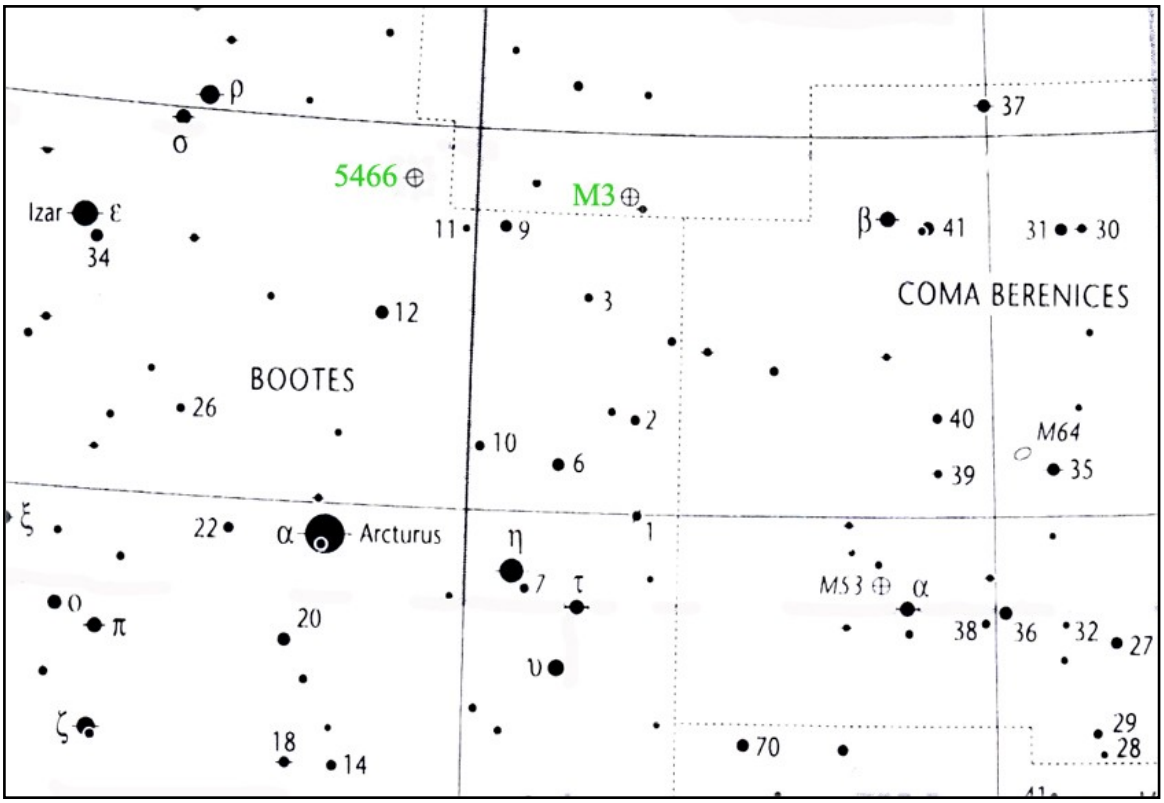
Mike Mastronardi asked if he could make a general comment regarding the last open house at Hallam, about how quite a few visitors ended up attending for the evening, and how interested they were to see the sights our main telescope had to offer. Steve asked if there'd been any observations of Mars? He noted that there had been numerous cloud features in the last week or two - very interesting to see, especially along the terminator that separates evening and morning. Noting the temperature difference between day and night, he mentioned there had been some fog forming due to the changes in conditions.

(Continued on page 5)

At The Eyepiece: Spring Globulars by Mike Ethier

Any seasoned observer knows that Spring is galaxy season. The skies are rich with bright galaxies, and armed with a 6" telescope the best and brightest can be enjoyed. With our club's 14" scope, most of the fainter NGC list can be picked off, too. Uranometria 2000 lists over 26,000 galaxies and/or galaxy clusters in its charts, a daunting task for any one person to observe or photograph. Until summer constellations begin to rise later in the night, there is not much to see in the way of clusters. In a future Spring article, I would like to discuss some of the galaxy wonders of Leo, and not just the one famous triplet, but a number of other "triplets" as well.

This month, however, I am turning to a pair of globular clusters, one of them a highlight of the entire flock. Uranometria 2000 plots 170 globulars, including those inside the Magellenic Clouds. I'm not certain how many are observable from northern latitudes, but it seems reasonable to assume that observing the entire viewable list is not too daunting a task. We all know that the summer sky is crowded with globulars, though after seeing too many in short order they can tend to look somewhat similar, at least in smaller scopes.



If you did not catch the recent Hubble view of M5 published in APOD on April 25th, you should stop reading now and go take a look. Hubble's view of M5 is the perfect image of this object type, and the image we are all seeking when we go to the eyepiece, whether with a 6" mirror or a 36". I am convinced that globular clusters alone are responsible for most of us wanting bigger and bigger mirrors at our disposal.

M5 is not well placed in early spring skies, but a worthy competitor is. M3 (NGC 5272) is one of the finest globulars in the sky, and makes a very refreshing sight after viewing so many galaxies. Finding M3 is easy. Locate Arcturus, and then nearby Eta (just south preceding it, mag. 2.5). Make Arcturus and Eta the east-west baseline for a right-angle triangle, shooting north twice the distance of that baseline (see map: note M53 is also shown, but is not part of this discussion). At a visual mag. of 6.3, even in binoculars M3 is impressive. It resolves nicely in a 6" mirror, and in my 12" at 170x I'm beginning to get that Hubble feeling. The main body spreads out over 18', though outliers go well beyond. The brightest star is mag. 12.7, so in a really dark sky smaller scopes will partially resolve this cluster nicely.

By comparison, our second globular is much harder to see and resolve. NGC 5466 can be located 25' following M3, and looks impressive enough on paper. Its combined visual mag. is 9.2. However, it is spread out over 9' and the brightest star is only mag. 13.8. In a great sky this one is barely visible in a 6" scope, and I have swept past it with the 12". Once located, it provides another wonderful lesson in interstellar distances. In the larger scope the center shows a slow burn, rather than the hot intensity of M3. Resolution of stars is more ephemeral. Patience is needed to begin to see the wonders of this large but very faint object. Still, it is a gem and would be worth a trek to the club observatory's 14" to see. In fact, it would be better to begin with NGC 5466, as our observatory scope will track right to it. After observing the fainter object for a time with different eyepieces, moving to M3 will be guaranteed to give the viewer a rush.

Amidst a night of viewing Spring galaxies, I always enjoy stopping for a break and viewing these two globulars. Even after dozens of times I still enjoy the contrast and quiet spectacle they provide.

April Meeting Minutes (continued)

(Continued from page 3)

The conjunction of Jupiter and the Moon earlier in the month had been visible from around the Windsor area due to a clear night in the west for the first time in a while. The two were still fairly close together for quite some time over a few days, so it was good to finally see them so close together.

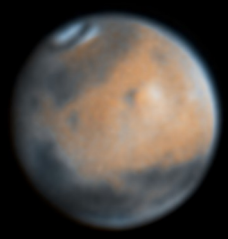
Brian Thomas took an excellent image of an Iridium satellite flare just to the upper-right of Polaris, the north star. Another great image of the lunar crater Copernicus, as well as another of the region known as Goldsmith were shown, all taken by Mitch Arsenault. Yet another image from Brian showed the Sun in a Hydrogen-alpha filtered telescope.

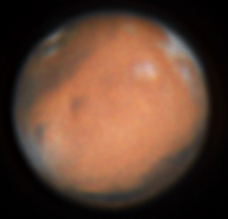
Jupiter will remain high in the West-Southwest after sunset and it will set shortly after 1:30 a.m. and is 36 arcseconds in diameter at the end of April. Saturn reaches opposition on May 10th so it rises just after sunset and the rings are 43.4 arcseconds in diameter (the ball of the planet is 18.6 degrees). The rings are currently tilted 22 degrees from their edge-on position.

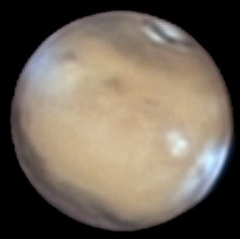
There are a number of spring constellations that are prominent in the sky right now. Cancer is visible, and the star Arcturus makes Bootes a prime region to scan around. The Big Dipper as usual remains a good constellation to view not all that far away from the North. Scorpius is on its way along with Ophiucus. Deep sky objects around the big dipper include Messier 101, 51, 63, 106, 108, 97, 81 & 82. Images of each of these galaxies, including the planetary nebula M97 were shown.

Steve finished his presentation by speaking about the new dwarf planet discovered in the Kuiper Belt. This new-found object happens to have rings around it, and this was realized when it happened to occult a distant star.

Rick thanked Steve for his presentation and also thanked everyone for coming out to the meeting. The meeting was **adjourned at 9:45 p.m.**

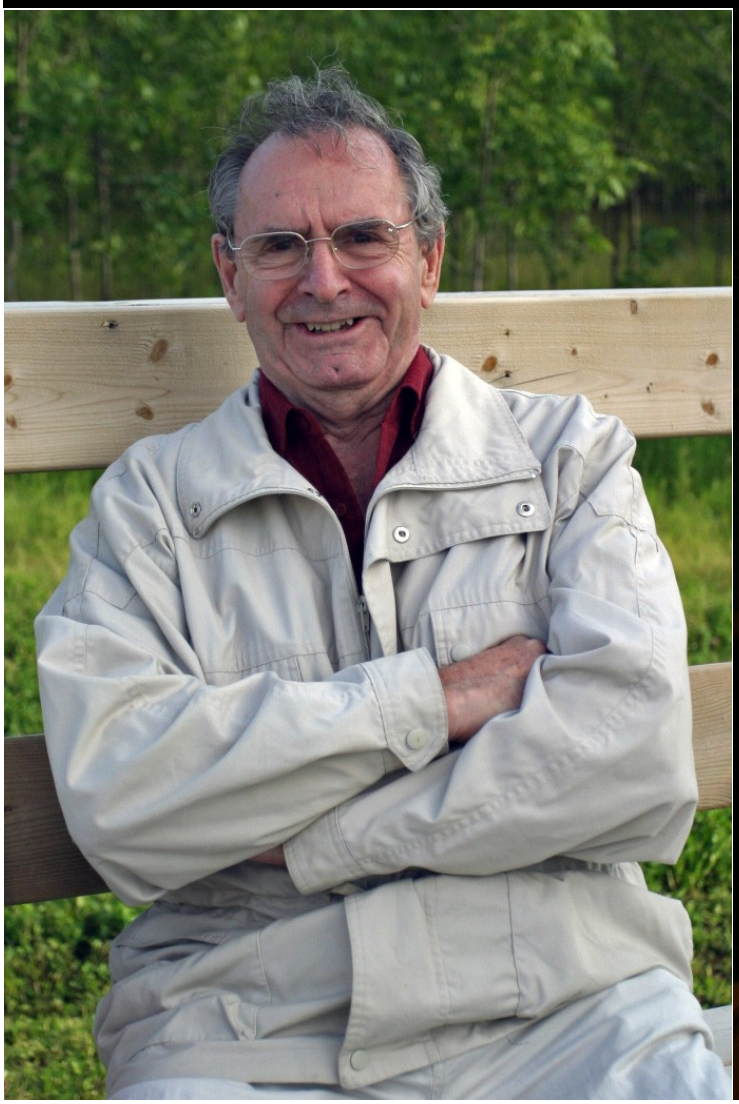






Top: Mars on May 5 by Pete Barbaro, *Middle:* Mars on April 6 by Pete Barbaro, *Bottom:* Mars on April 6 by Mike Pataky, *Left:* Jupiter on April 5 by Mike Pataky

Obituaries by Randy Groundwater



We were saddened to learn of the loss of one of our Centre's longest-serving members, when Mr. Vern Richards passed away suddenly on April 6, 2014. Vern was 85.

Vern was a faithful member of the Windsor Centre for more than forty years and until recently was a familiar face at the monthly membership meetings and the annual picnic. A quiet and mild-mannered gentleman, Vern had a deep and enduring love for astronomy. I will very much miss having conversations with Vern, who was among the very first who extended a hand of friendship when I first joined the Centre in the mid 1970s.

Our sympathy is extended to Vern's family, in their loss.

It is with sadness and great regret that we acknowledge the passing of Rod Clark, a long-serving and faithful member of the RASC - Windsor Centre, who died peacefully on April 22 at the age of 90.

Rod was a familiar and welcome face at monthly membership meetings where he made many friends and gained the respect of all with his quiet, friendly demeanor. Rod was a steadfast supporter of all Centre activities through the years, attending and assisting at many of our public events and presentations. He was also a regular supporter of all the nighttime activities at Hallam Observatory, including the monthly open houses. He could always be seen sharing his love and enthusiasm for astronomy and stargazing with everyone, particularly young people, viewing the stars and planets through his telescope.

Rod kept active throughout his retirement, including writing the astronomy column, "Our Celestial Neighborhood" which appeared during the 1990's and early 2000's in the pages of the *Tecumseh Tribune* newspaper.

We extend our deepest sympathy to his wife, Rosaline, and family at this time.