

Hallam Observatory Fee

A reminder that the Hallam Observatory annual access/key fee of \$60 is due October 1st. If you no longer wish to have your own access to the observatory please contact Steve Mastellotto (Steve.Mastellotto@gmail.com) to arrange to turn in your key.

Key access to Hallam Observatory is available to all RASC Windsor Centre members in good standing who have been members for at least 1 year and complete a training session on the observatory equipment. Note that an additional \$10 key cutting fee applies.

You can make your payment (renewal - \$60 and new - \$70) via Interac email transfer or by cheque payable to **RASC, Windsor Centre**. Details are:

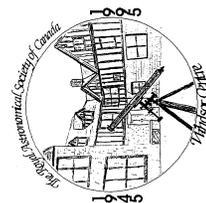
Email for Interac transfer: rasc_windsor@outlook.com

Mailing address: RASC, Windsor
5505 Rhodes Dr., Box 317
Windsor, ON
N8N 2M1

Astrophotos



Randy Drum captured NGC 7293 "The Helix Nebula" or "The Eye of Sauron" with his 100mm Skywatcher Esprit and ASI2600mc cooled camera. 66 frames of 4 minutes each for a total exposure of 4.4 hours.



AURORA



Volume 47, No. 1

The Royal Astronomical Society of Canada - Windsor Centre

September 2021

Flyer

Next Meeting

Tuesday, October 19, 2021

via

Online Zoom Meeting
begins at 7:30 p.m.

Speaker: Dr. Laura Parker

Topic: Dark Energy

Upcoming Events

Neptune: Is at opposition on **Tuesday, September 14th**.

Autumnal Equinox: On **Wednesday, September 22nd at 3:20 p.m. EDT**.

Moon and Messier 35: The moon will be about 2 degrees from M35 on the night of **Tuesday September 28th**.

Council Meeting: The Windsor Centre Council will be meeting via Zoom on **Wednesday October 13th at 7:30 p.m. EDT**.

Jupiter Double Shadow Transits: This is the season to be watching your Observer's Handbook for potential shadow events on Jupiter.

Orionid Meteor Shower: Peaks on **Thursday, October 21st at 8:00 a.m. EDT**. Best views will be from the Midnight until Dawn when you can expect to see between 20 - 40 meteors per hour. The Full Moon occurs on the 20th effectively washing out this display.

Monthly Meeting Minutes June 15, 2021

The monthly meeting of the **Royal Astronomical Society of Canada - Windsor Centre** was held via Zoom Online Meeting.

Windsor Centre **President, Mahayarrahh-Starr Livingstone** chaired the meeting. Starr called **the meeting to order at 7:35 p.m.** and welcomed the members and our guest speaker and Centre member Steve Pellarin to the online meeting.

Starr invited members to review the **minutes of the May 18, 2021 general meeting** which were printed in the Aurora newsletter. A **motion to accept the minutes** was made by Steve Mastellotto and seconded by Steve Pellarin. **MOTION CARRIED.**

As **Chair of the marketing committee Steve Pellarin** gave a quick report on promotional items which will soon be available for purchase off of our web-page. The first items will be winter themed and further seasonal items will be available in 2022. A period of time will be allotted for ordering items and then they may be picked up at the same time.

Director of Observing Report, Steve Mastellotto: Steve began his report by sharing images taken by members. **Brian Simpson** had travelled to Manitoulin Island in search of the very dark sky available there. His compelling image of **M81, Bodes Galaxy** was presented. Brian also photographed the **annular solar eclipse that occurred June 10th** in the dawn sky. His northern destination allowed him to capture the event just beyond the maximum point. Steve explained how the slightly eccentric orbit of the moon allows for an annular solar eclipse vs a total solar eclipse. The Sun's diameter also changes in size due to Earth's orbital path however this is not as dramatic a change as we see with the moon's orbit. **Jack Zhu** captured an image occurring near the end of the annular eclipse and he also shared a composite of a video sequence showing a bird dramatically flying across the disc of the Sun. **Paul Pratt** photographed the **eclipse from Wheatly** and the reflection could be seen shining across Lake Erie. A hazy image of the eclipse was taken from the **Windsor Sculpture Park by Randy Groundwater**. A variety of moon photographs were sent in by **Pete Barbaro, Starr Livingston and Juliana Grigorescu**. Deep sky images were also presented by **Dan Kahrama, Juliana and Starr**.

Steve described a few of the events which are available soon beginning with June 20th, the official start of Summer. **Mercury** will appear as a morning object in July and be in conjunction with **Mars** on August 18. You will find **Venus** after sunset in the western sky with Mars also sinking slowly towards the western horizon each night. **Saturn and Jupiter** are rising late in the evening and will be in **conjunction on August 2nd and 19th** respectively.

Visible in the southern hemisphere Jupiter's moons will put on a captivating **triple shadow transit on August 15th** which begins at 10:42 a.m. as Callisto and its shadow sail across Jupiter's disc. This is followed by the shadow transits from Ganymede and Europa. By 1:34 p.m. these two moons will be following each other in such a way that there will be an eclipse of Europa by the

shadow of Ganymede. **The Perseid meteor shower will peak on August 12th** and you may see them for a few weeks before and after this date. These meteors arise as Earth passes through the debris left behind from comet 109P/Swift-Tuttle.

Main Presentation

The Death of Massive Stars & Their Remnants, Steve Pellarin: Steve presented an interesting and detailed account of various processes that occur during the **evolution of a star**. He explained that stars are essentially large nuclear fusion engines. The abundance of hydrogen gas which they are mostly made of is compressed due to gravity and results in extremely high pressure and temperatures. This creates an environment at their cores where electrons are stripped away and the nuclei crash into each other creating larger nuclei. The energy from the **nuclear fusion creates pressure against the gravity and prevents the star from collapsing**. Our Sun is a low mass star and it is believed the temperatures at its' core can only create new atoms of carbon and oxygen. However, stars larger than 10 Solar mass have the capacity to produce heavier and **heavier elements until they reach and stop at the formation of iron**.

Steve explained how the evolution of certain stars end in **supernova explosions**. Depending on how massive these stars are or how close they are to Earth they may even be visible during the day for weeks at a time. The research on the frequency of these explosions have astronomers believing that **we are overdue for one of these luminous events in our own Milky Way galaxy**. Supernovae may have already occurred nearby but were not visible due to massive amounts of gas and dust which block our view. Steve explained the connection between the **mass of a star and the length of its life**. Smaller stars like our Sun usually cannot create the conditions within their core to end in a supernova. Smaller mass stars 'sip' their fuel and can live much longer than more massive stars. **Larger mass stars use up their fuel quicker**, live shorter lives and may **end in spectacular supernovae explosions**. A typical explosion produces energy that is equivalent to between 10-100 billion stars. In the early 20th century astronomers began detailed research on these bright objects in the sky. The data from their spectrographs revealed dark absorption lines within the various wavelengths of light. These lines represented atoms which are present in the outer layers of the star. Studying these wavelengths after a supernova occurred provided data that distinguished between two **different types of supernovae: Type I and Type II**. **Type I** explosions can happen with white dwarf stars that often have a **companion star which they pull material from**. **Type II** events are associated with **much more massive stars**.

Steve elaborated on the complicated processes that go into the formation of **neutron stars** and **spinning neutron stars** known as **pulsars**. These fascinating stars along with **black holes** are often created in the wake of a supernova explosion. The beautiful remnants from these luminous cosmic events were also discussed.

Meeting adjourned at 9:25 p.m.. Recorded by Nancy Ng, Secretary, RASC Windsor Centre.