Winnicentrics

The Newsletter of the Winnipeg Centre of the Royal Astronomical Society of Canada

Regular meetings of the Winnipeg Centre are held in the Robert B. Schultz Lecture Theatre in St. John's College at the University of Manitoba, 92 Dysart Road. Free parking is available in the lot across the street. The theatre is on the lower (basement) floor of the College. Meetings are usually held on the second Friday of each month from 7 p.m. to 10 p.m. After the meetings, members who wish to do so usually retire for pizza and more conversation about astronomical subjects.

One of the summer meetings, usually in June but occasionally July, is not at St. John's College but is instead a barbeque at either a member's house or at Glenlea. Check the RASC Winnipeg website (http://winnipeg.rasc.ca/) in summer months to confirm the dates and locations of meetings and social gatherings.

Meeting dates and places may be adjusted during exam times and during Bombers home games or other stadium events.

Upcoming Events

Meetings
February 21
March 13
April 17

Members' Observing Nights
Dates TBA, weather permitting

Oak Hammock Marsh Astronomy Night
March 19 Auroras (Gerry Smerchanski)
April 16 Telescopes

University of Manitoba Open House
February 26
March 25
April 29

New Moon
February 23
March 24
April 22

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Subscribe To Our YouTube Channel!

RASC Winnipeg meetings from January 2019 to the present are online at:

https://www.youtube.com/channel/UCI-5qhaejiUZHBnQdrbYDAA

If enough viewers subscribe to the channel, a more appropriate address using the RASC name can be obtained.

WHO, WHERE, WHEN?

Executive Council

Winnipeg Centre Officers & Volunteers

President: Bryan Stach

Vice-President:
Dennis Lyons

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Treasurer: Abdul al Manni

Past President:
Brenden Petracek

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Sam Giesbrecht
Darren Hennig
Bill Krosney
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Dennis Lyons

SWSP Organizer:
Silvia Graca

Webmaster:
TBA

Winnicentrics Editor:
Kaeren Anderson

Observatory Director:
Bryan Stach

Winnicentrics is published six times or more each year by the Winnipeg Centre, RASC. Winnicentrics is produced by and for the members of the Winnipeg Centre. Any opinions expressed are those of the author.

If you have comments, questions, or concerns about Winnicentrics, you can contact any of the councillors above.

Notices

Challenge your observing skills with the RASC *Explore the Universe* program. Visit https://rasc.ca/explore-universe or contact Dennis Lyons for more information.

February 21, 2020* Meeting Schedule

7:00 pm Beginner's Session: *Venus* (Gail Wise)
7:30 pm Announcements
What's New? Winnipeg Centre Website (Gord Tulloch)
What's Up? Upcoming events in the sky (Jay Anderson)
What's On At The Planetarium? (Scott Young)
8:30 pm Break for Coffee and Refreshments
9:00 pm Featured Presentation: Richard Conrad
Astronomy Software

March 13, 2020 Meeting Schedule

7:00 pm Beginner's Session
7:30 pm Announcements
What's Up? Upcoming events in the sky
What's New? New discoveries in astronomy
8:30 pm Break for Coffee and Refreshments
9:00 pm Featured Presentation: Dr. Philip Groff
RASC National and Q & A

April 17, 2020* Meeting Schedule

7:00 pm Beginner's Session
7:30 pm Announcements
What's Up? Upcoming events in the sky
What's New? New discoveries in astronomy
8:30 pm Break for Coffee and Refreshments
9:00 pm Featured Presentation: Gerry Smerchanski
The Great Astronomy Debate of 1920

* Please note that the February and April 2020 meetings have been rescheduled for one week later to accommodate Valentine's Day and Good Friday respectively.

Astronomical Events
February - April 2020

The Planets

Mercury:
- Reaches highest point in morning sky on March 13

Venus:
- At greatest elongation east on March 24
- In evening sky near M45 on April 3

Mars:
- March 18: Close approach with the Moon and Jupiter, low in dawn sky
- March 23: Conjunction with Pluto (not visible from Winnipeg)
- March 31: Conjunction with Saturn low in dawn sky

Jupiter:
- Conjunction with the Moon and Pluto low in dawn sky on April 16

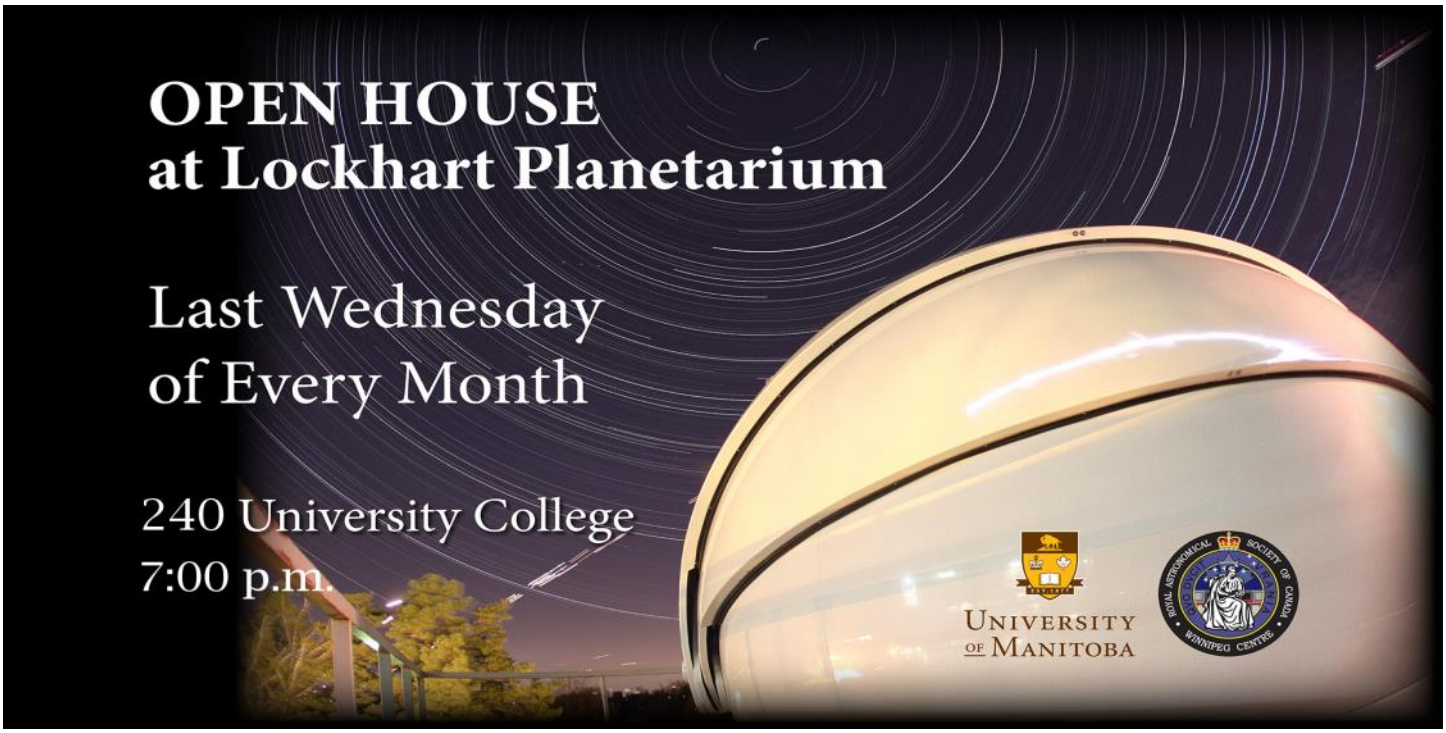
Saturn:
- Recently passed solar conjunction and not visible in morning sky until late March

Uranus:
- In southwest at dusk during February and early through early March, in becoming harder to view as it approaches solar conjunction

Neptune:
- Approaching solar conjunction and not visible

The Sky

- Spring equinox at 10:34 p.m. on March 19
- March 26: 136472 Makemake at opposition in Coma Berenices
- April 16: 136108 Haumea at opposition in Bootes



Update From National Council

The National Council (NC) met by teleconference on Sunday, February 9, 2020. The role of the National Council is to be the link between the RASC Board of Directors and the Centres. The following business was discussed:

- Review of Centre Manual (handbook) – The purpose of the manual is that it is meant to be used by the Centre Councils as a draft for them to build their own manual while capturing all the items they are responsible for. The manual is being reviewed and revised by the NC. It is early on but the structure is changing slightly and being updated with things like Green Laser Usage. If you would like to assist. please let me know.
- Future General Assembly (GA) Hosts – Vancouver is hosting this year and it was indicated that Winnipeg will be hosting in 2021. More to come from Bryan.
- The Board gave an update on Sky News, and it is now operating within budget and has a new editor. Please go to Skynews.ca and check out the new website. They are looking for content for the website, so please submit.
- The Treasurer reported that the 2020 budget is a balanced budget with a small surplus forecasted.
- Recruiting has begun for the upcoming GA where the new members of the Board will be elected. At this time a President, VP and Secretary will be recruited and appointed to the NC. Volunteers are being solicited for all the committees as well, so if you want to help the RASC consider volunteering for any of these positions. Information available on the website.
- The website and back store IT will be upgraded in the near future and is expected to be online in less than six months. You should be able to renew, donate, etc. all from one site once it is completed.
- National is working on gathering all the information that various centres have developed and make them available to everyone. For instance, there are Binocular handouts, Observing Mars, etc. that are available but very few are aware of them.
- Information is being gathered to see how the various centres are applying for green laser permits for areas within the 10 kilometre airport exclusion zone.

The meeting lasted about two hours and was productive. If you have any questions, please let me know.

Cheers,

Dennis Lyons
National Council Representative

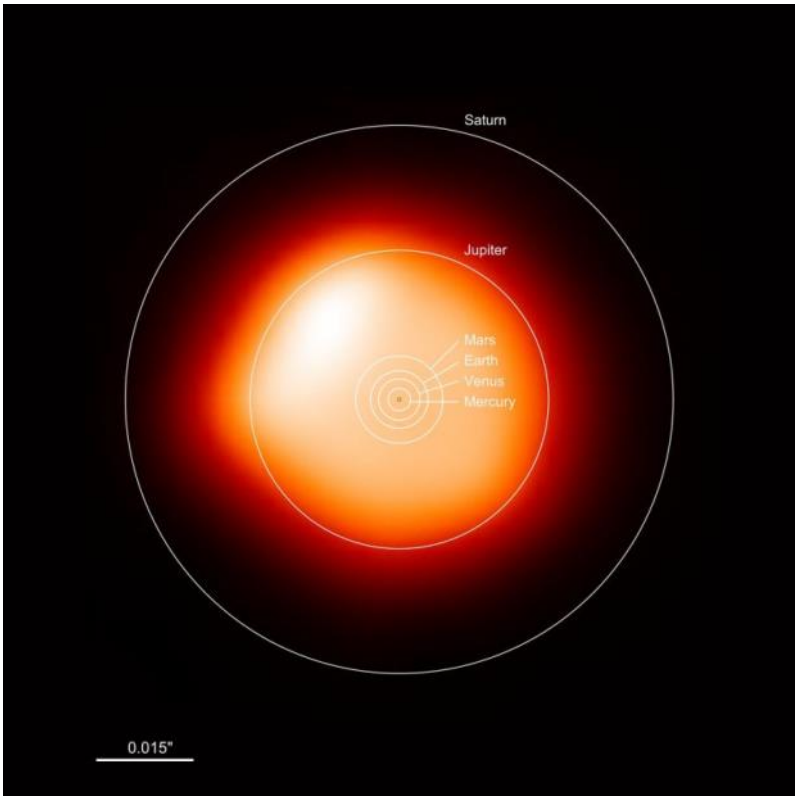
Observing the Minima of Betelgeuse

By Gord Tulloch, RASC Winnipeg Centre, AAVSO

Lately there's been a lot of buzz – not only in the astronomical community – about Alpha Orionis, named Betelgeuse. The star has dimmed quite precipitously from its normal range of variation (magnitude 0.7 to 1.0) to a very low minimum of 1.614 as of February 2020. Does this mean the star is about to explode? While that would be very cool, most astronomers now feel it's not likely, although they do predict that Betelgeuse will go supernova within the next 100,000 years. For an 8-million-year-old star, that's a very brief life in astronomical terms if not human terms!

Betelgeuse is a pulsating semiregular variable Red Supergiant (type SRc) star with two superimposed periods, one of about 400 days and one of about 2100 days. These stars are variable through pulsations of their atmospheres – radial velocity measurements through Doppler-shifted spectra of the stars demonstrate that as they dim, the atmosphere is moving outward and as it brightens, inward. The main and second overtone periods of variability are typical in this kind of star.

The fluctuations of this massive star are such that if we were to transport it into our Solar System, at minimum the surface of the star would extend out to the orbit of Mars, completely engulfing the inner planets. At maximum the star would extend to the orbit of Jupiter!



Betelguese at maximum - Credit: ALMA (ESO/NAOJ/NRAO)/E. O'Gorman/P. Kervella

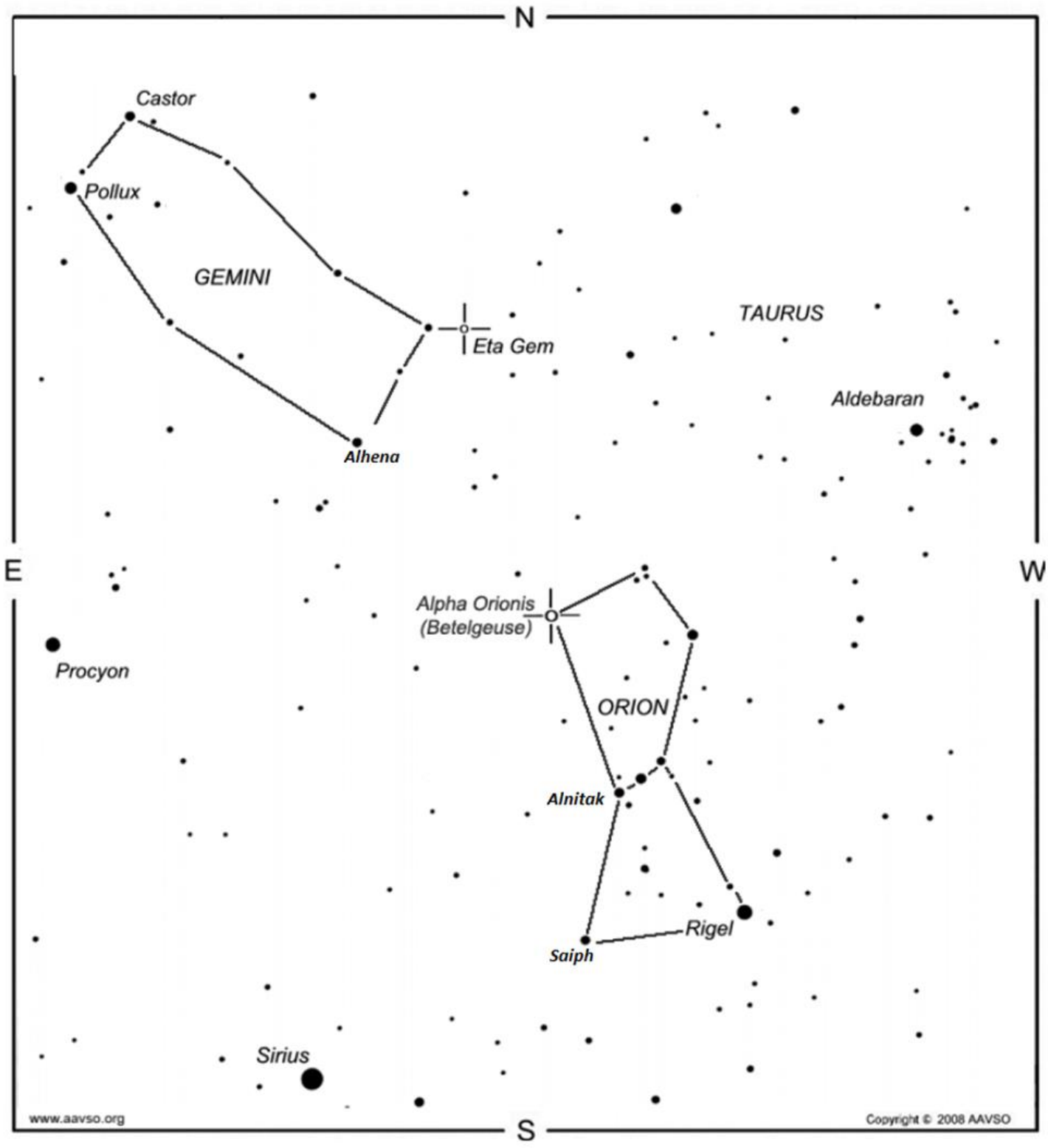
With two periods of variance, inevitably the two periods will coincide with the two minimums happening at the same time, which results in a very low overall minimum like the one we're seeing now. Other effects such as gas or dust eruptions on the star and other surface brightness changes may also have an impact, but astronomers are not seeing other signs of imminent explosion.

How can you observe this phenomenon for yourself? You can use a technique known as differential photometry, which compares known similar brightness of other non-variable stars to estimate the brightness of a target star. Normally, the American Association of Variable Star Observers (AAVSO) recommends using Procyon (alpha CMi, magnitude 0.5) and Aldebaran (alpha Tauri, magnitude 1.1) for comparison stars, but given the dimness of Betelgeuse at present, in a recent Alert Notice the organization recommends the following stars instead (V stands for Visual):

- Rigel (bet Ori) - 0.12 V mean magnitude (note that colour is blue; use with caution)
- Procyon (alf CMi) - 0.36 V
- Aldebaran (alf Tau) - 0.87 V
- Pollux (bet Gem) - 1.14 V
- Alnitak (zet Ori) - 1.79 V
- Alhena (gam Gem) - 1.92 V
- Saiph (kap Ori) - 2.06 V

The attached chart, adapted from the AAVSO Chart for the area, shows the positions of these stars. To estimate the magnitude of the star, look at each comparison star – is Betelgeuse brighter or dimmer? If you compare the target star to a variety of similar stars it's easy with a bit of practice to get pretty close to the actual brightness. Compare your results to data coming from other observers at AAVSO using the light curve generator at https://www.aavso.org/LCGv2/ - use the star designator ALPHA ORI and select only the V band for the chart. Have fun!

Note: Castor (alf Gem) at 1.58 V and Bellatrix (gam Ori) at 1.64 V are not recommended due to the colour of the star leading observers to overestimate their brightness. Visual observers also need to be aware of the Purkinje effect and use the quick-glance method to make their observations; do not stare at alf Ori or the comparison stars, as doing so may make them become artificially bright. The Purkinje effect is the tendency for the peak luminance sensitivity of the eye to shift toward the blue end of the color spectrum at low illumination levels as part of dark adaptation.



Positions of comparison stars that can be used when estimating the magnitude of Betelgeuse

TWO OLD STARS

Orion, "The Hunter" is one of the most spectacular constellations in the winter sky. The easiest way to find it is to start at the brightest, fiercely sparkling white star in the sky, Sirius and then scan upwards and to the right. This will lead you to three equally spaced stars lying in a straight line pointing roughly in the direction of Sirius. These stars form Orion's belt. There is a sort of straggling of faint stars hanging down from the belt where a sword would hang. From there it is easy to see the belt is about halfway down a rectangle of stars, which form Orion's body. The lower right star is Rigel, a bright, white star, and the top left star is red or orange. Binoculars bring out star colours really well. It is usually referred to as Betelgeuse, but many years ago astronomer Patrick Moore consulted some experts on ancient tongues about this name. He was told that the name has become highly corrupted and the nearest one can get to something reasonable now is Betelgeux, pronounced Bayteljurze, which does sound more ancient and astronomical than "Beetle Juice". At some point in the not too distant future that discussion is going to become moot, because Betelgeux is very close to the end of its stellar life, and destined to end it in a spectacular explosion, a supernova. For a few weeks it will outshine all the other stars in our galaxy combined, and be easily visible in daylight. It will end up collapsing to form a neutron star, or perhaps even a black hole.

A star's life consists of three parts, rather like ours: youth, maturity and old age. The youth part consists of formation and settling down. Then there is a period – the longest of the three – of stability and maturity. Astronomers refer to this period as the main sequence life of the star. Finally there is old age, which arises when the star starts to run out of fuel. For small stars this consists of sneezing off the outer layers until all that is left is the core of the star, gradually cooling off. Big stars have more options. When they run out of fuel they shrink, driving up their core temperatures until they become hot enough for the waste products of previous energy production to provide more energy, enabling them to swell up again. However, inevitably, the final result is the end of the fuel supply, collapse and a huge explosion where the star blows itself to bits, while compressing its core into a neutron star or black hole. As stars approach the end of the line, they swell into red giant stars and become immensely brighter, squandering what's left of their fuel and bringing on the inevitable all the sooner. Betelgeux is now at that point. It is currently shining about 100,000 times brighter than the Sun, and its end cannot be that far off, certainly in the next few thousand years.

In most cases, all the fuel a star will get to power its lifetime of shining it gets when it forms. However, paradoxically, the more fuel it starts with, the shorter its life will be. For example, Betelgeux has about 12 times the mass of the Sun. During its main sequence life it would have been about 1500 times brighter than the Sun. Our Sun will have a lifetime of around ten billion years. Even if Betelgeux has more fuel than the Sun, during the main sequence part of its life it was shining so much brighter than the Sun that its lifetime has to be much shorter, tens of millions of years.

There is another star in the same sort of situation. It is Antares, the brightest star in the constellation Scorpius, "The Scorpion". It is visible during summer, low in the south. Like Betelgeux, it is red or orange, depending on your colour vision. This means there is a supernova candidate star available for us to watch for in the summer and the winter. Just cast an occasional eye in their direction. When it happens you will notice it.

(Originally published by the National Research Council on January 7, 2020)

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A group shot from the New Year's Day hike at Birds Hill Park.

Flame Nebula and Barnard's Loop by Ian Dixon. Taken near Morris, Manitoba with Canon 60D and Rokinon 135mm lens stopped down to f3.3, and Optolong CLS City Light Suppression filter. ISO 400, three 300-second exposures, unguided using a iOptron SkyGuider Pro mount.

Moondogs photographed on January 10, 2020 by Sheila Wiwchar.

GLP-TRAINED USERS/SPOTTERS WINNIPEG CENTRE

9 August 2019 (Expires 8 August 2022)

Abdul al Manni
Kaeren Anderson
SHR Bannister
Michelle Boyce
Sean Ceaser
Ralph A. Croning
Patrick Curry
Kevin Davis
Michael Fry
Darren Hennig
LLoyel Hull
Paul Karlowsky
Clifford Levi
Dennis Lyons
Alan Macklem
Jim Mcdowal
Krzysztof Keller
Daemon Nightshade
Brian Renaud
Stan Runge
Gordon Sharr
Bryan Stach
Gail Wise

11 August 2019 (Expires 10 August 2022)

Jay Anderson
Judy Anderson
Trevor Bryant
Silvia Graca
Marc Sarrasin
Gerry Smerchanski

13 December 2019 (Expires 12 December 2022)

Stephen Altstadt
Robin Clarke
Lucille Eustache
Ed Johnson
Adelle Kennedy
Timothy Kennedy
William McDonald
Kevin McGregor
Michelle Paquette
Ed Rajfur
Bruce Smith
Sheila Wiwchar

Some late-breaking news in astronomy

Meet the Neighbours!

A second exoplanet has been discovered in orbit around Proxima Centauri, the closest star to Earth at a distance of 4.2 light years. In addition to Proxima b, a rocky planet discovered in 2016, the newly-discovered Proxima c is estimated to be at least six times the mass of the Earth but outside the habitable zone – and a balmy 40 Kelvin.

https://astronomy.com/news/2020/02/proxima-centauri-the-closest-exoplanet-to-earth

Mars 2020 Rover Slated for July Launch

The components of NASA's latest rover have now been transported from the Jet Propulsion Laboratory in California to Cape Canaveral, Florida for reassembly, packaging and mounting on the rocket that will take it to Mars. Launch date is set for July 17, 2020.

https://astronomynow.com/2020/02/14/mars-2020-rover-moved-to-cape-canaveral-for-july-launch-preparations/

New Search Methods for SETI

The Search for Extraterrestrial Intelligence (SETI) originally scanned the skies for radio signals that could identify intelligent life elsewhere in the universe. New initiatives will expand the search, looking for industrial chemicals in exoplanet atmospheres, rings of artificial satellites, and other signs that could identify a technologically advanced civilization.

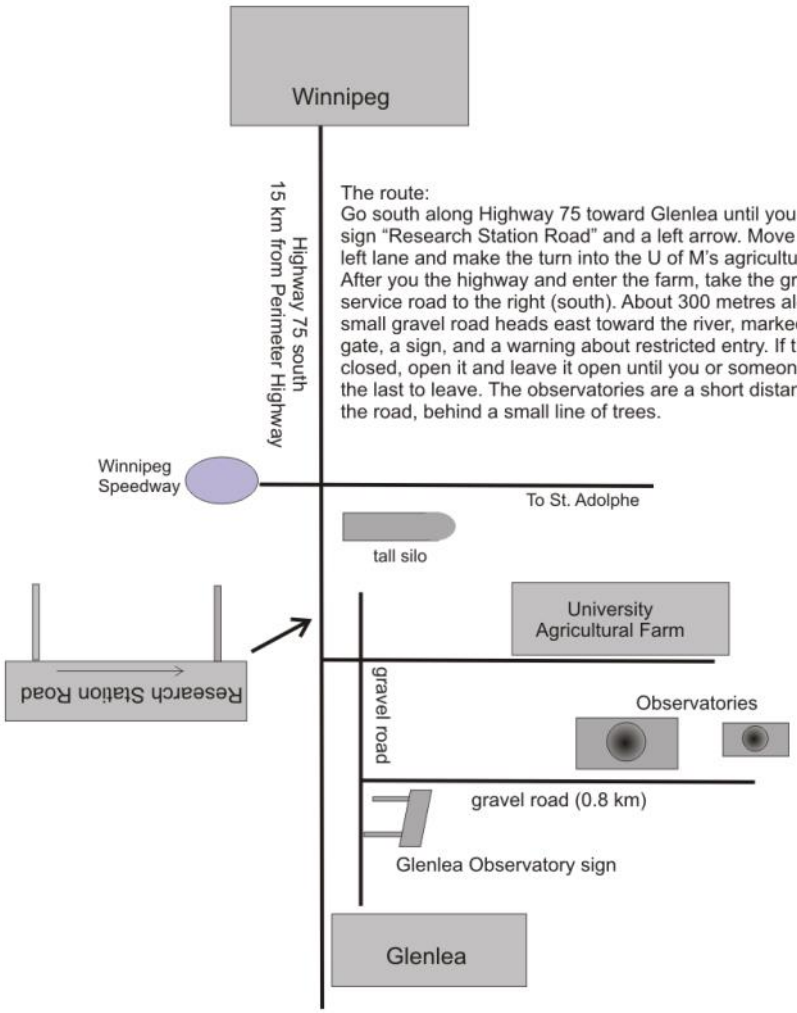
https://www.sciencedaily.com/releases/2020/02/200215082548.htm
https://www.seti.org/

Detecting Gravitational Wave Memory

As the number of black hole collisions detected by LIGO and Virgo continues to grow, existing data from gravitational waves is being reanalyzed in the hope of finding evidence of gravitational wave memory, permanent distortions of space caused by the wave. The research team estimates that data from approximately 2000 collisions would be required to demonstrate the existence of the memory effect, but expects to meet this target midway through the 2020s.

https://phys.org/news/2020-02-astronomers-gravitational-wave-memory.html

Finding the Observatory



The Winnipeg Centre maintains a working observatory and warm room at the University of Manitoba's Research Farm. The observatory contains a 30 cm Meade telescope on a fork mounting. Members of the Centre may sign out the use of this telescope provided they have first taken a short instruction course on its use.

The Meade provides outstanding views of the night sky. Its large aperture collects more than 1800 times as much light as the human eye. It is capable of magnifying more than 500 times under favourable conditions.

The warm room provides a convenient place for members to take refuge from winter temperatures and summer mosquitoes, or to wait out a passing cloud. The building also provides desk space and lighting for planning a night's observing session. A cement pad in front of the warm room and observatory provides a convenient space to place members' telescopes while conducting personal observing programs.

Etiquette requires that you approach the observing site with your headlights off if that's possible on your model of car. Headlights should remain off, but you can still use your parking lights to drive. Proceed slowly, and be careful about parked cars along the road, or people walking. If you cannot turn off your headlights, make a cardboard or garbage bag mask to dim the lights. You might wish to turn around at the end of the road so that you are facing the direction back toward the highway at the end of the evening.

Remember to close the gate if you are the last one to leave.