Event Horizon

Volume 27, Number 4
February 2020

From The Editor

Ahhh, February!

Welcome to the Armpit of Winter! (Not!)

Maybe we'll get a clear night or two, but in the meantime, you can enjoy this month's E.H. in the cozy comfort of indoors.

Happy Reading!

Bob Christmas,
Editor

editor 'AT'
amateurastronomy.org

Chair's Report by John Gauvreau

Mild temperatures and cloudy skies go hand in hand in the winter, and after a snowy November we have had a couple of relatively pleasant months that have offered little for the skygazers among us. Just last night, I was thrilled to see a crescent moon high above a dazzling Venus as I was walking into a church hall where Jim Wamsley and I were about to do a presentation for a group of Pathfinders (high school aged Girl Guides). The evening went well and all of us, guides and HAA members alike, had a great time. Of course, by the time I got home, the clouds had rolled in and opportunity was lost. Who knows when we will get our next shot at a clear sky?

January Meeting

A big thank you goes out to all who participated in our Show and Tell last month; Les Webb, Ed Smith, Ann Tekatch, Bill Tekatch, Jim Wamsley and Matthew Mannering. Each took the time to share an interesting item and there was a lot of interest in the room. It was a nice reminder that we have active members who are doing all kinds of interesting things with this hobby that we sometimes don't notice. And there were two more people not quite ready to show off their new toys (Peter and Chris!) and hopefully we can benefit from them at a future presentation.

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Chair's Report (continued)

February Meeting

This month we have our very own *Bernie Venasse* talking about double stars. Those that have observed with me know that doubles are one of my favourite targets. Often at public observing nights while many other scopes are pointed at the Moon or planets like Jupiter and Saturn, I will point my refractor at a nice double, like Albireo, to show off the colours and explain how different things can be in other stellar systems. Doubles are observable from any location, no matter the light pollution, and with any telescope, no matter the size, and by any observer, no matter the experience level. Come on out for this talk to get some midwinter observing inspiration!

Our March talk will be presented by *Robert Godwin*, founder of Apogee books. More on that next month!

Speaking of the meetings…

When you arrive at the meeting next week, be sure to look around the room at some of the tables and people there to help.

When you arrive at McMaster Innovation Park, check out the amazing community artwork in place on the walls. It's changed every few months so be sure to take a look now and then. *(Continued on page 3)*

HAA Helps Hamilton

To support our community, we collect non-perishable food items and cash for local food banks at our general meetings. Please bring a non-perishable food item to the meeting or a donation of cash and help us help others.

Our donations go to Hamilton Food Share, which delivers them to various food banks around the Hamilton area.

If you would like to help or have any questions about this initiative, please contact the H.A.A.

Hamilton Food Share
Hunger. It's just unacceptable.

Masthead Photo: *The Stars of Orion, by Sylvie Gionet.*

In this image, taken the evening of January 29, 2020, notice how Betelgeuse, on Orion's left shoulder, appears no brighter than Bellatrix on Orion's right shoulder, or the stars of Orion's Belt! Rigel, at lower right, outshines them all! Read more about Betelgeuse in this month's NASA Night Sky Notes on page 8.

This is a ½ second exposure at f/1.8 and ISO 6400 with a Canon Rebel T6i through a 50mm lens.

Chair's Report (continued)

Upon arriving at our room you will find a welcome desk out front. Stop and say hi to the volunteers there to greet you. They can direct you if you need any particular services from the club and they will be happy to give you a door prize ticket for our monthly draws. Everyone who arrives on time for the meeting's 7:30 start gets a free ticket.

Just inside you will find our membership director, Les Webb. He will sell you some 50/50 tickets if you like and help with things like address changes and getting you the club emails.

As you look around the room you will see the club's Secretary, Denise White, at the library (read more in last month's E.H.), the club's Treasurer, Ann Tekatch, who can help with your membership forms if you want to join or renew, and finally the aforementioned Bernie Venasse, who runs the member's services table and will provide you with observing forms, award applications and will even laminate your membership card (everyone wants it laminated!).

Telescope Loaner Program

The club has received two beginner telescopes for allocation, and one has entered into the loaner program. A SkyWatcher 5" reflector is now available for members to borrow, along with our other scopes that include two 8" dobsonians among others. If you are a member interested in borrowing a scope for a month long period please contact Jim Wamsley (his email, along with mine, is on the last page of this newsletter).

Finally

A sad note to pass along. The club's former Observing Director, Bret Culver, passed away in January. Many of you may not know Bret, as he was more active in the club's early years, but he was a great observer and well remembered by those that knew him. He was still an active observer and I always enjoyed my time out at the telescopes with Bret. He was a generous and fun observing companion. Hearing from those that knew him better than I only made me wish I had even more telescope time with him.

H.A.A.'s Loaner Scope Program

We at the HAA are proud of our Loaner Scope Program.

If you don't have a telescope of your own and want to make use of one for a month or so, you can borrow one of our fine loaner scopes.

Please contact Jim Wamsley, at:
905-627-4323
or e-mail Jim at:
secondchair 'AT' amateurastronomy.org

and we'll gladly get one signed out for you.

January Astrophysics Group Meeting Summary by Mike Jefferson

January 17, 2020

Those present were Doug Black, Doug Currie, Steve Germann, Mike Jefferson and Gary Sutton.

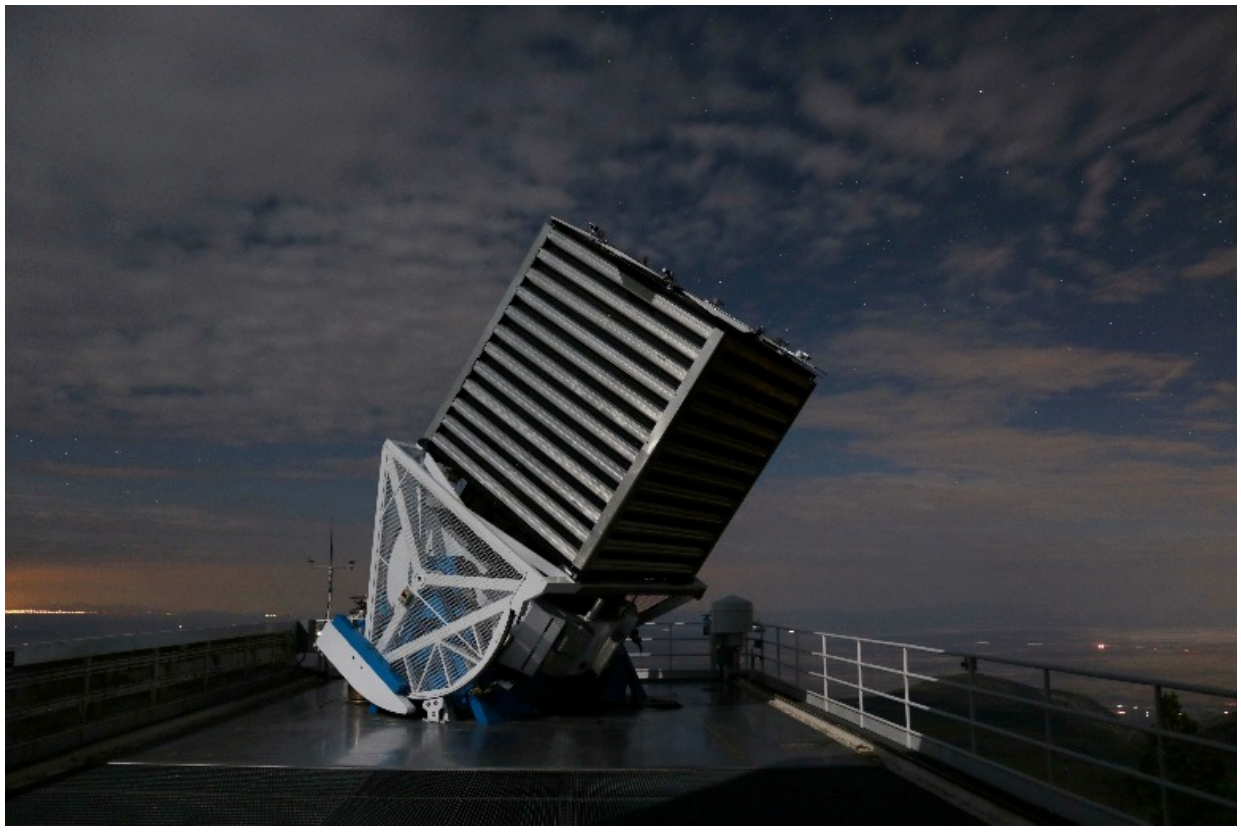
This meeting began with a discussion of the direction that this group is going in. It has been in existence for more than 3 years now and we are looking to complete some projects that would indicate a degree of accomplishment. Some topics that came up are the possible purchase of the 3rd Edition of Carroll's and Ostlie's "Modern Astrophysics" for the purpose of organizing a series of seminars on a multitude of astrophysical topics. The second item that arose was the possibility of fund raising for an observatory. The third item that was considered was a collection of past data and websites used in various earlier group talks. No conclusions were reached regarding the 2nd and 3rd topics, and the discussion for these was tabled for the time-being. Doug Black will use "Modern Astrophysics", 3rd Edition, for next month's topic.

Steve Germann did a presentation on the *Sloan Digital Sky Survey*. The survey can be found on the Internet at sdss.org and it is in the public domain for researchers or the general public to use – i.e. a data bank. There are spectra, galaxies, open and globular clusters, quasars out to Redshift 7, nebulae and physical parameters and descriptors of almost every imaginable object in the visible universe. It is dealt with in a book "A Grand and Bold Thing", fairly recently published. It has been set up in stages: *SDSS 4* which should finish collecting data in July of 2021; *SDSS 5* which will continue the agenda; and *SDSS Classical* which has been ongoing from the beginning of this project. It consisted of a series of different surveys done with the project telescope at Apache Point, near White Sands Proving Ground and Monument, New Mexico. It has been able to image objects down to +23.4 magnitude – or the faintest objects to date from the surface of the Earth.

Next month, Astrophysics will hold its February meeting on the 21st @ Doug Black's. Doug B. will present a topic on exo-planets derived from Carroll's and Ostlie's "An Introduction to Modern Astrophysics".

We thank Doug B. for the hospitality and refreshments at the January meeting.

Please watch "Event Horizon" and the HAA website for any possible changes or updates re: the February Astrophysics meeting.



The Sloan Digital Sky Survey telescope at night.

Image Credit: Patrick Gaulme

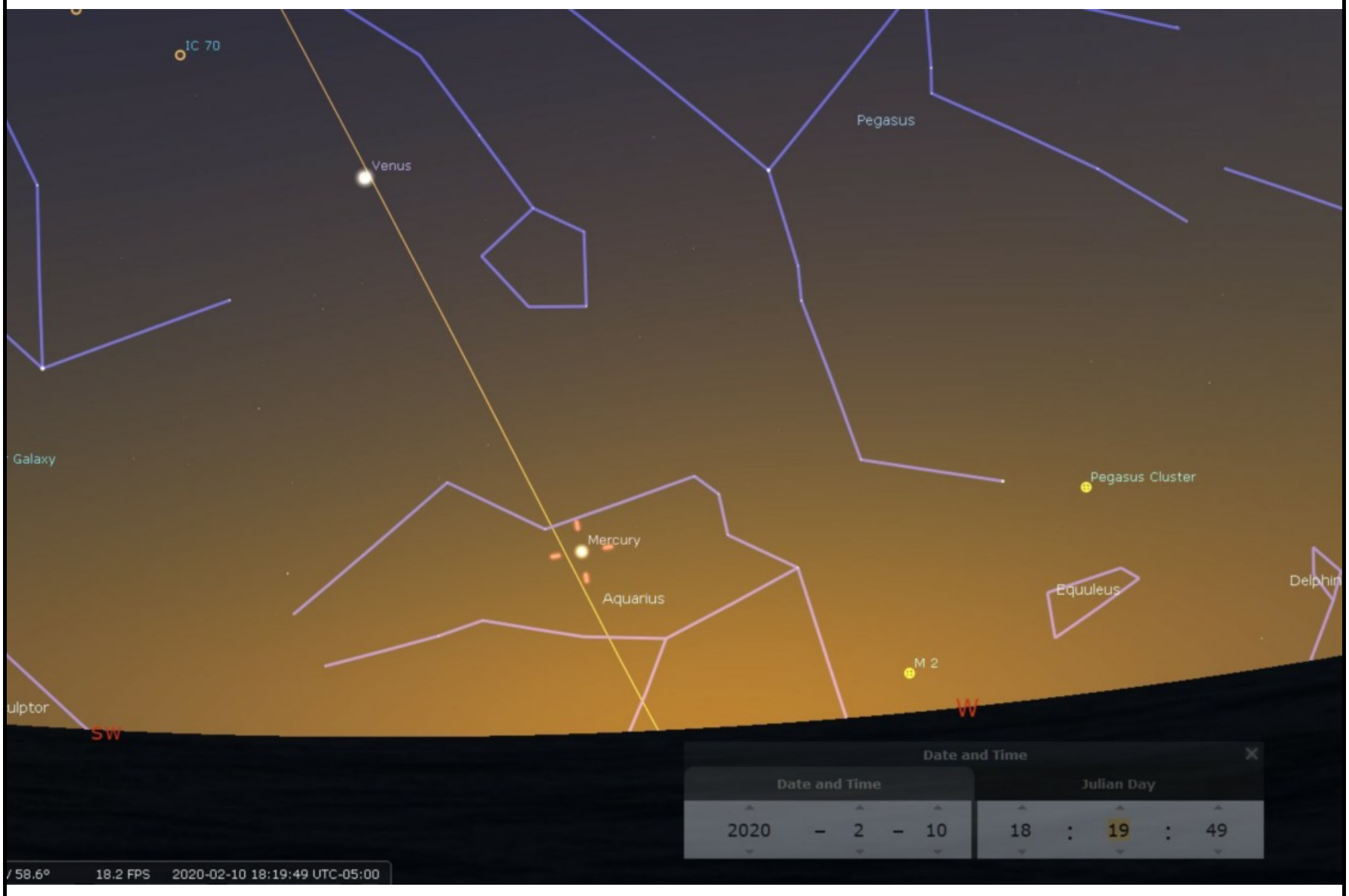
The Sky This Month for February 2020 by Matthew Mannering

This month has some interesting celestial events for us to view.

Beginning February 5th, *Mercury* should be visible low in the west about a half hour after sunset. Your last chance to see Mercury will probably be on the 15th. Here are some dates, times and heights above the horizon to help you see it:

Feb 4th – 8° at 6:10pm, Feb 10th – 9.5° at 6:20pm, Feb 15th – 7.5° at 6:30pm

Here's a Stellarium chart showing Venus and Mercury on February 10th:



Between Feb 11th and the 25th, the *Zodiacal Light* should be visible in the west from a dark sight right after astronomical twilight ends. Zodiacal light is light reflected off of dust particles in the inner solar system along the plane of the ecliptic. It is brightest in the direction of the Sun and when the ecliptic is at a steep angle to the horizon. You can look for it again in mid March. Astronomical twilight ends when the Sun is 18° below the horizon. Here are some sample times for this period:

Feb 11th at 7:20pm, Feb 18th at 7:30pm, Feb 25th at 7:40pm

Another significant date to remember is February 18th. At 6:15am the *Moon*, *Mars*, *M8* (the Lagoon nebula) and *M20* (the Trifid nebula) will form a very nice grouping low in the east. The chart at the top of the next page shows the top half of Sagittarius (the Teapot) and the grouping above.

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The Sky This Month for February 2020 (continued)

Then an hour later at 7:23am *the Moon will occult Mars*. The occultation will occur after sunrise (about 7:11am) so Mars may be very difficult to see. Start tracking Mars before sunrise so that you will know where it should intersect the Moon.

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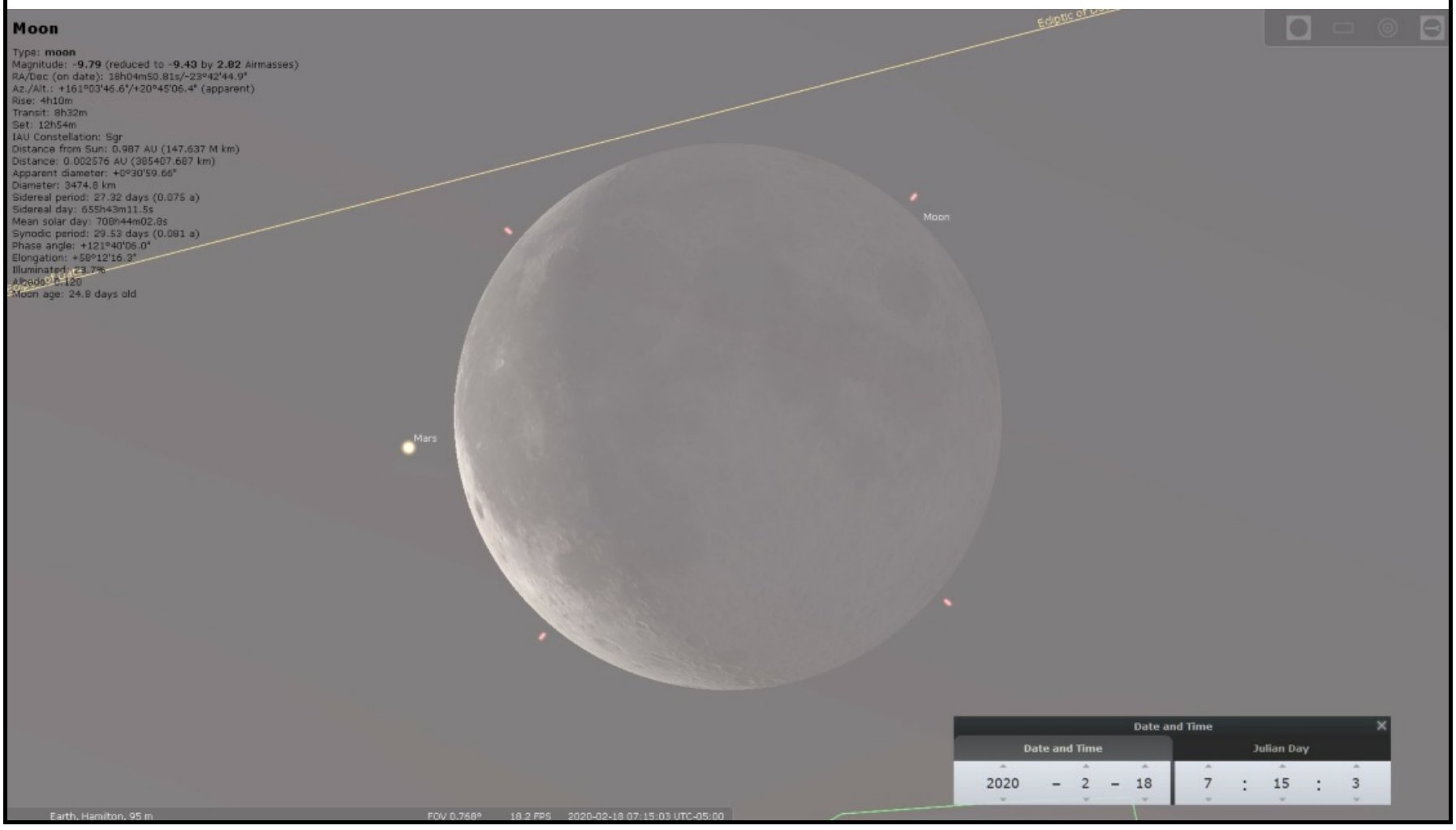


The Sky This Month for February 2020 (continued)

Other events for February are:

- 4th – Moon 2.5° from Aldebaran at 1:15am.
- 8th – Moon 1.0° from the Beehive (M44) at 5:15am.
- 20th – Moon 2.4° from Saturn at 6:25am.

The Moon

Libration this month is as follows: The Northern limb will be most exposed on the 26th and the Southern limb on the 12th. The Western limb will be most exposed on the 5th and the Eastern limb on the 17th.

The phases of the Moon for February occur as follows: first quarter Moon on the 1st, full Moon on the 9th, last quarter on the 15th, new Moon on the 23rd.

The Planets

- *Mercury* appears low in the western evening sky from the 4th to the 15th.
- *Venus* shines brightly in the western evening sky all month.
- *Mars* sits about 15 degrees above horizon in the south east all month at 6am.
- *Jupiter* begins to appear early in the month low in the south east in the morning twilight.
- *Saturn* emerges out of the glare of the rising Sun beginning mid month.
- *Uranus* is in Aries and sets around midnight.
- *Neptune* is moving towards the western evening horizon and is lost in the Sun's glare by the end of the month.

The Moon, Venus and Mercury as they appeared on March 18, 2018.

Image Credit: Bob Christmas

NASA Night Sky Notes

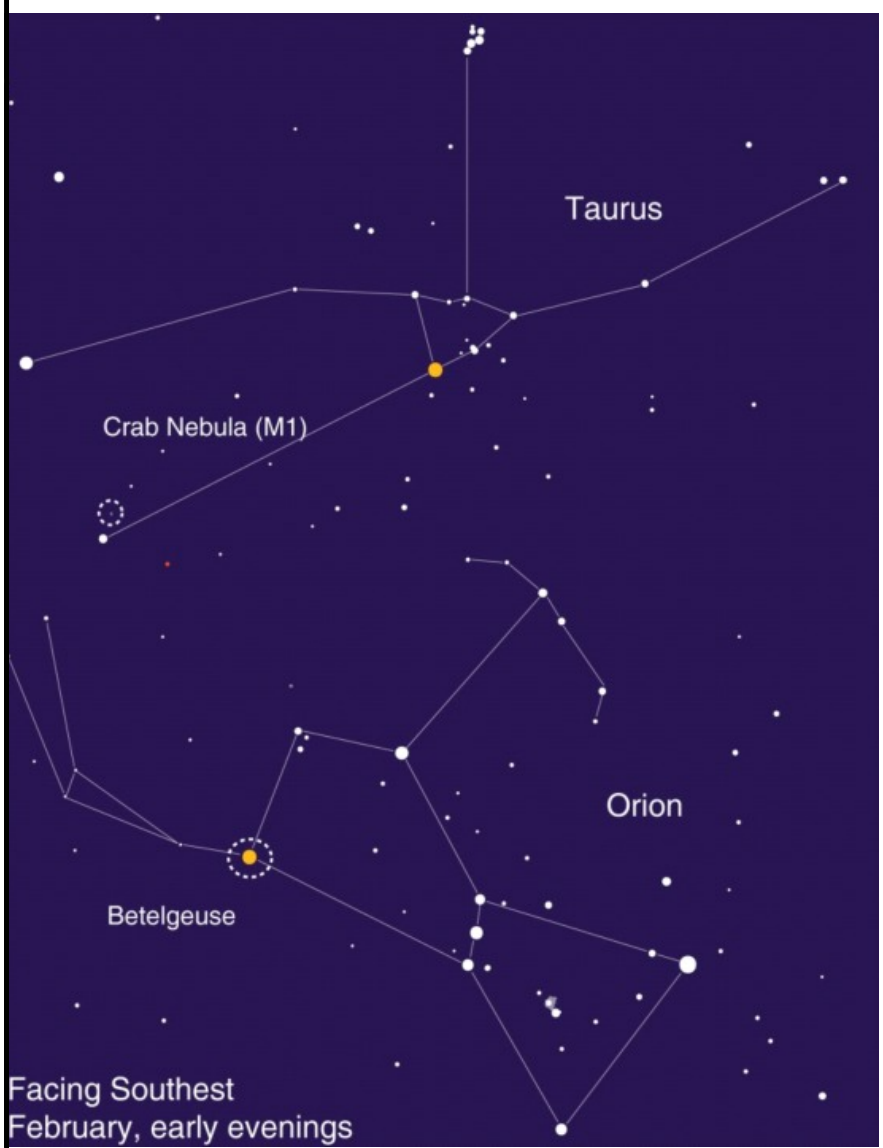
This article is distributed by NASA Night Sky Network.

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach.

Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Betelgeuse and the Crab Nebula: Stellar Death and Rebirth

By David Prosper



Spot Betelgeuse and the Crab Nebula after sunset! A telescope is needed to spot the ghostly Crab.

What happens when a star dies? Stargazers are paying close attention to the red giant star **Betelgeuse** since it recently dimmed in brightness, causing speculation that it may soon end in a brilliant supernova. While it likely won't explode quite yet, we can preview its fate by observing the nearby **Crab Nebula**.

Betelgeuse, despite its recent dimming, is still easy to find as the red-hued shoulder star of Orion. A known variable star, Betelgeuse usually competes for the position of the brightest star in Orion with brilliant blue-white Rigel, but recently its brightness has faded to below that of nearby Aldebaran, in Taurus. Betelgeuse is a young star, estimated to be a few million years old, but due to its giant size it leads a fast and furious life. This massive star, known as a supergiant, exhausted the hydrogen fuel in its core and began to fuse helium instead, which caused the outer layers of the star to cool and swell dramatically in size. Betelgeuse is one of the only stars for which we have any kind of detailed surface observations due to its huge size – somewhere between the diameter of the orbits of Mars and Jupiter - and relatively close distance of about 642 light-years. Betelgeuse is also a "runaway star," with its remarkable speed possibly triggered by merging with a smaller companion star. If that is the case, Betelgeuse may actually have millions of years left! So, Betelgeuse may not explode soon after all; or it might explode tomorrow! We have much more to learn about this intriguing star.

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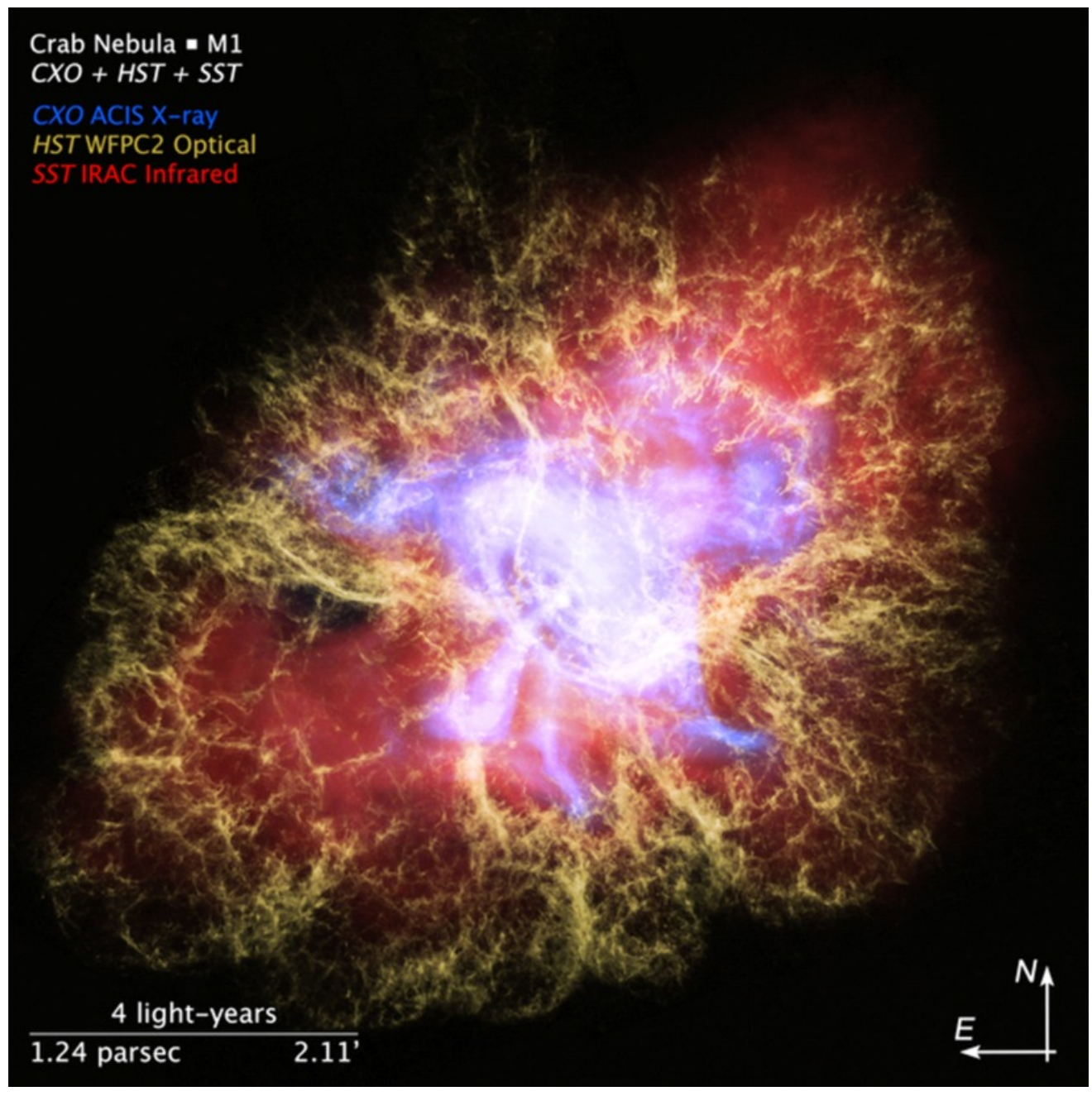
The **Crab Nebula** (M1) is relatively close to Betelgeuse in the sky, in the nearby constellation of Taurus. Its ghostly, spidery gas clouds result from a massive explosion; a supernova observed by astronomers in 1054! A backyard telescope allows you to see some details, but only advanced telescopes reveal the rapidly spinning neutron star found in its center: the last stellar remnant from that cataclysmic event. These gas clouds were created during the giant star's violent demise and expand ever outward to enrich the universe with heavy elements like silicon, iron, and nickel. These element-rich clouds are like a cosmic fertilizer, making rocky planets like our own Earth possible. Supernova also send out powerful shock waves that help trigger star formation. In fact, if it wasn't for a long-ago supernova, our solar system - along with all of us - wouldn't exist! You can learn much more about the Crab Nebula and its neutron star in a new video from NASA's Universe of Learning, created from observations by the Great Observatories of Hubble, Chandra, and Spitzer: bit.ly/CrabNebulaVisual

Our last three articles covered the life cycle of stars from observing two neighboring constellations: Orion and Taurus! Our stargazing took us to the "baby stars" found in the stellar nursery of the Orion Nebula, onwards to the teenage stars of the Pleiades and young adult stars of the Hyades, and ended with dying Betelgeuse and the stellar corpse of the Crab Nebula. Want to know more about the life cycle of stars? Explore stellar evolution with "The Lives of Stars" activity and handout: bit.ly/starlifeanddeath.

Check out NASA's most up to date observations of supernova and their remains at nasa.gov.



This image of the Crab Nebula combines X-ray observations from Chandra, optical observations from Hubble, and infrared observations from Spitzer to reveal intricate detail. Notice how the violent energy radiates out from the rapidly spinning neutron star in the center of the nebula (also known as a pulsar) and heats up the surrounding gas. More about this incredible "pulsar wind nebula" can be found at bit.ly/Crab3D

Credit: NASA, ESA, F. Summers, J. Olmsted, L. Hustak, J. DePasquale and G. Bacon (STScI), N. Wolk (CfA), and R. Hurt (Caltech/IPAC)

Eye Candy the Members' Image Gallery

Sunrise Behind the Burlington Skyway Bridge, by **Dan Copeland**

The Waxing Crescent Moon, January 29, 2020, by **Sylvie Gionet**
This 1/125 second exposure was taken with a Canon Rebel T6i & EF 55-250mm zoom lens at f/5.6, 250mm & ISO 1600.

Eye Candy the Members' Image Gallery

Venus after Sunset from Santa Cruz Huatulco in Mexico, January 22, 2020, by **Tom Kelley**

The Summer “Impromptu” Star Party

A brand new Star Party is coming this summer to Southwestern Ontario.

This new Star Party is to be held this July at the *Backus Heritage Conservation Area* near Port Rowan and Long Point, in Norfolk County, Ontario.

The conservation area has camping, washrooms, showers, swimming, and a large field from which to observe with no lights to interfere.

For more information, contact Dan Copeland:

dan ‘AT’ dancopeland.ca

Information is also available from these links:

https://www.facebook.com/JulySISP

https://www.facebook.com/events/440504859974733/

William J. McCallion Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- **Public shows every Wednesday (7:00pm)**
- **Public transit available directly to McMaster campus**
- **Tickets $7 per person; private group bookings $150**
- **Different shows every week**
- **Upcoming shows include:**
  - **Feb 5: Introductory Astronomy for Kids — Galaxies**
  - **Feb 12: Behind the Lens: Women's Contributions in Astronomy**
  - **Feb 19: Moons**
  - **Feb 26: Galaxies: Island Universes**
- **For more details, visit www.physics.mcmaster.ca/planetarium**

UPCOMING EVENTS

February 14, 2020 - 7:30 pm — *HAA Meeting* at McMaster Innovation Park, 175 Longwood Road South, Hamilton, ON. Our main speaker will be H.A.A. member *Bernie Venasse*. Bernie will be talking about double stars. Everyone is welcome.

March 13, 2020 - 7:30 pm — *HAA Meeting* at McMaster Innovation Park. Everyone welcome.

2019-2020 Council

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Check out the H.A.A. **Website**

www.amateurastronomy.org

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Observing site for the HAA provided with the generous support of the
Binbrook Conservation Area
Come observing with the HAA and see what a great location this is for stargazing, a family day or an out-door function.
Please consider purchasing a season's pass for $79 to help support the park.
http://www.npca.ca/conservation-areas/binbrook/
905-692-3228

The Harvey Garden HAA Portable Library

Contact Information

E-mail: library@amateurastronomy.org