New Braunfels Astronomy Club

Larry's Celestial Calendar & Newsletter by Eric Erickson

292nd Edition

November18th to December16th,2021

Venus Dominates Summer Evenings

Jupiter and Saturn are Beautiful

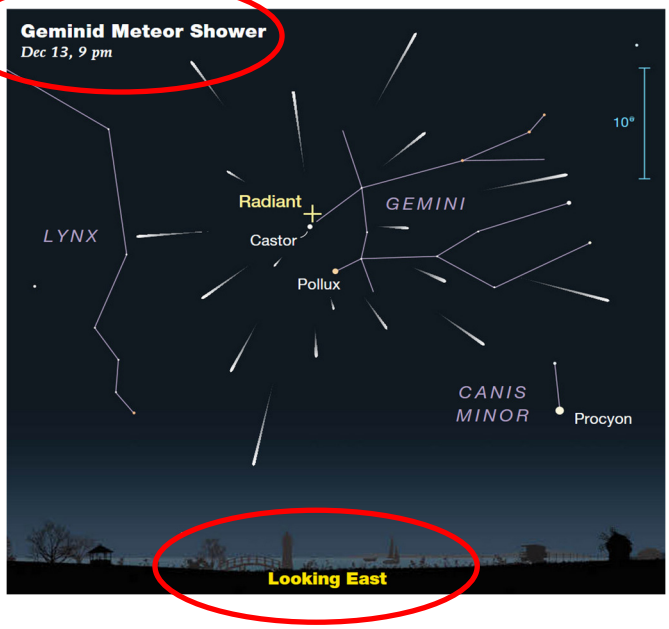
Blue Neptune & Gray-Green Uranus

Geminids Peak

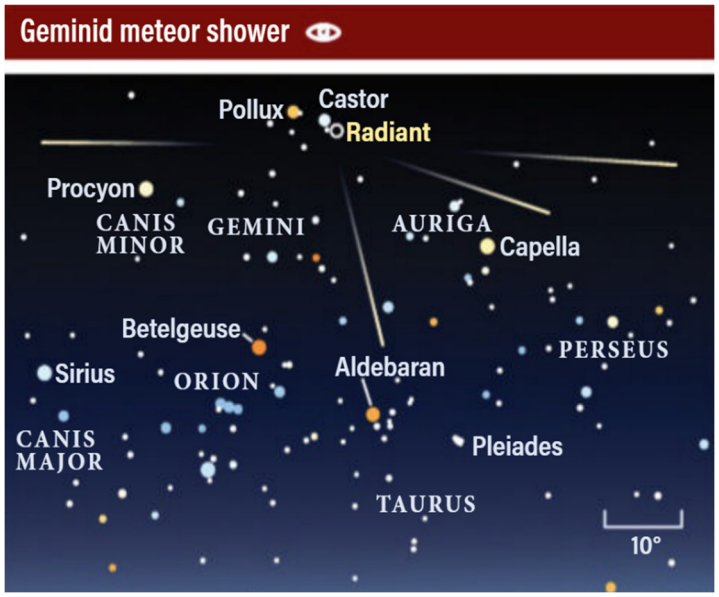
Almost Total Lunar Eclipse…Almost

Solar System Observing

- Mercury is heading for its November 28th conjunction with the Sun and difficult until the end of December.
- Venus dominates the western evening sky after sunset.
- Earth still spins, and we are still here to marvel at it all. **The Geminids arrive!**



-From Sky & Telescope Magazine

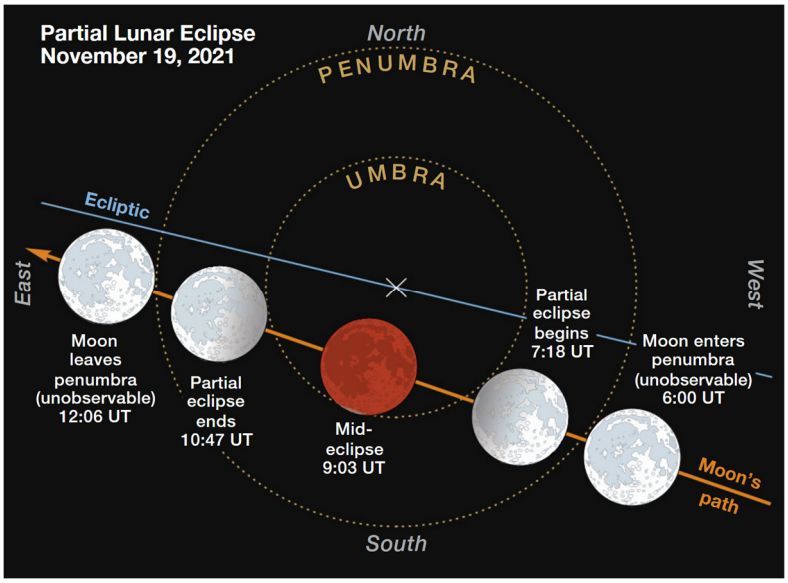


-From Astronomy Magazine

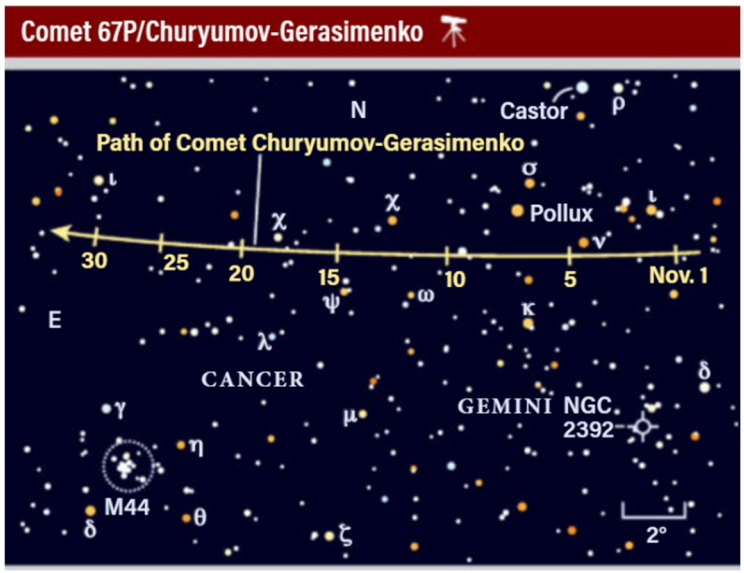
Looking WEST after 3:00 am CST on December 14

- The Moon **Near total eclipse** on November 19th. Partial phase starts at 1:18 am CST with maximum eclipse at 3:03 am CST.

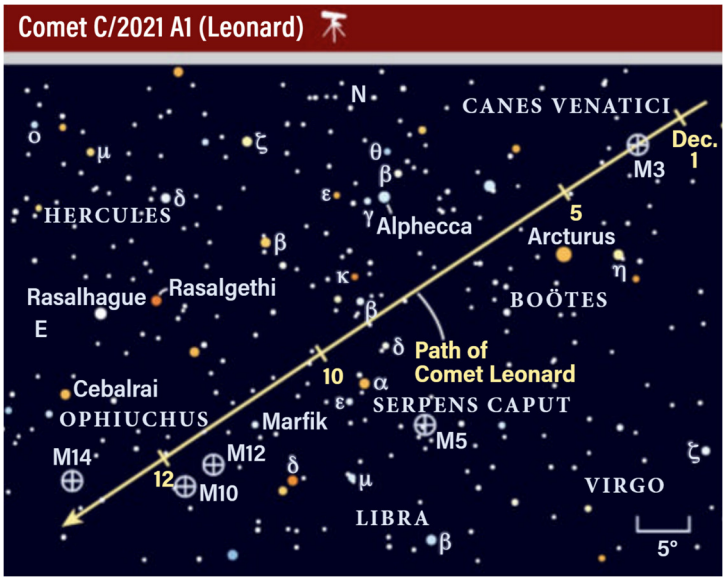
From Sky & Telescope Magazine-

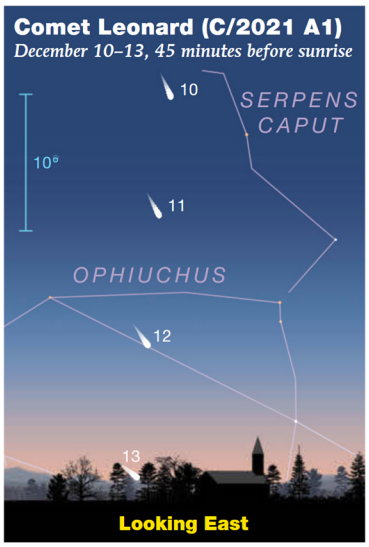


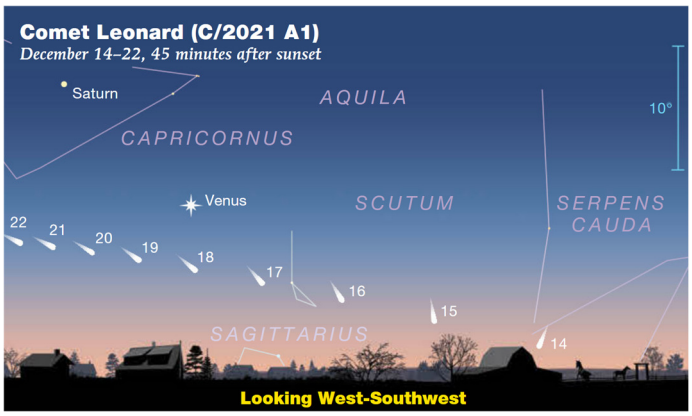
- Mars appears in the low pre-dawn southeast by the end of November and gets higher in the sky during December.
- Jupiter is past opposition, and still looking great in the south and southwestern sky.
- Saturn is past opposition, rising about an hour earlier than Jupiter.
- Uranus is visible most of the night in southern Aries. At magnitude 5.7 it is catchable in binoculars. Look for a fairly bright greenish gray “star”.
- Neptune is magnitude 7.7 and visible in binoculars, a bright blue “star”. It’s up most of the night in eastern Aquarius
- Comet(s)
    - Identified in 1969, Comet 67P/Churyumov-Gerasimenko was examined by the Rosetta spacecraft and Philae probe in 2014. At magnitude 8-9 it can be seen with 4” and larger telescopes. Look for it after midnight.
    - Discovered on January 3rd, 2021, by Gregory J. Leonard, Comet Leonard (C/2021 A1) should be a naked eye comet.



-From Astronomy Magazine (2)







-From Sky &Telescope Magazine (2)

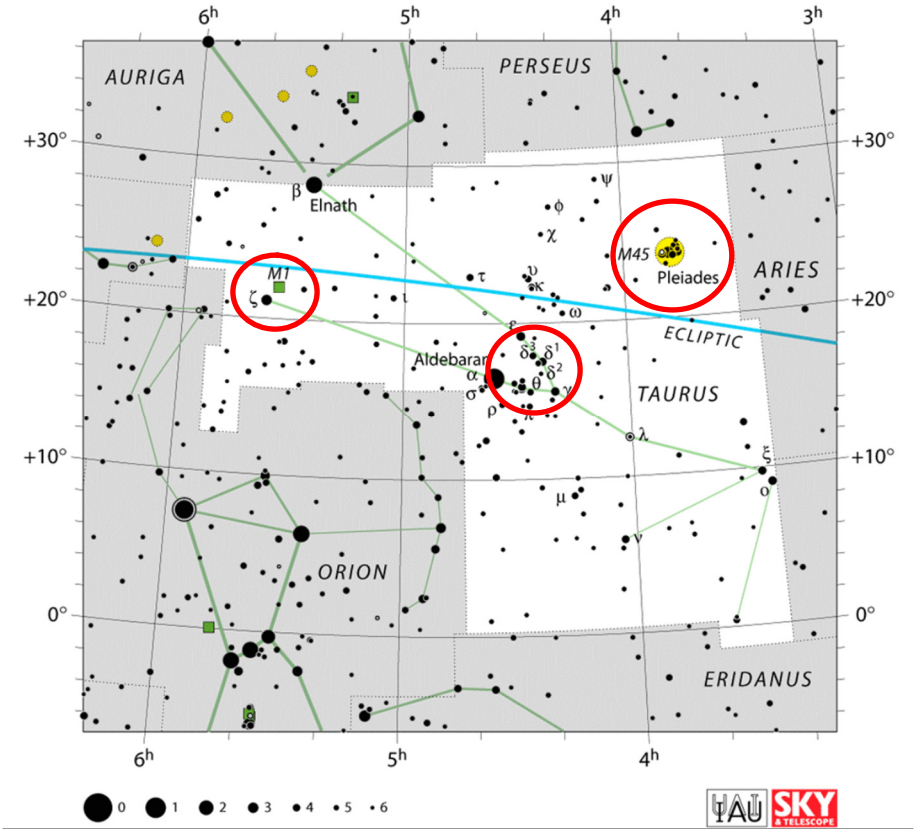
Best ISS viewing for New Braunfels (works for Canyon Lake too)

-From Heavens Above

Date	Start Time	Start Loc	Max Alt °	End Loc	Note
11/18	18:22	SW	65	NW	Enters Earth's shadow above the horizon
11/20	18:25	WSW	19	NNE	Enters Earth's shadow above the horizon
12/07	18:05	NNW	19	E	Close to Capella in Auriga
12/08	18:55	NW	61	SSE	Close to Vega in Lyra
12/09	18:07	NW	64	SE	
12/10	18:58	WNW	15	S	Close to Venus low along the horizon
12/11	18:10	NW	28	SSE	Between Saturn and Venus, closer to Saturn
12/16	06:05	S	11	ENE	Passes above Mars

My Observing Pick: Taurus

The old bull has been around a while. Dating back to at least the *Early Bronze Age*, this constellation has been used to mark the spring equinox and asociated with agricultural practices. This is the old bull of numerous cultural myths, including ancient Sumer, Akkad, Assyria, Babylon, Egypt, and of course Greece and Rome. Taurus is a large, spralling constellation with a distinctive streched V shape, forming its snout, face, and horns. Bright star Aldebaran forms the bull's right eye. The brighter V shaped pattern is open star cluster the Hyades (Caldwell 41, Collindar 50, Melotte 25), but Aldebaran is not a member. Another large open star cluster in Taurus, the Pleiades (Messier 45) is always a crowd pleaser. In binoculars or telescope its bright young blue-white stars are brilliant against a dark background. Messier 1, the Crab Nebula, a supernova remnant is a challenge in scopes smaller than about 6".



Mars Exploration turns 50

Where were you on November 14, 1971? Were you not born yet, too young, or just can't remember? Me, I was working and hanging out with friends, not aware of the momentous event occurring at Mars, and certainly not aware of the record making 5 launches that previous May. All five were set on a course for Mars, three from the Soviet Union and two from the US. We were in a heated space race with the USSR, and they were determined to beat us to Mars. After all, we overtook and ultimately beat them to the Moon.

NASA's Mariner 9 was the first earthly spacecraft to enter orbit around another planet, on November 14, 1971. The US won the race again, but not by much. The USSR's Mars 2 spacecraft reached orbit around Mars on November 27 and Mars 3 attained orbit on December 2, 1971. Now, that was a race!

While Mariner 9 made history, that isn't the whole story, not by a mile. Let's start at the beginning.

The Soviet Union turned the world upside down with its launch of Sputnik on October 4, 1957. The race for space was on! For the next few years the USSR would have many more successes that the US. But starting in 1962 the US's success rate improved drastically and the race started its neck and neck phase. JFK had set us on a course for the Moon…and beyond, but the race to mars also got off to a rough start.

1960 – The Soviets had an aggressive plan, with two launches for Mars, Marsnik 1 and 2 (Mars 1960A and B). Both failed to attain an Earth parking orbit and burned up.

1962 – The Soviets launched 3 missions. Sputnik 22 broke up in Earth parking orbit, Mars 1 lost communication as it approached Mars, and Sputnik 24 broke up as it attempted to transfer to Mars trajectory.

1964 – The US launched Mariner 3, but its protective shroud did not jettison so it could not attain a Mars trajectory. Mariner 4 was launched and succeeded in its Mars fly by mission. The Soviets launched Zond 2 which became the first spacecraft to successfully test an electric ion (plasma) engine. It lost communication before reaching Mars.

1969 – The US launched Mariners 6 & 7, both successful Mars flybys. The Soviets launched Mars 1969A & B, never officially announced. They both exploded during launch.

1971 – The Soviets launched 3 missions. Cosmos 419 never made it passed Earth parking orbit as its stage 4 was set to ignite after 1.5 years instead of the planned 1.5 hours. Mars 2 & 3 were successful orbiters, but the landers failed. The US launched 2 missions. Mariner 8 failed at launch. Mariner 9 succeeded, beating the Soviet orbiter Mars 2 by a couple of weeks.

Fast forward and we now have roving landers, one collecting samples for Earth return, a science station, and orbiting vehicles. Plans to send humans to Mars are progressing as competing companies push hardware and software development, and astronaut development. The trip will be long, maybe a one way for the first voyagers. -Eric Erickson

Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
11/18 NBAC Meeting 6:00 pm, at TJ's Loop 337	19 Full Moon 2:57 am CST & early am **Eclipse** Dusk: The full Moon is between the Hyades and Pleiades	20	21	22	23	24
25	26	27 Last Quarter Moon 6:28 am CST	28 Mercury reaches Superior Conjunction 11:00 pm CST	29	30	12/01
02	03	04 New Moon 1:43 am CST Venus at max brightness Mag -4.9	05	06 The crescent Moon is 1.9° S of Venus after sunset	07 The crescent Moon is 4° S of Saturn after sunset	08
09 A waxing crescent Moon is 4° S of Jupiter after midnight	10 First Quarter Moon 7:36 pm CST The Moon is 4° S of Neptune 7pm CST	11	12	13 The Geminid Meteor Shower is going on – start looking tonight in the **east** around 8 pm CST. A bright Moon interferes.	14 The Geminid Meteor Shower peaks 1 am CST. It's better after around 3 am CST when the Moon sets. Now look in the **west**	15 The Moon is 1.5° S of Uranus just after Midnight
16 NBAC Meeting 6:00 pm, at TJ's Loop 337						