New
Braunfels
Astronomy
Club Because It's Out There

March 17th, 2022
Meeting 270

Agenda

- Open meeting and introduce new members (get names, email)
- Old Club Business: Club organization
- New Club Business (events, outreach): Astronomical League membership & Library Telescope Program, Astronomy Night at TPML, March star party at Dots?
- Interesting observations, experiences: Trip to McDonald Observatory report
- Show and tell:
- What's in our sky this month? Newsletter + member input
- Main feature(s):
- Discussion, feedback and close the meeting

Notes:

Coming up: OUR 271st ASTRONOMY CLUB MEETING

April 21st, 2022, from 6 - 8 pm **Bosses Pizza on Loop 337**

astronomynbtx.org Email: info@astronomynbtx.org

Astronomy Friends New Braunfels…… facebook.com/groups/354953995432792/

Comal County Friends of the Night Sky…… facebook.com/groups/166098014710276/

comaldarksky.org/ Email: info@comaldarksky.org

New Braunfels Astronomy Club

Because It's Out There

Larry's Celestial Calendar & Newsletter

by Eric Erickson

296th Edition
Volume 25, Number 3
March 17th to April 21st, 2022

NBAC's 25th Year!

Cover Story> Brown Dwarfs

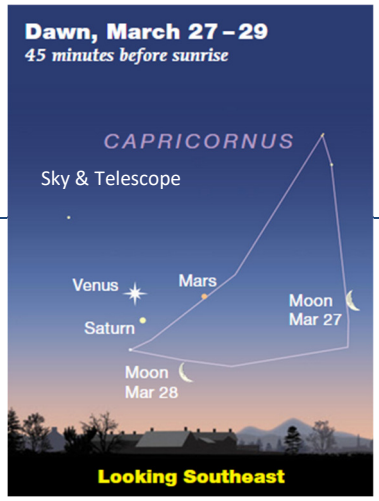
NASA/JPL

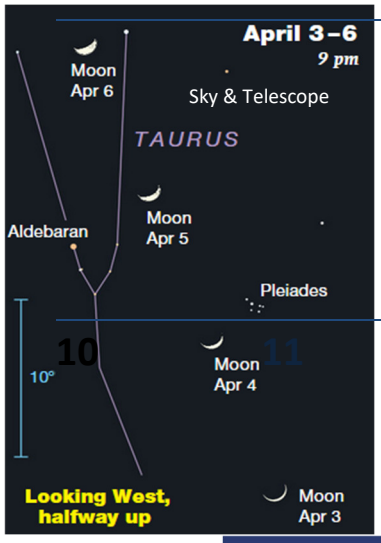
MAR/APR 2022

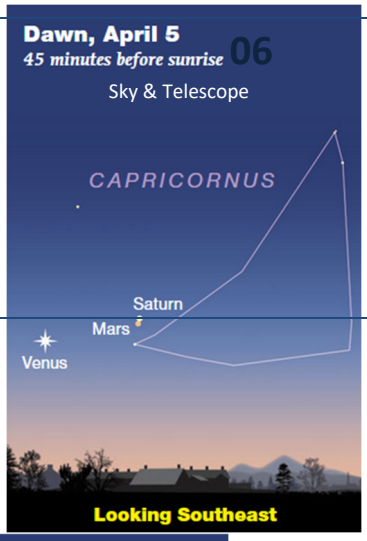
NBAC *OBSERVING CALENDAR*

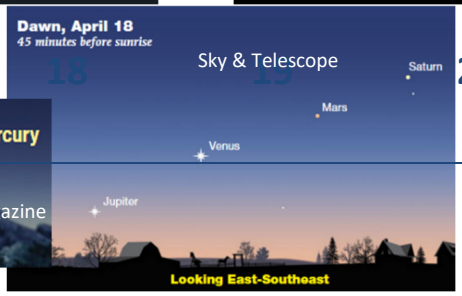
SUN	MON	TUE	WED	THU	FRI	SAT
				Mar 17	18	19
				NBAC Meeting 6:00pm Bosses Pizza on Loop 337		
20	21	22	23	24	25	26
27	28	29	30	31	Apr 01	02
					New Moon - no foolin!	
03	04	05	06	07	08	09
10	11	12	13	14	15	16
17	18	19	20	21		

On the Cover: A Brown Dwarf might look like this. Some call it a failed star. Others call it a giant planet. It's an object on the continuum - a Brown Dwarf.









NBAC Meeting 6:00pm Bosses Pizza on Loop 337

Solar System Happenings

- Mercury is a morning planet in March. Catch it before sunrise as it joins with Venus, Mars, Saturn, and the Moon at various times. On April 2nd it is in superior conjunction with the Sun. Mercury then arrives in the western sky just before sunset starting April 9th. It gets better in the following weeks and on April 17th it gets within 2° of Uranus.
- Venus is a morning planet, shining brilliantly in the east before sunrise. It joins with other planets and the Moon. It is waning in size and about 50% illuminated.
- Earth still spins, and we are still here to marvel at it all.

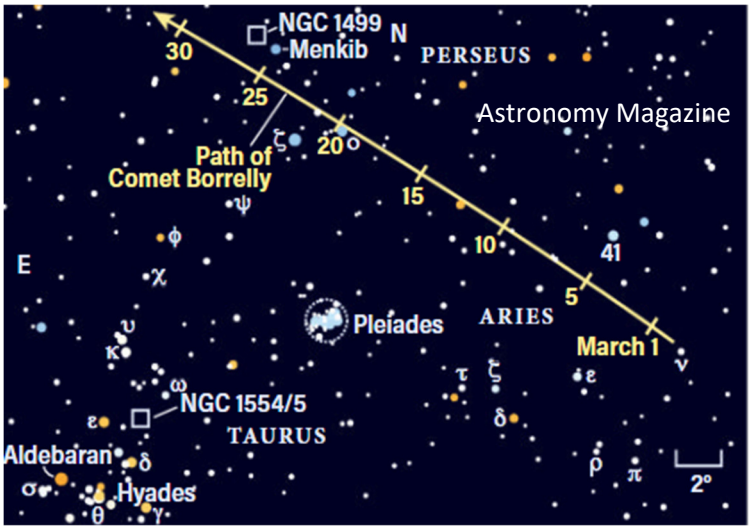
Zodiacal Light: Toward the end of winter and into spring zodiacal light is visible in the western sky. Get away from outdoor lighting and tall trees. Look in the west after sunset for a triangle shaped glow coming from the horizon. Zodiacal light is sunlight reflected by interplanetary light along the ecliptic. In spring zodiacal light points into the Milky Way for a double pleasure and photo opp.

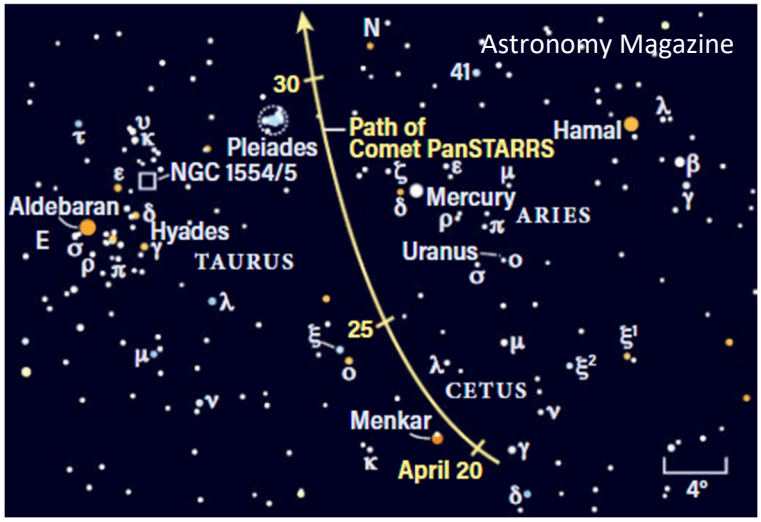
Best ISS viewing for New Braunfels (works for Canyon Lake too) -From Heavens Above

Date	Start Time	Start Loc	Max Alt °	End Loc	Note
03/17	20:50	ESE	26	NNE	Enters Earth's shadow before making the horizon
03/18	20:01	SW	49	NE	
03/20	20:02	W	16	NNE	Moves along the horizon
04/20	06:21	SSW	36	NE	Skirts above Saturn, Mars, Venus, and Jupiter
04/21	05:34	SSE	18	ENE	Exits Earth's shadow at 05:34. Slips below Saturn then above Mars, Venus and Jupiter.

- The Moon dances with planets and stars
- Mars is a morning planet, joining with Venus, Mars, Mercury, Saturn, and the Moon at various times. Jupiter joins the party in mid-April.

- Jupiter is in conjunction with the Sun, returning as a morning planet in mid-April and forms the foundation of a nice pre-dawn 4 planet lineup on April 18th.
- Saturn Is low in the pre-dawn eastern sky variously with Venus, Mars, Mercury, and the Moon. On April 18th it gets in a lineup with Jupiter, Venus, and Mars.
- Uranus is in southern Aries. At magnitude 5.8 it is catchable in binoculars. Look for a fairly bright greenish gray "star". On April 17th it and Mercury are around 2° apart in the post-sunset western sky.
- Neptune is in conjunction with the Sun.
- Comet(s)
  - Periodic comet 19P/Borrelly was discovered by French astronomer Alphonse Borrelly on December 28, 1904. Visually a challenge for 4" scopes, it should produce a nice image
  - C/2021 03 (PanSTARRS) comes on the scene for N. America on April 21st, but only in the southern states. Look for its core below Mercury just after sunset the night of our April meeting. Use binoculars or a telescope.





Cover Story

In-Between

My philosophic view of our universe is everything, really, everything that exists is on the spectrum of existence. I see existence as a smeared continuum vs. absolutes. An example is visible light. It's part of the electromagnetic spectrum. Red light is part of the visible light spectrum. But is there an absolute red? We humans have an insatiable need to categorize and compartmentalize, so astronomers use 656.281 nanometers wavelength, called hydrogen-alpha (H-alpha) as a standard. H-alpha light comes from the phenomenon of hydrogen atoms emitting light at this wavelength after ionization and returning to their natural energy state. H-alpha light is abundant since hydrogen is the most abundant element in our universe. However, 656.281 nm defines one red among the infinite possible red wavelengths surrounding H-alpha.

The same goes for stuff like celestial bodies (rocks, planets, stars, etc.). They live on the continuum of existence, and we categorize/name them based on characteristics such as mass, chemical makeup, luminosity, temperature.

We define stars by their sustained ability to fuse hydrogen into helium. Never mind stars that have depleted their hydrogen and fuse helium or other, heavier elements – they were stars to begin with. Our Sun is called a *yellow dwarf* star. Why? It's on the smallish side of the star size and mass spectrum and it produces a yellowish-white light. At 8% - 50% the Sun's mass, *red dwarf* stars are the smallest and dimmest stars, hydrogen fusion perking along and producing reddish light.

An object with mass below 8% of our Sun's mass (80 times Jupiter's mass) cannot sustainably fuse hydrogen. Those whose mass is 70-80 times Jupiter's might intermittently fuse deuterium. They're not called stars. They are not called planets either. These objects are called *brown dwarfs*. They are in-betweeners. They live in an area of the existence spectrum between planets and stars. It's a continuum. While Jupiter is cold in its clouds, -234 degrees F, objects greater than 8-10 times Jupiter's mass are hot all the way through. An object 70 times Jupiter's mass is hotter than a blast furnace and glows a dull red!

The process for a brown dwarf's formation has not been nailed down. One hypothesis is that they form in the same scenario as stars, but without enough mass to fuse hydrogen. Another is they arise during planetary formation around a nascent star and escape or get flung out of the planetary system. We do know brown dwarfs with 13 to 70 times the mass of Jupiter have super-hot atmospheres, with titanium oxide, magnesium silicate and iron clouds. Without sustained fusion brown dwarfs will slowly cool over hundreds of millions of years and just go cold.

-Eric Erickson

My Celestial Pick: Auriga

The Charioteer sounds adventerous. Auriga can be an adventure in observing and astrophotography. Auriga is Latin for the charioteer and was included in Ptolomy's original 48 constellations.

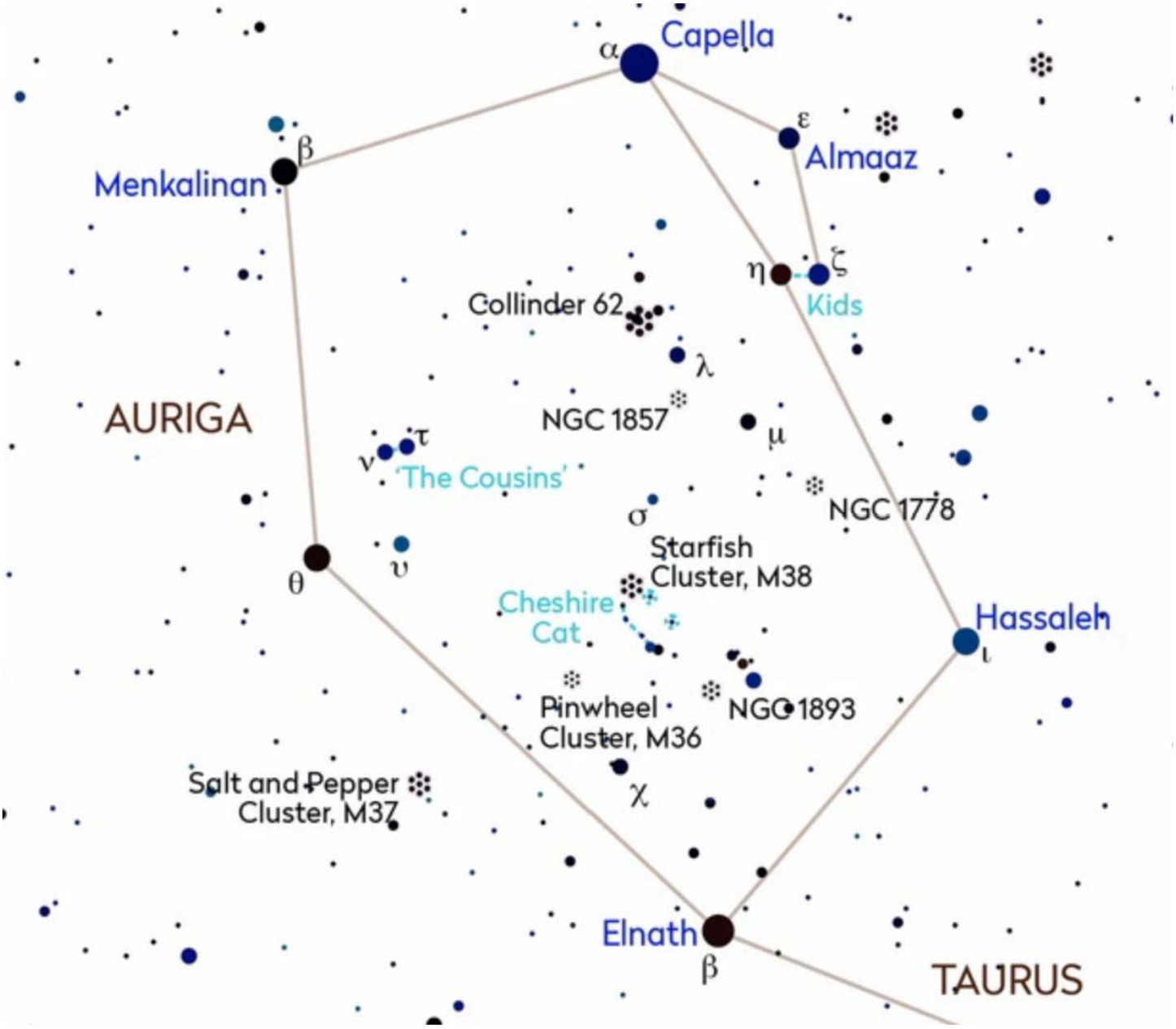
Auriga is central in many cultures but I will stick with the Greeks, they're fun. In Greek mythology Auriga is variously identified with Erichthonius, credited with inventing the 4-horse chariot, or Myrtilus, son of Hermes and charioteer for King Oenomaus (wine man). In keeping with Greek mythology, there has to be drama.

King Oenomaus feared death by son-in-law as prophesied, so he killed every suiter of his daughter, eighteen in all, by luring them into a chariot race, defeating and killing each. Then, to make a point, he mounts each of their heads on the wooden collumns of his palace. Along comes Pelops, son of king Tantalus, and gets his nerve up to ask for Oenomaus's daugher's hand in marriage. Doesn't he see the 18 heads up on posts? Oenomaus challenges Pelops to a chariot race with the intent to kill him. Well, after some twists and turns and shenanigans by Pelops, it turns out badly for Oenomaus (death by would-be son-in-law) and Pelops gets the daughter!

A bit of trivia, this epic chariot race Oenomaus lost is credited for originating what would become the Olympic games. I wonder if shenanigans is supposed to be part of the games? Seems most everyone tries them.

Auriga is easy to spot, it looks like an elongated and misshapen pentagon with bright star Capella anchoring.

Capella is a quadruple star system consisting of two binary systems. Capella A (a & b) cannot be separated visually. They are very close to each other, the distance of Venus to the Sun and only separable via spectroscopic analysis. The other binary pair is observable and are called H & L. Don't get excited, you will need around a 12" diameter scope or larger to separate them. And what about the other letters, B-G, I,J, and K? The *Washington Double Star Catalogue* lists stars in the Capella system up to R, but only Aa, Ab, H, & L are gravitationally associated in the Capella system. The others are "line of sight" companions, not associated but apparently close as they occupy the nearby sky. Check it out.


Capella
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TAURUS

Imagining Imaging: Platform for club imagers…images and imagers needed!

Lagniappe