New Braunfels Astronomy Club

Texas, USA

April 16th, 2020 — 248th Meeting (Zoom 1)

Larry's Celestial Calendar & Newsletter

273rd Edition

-by Eric Erickson

Comet PanSTARRS (C/2017 T2)

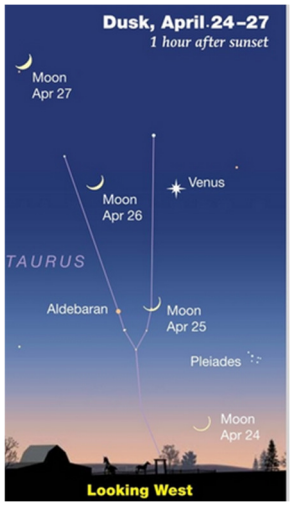
Lyrid Meteor Shower

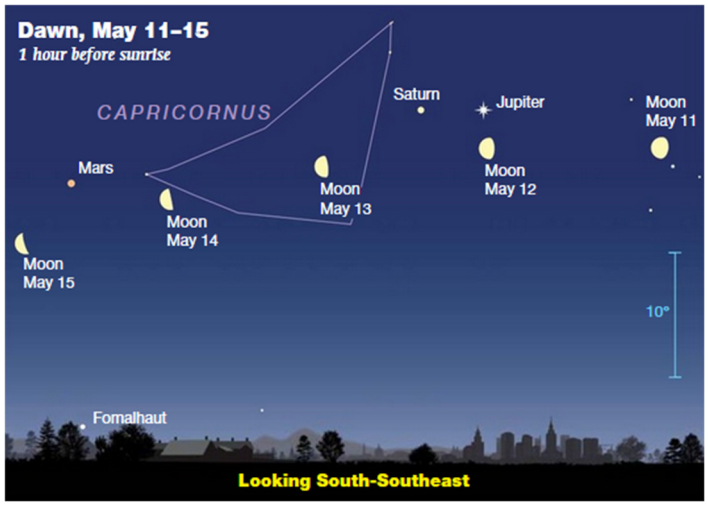
Eta Aquariid Meteor Shower

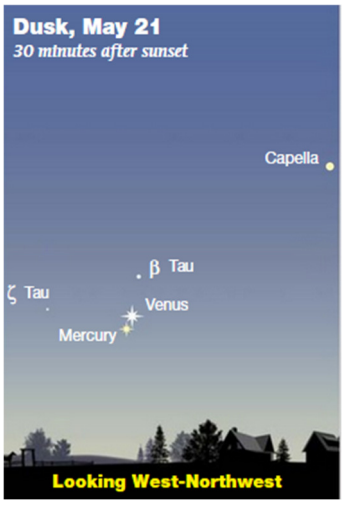
Venus & Mercury in Conjunction

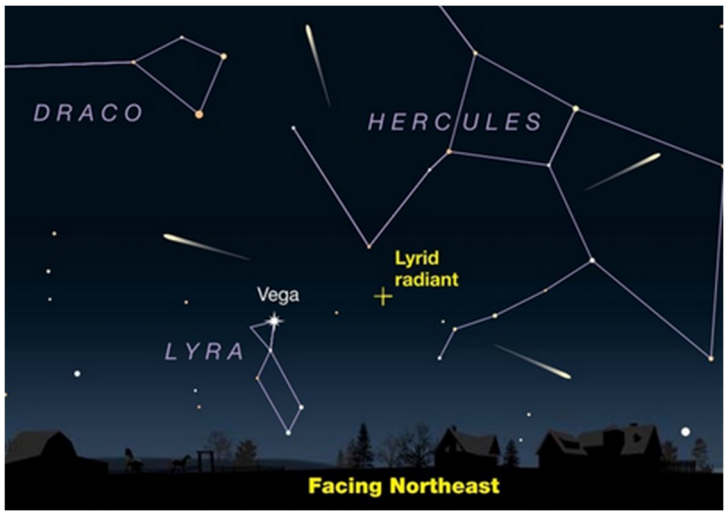
Observer's Highlight Calendar for Clear Skies

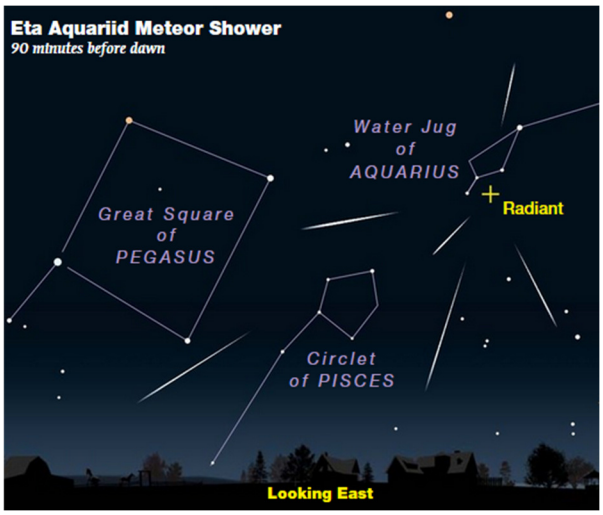
-From Sky and Telescope Magazine







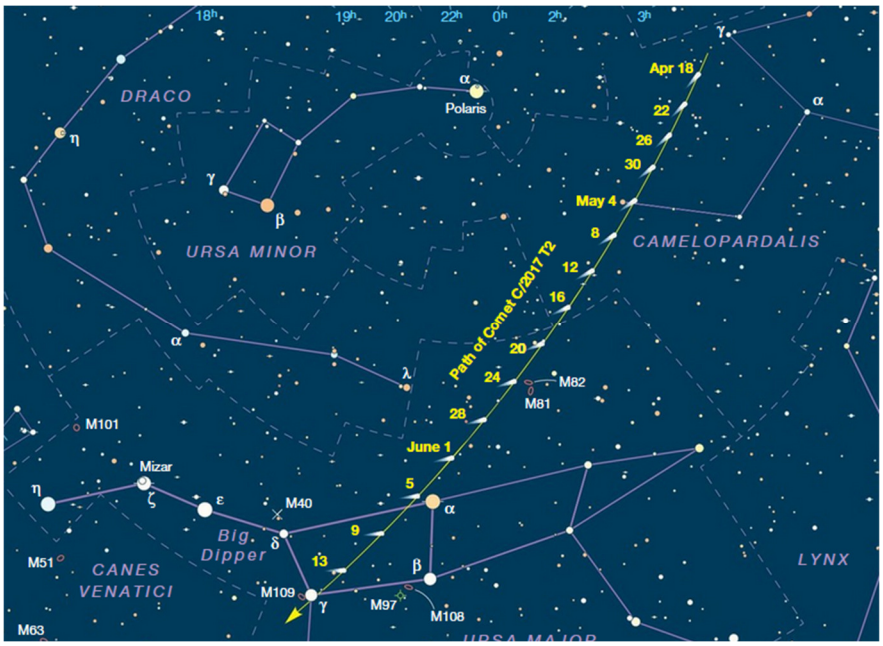




Month	Date	Time/Direction	Event
Apr	22	Before dawn/NE	Lyrid Meteor Shower (comet Thatcher) peaks
Apr	22	9:26 pm CDT	New Moon
Apr	30	3:38 pm CDT	First Quarter Moon
May	5	Before dawn/E	Eta Aquariid Meteor Shower (comet Halley) peaks
May	7	5:45 am CDT	Full Moon
May	11-15	Before dawn/SE	A waning Moon travels past Jupiter, Saturn, into Capricornus, then past Mars. On the 12th it makes a pretty triangle with Jupiter and Saturn
May	14	9:03 am CDT	Last Quarter Moon
May	21	After sunset/WNW	Venus and Mercury are in conjunction - pretty

Solar System Roundup

- Mercury is a morning “star” until May 11 when it moves to the evening
- Venus is an evening “star” and is in conjunction with Mercury on May 21
- Earth still spins, and we are still here to marvel at the wonders of our universe
- The Moon is with Venus in the evening, Jupiter, Mars, and Saturn in the morning.
- Mars is a morning “star”, and is joined by the Moon, Jupiter, and Saturn in the SE
- Jupiter is visible in the SE - early morning hours before sunrise
- Saturn is visible in the SE - early morning hours before sunrise
- Uranus is in the Sun’s glare and not a good target
- Neptune is in conjunction with the Sun
- Comet(s)
    - PANSTARRS (C/2017 T2) is around magnitude 9 and should be visible in binoculars at least 50mm, 4” or larger scopes.

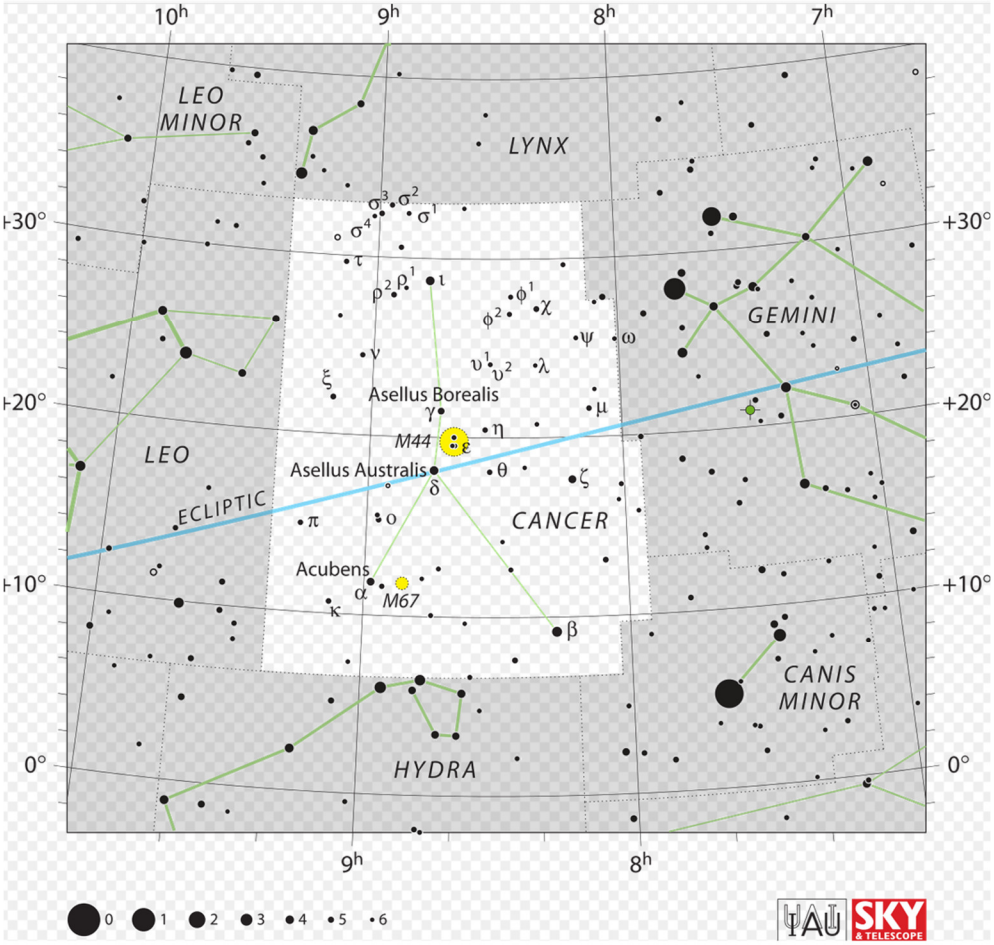


- ISS viewing for New Braunfels (works for Canyon Lake too).
  - From Heavens Above.

Date	Start Time	Start Loc	Max Alt °	Travel Toward	Note
04/23	06:01	SSW	42	NE	Gets very close to Jupiter
04/25	06:04	WSW	43	NE	
05/14	05:40	NNW	22	ESE	
05/15	21:31	SW	80	NE	
05/16	20:44	SWS	47	NE	Close to Arcturus
05/17	21:33	W	22	NNE	
05/18	20:46	WSW	39	NNE	
05/20	20:46	W	14	NNE	Close to horizon – gets close to Mercury and Venus too

My Observing Pick: Cancer

Where's the crab? I guess anyone who can read Latin can see the crab too. So, Cancer is Latin for crab. There is not much mythology, other than Heracles getting nipped in the foot by a crab as he fought the multi-headed Hydra. Heracles kills the crab and his enemy; goddess Hera sends it to the sky. What a great story!



See-Through Galaxies

Not kidding, there are galaxies that are transparent! Our Milky Way is not one of them, we are quite obscure thank you.

In 1984 Allan Sandage and Bruno Binggeli discovered the first see-through galaxy, in the Virgo supercluster of galaxies. This discovery, like many, changed how astronomers thought about galaxy formation. It also led to the term *ultra-diffuse galaxy* (UDG). Problem is, they are extremely difficult to detect, and this proved to be a huge challenge. Guess Sandage and Binggeli got lucky.

Fast forward to 2013. Two astronomers were wondering how to detect these virtually invisible galaxies. One came up with the idea of using new fast telephoto lenses from Canon (400mm f2.8) with special sub-wavelength coatings, in an array. An array would produce the equivalent of a larger lens, with a focal ratio even faster than f2.8. The idea was to capture very faint objects in wide field images, like the one Sandage and Binggeli found. Their instrument's lens coatings were optimal for imaging them.

Starting in 2013 with an eight lens array the astronomers imaged M101 in Ursa Major and discovered an anomaly in its halo. With this encouraging result they eventually settled on two arrays of 48 lenses each. So, each array has the light gathering capability of a one-meter telescope with an f ratio of 0.4, extremely fast! I have written about these lens arrays previously, so this part is a repeat. The arrays are called Dragonfly (DF).

Armed with their Dragonfly arrays, the team searches for UDGs and not surprisingly have found a few, DF2, DF4, and DF44. Here's where it gets interesting.

These tenuous galaxies appear to either have little to no dark matter or be mostly dark matter! When conflicts like this occur in science, it usually means something is amiss. In the case of UDGs, there might be issues with understanding how they form. Or they are weird.

We do know they have few stars but can be as large as the Milky Way.

How do UDGs form? One possibility is they are the result of galactic mergers. During the messy merger all kinds of stuff gets thrown around so they could be what are termed *tidal dwarf galaxies*. They might be the detritus collections of gas, dust, and stars tossed out from merging galaxies. Another idea is they are caused by a nearby quasar's ion winds causing gas clouds to form. Or, in another scenario, they could form from gas clouds between close galaxies in a group. Gas flows along gravitational "streams" but could be disrupted by one of the galaxy's supermassive black hole's relativistic jet of particles. It might get kicked away as a cloud big enough to form a UDG. All these hypotheses have problems fitting known models.

Let's just say, UDGs are a work in progress. And weird.

Eric Erickson

Coming up: OUR 249th ASTRONOMY CLUB MEETING

May 21st 2020, from 7 – 9:00 p.m. ZOOM meeting

New Braunfels Astronomy Club Meeting

Date:

Agenda

- Open meeting and introduce new members

- Interesting observations, experiences

- Show and tell

- What's in our sky this month? Newsletter and Abrams Sky Calendars

- What's going on – events, outreach

- Main feature(s)
  - Bob Keyser – Is Anyone There? The Drake Equation and probability of intelligent live in our universe

- Open for discussion

- Feedback and close the meeting