

Comet NEOWISE brightened our skies before dawn, then it swung around the sun and appeared below the Big Dipper after dark. Although not spectacular, it was the best comet we have seen in several years.

Solar System: Clif Ashcraft took several Moon closeups (Ptolemaeus, Purbach, Arzachel) and imaged Jupiter, Saturn, and finally Mars. On July 16 he found a *long white storm on Jupiter* at the edge of the North Equatorial Belt. Bobby Marinov imaged Jupiter and Saturn also.

Many people enjoyed observing Comet NEOWISE naked eye or with binoculars. Nice images were submitted by *Mary Ducca sitting at the left*, Isbel Gonzalez, Helder Jacinto, Neil Yoblonsky, and *Bobby*.

Stars: Steve Lowe has taken spectra of six Wolf-Rayet stars, both oxygen type and carbon type.

Tony Sharfman got an image of globular cluster M13 which resolved the stars near the cluster's center.

Deep Sky: Isbel used a remote half meter telescope in the Canary Islands for a colorful picture of the Helix Nebula.

Bobby imaged the Cygnus Wall, the Cat's Paw Nebula, the Iris Nebula, active *spiral galaxy NGC7331*, Stephen's quintet, and a multitude of tiny galaxies from a dark sky deep in the heart of Texas. NGC7331 is about 50 million light years from us in Pegasus and has been called the Milky Way's twin although it does not have a stubby bar like our galaxy does. It is part of the Deer Lick Galaxy Group with NGC 7335 (lenticular galaxy above 7331) and NGC 7337 (spiral above left of 7331). These are both about 350 million light years away from us. There are many other more distant galaxies in the image as well.

Presentations: Dennis Conti gave one of the AAVSO webinars, on exoplanet observing on July 18. Clif encouraged members to sign up for any of these 13 free tutorials in August and September (aavso.org).



Other: Clif presented a graph to calculate the telescope f ratio needed for Nyquist sampling for any given camera pixel size. He also provided a Moon mosaic grid plan and reported on drizzle and Barlow experiments he has been doing with Ralph Taggart in Australia.

Isbel pointed out that there are many Zooniverse and NASA citizen science projects.

John Kozimbo pointed out that two 15 year old girls used NASA data to find an asteroid shifting its orbit toward earth during a school project in India. There is also an organized effort to preserve NASA historic sites.

Bobby pointed out that the European Southern Observatory's VLT has taken a direct image of two Jupiter sized exoplanets orbiting a young sun-like star in Musca.

Respectfully submitted, Mary Lou West, Research Chair