Huachuca Astronomy Club
Sierra Vista
Arizona

Nightfall

A Publication of the Huachuca Astronomy Club

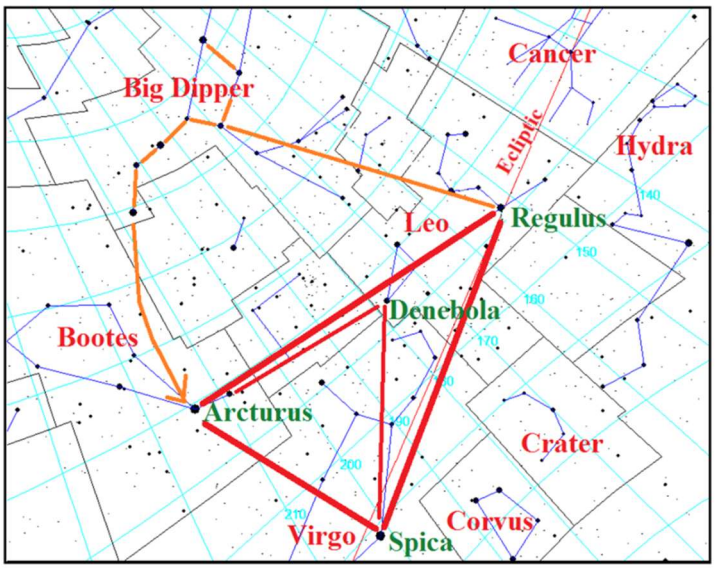
April 2017

President's Notes

Something for Everyone

As I write this, I'm looking out towards the freshly snow-dusted Huachuca Mountains, a bit of frost-melt dripping from the observatory roof, and the incredibly clear blue Sierra Vista sky: welcome, everybody to April. Whether you're an evening watcher or an early morning viewer, the sky this month has something for every observer.

The Spring Triangle



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Jupiter rules the night. Rising just after dusk and crossing the sky all night, Jupiter is well placed for observing, and when I say observing I mean wide-eye staring. The gas giant has a lot of cloud action going on and should be checked every night you're out. Long, dark ovals have appeared at the edges of several of the planet's cloud bands adding interest beyond just the Great Red Spot; a must see.

Those with eagle eyes and binocular-wielding observers of the early evening say goodbye to the winter Milky Way, Orion the hunter and the twins; and say hello to Leo, Hydra, Coma Berenices, Corvus, and Virgo. Away from the Milky Way, we are, for the most part, looking at stars local to our neighborhood, that is, in our arm of the galaxy. One way of getting to know this area of the sky is to frame it with bright stars. These imaginary frames serve (much like constellations) as common signposts to direct you and others around the sky. These are called asterisms. One well-known asterism is the Spring Triangle.

The Spring Triangle is classically drawn using the bright stars of Regulus in Leo, Spica of Virgo, and Arcturus of Boötes. Sometimes one star is changed and the asterism is formed by Arcturus, Spica and Denebola instead of Regulus, making a more nearly equilateral triangle. Denebola, which marks Leo's tail, is slightly dimmer than Regulus, but it is still an easy naked-eye star. Arcturus is a neighbor at just about 37 light years from Earth. It's a beautiful orange giant star. Spica is a blue giant about 250 light years away, not a close neighbor but a neighbor nonetheless. Spica is actually part of a spectroscopic binary system of stars [that is multiple stars inferred by the observed periodically changing (Doppler) spectral lines, rather than being able to be "split" visually]. Regulus, the brightest star in Leo constellation, is another neighbor only 79 light years from Earth, and is also composed of multiple stars. Regulus A is a spectroscopic binary system composed of a blue-white main sequence star and a companion believed to be a white dwarf. The two stars orbit each other about every 40 days. Getting to know these guide stars will help you get around this region of the sky's constellations. And for those of you who hunt with light buckets, the realm of spring galaxies is contained within the triangle.

For you night owls, the late night and early morning sky holds Scorpius, the summer Milky Way and a newly found comet, C/2017 E4 (Lovejoy). Terry James Lovejoy of Birkdale, Queensland, Australia, found the comet on March 9, 2017, dimly glowing at about magnitude 15 (on three CCD, 8-second exposures, taken five minutes apart with a HyperStar Celestron C14 operating at f/1.9 (+ QHY9 camera)). It was just a faint fuzzy spot in Sagittarius. It has quickly brightened since then and is now visible in binoculars and small telescopes. April 20 to 22 will find the comet passing close to M31, the Andromeda Galaxy. By that time, the comet may also just barely reach naked eye brightness. Both the galaxy and the comet should be visible in same field in binoculars, and should make for a wonderful photo opportunity.

One last note. The Sun has been active the last week or two. During the Karchner star party, we saw sunspot groups spanning the orb. So there you have it, all the reasons you need for a great bout of insomnia.

Clear Skies, everyone.

At the April Meeting

The Dawn spacecraft has been in orbit around Ceres since March 2015, revolutionizing our understanding of the only dwarf planet in the inner solar system. This talk will focus on new discoveries and new mysteries from Dawn's exploration of Ceres, including the anomalously bright areas on the surface.

Margaret is a National Science Foundation Graduate Research Fellow and PhD candidate in the Department of Planetary Sciences/Lunar and Planetary Laboratory, working with Dr. Shane Byrne characterizing the impact crater population of the North Polar Layered Deposits, Mars. Her project has recently been expanded to include the South Polar Layered Deposits. Her research focus is on impact processes and frost transport. She has recently started working on numerical simulations of ground ice stability and evolution on Ceres.

Margaret received her B.S. in Physics and Astronomy from Northern Arizona University, with minors in biology and mathematics. She wrote her senior honors thesis on the impact population of south-central Arabia Terra and the implications for volatiles. She also did an REU at the Harvard-Smithsonian Center for Astrophysics comparing WISE and Spitzer IR observations of disks to detect variability changes.

Margaret is from Bellingham, Washington, and says monsoon season in Tucson is her favorite thing about living in the desert.

Welcome our new members

Rhoda Bryant and Steve Lamberson of Palominas joined as a family at the March meeting. They both own Celestron telescopes. John Sullivan of Sierra Vista also joined at the March meeting. Jennifer Belieff of Sierra Vista is our newest student member. She joined via our website application the day after our March meeting. Welcome! We are glad you joined.

March Star Party Corner

By Keith Mullen, HAC Member Star Party Coordinator

On Saturday March 25th, 21 members gathered at RGO for what was scheduled to be an all night Messier Marathon. Although most came out with intentions on calling it a night sometime around midnight, there were 7 who took the pledge to see the sun come up at 6:10 am and feast on a Marathon Breakfast.

Before we even had a chance to observe M-74 the clouds rolled in and didn't give us much hope of catching more than a dozen or two all night. As the story goes needless to say, everyone except Carlos Zenzio and myself had packed up and were already home by 1:00 am, and that was only because we were working on Carlos's Bino's. Jupiter peaked out at about 1:30 so we decided to check it out with colored filters. We spent the next couple hours just on Jupiter and hardly noticed the sky had completely cleared so we just hung around until sunup and called it a night. We've had 6 Messier Marathons here with 2 complete and four washouts, anyone care to give 2018 a try, I'll be here!

Next month's scheduled member star party will be hosted by Bob & Barb Kepple at their beautiful Desert Starlight Observatory on Sat. April 22nd and May's will be at the Blue Marvel Observatory of Gary and Aracelis Grue on Sat. May 20th.

Protecting Arizona's dark skies

by Dana Cole, Sierra Vista Herald

April 5, 2017

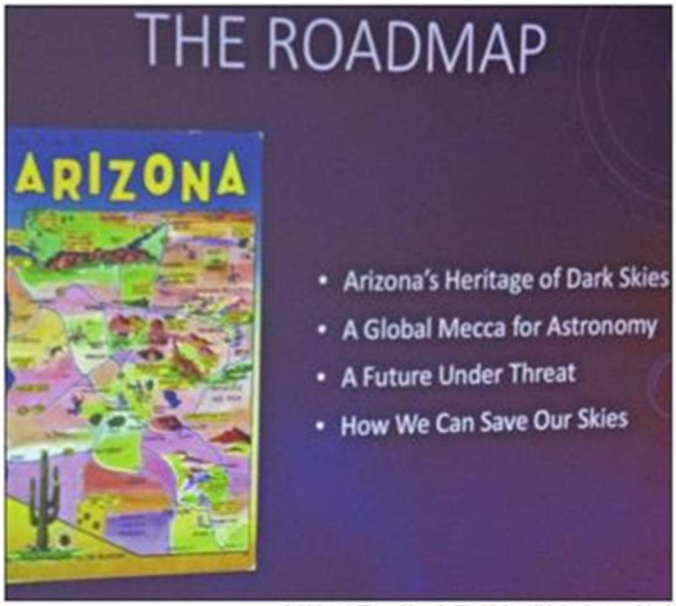
Huachuca Astronomy Club of Southeastern Arizona members patiently wait for the skies to clear Saturday afternoon at Kartchner Caverns in Benson. Clouds prevented club members and attendees from observing the sun while using special hydrogen alpha solar filters. The Astronomers of Verde Valley were also on hand for the viewing.

BENSON — Uncooperative weather forced astronomers to pack up early Saturday for the annual spring astronomy program at Kartchner Caverns State Park, but a presentation in Kartchner's Discovery Center auditorium was conducted as planned.

Ten astronomers volunteered for the event — designed as an educational program for the public — to help encourage the protection of dark skies. The program started with solar telescopes set up at 1 p.m. for the public's benefit, but

cloudy, rainy weather ended the daytime and nighttime viewing.

As with Kartchner's past astronomy events, there was a 5:30 p.m. presentation in the facility's auditorium. Guest speaker John Barentine, Ph.D., astronomer and program manager for the International Dark-Sky Association, spoke about the future of Arizona's night skies and the importance of preserving the dark skies from the growing threat of light pollution.



SIERRA VISTA HERALD STAFF PHOTO BY DANA COLE

Four key topics discussed by John Barentine, Ph.D., program manager for the International Dark-Sky Association during his lecture Saturday evening as part of an astronomy program at Kartchner Caverns State Park.

His talk, "Arizona's Night Skies: Past, Present and the Future," started with a review of archaeological and historical evidence for astronomy in Arizona's past. He touched on the relationship prehistoric cultures had with the night sky, dating as far back as the 1300s, noting that early cultures relied on the dark sky for farming, warfare and religion.

He spoke of the arrival of the Europeans in the 1500s and credited Father Kino as being the first European astronomer in the New World.

"Percival Lowell is the beginning of modern astronomy in Arizona," Barentine said. He built an observatory in Flagstaff in the early 1900s where he studied Mars, a planet that he adamantly believed was inhabited. It's a belief he maintained until his death in 1916.

In 1930, Pluto was discovered at Lowell Observatory.

The history of astronomy and its importance in Arizona continues with the founding of Kitt Peak in Tucson in 1958 and its collection of world class telescopes. After looking at several different sites throughout the United States, the National Science Foundation settled on Kitt Peak. Today, 60 years after its founding, the site is home to the densest collection of research telescopes in the world.

Arizona also is the first planetary research site in the world, with its laboratory on the University of Arizona campus. In addition, the UA is currently building mirrors for the biggest telescopes in the world, said Barentine, representing an important science and engineering investment.

"That means money," Barentine said.

But to keep conditions right for Arizona, it requires a good economic argument.

"The Arizona Astronomy and Space Science sector commissioned a study in mid-2000 that determined the annual value of astronomy to the Arizona economy is about $250 million," Barentine said. That amount is equivalent to (roughly) what a state would expect to make if awarded the Super Bowl.

So, what does astronomy's future look like in Arizona given the explosive growth from cities like Phoenix?

Arizona's night skies are getting brighter, Barentine warned.

The light pollution that comes with a growing city could threaten the important work being conducted at Kitt Peak and other observatories throughout the state, Barentine warned.

Astronomy has a future in Arizona, but part of that will depend on what cities do about light pollution in the future. Making better decisions about lighting in terms of policy and technology in the future will help to maintain the state's dark skies.

"By and large, we are wasting a lot of light," Barentine said. "If we could just combine the light that we generate to the ground where it is needed and not emit it up into the night sky, we would save about 50 percent of the light that we generate."

In the United States alone, that's a waste of about $20 billion a year from residential lighting alone.

Barentine recommends using light only when needed, shielding light so it's directed to the ground and using such adaptive controls as motion sensors as important steps in protecting the night

He also praised lighting codes that have been adopted by Cochise County and Sierra Vista and said that Benson is well on its way.

SIERRA VISTA HERALD STAFF PHOTO BY DANA COLE

Bob Gent, an astronomer with the Huachuca Astronomy Club, left, introducing speaker John Barentine, Ph.D., program manager of the International Dark-Sky Association. Barentine presented on the importance of protecting Arizona's dark skies Saturday evening during an astronomy event at Kartchner Caverns.

Barentine grew up in Phoenix and was involved in amateur astronomy there from grade school. He attended the University of Arizona, beginning research in jobs at the National Optical Astronomy Observatories and National Solar Observatory headquarters in Tucson. He obtained a master's degree in physics at Colorado State University and a master's and Ph.D. in astronomy at the University of Texas at Austin. The asteroid (14505) Barentine is named in his honor.

This article is provided by NASA Space Place.

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Space Place Article March 2017

What It's Like on a TRAPPIST-1 Planet

By Marcus Woo

With seven Earth-sized planets that could harbor liquid water on their rocky, solid surfaces, the TRAPPIST-1 planetary system might feel familiar. Yet the system, recently studied by NASA's Spitzer Space Telescope, is unmistakably alien: compact enough to fit inside Mercury's orbit, and surrounds an ultra-cool dwarf star—not much bigger than Jupiter and much cooler than the sun.

If you stood on one of these worlds, the sky overhead would look quite different from our own. Depending on which planet you're on, the star would appear several times bigger than the sun. You would feel its warmth, but because it shines stronger in the infrared, it would appear disproportionately dim.

"It would be a sort of an orangish-salmon color—basically close to the color of a low-wattage light bulb," says Robert Hurt, a visualization scientist for Caltech/IPAC, a NASA partner. Due to the lack of blue light from the star, the sky would be bathed in a pastel, orange hue.

But that's only if you're on the light side of the planet. Because the worlds are so close to their star, they're tidally locked so that the same side faces the star at all times, like how the Man on the Moon always watches Earth. If you're on the planet's dark side, you'd be enveloped in perpetual darkness—maybe a good thing if you're an avid stargazer.

If you're on some of the farther planets, though, the dark side might be too cold to survive. But on some of the inner planets, the dark side may be the only comfortable place, as the light side might be inhospitably hot.

On any of the middle planets, the light side would offer a dramatic view of the inner planets as crescents, appearing even bigger than the moon on closest approach. The planets only take a few days to orbit TRAPPIST-1, so from most planets, you can enjoy eclipses multiple times a week (they'd be more like transits, though, since they wouldn't cover the whole star).

Looking away from the star on the dark side, you would see the outer-most planets in their full illuminated glory. They would be so close—only a few times the Earth-moon distance—that you could see continents, clouds, and other surface features.

The constellations in the background would appear as if someone had bumped into them, jostling the stars—a perspective skewed by the 40-light-years between TRAPPIST-1 and Earth. Orion's belt is no longer aligned. One of his shoulders is lowered.

And, with the help of binoculars, you might even spot the sun as an inconspicuous yellow star: far, faint, but familiar.

Want to teach kids about exoplanets? Go to the NASA Space Place and see our video called, "Searching for other planets like ours": https://spaceplace.nasa.gov/exoplanet-snap/

This artist's concept allows us to imagine what it would be like to stand on the surface of the exoplanet TRAPPIST-1f, located in the TRAPPIST-1 system in the constellation Aquarius. Credit: NASA/JPL-Caltech/T. Pyle (IPAC)

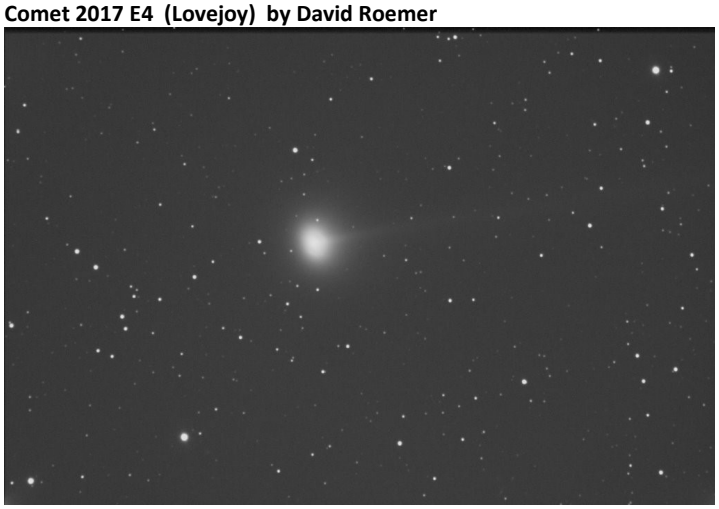
Pictures from HAC Members

M 108 By Mike J. Shade

NGC 3190 By Mike J. Shade

M6 Lagoon Nebula by David Roemer

Comet 2017 E4 (Lovejoy) by David Roemer



want Ads

For sale: Meade EXT60AT never used before, includes tri-pod.

Asking $200.00 B/O
Contact Keith Mullen at 266-4230

For sale: Meade 10" LX200 classic telescope

In very good condition, with tripod, 120v AC and 12v DC power converters with 25' power cords, dew shield, 8x50 finder scope, electric focuser, piggy back bracket, and soft sided carrying case.Also includes a set of Meade CCD color filters, Meade CCD 3.3 focal reducer and CCD variable T-adapter. Plus some other equipment. Asking $ 1,800.

Contact Bob Stroxtile at strox@ssvecnet.com or call 520-249-0875.

For Sale: Pier Tech electric telescoping pier with Lati-wedge made for the latitude of Sierra Vista

All the hardware, bolts, nuts, washers and plates are with the pier. Pier Tech can make new legs for it to make it correct for anywhere in the world. The pier and wedge have never been used and the only time the pier was out of the box was to take the photos. New today, the pier and wedge are $3,400. Asking $2,800.

Contact Bob Stroxtile at strox@ssvecnet.com or call 520-249-0875.

FOR SALE: Meade Starfinder 8" Reflector Telescope

Will Sell at a very reasonable price. Included are a Telrad Finder, Filters, and additional Lenses.

Contact Mr. Jim Moses at (520) 803-0913 or by email jjmoses2@gmail.com

For Sale: Planewave CDK14 corrected Dall-Kirkham telescope.

Includes the OTA, new November 2014, optional truss rod shroud and optional upper dovetail and the accessories that were included with the telescope (primary to secondary spacing tool). There is NO FOCUSER (they do not come with one, you need to add one) but the adapter for an Optec TCFS3i (which is the focuser I used) is included. I also have the factory wooden shipping crate. The telescope has been in use every clear night in the observatory in Sonoita. This is an outstanding instrument and a great imaging scope.

FOR SALE: Celestron Celestar 8 inch S/C Deluxe - $1200.

Will also sell pieces individually

Contact Rhonda and Terry Taylor at (520) 366-2378 or by email at twrl2@yahoo.com. Or See Craigslist at http://sierravista.craigslist.org/bar/4523742100.html

FOR SALE: Older Optical Guidance Systems 12.5" f/9 Ritchey-Chretian telescope.

Very good Paul Jones ceramic optics, Robofocus secondary focuser, will include Takahashi collimating telescope. Some of the images through the scope are at Mshadephotography.com.

Contact Mike J. Shade at mshade@q.com

FOR SALE: 8" Celestron Nex Star

Good condition with all original accessories.

Contact Mae Childs at maechilds2014@aol.com

FOR SALE: 12.5" dob

Made by an local ATM in Tucson for 500.00. Celestron 8" OTA with additional Hyperstar III Optics from Starizona. Both for 1000.00

Contact Max Mirot at galiloeo@yahoo.com

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HAC Apr/May Calendar of Events

SU	MO	TU	WE	TH	FR	SA
2 May	**3** 2:39 PM	**4**	**5**	**6**	**7** Jupiter at Opposition	**8**
9	**10**	**11** 2:08 AM Caring Con. Students Patterson	**12** Yuri's Day 	**13**	**14** **HAC Meeting Library Commons**	**15** Family Day Open House at Patterson 9A to Noon
16 Easter 	**17**	**18**	**19** 5:57 AM Phoenix Bot Gardens Group at Patterson	**20** Earth Day Vet Park 10A-2P	**21** Lyrid Meteors	**22** Member Star Party Kepple's Desert Starlight Observatory Lyrid Meteors
23 Lyrid Meteors	**24**	**25**	**26** 8:16 AM	**27**	**28** 7 PM Village Meadow Elementary	**29**
30	**1 May** Col. Smith -Day 12:45-1:30 Faras -Evening 6:30-8:00	**2** 10:47 PM	**3**	**4** Patterson Public Night 7:30 PM	**5** Eta Aquarid Meteors	**6** Eta Aquarid Meteors
7 Eta Aquarid Meteors	**8**	**9**	**10** 5:42 PM	**11**	**12** Hac Meeting Student Union	**13**
14	**15**	**16**	**17** Mercury W. Elongation	**18** 8:33 PM	**19**	**20** Member Star Party Grue's Blue Marvel
21	**22**	**23**	**24**	**25** 3:44 PM	**26**	**27**
28	**29** 	**30**	**31**	**1 Jun** 8:42 AM Patterson Public Night	**2**	

All event times MST. Join Haclist to keep up to date with all of the Huachuca Astronomy Club events
Send an email to: haclist-subscribe@yahoogroups.com