NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

FEBRUARY 2018

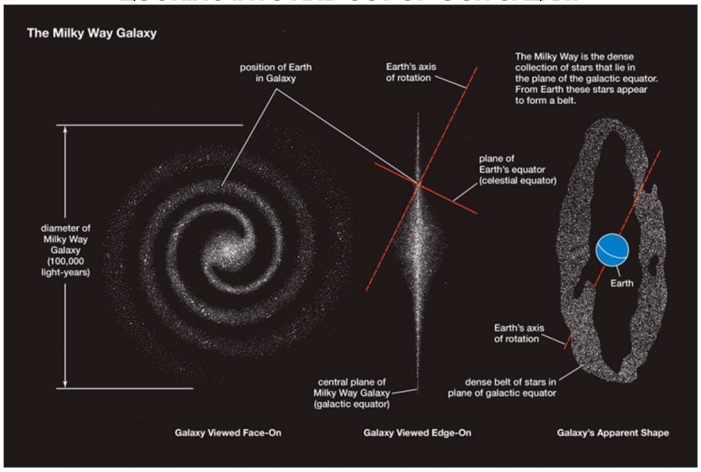
PRESIDENT'S NOTES

TRAVEL AT LIGHTSPEED EVERY CLEAR NIGHT

Well it's February and the winter Milky Way, the Perseus arm of the galaxy, has passed overhead on its ever-westward travels. What is left to its east is a hole in our celestial canopy. In the graphic below, the far-right section shows the two windows allowing us to look beyond our galaxy. Sure, we have some very bright stars in the constellations of Cancer, Leo, and Virgo but they are neighboring stars set in the inky black background. We see bright stars in the foreground of the Milky Way as well, but they are harder to pick out from the background stars. This stars form a halo all around our sun, as they are a usually part of our same local arm in the galaxy. The brightest star in Leo for instance, Regulus, is only about 85 light-years away; just next door.

The two left views in the graphic show our position in an arm of the galaxy and the view we see looking out from Earth inward, toward the Milky Way center, or out along the disk of the galaxy. These stars are our neighbors, in our own galaxy, they are in local space.

LOOKING INTO AND OUT OF OUR GALAXY



Source: PBS & WGBH Educational Foundation, 2018,https://az.pbslearningmedia.org/asset/141482428-earth-space/

But, if we aren't looking along the disk, we can look outward without all those galactic stars. Once we look beyond the halo of our galactic arm out into that inky background, the view is entirely different. That is deep space. The intergalactic void. The realm of the galaxies. Somewhere even science fiction seldom goes.

Right now, we have no star drives or warp engines to span those distances. Nor do we want to board a ship and spend tens of thousands of generations (at the slow velocities our present rockets can achieve) just to visit these far away galaxies. So, what a relief it is that we can travel beyond the void while sitting comfortably in our backyards, with the help of a telescope. We don't even need to use compressed oxygen. But how can we do that, the nearest neighboring galaxy (Andromeda) is 2.5 million light-years away. What's the trick?

The trick and the truth are that the light from Andromeda and other galaxies (even much further away) has already taken the time needed to get here. The light started on its trip here as soon as the stars in those galaxies started shining. We are getting bathed by light from these far away galaxies all the time. Three rather bright galaxies (easily seen with a small telescope) in Leo, known as, yep, the Leo Triplet (also known as the M66 Group or, M65, M66, and NGC 3628), is a small group of galaxies about 35 million light-years away. Light that we see now left those galaxies long before the rise of primates on Earth. Some of the galaxies in the Virgo Cluster (another group of galaxies viewable with our telescopes) located in, right again, Virgo, are 65 million light-years away. I'm running a little long here, but my point is there are dozens of galaxies in this month's sky within the range of modest telescopes, like many of us own, and it's like we ordered that galactic light millions of years ago, so it would be a shame to not look up, focus the scope, and accept the order.

Clear skies everybody!

Welcome our new members

Dave Dechant of Sierra Vista, Lynn Moon of McNeal and Jerry and Dawn Doss of McNeal all joined the club at the January meeting. Lynn informs us that he owns a Meade DS2114 Reflector. Jessica Bijonowski joined the club via our online application this week. Welcome to the club, we are glad you joined!

At the February Meeting

Dr. Kat Volk, University of Arizona, Lunar and Planetary Laboratory will deliver a talk titled: "Are there unseen planets lurking in the Kuiper belt?"

Recent studies have found tantalizing clues pointing to the possibility that our outer solar system is hiding one or more unseen planets. These clues come from the observed set of Kuiper belt objects, icy bodies like Pluto that orbit the sun at distances beyond Neptune. The most distant of these Kuiper belt objects might be hinting at the existence of a 10 Earth mass planet a few hundred times farther from the sun than the Earth is. The unexpectedly warped average orbital plane of the more nearby Kuiper belt objects hints at a much closer, Mars to Earth mass planet. I will outline the evidence we have for these potential planets, discuss the challenges of finding objects in the distant solar system, and discuss ongoing and future surveys that will help us improve our inventory of the outer solar system.

Kat Volk is a planetary scientist at the University of Arizona's Lunar and Planetary Laboratory. She received her PhD in 2013. Her recent research focuses on the Kuiper belt, a population of small icy bodies in the outer solar system. She studies the orbits of Kuiper belt objects to find clues to how the larger planets in the solar system evolved from their initial to current locations. She is also part of the Outer Solar System Origins Survey, which has discovered over 800 new Kuiper belt objects, improving our understanding of the outer solar system.

The meeting will be held in the Student Union Building at Cochise College, 901 N. Colombo Avenue in Sierra Vista at 7 pm on February 9. The meeting is open to the public and admission is free. We will treat Kat to dinner at the Outback Steak House before the meeting. Please RSVP to Ted Forte if you would like to join us for dinner at Outback at 5pm.

HAC Dues for 2018

Are your HAC dues up to date? If you are unsure of your membership status, please check with the treasurer, Ted Forte. Most HAC memberships expire each December and there are a number of members that have not renewed yet. You may pay your dues by cash or check in person at the February 9 meeting. Make checks payable to “Huachuca Astronomy Club”. You may also pay your dues on-line at www.hacastronomy.org by pulling down the “Join” menu and clicking on “Renew”. You can use your credit card or PayPal account. You can also send your renewal check to PO Box 922 Sierra Vista, AZ 85636.

If you have paid your 2018 dues, THANK YOU! We appreciate your continued participation and support.

Outreach Opportunities

We have several outreach events coming up. (On Thursday, February 8 you are invited to set up telescopes at the historic Warren Ballfield in Bisbee. Gates open about 5pm for setup and socializing. The event runs from 7 till 9.

Wednesday February 14, we host a youth group at Patterson starting at 7 pm. Wednesday, February 21, we are asking members to set up telescopes for the students, parents and teachers at Coronado Elementary School in Hereford. The event starts at 5:30pm. Then Thursday, February 22 is our regular monthly public night open house at the Patterson Observatory. The public has been invited to arrive at 6:30 pm. On Friday February 23, we will do another school event at Joyce Clark Middle School in Sierra Vista. That event starts at 6 pm.

We need HAC members at all of these events. Please mark your calendar and try to come out.

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Space Place Article **January 2018**

Sixty Years of Observing Our Earth by Teagan Wall

Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there’s a disaster—such as a hurricane or a large fire—they can help track what’s happening. Then, communication satellites can help us warn people in harm’s way.

There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites

orbiting Earth. With that many always around, it can be easy to take them for granted. However, we haven't always had these helpful eyes in the sky.

The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America's first scientific instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet.

For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth's seas.

Satellites also help us to study Earth's atmosphere. The atmosphere is made up of layers of gases that surround Earth. Before satellites, we had very little information about these layers. However, with satellites' view from space, NASA scientists can study how the atmosphere's layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too.

When there's an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake . In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years, or even decades.

Satellites have also allowed us—for the first time in civilization—to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we're able to capture new pictures of our planet many times every day.

Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer 1—and the decades of hard work and scientific advances since then.

This photo shows the launch of Explorer 1 from Cape Canaveral, Fla., on Jan. 31, 1958. Explorer 1 is the small section on top of the large Jupiter-C rocket that blasted it into orbit. With the launch of Explorer 1, the United States officially entered the space age.

Image credit: NASATo learn more about satellites, including where they go when they die, check out NASA Space Place: https://spaceplace.nasa.gov/spacecraft-graveyard

Pictures from HAC Members

Super Blue Moon on Way to Eclipse by Bob Kepple

Super Lunar Eclipse from Jay LeBlanc

Comet C2016 R2 by David Roemer

M42 and M45 from Jay LeBlanc

The Moon in Color by David Roemer

Want Ads

For Sale: Meade 10" 2120 OTA with HTMC

I bought it on Cloudy Nights from a guy in Wickenburg, had the secondary professionally cleaned at Starizona in Tucson. The OTA comes with either a Celestron 1.25 visual back or a 2" rotating visual back, an adjustable focus finder as shown in the picture, and a Vixen style dovetail bracket. Of course, there is also a front cover.

Asking $500

Contact Carl Swanson at (480)600-7353 or cswanson@gotsky.com

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 the adapter for an Optec TCFS3i 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

Club Officers and Contacts

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Farpoint Astronomy http://www.farpointastro.com/

Starizona http://starizona.com/

HAC Feb/Mar Calendar of Events

SU	MO	TU	WE	TH	FR	SA
4 Zodiacal Light next two weeks	**5**	**6**	**7** **8:54 AM** Jupiter 4° S of moon	**8** Warren Ballpark 7 PM Mars 4° S of moon	**9** HAC Meeting Student Union	**10**
11 Saturn 2° S of moon	**12**	**13**	**14** Youth Group at Patterson 7pm	**15** **2:05 PM**	**16**	**17** Member Star Party at Gary Grue's Obsv.
18	**19**	**20**	**21** Coronado Elem STEM Night 6 PM	**22** Patterson Public Night 6PM	**23** **1:09 AM** JCMS 6PM	**24**
25	**26**	**27**	**28**	**1 Mar** **5:51 PM**	**2**	**3**
4	**5** Mercury/Venus Zodiacal light next two weeks	**6**	**7**	**8**	**9** **4:20AM** HAC Meeting Student Union	**10**
11 Daylight Savings Begins for most of USA	**12**	**13**	**14**	**15** Mercury greatest east elongation	**16**	**17** **6:12 AM** Mess Marathon RepoGazer
18	**19**	**20**	**21**	**22** Patterson Public Night 7PM	**23** **Patterson Open House 8-10PM**	**24** **8:35AM**
25	**26**	**27**	**28**	**29**	**30**	**31** **5:37AM**
1 Apr	**2**	**3**	**4**	**5**	**6**	

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