NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

MARCH 2018

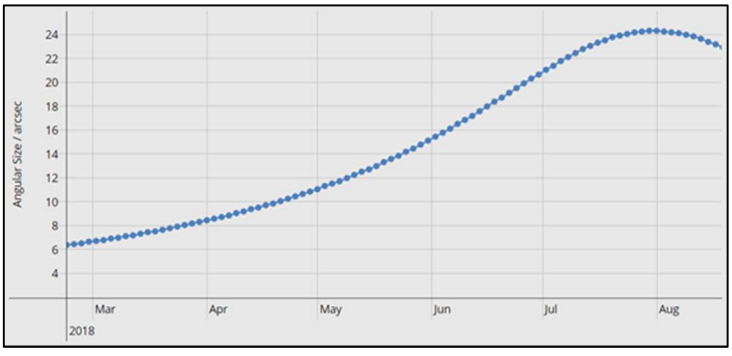
PRESIDENT'S NOTES

What… it's already March, you're kidding me!?! The local sky action (our own solar system team mates) this month is still in the predawn sky, with a parade of planets for your viewing pleasure. From west to east we have gas giant Jupiter; sci-fi star Mars; statuesque Saturn; and then, telescopically still a dot, Pluto. Yep, I know, I put Pluto in with the planets.

Jupiter is beautiful, as always. Binoculars are enough to see the four large Galilean moons, while even a small telescope can capture the large darker cloud bands and red spot, when it comes around; and come around it does. Jupiter's daily rotation is only 9.8 Earth-hours, so watching the gas giant for an hour gives you quite a spin. Again, in that time, even with a small telescope you will see the moons change their apparent distances from the plant and each other, and possibly notice subtle changes in the shape, width, and shading of the major bands. If viewed through a larger telescope, the show just gets better.

I haven't had a chance to get a peek at Mars yet, but we're catching up to the red planet on our way opposition in July. While still small, the apparent size of Mars (see graph) is steadily increasing in March. If you can put Mars on the viewing schedule every week or so, you will see the planet beginning to bloom in size. You may not see much surface detail yet, but you will get to know the look of the planet to be better prepared for opposition viewing, and maybe glimpse the changing ice caps along the way.

APPARENT SIZE OF MARS THROUGH OPPOSITION, 2018



Source: in-the-sky.org

Saturn's rings are beginning to close, as we see them from Earth. Nonetheless, they are still open wide enough to provide great views of the separate ring components. Don't expect to see much in the way of banding or cloud features on Saturn, certainly not like the images you commonly see.

Indeed, this is true of all the planets; surface and cloud features are usually subtle shadings rather than the rock solid transitions of the topographies of our moon. So what about color filters? Filter use is a big subject that I'll go into next month, but suffice to say, filters can add contrast to those delicate shades, help define borders of features, and bring out nearly invisible surface and cloud features.

'Til then,

Clear skies, everybody!

AT THE MARCH MEETING

Our March 9 meeting at 7pm in the Student Union, Cochise College Sierra Vista features a talk by Dr. Nick Ballering.

Nick is a postdoctoral research associate in astronomy at the University of Arizona, Steward Observatory. He received his B.S. in astronomy and physics from the University of Wisconsin, Madison. He then attended graduate school at the University of Arizona under the guidance of professor George Rieke, receiving his PhD in 2016. His research interests revolve around exoplanetary systems. What is their architecture? How do they form? How common or rare is our solar system? Nick works to answer these questions by observing circumstellar disks.

Nick uses ALMA to study the mass distribution of protoplanetary disks in stellar clusters to assess their potential for planet formation. He works with professor Josh Eisner and is a member of the Earths in Other Solar Systems team.

Talk title: Circumstellar Disks: Windows into Exoplanetary Systems

Talk abstract: Protoplanetary disks around young stars are the birthplaces of planets, while debris disks around older stars reveal the architectures of mature planetary systems. I will highlight my work on both classes of disks. The questions driving this research include: Do most protoplanetary disks have sufficient mass to form planets like those in our solar system? How are disks affected by their external environment? Do other planetary systems also have an asteroid belt, a Kuiper belt, and giant planets in between? I will also emphasize the dramatic progress made in the study of circumstellar disks since the advent of the ALMA radio telescope array, as well as the promise of future discoveries with the upcoming James Webb Space Telescope.

We will take Nick to dinner at the Outback Steak House before the meeting at 5pm. Members wishing to participate in the dinner should RSVP to Ted Forte.

2018 Membership Dues

Some members have not paid their dues for 2018. Dues will be collected at the March meeting (cash or check) Dues may also be paid on-line using a credit card or PayPal account at www.hacastronomy.org or mailed to PO Box 922 Sierra Vista, 85636.

The Kartchner Star Party

Saturday April 7 is our next star party at Kartchner Caverns State Park. Weather permitting; we will begin with solar observing about noon.

At 5:30 pm, our guest speaker, Dr. Grant Williams, will give a talk entitled The Three-Dimensional Nature of Supernovae: Are Exploding Stars Round?

Grant is an Astronomer at the University of Arizona's Steward Observatory and the current Director of the MMT Observatory. He earned a Bachelor's degree in Physics from the University at Buffalo in 1994 and an MS and PhD from Clemson University in 1996 and 2000. As a student, Dr. Williams worked on early experiments to search for the optical counterparts of gamma-ray bursts using robotic telescopes. His first postdoctoral position was at Steward Observatory assisting with the design, construction, and commissioning of the "90prime" instrument, a prime focus imager for the 90-inch Bok Telescope on Kitt Peak. Grant has been employed at the MMT Observatory since September 2002, initially as the first Firestone Postdoctoral Fellow and more recently (Oct. 2007 - Dec. 2010) as the Associate Director. He's also provided observatory and instrument support as a Staff Scientist and Technical Coordinator. He began his appointment as Director of the MMT Observatory on January 1, 2011.

Then, weather permitting, we will commence night sky observing after dark. These star parties always attract large crowds and are great fun. Volunteers that bring telescopes to set up are entitled to free admission to the park. Just explain to the ranger at the gate that you are part of the astronomy activity.

RAIN grant awarded to Patterson

The Patterson Observatory is the recipient of a Southeast Arizona RAIN Grant through the National Science Foundation to create a display space (a "mini science center") at the observatory. The new museum-like exhibit in the central bay of the observatory will feature astronomy and space science materials and artifacts. The new science exhibit area will be completed later this year. Club members will provide the labor and management to create the space. If you would like to be part of the project, have suggestions for displays, or objects to donate please let Ted Forte know.

The *Rural Activation and Innovation Network* (RAIN) is an Innovations in Development project supporting informal STEM education (ISE) in rural Arizona funded through a grant from the National Science Foundation.

Patterson daytime volunteers wanted

The University South Foundation will be offering small grants to area schools to help defray the cost of field trips to the UA Sierra Vista campus. Visiting students will tour the Discovery Gardens and the Patterson Observatory. We will need volunteers to man the observatory and operate the solar telescope for these field trips. With the completion of the mini science center later this year, additional daytime operating hours are anticipated as well. Anyone wanting to volunteer should contact Ted Forte. Training (talking points for the tour and operating instructions for the solar scope) will be provided.

St Patrick's Day Messier Marathon and Pot Luck

The March member star party will be a joint event with the Palominas Astronomy Club at Repogazer (Keith Mullen's observatory) 9911 E. Pleiades Place in Palominas. The pot-luck dinner and scope setup start at 4:30. Bring a dish to share. The star party goes on all night. Continental breakfast will be provided by Keith and Teresa for anyone who completes the marathon. Keith would like marathon participants to register. Contact Keith at 520 266 4230 to RSVP for the marathon and for directions.

This article is provided by NASA Space Place.

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Space Place Article **February 2018**

What Is the Ionosphere?

By Linda Hermans-Killiam

High above Earth is a very active part of our upper atmosphere called the ionosphere. The ionosphere gets its name from ions—tiny charged particles that blow around in this layer of the atmosphere.

How did all those ions get there? They were made by energy from the Sun!

Everything in the universe that takes up space is made up of matter, and matter is made of tiny particles called atoms. At the ionosphere, atoms from the Earth's atmosphere meet up with energy from the Sun. This energy, called radiation, strips away parts of the atom. What's left is a positively or negatively charged atom, called an ion.

The ionosphere is filled with ions. These particles move about in a giant wind. However, conditions in the ionosphere change all the time. Earth's seasons and weather can cause changes in the ionosphere, as well as radiation and particles from the Sun—called space weather.

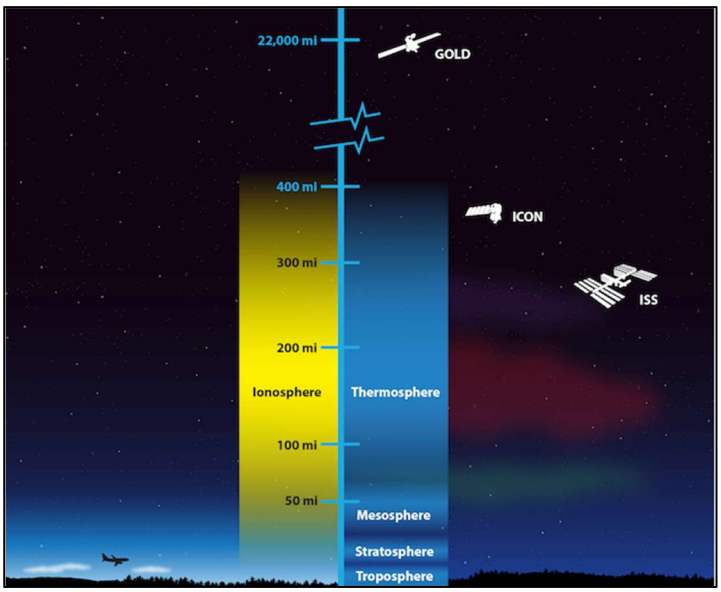
These changes in the ionosphere can cause problems for humans. For example, they can interfere with radio signals between Earth and satellites. This could make it difficult to use many of the tools we take for granted here on Earth, such as GPS. Radio signals also allow us to communicate with astronauts on board the International Space Station, which orbits Earth within the ionosphere. Learning more about this region of our atmosphere may help us improve forecasts about when these radio signals could be distorted and help keep humans safe.

In 2018, NASA has plans to launch two missions that will work together to study the ionosphere. NASA's GOLD (Global-scale Observations of the Limb and Disk) mission launched in January 2018. GOLD will orbit 22,000 miles above Earth. From way up there, it will be able to create a map of the ionosphere over the Americas every half hour. It will measure the temperature and makeup of gases in the ionosphere. GOLD will also study bubbles of charged gas that are known to cause communication problems.

A second NASA mission, called ICON, short for Ionospheric Connection Explorer, will launch later in 2018. It will be placed in an orbit just 350 miles above Earth—through the ionosphere. This means it will have a close-up view of the upper atmosphere to pair with GOLD's wider view. ICON will study the forces that shape this part of the upper atmosphere.

Both missions will study how the ionosphere is affected by Earth and space weather. Together, they will give us better observations of this part of our atmosphere than we have ever had before.

To learn more about the ionosphere, check out NASA Space Place: https://spaceplace.nasa.gov/ionosphere



This illustration shows the layers of Earth's atmosphere. NASA's GOLD and ICON missions will work together to study the ionosphere, a region of charged particles in Earth's upper atmosphere. Changes in the ionosphere can interfere with the radio waves used to communicate with satellites and astronauts in the International Space Station (ISS). Credit: NASA's Goddard Space Flight Center/Duberstein (modified)

Pictures from HAC Members

Rosette Nebula by David Roemer

M51 Whiirlpool Galaxy by Alex Woronow

Exposures
Â Â Â HÂ Â Â 11 x 1800
Â Â Â LÂ Â Â 19 x 1200
Â Â Â RÂ Â Â 12 x 1200
Â Â Â GÂ Â Â 9 x 1200
Â Â Â BÂ Â Â 9 x 1200
Â Â Â TOTAL (21.8 hours selected from 29 hours available)
Width of image ~36

Scope: RCOS 14.5 at Deep Sky West
Processing: PixInsight
M 51, the Whirlpool Galaxy and it companion (M 51B) have undergone a collision with the dwarf-galaxy B component, which is now emerging from M 51, and has suffered major disruption. This collision spawned an enormous amount of star birth in M 51. The blue regions are young, hot stars and the red regions are ionized hydrogen clouds the stuff of which stars will yet be made. In addition to star birth, the collision has dispersed clouds of stars causing the haze surrounding both galaxies.The Whirlpool, a Seyfert galaxy, has a super-massive black hole at it center surrounded by swirls of dust and stars. It lies about 23 million light-years from earth.

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

For Sale: 8" Celestron Nex Star

Good condition with all original accessories.
Contact Mae Childs at maechilds2014@aol.com

Fork Mounted C-14 for Sale

This monster telescope is not a grab and go. It is at the limit of one person setup. At well over 100 lbs. of heavy metal, it deserves its own place. Nor is it a go-to, although I have added electronic setting circles and push-to computer. The Lumicon NGC-Max is a standalone computer, but can also be connected to a PC to use with planetarium programs, like "The Sky". The cables are included.

This scope works wonderfully at f/11, pulling in faint fuzzies and tack-sharp planets. May I mention Mars is coming? Also included is the Lumicon Giant Easy Guider system for those times you want to view or image at a few f-stops faster. The giant easy-guider changes the telescope to either f/7 or f/5 for wide-field viewing and includes a prism guiding port for guiding eyepiece.

If f/5 isn't fast enough for your imaging pleasure, then strip off all that stuff, put on the Starizona HyperStar Type 3 Lens, and shoot without guiding at f/1.9. I retrofitted the HyperStar kit, along with a new corrector plate with StarBright XLT optical coatings. Two-minute subs are all you'll need to grab most of what's out there, down to about mag 18. It comes with a couple of camera adaptors, and if you need a different adaptor, Starizona is just up the road. I've also added a feather-touch 1:10 micro-focuser that really makes a difference.

This C-14 is a wonderful classic and comes with the original adjustable 2" mirror diagonal, heavy-duty wedge, heavy-duty field tripod; counter weight bars and weights, and all the original trunks. I even have the manuals.

I do not want to ship, and it is something you'll want to try first anyway. I won't break up the package. After much consideration, I am asking $4,500. Email me if you're interested in a test drive. david_roemer@earthlink.net

Club Officers and Contacts

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For more information on products and contact information, their websites are:

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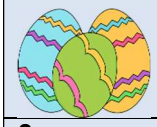
HAC March/April Calendar of Events

SU	MO	TU	WE	TH	FR	SA
4 Mar	**5** Mercury/Venus Zodiacal light next two weeks	**6**	**7**	**8**	**9** **4:20AM** HAC Meeting Student Union	**10**
11 Daylight Savings Begins	**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** Pat Open House For Honor Society students 8-10PM	**24** **8:35AM**
25	**26**	**27**	**28** Regulus 1° from moon	**29**	**30**	**31** **5:37AM**
1 Apr 	**2** Mars and Saturn 1.3° apart	**3**	**4**	**5** Faras Elementary astronomy night Pirtleville 7PM	**6**	**7** Kartchner Star Party noon -?
8 **1:18AM**	**9**	**10**	**11**	**12**	**13** Hac Meeting Student Union Mercury Stationary	**14** MACSclub at Patterson 7pm
15 **7:57PM**	**16**	**17** Venus 5° from moon	**18**	**19** Earth Day 10am-2pm at Vet park Patterson Public Night 7:30 pm	**20**	**21** UA Family Day / Astronomy Day Patterson 10am-2pm Lyrid Meteors
22 Earth Day **3:46PM** Lyrid Meteors	**23** Lyrid Meteors	**24**	**25**	**26**	**27** Math & Science Experience Patterson Obs. 8am- 1pm	**28**
29 **6:58 PM** Mercury greatest West elongation	**30** Jupiter 4° S of Moon	**1 May**	**2**	**3**	**4**	

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