NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

MAY 2016

PRESIDENT'S NOTES

PATTERSON OBSERVATORY; THIS MONDAY; MAY 9; DAYBREAK; BE THERE!

May is here and so is a rare transit of the Sun by Mercury, (there are, on average, only thirteen transits each century). HAC volunteers will be at the Patterson Observatory at daybreak on May 9, with solar filtered telescopes, following this event throughout its passage, and members and public are welcome! Some of us will probably be trying to image the transit as well. So, stop on by the Patterson, if you have a chance.

Mercury transits occur only if the planet is in inferior conjunction with the Sun (that is, between Earth and Sun) and is crossing through Earth's orbital plane (the Ecliptic). Mercury's orbit is eccentric and inclined and so crosses Earth's orbital plane only in early May and early November each year. So, if Mercury is passing between Earth and the Sun at the right time in either of those two months, a transit will be seen. This last occurred in November of 2006 and after this one, the next two Mercury transits will take place in Novembers, on November 11, 2019 and November 13, 2032.

Mercury is a small planet, and it is quite a ways from Earth, so it will appear very small as it crosses the Sun. However the eccentric nature of the orbit also figures into the planet's size in relation to the Sun as well. During May transits, the apparent diameters of the Sun and Mercury are 1,902 arc-seconds and 12 arc-seconds, respectively. So, Mercury appears to be 1/158 the size of the Sun. This is in contrast to November transits where the Sun is 1,937 arc-seconds and Mercury only 10 arc-seconds, respectively. Making Mercury appear to be 1/194 the size of the Sun.

By the way, NASA's Curiosity, the can-do rover, made time-lapse images about one hour apart while Mercury was passing in front of the Sun on June 3, 2014. Two sunspots, each about the diameter of Earth, also appear in the images. This was the first observation of any planet's transit of the Sun observed from any planet other than Earth. It is also the first observation of Mercury from Mars. What a wonderful little machine.

So, what about Mars? There is no more putting it off, you must observe Mars. It is at its closest to Earth, and therefore appears the largest since 2005. I hear you out there, you know who you are, no, it will not be as large as the moon! The "Red Planet" is well placed for observation, in the constellation Scorpius, along with another interloper, Saturn. It screws up the constellation for me, but you'd need to move Heavens and Earth to change them. Anyway, Mars is now visible for much of the night. Rising to acceptable altitude to begin viewing by 9pm and reaching its highest point in the sky at around midnight local time, even with a big and bright Moon there is no hindrance to gazing at our neighbor world.

I have yet to get a good look at or image of Mars this time around. Most of my attempts have been thwarted by winds at the ground or upper atmosphere and the low elevation of the planet when I've tried. On the occasions, I've tried imaging the results were not pretty, just blobby messes. I'm hoping this situation changes in late April and throughout May. Perhaps you have had better luck with your seeing or your determination and planning and have taken a great Mars image; remember to share. Let all the club members have a look.

AT THE MAY MEETING

The next meeting of the Huachuca Astronomy Club will be held on Friday, May 20, at 7 pm in the Student Union Community Room of Cochise College. John Kalas of the TAAA board of directors will give us an update on the Tucson Amateur Astronomy Association's Chiricahua Astronomy Complex being built just west of the Chiricahua Mountains.

Phase 1 construction began in mid-2009 and the site was opened in February 2010 with the very basic infrastructure required by Cochise County, such as road improvements, electric installation, well and septic construction, a gravel parking lot and a bathroom facility. Phase 2 construction added nifty astronomy-related amenities, such as a roll-off roof observatory, ten concrete telescope pads with power, a

large Amphitheater telescope pad with adjacent steel storage container for club equipment, an additional steel storage container for secure member equipment storage and a 4-lane RV area. Later, a picnic Ramada and a second equipment storage container were added in Phase 3. Currently, Phase 4 construction is underway to install ten additional concrete telescope pads with electricity for specific members. Phase 5 is now in design.

John Kalas is the CAC Site Director and Construction Coordinator. John has been a resident of Tucson and a member of the Tucson Amateur Astronomy Association (TAAA) for over 20 years. John has served the TAAA in many capacities over the years including president of the organization from 1998 to 2001.

Transit of Mercury

The Patterson Observatory will open for the transit of Mercury on Monday, May 9. We are inviting the public to come view the Mercury transit from 7 a.m. until noon. The transit is in progress at sunrise and some members plan to be at the observatory at daybreak. We will have coffee brewing. We have invited local schools to come and view the transit so the observatory will be open rain or shine. We will have alternate activities (like Night Sky Network presentations) in the case of inclement weather. We need as many members as can make the event to come and participate. Bring a solar scope if you can, or just come to help manage any of the many other scopes that will be there. Fingers crossed for clear skies!

Astronomy Day is a grass roots movement designed to share the joy of astronomy with the general population - "Bringing Astronomy to the People." On Astronomy Day, Saturday, May 14, 2016, thousands of people all over the world who have never looked through a telescope will have an opportunity to see firsthand what has so many amateur and professional astronomers all excited. These astronomical PR events are a fun way to highlight both the hobby and the science of astronomy. HAC will celebrate Astronomy Day at the Sierra Vista Library. Weather permitting, members will set up solar telescopes starting about 10 a.m. The event lasts until at least 3 p.m. We will have some educational handouts and some fun stuff for kids, but the most important thing we have to share is our enthusiasm and love of the sky. All HAC members are encouraged to participate; set up a telescope, or just come to socialize and engage the public.

An Opportunity to Win a New Celestron Scope

Celestron Telescopes has chosen the Huachuca Astronomy Club to be the recipient of a New Celestron 102 SLT Computerized GO-TO Scope.

This telescope was displayed at the May 7th Member Star Party at the Repogazer Observatory (RGO) at HAC member Keith Mullen's home and will be again at the May members meeting.

To win this telescope is easy. Write a one-page essay on why you think you would be a worthy recipient, including how winning this scope would enhance your interest in Astronomy.

All Essay's will be sent to Celestron where the staff will determine who is the winner. There are no particular rules or requirements, and Celestron's decision will be final. We've done this before at HAC with two sisters declared as co-winners due to their essay's Merrits and Celestron promises to do it again to help support HAC's inreach efforts. Announcement of the winning Essay will be at Celestron's discretion after a reasonable amount of time and after the scope has been available to be seen by many members. HAC member and former V.P., Keith Mullen will have the scope and will make it available for any HAC member who wishes to come out to Hereford and examine it, call (520)266.4230 to schedule a time.

General Scope info: Celestron's NexStar 102 SLT, Computerized Mount and tripod, with an additional 60 mm OTA included, two eyepieces, a diagonal and red dot spotter scopes with each OTA, complete operating instructions and a CD of "The sky". No manufacturer warranty included.

Space Place Article — April 2016

Hubble Shatters The Cosmic Record For Most Distant Galaxy

By Ethan Siegel

The farther away you look in the distant universe, the harder it is to see what's out there. This isn't simply because more distant objects appear fainter, although that's true. It isn't because the universe is expanding, and so the light has farther to go before it reaches you, although that's true, too. The reality is that if you built the largest optical telescope you could imagine -- even one that was the size of an entire planet -- you still wouldn't see the new cosmic record-holder that Hubble just discovered: galaxy GN-z11, whose light traveled for 13.4 billion years, or 97% the age of the universe, before finally reaching our eyes.

There were two special coincidences that had to line up for Hubble to find this: one was a remarkable technical achievement, while the other was pure luck. By extending Hubble's vision away from the ultraviolet and optical and into the infrared, past 800 nanometers all the way out to 1.6 microns, Hubble became sensitive to light that was severely stretched and redshifted by the expansion of the universe. The most energetic light that hot, young, newly forming stars produce is the Lyman-α line, which is produced at an ultraviolet wavelength of just 121.567 nanometers. But at high redshifts, that line passed not just into the visible but all the way through to the infrared, and for the newly discovered galaxy, GN-z11, its whopping redshift of 11.1 pushed that line all the way out to 1471 nanometers, more than double the limit of visible light!

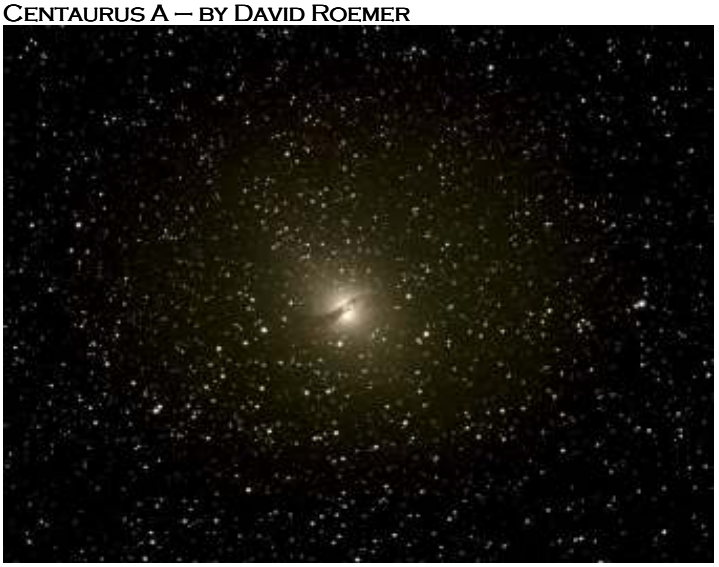
Hubble itself did the follow-up spectroscopic observations to confirm the existence of this galaxy, but it also got lucky: the only reason this light was visible is because the region of space between this galaxy and our eyes is mostly ionized, which isn't true of most locations in the universe at this early time! A redshift of 11.1 corresponds to just 400 million years after the Big Bang, and the hot radiation from young stars doesn't ionize the majority of the universe until 550 million years have passed. In most directions, this galaxy would be invisible, as the neutral gas would block this light, the same way the light from the center of our galaxy is blocked by the dust lanes in the galactic plane. To see farther back, to the universe's first true galaxies, it will take the James Webb Space Telescope. Webb's infrared eyes are much less sensitive to the light-extinction caused by neutral gas than instruments like Hubble. Webb may reach back to a redshift of 15 or even 20 or more, and discover the true answer to one of the universe's greatest mysteries: when the first galaxies came into existence!

Images credit: (top); NASA, ESA, P. Oesch (Yale University), G. Brammer (STScI), P. van Dokkum (Yale University), and G. Illingworth (University of California, Santa Cruz) (bottom), of the galaxy GN-z11, the most distant and highest-redshifted galaxy ever discovered and spectroscopically confirmed thus far.

Pictures from HAC Members

Comet 116P Wild – by David Roemer

Centaurus A – by David Roemer



Omega Centauri By David Roemer

Want Ads

FOR SALE: Dobsonian Reflector and StellaCam

16-inch, f4.5 Truss-tube Dobsonian Reflector for sale. It has wheelbarrow handles to wheel it around and load into a van or pickup truck with a set of ramps. It comes with an 8x50 viewfinder, Sky commander digital setting circles, and a rainproof scope cover. Was asking $2000.00 but will sell for $1800.00 to fellow club members.

Contact Bob Kepple at 520-366-0490, or Astrocards@aol.com.

FOR SALE: Mirror Blank.

13 7/8" diameter by 4 1/2" thick. Pyrex Glass with no scratches or bubbles. Very Rare - Perfect for doing a large binocular. $75.00

Contact Rob Shernick at (520) 458-6790 or by email at nuvolari_p3@q.com

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: 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

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Our sponsors have been keeping us supplied in door prizes for some years. If you have not contacted them lately, please consider this. They have a lot of great astronomical products that we all need.

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

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HAC May/June Calendar of Events

SU	MO	TU	WE	TH	FR	SA
May 1 May Day	**2**	**3**	**4** Eta Aquariid Meteors	**5** Eta Aquariid Meteors	**6** 3:30PM Eta Aquariid Meteors	**7** Member Star Party. Keith & Teresa Mullen
8 	**9** Patterson Obs. 7AM **Transit of Mercury**	**10**	**11** D.H.S.at Patterson 7:30PM	**12** Patterson Public Night 7:30PM	**13** 1:02PM	**14** **Astronomy Day** Sierra Vista Library 10AM-3PM
15	**16** 	**17**	**18**	**19**	**20** HAC Meeting Student Union John Kalas	**21** 5:14PM
22 Mars at Opposition	**23**	**24**	**25**	**26**	**27**	**28**
29 8:12AM	**30**  Mars closest approach	**31**	**Jun 1** MAC Lunch TMAC	**2**	**3**	**4** 11:00PM Member Star Party
5 Mercury at greatest W. elongation	**6**	**7**	**8**	**9** Patterson Public Night 8PM	**10**	11 Jupiter 1.5° North of Moon
12 4:10AM	**13**	**14**	**15**	**16**	**17** HAC Meeting Library Com. Steph Sellum	18
19 	**20** 7:02 AM	**21**	**22**	**23**	**24**	**25**
26	**27** 2:19 PM	**28**	**29**	**30** Mars Stationary	**JUL 1**	

TRANSIT OF MERCURY MAY 9TH **ASTRONOMY DAY MAY 14**

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