Nightfall

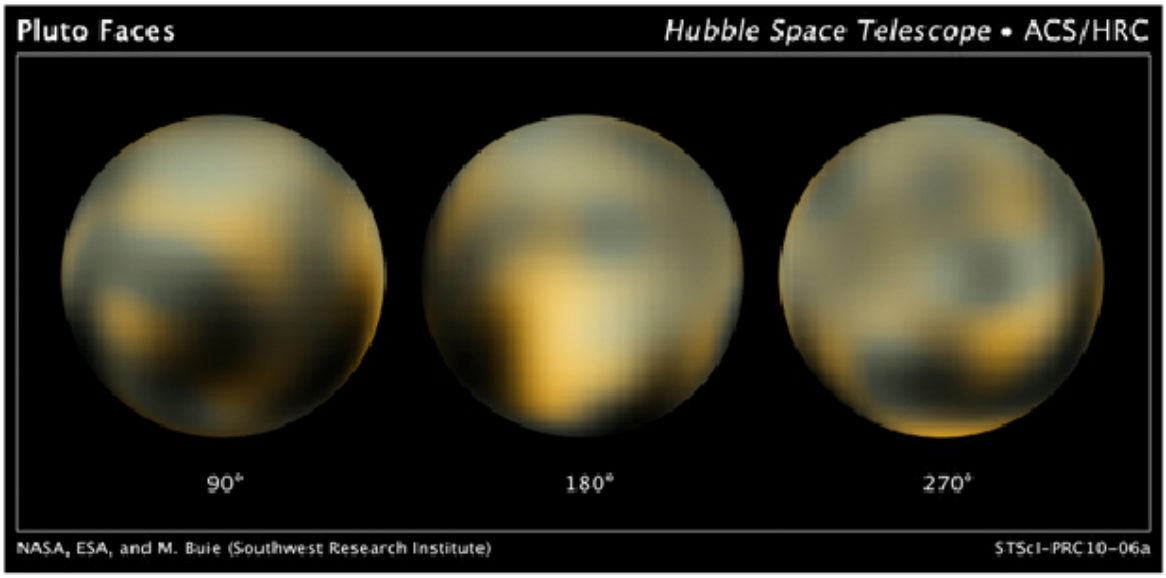
Monthly publication of the Huachuca Astronomy Club

JULY 2015

President's Notes

It's July, are you ready for the monsoon? It seems like it's been a very short observing season this year, but it's time to get your astro-gear weatherized. I know I have my to-do list.

By the time you read this article, we will be very close to having another little piece of our solar system become a known. Pluto, once our ninth planet, now relegated to dwarf planet status, will be visited by the New Horizons spacecraft on July 14, and hopefully (soon after) wondrous images will be returning to us showing not only Pluto but its five known moons (and maybe a few more). We didn't even know about four of those moons when the New Horizons mission was being planned and two more moons were found as a result of the mission just months before it lifted off from Earth nine and half years ago. While at the Rocky Mountain Star Stare in early June I was bowled over by the lecture given by Dr. Fran Bagenal, Professor of Astrophysical and Planetary Sciences at the University of Colorado, Boulder. She is also the co-investigator and team leader of the plasma investigations on NASA's New Horizons mission to Pluto and the Juno mission to Jupiter. Her talk centered on what was known about Pluto before the mission and what has been learned by other means as the spacecraft has been on its way. Pluto was little more than a smudge on a glass plate or a blob about 20 pixels across on a CCD before the mission. Even now, after those nine and half years, observations by the unblinking eye of Hubble have done little to enhance that image. Below is the best guess of what we may see on Pluto's surface. Yep, it isn't much, but keep it handy so you can fill in the blanks as the data come in.



This is the most detailed view to date of the entire surface of the dwarf planet Pluto, as constructed from multiple NASA Hubble Space Telescope photographs taken from 2002 to 2003. Credit: NASA, ESA, and M. Buie (Southwest Research Institute). Photo No. STScI-PR10-06a

Although she began her talk with this quote, I think it is just as well used as a closing statement, of Pluto she said, "I think of planets like people. There are big people and there are small people, there are even dwarf people, but they are all people none the less." Here's hoping the best for New Horizons encounter with the *planet* Pluto on July 14, 2015.

Welcome our new members

Phillip Shulsky of Virginia Beach joined in May. Phillip is new to astronomy and has acquired an 8-inch Celestron SCT. Scott Tillman of Hereford and Kya Teskey also of Herford joined at the June meeting. Welcome! We are glad you joined.

At the July 3 HAC Meeting …

The Huachuca Astronomy Club will hold a **FREE telescope clinic** in the community room of the Student Union Building at Cochise College, 901 N. Colombo Avenue, Sierra Vista. The meeting starts at 7PM. You are invited to bring your telescope for help with set-up, alignment, maintenance and operation. Get that telescope out of the closet and ready to view the stars. Several experienced astronomers will be on hand to help you and answer your questions. A door prize will be awarded but you must be present to win

Dine Under the Stars

Dine Under the Stars or DUTS is the annual fundraiser of the University South Foundation, Inc. This year's event is on Saturday, October 3rd. The foundation is the owner of the Patterson Observatory and supporting the foundation helps to ensure the continued availability of the observatory. But there is more; the foundation's primary purpose is to support the students, faculty and staff of the University of Arizona, South. In 2014 the foundation awarded $65,000 in scholarships to UA South students, made two Superior Faculty Awards totaling $4,000 and made another $4,000 available as a grant to allow a UA South teacher to travel to Finland to observe and analyze a teacher education program. The foundation also awarded two outstanding staff awards in 2014. 2015 is shaping up to have similar numbers. DUTS is a major component of the foundation's fundraising efforts. 100% of the money collected at DUTS goes toward the foundation's charitable functions. Ted Forte represents HAC on the University South Foundation, board of directors. Ted's participation on the board gives HAC a direct hand in the management and operation of the Patterson Observatory. Ted will be selling tickets to DUTS this fall. Please purchase a ticket if you possibly can. Adult tickets are $40 each.

This year's theme for Dine Under the Stars is *Denim and Diamonds* There will be a catered dinner, live music and dancing, a dance exhibition, a 50/50 raffle, a silent auction, attendance by Miss Sierra Vista and other dignitaries and a special visit from Wilbur and Wilma (Wildcat Mascots). Of course it wouldn't be Dine Under the Stars without stargazing in the Patterson Observatory.

Welcome to our New Board Member

Ken Duncan is the newest Member at Large on the HAC Board of Directors. Ken replaces Bob Hoover who regretfully had to leave the board this month. Ken will finish out Bob's term that is up in December. We also expect to have to replace Wayne Johnson who will be relocating to Flagstaff soon. Please let one of the club officers know if you are interested in serving on the Board of Directors. Duties are few, and meetings are rare, but board members get to decide the direction the club will take over the next year. Be a part of shaping the club, volunteer for the board. Elections will be held at the general meeting in November. We also need volunteers to serve on the nomination committee. It is the task of the nominating committee to find volunteers to serve.

Many thanks to Bob Hoover who has served on the board for several years. Bob has served as HAC secretary, a board member at large, public affairs officer and outreach coordinator.

The "G" in GOES Is What Makes It Go

By Ethan Siegel

Going up into space is the best way to view the universe, eliminating all the distortionary effects of weather, clouds, temperature variations and the atmosphere's airflow all in one swoop. It's also the best way, so long as you're up at high enough altitudes, to view an entire 50 percent of Earth all at once. And if you place your observatory at just the right location, you can observe the *same* hemisphere of Earth continuously, tracking the changes and behavior of our atmosphere for many years.

The trick, believe it or not, was worked out by Kepler some 400 years ago! The same scientist who discovered that planets orbit the sun in ellipses also figured out the relationship between how distant an object needs to be from a much more massive one in order to have a certain orbital period. All you need to know is the period and distance of one satellite for any given body, and you can figure out the necessary distance to have any desired period. Luckily for us, planet Earth has a natural satellite—the moon—and just from that information, we can figure out how distant an artificial satellite would need to be to have an orbital period that exactly matches the length of a day and the rotational speed of Earth. For our world, that means an orbital distance of 42,164 km (26,199 miles) from Earth's center, or 35,786 km (22,236 miles) above mean sea level.

We call that orbit *geosynchronous* or *geostationary*, meaning that a satellite at that distance always remains above the exact same location on our world. Other effects—like solar wind, radiation pressure and the moon—require onboard thrusters to maintain the satellite's precisely desired position above any given point on Earth's surface. While geostationary satellites have been in use since 1963, it was only in 1974 that the Synchronous Meteorological Satellite (SMS) program began to monitor Earth's weather with them, growing into the Geostationary Operational Environmental Satellite (GOES) program the next year. For 40 years now, GOES satellites have monitored the Earth's weather continuously, with a total of 16 satellites having been launched as part of the program. To the delight of NASA (and Ghostbusters) fans everywhere, GOES-R series will launch in 2016, with thrice the spectral information, four times the spatial resolution and five times the coverage speed of its predecessors, with many other improved capabilities. Yet it's the simplicity of gravity and the geostationary "G" in *GOES* that gives us the power to observe our hemisphere all at once, continuously, and for as long as we like!

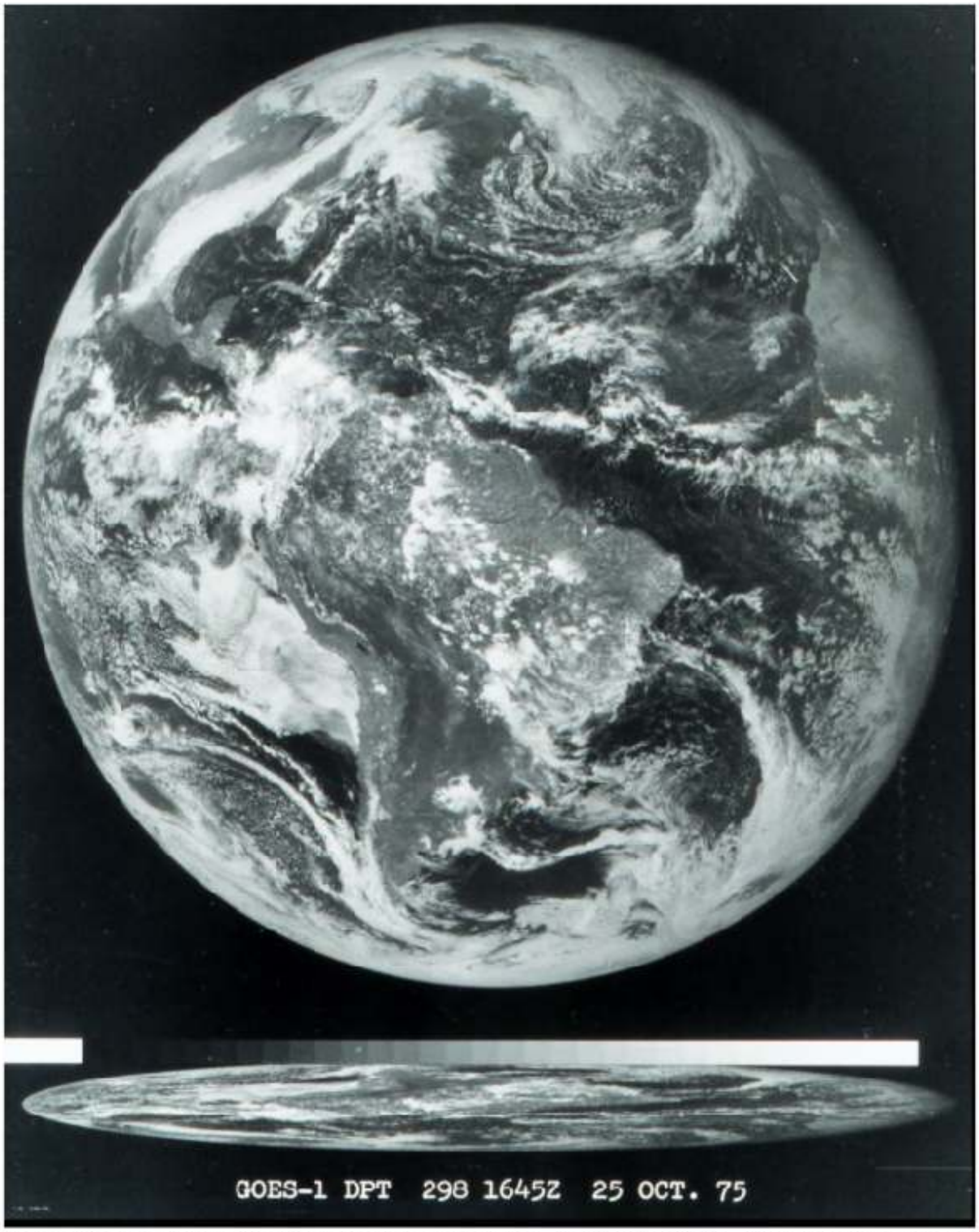
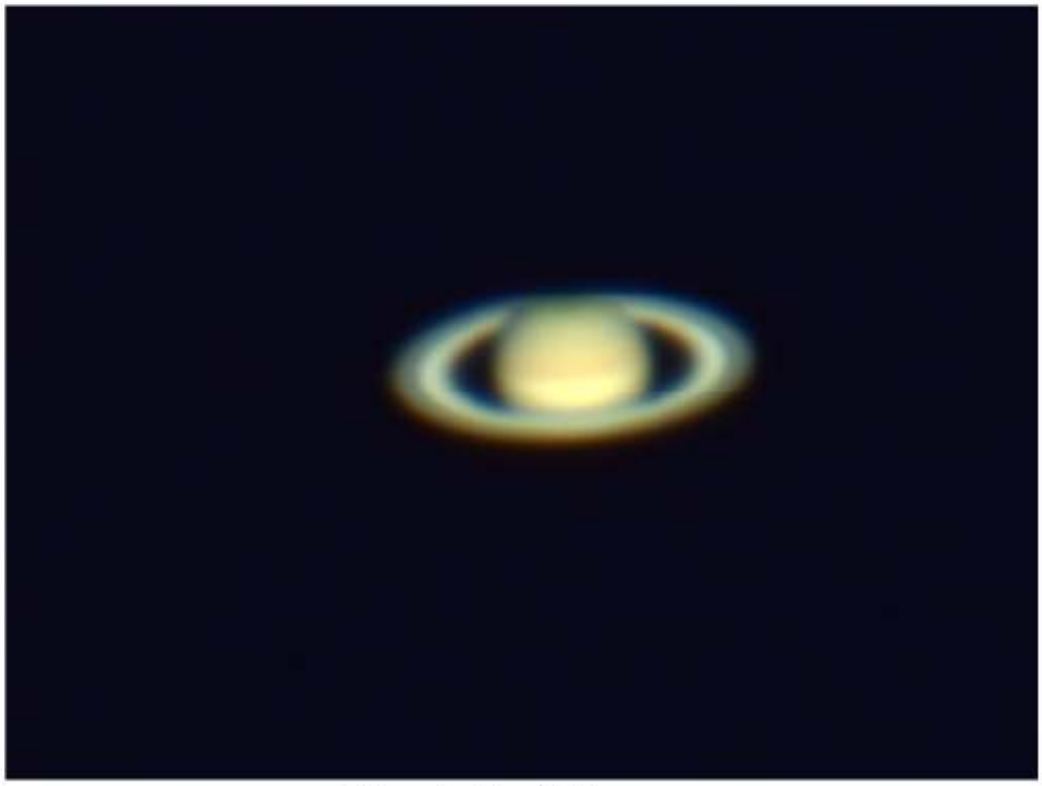


Image credit: National Oceanic and Atmospheric Administration, of the first image ever obtained from a GOES satellite. This image was taken from over 22,000 miles (35,000 km) above the Earth's surface on October 25, 1975.

Pictures by HAC Members

Venus and Jupiter in Leo by Bob Gent



Saturn by David Roemer

Pictures by HAC Members

Captured at RISS-Remote June 21-23 operated from Herndon, Virginia. This image is comprised of 25 sets of LRGB with 20m Luminance exposures binned 1x1 and 10m RGB exposures binned 2x2. Subframes aligned and stacked in MaxIm DL set to reject images with stars more than 20% out of round. Processed in PixInsight with final touches using the Apple Photos application. Equipment includes an AP155 F7 refractor, AP900 mount, and QSI 683 camera operating at -20C.Craig Anderson

Pictures by HAC Members

Over the weekend I was so captivated by the Milky Way that I had to try to image it. It was very warm and the sensor on my DSLR peaked at 99 degF when I shot this widefield image of the Summer Triangle. The image has a lot of noise, despite stacking 14 subs and some elongation around the edges that I think is caused by the stock lens, even though was stopped down 3 stops. The exposures were 5 minutes each, so 70 minutes total. I was guiding through the 5" refractor.

Top center is Vega, lower left is Deneb, and lower right is Altair. Albireo is in the center. I need a cooled DSLR! That would allow a more aggressive stretch!

Huachuca Astronomy Club – Board of Directors

Officers:

President: David Roemer Vice President: Chris Ubing

Secretary: Rick Burke Treasurer: Ted Forte

Members at Large:

Ken Duncan Wayne Johnson

Gary Grue Bert Kelher

Past President: Bob Gent

www.hacastronomy.com -- A great place to visit!

Our sponsors: Please support our sponsors, ***Farpoint and Starizona***. They 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:

http://www.farpointastro.com/
http://starizona.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.
Please contact Mr. Jim Moses at (520) 803-0913 or at 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 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 image through the scope are at Mshadephotography.com.
Contact Mike J. Shade at mshade@q.com

FOR SALE: Mae Childs has an 8" Celestron Nex Star Good condition with all original accessories.
Please contact Mae 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

How to contact the Nightfall editor, Cindy Lund:
Email: alund@juno.com
Phone 520-456-4817
Mail: 3666 Via El Soreno
Sierra Vista, AZ, 85650

HAC Calendar of Events for July-August 2015

SU	MO	TU	WE	TH	FR	SA
28 Saturn 2° south of Moon	29	30 Asteroid Awareness Day	1 July 10:20PM	2	3 HAC Meeting Student Union 7P Telescope Clinic	4 
5	6 Pluto Opposition	7	8 4:24PM	9 Venus greatest brilliancy	10	11
12	13	14 New Horizons flyby of Pluto	15 9:24PM	16	17	18
19	20	21	22	23	24 12:04AM	25 Ceres Opposition
26	27	28	29 Delta Aquarid Meteors	30 Delta Aquarid Meteors	31 6:43AM Delta Aquarid Meteors	August 1
2	3	4	5	6 10:03 pm Business at Twilight: Patterson	7	8
9	10	11 Perseid meteors	12 Perseid meteors	13 Perseid meteors	14 10:53AM Perseid meteors	15
16	17	18	19	20	21	22 3:31PM
23	24	25	26	27	28 HAC Meeting Student Union Building 7P Vishnu Reddy PSI	29 2:35 PM
30	31 Neptune at Opposition	RAIN RAIN	GO AWAY	COME AGAIN	ANOTHER DAY	

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