Nightfall

Monthly publication of the Huachuca Astronomy Club

SEPTEMBER 2014

President's Notes

Scattered showers, clearing trends, dropping relative humidity, dust caps removed, scopes slewing skyward, dodging clouds; it must be September. It is time to remember what stars look like, brush up on which constellations are rising and setting, and reassess our viewing schedules. It is also time to evaluate equipment.

Yep, blow dust-off across the objectives, center (or off center) the secondary, collimate mirrors, lubricate gear assemblies, and check polar alignment for starters. For some of us this happens without a second thought, but for others who are new to the hobby (obsession), these chores may be major hurdles that confound and drag their ambitions of night sky viewing to a total halt. All the wonder that can be found in astronomy is drained from their minds. The telescope, and its promise to explore the universe, sits in the corner collecting dust instead of collecting the light from planets and comets.

I don't like to think that this happens a lot, but it does. Every year carefully wrapped boxes of wonder are cautiously placed, under Christmas trees. Later, bug-eyed kids and (yeah) bug-eyed adults rip the telescopes free from the packaging and begin to set them up only to become frustrated and confused. Even when they are set up correctly, they don't perform as they were expected. Nothing looks like it does in books.

To help in the redemption of the wonder and the re-education of the would-be observers, the September meeting of the HAC will be a telescope orientation and tune-up night. The public is encouraged to bring their telescopes to the meeting, so tell your friends and neighbors. There will be a short overview of the various kinds of commercially available telescopes, helpful handouts, and a discussion of common accessories to widen the enjoyment of astronomy. Tell people this should help making decisions for this Christmas easier as well.

The short talk will be followed by a telescope clinic. I'm asking club members to be on hand to help those who bring telescopes to set up, align, and feel more comfortable using their rigs. Club members should also be happy to give advice on objects to view, books to read, and the selection of eyepieces to get the best out of their telescopes. I hope that we'll have a good turnout, otherwise we can argue about how to tweak the club scopes.
Until then, clear skies to all!

New Member Corner

We welcome Tom and Kara Creech who joined at the August meeting and Jim Whitesell who joined shortly after. All are from Sierra Vista. **Welcome!** We are glad you joined.

We're taking Orders

The treasurer (Ted Forte) will be taking orders for **2015 Calendars and RASC Handbooks.** The Astronomy Magazine calendars are $6.50 each and you can sign up and pay for them at any of the next few meetings. The RASC Observer's Handbooks will be made available for ordering in November. The price varies by how many copies we order as well as the base price which has not been announced. Last year, members paid $20 each for the observer's handbook. (It should be in that ballpark) There will be signup sheets for both at the September meeting.

Ted is also taking orders for the special club offer from Skyhound to get discounts on the observing software, **Sky Tools 3**. Members can get a 25% discount if just two people order through the club. The discounts increase up to 50% for larger orders. Let Ted know if you are interested. See http://www.skyhound.com/club_discounts.html for details of the offer.

Dine Under The Stars Tickets

Dine Under the Stars (DUTS) is the University South Foundation's annual fundraiser. The Foundation is the entity that owns and maintains the Patterson Observatory. This year's event titled Rock Around the Clock is on September 27th and will feature live music by Clayton & Sallee and "COMPANY" and a themed buffet donated by La Casita Mexican Restaurant & Cantina. The Patterson will be open for observing during the event that runs from 6-9 PM. Ted Forte is the HAC's representative on the Foundation's board of directors and he will have DUTS tickets for sale at the September meeting. By buying a ticket, you will be helping to support not only the Patterson Observatory but also the students, faculty and staff of the University of Arizona, South. Tickets are $40 for adults, $25 Student (with valid ID) and $15 Child (12 and under). Cash or Check. Make checks out to "University South Foundation". Please consider supporting this worthy cause and buy a ticket.

HAC Memberships expire in December

It's not too early to start thinking about renewing your membership in the **Huachuca Astronomy Club.**
Individual: $25 Family $35 Military $20($25 family) Student $10
Don't miss out on all the great benefits of belonging. Fellowship, fun, stars, tours, observing programs, star parties, discounts, engaging speakers, and so much more. Stay a part of it all. Renew your membership, participate, enjoy. And while you're at it, think about serving as an officer of the club or member of the board: **ELECTIONS IN NOVEMBER** for the 2015 slate of club leaders!

Cochise County Light Pollution Code Update

The Cochise County Board of Supervisors will meet on Tuesday, September 9 at 10 am in Bisbee. Among other topics, they will be discussing the newly revised county light pollution code. This code update was approved unanimously by the planning commission last month, and this revision includes urgently needed restrictions on digital signs. It also has other updates which including setting a maximum CCT of 3,000 Kelvin for all non-residential lighting.

We need you to attend the meeting and speak up for these code revisions. The board of supervisors will consider approving these revisions at this meeting, and they need to hear from us. If you are unable to attend, but care about night sky preservation, please call, write, or email the board of supervisors. Encourage them to protect the night sky and to approve the changes as sent from the planning commission. Complete BOS contact information is available at the Cochise County website: http://cochise.az.gov/cochise_board_supervisors.aspx?id=224

2014 Lowell Speckle Interferometry Workshop

Friday-Sunday, October 3-5, 2014
Giclas Lecture Hall, Lowell Observatory, Flagstaff, AZ, USA
Workshop co-chairs:
Gerard van Belle, Lowell Observatory
Russell Genet, California Polytechnic State University

Overview

Speckle interferometry, once the sole province of professional astronomers, has expanded to include many amateur and undergraduate and even high school student observers and analysts. This expansion is due to the increased availability of high-speed CCD cameras, powerful PCs, PC-friendly software, and opportunities for publication.

Speckle interferometry overcomes normal atmospheric seeing conditions by taking a series (often thousands) of short-exposure images (typically 10-60 milli-seconds) which "freeze out" the usual atmospheric smearing. Speckle interferometry only works within the isoplanatic patch where atmospheric distortions are correlated—typically less than 10 arc seconds. Analyzing speckle images works best when observing geometrically simple objects such as close visual double stars, binary asteroids, Pluto and Charon, Jupiter's moons, and the diameters of large nearby stars.

The Lowell Speckle Interferometry Workshop brings professional, amateur, and student astronomers together in a synergistic mix that aims to consider science programs, speckle observations, data reduction, and analysis in a hands-on, informal atmosphere.

The workshop will feature, weather permitting, speckle interferometry observations on Lowell Observatory's 4.3-meter Discovery Channel Telescope in nearby Happy Jack. We will be using the Differential Speckle Survey Instrument (DSSI) developed by Elliott Horch. DSSI features simultaneous observations in two color bands and two Andor iXon EMCCD cameras.

Schedule

Friday, October 3
Morning: free time
Afternoon: Theory of speckle interferometry
Evening: at Lowell Observatory Rotunda patio
    All portable equipment set-ups are welcome
Saturday, October 4
Morning: free time
Afternoon: Science applications of speckle
    Binary stars
    Binary asteroids
    Pluto & Charon / Jupiter's moons
    Resolved stellar disks
Evening: at 4.3-meter Discovery Channel Telescope with DSSI
Sunday, October 5
Morning: free time
Afternoon: Data reduction workshop using observations from previous 2 nights
Evening: Banquet

Asteroid Time Capsule Campaign

Anna H. Spitz

NASA's OSIRIS-REx asteroid sample return mission and The Planetary Society announce the start of the Asteroid Time Capsule Campaign on September 2, 2014. This campaign asks participants to tweet or post an image on Instagram (with hashtag#asteroidmission) to answer the question: Where are we now and where will we be in 2023 in Solar System exploration? Top tweets and images will be etched on the silicon wafer, which will be placed in the Sample Return Capsule (SRC). An identical wafer will be placed on the spacecraft. All entries will be archived in a virtual Time Capsule kept at the University of Arizona and opened in 2023. More information about the mission, ways to get involved, and the campaign is available on our website, asteroidmission.org.

This campaign complements Messages to Bennu, which collects names to fly on the spacecraft. Participants can print a Certificate of Participation and their names will fly in the SRC and on the spacecraft.

Both campaigns end on September 30, 2014.

Direct links for the Asteroid Time Capsule Campaign are:
www.instagram.com/osiris_rex
www.twitter.com/OSIRISREx

Total Lunar Eclipse

Bob Gent

On the early morning on October 8, we will be treated to a total lunar eclipse. The Earth's shadow will become visible, as the moon begins to move into the umbral shadow about 02:15 am MST. The point of greatest eclipse will occur on October 8 at 3:56 am MST. As an added treat, the planet Uranus will be only about a degree from the eclipsed moon during totality! Uranus is near opposition, so it will be shining fairly brightly at magnitude 5.7. With a wide field image, we should be able to capture both the eclipsed moon and the planet Uranus in the same field of view. I do not recall a past time when a planet was visible only a degree from a total lunar eclipse.

Here is a link to additional information at NASA: http://eclipse.gsfc.nasa.gov/OH/OH2014.html#LE2014Oct08T

There is also a wiki article with a simulation of the eclipse at:
http://en.wikipedia.org/wiki/October_2014_lunar_eclipse

Space Place Partner's Article

Droughts, Floods and the Earth's Gravity, by the GRACE of NASA

By Dr. Ethan Siegel

When you think about gravitation here on Earth, you very likely think about how constant it is, at 9.8 m/s^2 (32 ft/s^2). Only, that's not quite right. Depending on how thick the Earth's crust is, whether you're slightly closer to or farther from the Earth's center, or what the density of the material beneath you is, you'll experience slight variations in Earth's gravity as large as 0.2%, something you'd need to account for if you were a pendulum-clock-maker.

But surprisingly, the amount of *water content* stored on land in the Earth actually changes the gravity field of where you are by a significant, measurable amount. Over land, water is stored in lakes, rivers, aquifers, soil moisture, snow and glaciers. Even a change of just a few centimeters in the water table of an area can be clearly discerned by our best space-borne mission: NASA's twin Gravity Recovery and Climate Experiment (GRACE) satellites.

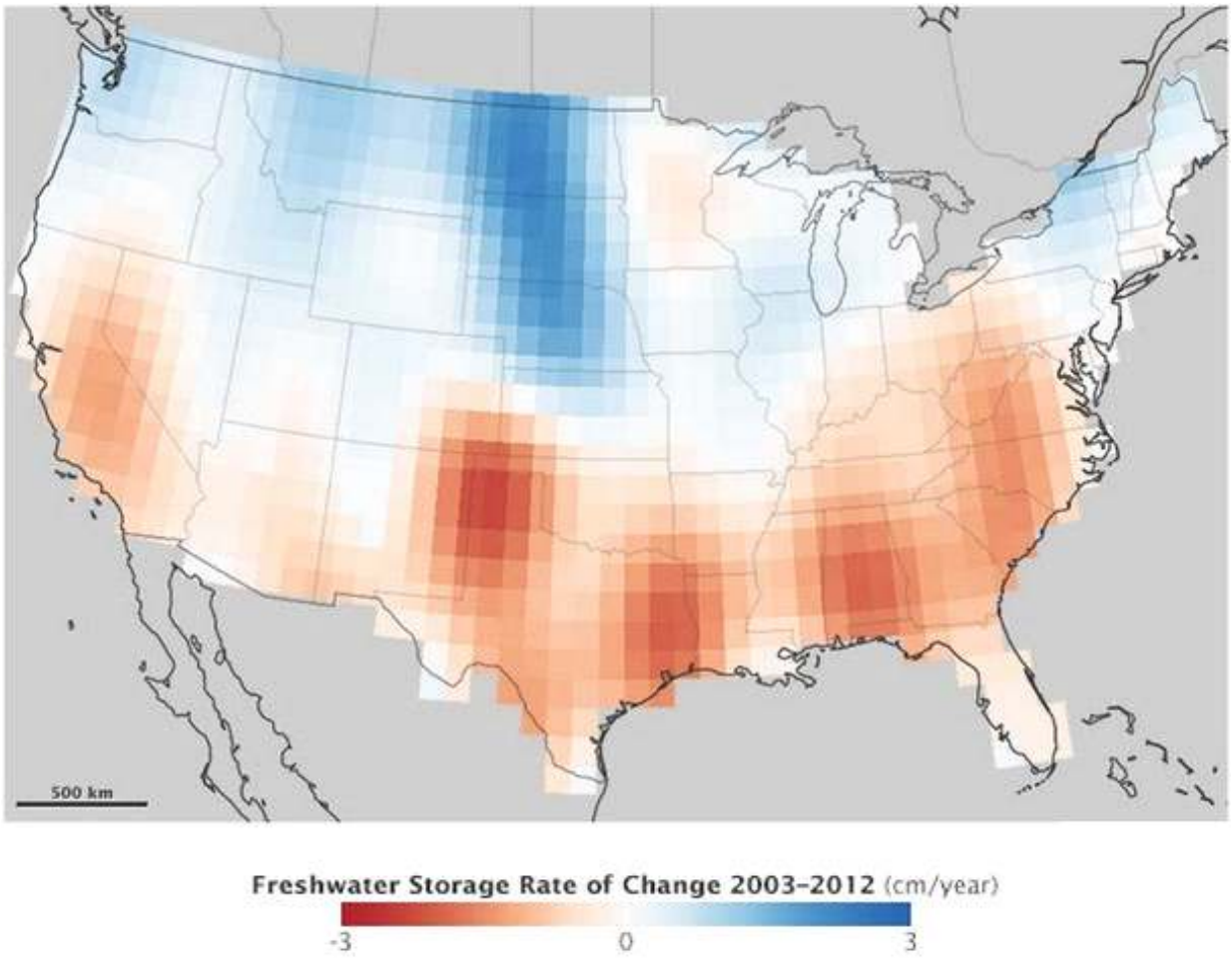
Since its 2002 launch, GRACE has seen the water-table-equivalent of the United States (and the rest of the world) change significantly over that time. Groundwater supplies are vital for agriculture and provide half of the world's drinking water. Yet GRACE has seen California's central valley and the southern high plains rapidly deplete their groundwater reserves, endangering a significant portion of the nation's food supply. Meanwhile, the upper Missouri River Basin—recently home to severe flooding—continues to see its water table rise.

NASA's GRACE satellites are the only pieces of equipment currently capable of making these global, precision measurements, providing our best knowledge for mitigating these terrestrial changes. Thanks to GRACE, we've been able to quantify the water loss of the Colorado River Basin (65 cubic kilometers), add months to the lead-time water managers have for flood prediction, and better predict the impacts of droughts worldwide. As NASA scientist Matthew Rodell says, "[W]ithout GRACE we would have no routine, global measurements of changes in groundwater availability. Other satellites can't do it, and ground-based monitoring is inadequate." Even though the GRACE satellites are nearing the end of their lives, the GRACE Follow-On satellites will be launched in 2017, providing us with this valuable data far into the future. Although the climate is surely changing, it's water availability, *not* sea level rise, that's the largest near-term danger, and the most important aspect we can work to understand!

Learn more about NASA's GRACE mission here: http://www.nasa.gov/mission_pages/Grace/

Kids can learn al about launching objects into Earth's orbit by shooting a (digital) cannonball on NASA's Space Place website. Check it out at: http://spaceplace.nasa.gov/how-orbits-work/

Space Place Partner's Article



NASA Earth Observatory image by Jesse Allen, using GRACE data provide courtesy of Jay Famigleitti, University of California Irvine and Matthew Rodell, NASA Goddard Space Flight Center. Caption by Holli Riebeek.

NASA's Space Place is an award winning educational website about space and Earth science targeting upper-elementary aged children. The Huachuca Astronomy Club and the Patterson Observatory are both Space Place partners.

Members' Photos

Jupiter, Moon, and Venus by Ed Erbeck Jr

Comet Oukaimeden by David Roemer

Comet Jacques by David Roemer

Huachuca Astronomy Club – Board of Directors

Officers:

President: David Roemer Vice President: Chris Ubing

Secretary: Ted Forte Treasurer: Ted Forte

Members at Large:

Bob Hoover 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: A friend back east has an unused Obsession mirror cell for a 25-inch scope for sale. (See photo) he's asking $500 and estimates that it would cost about $75 to ship it. If anyone is interested, respond and I'll put you in touch with him.
Contact Ted Forte at <tedforte511@gmail.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

2014–Astronomically Handy Sky Calendar from Doug Snyder & the H.A.C.–2014

ARIZONA Observers SKY EVENTS Calendar for 2014 –All Times shown are MOUNTAIN STANDARD TIME*

JULY 2014

HIGHLITE: Due to Monsoons, no scheduled observing events

03 Th Earth at aphelion,1700 hrs.; 1.016 AU
04 Fr Pluto at opposition, 0100 hrs.; mag. 14.1, distance 32.5 AU
05 Sa ☽ First Quarter Moon 0500 hrs.
07 Mo Saturn within 1.5° of 76% Moon; 2030 hrs.
11 Fr **HAC Meeting,** Cochise College, 7 pm
12 Sa ○ Full Moon 0426 hrs.
12 Sa Mercury G_Elong. W. (21°); morning 'star' in East, mag. +0.4; reaches mag. 0.0 on July 15
18 Fr ☾ Last Quarter Moon 1909 hrs.
26 Sa ● **NEW MOON** 1543 hrs.
29 Tu **Delta Aquarids** Meteor Shower Pk. at 0200 hrs.; rate may approach 20 per hour, some persistent trains.
30 We Alpha Capricornids Meteors– weak, slow moving, but yellowish fireballs can be photogenic; best rate of 5/hour?

July (first-half): C/2012 K1; evening hrs. in LEO; mag 7?

AUGUST 2014

HIGHLITE: Monsoon Season; Choose your own Highlite !

03 Su ☽ First Quarter Moon 1751 hrs.
08 Fr **HAC Meeting,** Cochise College, 7 pm
10 Su ○ Full Moon 1110 hrs; **largest** of 2014
12>13 Tu>We Perseid Meteor Shower Pk. at 1700 hrs. on the 12th; v. unfavorable due to strong moonlight; rates can be high as 90/hour under dark skies
17 Su **Conjunction:** Venus/Jupiter within 1.0° and close to Beehive cluster; 0500 hrs.; But very low in the ENE skies; closest planet-planet conjunction of 2014
17 Su ☾ Last Quarter Moon 0527 hrs.
24 Su Comet Siding Spring (C/2013 A1) at opposition, 1800 hrs.; may collide with MARS in mid-October !
25 Mo ● **NEW MOON** 0714 hrs.
29 Fr Neptune at opposition, 0800 hrs.; mag. +7.8; distance 29 AU; size 2.4"
31 Su Moon/Saturn/Mars within 5° circle; Moon will be at about 35%; 2000 hrs.

SEPTEMBER 2014

HIGHLITE: Comet Possibilities

01 Mo Aurigid Meteor Shower; peak after midnight of Aug. 31 and into morning of Sept.01; fast and many are bright ; low hourly rate (5) but may outburst
02 Tu ☽ First Quarter Moon 0412 hrs.
08 Mo ○ Full Moon 1839 hrs; Harvest Moon
12 Fr **HAC Meeting,** Cochise College, 7 pm
15 Mo ☾ Last Quarter Moon 1906 hrs.
20 Sa **Kartchner Caverns/HAC S.P.,** dusk
21 Su Zodiacal Light in east before morning twilight for next two weeks
22 Mo **Autumnal Equinox** 1929 hrs.
23 Tu ● **NEW MOON** 2315 hrs.
25 Th **HAC** Public S.P.; P.O.; SS@1813 hrs.
27 Sa **Saturn** within 2° of 14% Moon, low in the WSW, 2000 hrs.

Comet Possibilities for September 2014
C/2013 A1:v.low in S., early evening;9/17>9/30 (Siding Spring); encounter MARS on 10/19
C/2012 K1: low in E., early morning; 9/1>9/30
C/2013 V5: low in E., morning; 9/1>9/13

OCTOBER 2014

HIGHLITES: MARS & COMET; 1 LUNAR ECLIPSE & 1 SOLAR ECLIPSE IN SAME MONTH !

01 We ☽ First Quarter Moon 1233 hrs.
04 Sa **NATIONAL ASTRONOMY DAY** **HAC** opens Patterson Observatory for Public Exhibits and Viewing
07 Tu Uranus at opposition, 1400 hrs.
08 We ○ Full Moon 0351 hrs.
08 We **TOTAL LUNAR ECLIPSE** Start: 0117hrs., End: shortly after moonset at 0630 hrs.; Totality: 0328 h. to 0423 hrs.
09 Th Draconids Meteor Shower; unfavorable due to bright Moonlight
10 Fr S. Taurids Meteor Shower; Pk. 0500h.
10 Fr **HAC Meeting,** Cochise College, 7 pm
15 We ☾ Last Quarter Moon 1213 hrs.
19 Su **Comet Siding Spring** (C/2013 A1) **Close** Encounter/Graze with **MARS!**
20 Mo Zodiacal Light in East before morning twilight for next two weeks
21 Tu **Orionid Meteor Shower**; v. favorable; Swift, some bright, rate about 20+/hr.
23 Th ● **NEW MOON** 1457 hrs.
23 Th Partial **Solar ECLIPSE,** Start:1430 hrs. End: 1648 hrs.; max: 1543 hrs.(29.3%) **HAC** viewing at S.V. City Library, 1 pm
25 Sa **HAC** Member S.P.
30 Th **HAC** Public S.P.; P.O.; SS@1733
30 Th ☽ First Quarter Moon 1949 hrs.

NOVEMBER 2014

HIGHLITE: METEORS & FIREBALLS

01 Sa Mercury at G_Elong. W.(19°), 0600 hrs.; **best** morning apparition of 2014, east
06 Th C/2012 K1 (PanSTARRS) at (2nd) opposition, 2000 hrs., in Pictor; possibly will or will have brightened to mag. 6
06 Th ○ Full Moon 1523 hrs.
11 Tu North Taurids Meteor Shower; rate of about 5/hr; waning 77% moon & bright
14 Fr **HAC Meeting,** Cochise College, 7 pm
14 Fr ☾ Last Quarter Moon 0816 hrs.
17>18 Mo>Tu **Leonid Meteor Shower** Peak at 1500 hrs on 17th; view pm hrs on 17th into am hours on 18th; about 20% moon; fast meteors & bright; a good number leave persistent 'trails' ; no 'storm' has been predicted, but do you remember 2001? Some of us do. WOW.
20 Th **HAC** Public S.P.; P.O.; SS@1720 hrs.
22 Sa ● **NEW MOON** 0532 hrs.
22 Sa **HAC** Member S.P.
29 Sa ☽ First Quarter Moon 0306 hrs.

Comet Of The Month—An Observing and Imaging Challenge for C/2012 K1 (PanSTARRS)
Throughout November, this comet will remain VERY low near our southern horizon and reside in these constellations: Pictor, Dorado, Phoenix, Reticulum, Horologium, and Eridanus, but may reach mag. 6 this month. Close encounter with Globular Cluster NGC1261 on 11/13; good luck!

DECEMBER 2014

HIGHLITE: GEMINID METEOR SHOWER

06 Sa ○ Full Moon 0527 hrs.
12 Fr **HAC Meeting,** Cochise College, 7 pm
13 Sa **Geminid** Meteor Shower Pk. Favorable Year, but with 50% moon; Pk. 0500 hrs. Saturday am; hourly rate can be as high as 120/hr.; mostly bright, few leaving 'trains';12/14 (Sunday) morning activity is possible also; Parent body is asteroid 3200 Phaethon (1.5 year orbit); radiant is near Castor
14 Su ☾ Last Quarter Moon 0551 hrs.
15 Mo **Dbl. Shadow Transit**, J. ; 2312 hrs. (Europa & Io); Note: At 0025 hrs. on 12/16, **both** Europa & Io will be in the process of transiting Jupiter! See 'em?
18 Th **HAC** Public S.P.; P.O.; SS@1721 hrs.
20 Sa **HAC** Member S.P.
21 Su Winter Solstice, 1603 hrs.
21 Su ● **NEW MOON** 1836 hrs..
22 Mo Ursids Meteor Shower Pk. 1300 hrs.; good date, but poor peak timing; (favors northern Asia); radiant is near β Ursa Minor (Kokab); rate is about 10/hour; faint, with a few fireballs. Parent comet is 8P Tuttle
25 Th *MERRY CHRISTMAS TO ALL !*
28 Su ☽ First Quarter Moon 1132 hrs.
28 Su Conjunction of Moon and Uranus; 2245 hrs.; less than 1.0° apart; first quarter Moon and mag. 5.8 Uranus

HAPPY NEW YEAR !

*Times/Dates= ARIZONA Mountain STANDARD Time (NO DST; UT-7hrs); **updates/ details,** see: www.hacastronomy.com or http://skycalendar.blackskies.org;
Abbr: Tr=Transit; Pk=Peak; Merc=Mercury; E=East W=West; S=South; N=North; J, Jup.=Jupiter; V=Venus; v. = very; "=arc seconds; SS=SunSet; S.P.=Star Party; h., hrs.=hours (24 hour time system); MP=Minor Planet; MS=Moon Set; MR=Moon Rise; wks=weeks; Lt=Light; pm=evening; @=at; Pub.=Public ; NEA= **N**ear **E**arth **A**steroid; am=morning; mag.=magnitude; **meteor dates reflect predicted Peak Morning, but Moon may still be present; P.O.=Patterson Observatory; ; dbl=double; I=Io; Eu=Europa; G=Ganymede; C=Callisto; UT=Universal Time; **bold text=**possibly a promising/worthy event, activity or object; G_Elong=Greatest Elongation; AU=Astronomical Unit(93 million miles); °= degrees; *compiler*: **Doug Snyder**(C/2002 E2, MP15512,starhaven@me.com); V1.1.2014