# Nightfall

*Monthly publication of the Huachuca Astronomy Club*


# December 2013

## President's Notes

Merry Christmas, Happy New Year, Clear Dark Skies, and Long Winter Nights!

With December halfway through, we should be plotting out our plans for 2014. Oh sure, we don't know what's in the boxes under the tree yet, but I'm sure they are astronomically themed. So let's just say you're getting what you asked for and work it into the plan.

What sort of a plan you ask? Well, I for one, am going to eat better, lose some weight, run a marathon, … wait a minute, those are my resolutions for next year. You know how long those last. Anyway, looking in the short-term I am going to plan to be a little more methodical in my exploration of the sky, more systematic in my filing of astro-images, organize all those cables, see the major meteor showers, get back to doing a Messier marathon, and really get to know the software I got last year. Ok, that too sounds and reads like my resolutions, but you get the picture. What I really want to stress is to keep using our toys, reading our books, sharing our enthusiasm, and teaching kids and their folks. Oh, and get out to look at Comet Lovejoy, it's a beauty.

## Next Meeting

Our guest speaker will Dr. Vishnu Reddy from the Planetary Science Institute in Tucson, Arizona. His research focuses on asteroids, meteors, and meteorites in the Solar System. Asteroid (8068) Vishnureddy was named by the International Astronomical Union after Dr Reddy. Read his bio on Page 6.

**The next general meeting of HAC will be held on Friday, January 10th, 2014, at 7 PM, in the science lecture hall, room 1110 of the science building of Cochise College.**

## Welcome New Member

This month we welcome new HAC member Mark Orvek of St. David AZ who joined the club at the November meeting. Welcome Mark, we're glad you joined!

## Help Fight Digital Signs

To Members and Friends of the Huachuca Astronomy Club:

The City of Sierra Vista is moving ahead to lift a prohibition on digital signs that has existed for years. Apparently, some local businesses have been pushing for digital signs, and a task force has been formed that would modify the current code to allow such LED or digital signs. I am a member of that task force and have expressed an objection to allowing these signs, but I am in a minority.

Opening the doors to digital signs is not a step in the right direction. Signs tend to cutter our scenic beauty. With changing messages on display boards, it would be distracting and ugly to drive through the city. For their size, these signs can consume a lot of energy. For example, some of the larger signs in Phoenix can burn over $2,000 in power each month. Thank goodness, LED signs of this size are not proposed for our area. Also, some cities and towns have permitted digital signs, and owners have forgotten to set dimmer limits at night. This could be a code enforcement challenge and a threat to our night skies.

Perhaps you, too, would not like to see new digital signs? If so, please contact the Mayor and City Council and let them know your thoughts on this. As it now stands, they are hearing from businesses that these digital signs are important to them. If we care about scenic beauty of the area, we must all speak up. I would also ask that you please share this email with friends who live in or near Sierra Vista.

Please send letters to:

Mayor and City Council
City of Sierra Vista
1011 N Coronado Dr
Sierra Vista, AZ 85635

The following link to the mayor and city council web page contains addition contact information:
http://www.sierravistaaz.gov/department/index.php?structureid=2

On a plus side, if the city decides to move ahead and allow digital signs, I have offered to help set standards to control sign brightness. So far, the staff and businesses seem wiling to accept these recommendations to limit light output.

Thank you very much for speaking up on this subject.

Best wishes for the holidays,

Bob Gent, Lt Col, USAF, Ret.
Past President, HAC and
Past President, International Dark-Sky Association

# Congratulations Ray Perger

Ray Perger, one of the senior members of the Huachuca Astronomy Club was awarded an honorary lifetime membership in the club at the November 2013 meeting. Ray has been a member since 1987 and joined the club at the request of the late David Patterson, a charter member of the club. In 1994 Ray was elected president of the club and shortly thereafter decided to take a course in astronomy at Cochise College from another of our membership, Kim Rogalski. He has a keen interest in astronomy and continues to observe from this backyard with his 80mm Celestron.

# Willcox Star Party Report

Ted Forte

Bob and Michelle Hoover, Bob Gent, David Roemer, Nancy Hannaford and Halina and I set up telescopes at Willcox Middle School and treated the kids, parents and teachers to views of the moon, Venus, and a number of deep sky objects and double stars. The temperatures fell into the low 30's and that probably had an effect on attendance. We were told to expect about 350, but much fewer than that were actually there. The organizer told me she thought that 200 people attended. There might have been that many – there were warming grills, s 'mores and coco to be had on the other side of the building and I think many attendees were content to stay there. By my estimate about 100 or so visited the scopes.

It was a lot of fun. The kids were very well behaved and quite a few seemed interested. I spent most of the first hour showing a crescent Venus through a 10-inch Dob, and then I switched to M31. For a lot of the attendees, this was their first look at either. Of course the green laser pointer stole the show. Isn't that always the way? No matter what marvel you are pointing out in the sky, it is the POINTER that amazes most kids. I had fun telling a few that when you study astronomy, you develop the ability to beam green light from your fingertips. I just hope none of the kids went away believing that.

Everyone was very appreciative which made the 80-mile trip worth the effort. I would not be at all surprised if we are invited back often.

Many thanks to Bob Hoover for coordinating the event.

Ted

# Astronomical League Observing Programs - Planetary Nebula December Edition

by Ted Forte

(Captured from the HACList)

I've come to the end of this treatise on the objects of the regular Planetary Nebula Program that I started in January. With this installment we have now covered all 110 PNe in the program and I will post the entire composite essay in the files section here on HAClist. There are about 3,000 planetary nebulae in the Milky Way galaxy and several hundred of them are visible in amateur telescopes. These 110 objects are by no means the only PN targets you can examine. My posts here on Haclist don't even include all of the objects associated with the program. There are 26 alternate objects for observers in far northern latitudes, where some of the objects of the base program do not rise above the local horizon. Observers in the southern hemisphere can complete the Southern Planetary Nebula Program. That list replaces the 40 most northern objects with 40 PNe having declinations below $0^0$. 176 objects in all.

The list of objects for December contains just four objects.

Let's dispatch the two objects best described as stellar first. IC 351 and IC 2003 are both in Perseus and nothing short of large aperture and high magnification will reveal anything much more than a star-like point of light. These challenging stellar objects are as much a part of the planetary nebula mystique as the showpieces and should not be disparaged. Still, there's not much to describe here, so let's just rejoice in the joy of the hunt, mark them off, and move on. IC 351 lies in the foot of the hero, 2 degrees 20 minutes WSW of Menkib (Xi Persei) and 3 and a half degrees NW of Zeta Persei. IC 2003 lies midway between those same two stars.

Louis Swift discovered IC 289 in 1888. Located in Cassiopeia, this 13th magnitude disk can appear annular in larger scopes. The 16th magnitude central star is probably not visible.

Those of you that remember Walter Scott Houston probably have memories of some object or another that he encouraged you to seek out. For me, I think of NGC 1360, the much ignored planetary in Fornax. I wonder how many of you have explored this constellation and know this planetary? The way Scotty put it was:

"Perhaps NGC 1360 is overlooked because it is in a nondescript constellation that U.S. observers subconsciously class as too far south."

That admonition resonated with me and enticed me to give it a try and I found it to be a not too difficult planetary; large and reasonably bright. A bright central star in an oval disk of nebulosity elongated NNE-SSW. Well worth the gyrations required to bring it into view. And as Scotty pointed out, it is no further south than M4.

Planetary nebulae for December

| | | | | |
|---|---|---|---|---|
| IC 289 | PN G138.8+02.8 | Cas | 03h11m05.6s | +61°21'03" |
| NGC 1360 | M 1-3 | For | 03h33m39.0s | -25°50'07" |
| IC 351 | PN G159.0-15.1 | Per | 03h48m10.0s | +35°04'33" |
| IC 2003 | PN G161.2-14.8 | Per | 03h56m58.7s | +33°54'09" |

I hope you have enjoyed this series of articles on the Planetary Nebula Program. It was my hope that a few of you would be inspired to complete the program and a few of you have hinted that I was successful. Time will tell. As one more enticement I'd like to say that in my opinion the Planetary Nebula Program pin is quite attractive; you'll be proud to wear it!

## About Our January Guest Speaker

Our guest speaker will Dr. Vishnu Reddy from the PlanetaryScience Institute in Tucson, Arizona. His research focuses on asteroids, meteors, and meteorites in the Solar System. Some asteroids are perturbed from their orbits in the Main Asteroid Belt to become near-Earth objects (NEOs), which have the potential to impact the Earth and cause catastrophic damage to life and property. A majority of this thesis work was done using the NASA Infrared Telescope Facility on Mauna Kea, Hawaii. Prior to graduate school, he participated in an astrometric survey as an amateur astronomer discovering 23 new Main Belt asteroids and improving orbits of 1000s of other asteroids. Currently, Dr Reddy's primary focus is surface composition of asteroids. Dr Reddy is also member of the Framing Camera (FC) team on NASA's Dawn mission to asteroids Vesta and Ceres. Dr Reddy received his PhD in Earth System Science from the University of North Dakota, Grand Forks, with the thesis "Mineralogical Survey of Near-Earth Asteroid Population: Implications for Impact Hazard Assessment and Sustainability of Life on Earth."

# The Big Picture: GOES-R and the Advanced Baseline Imager

By Kieran Mulvaney

The ability to watch the development of storm systems – ideally in real time, or as close as possible – has been an invaluable benefit of the Geostationary Operational Environmental Satellites (GOES) system, now entering its fortieth year in service. But it has sometimes come with a trade-off: when the equipment on the satellite is focused on such storms, it isn't always able to monitor weather elsewhere.

"Right now, we have this kind of conflict," explains Tim Schmit of NOAA's National Environmental Satellite, Data, and Information Service (NESDIS). "Should we look at the broad scale, or look at the storm scale?" That should change with the upcoming launch of the first of the latest generation of GOES satellites, dubbed the GOES-R series, which will carry aloft a piece of equipment called the Advanced Baseline Imager (ABI).

According to Schmit, who has been working on its development since 1999, the ABI will provide images more frequently, at greater resolution and across more spectral bands (16, compared to five on existing GOES satellites). Perhaps most excitingly, it will also allow simultaneous scanning of both the broader view and not one but two concurrent storm systems or other small-scale patterns, such as wildfires, over areas of 1000km x 1000km.

Although the *spatial* resolution will not be any greater in the smaller areas than in the wider field of view, the significantly greater *temporal* resolution on the smaller scale (providing one image a minute) will allow meteorologists to see weather events unfold almost as if they were watching a movie.

So, for example, the ABI could be pointed at an area of Oklahoma where conditions seem primed for the formation of tornadoes. "And now you start getting one-minute data, so you can see small-scale clouds form, the convergence and growth," says Schmit.

In August, Schmit and colleagues enjoyed a brief taste of how that might look when they turned on the GOES-14 satellite, which serves as an orbiting backup for the existing generation of satellites.

"We were allowed to do some experimental imaging with this one-minute imagery," Schmit explains. "So we were able to simulate the temporal component of what we will get with ABI when it's launched."

The result was some imagery of cloud formation that, while not of the same resolution as the upcoming ABI images, unfolded on the same time scale. You can compare the difference between it and the existing GOES-13 imagery here: http://cimss.ssec.wisc.edu/goes/blog/wp-content/uploads/2013/08/GOES1314_VIS_21AUG2013loop.gif

*Learn more about the GOES-R series of satellites here: http://www.goes-r.gov.*

*Kids should be sure to check out a new online game that's all about ABI! It's as exciting as it is educational. Check it out at http://scijinks.gov/abi*

*The Advanced Baseline Imager. Credit: NOAA/NASA.*

*Download photo at: http://www.goes-r.gov/spacesegment/images/ABI-complete.jpg*

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Jet Propulsion Laboratory

California Institute of Technology

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# 2013—ARIZONA's Astronomically Handy Sky Calendar from Doug Snyder & the H.A.C.—2013

**ARIZONA Observers SKY EVENTS Calendar for 2013 —All Times shown are MOUNTAIN STANDARD TIME***

## January 2013

**HIGHLITE1: Moon & Jupiter on 21st**
**HL2**(month):**Saturn's Rings open to 18°**
Note: **HAC** = **H**uachuca **A**stronomy **C**lub

03 Th Quadrantids Meteor Shower - unfavorable year due to Moon light! 04 Fr ☾ Last Quarter Moon 2058 hrs.
11 Fr ● **NEW MOON** 1244 hrs.(lunation#1114)
12 Sa **HAC** Member **S**tar **P**arty (S.P.)
17 Th **HAC** Pub. S.P.;P.O.; SS@1743h.
18 Fr ☽ First Quarter Moon 1645 hrs.
21 Mo MOON & Jupiter v. close, 2000h
25 Fr **HAC Meeting**, Cochise College, 1900 hrs
26 Sa ○ Full Moon, 2138 hrs.
29 Tu Zodiacal Lt. in W., pm, next two weeks after evening twilight.

## February 2013

**HIGHLITE: Merc. & Mars close on Feb. 8th**

03 Su ☾ Last Quarter Moon 0656 hrs.
09 Sa **HAC** Member **S**tar **P**arty (S.P.)
10 Su ● **NEW MOON** 0020 hrs.
14 Th **HAC** Pub. S.P.; P.O.; SS@1808hrs. 15 Fr **NEA** 2012 DA14; to mag.12 in evening hrs.; size= 57meters; visit spaceweather.com
16 Sa Merc. evening planet in W., 7"
17 Su ☽ First Quarter Moon 1331 hrs. 22 Fr **HAC Meeting,** Cochise College
25 Mo ○ Full Moon 1326 hrs.
27 We Zodiacal Lt. in W., pm, next two weeks after evening twilight

## March 2013

**HIGHLITE: Messier Marathon S.P.** 04 Mo ☾ Last Quarter Moon 1453 hrs. 09 Sa **HAC Messier Marathon S.P.**
09 Sa **Comet Pan-Starrs** (C/2011 L4); 2100hrs, at Perihelion—Mag. 0?
11 Mo ● **NEW MOON** 1251 hrs.
14 Th **HAC** Pub. S.P.; P.O.; SS@1829h.
16 Sa **KartchnerCavernsStatePark**SP.
17 Su Moon&Jup. close;1900hrs; 1.4°
19 Tu ☽ First Quarter Moon 1027 hrs.
20 We **Vernal Equinox**, 0402 hrs.
22 Fr **HAC Meeting,** Cochise College
27 We ○ Full Moon 0227 hrs.
31 Su Merc. morning planet in E. size 9" Easter Sunday

## April 2013

**HIGHLITE: Saturn Opposition, 4/28**
**HL2: Comet Pan-Starrs** (early in month & bright?)

02 Tu ☾ Last Quarter Moon, 2137 hrs. 06 Sa **HAC** Member S.P.
10 We ● **NEW MOON** 0235 hrs.
14 Su Jupiter within 4° of crescent Moon
18 Th ☽ First Quarter Moon 0531 hrs. Th **HAC** Pub. S.P.; P.O.; SS@1852h.
20 Sa **ASTRONOMY DAY—Global**
22 Mo Lyrid Meteors—v. unfavorable due to moonlight; peak 0400?
25 Th ○ Full Moon, 1257 hrs.
26 Fr **HAC Meeting,** Cochise College
28 Su Saturn at **Opposition,** 0100 hrs. mag. +0.1, size 18.8", 8.82 AU

## May 2013

**HIGHLITE: Merc., Venus, Jup. Conjunction!** 02 Th ☾ Last Quarter Moon, 0414 hrs.
05 & 06 Su & Mo **η Aquarid Meteors**; favorable; pk@4am each morning; possibly 40 per hr.
09 Th ● **NEW MOON** 1728 hrs.
11 Sa **HAC** Member S.P.
16 Th **HAC** Pub. S.P.; P.O.; SS@1912hrs.
17 Fr ☽ First Quarter Moon 2134 hrs.
24 Fr ○ Full Moon, 2125 hrs. very shallow penumbral Lunar Eclipse, 1.5%; mostly undetectable, starts at 2053hrs.
24 Fr **HAC Meeting,** Cochise College
**24-29** Planetary Conjunction, **best** of 2013;evening twilight line up of Merc.,Venus,Jup.;26th is !!
31 Fr ☾ Last Quarter Moon, 1158 hrs.

## June 2013

**HIGHLITE: (Gamma) Delphinids?**

04 Tu Venus in **M35**, pm, low in NW
08 Sa ● **NEW MOON** 0856 hrs. **HAC** Member S.P.
11 Tu **Meteors**-Del.; 0100-dawn? v. favorable year, activity is ??
12 We Merc. G. Elong. 24°, pm planet
13 Th **HAC** Pub. S.P.; P.O.; SS@1927hrs.
16 Su ☽ First Quarter Moon 1024 hrs. 20 Th Merc. 2° S. of Venus, pm
20 Th Summer **Solstice** 2204 hrs. 23 Su ○ Full Moon,0432h.largest of 2013 28 Fr **HAC Meeting,** Cochise College
29 Sa ☾ Last Quarter Moon, 2153 hrs.

## July 2013

**HIGHLITE:** Mars, Jup., Merc., am, E., July **22nd**

01 Mo Pluto at Opposition,1800 hrs.
06 Fr Moon/Mars close; . low in E.,0430h.
08 Mo ● **NEW MOON** 0014 hrs.
15 Mo ☽ First Quarter Moon 2018 hrs.
22 Mo ○ Full Moon, 1116 hrs.
26 Fr **HAC Meeting,** Cochise College
29 Mo ☾ Last Quarter Moon, 1043 hrs.
29-30 Mo-Tu: **Meteors:** Delta(δ)Aquarids; am hrs.; favorable year

## August 2013

**HIGHLITE1: Perseid Meteor Shower**
**HL2:** Moon/Planet pairings, am! & pm during month

06 Tu ● **NEW MOON** 1451 hrs
11-13 Su-Tu; **Perseids**; Pk. am of 12th; fast, bright
14 We ☽ First Quarter Moon 0356 hrs.
20 Tu ○ Full Moon, 1845 hrs.
23 Fr **HAC Meeting,** Cochise College
26 Mo **Neptune** at Opposition, 1900 hrs.
28 We ☾ Last Quarter Moon, 0235 hrs.

## September 2013

**HIGHLITE:** Moon&Venus close, pm, 8th

03 Tu Zodiacal Lt. in E., am, next two weeks before twilight.
05 Th ● **NEW MOON** 0436 hrs.
12 Th ☽ First Quarter Moon 1008 hrs. **HAC** Public S.P., P.O.;SS@1830hrs.
19 Th ○ Full Moon (Harvest), 0413 hrs.
22 Su Fall **Equinox**,1344 h. (Aurora?)
26 Th ☾ Last Quarter Moon, 2055 hrs.
27 Fr **HAC Meeting,** Cochise College

## October 2013

**HIGHLITE: Jup. Dbl Shadow Transits (3) 17th, 18th, 26th;** details online

03 Th Zodiacal Lt. in E.,am, next two wks. **Uranus** at Opposition, 0700 hrs.
04 Fr ● **NEW MOON** 1734 hrs. **HAC** Member S.P.
05 Sa **Kartchner Caverns StatePark** S.P.
10 Th **HAC** Public S.P., P.O.;SS@1755hrs.
11 Fr ☽ First Quarter Moon 0402 hrs.
12 Sa **Astronomy Day** (Autumn)
18 Fr ○ Full Moon,1638h.; Lunar eclipse @MR
25 Fr **HAC Meeting,** Cochise College
26 Sa ☾ Last Quarter Moon, 1640 hrs.

## November 2013

**HIGHLITE: Comet ISON (C/2012 S1) !!!! ???** 01 Fr Venus G. Elong. E.(47°),0100hrs., **pm** planet
02 Sa **HAC** Member S.P. Jup., dbl. Shadow Tr., 0414hrs., I & Eu;
03 Su ● **NEW MOON** 0550 hrs.
05 Tu S. Taurid meteors Pk., 0400 hrs.; favorable;
07 Th **HAC** Public S.P., P.O.; SS@1727 hrs.
09 Sa ☽ First Quarter Moon 2257 hrs.
17 Su ○ Full Moon, 0816 hrs.; Merc. **am** planet 22 Fr **HAC Meeting,** Cochise College
25 Mo ☾ Last Quarter Moon, 1228 hrs.
28 Th **Comet ISON**, **Perihelion** @ 1600hrs.
30 Sa **HAC** Member S.P. (for **December**)

## December 2013

**HIGHLITE: Comet ISON ??? !!!!**

02 Mo ● **NEW MOON** 1722 hrs.
06 Fr Venus@greatest illumination, mag. -4.9, 26% illuminated, size 41" 09 Mo ☽ First Quarter Moon 1008 hrs. 12 Th **HAC** Public S.P., P.O.;SS@1714h. 13 Fr Geminid Meteors Pk. 2300h., fair? 14 Sa **HAC Meeting/XMAS Party** 17 Tu○ Full Moon,0413h.(smallest 2013)
21 Sa Winter **Solstice,** 1011 hrs.
22 Su Ursid Meteors Pk., 0700 hrs.
25 We ☾ Last Quarter Moon, 0648 hrs.
26 Th **C/ISON:** closest to Earth, 0300h.

*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; ;
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; dbl= double; AU=Astronomical Unit; °= degrees; *compiler*: **Doug Snyder** (C/2002 E2, MP15512); V1.1.2013