NIGHTFALL
Huachuca Astronomy Club of Southeastern Arizona

Volume 11, Issue 5
December 2010

General Meeting
17 December 2010

7 pm, Cochise College, Sierra Vista, Rm. COM 704

This Month's Speaker: Neal Galt

PLUS our monthly Show-N-Tells, upcoming event details, refreshments & Door Prizes!

The President's Perspective

by Bob Gent

Elections:I'd like to thank outgoing president Wayne Johnson for his four years of service to HAC. He won't be going far since he will remain a member of our board as immediate past president.

We should all thank Del Gordon for his service as our webmaster. Thanks to his work, we have a great website. Also, a few years ago, Del won the ***Webmaster of the Year*** award from the Astronomical League. With well over 250 societies in the AL , this is no small achievement. We also appreciate the service of board member Chris Hanawalt .

Effective December 1, all of the new board officers took office. I was elected President, and the other officers and board members are Glen Sanner, Vice President, Bob Kepple Tre asurer, and Bob Hoover, Secretary. Board members-at-large are Doug Snyder, Keith Mullen, Rich Swanson, and Ken Kirchner. Rich is continuing to serve as outreach director, and Ken is serving as our website manager. Congratulations to all for being elected or reelected to these positions.

Next HAC meeting:

Our monthly meeting will be held in the usually place at Cochise College at 7 pm on December 17. SV Herald reporter and astronomer, Neil Galt, will give us an update, and we'll also be hearing from Rich Swanson and Glen Sanner. I look forward to seeing everyone at our meeting!

Night Sky Events:

We have some big astronomy events coming up this month. On the early morning on December 14, we should have a very good Geminid Meteor Shower. Dress warmly! After the first quarter moon sets, the meteors should be easier to see. And rate is predicted to be about 120 meteors per hour.

Here's another big astronomy news item. On the night of December 20-21, there will be a total lunar eclipse. This only happens during full moons, and observers in North America are well positioned for this event. The entire eclipse will be visible from the USA , and we won't have this opportunity again until 2014. The start of the penumbral eclipse will be at 10:27 pm MST on December 20, and the total eclipse will begin at 1:40 am on December 21. This is an unusual eclipse because it is also the date of the winter solstice. In addition, the moon will be relatively close to the zenith during the eclipse. The moon will appear to turn into a rusty, dim red during totality.

-- Bob Gent, HAC President

Travels on the Celestial Sphere: Binocular Objects for Autumn & Winter

By Bob Kepple & Glen Sanner

This month we present a number of fine objects for binoculars and small telescopes. All of them are quite visible to the naked eye under clear dark skies as hazy patches of light among the stars. We could have called this article Naked Eye Objects.

M31 NGC 224 Galaxy Type SA(s)b I-II Dia. 185'x75', Mag. 3.4v, $00^h42.7^m$ $+41^o$ 16', And

Visible to the naked eye under clear, dark skies, M31, **The Great Andromeda Galaxy**, is our Milky Way Galaxy's closest galactic neighbor in space similar in size to our own galaxy. It lies 2.2 million light years away and spans 150,000 light years with a mass of one trillion suns. Like the Milky Way, M31 has two neighboring satellite galaxies, M32, and NGC 205. M31 is approaching us at 500,000 km/hr and in another two to three billion years a collision will result with the Milky Way and M31 eventually merging after a billion year dance with one another. (The sun may do us in before this as it turns into a red giant.) With this collision each galaxy's gravity will tug on the other galaxy distorting both of their galactic and the tidal forces will distort their structures and they will become one massive elliptical galaxy. M31 and its companions are a fine object in binocular and small telescopes with the parent galaxy's dark lanes plainly visible.

NGC 752 Open Cl. 60*, Tr Type III 1 m, Dia. 50', Mag. 5.7v, $01^h57.8^m$ $+37^o$ 41', And

NGC 752 is located west of a line between the bright stars of 57-Gamma Andromedae, and 4-Beta Trianguli near the end of the two stars strings that form the constellation of Andromeda. It is visible to the naked eye under clear dark skies as a fuzzy patch of light. It's diameter spans nearly a degree of sky (about twice that of a full moon). Binoculars will resolve over two dozen stars and small telescope will show 60 to 70 stars in an irregular distribution having no central compression. The double star 56 Andromedae lies to the SSW (mags. 5.7, 6.0; Sep. 190"; PA 300^o).

NGC 869 Open Cl. 200*, Tr Type I 3 r, Dia. 29', Mag. 5.3v, Be* 6.55, $02^h19.0^m$ $+57^o$ 09'
NGC 884 Open Cl. 115*, Tr Type I 3 r , Dia. 29', Mag. 6.1v, Be* 8.05, $02^h22.4^m$ $+57^o$ 07'

NGC 869 and NGC 884 are known as **The Double Cluster in Perseus**. Older star atlases designated these clusters as "h" and "Chi" Persei. The Double Cluster in Perseus has been known by the Greeks and Babylonians since ancient times. The clusters are not just a chance alignment, both formed out of the same Perseus OB1 stellar association of young supergiants and blue stars. NGC 869 lies 7,200 light years away and NGC 884 is slightly further at 7,500 light years. NGC 884 formed about 14 million years ago and NGC 869 formed about 6 million years ago. Their proximity makes a

stunning sight in binoculars and at low power in small telescopes. The diameter of each cluster is nearly half a degee and the two of them are clearly visible to the naked eye as two fuzzy patches in contact. It's a mystery why Charles Messier included M45 in his catalog but omitted these two fine clusters.

M45, Mel 22, Open Cl. 100*, Tr Type I 3 r, Dia. 110', Mag. 1.2v, $03^h47.0^m$ $+24^o47'$, Tau

Messier 45, known as "**The Pleiades**", is one of the most beautiful objects in the sky. It seems strange that is was never given an NGC number but Messier and Mellotte included it in their catalogs. In ancient times it was known as the Seven Sisters and was often used as a test of good eyesight, the more stars you could resolve with the naked eye, the better your eyesight. The Pleiades Cluster lies some 410 light years away, the fourth closest open cluster to the Earth with a true diameter of seven light years. It is a relatively young cluster at about 70 million years of age. Its brighter stars form a small dipper-shaped asterism and each star illuminates a fine blue colored reflection nebulosity. Binoculars probably give the finest views of this cluster and very low power on small telescopes is needed to view its span of two degrees.

Cr 50, Mel 25, Open Cl. 380*, Tr Type II 3 m, Dia. 330', Mag. 0.5v, $04^h27:^m$ $+16^o$, Tau

Collinder 50 or Melotte 25 is better known as **"The Hyades"**, a conspicuous naked eye V-shaped star cluster that forms the face of Taurus, the Bull. The Hyades is the second nearest star cluster to the Earth lying only 150 light years away, only the Ursa Major Moving Group that forms the Big Dipper is closer to us. The 1^{st} magnitude reddish-orange giant star Aldebaran is the brightest star at the SE end of the "V", however, it is not a true member of the cluster. Aldebaran lies only 68 light years away, nearly twice as close as the other members. The V-shaped asterism is about 12 light years across but some out lying stars give the cluster a diameter of about 27 light years. The Hyades is "the" best naked eye cluster in the sky with a span of 4.6 degrees, nearly 10 full moons lined up from end to end. It is so large that even at the lowest of powers you can not see the entire cluster in an eyepiece so one must use binoculars. Over 60 stars are visible in binoculars, a very fine sight indeed.

M42, NGC 1976, E/R Nebula, Dia. 65'x60', Great Orion Nebula, $05^h35.4^m$ $-05^o27'$, Ori The Great Orion Nebula is one of the most famous objects in the sky, visible as a diffuse nebulous patch were Orion the Hunter's knife would be hanging from his belt formed by three bright stars. The Great Orion Nebula covers one square degree of sky, four times the area of four full moons. It is just one HII region in the area, part of a vast cloud of neutral hydrogen that covers the entire constellation of Orion. The nebula lies 1,600 light years away and spans an area of 30 light years. The material, made mostly of hydrogen, is in the process of forming new stars. The Trapezium which lies in the heart of the nebula contains some of the youngest stars in the sky at only a few hundred thousand years old, which is astronomically young. The Orion Nebula is an interesting complex full of bright and dark clouds that display intricate detail. The most prominent area looks like a bird or eagle with its wings spread in flight. Again this is a fine binocular or small telescope object.

*Member Review – **Bob Kepple***

by Mark Meanings

A couple of months ago, I was attending the monthly HAC general meeting and time was set aside by our ALCOR to announce that Bob Kepple had completed yet another Astronomical League Observing Club pin. "Wow", I thought, "this guy is *REALLY* into observing! I gotta know more about him and how he conducts his observations." Doing a little bit of research, I found that Bob's

observing goes all the way back to 1979 when he earned his first observing club award by becoming #406 of the Messier Club. Since then, Bob has also become a member of: Herschel II Club (#51 DA), Globular Cluster Club (#88), Double Star Club (#346), Open Cluster Observing Club (#16), Planetary Nebula Club (#4), Deep Sky Binocular Club (#254), Binocular Messier Club (#791),Arp Peculiar Galaxy Club (#53V), Lunar Club (#604), Master Observer Club (#84), Galaxy Groups and Clusters Club (#22-DA), and the Dark Nebula Club (#3).

Wanting to know more, I recently asked Bob to do a "virtual" interview over email:

IMM: Describe your telescope, observatory, and any other hardware/software that you use to make your observations.

BK: *My observatory is named Desert Starlight Observatory (DSO may also stand for Deep-Sky Objects). It houses a 22-inch, f4.5 Dobsonian equipped with an Argo Navis and a ServoCat and a Celestron 11 which I use with an StellaCam II Video Camera. I have also built a 16-inch Dobsonian which I use as a portable scope for star parties.*

IMM: Do you plan your observations beforehand? I assume the answer to that is yes, so I'll also ask how many targets you schedule for a particular night. Does it depend on the type of object you're observing, or does it depend more one what's up?

BK: *If I'm doing a League program, that's my plan, otherwise I usually decide after I get out under the stars and see what the seeing is like. If its very steady I'll go for objects low on the southern horizon, if the seeing is not good I'll observe closer to the zenith. I like to mix the faint fuzzies with showpieces. If the moon is out I'll do double stars, open and globular clusters, and anything that can stand up to moonlight. With the Argo Navis I can do any number of objects I want as it take little time*

to locate them. If I'm doing galaxy clusters I may only do half a dozen or so as you can spend a lot of time on each cluster identifying all the faint members. If I'm in a showpiece mood I can do 50 to 100 in an evening.

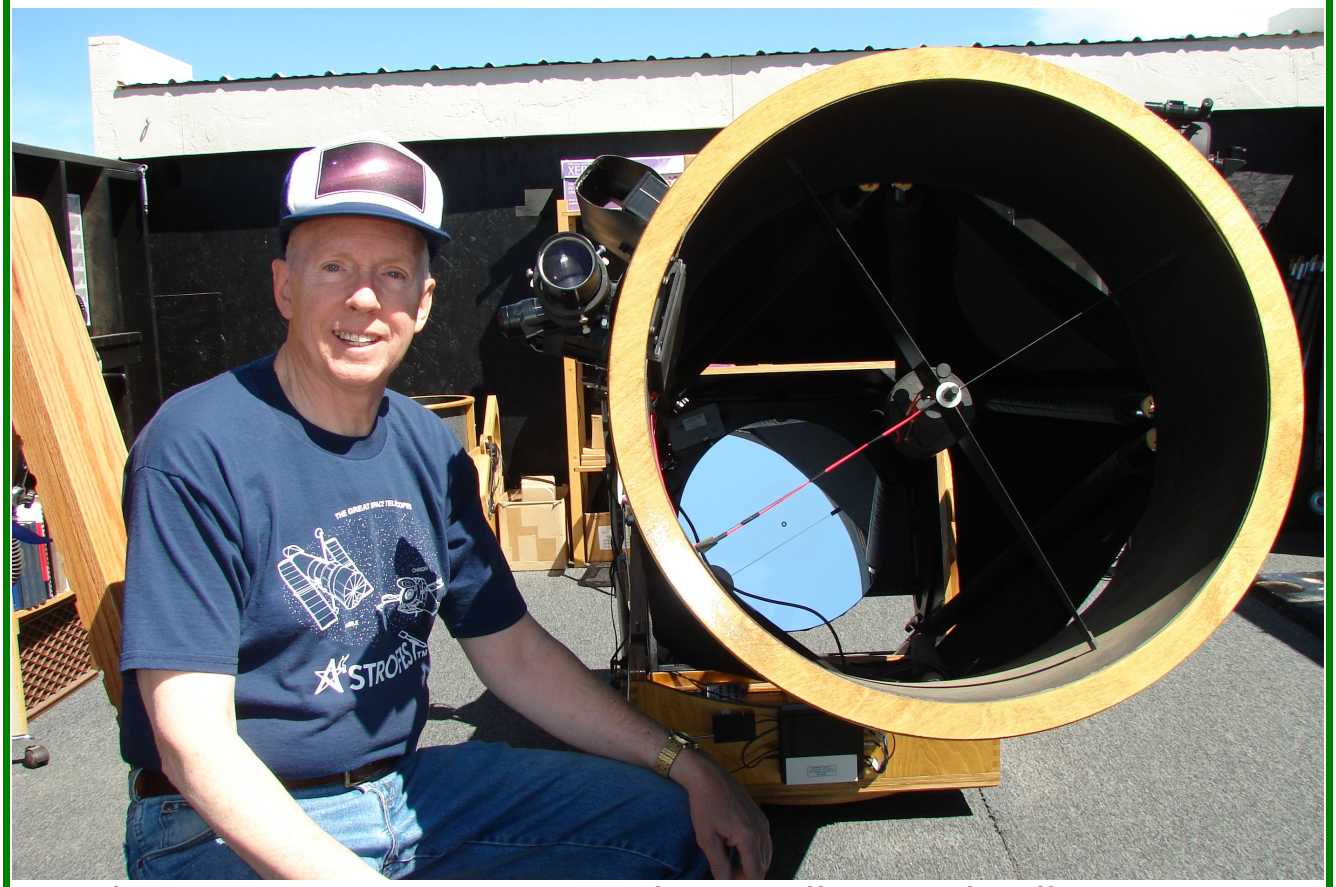
IMM: What does an observation consist of? Do you eyeball it, or do you use a camera? What information do you record for each kind of object? How long does a typical observation take you to record before you move on to the next one?

BK: *I can spend an average of ten or fifteen minutes in a galaxy cluster. If its an Abell Galaxy Cluster with lots of members I may be there half and hour especially if Glen and I are observing together as we each take turns seeing all the objects and trying to detect all the fainter members. Since I have so many observations, I''ve gotten to the point that I only make a written observation if its an object I haven't seen before or one that needs updated. My observations include: Galaxies: Brightness of the object, size, elongation, is there a core or stellar nucleus, is there any spiral structure, knots, of dark lanes visible. Are there any stars embedded in the halo, touching the periphery, or nearby. Are there any companions nearby or other interesting asterisms or double stars nearby. Open Clusters: Overall brightness, size and elongation, stellar distribution and patterns, compression, number of stars, brightness of the stars, how bright is the lucida (brightest star in cluster), number of stars visible, and the surrounding star field including asterisms and other deep-sky objects.*

IMM: Is there any particular time of the month (or more specifically, phase of the moon) that you do your observations?

BK: *When observing deep-sky objects I only go out when the moon is absent. During crescent to first*

quarter I often go out after the moon sets for a couple hours. After the moon starts setting after midnight I stop going out. I'll take a break from astronomy between first quarter and full moon and begin observing again when I can get a couple hours before moon rise. When the weather is cloudy at dusk I check the sky every half hour. The sky will often clear between 8pm to 10 pm and I'll go out for three or four hours. I rarely stay out past 2am. If I have to get up early, I'll quit earlier. There's no since abusing yourself when you consider that any object you stay up late to see will be up and hour earlier just a month from now.



IMM: If you have multiple telescopes, do you prefer to use different ones for different object types (e.g. a refractor for planets/multiple stars, and a large reflector for faint galaxies)?

BK: *I do have multiple telescopes but always use the 22-inch Dob for everything. The 16-inch Dob is used for star parties since I don't want to hug the 22-inch around. I'll take the 16-inch to The Texas Star Party or The Okie-Tex Star Party and also to our own HAC events. The 11-inch Celestron is used when I want to use the StellaCam Video Camera. The shorter tube assembly of the Schmidt-Cassegrain is better suited with all the cables needed. With the StellaCam one can see object five time fainter than with an eyepiece. A refractor is only better for planets when the seeing conditions are bad due to the fact that a larger instrument also magnifies the turbulence. If the seeing is steady the larger telescope, even if the f-ratio is lower, will always grasp more subtle details because of the aperture.*

My favorite objects are deep-sky objects, especially globular clusters, nebulae, and galaxies, but if a planet or comet is out I make it a point to view them. I also love to observe meteor showers, especially the Perseids and the Geminids. I will stay up all night for these two showers. The best shower (actually a storm) I ever witnessed was the 2001 Leonids when members of the HAC club

counted over 7,500 from about 1:00am to dawn. The next best astronomical event was the Shoemaker-Levy comet impact on Jupiter.

Thanks ever so much, Bob, for sharing more details of your observing with us. Congratulations and keep up the excellent work!

December 2010/January 2011 Bright ISS Passes

from www.heavens-above.com

Date	Start	End	Max Alt/Az	Mag
17 Dec	06:04	06:07	27 / SW	-2.4
23 Dec	18:35	18:38	82 / ESE	-3.8 *** bright!!!!
25 Dec	17:50	17:56	90 / NW	-3.7 *** bright!!!!
11 Jan	18:32	18:36	33 / NE	-2.9
12 Jan	18:56	19:01	46 / SW	-2.6
13 Jan	17:45	17:50	35 / NE	-3.0

Double Vision:New Instrument Casts Its Eyes to the Sky

Editors Note: If you haven't already heard, the LBT has just acquired some new (and awesome!) imaging capabilities. Here's an article pulled from Science Daily (www.sciencedaily.com):

The Large Binocular Telescope Interferometer has taken its first images of the star Beta Peg in the constellation Pegasus -- an encouraging start for an instrument designed to probe the cosmic neighborhoods where Earth-like planets could exist.

Eight years in development, the NASA-funded instrument combines beams of light from twin 8.4-

meter (28-foot) mirrors mounted atop the Large Binocular Telescope on Mount Graham, Ariz. "By combining the light of the telescopes, we're able to realize its full potential," said Project Manager Tom McMahon of the University of Arizona, Tucson. "Together, the two mirrors form the largest single-mount telescope in the world."

"The quality of the first-light images is wonderful," said the principal investigator for the project, Phil Hinz of the University of Arizona. "The telescope was stable and the instrument was working properly."

With this high-resolution imaging capability, astronomers hope to probe nearby solar systems -- specifically, the areas in these systems where Earth-like planets with liquid water could exist. Though the Large Binocular Telescope Interferometer won't be able to detect Earth-size planets, it will be able to see dust disks that are indicative of planet formation, in addition to detecting large, Jupiter-size planets farther out from the star. These findings will help future, space-based exoplanet missions know where to search for Earth-like planets in our own galactic neighborhood.

With its ability to probe this "habitable zone" of other solar systems, the Large Binocular Telescope Interferometer will also complement the capabilities of other NASA missions -- the Keck Interferometer, which can find dust very close to stars; and the Spitzer Space Telescope, which is adept at observing planet-forming dust that is much more distant.

"This instrument will help complete our picture of what planetary systems look like and be a pathfinder for finding Earth-like planets that are close by," Hinz said.

With a major upgrade of the Large Binocular Telescope's adaptive optics system scheduled for next year, the interferometer will undergo testing and commissioning for the majority of 2011, and during that time, scientific observations will begin.

"This is the highest-resolution instrument of its kind in the world," McMahon said. "We won't just be able to image exoplanets, but extragalactic objects, nebulae and galaxies. It's taken time to make sure it works as envisioned, but now it's time to do science."

The Large Binocular Telescope Interferometer is funded by NASA and managed by Ben Parvin at NASA's Jet Propulsion Laboratory, Pasadena, Calif., as part of NASA's Exoplanet Exploration Program. The instrument and product development are provided by the University of Arizona, Tucson

More information about the Large Binocular Telescope Interferometer is available at: http://lbti.as.arizona.edu/LBTI-Main/Project.html

Send in Your Articles!!!!

It's all too easy these days to jump onto the web and find out about every astronomical event going on at the time. But what's harder to find is local activity. This, in my opinion, is what a Club Newsletter is for: to present to the members all the things going on within the club. These are things that generally won't be found anywhere on the web, but are of huge importance and interest to members of the club. So – if you have an event, or hear of an event, or are doing anything astronomical, please let me know so I can include it in the newsletter. It's easiest to email me at: cosmiclettuce AT yahoo DOT com.

Huachuca Astronomy Club P.O. Box 922 Sierra Vista, AZ 85636 http://www.hacastronomy.com, Yearly Membership: Individual: $25; Family: $35; Military: $20; Student:$10 (with restrictions); President: Bob Gent, (520) 378-2915; Vice President: Glen Sanner, (520) 803-0576; Treasurer: Bob Kepple, (520) 366-0490; Secretary: Bob Hoover; Webmaster: Ken Kirchner; Star Party Coordinator: Glen Sanner; Past President: Wayne Johnson; Outreach Events Coordinator: Rich Swanson, (520) 803-7298; Loaner Scopes: Bob Gent, (520) 378-2915; Newsletter Editor: Mark Meanings

The HAC board of directors greatly appreciates everyone at Starizona for their generous support.