

October
2007

NIGHTFALL

Huachuca Astronomy Club of Southeastern Arizona



HAC Web Page: hacastronomy.com

HAC MEETING: Friday, October 26, 2007

7 pm, Cochise College, Sierra Vista, Rm. 305A/B

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

Speaker: Several HAC Members

Topic: "Basics for Buying an Astronomical Telescope"

Star Party Corner

Keith Mullen, Star Party Coordinator (520) 366-0049 email: repozazer@msn.com

Participation is the Lifeblood of the Club!

Our last two attempts at Member Star Parties have led me to believe that the No More No Go is a viable option to just staying home when the weather doesn't cooperate. We have had gatherings of over 25 members at each of these for some good conversation, and even some birthday cake, proving a Star Party can be more than just observing. Don't get me wrong, I like the action of a full observatory and all the people around, but let's make due with what we get instead of just writing it off until next month. This policy will continue until someone comes up with a more proactive solution! On the other hand, the Public Star Party at JBO was a handful with double figures of public attendees and at least a dozen or more students; the place was buzzing and all we had for scopes were Dave's Big Blue, while Glen and I managed to bring some optical equipment too. Far too little glass for such a crowd. We do call these gatherings Public/Member Star Parties to let you know it's for everyone not just the public who show up. How many of you were one of those first timers making it out to JBO to see "What's Up There"?

October Star Party Schedule

JBO is the place in October with the Public Star Party falling on Friday the 5th and the Member Star Party/Annual HAC Picnic on Saturday the 13th. Dave and Cheryl have graciously given up their pool area for this year's Pot-Luck extravaganza and have asked everyone to call them 520-378-0981 and let them know what dishes you intend to bring. This helps eliminate one of those 18 salad dinners and helps to even out the eating field. Folks, don't forget to throw the scope in the trunk along with that chicken or salad. This is a Star Party too. Let's see how much we can eat and see in one night,!

President's Perspective

I was disappointed to read that the town of Sierra Vista has once again decided to table updating its lighting ordinance because some merchant is concerned that he will not be able to light up the night sky for "safety concerns". He also mentioned that over a dozen of his fellow businessmen were not aware of the lighting ordinance to be enacted. Where have they been, sitting in a cave? Don't they live in this town? Don't they read the paper? This sounds like a stalling routine that will not work! We live in this part of Arizona because we love the night-time sky and its wondrous (not "stupid", as some ignoramus named "Safety First" stated in the SV Herald's web site listed below) stars and Milky Way. We are fortunate to be able to enjoy the universe from most of our yards, but unfortunately it is a constant and unsavory confrontation with those who would deny us the pursuit of our hobby for their version of safety. Improper lighting causing glare and light trespass should be considered like smoking in a restaurant, not good for your health! If you are on the HAClist, please read Bob Gent's email concerning the City Council's non-action on behalf of protecting the night sky. If you are not on HAClist, please consider signing up for it on the Yahooogroups. com website so that news of an urgent matter can be passed on to you quickly. Bob mentioned two websites to look at concerning the Sierra Vista lighting situation. The first: <http://www.svherald.com/articles/2007/09/19/news/doc46f0bdc6f511558558279.txt> is coverage of the lighting ordinance discussion at City Hall. Following the article is a chance for you to respond. I hope that you will see that I responded to "Safety First's" rude remarks with some of my own comments. For contacts to the SV government, here's the link to the city's website: <http://www.ci.sierravista.az.us/cms/> . Please contact them and make your opinions heard on the light pollution issue and let them know it's important to pass lighting ordinances that make sense and preserve our night-time sky!

Clear skies,
Wayne (aka Mr. Galaxy) your "riled up" resident president

Dollar\$ & Cent\$

Tim Doyle

The Club has a checkbook balance (mid September) of \$3829.49. With \$118.19 in petty cash. You will note that this is down from the \$4500+ we had last month. This is because we have upgraded our club solar scope (PST) so it will now track the sun. We also got a parallelogram so we can put up our Sky Scout with a pair of binoculars at our star parties. **A big welcome to Don & Mary Roland who joined last meeting.** We still have club T-shirts XXL & medium (\$10) sweatshirts Hooded and non-hooded. XL, XXL, available at \$10 & \$15. (This is below our cost) We will put these out on display at the next meeting by the refreshments so you can take a look at them.

Outreach Biz

Jeanne Herbert

There are no Outreach events currently scheduled for the month of October.

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 Yearly Membership: Individual: \$25; Family: \$35; Military: \$20; student:\$10 (with restrictions)
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Treasurer: Tim Doyle 378-5121; **Secretary:** Jeanne Herbert, 366-5690
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 Outreach Events Coordinator: Jeanne Herbert, jeanne_hrbt@yahoo.com / 366-5690 (early evenings)
 Loaner Scopes: Gary Myers 432-4433; Newsletter Editor: Teresa Mullen, nightfall@hacastronomy.com / 366-0049

This issue of Nightfall can also be found on-line at hacastronomy.com. Click 'Newsletter' link. There is much more information about astronomy and our HAC activities on our club web site. *To join the HAC-LIST, send an email to haclist-subscribe@yahooogroups.com .

About the October Speakers ...

A short power-point presentation will be given by HAC president Wayne Johnson (aka Mr. Galaxy) to explain terms and characteristics used to describe a variety of astronomical telescopes. The slide show will be followed by demonstrations from several of HAC's telescope owners illustrating how they use their telescopes. If the weather cooperates we will do some observing outside through these telescopes.

Wayne (aka Mr. Galaxy) Johnson has been an amateur astronomer for nearly 50 years and has owned a variety of telescopes, some purchased off the shelf, some home-built. In addition, several of our own HAC members have volunteered to explain why they bought the telescopes they did and talk about their scope's characteristics.

The Best Galaxies of Autumn By Bob Kepple & Glen Sanner

Last spring we did an article on the best galaxies of that season so this month it seems fitting that we follow-up with an article on the best galaxies visible in autumn skies. Most of these galaxies are quite visible in small telescopes but, of course, the more aperture you use the better the view. While looking for these objects and reading our descriptions don't be discouraged if we say that a particular galaxy needs at least a medium size scope to be best seen. Often the object is quite visible in small telescopes but spiral arms and other features may be not visible. That doesn't mean you shouldn't look. No matter what size of telescope you are using try using a variety of magnifications on each object. Start with a low power to find the object then keep increasing the power until the view becomes a little unclear then drop back to the last eyepiece that gave a good view. Pushing the magnification to the limit of seeing conditions will bring out details that are often missed at lower powers.

#1. M31 NGC 221 Gx Type SAb I-II Dia. 185' Mag. 3.4v SB 13.6 00^h42.7^m +41°16' Andromeda

The Great Andromeda Galaxy is the closest galactic neighbor in space similar in size to our own Milky Way Galaxy. On a clear, dark night, M31 is visible to the naked eye as a faint, hazy patch several times as wide as the full moon. Light from this galaxy began its journey to us while the woolly mammoths were still roaming our planet during the Pleistocene epoch 2.2 million years ago. This galaxy was noticed as far back as 905 A.D. by the Persians. Its true diameter spans 150,000 light years and contains a mass between 200-300 billion suns. M31 has two companions, M32 and NGC 205, similar to our own galaxy with its own satellite galaxies, the Magellanic Clouds. M31 is approaching us and will collide with the Milky Way in about 1.5 billion years. Sorry I brought this up – now we'll all lie awake worrying about it !?!?

Using 4 to 6-inch scopes at 50x allows you to see M31 and both its companions in the same field of view. At 100x M31 is a large, flat oval of grayish light with a bright center. The spiral arms are not prominent but with careful observation you may see some slightly brighter streaks around the core and a dark lane along the western flank. With 8 to 10-inch scopes the halo takes on a mottled texture and the spiral arms and dark lane become more obvious. NGC 206, a stellar association within M31's envelope is easily visible in the SE arm. Through 16-inch and

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Travels on the Celestial Sphere

Glen Sanner

In early November (11-2-06) John Cassella and I observed some lunar features with the 12.5" telescope at DOW. I very seldom write up lunar observations but I thought these might be of interest to the club observers who keep an eye on the Moon.

We observed several regions last night but in particular one feature caught our eye after looking in the Atlas of the Moon by A. Rukland The Modern Moon: A Personal View by Charles Wood (a former HAC speaker). In chapter 16 of his book Charles Wood mentioned a feature called "the Helmet".

It is in the southern part of Oceanus Procellarum between Mare Cognitum and Mare Humorum at selenographic coordinates 31° W, and 17° S. This feature is approximately 140km east of the large crater Gassendi and was named "the Helmet" by C.M. Pieters and colleagues for its resemblance to a helmet. Charles Wood mentions in his book that this feature has a different albedo than the surrounding area. He is correct and it is easily picked out from the area around it. Wood states that it is more reflective in the near-infrared wavelengths and strongly absorbent in the UV part of the spectrum, thus making it easier to see from the surrounding mare.

From an article by Harald Hiesinger and James Head in Reviews in Mineralogy & Geochemistry, they state that parts of "the Helmet" are a result of volcanism causing similar features on the Moon like the Gruithuisen domes and other non-mare domes.

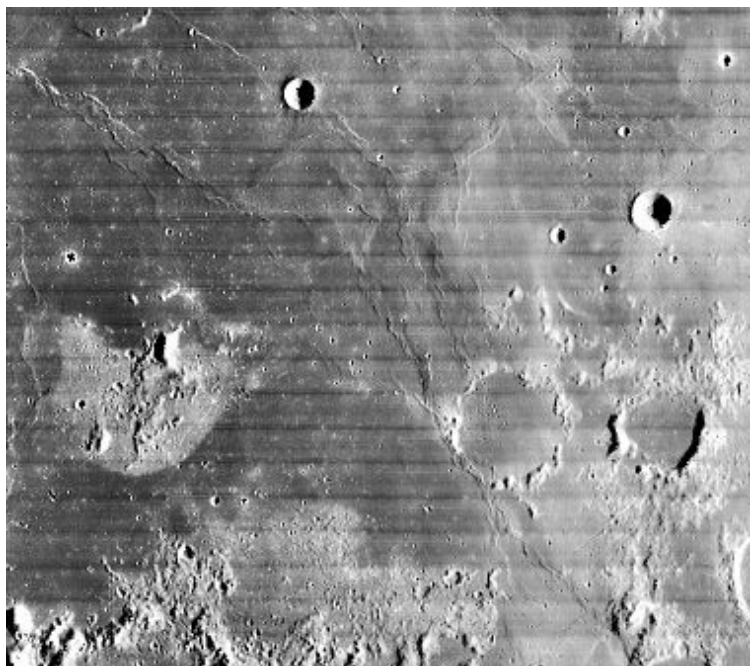
In another article in the Journal of Lunar and Planetary Science, authors N.V. Bondarenko and Yu. G. Shkuratov point to features just east and south of Herigonius Eta to be "dome like" in appearance. Many craters appear on "the Helmet" and are also interesting to view, as is Herigonius Eta.

In any case it was enjoyable to look at and wonder about how "the Helmet" was formed. During our observations John and I always want to push the performance of the scope we are using or perhaps we are pushing ourselves to see features that strike us as small, large or unusual. As you all know the features on the Moon are so different and varied that there is always something new to look at on our nearest celestial neighbor.

Please, go out and look, see if you can find "the Helmet." It was a 12 day old Moon when we made this observation.

The photo of "the Helmet" is courtesy of USGS digitized Lunar Orbiter project.

Godspeed,
Glen



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larger scopes the Andromeda Galaxy is a true showpiece with a bright core and a milky white halo. The outer halo is diffuse with no definite edge. The dark lane is quite obvious and many stellar objects that are globular clusters and H-II regions like the Orion Nebula may be seen at high power. The brightest globular is G76 in the eastern half of the SE arm. Also in the SW arm is the most noticeable stellar association designated A78.

#2. NGC 253 Gx Type SABc II Dia. 30.0'x6.9' Mag. 7.6v SB 13.2 00^h47.6^m -25°17' Sculptor

The Sculptor Galaxy, a magnificent object, is the brightest member of the rather nearby 8 million light year distant Sculptor Galaxy Group. Its true size is at least 70,000 light years across, comparable to the diameter of our Milky Way Galaxy. This galaxy is one of our favorite objects and it is just as impressive as the Andromeda Galaxy. In small scopes, it is a fairly bright, highly elongated glowing streak of light. In medium-size telescopes it takes on a mottled texture with a well concentrated and highly extended core which is not significantly brighter than the outer extensions. Through 16-inch and larger instruments NGC 253 is Stunning! The envelope is huge and full of bright and dark streaks and patches. A dark dust lane is visible NW of the core and at least a dozen faint stars may be seen embedded in the halo.

#3. NGC 55 Gx Type SBm III Dia. 30.0'x6.3' Mag. 8.1v SB 13.6 00^h14.9^m -39°11' Sculptor

NGC 55 is the second brightest member of the 20 degree wide Sculptor Galaxy Group that also includes NGCs 253, 300, and 7793 in Sculptor and 45 and 247 in Cetus. Small scopes will show a fairly faint, large, thin galaxy with an unevenly illuminated halo spanning half a degree. It is a splendid, highly elongated object in 12-inch and larger telescopes visible as an unevenly illuminated streak extended 20'x4' ESE-WNW. Through 16-inch and larger scopes it is a superb sight! The halo is an extremely long, thin 30'x4' streak with an oval core off center to the west. Several small, brighter patches are visible along the major axis east of the core. A particularly bright knot may be seen just SE of the core.

#4. NGC 300 Gx Type SAcD III-IV Dia. 30.0'x6.9' Mag. 7.6v SB 13.2 00^h47.6^m -25°17' Sculptor

NGC 300 needs a medium or large telescope to be seen at its best. It has the same magnitude as NGC 55 but its surface brightness is much lower because it is oriented face-on to us rather than edge-on. A 12-inch scope will show a poorly concentrated core surrounded by a faint halo elongated 14'x10' ESE-WNW. Through 16-inch or larger telescopes NGC 300 displays a 16'x10' diameter halo with a broad, well concentrated central region that brightens to an inconspicuous stellar nucleus. Mottling may be discerned in the central region. The galaxy is embedded in a triangle of 9.5-10th magnitude stars.

#5. M33 NGC 598 Gx Type SAcD II-III Dia 67'x41' Mag 5.7v SB14.2 00^h47.6^m -25°17' Triangulum

Pinwheel Galaxy or Triangulum Galaxy. Messier 33 is the third largest member of the Local Galaxy Group after the Andromeda galaxy and our own Milky Way. It is only 2.4 million light years away but since it is turned face-on to us it has a low surface brightness. M33 was discov-

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Space Place Astronomy Club article

A Missile in Your Eye

by Patrick L. Barry

Satellite technology designed to catch ballistic missile launches may soon help doctors monitor the health of people's eyes.

For the last 15 years, Greg Bearman and his colleagues at JPL have been working on a novel design for a spectrometer, a special kind of camera often used on satellites and spacecraft. Rather than snapping a simple picture, spectrometers measure the spectrum of wavelengths in the light coming from a scene. From that information, scientists can learn things about the physical properties of objects in the photo, be they stars or distant planets or vegetation on Earth's surface.

In this case, however, the challenge was to capture snapshots of short-lived events—like missile launches! The team of JPL scientists designed the new spectrometer, called a computed tomographic imaging spectrometer (CTIS), in collaboration with the Ballistic Missile Defense Organization as a way to detect missiles by the spectral signatures of their exhaust.

But now the scientists are pointing CTIS at another fast-moving scene: the retina of an eye.

Blood flowing through the retina has a different spectral signature when it is rich in oxygen than when it is oxygen deprived. So eye doctors can use a spectrometer to look for low oxygen in the retina—an indicator of disease. However, because the eye is constantly moving, images produced by conventional spectrometers would have motion blurring that is difficult to correct.

The spectrometer that Bearman helped to develop is different: It can capture the whole retina and its spectral information in a single snapshot as quick as 3 milliseconds. "We needed something fast," says Bearman, and this spectrometer is "missile-quick."

CTIS is even relatively cheap to build, consisting of standard camera lenses and a custom, etched, transparent sheet called a grating. "With the exception of the grating, we bought everything on Amazon," he says.

The grating was custom-designed at JPL. It has a pattern of microscopic steps on its surface that split incoming light into 25 separate images arranged in a 5 by 5 grid. The center image in the grid shows the scene undistorted, but colors in the surrounding images are slightly "smeared" apart, as if the light had passed through a prism. This separation of colors reveals the light's spectrum for each pixel in the image.

"We're conducting clinical trials now," says Bearman. If all goes well, anti-missile technology may soon be catching eye problems before they have a chance to get off the ground.

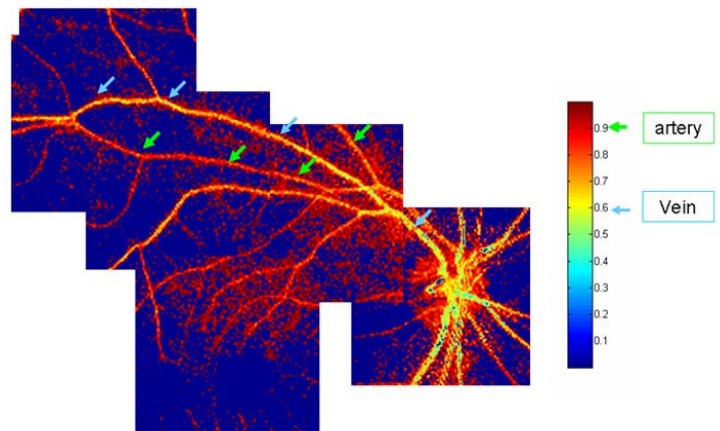
Information about other NASA-developed technologies with spin-off applications can be found at <http://www.sti.nasa.gov/tto>.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Caption:

This three-color composite image from the computed tomographic imaging spectrometer shows the oxygenation of the blood in the arteries and veins of a human retina. (Arteries appear red, veins appear yellow.)

Note to editors: this image may be found at http://spaceplace.nasa.gov/news_images/retinal_oximetry.jpg.



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ered in August 1764 by Charles Messier but Lord Rosse was the first to detect its spiral structure in the mid 19th century. It is a challenging object for small telescopes but with our elevation and dark skies in southeast Arizona, we see it better than most Easterners. 4 to 6-inch scopes will show a very faint, oval glow elongated nearly N-S lying within a NNE-pointing isosceles triangle of 7.5 magnitude stars. 12-inch telescopes show a fairly faint 60'x30' halo that is distinctly uneven in brightness. The core is broad and diffuse with some mottling toward center. At least a dozen 13th magnitude stars are embedded in the halo. This is the type of galaxy that responds to increased aperture. If you are accustomed to smaller scopes, your first view of M33 through a 20-inch or larger instrument will surprise you. A 20-inch scope shows a fine spiral-arm pattern that is traceable with direct vision over a 65'x35' diameter halo. A bright, round core with a sharp stellar nucleus lies at center. The halo is mottled and very uneven in brightness with over two dozen H-II regions and stellar associations visible. Many of these "knots" have their own NGC numbers because early observers were not seeing the faint outer portions of Messier 33 and thought they were separate objects.

#6. NGC 247 Gx Type SABdm III-IV Dia. 19.0'x5.5' Mag. 9.2v SB 14.1 00^h47.1^m -20°46' Cetus

NGC 247 appears faint and extremely elongated 12'x3' N-S with 8 to 10-inch telescopes. 100x at this aperture will show a faint, extended core with much fainter extensions. The galaxy is quite nice when viewed through 16-inch and larger instruments. The halo becomes fairly bright and is shaped like a teardrop elongated 19'x5'. The southern edge is pointed and brighter than the broader and more diffuse northern extension. A 9th magnitude star is visible just inside the southern tip. The central area is mottled and brightens gradually to an extended core.

#7. NGC 7331 Gx Type SAb I-II Dia. 10.5'x3.7' Mag. 9.5v SB 13.3 22^h37.1^m +34°25' Pegasus

Viewed with 8 to 10-inch telescopes NGC 7331 is a fine bright galaxy highly elongated 6'x1.5' N-S. It has a large, bright extended core containing a stellar nucleus. 12-inch scopes will show a halo elongated 8'x2' while 16-inch or larger instruments can detect the full extent of its 10'x 3' halo. The halo is speckled near its prominent oval core and a subtle dust lane may be glimpsed along the western flank. Look for four small, fainter companions (NGCs 7335, 7336, 7337, and 7340) in the field east of the main galaxy.

#8. NGC 891 Gx Type SAb? III Dia. 13.0'x2.8' Mag. 9.9v SB 13.7 02^h22.6^m +42°21' Andromeda

NGC 891 appears fainter than its assigned magnitude due to low surface brightness. It is visible in small scopes as a faint streak but the dust lane is not visible unless you have very keen eyes. A 10 or 12-inch scope is usually needed to glimpse the dust lane. At this aperture it is a fine needle suspended in a rich star field. Although it is still fairly faint, the halo may be traced out to 10'x2' NNE-SSW with a moderate brightening to a slightly bulged core. Bright patches along the halo may be visible on a clear, steady night. There is a 13th magnitude star at the SSW tip. In 16-inch and larger instruments NGC 891 is a stunningly beautiful object. It is large and slender, elongated 12'x2.5' NNE-SSW with a noticeably brighter center that fades toward the tips. The

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Volume 8 Issue 10, page 8 Teresa Mullen, Editor

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dark lane is prominent near the nucleus but becomes more difficult in the extensions. This beautiful needle seems to be suspended three-dimensionally against the stars.

#9. NGC 7793 Gx Type SAd III-IV Dia. 10.5'x6.2' Mag. 9.2v SB 13.6 23^h57.8^m -32°35'
Sculptor

Last on our list is NGC 7793, one of the smaller members of the Sculptor Galaxy Group, with only a 24,500 light year diameter compared to our Milky Way's 100,000 light year diameter. Although it is nearby in space at approximately 8 million light years away it appears fairly faint because it is a face-on galaxy with low surface brightness. This is the fourth galaxy from the Sculptor Galaxy Group to make our list but there are many more galaxies in Sculptor that are worthy targets for deep-sky observers. Medium size telescopes will show a fairly faint halo elongated 6.5'x3.5' E-W with a small core. 16-inch and larger instruments will show an irregularly bright 8'x4' halo brightening to a mottled core having an indistinct nucleus. A close triplet of 10-11th magnitude stars lies 8' north.

We hope you enjoy viewing our list - it is only a starting point to the many treasures of the night sky. To find them use *Sky Atlas 2000*, *Uranometria 2000*, or *The Night Sky Observer's Guide*. Some of this material was taken from *The Night Sky Observer's Guide* by the authors with permission from the publisher Willmann-Bell, Inc.