

July 2007
HAC's 25th
Anniversary!

Huachuca Astronomy Club of Southeastern Arizona



HAC web page <http://hacastronomy.com>

HAC MEETING: Friday, July 27, 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: Jay Holberg

Topic:

"Sirius: The Biography of a Star"

JBO—Get's a new look!



Photo shot Courtesy of HAC's Past President Doug Snyder

HAC Vice President , Keith Mullen with heavy equipment in his hands gives JBO a face lift!!! You must pay a visit and enjoy the new spacious scope field!

HUACHUCA ASTRONOMY CLUB 25TH ANNIVERSARY PARTY

07/07/07 AT 5:00 P.M.

**ARIZONA FOLKLORE PRESERVE
RAMSEY CANYON ROAD**

GUEST SPEAKER: DAVID LEVY

EXCITING DOOR PRIZES

TICKETS ARE \$25.00 PER PERSON

**CONTACT Keith & Teresa Mullen
at the meeting or 366-0049.**

DINNER MENU

**ROAST TOP SIRLOIN
LEMON CHICKEN
PARSLEY POTATOES
GREEN BEANS ALMANDINE
RICE PILAF
ROSEMARY CARROTS
DINNER ROLLS
DESSERT
COFFEE & ICED TEA**

President's Perspective

I'd like to take this opportunity to wish Helen Patterson, who is on the HAC board and has been organizing our 25th Anniversary Dinner, a quick recovery from recent surgery. We hope that she can attend the festivities she worked hard to make a reality, but if she can't, we have her in our thoughts. Teresa Mullen has offered to assist in completing any unfinished tasks for which we are grateful.

Speaking of the Anniversary Dinner, remember that it will be held on 7/7/7 at 5pm at the Arizona Folklore Museum in Ramsey Canyon and promises to be a fun event. The menu sounds delicious and the location is wonderful. I have confirmed that our featured guest speaker, David Levy, along with his lovely wife, Wendee, will be there. David gave one of the very first invited talks to HAC after David Patterson founded it. This time the talk is titled "The Nightwatchman", and discusses Levy's comet adventures in the passionate way that only he can. In addition, I have been able to locate several of HAC's past presidents and have asked them to say a few words about their time as president. It's a great way for current members to keep touch with HAC's history and for the ex-presidents to take pride in the fact

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Dollar\$ & Cent\$ - Tim Doyle

The Club has a checkbook balance (mid May) of \$4,414.91. This amount does not reflect what we have taken in for our 25th Anniversary Dinner. We still have club T-shirts XXL & medium (\$10) sweatshirts Hooded and non-hooded. XL, XXL, available at \$15 & \$25. (this is below our cost)

For those of you that are new to the club, at this time we are sending our current roster to the Astronomical League (AL). You will be receiving their magazine on a quarterly basis. This is part of your dues structure and we hope that you enjoy it. Don't just throw it away as it has quite a bit of information in it, including observing certificates that you can earn as a member of the AL. Some of these certificates are designed just for the beginning observer so that you can learn more about the night.

Outreach Biz Jeanne Herbert

Volunteers Needed!!

On Saturday morning, July 21, HAC members will be assisting Cub Scouts at Veterans Park earn their Astronomy Belt Loop.

The event runs from 7 a.m. to 12:30 p.m. Let me know if you are available to help with this event, 366-5690.

A huge thank you to those that have already volunteered!
Jeanne

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Yearly Membership: Individual: \$25; Family: \$35; Military: \$20; student: \$10 (with restrictions)
President: Wayne Johnson, mrgalaxy@juno.com; Vice President: Keith Mullen, 520.366.0049 or repogazer@msn.com
Treasurer: Tim Doyle 378-5121; Secretary: Jeanne Herbert, 366-5690
Star Party Coordinator: Keith Mullen, repogazer@msn.com
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

About the 7/27 Speaker...

Jay Holberg is a senior research scientist at UA's Lunar and Planetary Laboratory in Tucson, AZ, where he has been since 1983. He obtained his PhD in Physics from UC Berkeley in 1974. Dr. Holberg worked on the Voyager mission to the outer planets, which is where he developed his interest in Sirius and currently studies white dwarf stars, one of which orbits around Sirius. He has written a book on the topic of Sirius and it should be available very soon.

Star Party Corner

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

Participation is the Lifeblood of the Club!

June was a full month as far as star parties went. We had a large crowd at the Public Star Party at JBO on the 9th. Gary Myers had Dave's 14" Celestron hooked up in the old observatory and running most of the night. I had better than a platoon of National Guard Officers at RGO for a sundown to sunup event. We sent them home to join their own astronomy clubs in whichever town or city they lived. While at Riverside I received a Celestron Sky Scout from the Celestron crew and we unveiled it that night. It belongs to the club now and will be used as a loaner once we get a parallelogram and tripod to mount it on. More on this toy later! June 15th saw us back at JBO for the Member Star Party. We had a fairly good turnout, but not great, and I missed seeing some of the regulars (maybe vacation season).

July Star Party Schedule

Saturday, July 14th Will be the inaugural member Star Party at Song of the Lamb Observatory, (SOLO) in Huachuca City. Paul and Dorothy Dybvig will be hosting the first of hopefully many at their newly finished observatory. They promise to have refreshments on hand so maybe you could bring along some sort of snack too. I'll be on vacation so I'm hoping that Wayne or Doug can stand in for me as coordinator on this one. You can find a downloadable map on the HAC webpage to SOLO. Let's show Paul and Dorothy that we are a bunch of participators. Get out there!

Friday July 20th Is the scheduled night for the Public Star Party held at JBO. Dave will be thrilling the public with views through the 32" while the C-14 will be available too. Let's go and give Dave a hand.

Stargazing with Binoculars

Hans Clahsen

Introduction to Binoculars

Binoculars are commonly described by their magnification and objective diameters. A pair of 7x50 binoculars has a magnification of 7 and objectives that are 50mm in diameter.

High magnifications have the advantage of revealing finer image details while low magnifications have the advantage of showing a larger true field of view.

Large apertures, or diameters, have the advantage of concentrating more light into each object's image. Small aperture binoculars have the advantage of smaller physical size and less weight.

It can be quite difficult to determine the best magnification and objective diameter for each user based only upon aperture and magnification. Another factor that should be considered is exit pupil diameter. The exit pupils of a pair of binoculars lie behind the eyepieces.

If you hold a pair of binoculars out at arm's length you'll see a small circle of light in each eyepiece. That circle of light is the exit pupil. If a thin piece of paper is moved closer or farther from the eyepiece until the exit pupil appears as a sharply defined disk on the paper, it will be discovered that the exit pupil is a real, as opposed to virtual, image.

The exit pupil's image on the paper is the image of the binocular's objective. If a fly were to land on the objective, a tiny image of that fly would be seen in the exit pupil. If a clear ruler is laid across the objective, the objective's effective aperture could be read by reading the ruler's markings as seen (perhaps with the aid of a magnifying glass) in the exit pupil. This provides an effective means of diagnosing internally stopped down objectives.

Exit pupil diameters can be calculated by dividing the aperture in millimeters by the magnification. Thus a pair of 20x80 binoculars would have $80\text{mm}/20$ or 4mm exit pupils.

Small vs. Large Exit Pupils

The human eye's entrance pupil is placed at the same location as the binocular's exit pupil. If the binocular's exit pupil is larger than the eye's entrance pupil, then for all practical purposes one could be using smaller aperture binoculars without sacrificing anything other than physical size and weight.

It's commonly stated that an average young adult under dark night conditions has entrance pupils that are about 7mm in diameter. Older adults often have somewhat smaller dark adapted entrance pupils. In the daytime, or when observing the moon with binoculars, the bright light causes the eye's entrance pupil to constrict to a diameter of just a few millimeters. Consequently, binoculars with 7mm or smaller exit pupils can be used effectively by a young adult for most night time astronomical purposes, but for daytime or lunar use one would be better off as far as physical size, weight, and cost are concerned, to use binoculars that have smaller (than 7mm) exit pupils.

As with aperture and magnification, it can be difficult for each individual to decide upon the best exit pupil diameter for their binoculars. This is made even more difficult due to the differences of opinion that often exist in this area even among the so called experts. Perhaps it boils down to how one really wants to use one's binoculars.

Dark Nebula

By Bob Kepple & Glen Sanner

Dark nebulae are simply clouds of interstellar dust silhouetted against bright nebulae or against the Milky Way. They contain light-absorbing dust and grains of graphites, silicates, ices, and possibly metals like iron and aluminum. Despite their seeming opacity, the density of these clouds are very low: most of their mass is molecular hydrogen, H₂, and even that has a number density well below one thousand molecules per cubic centimeter. (This is, however, very high by the standards of the interstellar medium.) The darkness of the clouds, then, is the consequence not of the density, but of depth – for these objects can be hundreds of light years thick. Their temperature is very low even for interstellar matter, 10 to 20 degrees Kelvin. They give themselves away not only by their darkness but also by the low-energy radio-wavelength emission of their carbon monoxide molecules.

The most common form of dark nebula designation is its Barnard Number (“B”) given to it early in the 20th century by the great Milky Way astrophotographer E. E. Barnard (who by a cruel irony, suspected these objects of being voids rather than obscuring masses). Another designation is Lynds Dark Nebula number (LDN). The relative opacity of dark nebulae is graded on a scale of 1 to 6. Type 6 dark nebulae are the densest and appear nearly black, while type 1 dark nebulae are little more than diminutions of the background Milky Way.

The general rule for observing dark nebulae is “less” is better: use the lowest possible magnification to enhance the contrast between the dark nebula and the sky background. Using too high a power will tenuous the dark nebula’s bright surrounding and thereby lose the very thing by which it can be seen at all. I have found that using an Ultra High Contrast filter (UHC) at low power helps make dark nebulae stand out very well.

The following list of dark nebulae may easily be seen with the naked eye, binoculars, or small telescopes:

The Great Rift of the Milky Way

The most conspicuous dark nebula of all is the Great Rift, a series of dust clouds only a few hundred light years away that bisects the Milky Way. It is clearly visible to the naked eye on a clear, dark night. Scanning its length with binoculars will show a wealth of detail. The best way to view is with a reclining lawn chair, just lay back and be comfortable, rest your arms on the sides of the chair to keep the binoculars steady and enjoy. Better yet is the use of binocular holders. There are two main types, the parallelogram mount and a mirror box mount. Hans Clahsen will be giving a Full Moon Workshop on the mirror box mountings June 30th at his home.

The Pipe Nebula (Barnard 59, 65-67, 78) Dia. 300’x60’ Opacity 6 RA 17h21:m -27° 23’

7x50 Binoculars: The pipe nebula is a huge dark nebula lying south and east of Theta Ophiuchi. It is clearly visible to the naked eye and is best in 7x50 binoculars. It is seven degrees in length, much too large for telescopic viewing and one would have to pan the telescope through at least 14 fields of view if you care to do so. The stem is an E-W lane covering 300 minutes of arc and the bowl, at the eastern end, another 200 minutes of arc. A row of bright stars runs along the stem’s northern flank. Look for B72, a tiny 4 minute S-shaped extension called the Snake Nebula at the bowl’s WNW edge. The Pipe Nebula complex lies between 600 and 700 light years away.

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that a club they worked so hard to make a success still continues and thrives to this day. With hard work and dedication it will continue to do so for many more years to come! Fifty people have signed up for this special occasion already, but we'd like to see a few more; there is room for only 70 people total. The decision date to notify the caterer is July 2nd. If you have been hesitating because you were unsure about your plans, please make the decision to attend this celebration. It should be a most enjoyable time. Besides, Keith says he has some great door prizes to make it worth your while!

Our speaker at the June 2nd meeting gave a very interesting talk about designing a 17th century telescope. I was able to accept Alan Binder's invitation to members of the club to come to his house to see the actual telescope and view through it. Since I live in Benson and he lives in Vail the drive wasn't too bad. It was fascinating to view through his historic replica and put myself in the shoes of the 17th century astronomers to experience what they could see. Alan also has a couple other homemade telescopes that are located in a double-domed observatory. I highly recommend the trip!

As always, if you have suggestions or questions about HAC feel free to contact me (email: mrgalaxy@juno.com or home phone: 520-586-2244) or talk to any of our board members.

Clear Skies!

Wayne (aka Mr. Galaxy), your resident president

Backyard Astronomer – Neal Galt

Just one hour after sunset on July 1st, we can find Saturn and Venus locked in a tight embrace over the western horizon. They will separate from this point, but on July 16th the crescent moon will fill the gap between Saturn and Venus and create a tight clustering to include the bright star Regulus.

Mercury can be found between July 18th and the 28th low over the eastern horizon before sunrise.

Venus is that very bright object over the western horizon. Watch it in July and you will see it get lower each night. By August, it will cross over into the morning sky. Until then, it will continue to blaze as it continues to near the earth. Now is the time to view it in a telescope and see its majestic crescent phase.

See Saturn over the western horizon now, because by month's end it will be lost in the solar glare.

Jupiter is now the evening highlight. You can find it over the southeastern horizon at sunset and view it for most of the night.

Mars is still an early morning object, but will be the rage in November and December when it swings in for a close encounter with the earth and will be an evening object.

Look up in July.....no major meteor showers....but lots of sporadic ones will appear at random

Chew on This

The Mars robotic rovers, Spirit and Opportunity, are equipped with RATs, or Rock Abrasion Tools. Their purpose is to abrade the surface patina off the Mars rocks so that the alpha x-ray spectrometer can analyze the minerals inside the rocks, rather than just on the surface.

But future robotic missions to Mars will be asked to go even further below the surface. Scrapers and corers will gather rock samples of substantial size, that, in order to be analyzed by a spectrometer, will need to be crushed into a fine powder.

Crushing rocks on Mars? Now there's a problem that brings to mind a multitude of possible approaches: Whack them with a large hammer? Squeeze them until they explode? How about just chewing them up? It was with this latter metaphor that the planetary instrument engineers struck pay dirt—so to speak.

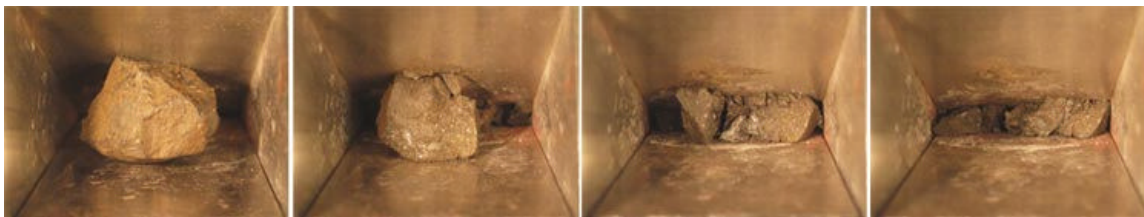
Thanks to NASA's Planetary Instrument Definition and Development Program, a small group of NASA engineers came up with the Mars Rock Crusher. Only six inches tall, it can chew the hardest rocks into a powder.

The Mars Rock Crusher has two metal plates that work sort of like our jaws. One plate stays still, while the other plate moves. Rocks are dropped into the jaw between the two plates. As one plate moves in and out (like a lower jaw), rocks are crushed between the two plates. The jaw opening is larger toward the top and smaller towards the bottom. So when larger rocks are crushed near the top, the pieces fall down into the narrower part of the jaw, where they are crushed again. This process repeats until the rock particles are small enough to fall through a slit where the two plates are closest.

Engineers have tested the Mars Rock Crusher with Earth rocks similar to those expected to be found on Mars. One kind of rock is hematite. The rusted iron in hematite and other rocks help give Mars its nickname "The Red Planet." Another kind of rock is magnetite, so-called because it is magnetic. Rocks made by volcanoes are called basalts. Some of the volcanoes on Mars may have produced basalts with a lot of a mineral called olivine. We call those olivine basalts, and the Rock Crusher chews them up nicely too.

Visit www.jpl.nasa.gov/technology to read the latest about other NASA technologies for exploring other planets and improving life on this one.

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



Caption:

Looking down on the jaws of the Mars Rock Crusher, we see a magnetite rock get crushed into smaller and smaller particles.

Note to editors:

This image may be downloaded from http://spaceplace.nasa.gov/news_images/magnetite.jpg

HUACHUCA ASTRONOMY CLUB

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Barnard 86 The Ink Spot Dark Nebula Dia. 5' Opacity 5 18h03.0m -27°53'

3 to 8-inch Scopes-100x: The ink spot is one of my favorite objects. It lies within the Great Sagittarius Star Cloud and is nestled next to open cluster NGC 6520 so you get “two for one” in the same field of view. The open cluster has over 60 stars within a 6 minute field. Look for two orange colored stars one near center the other at the NW edge. The dark nebula lies to the west and makes a fine contrast of objects. B86 is a triangular 5 minute inky object tapering to a point at its northern end. Another nice orange 6.9 magnitude star lies at the dark nebula's NNW edge making this one of the best views for telescope users!

Barnard 92 and Barnard 93 Dark Nebulae Opacity 6 18h15.5m -18°14'

3 to 8-inch Scopes-50x: Again, these two dark nebulae are among my favorite objects, mainly because they lie within the Small Sagittarius Star Cloud (M24). The view is just spectacular! Scanning the star cloud will show a misty concentration near center; this is NGC 6603, a fine 5 minute open cluster containing a hundred stars. B92 and B93 are two obvious dark patches lying at the star cloud's NW edge. If you have a UHC filter use it to enhance the nebulae, you will be surprised at how much the filter improves the view.

Barnard 64 Dark Nebula Dia. 20' Opacity 6 17h17.2m -18°32'

3 to 8-inch Scopes-50x: Here's another of my “two for one” favorites. To find B64 first find the 9 minute diameter globular cluster M9 which shines at 7.6 magnitude. B64 is a 20 minute diameter, somewhat comet-shaped dark nebula lying a little less than the width of a full moon due west.

That's our sky tour for this month. If the monsoons hold off, get out there and find these fine objects. These are starter objects. If you enjoyed them, you can find many more dark nebula by using a good star chart or *The Night Sky Observer's Guide* (which may be purchased from either Bob or Glen). Material for this article was using by permission from the publisher Willmann-Bell, Inc.