



# Desert Sky Observer

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NEWSLETTER OF THE ANTELOPE VALLEY ASTRONOMY CLUB, INC  
P.O. BOX 8545, LANCASTER, CALIFORNIA 93539-8545

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The A.V.A.C. is a Sustaining Member of The Astronomical League and the  
International Dark-Sky Association.*



## Up-Coming Events

**September 2:** Lunar Party at [Pedroza Flats](#)

**September 8:** Dark Sky Star Party at [Pedroza Flats](#)

**September 14:** Club Meeting\*

**September 15:** Aerospace Walk of Honor

**September 15:** Lunar Party at the [Reidhart's](#)

**September 17:** Board Meeting

**September 30:** Party at [Pedroza Flats](#)

\* Monthly meetings are held at the S.A.G.E. Planetarium on the Cactus School campus in Palmdale, the second Friday of each month. The meeting location is at the northeast corner of Avenue R and 20<sup>th</sup> Street East. Meetings start at 7 p.m. and are open to the public. *Please note that food and drink are not allowed in the planetarium*

## **Club President**

**Terry Pedroza**

Nominations are open for our 2008 board and I'm waiting for the first nomination. Will your name be first? Will you be a part of the 2008 Executive Board? Will the person seated next to you? Let's get those nominations in!

The Board of Trustees proposal is looking to be on our Agenda for the Annual Meeting; did you get your comments in? There was another proposal that came in and was discussed at last month's meeting and we sent out an email asking for comments. The overwhelming response was in favor of a board of Trustees. Thank you all for your responses! If you have any last minute suggestions or comments please get them in.

Another possible change to our constitution was suggested which states; if two members from one membership wish to run for an Executive Board position that they may and will receive individual voting privileges. As you know there is only one vote per membership and this has caused some families the cost of a second membership if both wished to run for an Executive Board position. We are still waiting to see if a written proposal reaches us in time to be placed on the ballot.

I am hoping for a large turnout at this year's Annual Meeting, please plan to attend and be a part of YOUR club's growth and development.

May your skies be clear and calm.

Terry

## ***Vice President***

***Shane Barker***

This month's speaker for September is Dr. Dana Backman; he will be speaking about a planetary debris disks and evidence of planet formation around nearby stars.

Dr. Dana Backman has been director of education & public outreach for SOFIA (Stratospheric Observatory for Infrared Astronomy) since 2003, at NASA's Ames Research Center near San Francisco, through a contract with the Seti Institute. A native of Hartford Connecticut, he obtained a bachelor's degree in physics from MIT and a doctorate in astrophysics from the University of Hawaii. He was subsequently an infrared observer support scientist at Kitt Peak National Observatory in Tucson, a post-doctoral research fellow at NASA-Ames, and a professor of physics and astronomy for 12 years at Franklin & Marshall College in Lancaster, Pennsylvania before returning to NASA-Ames with the SOFIA project. Aside from his SOFIA duties, he currently teaches introductory astronomy at Santa Clara University and in Stanford University's Continuing Studies (adult education) program, and has recently co-authored an introductory college textbook, "Perspectives on Astronomy".

I want to thank everyone again for attending the "Club Picnic" and everyone who brought food and items for the raffle and silent auction.

### **Interesting tid bit:**

Mars (magnitude +0.4, in Taurus) rises around midnight or 1 a.m. daylight saving time and shines very high in the east before dawn. It's near twinkly Aldebaran, which is similarly colored but less bright. Look above them for the Pleiades. In a telescope Mars is 8 arcseconds in diameter, half the size it will be around its Christmas-season opposition.

Shane Barker

## ***Director of Community Development***

***Rose Moore***

We have some Lunar Club events coming up in September. Please check the AVAC schedule online, or get in touch with Matt Leone. There are several events each month. So let's get out there and check out our nearest neighbor. And don't forget to bring your Moon music!

On Saturday, Sept. 15th is the 'Celebrate Downtown' Aerospace Walk of Honor event in Lancaster. The event is from 5:30pm to 9:30pm, and set up time can start at 2pm. We will have up a canopy and set up a couple of scopes for the public. Further information to come and will be sent out in an email the beginning of September. We need volunteers to help out with this event. Come out and talk to the public about astronomy!

October brings the Palmdale Fall Festival, the weekend of October 13th and 14th. We will be in the Aerospace section this year. The event runs all day, both days. Members can sign up for all or part of a day(s). We will need members to staff our booth, as well as telescopes for solar viewing. Further information will be forthcoming and will be announced at the next meeting and in email. November 17th will be a Public Star Party for the Leonid Meteor Shower at the Poppy Reserve at a time to be decided and further information will be announced in the fall.

Unfortunately, we were unable to do an astronomy event for the kids at the Painted Turtle Camp this year. We'll be in touch and hopefully schedule an event for them early next year. Thank you Dick Hague for working on this!

I'll be working on some basic guidelines for school star parties or other similar events. We're going to try to get some guidelines in place to present to groups that have asked us to do an event. If anyone has any suggestions, please email them to me. I'd appreciate any input!

Thanks, and clear skies!  
Rose M.

## ***AVAC Observing Challenge***

**By Tom Koonce**

This month's challenge will be for advanced beginners and intermediate level amateur astronomers. On September 21, the Sun will set due west. This happens twice a year as you know, on the Fall and Spring equinoxes. This month's first challenge is to observe this special sunset and to do a bit of science in the process. You're going to observe the time it takes the Sun to set, then use this information to calculate the length of one Day. You'll need a watch with a second hand to accomplish this challenge.

Get to a place where you can clearly see the horizon. Get to your spot several minutes before the actual event so you can enjoy the moment for a bit, then determine the time for the Sun to set by timing it from the instant it first touches the horizon until it is just halfway set. This is a lot easier than timing the full setting because of atmospheric effects.

Once you have this amount of time, write it down. Now you can make a calculation as to how long an entire day is. Knowing that the full Sun subtends an angle of 0.5 degrees in the sky, remembering that your timing of the sunset was just for half of the Sun, and knowing that there are 360 degrees in a circle and also one full rotation of the Earth (one day), tell me how long your day should be in hours.

### ***Data:***




- Observation Date/Time: \_\_\_\_\_
- Time of 1/2 sunset: \_\_\_\_\_seconds;
- Time x 2: \_\_\_\_\_seconds (Time of full sunset)

### ***Length of Day calculation:***

- (Time of full sunset ) x 2 = Time for 1 degree of Earth rotation = \_\_\_\_\_
- Time for Earth to rotate one degree (in seconds) x 360 degrees for on complete rotation = 1 Day (in seconds) = \_\_\_\_\_
- 1 Day (in seconds) / 60 = Day in minutes = \_\_\_\_\_
- Day in minutes / 60 = Day in hours = \_\_\_\_\_

Why isn't your calculation equal to 24 hours?

OK - Now wait for dark and get out the binoculars and telescope. We're going to start out again this month in Sagittarius with three more globular clusters. There are three small bright globular clusters laying along the bottom of the teapot in Sagittarius that are easier to see in telescopes than binoculars. They are hard to resolve, but can still be easily seen in small telescopes.

<p>Intermediate Challenge</p> 	<p><b><u>M69:</u></b> Globular Cluster</p> <p><b><u>M69:</u></b> Right Ascension 18:31.4, Declination -32:21, Distance 29.7 (kly), Visual Brightness 7.6 (mag), Apparent Dimension 9.8 (arc min)</p> <p>M69 is 9.8 arc minutes in diameter in very long exposure photos, corresponding to roughly 85 linear light years across at its 29,700 light years distance. M69 is quite close to the Galactic Center at 6,200 light-years distant) Visually M69 is found close to M12.</p>
<p>Intermediate Challenge</p> 	<p><b><u>M70:</u></b> Right Ascension 18 : 43.2, Declination -32:18, Distance 29.3 (kly), Visual Brightness 7.9 (mag), Apparent Dimension 8.0 (arc min)</p> <p>M70 is compact at 8.0 arc minutes in apparent angular diameter and roughly 68 light years in linear diameter. It has a bright visual core. M70 is rapidly receding from us, at about 200 km/sec.</p> <p>The core of M70 is of extreme density, as it has undergone a core collapse sometime in its history, similar to just a few other of the 150 known <a href="#">Milky Way</a> globulars. Globular cluster M70 became famous in 1995 when the great <a href="#">comet Hale-Bopp was discovered</a> near it by Alan Hale and Thomas Bopp as they were observing this globular</p>
<p>Intermediate Challenge</p> 	<p><b><u>M54:</u></b> Right Ascension 18:55.1, Declination -30:29, Distance 87.4 (kly), Visual Brightness 7.6 (mag), Apparent Dimension 12.0 (arc min)</p> <p>At the distance of 87,400 light years, M54 would be one of the most luminous known globular clusters with a brilliance of about 850,000 suns like ours, and outshined only by spectacular <a href="#">Omega Centauri</a> in our <a href="#">Milky Way</a>. Also, its diameter is very large at about 300 light years. It is about three times as distant as its two apparently close neighbors, <a href="#">M69</a> and <a href="#">M70</a>. M54 may be the first extragalactic globular cluster ever discovered.</p> <p>This globular cluster is bright but so small so that it may be overlooked in small binoculars or finder scopes (i.e. taken for a star). Because of its large distance, this globular cluster is difficult to resolve. It stays unresolved even in large amateur telescopes, which still show only mottled texture.</p>

## Intermediate Challenge



**M16:** (An emission nebula with an open cluster.) Right Ascension 18:18.8, Declination -13:47(deg:m), Distance 7.0 (kly), Visual Brightness 6.4 (mag), Apparent Dimension 7.0 (arc min)

M16 lies some 7,000 light years distant in the constellation Serpens, close to the borders to Scutum and Sagittarius, and in the next inner [spiral arm](#) of the [Milky Way galaxy](#) from us. It is a great cloud of interstellar gas and dust has entered a vivid process of star formation. Open star cluster M16 has formed from this great gaseous and dusty cloud, the diffuse Eagle Nebula IC 4703, which is now caused to shine by emission light, excited by the high-energy radiation of its massive hot, young stars. It is actually still in the process of forming new stars.

Other objects not to be missed while you're in the neighborhood: [M22](#), a fine globular cluster in Sagittarius that rivals [M13](#). Also try for the Omega Nebula, [M17](#) a fascinating emission nebula, also in Sagittarius. This is one of my favorites, but will require an OIII nebula filter to bring out contrast like the image below.



M22



M17 – Omega Nebula – “The Swan”

I hope you enjoyed these challenges and will spend time exploring the areas surrounding these objects!

## Did you know ? ? ?



During a lunar eclipse, when the Moon passes through the Earth's shadow, the Moon is never completely dark. Even at mid-eclipse, some light passing through Earth's atmosphere is bent before it reaches the Moon, giving it a faint reddish glow.

*Image by Steve Trotta 10/27/2004*



## *Cosmic Cockroaches*

By Dr. Tony Phillips

Cockroaches are supposed to be tough, able to survive anything from a good stomping to a nuclear blast. But roaches are wimps compared to a little molecule that has recently caught the eye of biologists and astronomers—the polycyclic aromatic hydrocarbon.

Polycyclic aromatic hydrocarbons (PAHs for short) are ring-shaped molecules made of carbon and hydrogen. “They’re all around us,” says Achim Tappe of the Harvard Center for Astrophysics. “PAHs are present in mineral oils, coal, tar, tobacco smoke and automobile exhaust.” Aromatic, ring-shaped molecules structurally akin to PAHs are found in DNA itself!

That’s why Tappe’s recent discovery may be so important. “PAHs are so tough, they can survive a supernova.”

The story begins a few thousand years ago when a massive star in the Large Magellanic Cloud exploded, blasting nearby star systems and interstellar clouds with hot gas and deadly radiation. The expanding shell, still visible from Earth after all these years and catalogued by astronomers as “N132D,” spans 80 light years and has swept up some 600 Suns worth of mass.

Last year “we observed N132D using NASA’s Spitzer Space Telescope,” says Tappe. Spitzer is an infrared (IR) telescope, and it has a spectrometer onboard sensitive to the IR emissions of PAHs. One look at N132D revealed “PAHs all around the supernova’s expanding shell. They appear to be swept up by a shock wave of 8 million degree gas. This is causing some damage to the molecules, but many of the PAHs are surviving.”

Astronomers have long known that PAHs are abundant not only on Earth but throughout the cosmos—they’ve been found in comet dust, meteorites and many cold interstellar clouds—but who knew they were so tough? “This is our first evidence that PAHs can withstand a supernova blast,” he says.

Their ability to survive may be key to life on Earth. Many astronomers are convinced that a supernova exploded in our corner of the galaxy 4-to-5 billion years ago just as the solar system was coalescing from primitive interstellar gas. In one scenario of life’s origins, PAHs survived and made their way to our planet. It turns out that stacks of PAHs can form in water—think, primordial seas—and provide a scaffold for nucleic acids with architectural properties akin to RNA and DNA. PAHs may be just tough enough for genesis.

Cockroaches, eat your hearts out.

Find out about other Spitzer discoveries at <http://www.spitzer.caltech.edu>.

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

## *News and Headlines*

### **Mars Rovers Get About As Spirit Clips Viking 2 For Operational Ground Duty**

After six weeks of hunkering down during raging dust storms that limited solar power, both of NASA's Mars Exploration Rovers, Spirit and Opportunity, have resumed driving. Opportunity advanced 13.38 meters (44 feet) toward the edge of Victoria Crater on Aug. 21.

[http://www.marsdaily.com/reports/Mars\\_Rovers\\_Get\\_About\\_As\\_Spirit\\_Clips\\_Viking\\_2\\_For\\_Operational\\_Ground\\_Duty\\_999.html](http://www.marsdaily.com/reports/Mars_Rovers_Get_About_As_Spirit_Clips_Viking_2_For_Operational_Ground_Duty_999.html)

### **Astronomers find a hole in the universe**

Astronomers have stumbled upon a tremendous hole in the universe. That's got them scratching their heads about what's just not there. The cosmic blank spot has no stray stars, no galaxies, no sucking black holes, not even mysterious dark matter. It is 1 billion light years across of nothing. That's an expanse of nearly 6 billion trillion miles of emptiness, a University of Minnesota team announced Thursday.

[http://news.yahoo.com/s/ap/20070824/ap\\_on\\_sc/universe\\_hole;\\_ylt=AkIeRP.zdKiZpSPIjHS3q7mHgsgF](http://news.yahoo.com/s/ap/20070824/ap_on_sc/universe_hole;_ylt=AkIeRP.zdKiZpSPIjHS3q7mHgsgF)

### **Ice particles could hit Cassini near Saturn moon**

Tiny grains of ice or particles of space dust could significantly damage the Cassini spacecraft when it passes close by Saturn's moon Enceladus next March, scientists said on Thursday. Images from Cassini beamed back to earth in 2005 showed multiple jets emanating from the moon's south polar region that scientists suspect arise from warm fractures, known as tiger stripes.

[http://news.yahoo.com/s/nm/20070823/sc\\_nm/space\\_cassini\\_saturn\\_dc;\\_ylt=Amo8eZJGUiAIdzGcKCTkWfCHgsgF](http://news.yahoo.com/s/nm/20070823/sc_nm/space_cassini_saturn_dc;_ylt=Amo8eZJGUiAIdzGcKCTkWfCHgsgF)

### **Einstein's Warping Found Around Neutron Stars**

Einstein's predicted warping of space-time has been discovered around neutron stars, the most dense observable matter in the universe. The warping shows up as smeared lines of iron gas whipping around the stars, University of Michigan and NASA astronomers say. The finding also indicates a size limit for the celestial objects.

[http://www.space.com/scienceastronomy/070827\\_star\\_warp.html](http://www.space.com/scienceastronomy/070827_star_warp.html)

### **New Wide Field Near-Infrared Imager for ESO's Very Large Telescope**

Europe's flagship ground-based astronomical facility, the ESO VLT, has been equipped with a new 'eye' to study the Universe. Working in the near-infrared, the new instrument - dubbed HAWK-I - covers about 1/10th the area of the Full Moon in a single exposure. It is uniquely suited to the discovery and study of faint objects, such as distant galaxies or small stars and planets.

<http://www.spaceref.com/news/viewpr.html?pid=23372>

### **Strange Asteroids Baffle Scientists**

Two space rocks in our solar system's outer asteroid belt might contain mineral evidence for a new class of asteroids or long eroded mini-worlds. The asteroids, (7472) Kumakiri and (10537) 1991 RY16, were found to contain basalt, a grey-black mineral that forms much of the crust on Earth and the other inner planets.

[http://news.yahoo.com/s/space/20070822/sc\\_space/strangeasteroidsbafflescientists](http://news.yahoo.com/s/space/20070822/sc_space/strangeasteroidsbafflescientists)

### *Astrophoto of the Month*



M42 – The Great Orion Nebula by Clint Whitman 12/31/2006

Tak 130 prime focus, Stacked 10 frames @ 60 sec using dark, Lights and Bias. Digital Rebel

See a full size photo, and the rest of Clint's photos, at:

[http://www.avastronomyclub.org/gallery/main.php?g2\\_itemId=2873](http://www.avastronomyclub.org/gallery/main.php?g2_itemId=2873)

### **A.V.A.C. Membership Information**

Membership in the Antelope Valley Astronomy Club is open to any individual.

The Club has three categories of membership.

- Family membership at \$30.00 per year.
- Individual membership at \$25.00 per year.
- Junior membership at \$15.00 per year.

Membership entitles you to...

- Desert Sky Observer—monthly newsletter.
- The Reflector—the quarterly publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club telescopes, binoculars, camera, books, videos and other items.

The Desert Sky Observer is available as a separate publication to individuals at a cost of \$10.00 per year. Subscription to the Desert Sky Observer does not entitle the subscriber to membership in the Antelope Valley Astronomy Club and its associated privileges.



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