
Desert Sky Observer

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NEWSLETTER OF THE ANTELOPE VALLEY ASTRONOMY CLUB, INC
P.O. BOX 4595, LANCASTER, CALIFORNIA 93539-4595

*The Antelope Valley Astronomy Club is a California non-profit Corporation
Visit the Antelope Valley Astronomy Club website At www.avac.av.org
The A.V.A.C. is a Sustaining Member of The Astronomical League*



Up-Coming Events

January 3: LMAG “Mars Rover Landing Day”

January 7: Full Moon

January 9: Monthly Club Meeting*

January 14: Last Quarter Moon

January 17: Star Party, [Crystalaire](#) CC

January 21: New Moon

January 29: First Quarter Moon

Anytime: *Observe*

* Monthly meetings held at the S.A.G.E. Planetarium at the Cactus School in Palmdale on the second Friday of each month. The meeting location is at the northeast corner of Avenue R and 20th Street East. Meeting starts at 7 p.m. Please note that food and drink are not allowed in the planetarium. Monthly A.V.A.C. meetings are open to the public.

President's Report

Terry Babineaux

The new year is upon us and with it come new challenges and opportunities. This is no cliché: because of the efforts of last year's board (thanks again to Terry and Debora Pedroza), our club stands poised to become a world class organization. With our newly minted 501(c)(3) federal exempt tax status, I anticipate a significant increase in our club's presence within the professional community. How much and how fast our club should grow will be one of the first challenges faced by the new Board.

The new Board's first order of business will be to stand back and take stock and measure of the outgoing Board's accomplishments. Their shoes will prove difficult to fill, but I have every intention of maintaining their standard. The essay contest, for example, has become both hallmark and symbol of who we are and what we are about (once again, *fantastic* job, Debora!). I am pleased to report that Michael Roberson, our new Director of Community Development, is already hard at work consulting with Deborah to set up this year's contest. I have no doubt that there will be missteps along the way, but I am confident that the enthusiasm of the new Board will overwhelm all obstacles.

I have personally gained much personal satisfaction sharing my love of amateur astronomy with other club members and the general public during the sponsored events in which I participated last year. Our club has never failed to deliver during these events and I look forward to the same throughout the coming year. I've learned that our club comprises a surprising demographic, the depths of which are deceptively deep— we are not all a bunch of

scientific eggheads. Far from it! One of my personal goals this year will be to explore means by which our club's members can better share and disseminate their experiences. Be it mirror grinding, chasing comets, or snapping astrophotos, I know that somewhere you'll find a member of our club involved. To me, this represents a human knowledge base far more potent than any computer program or published book could ever be.

In closing, I'd like to remind everyone that this is *your* club. Your input regarding who we are and where we are going is invaluable. My door is always open. Please don't hesitate to contact me or any of the other Board members if you have any ideas or concerns. To paraphrase Lynyrd Skynyrd (loosely!), if you just want to talk astronomy, that would be OK too. See you (or actually, not see you) under the dark skies!

Vice President's Report

Doug Drake

AVAC members, I am pleased to announce that Dr. Kevin Grazer will provide a lecture on the Cassini-Huygens spacecraft "Mission to Saturn & Titan" on January 9, 2004, at our next club meeting. This spacecraft is scheduled to go into orbit around Saturn this coming June/July, 2004, and was launched from Kennedy Space Center on October 15, 1997. Yes, we have been following this spacecraft since departure and it will have taken seven years to journey to Saturn.

This month, we can see Orion rise in the eastern sky with the apparent brightest star, Sirius, to follow behind. What's so special about this event? Well 3,000 to 4,000 years ago, this was the essence that foretold the Egyptians that the beginning of their agricultural year was about to begin. The Egyptian astrologer, knowing the sky very well, looked to the east, not in the evening but just before the Sun rose. You see, *all* beginnings happened in the east just as the Sun came up to start a new day.

At first, the astrologer (today he would be an astronomer and an astrologer) would see the three stars in Orion's belt rise just before the Sun rose. The three stars in Orion's belt are very significant because they are the pointers to Sirius. The astrologer knew that if a line was drawn through the three stars and continued down and to the left that in the following months Sirius would be seen along that line.

You can do the same thing this January, but in the evening sky, and watch Orion rise in the east. What you see first is the three stars straight up and down; you see Orion has been sleeping and is just waking up, so he is lying on his side. Six hours later, when he is fully awake, he is standing straight up in the southern night sky and the three stars in his belt are now horizontal.

Okay, so why was Sirius so special? Well, the first morning the Egyptian astrologer saw Sirius, he would tell the Pharaoh and the Pharaoh would in turn tell the people to start planting seeds and make way for water irrigation. The Pharaoh told them to do this because, as it just so happens, the Nile river would start to overflow- as it had done year after year- and it would provide water for the Egyptian irrigation system that watered the seeds that afforded food for the new year.

It's interesting how it all ties in to what we see in the sky, isn't it? Happy viewing.

Dir. of Community Development

Mike Roberson

Hello and welcome! I am looking forward to having a great year in 2004, and looking forward to making astronomy as fun as possible for everyone. I have some new ideas that hopefully will make this year even better, and I'd love to hear any ideas that you have, as well. The Astronomy Club is growing and moving in new directions this year, and we on the Board look forward to doing the best job that we can for you. Your help will be needed in several ways, and each person's talents can be used. Please don't be afraid to help reach out to our community and be a part of bringing the wonders of astronomy to others. I look forward to hearing from you soon. Enjoy the New Year and let's make it the best.

Doug Drake's *Planet Watch*



Venus

Venus will be at greatest elongation, 47 degrees, from the Sun on January 10th. This is the time of year in which Venus is the brightest object in the evening sky- a true beauty to behold. Look for Venus after sunset to the southwest.

Jupiter

Jupiter can be seen below Leo, the lion, but is seen after midnight for this month of January. Wait until the beginning of spring when Jupiter will give us excellent viewing.

Saturn

Saturn can be seen between Orion, the hunter, and Gemini, the twins. Saturn just went through opposition on the 31st of December, so January is the month to observe Saturn while it is closest to Earth. Watch and count how many rings you can see, three? Also notice that Saturn appears a slight yellow as compared to Jupiter.



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So Little Time, So Many Galaxies

by Dr. Tony Phillips

Fourteen billion years ago, just after the Big Bang, the universe was an expanding fireball, white hot and nearly uniform. All of space was filled with elementary particles and radiation. "Soupy" is how some cosmologists describe it.

Today the universe is completely different. It's still expanding- even accelerating- but there the resemblance ends. The universe we live in now is "lumpy." Great cold voids are sprinkled with glowing galaxies. In galaxies, there are stars. Around stars, there are planets. On one planet, at least, there is life.

How we got from there to here is a mystery.

Finding out is the goal the Galaxy Evolution Explorer, "GALEX" for short, a small NASA spacecraft launched into Earth orbit on April 28, 2003. GALEX carries an ultraviolet (UV) telescope for studying galaxies as far away as 10 billion light-years.

"GALEX is a time machine," says astronomer Peter Friedman of Caltech. Because light takes time to travel from place to place, pictures of distant galaxies reveal them as they were in the past. "GALEX is investigating the evolution of galaxies over 80% of the history of our universe."

The Hubble Space Telescope can see faraway galaxies, too, but GALEX has an advantage: while Hubble looks in great detail at very small regions of the sky, GALEX is surveying the entire sky, cataloging millions of galaxies during its 2-year mission.

GALEX is a UV mission for a reason. Friedman explains: "UV radiation is a telltale sign of star birth." Stars are born when knots of gas condense in interstellar clouds. The ones we see best are the big ones- massive stars that burn hot and emit lots of UV radiation. "These stars are short-lived, so they trace recent star formation."

Understanding star formation is crucial to studies of galaxy evolution. When galaxies collide, star formation surges. When galaxies run out of interstellar gas, star formation wanes. In galaxies like the Milky Way, spiral arms are outlined by star-forming clouds. The shapes of galaxies, their history and fates- they are all connected by star formation.

Even life hinges on star formation, because stars make heavy elements for planets and organic molecules.

"Our measurements of UV radiation will tell us both the rate at which stars are forming in galaxies and the distances of the galaxies," says Friedman.

How did we get here? GALEX will show the way.

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

* * WANTED * *

Counterweight, 4-7 pounds with 3/4" to 1" hole (shaft size); contact [Terry Pedroza](mailto:TerryPedroza), 661-718-3963

Did you know? ?

NASA spacecraft "Cassini" is scheduled to reach Saturn on July, 2004.

? ? ?



Outgoing Club President Terry Pedroza presents Farrah of Woodland Hills Camera with a certificate of appreciation.



Terry Pedroza, on the loose around camera and telescope equipment! Mark of Woodland Hills Camera looks on.



The proud owner of a new scope.



Tom Koonce presents the Pedroza's with a token of appreciation for all their hard work.



Doug Drake Presents the Keith Lawson Award to Terry Pedroza.

What is the Closest Galaxy to the Milky Way? The Canis Major Dwarf Galaxy

Reference: http://www.seds.org/messier/more/cma_dw.html

The Sagittarius Dwarf Elliptical Galaxy, SagDEG was discovered by stellar brightness density investigations (see also e.g. the August 1994 issues of *Astronomy* or *Sky & Telescope*). This galaxy was immediately recognized as being the nearest known neighbor to our [Milky Way](#), significantly closer than the [Large Magellanic Cloud](#) which was considered to be our closest companion until then. It held the title of our nearest intergalactic neighbor for nine years, but lost it in November 2003 to the then newly discovered [Canis Major Dwarf](#).



Right Ascension	07 : 15 (h : m)
Declination	-28: (deg : m)
Distance	25.0 (kly)
Apparent Dimension	720 (arc min)

[Irregular Galaxy](#) *Canis Major Dwarf*, centered in [Canis Major](#)

Discovered in November 2003 by Martin, Ibata, Bellazzini, Irwin, Lewis, and Dehnen, this small galaxy, or galaxy remnant, was discovered only in 2003 by a team of astronomers from France, Italy, the UK, and Australia. It was found from the analysis of data on asymmetries in the population of Galactic red giant stars (of spectral type M) in the 2MASS All Sky catalog. These stars show several large-scale asymmetries, the most significant of which is a strong elliptical-shaped over-density close to the Galactic plane, around the position RA=07:20, Dec=-30, with an extension in Galactic longitude of about 12 deg (720 arc min). The distance of this concentration was estimated at 25,000 light-years from us and 42,000 light-years from the center of our [Milky Way Galaxy](#).

The authors find that this concentration is the nucleus of a dwarf galaxy which is in a progressive state of disruption, as it orbits our [Milky Way Galaxy](#). This galaxy is thus our nearest known intergalactic neighbor, and a new dwarf member of the [Local Group](#). The major part of its matter has been distributed along its orbit, and forms arc structures around the Milky Way. It may have been a considerable though small galaxy at one time, having of the order of one billion stars, and may have contributed up to about one percent of the matter of our Milky Way.

The image shows the Canis Major Dwarf's nucleus just below the stellar band indicating the equatorial plane of our Milky Way. This is an infrared view, composed from the Two-Micron All Sky Survey (2MASS).

In many respects such as size, orbit and the process of dissolution, the Canis Major Dwarf is similar to [SagDEG](#), which had been discovered in 1994 and taken the place as the nearest known neighbor for nine years.

Some Milky Way globular clusters are loosely grouped around the nucleus of the Canis Major dwarf, and at least some of them may have their origin in the halo of this small galaxy, and may represent the remnant of its former globular cluster system: [M79](#), [NGC 1851](#), [NGC 2298](#), and [NGC 2808](#). Open clusters AM-2 and Tombaugh 2 are strong candidates for being physically associated with the Canis Major Dwarf.

Links:

[University of Strassbourg Press Release](#) (November 4, 2003) - [\[Local Copy\]](#)

[Canis Major Dwarf: A New Closest Galaxy](#). Astronomy Picture of the Day (APOD) November 23, 2003.

Astronomy Links on the Web

<http://www.actonastro.com/>

(Steve Trotta's website- note the new address)

<http://www.noexitrecords.com/zerobox/astro.htm>

(Tom Varden's website)

<http://www.astro-tom.com/>

(Tom Koonce's website)

<http://www.projectsandhobbies.com/howtolearnastronomy.htm>

(Getting started in Astronomy ...)

<http://www.astromart.com/>

(time to go shopping- post-Christmas shopping, you know)

www.exploratorium.edu/auroras/index.html

(how far south is the aurora extending?)

<http://www.avac.av.org/>

(Hey, that's us! So get going!)

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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Al's Vacuum and Sewing: 904 West Lancaster Blvd. (661) 948-1521. Stop by and say “hey” to Matthew and Suzanne.

QNET: 1529 E. Palmdale Blvd., Suite 200. (661) 538-2028. As an Internet provider, they are kind enough to provide us with a free website.

Darkrooms Plus: 20th St. W. near Pep Boys in Lancaster. (661) 945-1444. They offer all club members a 10% discount on all purchases. Stop by and say “hey” to Cathy or Hank.

High Desert Broadcasting: General Manager, Vicky Connors (661) 947-3107; They assist us in advertising our Club.

Woodland Hills Camera: 5348 Topanga Canyon Blvd., Woodland Hills. 888-427-8766.
www.telescopes.net

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Introducing the *Telguide*.

The Telrad is without a doubt one of the best inventions ever for the amateur astronomer. With a book of Telrad finder charts, it makes locating objects a snap. But what if you don't have the charts or you want to move on from the Messier and Caldwell objects? What if you lost the plastic overlay that came with your atlas? That's where the *Telguide* comes in.



The *Telguide* is an illuminated overlay for use with all versions of the Sky Atlas 2000 and Uranometria 2000. Simply find the object you want to view on your sky chart, place the *Telguide* over it, and line up your Telrad to match the view. The *Telguide* can also be ordered for use with the Rigel Quick Finder.

To purchase Steve Trotta's invention, e-mail him with your Atlas name, version, and edition at steve@actonastro.com

Challenges of Getting to Mars

reprinted from JPL's website



Artist concept of Mars rover landing

[Flash animation of Rover landing sites](#)

Two out of three missions to the red planet have failed. One reason there have been so many losses is that there have been so many attempts. "Mars is a favorite target," says Dr. Firouz Naderi, manager of the Mars Program Office at the Jet Propulsion Laboratory. "We -- the United States and former USSR -- have been going to Mars for 40 years. The first time we flew by a planet, it was Mars. The first time we orbited a planet, it was Mars. The first time we landed on a planet it was Mars, and the first time we roved around the surface of a planet, it was Mars. We go there often."

Another reason is that getting to Mars is hard.

To get there, Spirit and Opportunity, the two Mars Exploration Rovers launched this past June and July, will have to fly through about 483 million kilometers (300 million miles) of deep space and target a very precise spot to land. Adjustments to their flight paths can be made along the way, but a small trajectory error can result in a big detour and or even missing the planet completely.

The space environment isn't friendly. Hazards range from what engineers call "single event upsets," as when a stray particle of energy passes through a chip in the spacecraft's computer causing a glitch and possibly corrupting data, to massive solar flares, such as the ones that occurred this fall, that can damage or even destroy spacecraft electronics.

The road to the launch pad is nearly as daunting as the journey to Mars. Even before the trip to Mars can begin, a craft must be built that not only can make the arduous trip but can complete its science mission once it arrives. Nothing less than exceptional technology and planning is required.

If getting to Mars is hard, landing there is even harder. "One colleague describes the entry, descent and landing as six minutes of terror," says Naderi.

Spirit and Opportunity will enter the Martian space traveling 19,300 kilometers per hour (12,000 miles per hour). "During the first four minutes into descent, we use friction with the atmosphere to slow us down considerably," says Naderi. "However, at the end of this phase, we're still traveling at 1,600 kilometers per hour (1,000 miles per hour), but now we have only 100 seconds left and are at the altitude that a commercial airliner typically flies. Things need to happen in a hurry."

A parachute opens to slow the spacecraft down to 'only' 321 kilometers per hour (200 miles per hour), but now we have only 6 seconds left and are only 91 meters (100 yards) off the ground. Now, the retro rockets fire to bring the spacecraft down to zero velocity, and we're the height of a four-story building above the surface. The spacecraft freefalls the rest of the way cocooned in airbags to cushion the blow. It hits the ground at 48 kilometers per hour (30 miles per hour) or 80 kilometers per hour (50 miles per hour) if it is windy. It bounces as high as a four-story building and continues to bounce afterward, perhaps 30 times all together. What's inside the airbag weighs 453 kilograms (half a ton). So, the challenge of entry, descent and landing is how to get something that massive traveling at 19,300 kilometers per hour (12,000 miles per hour) slowed down in six minutes to have a chance of survival."

Mars doesn't exactly put out a welcome mat. Landing is complicated by difficult terrain. The Martian surface is full of obstacles--massive impact craters, cliffs, cracks and jagged boulders. Even the toughest airbag can be punctured if it hits a bad rock. Unpredictable winds can also stir up further complications.

No matter how hard it is, getting to Mars is just the beginning. "The challenge after we land," says Rob Manning, manager of Mars Exploration Rovers entry, descent and landing operations, "is how to get the vehicle out of its cramped cocoon and into a vehicle roving in such a way as to please the scientists."

The rewards are great. "Mars is the most Earth-like of the planets in our solar system," says Naderi. "It has the potential to have been an abode of life."

The risks are also great. "We do everything humanly possible and try to avoid human mistakes," says Naderi. "That's why we check, double check, test and test again and then have independent eyes check everything again. Humans, even very smart humans, are fallible particularly when many thousands of parameters are involved. But even if you have done the best engineering possible, you still don't know what Mars has in store for you on the day your arrive. Mars can get you."

"We are in a tough business," says Naderi. "It is like climbing Mt. Everest. No matter how good you are, you are going to lose your grip sometimes and fall back. Then you have a choice, either retreat to the relative comfort and safety of the base camp, or get up, dust yourself off, get a firmer grip and a surer toehold and head back up for the summit. The space business is not about base camps. It is about summits. And, the exhilaration of discoveries you make once you get there. That is what drives you on."

