

San Diego Astronomy Association

Celebrating Over 40 Years of Astronomical Outreach



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 P.O. Box 23215, San Diego, CA 92193-3215

December 2008

TDS – What’s Been Happening

by Alice Harvey

As I write this column toward the end of November, I wonder where the month (and the year!) went. I haven’t been out to TDS much in November – weather, family, stuff, you know the drill. But there’s been a little bit going on.

The last weekend of October, the 25th, brought the annual visit of the Air Cadets, guests of Dennis Ritz. It is always a pleasure to have these young people out to the site. They are interested, polite and a joy to have around. Plus they put on a mean BBQ !!! We had a wonderful night for them as well. Peter DeBaan and Tim Newbert were hosts on the club scope that night and were kept extremely busy. Jim Traweck set up the 8” D&B reflector outside of the observatory and there was a constant flow of people there as well. We had good seeing, nice conditions – cool but not too cold – and a good crowd of other guests as well as the Cadets. And in the morning, they broke camp and even took out all of our trash. Great kids! You are welcome back any time you want.

The following weekend, October 31st (Halloween) and November 1st, was also the weekend of Nightfall out at Borrego Springs. Friday was clear, but Saturday was cloudy. I decided to save the gasoline – an easy decision these days. In fact, I ran in to Dennis Mammana at Palomar Observatory on Sunday (at the screening of *The Journey to Palomar*) and was surprised to see him since I knew he was scheduled at Nightfall – he was the one who told me it had clouded over.

November 8th brought a fairly large moon, so no trip eastward. The same for the 15th, although I did drive up to Riverside for their monthly Program Meeting. Got to see the Freeway Complex Fire on the way – that was interesting to say the least.

The weekend of the 22nd – I didn’t hear from anyone who was out at TDS. I was in Seattle helping my daughter move, and I can tell you from serious scientific inquiry and investigation that Seattle, in fact, has no stars whatsoever. I determine this from 3 days of data collection – I would go outside after dark and look up. Nothing!! It is a beautiful city, but don’t even think about moving there if you have any interest in astronomy – unless it’s radio astronomy.

Well, one more month in the year. May it be a clear one, at least on the weekends. See you out in the East County.

What Happened to Comet Holmes?

by Dr. Tony Phillips

One year after Comet 17P/Holmes shocked onlookers by exploding in the night sky, researchers are beginning to understand what happened.

“We believe that a cavern full of ice, located as much as 100 meters beneath the crust of the comet’s nucleus, underwent a change of phase,” says Bill Reach of NASA’s Spitzer Science Center at the California Institute of Technology. “Amorphous ice turned into crystalline ice” and, in the transition, released enough heat to cause Holmes to blow its top.

Anyone watching the sky in October 2007 will remember how the comet brightened a million-fold to naked eye visibility. It looked more like a planet than a com-

SDAA Business Meeting

Next meeting will be held at:
 3838 Camino del Rio North
 Suite 300

San Diego, CA 92108
 December 9th at 7 pm

Next Program Meeting

Annual Banquet
 February 7, 2009, 5:30 to 11:30 pm
 Crowne Plaza San Diego
 2270 Hotel Circle North

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-----Banquet Flier Insert-----



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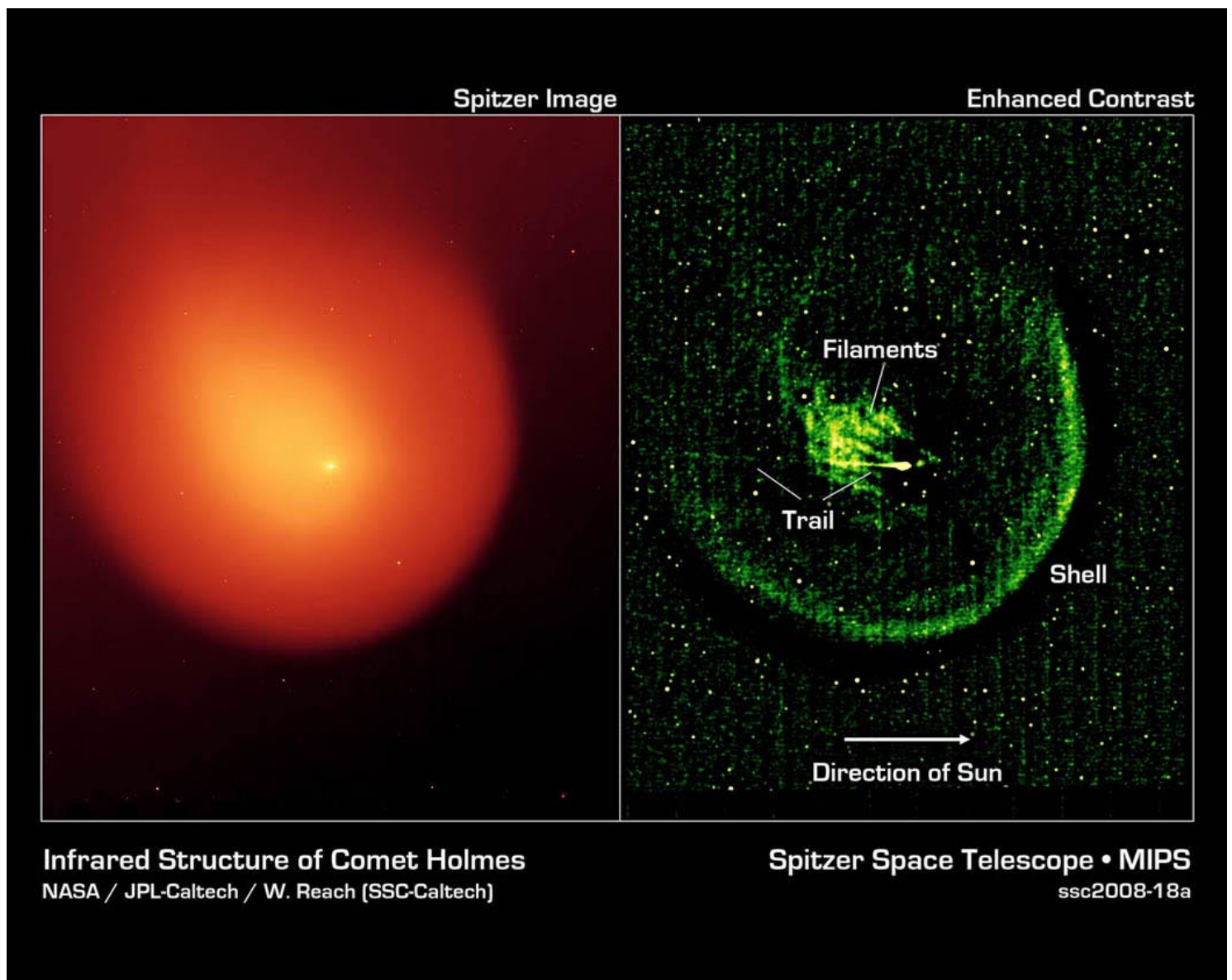
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et—strangely spherical and utterly lacking a tail. By November 2007, the expanding dust cloud was larger than Jupiter itself, and people were noticing it from brightly-lit cities.

Knowing that infrared telescopes are particularly sensitive to the warm glow of comet dust, Reach and colleague Jeremie Vaubaillon, also of Caltech, applied for observing time on the Spitzer Space Telescope—and they got it. “We used Spitzer to observe Comet Holmes in November and again in February and March 2008,” says Reach.

The infrared glow of the expanding dust cloud told the investigators how much mass was involved and how fast the material was moving. “The energy of the blast was about 1014 joules and the total mass was of order 10¹⁰ kg.” In other words, Holmes exploded like 24 kilotons of TNT and ejected 10 million metric tons of dust and gas into space.

These astonishing numbers are best explained by a subterranean cavern of phase-changing ice, Reach believes. “The mass and energy are in the right ballpark,” he says, and it also explains why Comet Holmes is a “repeat exploder.”



Comet Holmes as imaged by the multiband imaging photometer (MIPS) on the Spitzer Space Telescope. The enhanced contrast image at the right shows the comet's outer shell and mysterious filaments of dust.



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Another explosion was observed in 1892. It was a lesser blast than the 2007 event, but enough to attract the attention of American astronomer Edwin Holmes, who discovered the comet when it suddenly brightened. Two explosions (1892, 2007) would require two caverns. That's no problem because comets are notoriously porous and lumpy. In fact, there are probably more than two caverns, which would mean Comet Holmes is poised to explode again.

When?

"The astronomer who can answer that question will be famous!" laughs Vaubaillon.

"No one knows what triggered the phase change," says Reach. He speculates that maybe a comet-quake sent seismic waves echoing through the comet's caverns, compressing the ice and changing its form. Or a meteoroid might have penetrated the comet's crust and set events in motion that way. "It's still a mystery."

But not as much as it used to be.

See more Spitzer images of comets and other heavenly objects at www.spitzer.caltech.edu. Kids and grownups can challenge their spatial reasoning powers by solving Spitzer infrared "Slyder" puzzles at <http://spaceplace.nasa.gov/en/kids/spitzer/slyder>.

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

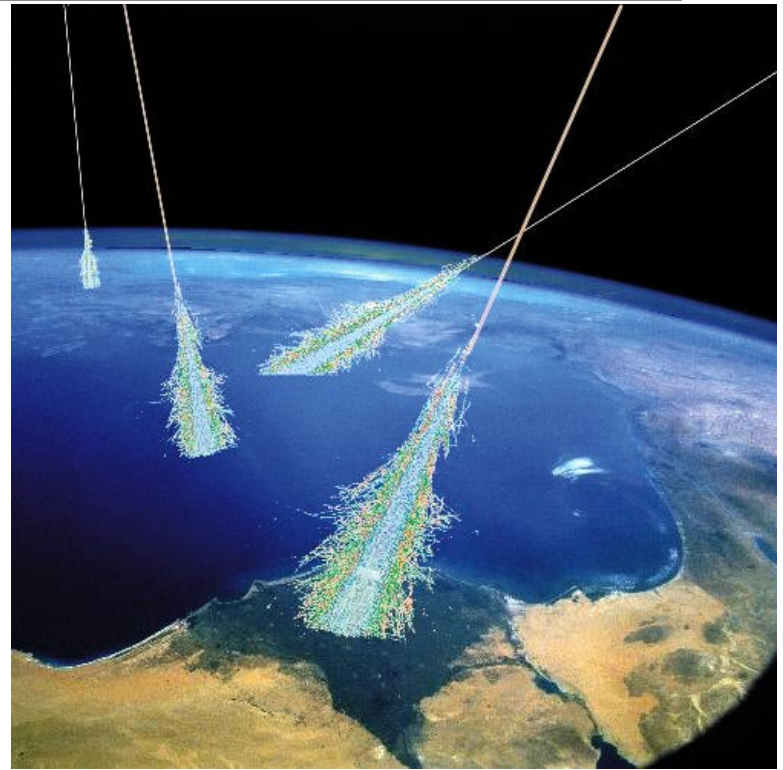
Discovered: Cosmic Rays from a Mysterious, Nearby Object

by Dr. Tony Phillips
Science@NASA

An international team of researchers has discovered a puzzling surplus of high-energy electrons bombarding Earth from space. The source of these cosmic rays is unknown, but it must be close to the solar system and it could be made of dark matter. Their results are being reported in the Nov. 20th issue of the journal *Nature*.

"This is a big discovery," says co-author John Wefel of Louisiana State University. "It's the first time we've seen a discrete source of accelerated cosmic rays standing out from the general galactic background."

Galactic cosmic rays are subatomic particles accelerated to almost light speed by distant supernova explosions and other violent events. They swarm through the Milky Way, forming a haze of high energy particles that enter the solar system from all directions. Cosmic rays consist mostly of protons and heavier atomic nuclei with a dash of electrons and photons spicing the mix.



An artist's concept of cosmic rays hitting Earth's upper atmosphere. Credit: Simon Swordy, University of Chicago.

To study the most powerful and interesting cosmic rays, Wefel and colleagues have spent the last eight years flying a series of balloons through the stratosphere over Antarctica. Each time the payload was a NASA-funded cosmic ray detector named ATIC, short for Advanced Thin Ionization Calorimeter. The team expected ATIC to tally the usual mix of particles, mainly protons and ions, but the calorimeter found something extra: an abundance of high-energy electrons.

Wefel likens it to driving down a freeway among family sedans, mini-vans and trucks—when suddenly a bunch of Lamborghinis bursts through the normal traffic. "You don't expect to see so many racecars on the road—or so many high-energy electrons in the mix of cosmic rays." During five weeks of ballooning in 2000 and 2003, ATIC counted 70 excess electrons in the energy range 300-800 GeV. ("Excess" means over and above the usual number expected from the galactic background.) Seventy electrons may not sound like a great number, but like seventy Lamborghinis on the freeway, it's a significant surplus.

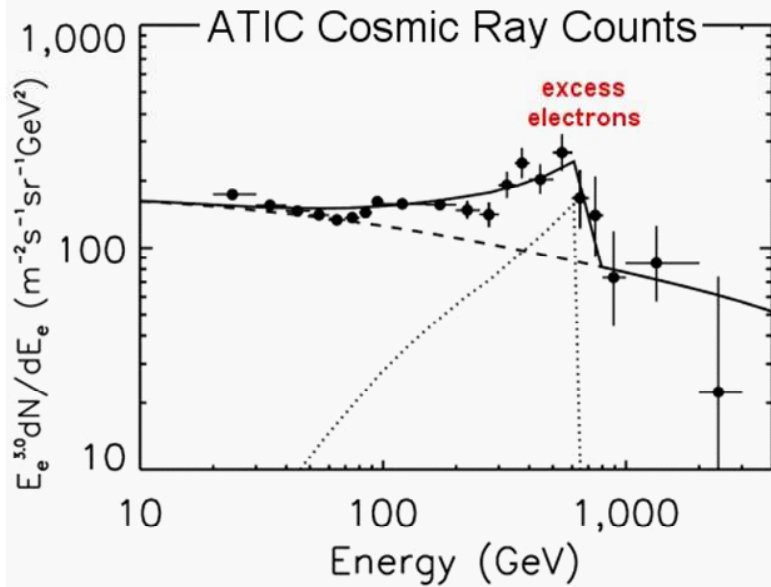
"The source of these exotic electrons must be relatively close to the solar system—no more than a kiloparsec away," says co-author Jim Adams of the NASA Marshall Space Flight Center.

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ATIC high-energy electron counts. The triangular curve fitted to the data comes from a model of dark-matter annihilation featuring a Kaluza-Klein particle of mass near 620 GeV. Details may be found in the Nov. 20, 2008, edition of *Nature*: “An excess of cosmic ray electrons at energies of 300-800 GeV,” by J. Chang et al.

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Why must the source be nearby? Adams explains: “High-energy electrons lose energy rapidly as they fly through the galaxy. They give up energy in two main ways: (1) when they collide with lower-energy photons, a process called inverse Compton scattering, and (2) when they radiate away some of their energy by spiraling through the galaxy’s magnetic field.” By the time an electron has traveled a whole kiloparsec, it isn’t so “high energy” any more.

High-energy electrons are therefore local. Some members of the research team believe the source could be less than a few hundred parsecs away. For comparison, the disk of the spiral Milky Way galaxy is about thirty thousand parsecs wide. (One parsec approximately equals three light-years.)

“Unfortunately,” says Wefel, “we can’t pinpoint the source in the sky.” Although ATIC does measure the direction of incoming particles, it’s difficult to translate those arrival angles into celestial coordinates. For one thing, the detector was in the basket of a balloon bobbing around the South Pole in a turbulent vortex of high-altitude winds; that makes pointing tricky. Moreover, the incoming electrons have had their directions scrambled to some degree by galactic magnetic fields. “The best ATIC could hope to do is measure a general anisotropy—one side of the sky versus the other.”

This uncertainty gives free rein to the imagination. The least exotic possibilities include, e.g., a nearby pulsar, a ‘microquasar’ or a stellar-mass black hole—all are capable of accelerating

electrons to these energies. It is possible that such a source lurks undetected not far away. NASA’s recently-launched Fermi Gamma-ray Space Telescope is only just beginning to survey the sky with sufficient sensitivity to reveal some of these objects.

An even more tantalizing possibility is dark matter.

There is a class of physical theories called “Kaluza-Klein theories” which seek to reconcile gravity with other fundamental forces by positing extra dimensions. In addition to the familiar 3D of human experience, there could be as many as eight more dimensions woven into the space around us. A popular yet unproven explanation for dark matter is that dark matter particles inhabit the extra dimensions. We feel their presence via the force of gravity, but do not sense them in any other way.

How does this produce excess cosmic rays? Kaluza-Klein particles have the curious property (one of many) that they are their own anti-particle. When two collide, they annihilate one another, producing a spray of high-energy photons and electrons. The electrons are not lost in hidden dimensions, however, they materialize in the 3-dimensions of the real world where ATIC can detect them as “cosmic rays.”

“Our data could be explained by a cloud or clump of dark matter in the neighborhood of the solar system,” says Wefel. “In particular, there is a hypothesized Kaluza-Klein particle with a mass near 620 GeV which, when annihilated, should produce electrons with the same spectrum of energies we observed.”

Testing this possibility is nontrivial because dark matter is so, well, dark. But it may be possible to find the cloud by looking for other annihilation products, such as gamma-rays. Again, the Fermi Space Telescope may have the best chance of pinpointing the source.

“Whatever it is,” says Adams, “it’s going to be amazing.”

For more information about this research, see “An excess of cosmic ray electrons at energies of 300-800 GeV,” by J. Chang et al. in the Nov. 20, 2008, issue of *Nature*.

The Journey to Palomar

by Alice Harvey

I had the distinct privilege of seeing the premier of a new PBS documentary entitled “The Journey to Palomar” up at Palomar Observatory itself at a special screening attended by the filmmakers - Robin and Todd Mason. This is a remarkable film, and one every astronomer will be interested in seeing. It has been screened on PBS, and will likely be available on DVD, and would be a wonderful addition to anyone’s library (hint, hint – holiday present).



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Although the name of the film leads one to think primarily of the Palomar Observatory, this is really the story of George Ellery Hale, the man singularly responsible for building Palomar Observatory, as well as Mt. Wilson and the Yerkes Observatory. He was a more fascinating person than most of us ever knew.

Hale was brilliant, charismatic and driven. He had dreams of astronomical research far beyond the technology of the day. He also suffered from a serious depressive disorder that would totally disable him for periods of time. Somehow, he still managed to pull together not only the ideas, but the resources necessary (money) to make those ideas come to life. Palomar, Mt. Wilson and Yerkes were all world class observatories at the time, and Palomar and Mt. Wilson continue to provide important contributions to astronomical knowledge and progress.

Also screened (and available on the PBS DVD) was a short feature on the Thirty-Meter Telescope which is a joint project involving Caltech, one of Palomar's operators. Richard Ellis of Caltech was present and spoke about what was happening with that project. So we were treated not only to the past but the future as well.

But the real story for me was sitting on the floor of the Hale Telescope (yes, inside the dome of the 200") and watching the film. I would look at the screen and then look up at the telescope itself. To learn about the man who dreamed of this telescope above my head, and then see the reality of his dream was something I won't soon forget.

More info can be found at www.astro.caltech.edu/palomar/jtp/ or at www.journeytopalomar.org. Information on the Thirty-Meter Telescope can be found at www.tmt.org.

Library at Tierra del Sol

by Jean Naugle

We have finally been able to move the Library from the Observatory into the Warming Room. The bookcase is already full and we are in the process of finding an additional case. There will be a book on site for you to sign out the books and soon all of the books will be listed on the Web site. I want to just remind everyone that this is the honor system and that if you take a book out please do not keep it for "months on end." Please just keep it for one month. Bring it back, give someone else a chance and then you can check it out again. I also want to say Thank You to all of the members that have been donating books to the Library and to the Banquet raffle. Everything that you are giving is very much appreciated not only by those of us that have been doing astronomy for many years but also by those of us that are "newbies". Just remember that it never hurts to ask a question because we all learn from each and every question.

Solar Wind Rips Up Martian Atmosphere

by Dr. Tony Phillips
Science@NASA

Researchers have found new evidence that the atmosphere of Mars is being stripped away by solar wind. It's not a gently continuous erosion, but rather a ripping process in which chunks of Martian air detach themselves from the planet and tumble into deep space. This surprising mechanism could help solve a longstanding mystery about the Red Planet.

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Left: The crowd waits inside the dome for the beginning of the film. Right: Richard Ellis of Caltech on the left (involved with the Thirty-Meter Telescope) and filmmakers Robin and Todd Mason on the right answer questions from the audience after the screening. Photos Courtesy of Alice Harvey.



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SkyWatch for December, 2008

by John Mood



[Times PST]

[* = 1 star = EZ] [** = 2 stars = Moderate] [*** = 3 stars = Difficult]

2 degrees = Index finger held at arm's length.

Wed., 10 Dec. ---- MOON occults (passes in front of) M-45 (the PLEIADES), always a thrilling \sight; use binocs.

Fri., 12 Dec. ---- FULL MOON, 8:37 a.m.

Sat., 20 Dec. ---- MEMBERS STAR PARTY @ Tierra del Sol.

Sun. 21 Dec. ---- WINTER SOLSTICE, 4:04 a.m. BOO! HISS!

Fri., 26 Dec. ---- VENUS passes 1.5 degrees south of NEPTUNE; use binocs.

Sat., 27 Dec. ---- NEW MOON, 4:32 a.m.

---- PUBLIC STAR PARTY @ Tierra del Sol.

Tues., 30 Dec. ---- THE BIG ONE!!! VENUS passes 2 degrees south of JUPITER; great naked eye sight!!!

SPECIAL!!! ---- Cetus the Whale, which looks exactly like an orca (a killer whale), has his heart this month as it usually does about once a year, as the pulsating (very) red variable MIRA should be at its maximum, at an EZ 3rd mag. Dig it!

THE PLANETS ("The solar system gives us wisdom" ---- Beach Boys):

EVENING:----

VENUS [*] zooms across Capricornus the Sea-Goat, missing NEPTUNE [**] at mag 7.9 by 1.5 degrees on the 26th (use a good star map with binocs), & (THE BIG ONE!!!) JUPITER [*] by 2 degrees on the 30th.

URANUS [* ½] is at the western edge of Aquarius the Water Bearer; at mag 5.9 you younger observers can spot it naked eye, as I used to be able to do, if you have a good star map.

MORNING:----

SATURN [*] is in eastern Virgo the Virgin. SPECIAL!!! ---- Not since '95-'96 have we had such a breath-taking view of Saturn's rings. That is, such a THIN view. I looked at my pencil sketches made back then, & recalled the excitement that welled up in my throat as I saw in my 8" scope from both OB & TDS the rings just visible as a grey line across the black sky. A heart-stopping MUST for any eye-ball observer!!! Don't miss it. The rings are at 1 degree tilt now, the actual ring plane crossing not occurring 'til next Sept. NOT TO MISS!

{Pluto is no longer a planet. See my "SkyWatch for September, 2005" for why.}

OBSERVING HIGHLIGHTS:

Observe the 2 most distant objects the naked eye can see. 1st, the Great Andromeda Galaxy [* ½], mag 3.5 & even I at my age can still see it. 2nd, the "Pinwheel Galaxy" [**] nearby in Triangulum mag 5.7 but requires very dark skies because its surface brightness is so low. In my younger years, I'd use it to judge how "high" the sky was; if I could see it naked eye, I knew I was in for a good night of observing. Contemplate the age of the photons of light hitting your eyeball when you gaze at these distant objects; M-31 is now considered to be 2.5 million light years away & M-33 at 2.7 million light years. Both galaxies are members of our Local Group, which includes the Milky Way, M-31 being somewhat larger & M-33 somewhat smaller.

TIERRA DEL SOL

LAT = 32° 36' 48" N (± 0.1"), LONG = 116° 19' 55" W (± 0.1"), ELEV = 3710' (± 5'), at the bathroom, as determined from USGS 7.5 min 1/24000 map. (See my essay on GPS at www.sdaa.org.)

Send comments & questions to me by phone (619/225-9639), USPS (4538 Long Branch Av., San Diego, CA 92107) or my e-mail address (1happyalien@cox.net).

¡HAPPY VIEWING!



San Diego Astronomy Association

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Board of Directors Meeting Minutes

November 11, 2008 - Unapproved and Subject to Revision

1. Call to Order. The meeting was called to order at 7:05 P.M. with the following board members in attendance: Bob Austin, President; Jose Magsaysay, Treasurer; Edward Rumsey, Recording Secretary; Jean Naugle, Director; Kin Searcy, Director; and Lou Jackson. Associates Dennis Ritz, John Restivo, and Cyndi Carpenter, were in attendance.
2. Approval of Last Meeting Minutes. The minutes of the October 15, 2008 board meeting were reviewed and approved (6-0).
3. Priority / Member Business.
 - a. Welfare Exemption Claim: Mr. Ritz presented excellent progress with California Board of Equalization. A slight modification to the SDAA Articles of Incorporation would be required. Opposition from the membership is not anticipated. Mr. Ritz will prepare proposed modification for approval by the Board. If approved, amendment will be forwarded to the membership for a vote.
4. Treasurer's Report. Approved (6-0) as presented.
5. Membership Report. Net increase last month of one (1) associate for a new total of 516 members.
6. Site Maintenance Report. Mr Quackenbush will hardwire node #2 for the site wireless internet. The TDS phone is inoperable again. Mr. Rumsey will research a weather tight enclosure for a traditional instrument versus procurement of a pay phone.
7. Observatory Report. Nothing to report.
8. Private Pad Report. Four pads are available with four members residing on the waiting list.
9. Star Party/Outreach Report. Program is in full swing. December will be a little lighter with the holidays. The October 24 – Gooden Ranch event was a great success with 400 viewers. Next Gooden Ranch event is scheduled for February 27.
10. Library Report. Materials have been moved to the warming room. Bookcase is overflowing with a number of articles yet to be added. Ms. Naugle will procure a second bookcase of similar size for \$50 to \$75.
11. Education Report. Nothing to report.
12. Program Report. November 19th meeting will be gadget night. Ms. Naugle will present the slate of candidates and accept nominations from the floor to complete the process. Other committee members are Mr. Restivo and Ms. Carpenter. No December meeting. The banquet will serve as the January meeting. February 18th will be the next regular meeting at Mission Trails Regional Park.
13. NASA Robotic Observatory. The Tachyon provided internet access has had no bandwidth problems.
14. AISIG Report. Due to the holidays, no additional meetings are scheduled for the year. The next AISIG Meeting is planned for January 28th.
15. Newsletter Report. Need to get contested candidate Bio's into this edition. Draft will be routed on November 29th for review.



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SDAA Monthly Planner

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San Diego Astronomy Association

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Mark Smith	Dr. Tony Phillips
Bob Austin	

Have a great new piece of gear? Read an astronomy-related book that you think others should know about? How about a photograph of an SDAA Member in action? Or are you simply tired of seeing these Boxes in the Newsletter rather than something, well, interesting?

Join the campaign to rid the Newsletter of little boxes by sharing them with the membership. In return for your efforts, you will get your very own by line or photograph credit in addition to the undying gratitude of the Newsletter Editor. Just send your article or picture to Newsletter@SDAA.Org or emarksmi@san.rr.com.



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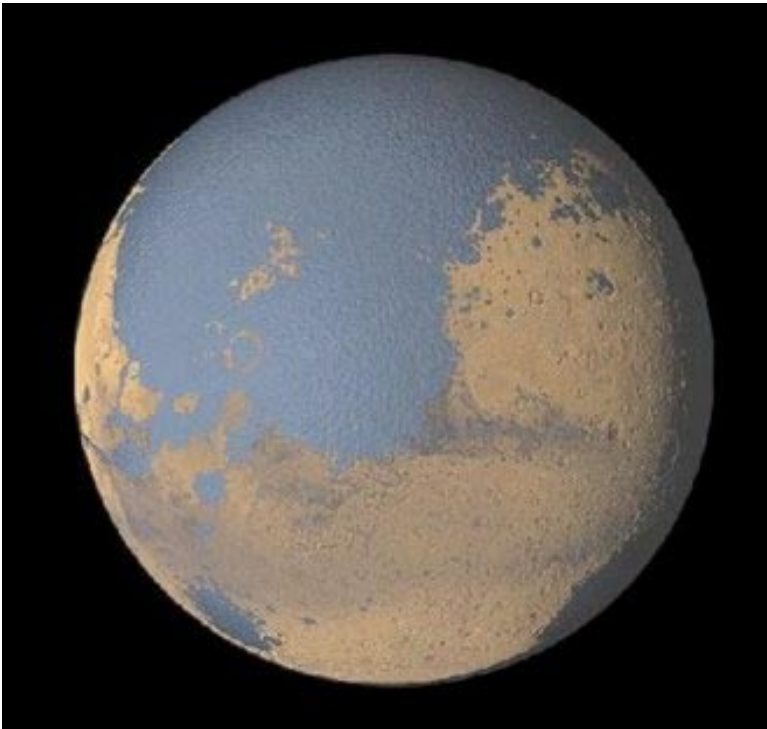
16. Website/Forums Report. Website is functioning very well. Will add Tachyon to our sponsor's page.
17. Banquet Committee Report. Preparations are near complete. To save mailing cost, this year's invitations will be part of the December newsletter – similar to some prior years. Cost to attend will be revenue neutral and is set as \$45 to include the parking fee.
18. Old Business.
 - a. Temporary Observatories: Mr Jackson will prepare and route a modified policy prior to the next board meeting.
 - b. Stage coach Trails: November and December new moons coincide with the holidays. The visit will be put off to January.
19. New Business. None
20. Adjournment. There was no further business, and the meeting was adjourned at 8:27 PM.

SUNRISE/SUNSET AND MOONRISE/MOONSET ALMANAC

Date	Sun Rise	Sun Set	Moon Rise	Moon Set	Date	Sun Rise	Sun Set	Moon Rise	Moon Set
Dec 1, 2008	6:30	16:39	9:48	20:05	Jan 1, 2009	6:47	16:51	9:53	21:49
Dec 2, 2008	6:31	16:39	10:23	21:03	Jan 2, 2009	6:47	16:52	10:20	22:48
Dec 3, 2008	6:32	16:39	10:55	22:01	Jan 3, 2009 – Sat – Quadrantids				
Dec 4, 2008	6:32	16:39	11:23	22:59		6:47	16:52	10:48	23:48
Dec 5, 2008 – (1st)	6:33	16:39	11:51	23:58	Jan 4, 2009 – (1st)	6:47	16:53	11:18	
Dec 6, 2008 – Sat	6:34	16:40	12:19		Jan 5, 2009	6:47	16:54	11:52	0:52
Dec 7, 2008 - Sun	6:35	16:40	12:48	0:59	Jan 6, 2009	6:47	16:55	12:32	1:59
Dec 8, 2008	6:36	16:40	13:21	2:03	Jan 7, 2009	6:47	16:56	13:21	3:10
Dec 9, 2008	6:36	16:40	13:59	3:11	Jan 8, 2009	6:47	16:56	14:20	4:22
Dec 10, 2008	6:37	16:40	14:45	4:23	Jan 9, 2009 - Fri	6:47	16:57	15:29	5:29
Dec 11, 2008	6:38	16:40	15:40	5:37	Jan 10, 2009 – (Full)	6:47	16:58	16:43	6:30
Dec 12, 2008 – (Full) – Hanukkah Starts					Jan 11, 2009 - Sun	6:47	16:59	17:58	7:20
	6:38	16:41	16:45	6:49	Jan 12, 2009	6:47	17:00	19:11	8:03
Dec 13, 2008 – Geminids Peak					Jan 13, 2009	6:47	17:01	20:19	8:39
	6:39	16:41	17:58	7:53	Jan 14, 2009	6:47	17:02	21:24	9:11
Dec 14, 2008 - Sun	6:40	16:41	19:13	8:48	Jan 15, 2009	6:47	17:03	22:26	9:41
Dec 15, 2008	6:40	16:42	20:25	9:34	Jan 16, 2009 – Fri	6:46	17:03	23:27	10:10
Dec 16, 2008	6:41	16:42	21:34	10:12	Jan 17, 2009 – (3rd).	6:46	17:04	0:27+	10:40
Dec 17, 2008	6:42	16:42	22:38	10:44	Jan 18, 2009	6:46	17:05	0:27	11:12
Dec 18, 2008	6:42	16:43	23:39	11:14	Jan 19, 2009 – MLK Day				
Dec 19, 2008 – (3rd)	6:43	16:43		11:42		6:45	17:06	1:26	11:47
Dec 20, 2008 – Sat	6:43	16:44	0:39	12:10	Jan 20, 2009	6:45	17:07	2:24	12:27
Dec 21, 2008 – Winter Solstice					Jan 21, 2009	6:45	17:08	3:21	13:12
	6:44	16:44	1:38	12:40	Jan 22, 2009	6:44	17:09	4:14	14:02
Dec 22, 2008	6:44	16:45	2:36	13:12	Jan 23, 2009	6:44	17:10	5:03	14:56
Dec 23, 2008	6:45	16:45	3:35	13:48	Jan 24, 2009 – Sat	6:43	17:11	5:46	15:53
Dec 24, 2008	6:45	16:46	4:32	14:29	Jan 25, 2009 – (New)	6:43	17:12	6:24	16:51
Dec 25, 2008	6:46	16:46	5:28	15:16	Jan 26, 2009	6:42	17:13	6:58	17:49
Dec 26, 2008 – Fri	6:46	16:47	6:19	16:07	Jan 27, 2009	6:42	17:14	7:29	18:47
Dec 27, 2008 – (New)	6:46	16:48	7:06	17:02	Jan 28, 2009	6:41	17:15	7:57	19:44
Dec 28, 2008 -Sun	6:47	16:48	7:48	18:00	Jan 29, 2009	6:41	17:16	8:24	20:42
Dec 29, 2008	6:47	16:49	8:24	18:57	Jan 30, 2009	6:40	17:17	8:51	21:42
Dec 30, 2008	6:47	16:50	8:57	19:55	Jan 31, 2009 – Sat	6:40	17:17	9:20	22:43
Dec 31, 2008	6:47	16:50	9:26	20:00					



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An artist's concept of ancient Mars with abundant air and water.

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"It helps explain why Mars has so little air," says David Brain of UC Berkeley, who presented the findings at the 2008 Huntsville Plasma Workshop on October 27th.

Billions of years ago, Mars had a lot more air than it does today. (Note: Martian "air" is primarily carbon dioxide, not the nitrogen-oxygen mix we breathe on Earth.) Ancient Martian lakebeds and river channels tell the tale of a planet covered by abundant water and wrapped in an atmosphere thick enough to prevent that water from evaporating into space. Some researchers believe the atmosphere of Mars was once as thick as Earth's. Today, however, all those lakes and rivers are dry and the atmospheric pressure on Mars is only 1% that of Earth at sea level. A cup of water placed almost anywhere on the Martian surface would quickly and violently boil away—a result of the super-low air pressure.

So where did the air go? Researchers entertain several possibilities: An asteroid hitting Mars long ago might have blown away a portion of the planet's atmosphere in a single violent upheaval. Or the loss might have been slow and gradual, the result of billions of years of relentless "sand-blasting" by solar wind particles. Or both mechanisms could be at work.

Brain has uncovered a new possibility—a daily ripping process intermediate between the great cataclysm and slow

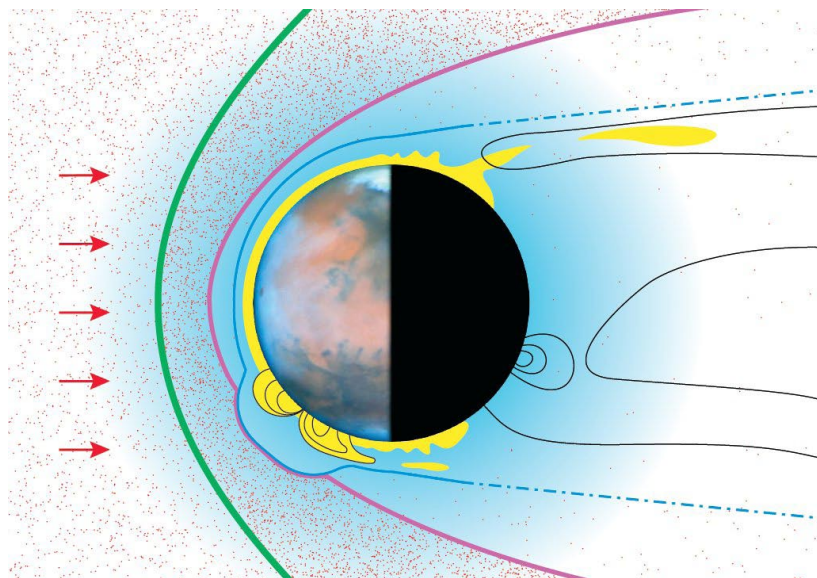
erosion models. The evidence comes from NASA's now-retired Mars Global Surveyor (MGS) spacecraft.

In 1998, MGS discovered that Mars has a very strange magnetic field. Instead of a global bubble, like Earth's, the Martian field is in the form of magnetic umbrellas that sprout out of the ground and reach beyond the top of Mars' atmosphere. These umbrellas number in the dozens and they cover about 40% of the planet's surface, mainly in the southern hemisphere.

For years, researchers thought the umbrellas protected the Martian atmosphere, shielding pockets of air beneath them from erosion by the solar wind. Surprisingly, Brain finds that the opposite can be true as well: "The umbrellas are where coherent chunks of air are torn away."

Addressing his colleagues at the Workshop, he described how he made the discovery just a few months ago:

Brain was scrolling through archival data from Global Surveyor's particles and fields sensors. "We have measurements from 25,000 orbits," he says. During one of those orbits, MGS passed through the top of a magnetic umbrella. Brain noticed that the umbrella's magnetic field had linked up with the magnetic field in the solar wind. Physicists call this "magnetic reconnection." What happened next is not 100% certain, but Global Surveyor's readings are consistent with the following scenario: "The joined fields wrapped themselves around a packet of gas at the top of the Martian atmosphere, forming a magnetic capsule a thousand kilometers wide with ionized air trapped inside," says Brain. "Solar wind pressure caused the capsule to 'pinch off' and it blew away, taking its cargo of air with it." Brain has since found a doz-

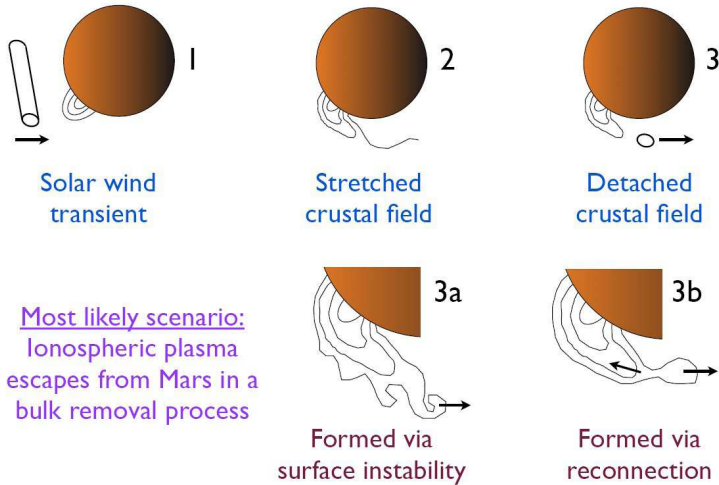


Solar wind blowing against Mars tears atmosphere-filled plasmoids from the tops of magnetic umbrellas. Credit: Graphic artist Steve Bartlett.



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Plasmoid Interpretation



Dave Brain of UC Berkeley presented this slide at the 2008 Huntsville Plasma Workshop to explain in cartoon fashion how plasmoids carry air away from Mars.

en more examples. The magnetic capsules or “plasmoids” tend to blow over the south pole of Mars, mainly because most of the umbrellas are located in Mars’ southern hemisphere.

Brain isn’t ready to declare the mystery solved. “We’re still not sure how often the plasmoids form or how much gas each one contains.” The problem is, Mars Global Surveyor wasn’t designed to study the phenomenon. The spacecraft was only equipped to sense electrons, not the heavier ions which would make up the bulk of any trapped gas. “Ions and electrons don’t always behave the same way,” he cautions. Also, MGS sampled the umbrellas at fixed altitudes and at the same local time each day. “We need to sample many altitudes and times of day to truly understand these dynamic events.”

In short, he told the audience, “we need more data.”

Brain is pinning his hopes on a new NASA mission named MAVEN. Short for “Mars Atmosphere and Volatile Evolution,” MAVEN is an upper atmosphere orbiter currently approved for launch to Mars in 2013. The probe is specifically designed to study atmospheric erosion. MAVEN will be able to detect electrons, ions and neutral atoms; it will be able to measure both magnetic and electric fields; it will travel around Mars in an elliptical orbit, piercing magnetic umbrellas at different altitudes, angles, and times of day; and it will explore regions both near and far from the umbrellas, giving researchers the complete picture they need.

If magnetized chunks of air are truly being torn free, MAVEN will see it happening and measure the atmospheric

loss rate. “Personally, I think this mechanism is important,” says Brain, “but MAVEN may yet prove me wrong.”

Meanwhile, the Mystery of the Missing Martian Air is shaping up to be a ripping good yarn.

SDAA Annual Fundraising Banquet

by Jean Naugle

Time again for the yearly Banquet. I hope as many of the SDAA members as possible will be coming. We have a great speaker lined up and I think that you all will enjoy him. We are again at the Crowne Plaza Hotel in Mission Valley and they are making our evening as starry a night as possible. We did our best to keep the cost down and found that the Crown Plaza was the most reasonable and that many places in town were double the price. Please budget to come and I think that you will be happy with the evening, the raffle prizes and the door prizes. Be sure and send in your Banquet ticket (see the insert) as soon as possible, you can also use PAYPAL but we will not be selling tickets at the door. Your \$45 per person ticket does include parking as well. I hope to see all of you and please come and let me know what you think of our “starry night decorations.”

Nightfall and Dennis Mammana

Photo Exhibit

by Jean Naugle

While my husband and I were in Borrego Springs for Nightfall over the Halloween weekend this year, we had time to go and see Dennis Mammana’s new Photo Exhibit. He had pictures from all over the world. Pictures of San Diego, comets, Aurora Borealis, Moon and Sun eclipses. I just wandered from each picture in absolute awe. I think that this is there until January but I am not sure so check his web site <http://www.dennismammana.com/>. Dennis Mammana also has photos that you can experience in the Under Ground Gallery below OPT (Oceanside Photo and Telescope). Just a reminder to visit the Under Ground Gallery when you go to OPT because of all that OPT gives to the SDAA.

Nominations for 2009 for SDAA Officers

by Jean Naugle

Members of the SDAA stepped up this year and volunteered without “much resistance” and I want to thank each and every one of the members that have agreed to run for the 2009 SDAA Board. I also want to thank the 2008 SDAA Nominating Com-



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mittee for their help in finding the 2009 Board nominees and their help: Cindy Carpenter, John Restivo and Duane Naugle.

I hope that all of the SDAA members will consider assisting in some way, and not only next year, be it at Star Parties, TDS, School Parties, on the SDAA Board or mentoring a new SDAA member. I would also ask that the SDAA members speak with me if you would consider helping out in some way because we can use more help in other ways.

Please be sure and VOTE and return your BALLOT in not only a TIMELY manner but so that it is back to be counted no later than JANUARY 10th, 2009 or it will not count.

SDAA Officer Election Biographies

The following are statements from the candidates for contested offices on the SDAA Board of Directors. The offices of Vice President and Corresponding Secretary are not being contested so no biographies are presented.

President:



Bob Austin

Bob Austin joined the SDAA in 2002. In the relatively few years since joining, he has consistently volunteered for multiple roles which include Star Party outreach, Site maintenance volunteer, RoboScope educator, and served as the SDAA club Vice President for 2005 -2006 and SDAA President for 2007 - 2008. Bob is a fixture on the TDS scene where he can be found mentoring new members and those getting started in Astro-Imaging. Over the years, Bob has been active in outreach throughout San Diego, providing parents, teachers, and students the rare opportunity to look through a telescope and learn about the universe. At TDS, Bob maintains a tradition of running an open observatory. Many TDS visitors have found their way up the hill to his building, where his door is always open.

Bob wants folks to get charged up about astronomy, even being accused of being an Astronomy Evangelist at times.

He is one of the folks you are sure to get a visit from when you show up on the public star party nights, inviting you to look through his "Big Dob," or answering questions about the club, or the sky.

Bob spends over 90 days a year at TDS and public star parties, and he works every day contacting members, listening to their requests, opinions and ideas, and openly communicating about the workings of the SDAA Business meetings. Bob also moderates the communications on the SDAA Yahoo discussion board where members often discuss important club events.

As President of the SDAA, Bob has worked hard to improve accessibility to the Board for all members of the club. He has turned his ear to the membership, listening to what direction they want the club to go and because of this, he successfully brought back the SDAA Annual BBQ, worked on the committee to get the WiFi set up, making the Internet accessible to the membership at TDS, and is currently working on a plan to develop the northeast corner of the TDS property for members to set up robotic observatories. The second site issue has been a top issue for Bob. He is currently leading negotiations with a RV Park near Blair Valley to allow the SDAA to use 40 acres to establish the development of a new viewing site.

Bob is asking for your vote for President. If elected, he will continue his strong public service commitment to the club, continue further development of TDS, insure continued open accessibility to the board, and continue a tradition of friendly outreach among the membership. Bob is committed to moving forward with the second site project, expanding the clubs resources, and managing the clubs assets to the benefit of all club members.



Brian Staples

For those of you who do not know me, my name is Brian Staples, and I am running for President of the SDAA.

I joined the SDAA the early 90s, and found myself out at TDS almost every weekend. TDS is one of the best privileges of membership. And for those privileges, I wanted to give something back, something more than my yearly dues. I ask the



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then-President if there were things I could do to help around the site. There were many tasks, which I was glad to help with. As I did more and more with the club, including the fledgling Stars in the Park and School Star Party Programs, I wanted to learn more about our vital and vibrant organization. I decided to attend a business meeting. One thing led to another, and over the last fifteen years, I've found myself as President, Vice-President, or Director. For many of those fifteen years, I have been involved in the business of the SDAA, and I've found it a most rewarding experience. I've watched and been a part of the phenomenal growth of one of the best amateur astronomy organizations in the world. Now, after a two year hiatus, I want to lend my skills once again to the operations of our beloved organization.

So why do I want to again be a member of the Board of Directors? The Board is the core of our group. It must act as a single, cohesive unit with an altruistic intent of making sure the club is always operating at its best, is serving its membership, its sponsors, and the general public who rely on us to bring them the wonders of the heavens above, and that we as an organization grow into the needs and the desires of all those we serve. Some members have expressed their concern to me over the organizational effectiveness of the current Board, and some, including our current President, have asked me to run again to bring my organizational and administrative skills to bear on this central core of our group. It would be an honor and a privilege to once again serve the SDAA in this capacity, and I look forward to the opportunity to sit with a strong Board and continue contributing to the vitality and vibrancy that is the SDAA.

Director (4 positions open):



Bill Carlson

Bill Carlson is a relatively new member, but has already proven to be a valuable asset to the club. He has been attending Stars in the Park frequently and has assisted with Astronomy Day and hosting the club scope. Bill was instrumental

in bringing WiFi Internet access to TDS and intends to keep working with the club to get county approval to build small private observatories at the site. He is also currently working on his own small observatory at the site, and intends on putting his background in computer software and electronics to good use for the SDAA.



Lou Jackson

Lou has been a member of the SDAA for six years, and has had the pleasure of serving as SDAA Treasurer and a Director over the last three years. He is a computer geek by day and an amateur astronomer by night.

Who is Lou Jackson?

Mr. Jackson has been interested in astronomy for most of his 60+ years. He reports that his first telescope was a home-made 6" Newtonian reflector that he owned in high school, and you would find him outside with it most clear nights.

After joining the US Air Force in 1968, life didn't seem to offer many opportunities for observing. After leaving the Air Force in 1975, he moved to Venezuela, and he says "it wasn't until 1986 when Haley's comet came around that my appreciation for heavenly bodies was transferred from Caribbean beaches back to the night sky".

After returning Stateside in 1990, his interest was again piqued with the appearance of Hale-Bopp in 1997 which "forced" the purchase of an 8" Celestron Ultima 2000. Being a natural born gadget freak, his interests have lately turned to astrophotography (and the occasional snapshot on the seashore).

Why is Lou Jackson Running for Director?

It is widely acknowledged that he probably has a screw loose. However, when asked this question, his response was:

"The SDAA has given me the rich experience of being able to share the wonders of the night sky with others at SDAA star parties. I never tire from hearing that muffled "Wow!" you hear every time a young person sees the rings of Saturn for the first time, or the cloud belts of Jupiter or craters on the moon."

"I will not promise a chicken in every pot, nor do I think we

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will see world peace in our lifetime, but it has given me great pleasure (and the occasional migraine) to be a member and officer of this great organization, and it is my fervent wish to continue to serve on the Board of Directors of the San Diego Astronomy Association.”



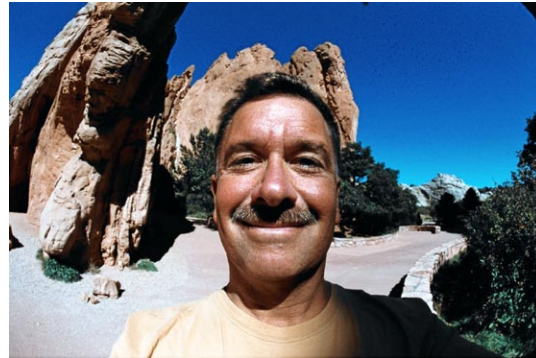
Mark Lane

My name is Mark Lane and I am the outgoing Vice President of the SDAA. Many of you know that I am also a professor of astronomy at Palomar College. I joined the club 6 years ago looking for a way to enjoy the hobby and comraderie of astronomy and to seek ways to give back to the community that helped foster my deep love of astronomy many years ago. Over the years I have served the club by becoming part of the SDAA Board of Directors, first as a Director and then as the Vice President. Through the years I have worked on various projects out at TDS and participated in public outreach events in the community. For the last two years I worked to fulfill the duties as Vice President, primarily concentrating my efforts on making the monthly Program Meetings informative and entertaining to the membership. I hope that you all feel that I have served you well.

My desire to serve the SDAA over these past years is a desire to make this club the best that it can be, whether that means working to get Dr. Alex Filippenko to speak at our last annual banquet, or more recently working with Brian McFarland, Brian Staples and many other SDAA volunteers at the Lightning Brewery annual fundraiser - an event that netted the club a quick \$1,500 and introduced hundreds of people from the community to the SDAA and its educational mission.

At this time it is important that I turn the job of Vice President over to someone who can give the position a fresh push forward. However, I would like to continue to serve the SDAA by remaining on the Board of Directors for the next year. The future is bright for the SDAA, with the proper leadership, this club will move in new and exciting directions. With your vote, I

believe that I can contribute to the work that is needed to keep moving this great club forward. Thank you.



Brian McFarland

My name is Brian McFarland and I'm running for one of the four one-year term SDAA Board of Director positions. I've been a member of SDAA for almost 20 years having started out on the public pads for several years, later leasing a private pad for a number of years and more recently became a partner in one of the private observatories. This has given me a good understanding of the needs of all our members and guests who use TDS. My focus has been telescope making, astrophotography, and visual observing – a little bit of everything I guess!

Over the years I've volunteered for a variety of club functions, including Board of Director and various Officer positions. I've also volunteered on numerous SDAA projects such as fence construction, club observatory repairs and upgrades, stints as the club electrician and private pad chair, upgrades to the club refractor and lending telescopes, TDS erosion control and private pad development, and well pump house improvements. Most recently I worked with Mark Lane and Brian Staples to organize a fundraiser for SDAA this past September sponsored by Lightning Brewery that netted the SDAA \$1,500 in proceeds. Mark, Brian and I are in discussions with Lightning's owners to do it again next summer, and our goal is to make it even more successful.

If elected I plan to continue volunteering wherever my skills are needed, and I look forward to working with all the other volunteers who make the SDAA such a great organization. I appreciate your vote!

Newsletter Deadline

The deadline to submit articles
for publication is the
15th of each month.



San Diego Astronomy Association



David Petit

After graduating from the University of California at Santa Barbara in 1977 with a degree in Marine Biology, I moved to San Diego with my wife Dora and daughter Jennifer. I have worked here as a software engineer for the past 30 years. I have a variety of interests and hobbies including hiking, biking, swimming, SCUBA diving, reading, and of course astronomy. Last January, I came to Balboa Park to see the planetarium show at the Fleet Theatre and afterwards I met members from SDAA who were sharing views from their telescopes. After visiting with SDAA members again the following month, I knew that that SDAA was an organization that I wanted to be a part of. I joined SDAA last March and by April, I was participating in club star parties and other SDAA and AISIG functions. I greatly appreciate all of the help and support offered by so many club members and also the opportunity to be a part of all club activities including star parties, science day, and various astronomy events where the club participates. This past year I have learned so much from so many club members who were always so generous sharing their knowledge and their views. Since joining the club I have participated in star parties at Balboa Park (5), Mission Trails (5), Heise Campground (2), TDS (4), Sycamore Canyon (2), and various schools (4). I have also participated in all of the AISIG meetings where I initiated the process of videotaping and donating back to the club, DVDs of AISIG presentations. This coming year, I look forward to being even more active in club activities. As a member of the board of directors, I will be looking for ways to involve even more participation in club meetings and activities.



Kin Searcy

SDAA member since moving from Virginia in 1997; US Naval Academy class of '66; electrical engineer. I observe with a 4-inch Televue NP-101is refractor and a 12.5 inch Starsplitter dob. I am a serious astrophotography learner and was appointed chairman of the AISIG several years ago. I think that I have expanded the AISIG with the help of some unbelievably talented imagers. I am also the Central Area Star Party Coordinator. I took that job on because there was an urgent need for a coordinator and because I have a strong commitment to public outreach. I genuinely enjoy the star parties and the company of the dedicated SDAA volunteers who support this worthwhile endeavor. As a former Cubmaster and Scoutmaster (Wood Badge), I enjoy igniting the science spark in youth. I prepared and delivered a dynamic slide presentation that I gave for 30+ evenings on the USS Midway and was a presenter at the Sally Ride Science Fair at UCSD. I am a merit badge counselor in astronomy and have worked with numerous scouts and troops.

If chosen to continue as a director, I will encourage learning, using the talents of outstanding SDAA members, to make astronomy alive to others. SDAA has an outstanding outreach program, and it would be my honor to continue our growth. I also look forward to the foundational work to seek a second site. I am an experienced Navy program manager who has managed 100 million dollar programs, and I believe that this experience will be valuable to SDAA as it looks for renewal and a second site.





San Diego Astronomy Association





San Diego Astronomy Association

AISIG Gallery

New member Tho Dinh posted some impressive images on the AISIG gallery. He captured the impressive image of the Horsehead (Back Page) from TDS. and the Triangulum Galaxy (M33) (page 18, top) from TDS and his home in Poway. He used a Vixen VC200L (8-inch VIXEN Cassegrain) on a large Astro Physics Mach1GTO using an astronomical CCD - SBIG-8XME. On the site, he thanks Tim Lewis for the post processing.

Scott Dixon made this nice image (below) of M45 - Pleiades cluster with nebulosity - from TDS with an LX 200 and unmodified Canon Xti. He combined 20 individual images for a total of 1 and 1/10 hours exposure.

Finally, we have an image by Michael Vander Vorst (page 18, bottom). This image was taken in Idyllwild using a tripod mounted Nikon D200 and an 18-200mm lens.



THE BACK PAGE



MEMBERSHIP INFORMATION

Send dues and renewals to P.O. Box 23215, San Diego, CA 92193. Include any renewal cards from Sky & Telescope, Astronomy, or Odyssey magazine in which you wish to continue your subscription. The expiration date shown on your newsletter's mailing label is the only notice that your membership in SDAA will expire. Dues are \$50 for Contributing Memberships; \$30 for Basic Membership; \$50.00 for Private Pads; \$5 for each Family membership. In addition to the club dues the annual rates for magazines available at the club discount are: Sky & Telescope \$32.95, Astronomy \$34, Sky Watch \$6.99, and Odyssey \$25.46. Make checks payable to S.D. Astronomy Assn. PLEASE DO NOT send renewals directly to Sky Publishing. They return them to us for processing.

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You are cordially invited to
**The San Diego Astronomy Association's
Annual Banquet**



on

Saturday, February 7, 2009

Crown Plaza San Diego, 2270 Hotel Circle North, San Diego, CA, 92108

5:30 – 11:30 pm

The Speaker:

Dr. Marc Rayman will describe the Dawn mission and its use of ion propulsion as well as its two exotic destinations. He also will share the excitement of controlling a spacecraft in deep space.

Dawn will be the first spacecraft ever to orbit an object in the asteroid belt



and the first ever to orbit two targets. Such a mission would be impossible without the use of ion propulsion, a technology that has mostly been in the domain of science fiction, but which was tested extensively on the Deep Space 1 mission, paving the way for Dawn.

Menu

Ohana Chicken

Rosemary Marinated Half-Chicken,
Roasted and Topped with Lemon Grass Sauce
Served with Roasted Red Potatoes & Seasonal Vegetables

Pork Loin Courvoisier

Oven-Roasted Pork Loin Served with a Based Cinnamon Apple and Topped with Apple Courvoisier Demi Glace
Served with Mashed Potatoes & Seasonal Vegetables

Spinach Fettuccini

Spinach Fettuccini with Roasted Roma Tomato Cream Sauce and Garnished with Parmesan Cheese
Served with Fresh Seasonal Vegetables

SDAA Banquet Order Form

Use this form or order online at www.sdaa.org/banquet.htm

Name _____

Address _____

City, State, Zip _____

Telephone _____

Email _____

Dinner Selections (*Enter number of each*)

Pork Courvoisier ____ **Ohana Chicken** ____ **Spinach Fettuccini** ____

Number Attending ____ @ \$45 each

Total Payment included \$ _____

**Make checks payable to SDAA*

Orders must be received no later than 01/31/2009

Mail to:
San Diego Astronomy Association
C/O Alice Harvey
8320 Regents Rd Unit 2-O
San Diego, CA 92122-1349