FIRST LIGHT

Journal of the South Bay Astronomical Society – December 2008
on line at www.geocities.com/sbas_elcamino

Monthly General Meeting: Friday, December 5th, 7:30 PM

Guest Speaker: Ron Rennie

"Russian Eclipse Tour" and "Time Travel, Tunneling, Tennis and Tea" a video lecture on Relativity by Prof. Richard Wolfson

Outreach Events

It's been a busy month for outreach events! With two star parties in the same week, it was good once again to see SBASers rise to the challenge. First, on Wednesday the 19th, we had the Crestwood School star party. At least 10 members with scopes arrived and put on a good show for the students and their families. Then, on Friday, the 21st, we returned to Linwood E. Howe Elementary school where we had done their first star party a year ago. Once again, students and families as well as teachers were greatly appreciative of the view of the various celestial objects. This party was a real challenge as clouds had lingered throughout the day. Finally towards evening it cleared just enough and we were able to present view of Jupiter, Venus, the Andromeda Galaxy (M31), some double stars and even a planetary nebula (the Saturn Nebula). Large crowds kept the SBASers quite busy!

The November 7 Meeting

President Ken Rossi began the meeting at 7:39 by greeting three newcomers, and then reviewing the Society's recent observing sessions. Craig Gates reported observing geosynchronous satellites passing across the Orion Nebula, noting that they are faint but within reach of amateur equipment.

Joe Fierstein described the history of the SBAS, and the work of the Society's officers over the years. He urged members to get involved, either as an officer of the club or as a volunteer for our outreach efforts. He ended by demonstrating some of the equipment sent to the Society by the Night Sky Network, to help teach the public simple astronomical concepts.

After President Rossi reviewed the star parties planned for the near future, he held the annual election of officers. The slate of candidates was the same as last year's, and the officers were elected unanimously by a show of hands. Perhaps if some members take Joe Fierstein's advice to heart, we may have a competition for offices next year.

After a fifteen-minute social break, President Rossi introduced the evening's speaker, Daniel Mousney from Woodland Hills Telescope & Camera, speaking about "The Night Sky". Mr. Mousney's talk was primarily a review of the various books that are currently popular with amateur astronomers. 'Nightwatch' by Terence Dickinson is a good introduction to the night sky, and 'The Messier Card' is a handy one-page map of these observing favorites. The 'Pocket Sky Atlas' is useful for navigating across the sky, and 'Burnham's Celestial Handbook' is in Mr. Mousney's opinion the best book of all for its vivid descriptions; for example, if the Milky Way Galaxy were condensed to the size of the United States, our Solar System would fit into a coffee mug.

'The Night Sky Observer's Guide' is useful for very dim objects, now that amateurs are getting bigger telescopes. It is particularly useful in its description of the same object in telescopes of differing aperture. Planispheres remain popular, and binoculars continue to be useful in revealing large asterisms that telescopes cannot accommodate. 'Binocular Astronomy' not only points out such objects, but gives a good description of how such objects are positioned relative to the Milky Way Galaxy. He finished his review of books with 'Universe in Your Backyard' and 'Sky Atlas 2000'.

Mr. Mousney ended his talk to the 40 audience members by reviewing the Sky Scout, the current business climate in astronomy, bino-viewers, planetary observing and H-alpha solar telescopes. President Rossi thanked the speaker and gave him a commemorative plaque, ending the meeting at 9:30.

- ***Dr. Steven Morris***

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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.

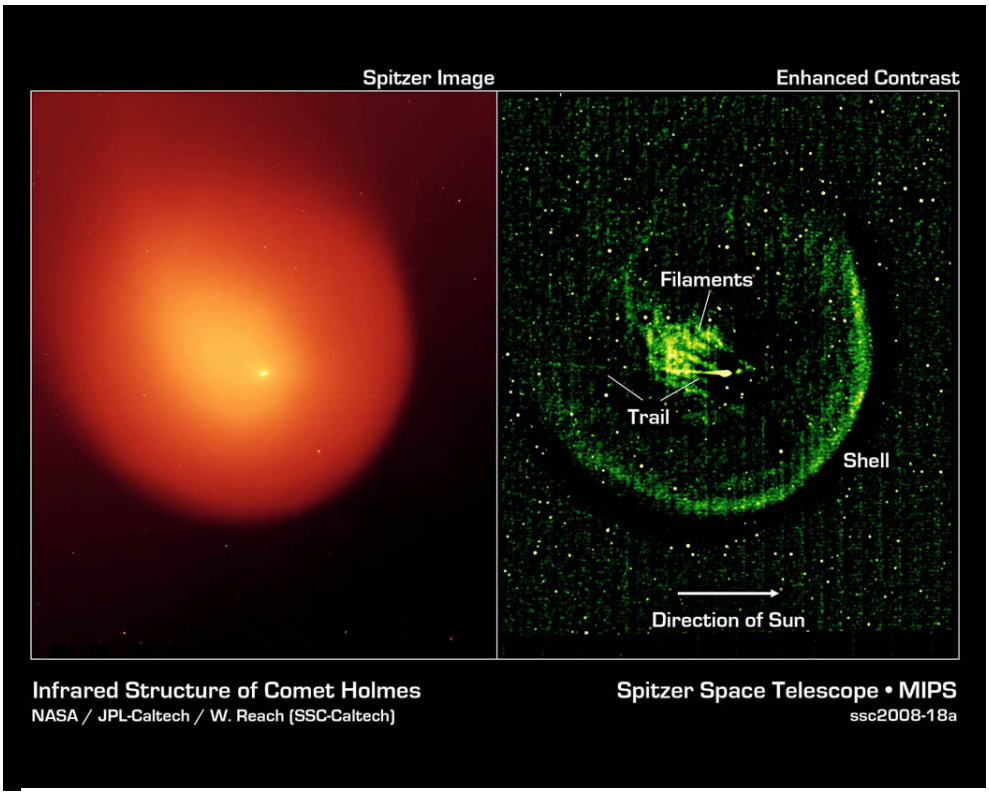
"We believe that a cavern full of ice, located as much as 100 meters beneath the crust of the comet's nucleus, underwent a change of phase," says Bill Reach of NASA's Spitzer Science Center at the California Institute of Technology. "Amorphous ice turned into crystalline ice" and, in the transition, 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 comet—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 10^{14} joules and the total mass was of order 10^{10} kg." In other words, Holmes exploded like 24 kilotons of TNT and ejected 10 million metric tons of dust and gas into space.



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.

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."

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.

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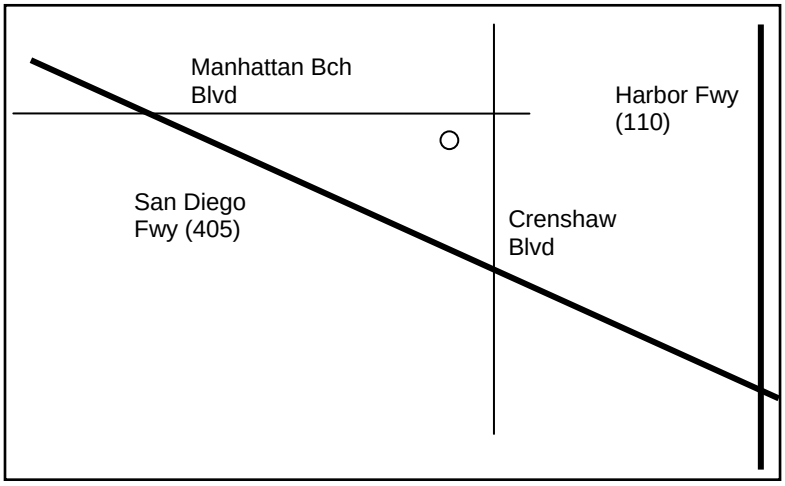
Monthly General Meetings

We normally meet on the first Friday of each month at 7:30 p.m. in the Planetarium at El Camino College (16007 Crenshaw Bl. In Torrance). If the first Friday is on or close to a holiday, we usually defer the meeting until the second Friday of the month. The Planetarium is on the south side of Manhattan Beach Blvd., one block west of Crenshaw Blvd. (near the center of the map at left).

The planetarium is the only round, domed building on campus. There is on-street parking, and we can often use campus parking: check inside to see if you need a FREE parking permit for your car.

We enjoy the planetarium facilities through the courtesy of the El Camino College Administration, and have several faculty members of the Astronomy Department as members of our Club. Our meetings always include an informal opening, when new attendees are invited to introduce themselves and let us know about their interests in astronomy. Members share their latest news and observations at this time. The rest of the evening is devoted to guest speakers, who range from amateur astronomers to professional astronomers to representatives from local aerospace companies to college professors. We are fortunate to have all these talented people in our area, willing to come and talk to us.



Monthly Planning Meeting

Committee members (and anyone else with an interest in Society activities) meet each month, usually on the Monday following the general meeting. Meetings are sometimes rescheduled due to travel and other circumstances. Exact date and time of each month's meeting will be announced in the schedule of events in FIRST LIGHT each month, and should also be verified with a committee member. The December 8th planning meeting will be held at the home of Ray Grace, 2706 Spreckels Lane in Redondo Beach (310) 370-1913. Take Hawthorne Blvd to 190th St., turn West to Inglewood Ave., then turn North (right) and proceed two blocks to Spreckels Lane and turn Right. If driving South

on Inglewood Ave., Spreckels Lane is two blocks south past the light at Ralston Ave., and turn Left, to the 4th house on the right (South side). Parking is available on both sides of the street.

Membership Dues Schedule

Month Join/Due	Member (Family)		Student	Expires
	USMail	Email		
January	$38.50	$33.00	$22.90	12/2009
February	$35.00	$30.00	$20.85	12/2009
March	$31.50	$27.00	$18.75	12/2009
April	$28.00	$24.00	$16.70	12/2009
May	$24.50	$21.00	$14.60	12/2009
June	$21.00	$18.00	$12.50	12/2009
July	$17.50	$15.00	$10.45	12/2009
August	$14.00	$12.00	$8.40	12/2009
September	$10.50	$9.00	$6.25	12/2009
October	$49.00	$42.00	$29.20	12/2010
November	$45.50	$39.00	$27.10	12/2010
December	$42.00	$36.00	$25.00	12/2010

To simplify the dues, we suggest that all membership expire in December. Dues are $42.00/year for FirstLight via US Mail, or $36.00 via Email notification ($25.00/year for students) and expire on December 31, of the current year. New members use Month Join, and current members select your expiring Month to calculate the amount. Members that expire in October or November may wish to write one check and include next years membership. Make checks payable to the South Bay Astronomical Society. Dues may be paid at the general meeting or mailed to:

South Bay Astronomical Society

Attn: Arnie Stodolsky

P.O. Box 1937

Redondo Beach, CA 90278

SBAS Membership Benefits

Contact Arnie Stodolsky for magazine subscriptions at club rates: “Sky & Telescope” $32.95 and “Astronomy” $34.00/1 year or $60.00/2 years!

Note: S&T subscribers at the club rate renew their subscriptions by mailing their renewal notice and check or calling the 800# on the renewal notice.

Only new subscribers or subscribers converting their subscription to the club rate need to contact Arnie or send a check to the PO Box. Astronomy subscriptions and renewals still go through Arnie or via the PO Box.

Black Holes Burp Big Bubbles

By Jeanna Bryner

Like cosmic bubble makers, some black holes spew out behemoth blobs of hot gas into their home galaxies. The bubbles ultimately pop, and their gassy contents keep both the black hole and its galaxy from ballooning to mega sizes, a new study finds.

The results apply to elliptical galaxies and their supermassive black holes, which can weigh as much as a billion suns or more. Our galaxy, the Milky Way, is a spiral galaxy. And while it houses a supermassive black hole, the researchers say the same process might not apply to it.

Black hole bubbles

The researchers focused on the supermassive black hole at the center of the elliptical galaxy M84, which is about 55 million light-years from Earth. (A light-year is the distance light will travel in a year, or about 6 trillion miles, or 10 trillion km.) They combined data collected by NASA's Chandra X-Ray Observatory and results from a black-hole computer simulation.

They noticed huge bubbles, or cavities, of hot plasma (ionized gas) rising up from the tips of the black hole's pair of laser-like jets. (As material falls into the gravitational clutches of a black hole, the energy can be spit out as jets of radiation and high-speed particles.) They estimate the bubbles are about 13,000 light-years across and they are launched from jets about every 10 million years.

The X-ray images showed that, like Russian dolls, each bubble has a smaller bubble tucked inside of it and so on. When the outer bubble bursts, spilling its gaseous guts, there's another inside waiting to pop as well. That continuous bubble-popping provides a constant input of heat into the surrounding interstellar gas.

"We think certain instabilities are formed on the interface between the bubble and the surrounding medium and these instabilities shred and puncture this bubble, and the stuff that is inside them, this hot plasma, is spilling out and mixing with the surrounding gas," said researcher Mateusz Ruszkowski, an astronomer at the University of Michigan.

Cosmic diet

The jolts of heat stem the food supply to the central black hole and slow down star formation nearby. Over time, black holes grow in heft as their gravity pulls in surrounding gases. Because cool gas is denser, it sinks to the center of galaxies — and toward the black hole — faster. If the gas around the black hole is kept warm, it sinks toward the black hole at a slower rate.

"In this way, you can feed the black hole and add more and more mass to it," Ruszkowski told *SPACE.com*. "If there's no mechanism to prevent the cooling that is essentially triggering this feeding process then the black hole would grow in an uncontrollable fashion."

But, he added, "nobody in the field thinks this is happening," he said. The new results, which are detailed in the Oct. 20 issue of *Astrophysical Journal*, reveal a mechanism for continuous heating of the interstellar material, he said. A similar mechanism keeps star formation in check and in turn the mass of the home galaxy.

Stars are thought to form as dense clouds of gas and dust collapse under their gravity. Over time, the material heats up and ultimately the tight bundle becomes a full-fledged star powered by thermonuclear fusion of hydrogen and other light elements in its core.

The cooler the material, the more likely the clumps of gas and dust will succumb to the force of gravity and collapse into luminous stars.

Reprinted from Space.Com

Schedule of Coming Events

5 December Friday Night 7:30 PM	**Monthly General Meeting** Guest Speaker: Ron Rennie Topic: Two Video Presentations – "Russian Eclipse Tour" and "Time Traveling, Tunneling, Tennis and Tea".
8 December Monday Night 7:30 PM	**Monthly Planning Meeting** See directions on Page 4.
11 December Thursday 7:00 PM	**JPL's Von Karman Lectures: The Mystery of Dark Matter.** Dr. Michael Seiffert. In 1998, two groups presented startling evidence that the expansion of the universe is accelerating, and the term "dark energy" was coined as a label for the cause of the acceleration. What is the nature of this mysterious component that we now believe makes up more than 70 percent of the energy density of the universe? This talk will attempt to explain the questions and a few of the answers. Location: Von Karman Auditorium at JPL 3800 Oak Grove Dr. Pasadena
13-14 December	**Geminid Meteor Shower Peak** Possible Zenith-Hourly-Rates of 50-60 meteors per hour but expect less to be seen due to the full moon.
20 December Saturday Night	**In Town Dark Sky Observing Session at Ridgecrest Middle School–** 28915 NortbBay Rd. RPV, Weather Permitting**:** Please contact Greg Benecke to confirm that the gate will be opened! Or possibly Rancho Del Mar High School, Rancho Palos Verdes, if on-going construction at Ridgecrest prevents that site from being used.
27 December Saturday Evening	**Out-of-Town Dark Sky Observing Session** Contact Greg Benecke to coordinate a location.

South Bay Astronomical Society

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General Meeting at El Camino College Planetarium:
Friday, December 5th, at 7:30 P.M.

Ron Rennie

A Video Presentation of his Russian Eclipse Tour

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South Bay Astronomical Society
P.O. Box 1937
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