FIRST LIGHT

Journal of the South Bay Astronomical Society – June 2009
on line at www.geocities.com/sbas_elcamino

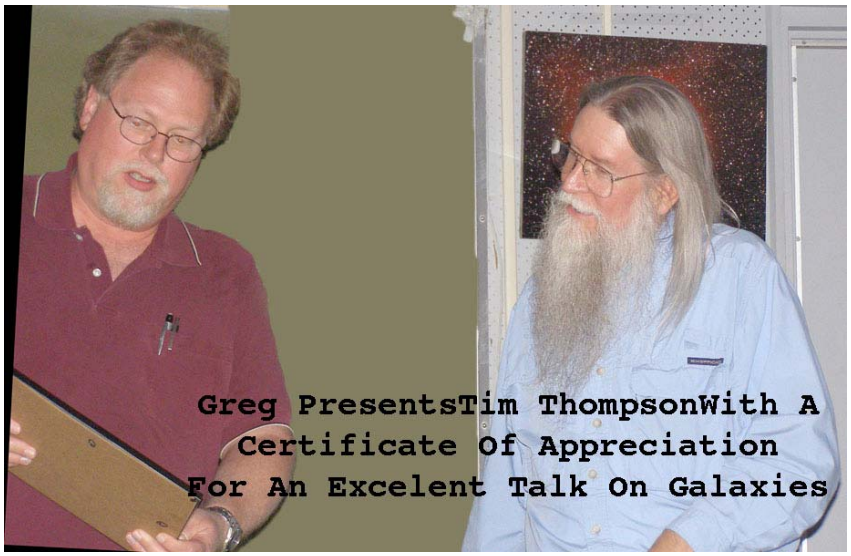
Monthly General Meeting: Friday, June 5th, 7:30 PM

Guest Speaker: Dr. Steven Morris, Harbor College

"Introduction to the Universe"

The May 1 Meeting

In the absence of the President and Vice-President, the Past President Greg Benecke opened the meeting at 7:38 by welcoming newcomers Linus Knoll, Scott Williams and Tom Kearney. Ron Rennie presented awards to Tom Bash, Greg Benecke and Craig Gates for their success in last month's Astrophoto Competition, each member receiving a round of applause.



Reviewing recent observing events, Greg noted that the SBAS had set up twelve telescopes at the Marsee Auditorium of El Camino College for the 100 Hours of Astronomy project, as part of the International Year of Astronomy. Arnie Stodolsky presented a plaque to the staff of El Camino College in recognition of their support of the IYA. Various observers reported on their observing sessions at Ridgecrest, Red Cloud Mine Road, Hole in the Wall, Tehachapi and Mt. Lemmon. Upcoming events include the RTMC Astronomy Expo, observing at Ridgecrest, and three outreach events in May. We received a big thank-you card from Silver Spur School, in acknowledgment of our previous efforts.

After an eighteen-minute social break, Greg Benecke introduced Tim Thompson, who recently retired from the Science Division of JPL and is currently the President of the Mount Wilson Observatory Association. The subject of his lecture was "Galaxies", and Tim Thompson began by pointing out that a recent gamma-ray burst, named GRB 090423, was measured to have a record-breaking redshift of 8.2. We can see objects at incredible distances with modern telescopes, but what is it that we're seeing?

The first galaxy ever observed was the Milky Way, known since humans first became humans. The second galaxy that was not only seen, but recorded in literature that has come down to us, is M31 (the Andromeda Galaxy) as noted in 950 AD by the Persian astronomer Abd al-Rahman al-Sufi. The first galaxy recorded as spiral in structure was M51, the Whirlpool Galaxy, by the 3rd Earl of Rosse in 1845. It was only in the 1920's that Edwin Hubble recognized spiral nebulae as stellar systems separate from the Milky Way.

We now recognize that the Andromeda Galaxy and our own Milky Way are large spiral galaxies that dominate the smaller galaxies of the Local Group, such as the Magellanic Clouds. Tim Thompson then gave the audience a tour

of some of the outstanding photographs that have been taken of galaxies such as M31 and M81 in recent years, as well as several animations simulating the collision of galaxies. Our own galaxy has collided with several smaller galaxies such as the Canis Major Galaxy in the past, and these simulations have shown us what happens to their stars as they are absorbed by the Milky Way. Studies of stars in the Milky Way show the same pattern of anomalous velocities as these models predict, presenting a nice agreement between theory and observation.

Tim Thompson ended by noting that there is much we do not understand about galaxies and cosmology. Studies of the velocities of stars as they orbit around the center of a galaxy at different radii show that galaxies have 'dark matter' in some unidentified form that contributes to the masses and the gravitational fields of galaxies, but do not form objects that glow. He took many questions from some of the forty people in attendance, and received a plaque and a round of applause from the appreciative audience. The meeting ended at 10:18.

- ***Dr. Steven Morris***

Scoring More Energy from Less Sunlight

For spacecraft, power is everything. Without electrical power, satellites and robotic probes might as well be chunks of cold rock tumbling through space. Hundreds to millions of miles from the nearest power outlet, these spacecraft must somehow eke enough power from ambient sunlight to stay alive.

That's no problem for large satellites that can carry immense solar panels and heavy batteries. But in recent years, NASA has been developing technologies for much smaller microsatellites, which are lighter and far less expensive to launch. Often less than 10 feet across, these small spacecraft have little room to spare for solar panels or batteries, yet must still somehow power their onboard computers, scientific instruments, and navigation and communication systems.

Helen Johnson, a spacecraft technician at NASA's Goddard Space Flight Center, works on one of the three tiny Space Technology 5 spacecraft in preparation for its technology validation mission.

Space Technology 5 was a mission that proved, among other technologies, new concepts of power generation and storage for spacecraft.

"We tested high efficiency solar cells on ST-5 that produce almost 60 percent more power than typical solar cells. We also tested batteries that hold three times the energy of standard spacecraft batteries of the same size," says Christopher Stevens, manager of NASA's New Millennium Program. This program flight tests cutting-edge spacecraft technologies so that they can be used safely on mission-critical satellites and probes.

"This more efficient power supply allows you to build a science-grade spacecraft on a miniature scale," Stevens says.

Solar cells typically used on satellites can convert only about 18 percent of the available energy in sunlight into electrical current. ST-5 tested experimental cells that capture up to 29 percent of this solar energy. These new solar cells, developed in collaboration with the Air Force Research Laboratory in Ohio, performed flawlessly on ST-5, and

they've already been swooped up and used on NASA's svelte MESSENGER probe, which will make a flyby of Mercury later this year.

Like modern laptop batteries, the high-capacity batteries on ST-5 use lithium-ion technology. As a string of exploding laptop batteries in recent years shows, fire safety can be an issue with this battery type.

"The challenge was to take these batteries and put in a power management circuit that protects against internal overcharge," Stevens explains. So NASA contracted with ABSL Power Solutions to develop spacecraft batteries with design control circuits to prevent power spikes that can lead to fires. "It worked like a charm."

Now that ST-5 has demonstrated the safety of this battery design, it is flying on NASA's THEMIS mission (for Time History of Events and Macroscale Interactions during Substorms) and is slated to fly aboard the Lunar Reconnaissance Orbiter and the Solar Dynamics Observatory, both of which are scheduled to launch later this year.

Thanks to ST-5, a little sunlight can go a really long way.

Find out about other advanced technologies validated in space and now being used on new missions of exploration at nmp.nasa.gov/TECHNOLOGY/scorecard. Kids can calculate out how old they would be before having to replace lithium-ion batteries in a handheld game at spaceplace.nasa.gov/en/kids/st5_bats.shtml.

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

SBAS Executive Board

President	Ken Rossi	515-1586	ken_a_rossi@yahoo.com
Vice-President	Ron Rennie	326-5589	vidron@sbcglobal.net
Secretary	Steve Pedersen	378-6479	epsonstlyusc82@earthlink.net
Treasurer & Astronomical League Rep.	Arnie Stodolsky	937-0220	astodols@ix.netcom.com

SBAS Committees

Program Chairman	Ron Rennie	326-5589	vidron@sbcglobal.net
Astronomical League Liaison	Bill Eisele	542-5070	Astronomy131@msn.com
Newsletter Reproduction	Arnie Stodolsky	937-0220	astodols@ix.netcom.com
Publications Committee:			
SBAS Website Webmaster	Alex Athas		sbas_elcamino@yahoo.com
***First Light* Editor**	Ken Munson	782-0873	kenmunson333@sbcglobal.net
Observing Committee	Greg Benecke	217-1512	BeneckeRUs@aol.com
	Craig Gates	376-6387	- - -
Membership Committee	Ray Grace	370-1913	rgrace3@verizon.net
Publicity Committee	Joe Fierstein	377-9834	joefiers@aol.com
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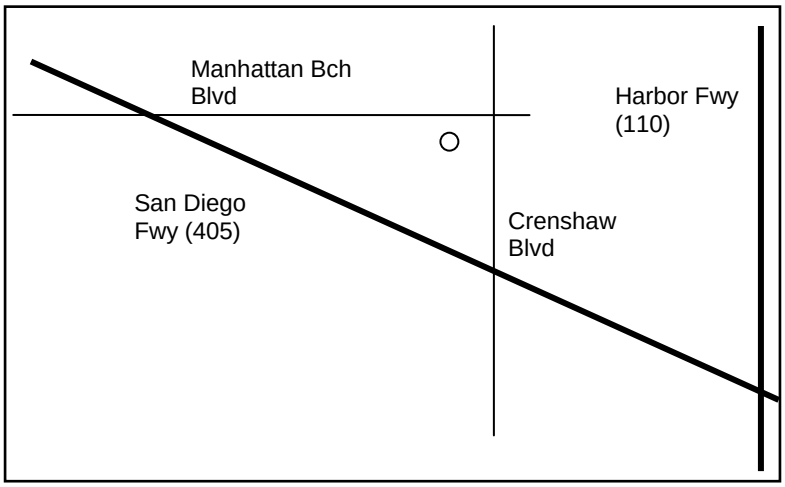
Monthly General Meetings



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 June 8th planning meeting will be held at the home of *to be announced*.

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.

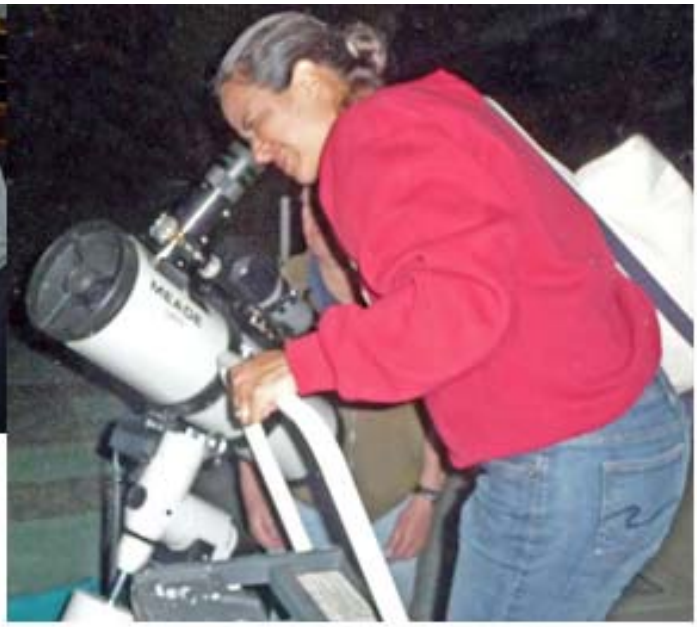
Only new subscribers or subscribers converting their subscription to the club rate need to contact Arnie or send a check to the PO Box. Astronomy subscriptions and renewals still go through Arnie or via the PO Box.

Astronomical League Observing Clubs

All SBAS members in good standing are also members of the Astronomical League and are eligible to participate in the League's Observing Clubs. The Astronomical League provides many different observing programs (clubs). These programs are designed to provide a direction for your observations and to provide a goal. The programs have certificates and pins to recognize the observers' accomplishments and for demonstrating their observing skills with a variety of instruments and objects. For more information go to:

http://www.astroleague.org/observing.html.

Outreach Events



Cornerstone
5/15/09

Pt Vicente
5/ 08/ 09

Schedule of Coming Events

5 June Friday Night 7:30 PM	**Monthly General Meeting** Guest Speaker: Dr. Steven Morris Topic: Introduction to the Universe
8 June Monday Night 7:30 PM	**Monthly Planning Meeting** See directions on Page 4.
11 June Thursday Night 7:00 PM	**JPL's Von Karman Lectures: Rainbows, Kepler – Things We Know About the Universe and How We Know Them** by Dr. Charles R. Lawrence. The structure and nature of the universe has puzzled and fascinated people for thousands of years. Only recently, however, has it been possible to measure some of its fundamental properties. What do we know, how do we know it, and what might we learn in the near future? Location: Von Karman Auditorium at JPL 3800 Oak Grove Dr. Pasadena
13 June 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! Alternate site: Rancho Del Mar High School -
20 June 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, June 5^{tht}, at 7:30 P.M.

Dr. Steven Morris, Harbor College

"Introduction to the Universe"

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Redondo Beach, CA 90278