

FIRST LIGHT



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

Monthly General Meeting: Friday, April 3rd, 7:30 PM
2nd Annual Astrophoto Competition

The March 6 Meeting

President Ken Rossi began the meeting at 7:38 by noting that the Kepler mission was to be launched in the next ten minutes (it launched on time, successfully). Randy Brewer introduced himself as a visiting amateur astronomer, who will be in the South Bay for the next three years. President Rossi described some recent observing sessions, and Arnie Stodolsky reported seeing Comet Lupin, Ceres and Saturn through the El Camino telescope. Steven Morris suggested that as Venus approaches inferior conjunction, someone with very keen eyesight might be just able to detect the planet as a thin crescent, with the naked eye.

Ron Rennie announced that our second annual Astrophotography Contest will occur at the next meeting, and urged our local astrophotographers to show us what they've managed to accomplish. The three categories are: Best Individual Photograph, Best Presentation, and Best Rookie (someone who has not previously won). Two star parties are planned, for the city of El Segundo and the Dodson Middle School. Finally, Joe Fierstein announced that he had not needed to spend all of the money the Night Sky Network had provided for him to attend their meeting, and that he was donating the extra money to our Society. Thanks, Joe!

After a 13-minute social break, President Rossi gavelled the meeting back to order, and introduced Dr. Steve Levin of JPL, who spoke on the "Juno Mission to Jupiter". Dr. Levin is a graduate of UC Berkeley and is the Project Manager of Juno, a Jupiter polar orbiter which is scheduled to blast off from Earth on August 18 2011 and reach Jupiter on August 2 2016. To avoid frying the spacecraft's electronics on arrival, Juno will be placed in a polar orbit to avoid the intense equatorial radiation belts. It will be powered by less than 500 Watts available from the solar panels, and will not rely on the nuclear power systems used in previous Jupiter probes. Juno will be allowed to crash into Jupiter after one year of data collection, to avoid any chance that as an uncontrolled derelict, it might collide with one of Jupiter's moons and seed it with biological contamination.

One goal of this mission is to investigate the origin of Jupiter, by determining the abundance of water on the planet and by determining the mass of its core. The Galileo probe has shown us that some of our ideas of planetary formation need to be corrected based on measurements of the abundance of elements such as helium and neon. Although information of Jupiter's gravitational field has been an incidental byproduct of previous probes, Juno is designed to measure gravity deviations as a critical part of its mission. As the gravitational field is affected by Jupiter's mass all the way down to its core, Juno's measurements should allow scientists to distinguish among several competing theories of where and how Jupiter formed in the early Solar System.

A second mission is the study of the planet's magnetic field, which is strongly affected by the planet's liquid metallic hydrogen layer, between the core and the near-surface regions. A third mission is a study of these near-surface regions to a depth of 1500 kilometers, which will be achieved by six radiometers tuned to wavelengths from 1.3 centimeters to 50 centimeters, detecting the thermal emission that escapes from these depths and radiates into space. The fourth and final of Juno's missions will be polar magnetospheric exploration, measuring particles precipitating into the atmosphere and creating its aurorae. Radio waves emitted above the surface of Jupiter will reveal the processes responsible for accelerating these particles onto the planet.

Dr. Levin answered several questions from the 40 people present, and President Rossi presented him with a plaque

as the audience applauded. The meeting then ended at 9:41.

- Dr. Steven Morris



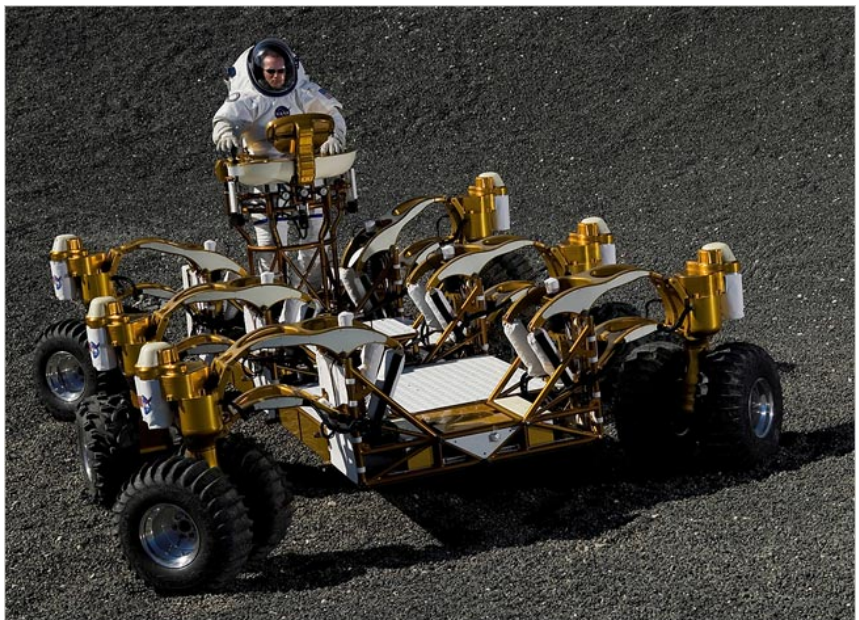
Apollo Upgrade

The flight computer onboard the Lunar Excursion Module, which landed on the Moon during the Apollo program, had a whopping 4 kilobytes of RAM and a 74-kilobyte “hard drive.” In places, the craft’s outer skin was as thin as two sheets of aluminum foil.

It worked well enough for Apollo. Back then, astronauts needed to stay on the Moon for only a few days at a time. But when NASA once again sends people to the Moon starting around 2020, the plan will be much more ambitious—and the hardware is going to need a major upgrade.

“Doing all the things we want to do using systems from Apollo would be very risky and perhaps not even possible,” says Frank Peri, director of NASA’s Exploration Technology Development Program.

So the program is designing new, more capable hardware and software to meet the demands of NASA’s plan to return humans to the moon. Instead of staying for just a few days, astronauts will be living on the Moon’s surface for months on end. Protecting astronauts from harsh radiation at the Moon’s surface for such a long time will require much better radiation shielding than just a few layers of foil. And rather than relying on food and water brought from Earth and jettisoning urine and other wastes, new



The Chariot Lunar Truck is one idea for a vehicle equal to the lunar terrain. Each of the six wheels pivot in any direction, and two turrets allow the astronauts to rotate 360°

life support systems will be needed that can recycle as much water as possible, scrub carbon dioxide from the air without depending on disposable filters, and perhaps grow a steady supply of food—far more than Apollo life-support systems could handle.

Next-generation lunar explorers will perform a much wider variety of scientific research, so they’ll need vehicles that can carry them farther across the lunar surface. ETDP is building a new lunar rover that outclasses the Apollo-era moon buggy by carrying two astronauts in a pressurized cabin. “This vehicle is like our SUV for the Moon,” Peri says.

The Exploration Technology Development Program is also designing robots to help astronauts maintain their lunar outpost and perform science reconnaissance. Making the robots smart enough to take simple verbal orders from the astronauts and carry out their tasks semi-autonomously requires vastly more powerful computer brains than those on Apollo; four kilobytes of RAM just won’t cut it.

The list goes on: New rockets to carry a larger lunar lander, spacesuits that can cope with abrasive moon dust, techniques for converting lunar soil into building materials or breathable oxygen. NASA’s ambitions for the Moon have been upgraded. By tapping into 21st century technology, this program will ensure that astronauts have the tools they need to turn those ambitions into reality.

Learn more about the Exploration Technology Development Program at www.nasa.gov/directorates/esmd/aboutesmd/acd/technology_dev.html. Kids can build their own Moon habitat at spaceplace.nasa.gov/en/kids/exploration/habitat.

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

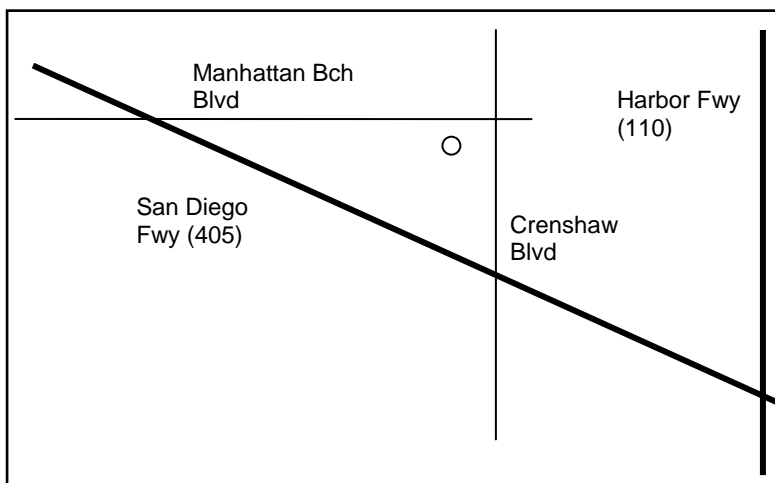
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Monthly General Meetings



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 April 6th planning meeting will be held at the home of Joe & Miriam Fierstein. Take Hawthorne Blvd. south past Pacific Coast Hwy. up the hill passing Silver Spur Rd. and Highridge until you get to the light at Eddinghill Dr., then turn right and go downhill to the 'T' intersection at Golden Meadow where you turn left up 2 blocks and turn left on Willow Tree Dr. to 3rd house on the right side from the corner – 7022 Willow Tree Dr., Rancho Palos Verdes.

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>.



El Segundo 3/20/09
Waiting for the Clouds To Pass

March Madness

SBAS Hosts 5 Events In One Month

3/4 Tulita; 3/9 Weblos; 3/13 Silver Spur; 3/20 El Segundo; 3/26 Dodson

Observing Reports

El Segundo Star Party - Despite cloudy skies 11 optimistic SBAS members showed up on the evening of March 20. Unfortunately the clouds didn't dissipate. However, the El Segundo Parks Dept came prepared with a projector and truck load of chairs. Joe brought his Laptop, CDs and telescope so we put on an out-of-doors astronomical show and tell to entertain a small group of about 40 people with plenty of kids. It wasn't like last year's crowd of several hundred, but we did the best we could under the circumstances.

- Joe Fierstein

Ordinarily I try to keep our external star parties to 2/month. But this being the International Year of Astronomy (IYA) we have had an unusually large number of requests. This plus a lapse of memory on my part led to a bunching of events during March; 5 in all. Plus of course, our regular meeting, our planning meeting and our "In Town" and "Dark Sky" star parties. That's quite a lot of activity for a club of only 80 members. We are certainly doing our part in promoting IYA. So I want to thank all those who participated. You have helped make astronomy come alive for hundreds of people and especially the children. Thankyou.

Here is a brief recap of the month's events:



SBAS @ Tulita School 3/4/09



Sun Viewing @ Silver Spur School 3/13/09

March 4: At Tulita Elementary School in Redondo Bch. "Science Faire". The theme was "Down On the Farm" It was supposed to be a combined Star Party and talk but the weather prevented any observing. Despite the ominous weather 5 SBAS members Ken Lehmer, Ron Rennie, Tim Moore, Bill Eisele and myself attended. Ron showed his videos of the different eclipses he has attended around the world and explained what was taking place. In an attempt to stick to the Farming theme I attempted to explain how the stars supplied the basic ingredients of life throughout the universe.

March 9 A meeting of a Weblo Scout Den at St. James Church in Torrance. The scouts were working to earn an astronomy "Belt Loop" Each of 6 scouts presented a project they had done relating to astronomy. I was impressed with their knowledge. Afterwards They correctly assembled a model of the solar system with all planets in the right order. They & their parents then proceeded to the parking lot to view the full moon thru my scope. It's hard to say who was more excited the scouts or the parents.

March 13 Silver Spur Elementary School in RPV - I Am A Scientist Day. Ken Lehmer was the scientist of the day. He taught 2 classes of 4-5th graders about the solar system, the Sun and the life cycle of a star. He also showed them how to make a pin hole camera and use it to measure the diameter of our sun. It was a great success. Outside, Jacques Linder & Joe Fierstein showed the sun to the students.

March 26 we will be at Dodson Middle School in RPV for an evening star party. Come and join the fun. Call Joe @310 377 9834 for directions. Clear Skies!

- **Joe Fierstein**

Star Explodes and So Might Theory

A massive star a million times brighter than our sun exploded way too early in its life, suggesting scientists don't understand stellar evolution as well as they thought.

"This might mean that we are fundamentally wrong about the [evolution of massive stars](#), and that theories need revising," said Avishay Gal-Yam of the Weizmann Institute of Science in Rehovot, Israel.

According to theory, the doomed star, about 100 times our sun's mass, was not mature enough to have evolved a massive iron core of nuclear fusion ash, considered a prerequisite for a core implosion that triggers the sort of supernova blast that was seen.

The new study involves old images that have just been compared. It is one of the rare instances where the progenitor of an [exploded star](#) has been found.

The explosion, called supernova [SN 2005gl](#), was seen at a distance of 215 million light-years in the barred-spiral galaxy NGC 266 on Oct. 5, 2005. Pictures from the Hubble Space Telescope archive, taken in 1997, reveal the star, pre-explosion, as a very luminous one.

The progenitor had been proposed previously, but now has been firmly identified, according to a study published Sunday in the online version of the journal *Nature*.

The progenitor star was so bright that it probably belonged to a class of stars called Luminous Blue Variables (LBVs), "because no other type of star is as intrinsically brilliant," Gal-Yam said. As an LBV-class star evolves it sheds much of its mass through a violent stellar wind. Only at that point does it develop a large iron core, then the [core collapses in an explosion](#).

The unexpected explosion could mean other stars may behave in ways not previously expected, including one relatively close to home, known as [Eta Carinae](#), just 7,500 light-years away and in our own Milky Way galaxy. Extremely massive and luminous stars topping 100 solar masses, such as Eta Carinae, are expected to lose their entire hydrogen envelopes prior to their ultimate explosions as supernovae.

"The progenitor identification shows that, at least in some cases, massive stars explode before losing most of their hydrogen envelope, suggesting that the evolution of the core and the evolution of the envelope are less coupled than previously thought, a finding which may require a revision of stellar evolution theory," said study co-author Douglas Leonard from San Diego State University.

One possibility is that the progenitor to SN 2005gl was really a pair of stars, a binary system that merged. This would have stoked nuclear reactions to brighten the star enormously, making it look more luminous and less evolved than it really is.

"This also leaves open the question that there may be other mechanisms for triggering supernova explosions," says Gal-Yam. "We may be missing something very basic in understanding how a superluminous star goes through mass loss."

Gal-Yam reports that the observation revealed that only a small part of the star's mass was flung off in the explosion. Most of the material, says Gal-Yam, was drawn into the collapsing core that has probably become a black hole estimated to be at least 10 to 15 solar masses

-Reprinted from Space.Com

Schedule of Coming Events

3 April Friday Night 7:30 PM	Monthly General Meeting 2 nd Annual Astrophoto Competition
4 April Saturday Night 6-10 PM	100 Hours of Astronomy Meet at the Marsee Auditorium at El Camino College to do a star party for people attending the evening's program at the auditorium.
6 April Monday Night 7:30 PM	Monthly Planning Meeting See directions on Page 3.
16 April Thursday Night 7:00 PM	JPL's Von Karman Lectures: Rainbows, Sunsets and Rocket Science Revisited by Dr. David J. Diner What do patterns of light from the sky reveal about particles in the air? Atmospheric particles -- aerosols, cloud droplets, ice crystals -- come in many sizes and shapes, and their interaction with sunlight affects Earth's climate and gives rise to many spectacular atmospheric optical displays. From blue skies, red sunsets and green flashes to rainbows, glories, arcs and halos, these effects are not only beautiful to behold but give us clues to the nature of the airborne particles that cause them. This talk will look at some fundamental principles of atmospheric optics. Location: Von Karman Auditorium at JPL 3800 Oak Grove Dr. Pasadena
18 April Saturday Night	In Town Dark Sky Observing Session at Ridgecrest Middle School – 28915 North Bay Rd. RPV, Weather Permitting: Please contact Greg Benecke to confirm that the gate will be opened! Alternate site: Rancho Del Mar High School -
19 April Sunday Morning 8AM to 1PM	Solar Viewing at the Palos Verdes Farmer's Market
25 April Saturday Evening	Out-of-Town Dark Sky Observing Session Contact Greg Benecke to coordinate a location.
1 May Friday Night 7:30 PM	Monthly General Meeting Guest speaker: Tim Thompspon, Los Angeles Astronomical Society Topic: Galaxies
4 May Monday Night 7:30 PM	Monthly Planning Meeting Location TBD.
8 May Friday Night 6-10 PM	Science Night at Pt. Vicente School 30540 Rue de la Pierre RPV

South Bay Astronomical Society

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***General Meeting at El Camino College Planetarium:
Friday, April 3rd, at 7:30 P.M.
“2nd Annual Astrophoto Competition”***

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**South Bay Astronomical Society
P.O. Box 1937
Redondo Beach, CA 90278**