

FIRST LIGHT



Journal of the South Bay Astronomical Society - June 2002
on line at www.geocities.com/sbas_elcamino

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

Guest Speaker: Mr. Ken Munson (SBAS / PanAmSat)

”Space Weather”

Observing A Rocket Launch

Thanks to Steve Morris for the heads-up on the Delta II launch of the Aqua satellite at around 0300 Sat. AM. I used Yahoo! Maps to get an approximation of the ground azimuth from Palos Verdes to Vandenberg, then went to the weather forecast page for PV at: <http://www.wunderground.com> and clicked on its astronomy link to get an idea of the stars at 0300, so I could use the constellations to guide me to the direction of Vandenberg. I went to Highridge Road to observe the launch, just below Ridgecrest School. It has a wide unobstructed view to the west. There are no streetlights close by, and there was no traffic on the road. I brought binoculars (7x35) to observe the launch. I figured that they would increase the detail I could see, and that I could easily track the rocket in them. I was right! I arrived at about 0250, got the binos focused and ready, and started looking (with the Mark I eyeball) in the general direction of Vandenberg (i.e., Ursa Major). I did not have long to wait.

They launched the rocket at the beginning of the launch window, 0255. Suddenly it was there: a vertical flame in the night. What a sight! Binos -- UP. As the rocket gained altitude and tipped to the south, the plume lengthened. I presume that this was a result of decreasing atmospheric density, i.e., less air around to push back and contain the flame. Downstream from the fiery incandescence at the engine nozzles, it seemed as though the plume exhibited all the color bands of the spectrum. After a while, the flame became a little less intense, and I could see an occasional spark far back in the tail of the plume. I presume these were the jettisoned strap-on solid rocket boosters. A little later, the plume was reduced to a dot and I saw a very bright object in an earth-bound (though still forward) trajectory, apparently incandescent from air resistance, with a glowing shock wave in front of it and a turbulent glow behind it, travelling rather slower than the rocket had been going. Eventually this object passed behind some trees. All too soon, the show was over and I came home, rather concerned that something might have gone wrong.

I logged onto the “spaceflightnow” web site, and my fears were relieved. Apparently the glowing object that fell to Earth was the empty first stage of the rocket (or perhaps it was the spacecraft fairing – these two events happened only 12 seconds apart). Since it was the brightest thing up there, that’s what I looked at, while the tiny dot of the second stage engine went on about its business. Lessons learned: Before observing a rocket launch, find out what the sequence of events is supposed to be and when they are supposed to occur. Bring a radio tuned to WWV so that one can hear the time elapse, rather than having to take eyes/binos off the rocket to look at a wristwatch in the dark. If one knows what’s supposed to happen at time X, it will help one to understand what one is seeing at time X.

More Vandenberg polar orbit (i.e., due south) launches are scheduled: sometime in October a Titan 2 with a military payload, on Oct 30 another Delta 2 with a science payload, Dec. 15 another Delta 2 with a science payload to investigate how the spinning Earth drags space-time with it. Useful websites for breaking and recent space news, Aqua launch timeline, Mission Status Center, and scheduled launches worldwide for the next 8 months are found at: <http://spaceflightnow.com>

- Fred Weber

One Light at a Time

Overhead street lights are a major source of light pollution, made worse by their “cobrahead” design that spews light sideways and upwards as well as down towards the street. I have such a light in front of my house, so last autumn I decided to see if I could get the authorities to install a shield that would prevent it from shining on my property. I live in the City of Torrance, so I began with a phone call to city hall. The receptionist brightly informed me that the streetlights are the responsibility of Southern California Edison, and I should contact them. I did so, and was routed to a woman who said that a shield would be installed. This seemed easy! I sent a letter dated September 12, 2001 to make this request more official and waited for developments. Two months later, I phoned back and asked how the project was going. I was informed that my letter had been received, the work order had been filled out, and it should be done in a few weeks.

I phoned back a month later, to discover that the project had been canceled and a shield would be put up only if the city of Torrance agreed to pay for it. I asked if a letter had been sent to me to inform me of this decision, or if a letter had been planned. The SCE representative said no, sounding a little embarrassed. Back to Torrance. A couple of phone calls and letters got me in touch with Ted Semaan, the Transportation Planner in the Planning Department. He wrote to me on January 22, 2002, saying that the planning staff was analyzing the matter, and was contacting adjacent property owners for their input regarding the requested installation. He warned me that if any of the neighbors wrote back objecting to the installation, the City would not request it. I immediately talked to my neighbors, and they agreed not to respond to the letter from the City.

On February 11, a letter arrived from Ted Semaan saying that no objections had been received, the City has concurred with my request for a street light shield, and the City would pay for it. If I had any questions, I was to contact Ryan Vergara of Southern California Edison. Finally, on the morning of Monday April 22, 2002, the light shield was installed! A mere seven months later, I no longer have light trespass from the streetlight outside my house, giving me a slightly darker backyard for stargazing.

While I am grateful to all concerned, I can't help but think that other cities are more aggressive in halting light trespass and light pollution. For example, an article appeared in the March 28, 2002 Calgary Herald newspaper, describing the official launch of an initiative to retrofit 11,000 street lights by the end of the year, saving \$2 million a year in operating costs. Calgary will install 40,000 lower-wattage, flat-lens street lamp fixtures by the end of 2007. According to a Calgary official, light is light, but if you can't see into your neighbour's yard because of the glare from the light, then you're not getting eyes on the street. This will get eyes on the street and that will make it safer. What an enlightened (so to speak) attitude! If a city in the oil-rich province of Alberta can mass-retrofit their lights for energy conservation, why can't energy-starved California?

In the meantime, if you have a bothersome street light near you, why not try to do something about it? The rules differ from city to city, so start with your city hall, keeping a record of names, dates and information received. If you live in Torrance, your first step is to talk to your neighbors. If even one of them objects, then you are stuck with bad illumination. If no one objects, write to: Ted Semaan, Transportation Planner, Planning Department, 3031 Torrance Boulevard, Torrance, CA 90509-2970, and request that Torrance ask Southern California Edison to install a street light shield on the offending fixture.

- Steven Morris

SBAS Astrophotography Display at the P.V. Library

SBAS will present a display of our talented astrophotographers' work at the Palos Verdes Library over a two-week period this month. Educational events to benefit not only the public but our organization as well are one of SBAS' stated purposes in our drafted Constitution and Bylaws. It is a very rewarding experience to participate in these activities because for people of all ages, either it's a first-time exposure to all that astronomy offers us or it's a reminder of everything that is fascinating and magnificent within (and outside) our galaxy!

Please contact Joe Fierstein to make arrangements for your astrophotographs to be included in our display. We will also have a display at the Torrance Library during the whole month of September – so we'll be able to use all of the new astrophotographs that you will be working on in the next few months.

- Laura Lucas

Your SBAS Committee

President	Greg Benecke	217-1512	BeneckeRUs@aol.com
Treasurer / Newsletter Reproduction	John Collins	-----	Jcollins@smad.com
First Light Editor	Laura Lucas	798-7281	Ipsaloquator@aol.com
Program Chairman	Joe Fierstein	377-9834	Yussel@aol.com
Observing Chairman	Bill Whiddon	548-8179	William.whiddon@trw.com
Astronomical League	John Collins	320-0555	Jcollins@smad.com
Executive Committee	Mark Braden	540-2810	Bradenm@fnic.com
	Ron Rennie	326-5589	Rkgrennie@yahoo.com
	Mike Mayerchak	831-9188	Mmayerchak@aol.com

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. 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). Click on the map to get a display that can be zoomed out for a regional view. The zoom display appears in a separate browser window, which can be closed to return to this page.

The domed roof of the planetarium is visible from the street. 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 who are willing to come and talk to us.

Monthly Planning Meetings

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 by any member or visitor wishing to attend. All are welcome!

We will meet on Monday, June 10th at 7:30 PM 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 Dr. to 3rd house on the right side from the corner – 7022 Willow Dr., Rancho Palos Verdes.

SBAS Membership Benefits

Contact John Collins for subscriptions, at club rates, to "Sky & Telescope" at \$29.95 and \$29.00 for "Astronomy" magazines! Make your check payable to SBAS and mail payment and your subscription / renewal form directly to SBAS c/o Microcosm, Inc. at 401 Coral Circle, El Segundo, CA 90245-4622.

Part of your dues to the SBAS goes toward membership in the Astronomical League. All paid members should be receiving the "Reflector", the league's newsletter, four times a year. As a member organization, we can participate in a number of award programs they offer. These are based on completing various observing challenges. Check out the Astronomical League website at www.astroleague.org

NexStar 8 Available to SBAS Members

All members in good standing (with at least six months of continuous membership) can borrow the club's Nexstar8 for up to 7 days. The fee of \$5 for a weekend, or \$10 for an entire week, is nonrefundable and will be added to the club's Accessories Fund "Wish List" for future purchases. A fully refundable deposit of \$200 cash or check is required. Loss or damage is the responsibility of the borrower. A copy of the complete South Bay Astronomical Society Nexstar 8 Borrowing Rules and Agreement is available upon request.

The **Accessories Fund "Wish List"** – Member contributions of any amount or donations will be appreciated! Do any members have a suggestion for the "wish list"?

"Friends of the Nexstar" is the group of members who have donated equipment or accessories for the SBAS telescope, and the planning committee has granted them the privilege of a waiver of the deposit & fee for borrowing the Nexstar8. Members include: Greg Benecke, Joe Fierstein, Dr. Steve Morris, John Evans and Dan Trimble.

SBAS Members \$ Buy \$ Sell \$ Trade \$ Listing:

- ❖ SBAS is offering a steamer trunk case for an SC 8" or less for *free!* Call Greg Benecke if you are interested.
- ❖ For Sale: Nexstar5 with tripod, equatorial wedge, 25mm eyepiece, AC Adapter, carrying case, The Sky s/w & piggyback camera adapter \$1,200 obo - contact Ken Munson (310) 782-0873 or email kenmunson333@cs.com!

Members send your advertisements to Laura Lucas!

Local Activism Fighting Light Pollution

Here are a series of messages, Joe Fierstein contacting Laverne Booth at IDA, and a message from Catherine Rich of The Urban Wildlands Group, on the Vincent Thomas Bridge Lighting Project.

I saw an interesting news byte on the PV Cox cable channel concerning the Vincent Thomas Bridge. Last week a trial run of the new lighting system was tested. It was made up of a series of blue LED Lamps strung along the bridge suspension cable. Each lamp consisted of a bank of LEDs arranged in a housing about 1 to 2 ft square. There was no mention of the large floodlights or the timing restrictions that were mandated at the meeting of the Coastal Commission. It was stated that "all the concerned players had participated in the new design and were satisfied that they had the best possible design regarding the environment". All the players from the Commission meetings were there - except astronomy people - Chip Israel from Lighting Design Alliance, Travis Longcore – The Urban Wildlands Group, Louis Dominguez- V.T. Bridge Committee. Were any of you contacted or participate in the new design? If they have eliminated the upward pointing floods then we may have come out ahead of the game as far as light pollution is concerned, although blue is not the best color for our purposes.

I remember when I proposed LEDs at one of our earlier meetings and was put down by the chairman and the Cal Trans rep who said they weren't practical and too costly. Perhaps the energy crunch has changed the economics. It was stated that there would be an 8-to-1 energy savings using LEDs. It's a step forward. However, I'm still concerned about the floodlights and if they will be included in the final design. If they are not included then this design, in my opinion, is an improvement. The installation is expected to be completed by Sept. '02.

- Joe Fierstein

It was The Urban Wildlands Group, with their threat of lawsuits and hardball advocacy that made the difference. The disappointing thing is that no one (to the best of my knowledge) from the Astronomy Community was involved. Perhaps some of the people who wanted more lighting tried to arrange this last event without the astronomy people knowing about it, to keep the design more to their liking. It's hard to keep track of everything that is going on, without someone notifying us directly.

IDA doesn't have enough staff or resources to keep track of, or to send someone to, every local event. The local people need to get themselves together as best they can. IDA can supply informational materials, and provide the central point for communications. I am no longer in Los Angeles county, I have moved to San Bernardino county, and I am now the San Bernardino County Section IDA Contact. San Diego County now has an IDA Section, and so does Central California.

We really need a Los Angeles County IDA Section. The starting point is to get someone to volunteer to be the Section Contact/Leader. I have been a Section Contact for about 3 years now, and it is really not that hard to do. Each area or county just needs to have someone as a central point, mainly to collect and disperse various types of information. Maybe some South Bay Astronomical Society member would consider this, especially if a few other members offered to help out.

- Laverne Booth, "International Dark Sky Association"

The project as approved a year-and-a-half ago had been stalled because of insufficient funding, but this new design using LEDs may end up being more affordable for the community (I guess LEDs are coming down in price a bit). Travis Longcore and I were invited to a demonstration of the blue LED lights. There was a fair-sized story in the Daily Breeze the next day, so we assumed local residents would become aware of the proposal. The story is linked from the "projects" page on our website: www.urbanwildlands.org

Although there is no actual design, only conceptual at this point, what we have heard, and seen, is infinitely better -- from all aspects -- than what they have a permit for now. The current permit is for a plan that still involves major floodlighting, including on the towers. Only the operational controls made the approved project somewhat palatable.

This new proposal is very close to what Joe was suggesting all along -- LED lights only. These are indeed blue, and they are talking about having them along the catenaries and roadway only. They chose blue so that the lights will stand out from the other lights in the Port (lots of orange glow, and bright white lights on the cranes, though many of these are turned off now when not in use!), thereby allowing lights of lesser intensity to be used. Recall also that the previous (approved) incarnation of the project included what they described as blue "jelly jar" lights along the roadway. I don't recall anyone raising objections to the use of blue light at that time.

Chip Israel of Lighting Design Alliance is very aware of dark-sky issues, as well as our wildlife issues, and said that this should meet dark-sky concerns. I don't want to misquote him, but essentially his main point was that these LED lights will be positioned to be visible to observers on the ground; there is nothing being installed to point light upward or to throw light onto the structure. We are also pleased that the towers will not be lit -- they were originally talking about also having white lights outlining the towers (we weren't too keen on that), but after the demonstration they thought that the blue lights would be sufficient. This new proposal, at least that which is being discussed, is nothing short of a gift to all of us, and Travis and I have offered to help them with their permit amendment or new application (of course only after we see a final design).

Although we cannot say with certainty that there will be no effect on birds because this type of lighting has not been used in such a situation before, we can say that with the information available to us, it appears to be an excellent compromise and a much less risky project than anything that we have seen to date. We were resigned to being stuck with the old plan, dependent on operational controls, whereas this would be acceptable as installed. I think, given that laws and regulatory bodies change over time, that it is preferable to have the quality of the project (from all of our various environmental points of view) dependent exclusively on the hardware instead.

Some additional good news: we also hear the officials at the Port are at least talking about improving the light and glare situation on their work lights. That would be wonderful. Even some bridge lighting proponents (not our biggest fans in 1999) are saying things like, "a lot of good came out of this."

- Catherine Rich, "The Urban Wildlands Group"

In-Town Observation Night

@Ridgecrest – Sat. May 4 - Arriving at the school about 6:30 (dusk) we found that the fog had gotten there ahead of us. After waiting around for about half an hour a few stars and Jupiter could be seen through the fog so we began setting up. Almost immediately the fog started closing in again. Some people left for home and the rest of us decided to use this opportunity to try and find a less foggy spot on the peninsula to do our observing.

We drove to the south side of the hill and since the road gate was locked, we walked through Ladera Linda Park. This park has some large little used areas free from security lights. The west end of the park was very dark and there was no fog in this area of the hill. Unfortunately, the sky was overcast with our May/June gloom marine layer. We would not have set up without permission and a key to the gate anyway.

From the park, we drove further down the coast along P.V. Drive South to a now defunct housing development, located between the highway and the ocean. We set up our telescopes on one of the level lots and finished off the evening looking up into the overcast that was thin enough to see stars through. This spot was rather close to the large light dome from the harbor and the lights from passing cars were annoying.

While the seeing conditions on this particular night were poor, we did learn a lot from this little adventure of ours. First, the newer members of our group are very enthusiastic about getting out and using their telescopes. Second, the area of Lader Linda Park that we looked at appears to be darker and less foggy than Ridgecrest School. Finally, if we go further to the east we get into the harbor area light dome. Whether or not we can get permission to use this park at night is a question yet to be answered.

Those who went on this excursion to the dark side of the hill with me were Shawn Belveal, Joe Fierstein, Craig Gates, Greg Beneke, and Mike & Lesley Rivas.

- ***Jim Madison***

Dark-sky Observing Reports

@Inyokern-Redrock - On May 11, the weather reports looked better to the North than the South, so interested members decided to try Redrock-Inyokern Road once again after being blown away the last couple of months by high winds. An early indication that the winds might actually be calm came while driving past a large brush fire in the Santa Clarita area. The smoke was rising in a large vertical column to several thousand feet above the terrain before being blown horizontally. The winds were even calm in Mojave when we stopped for some food.

When our caravan, consisting of Mike and Lesley Rivas, and my son Ben and I, arrived at the site, we found Craig Gates, his son-in-law Trent, and a friend with Craig's Nexstar 11 GPS and Nexstar 5 set up and ready to go. The winds were calm and the temperature warm! Mike and Lesley began setting up their 12 inch LX200 GPS while I set up the trusty C8 Deluxe.

As the twilight faded, we were treated to the planetary "alignment" that has been in the news of late. Mercury was low on the horizon with Saturn a bit higher. Up a bit more, Mars was just below Venus and Jupiter was considerably higher. All together a beautiful sight.

It was a night of big glass, both in aperture and eyepieces. Craig had borrowed some eyepieces from a contact at Celestron as well as a couple of Naglers from a friend. The Celestron Axiom 50mm impressed me as being a possibly better low power eyepiece than my Televue 55mm Plossl. A favorite of the night for all was the 31mm Nagler Type 5. This is a physically impressive eyepiece. It must be 4 inches in diameter and 6 inches tall. It is also an optically impressive eyepiece, with its 82 degree apparent field of view. It has nearly the same true field as the 50mm, but you do have to move your eye around to take in the entire view. I think we all added the Nagler to our wish lists.

This was Mike's first night out at a dark site with his scope. Between the 12 inch and Craig's Nexstar 11, I spent more time away from my scope than at it. We frequently aimed three or four scopes at the same object and compared the differences as you went up in aperture. We traded eyepieces and diagonals around as well. We viewed a number of seasonal globular clusters, planetary nebulae, reflection nebulae and galaxies. Comet Ikeya-

Zhang was fairly high in the mid night sky, but due to its position relative to the earth and the direction of the solar wind, the tail was almost unseen, but the coma was still prominent. We looked for a couple of comets from the Linear family, but were never able to be certain we saw them. As the Summer Milky Way rose in the wee hours of the morning, we decided to try for some dark nebula such as the Ink Spot. They could be made out but even darker skies would have been better.

As the morning twilight brightened Mike, Lesley and I packed up and were on the road before the sun was above the horizon. Craig, on the other hand, retired to his motorhome for some shuteye before the drive home. Since the night was so short, I had not slept at all, which may not really be the best idea before a two hour drive.

- **Greg Benecke**

Editor's Note: Based upon good observing circumstances, 40 five-planet conjunction events may have been seen in the last 4,000 years. The next time these bodies will be grouped so closely together will be in September 2,040!

@Mojave National Preserve - After months of observing the weather patterns and noting how clear the skies over the eastern Mojave were, I decided to go out to the Mojave National Preserve on Thursday, May 9, for some dark sky observing. Unfortunately, after months of clear skies, a cold front moved through a brought some light clouds!

The site I went to was Mid Hills Campground. Located on a ridge top at 5600 feet above sea level, it is a very picturesque site with lots of pinyon pine forest and other vegetation. It is a semi-developed site with very clean toilet facilities and water but not electricity. The last 10 miles of road is a very rough washboard dirt road. They should have a frequent flyer program because you spend about as much time airborne as on the ground!

It's not a great site for astronomers as most of the campsites have so many trees around that there is little view of the sky. The campsite I used (#19) had one of the largest open areas and had a great view of the sky. Site #24 also looks to be very good, with a large bare knoll behind it, which could accommodate a number of telescopes. The trees around campsite 19 did provide some blockage from the wind (which would not have been the case at 24). The vegetation at the site was good for preventing blowing dust. The light dome from Las Vegas was noticeable but, since it was hidden behind the trees, it didn't bother me too much. I spent the early part of the evening showing the sky to several neighboring campers. They were quite amazed to see Mars and Venus together in the eyepiece.

Aside from the partly visible light from Las Vegas, the sky was very dark. The glow of LA was barely noticeable low in the west and there were no apparent light domes to the south and east. Before the clouds moved in around midnight, the sky was very transparent and stable. Even before 9:00 it was so dark and clear that I could clearly make out the dust cloud on the rim of M104, the Sombrero Galaxy. Comet Ikeya-Zhang continues to be a bright nucleus surrounded by a hazy cloud but I could no longer see a tail. Did a lot of galaxy hunting and reached a new low by observing a 12th magnitude galaxy.

The cold front arrived around sundown bringing with it some light clouds. Curiously, they did exactly what I'd seen them do on satellite photos. That is, they parted in the west and slid around the mountains to the north and south. That was the only time I really noticed the light from Las Vegas. That big green light from one of the casinos really lit up the under side of the clouds! By the time Scorpio and Sagittarius rose around 1 AM, the clouds had moved in to block that area. It remained clear overhead all night. However, since the wind never quite died down, I didn't bother to do any piggyback photography.

Although Mid Hills is a beautiful campground, I couldn't really recommend it as an astronomy site. Hole-in-the-Wall Campground, south and at a lower elevation, might make a better site, particularly in the summer as there will be few campers out there. Since it is lower, the ridge to the north would likely hide the light dome from Las Vegas. It's more of a desert site so there are no trees, except a few Joshua Trees, to block the view. Cliffs to the west would however, limit viewing in that direction.

- **Ken Munson**

Schedule of Coming Events

<p>1 June Saturday 7:30 P.M.</p>	<p>In-Town Dark Sky Observing at Ridgecrest School</p> <p>Take Hawthorne Blvd. south across Pacific Coast Hwy.; continue up the hill past Silver Spur and turn left at Highridge. Go one mile and turn left on Whitley Collins, up one block and turn left on Northbay Rd., the new parking lot is at the end on the left. Enter parking lot and turn left, the gate is at the east end (it should be open about 15 minutes before sunset) and a paved road leading into the playground where we have traditionally set up. If at all possible, drop your equipment off and park your car in the new parking lot (less than 200 feet away). If you are absolutely certain that your vehicle does <u>not</u> drip anything you can park with your equipment. <i>Drive with care</i> to avoid steel pillars supporting basketball nets.</p>
<p>7 June Friday 7:30 P.M.</p>	<p>Monthly General Meeting: “Space Weather”</p> <p>SBAS member Ken Munson will present an industry level slide show on space weather.</p>
<p>8 June Saturday</p>	<p>Out-of-Town Dark Sky Observing – New Moon (June 10)</p> <p>We may go out to Redrock Inyokern Rd. but the location is subject to change!</p>
<p>10 June Monday 7:30 P.M.</p>	<p>Monthly Planning Meeting</p> <p>See page 3 for location and directions.</p>
<p>20 (JPL) 21 (PCC) June Thursday / Friday 7:00 P.M.</p>	<p>Theodore von Karman Lecture Series – Admission is Free!</p> <p>“Comets, Asteroids & the Interplanetary Shooting Gallery” lecture is presented at the JPL von Karman Auditorium (JPL) and the Pasadena City College Forum (PCC). For more information, call JPL at (818) 354-0112.</p>
<p>6 July Saturday Evening</p>	<p>In-Town Dark Sky Observing at Ridgecrest School –or- a new site?</p> <p>Final arrangements will be included in the July newsletter!</p>
<p>12 July Friday 7:30 P.M.</p>	<p>Monthly General Meeting:</p> <p>Speaker for the evening must confirm the scheduled date with our Program Chairman.</p>
<p>15 July Monday 7:30 P.M.</p>	<p>Monthly Planning Meeting</p> <p>Location to be scheduled.</p>
<p>18 (JPL) 19 (PCC) July Thursday / Friday 7:00 P.M.</p>	<p>Theodore von Karman Lecture Series – Admission is Free!</p> <p>“Jupiter’s Moon Io: A World of Great Volcanoes” lecture is presented at the JPL von Karman Auditorium (JPL) and the Pasadena City College Forum (PCC). For more information, call JPL at (818) 354-0112.</p>

South Bay Astronomical Society

* * * * *

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

Guest Speak: Mr. Ken Munson (SBAS / PanAmSat)

“Space Weather”

* * * * *

South Bay Astronomical Society
c/o Microcosm, Inc.
401 Coral Circle
El Segundo, CA 90245-4622