

FIRST LIGHT



Journal of the South Bay Astronomical Society – December 2007
on line at www.geocities.com/sbas_elcamino

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

Guest Speaker: Gene Rogers

“The Road not Taken...Yet”

Comet Holmes



Photos of Comet Holmes by club members (clockwise from left) Ray Grace, Ken Munson and Greg Benecke.



The November 2 Meeting

The meeting began at 7:35 with President Ken Rossi introducing newcomer Diana Newell to the membership, and then reviewing past and upcoming observing sessions. On the night of Halloween, President Rossi set up a telescope outside his home, and wouldn't give candy to any

trick-or-treaters until they had looked through the eyepiece. Ken Munson and Joe Fierstein also set up telescopes

outside that night; it's a clever way of introducing the stars to young people. Craig Gates reminded everyone of his Astronomy for City Dwellers course, and recommended it for newcomers who wish to learn about the sky.

Several observers reported seeing Comet Holmes, which will be in Perseus for the next few months and will be well-placed for observing. Greg Benecke reported on the success of Nightfall, a star party held in Borrego Springs. Greg reported that he and the hundred other amateur astronomers present had a very good time observing under dark skies. Turning to Society business, the nominated officers of the SBAS were voted into their positions for the next year, by a unanimous show of hands.

After a social break, Dr. Mike Gruntman was introduced as the evening's speaker, on the subject "The Road to Space". Dr. Gruntman has written two books on the history of rocketry and spacecraft, "Blazing the Trail" and "From Astronautics to Cosmonautics", and is currently the Professor of Astronautics at the Viterbi School of Engineering at USC. We are quite fortunate to have such expert speakers for our meetings!

The principle of rocket propulsion was discovered by Hero of Alexandria, who constructed a steam-driven device called an aeolipile. The Chinese and Indians developed rockets approximately one thousand years ago. The Indian rockets weighed up to 12 pounds and had a range of 1.5 miles. They were however highly inaccurate and unpredictable, and were used primarily as incendiary and terror weapons.

The first recorded use of rockets in European warfare was in 1379, in Italy. The British captured almost ten thousand Indian war rockets in 1799, and learned enough from them that rockets figured prominently in the War of 1812. "The rockets' red glare" was a military reality over Fort McHenry. Curiously, rockets were rarely used in the American Civil War. In 1834, the Russians had an ironclad submarine that could launch missiles from a submerged position. By the mid-19th century, artillery won out over rocketry in warfare, and rockets were used only for fireworks and the whaling industry.

Space travel, with or without rockets, had for a long time been the province of fiction writers and dreamers such as Lucian, Firdausi, Kepler, Cyrano de Bergerac, Daniel Defoe and Edgar Allan Poe. It was the story "From the Earth to the Moon" by Jules Verne that moved space travel from fantasy to future realism. In 1870, Edward Everett Hale wrote "The Brick Moon" in which a rocket was used to help determine longitude. This was the first suggestion that rocketry could have a practical and useful goal.

The four great space pioneers before World War Two were Tsiolkovsky, Esnault-Pelterie, Goddard and Oberth. Sadly, the first modern rocket was the German V-2 rocket, developed by Walter Dornberger and Wernher von Braun, with a range of 180 miles and a 2,000-pound warhead. 5,800 were made by slave labor in concentration camps, and 2,000 were fired. The US used rockets primarily as JATO (Jet-Assisted Take-Off) units for airplanes, developed at Caltech. Indeed, the Jet Propulsion Laboratory was founded in 1943-44.

After WW II, both the US and the USSR worked on ballistic missiles, although the top priority of the US at first was satellite reconnaissance, not weaponry. Indeed, the US Army's Jupiter C test launch on September 20, 1956 could have deployed a satellite into orbit, but the government specifically ordered that the launch remain merely an atmospheric test of the spacecraft's heat shield.

The launch of Sputnik on October 4, 1957 and the launch of Explorer 1 on January 31, 1958 initiated what became the "space race", which continued for many years. Since then, France, Japan, China, the United Kingdom, the European Space Agency, India and Israel (in chronological order) have entered the club of spacefarers, with Brazil likely to join soon. The next thousand years of rocketry may prove to be even more exciting.

Dr. Mike Gruntman ended by answering many questions from the 40 audience members, and the meeting ended at 10:07.

- Dr. Steven Morris



Going My Way?

Not many endeavors require that you plan the mode of transportation before you even know what it is you are transporting. But weighing the physics and economics of getting any sort of cargo to space is a major part of designing a space mission.

It's one of the first issues that NASA's New Millennium Program (NMP) considers when planning a new mission. NMP has the forward-looking job to identify promising new technologies for space exploration. It then helps to mature the technology so it will be available to space missions of the future. If the technology cannot be tested adequately on Earth, the last part of this process is to actually send the technology into space. With carefully documented test results, future mission planners can confidently incorporate the new technology into their designs.

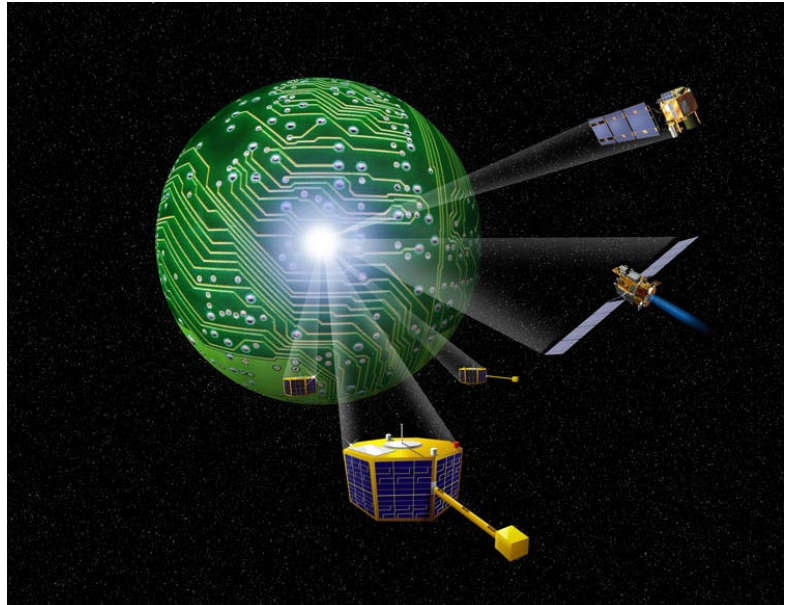
But where to begin? On call from the start, Linda Herrell is the New Millennium Program Architect. Given a list of proposed technologies, she has the job of figuring out the feasibility of wrapping a mission around them.

"We might be considering six or more technologies, anything from solar panels to imagers to masts for solar sails to more intelligent software. Of those, we may choose four. My job is to answer the question—can the selected technology be transported to and operated in space within the constraints of a low-cost technology validation project?"

Along with the list of possible mission payloads (the technologies), Linda also has a list of spacecraft to put them on, as well as a list of launch vehicle parameters. All she has to do is try them out in every possible combination (of which there are thousands) and see what might work.

"Fortunately, we have a software tool to help with this analysis," says Linda. When it comes down to it, her job is primarily to figure out how to get the technologies into space.

"Sometimes, it's like figuring out how to get across town when you don't have your own car. You have to get creative."



She keeps a database of all possible options, including riding piggyback on another spacecraft, hitching a ride on a launch vehicle as a secondary payload, or sharing a launch vehicle with other NASA, Department of Defense, or even commercial payloads.

NASA's New Millennium Program selects breakthrough technologies that will be of the greatest use to future space and Earth science missions and that are perceived to be risky to the first user.

Her assessment is but one of a gazillion factors to be considered in planning a mission, but it is indeed one of the very first "details" that forms the foundation for the rest of the mission.

Find out some of the technologies that NMP has already validated or is considering at nmp.nasa.gov/TECHNOLOGY/innovative-tech.html. Kids will enjoy watching Linda's cartoon alter-ego talk about her job at spaceplace.nasa.gov/en/kids/live.

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

New on the Space Place web site: "Solar Indigestion"

We usually take our star for granted. We forget that it's not just a big, bright, warm light bulb crossing the sky each day for our comfort and convenience. On the contrary, the Sun has a very active (if not meaningful) life of its own. And it's not always in a good mood. When the Sun is having a tantrum, or, even worse, indigestion, we are included in its "suffering." Space weather includes the effects of solar activity on Earth's environment--and us. Find out more about what happens to Earth during bouts of "solar indigestion" at <http://spaceplace.nasa.gov>

Play "New and Improved" Space Place Trivia!

Covering everything from asteroids to zodiac, the Space Place Trivia game tests your acquaintance with just about every part of the extensive NASA kids website, The Space Place. Read the term in big red letters (with

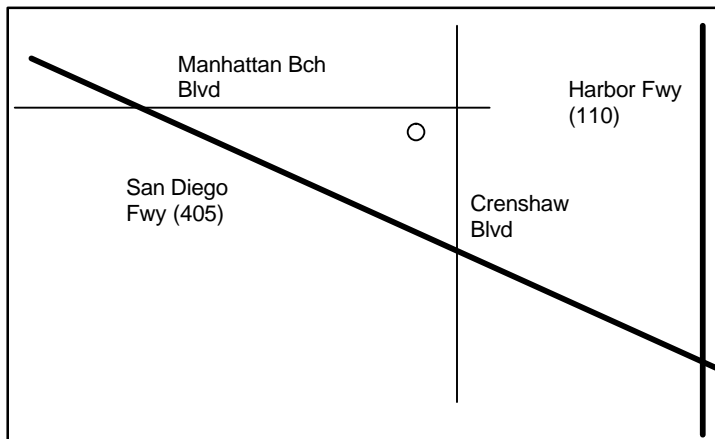
pronunciation guide), then pick the one sentence out of three in which the word makes sense (instead of nonsense). Recently updated to include newly added topics and activities on the site, the game links each term to the page or activity that explains or demonstrates it. So those "Oop-sies" can quickly be converted to "Right-o's!" Go to <http://spaceplace.nasa.gov> and click on "Games."

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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. 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 6th planning meeting will be held at 7:30 PM 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.

SBAS Membership News

Reminder: Membership dues increased in November to \$36 for email newsletter delivery and \$42 for regular mail delivery.

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, as will any suggestions for new purchases!

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!

December – Comets & Asteroids

Visible Comets:

Comet	Mag	Constellation(s)
Holmes	3.0 - ?	Perseus

Asteroid Occultations:

Local Date	Local Time	Durn	Star	Mag	Star	Planet		
D M Y	Hr Min	m/sec	mag	drop	No.	No	Name	
2-Dec-07	21 39.6	1.2s	10.3	5.3	TYC 5803-01056-1u	1084	Tamariwa	
31-Dec-07	18 59.2	2.4s	10.4	5.8	TYC 1866-00867-1u	3127	Bagration	

Planetary Occultations:

None

Check the JPL Ephemeris Generator page for coordinates of these objects at:

<http://ssd.jpl.nasa.gov/horizons.cgi#top>

Observing Reports

Ridgecrest – There was a good turnout of scopes on Saturday, November 3rd, at the Ridgecrest session. The evening showed promise of being a potentially great one with a low marine layer that was blanketing the city but left the top of Palos Verdes exposed. As the night settled in, the sky was very good and everybody was getting a good look at Comet Holmes, still bright and low in the northeast. For myself, I set up my scope with the Meade DSI for some quick photos of the comet in case I never got another opportunity. I managed to get a nice image but it just

didn't do the comet justice. Now I see that I need to get a smaller scope! I also imaged a couple of Messier Objects, M30 and M72, both globular clusters. M30 came out especially nice. By about 10:00 the conditions began to deteriorate with high clouds appearing. Most people continued to observe in those areas where the sky was still clear. I went through one of my lists of carbon stars, finding a couple of real gems. U Cygnus is a colored double with one being bright blue and a fainter red companion. V Cygnus has a deep red color to it which is a beautiful contrast to its neighbors. Like a ruby among diamonds. With the sky continuing to worsen, I decided to close up and go home.

- Ken Munson

Joshua Tree – After having gotten up at 6:00 AM to do a 15K run/walk with my daughter, Rebecca, I wasn't sure I was going to be in any condition to make a trip to the desert for dark-sky observing. I was hurting when I got to the finish line but after an hour's rest felt better and so packed up the scope and headed out. Alas, after a 3 hour drive, I got to Cottonwood Springs campground in Joshua Tree National Park only to find it was full. Apparently the campers were all rock-climbers as I didn't spot any scopes while driving around the campsites.

Frustrated, I decided to head deeper into the park hoping for a site at White Tank or Belle campgrounds. Instead, I found a parking area off the road at a trailhead about 5 or so miles north of Cottonwood. As luck would have it, although right next to the road, the curves of the road were such that the headlights of the cars didn't directly strike me except from a great distance. Turned out there wasn't a single car on that road from 9PM to 6AM anyway. The sky was very clear and amazingly transparent and the temperature rested at a balmy 50 degrees all night. It made for comfortable observing and I never even needed to put gloves on!

The first part of the evening was dedicated to more camera experimentation. I got an excellent image of Comet Holmes with my Nikon D100 DSLR. Once again, I can see that I need a smaller scope to truly show such large objects to their true glory. Still, the comet was great to finally see in all its glory in the dark desert sky, both in binoculars and the scope. For once my camera, scope and laptop were all working together very well. Unfortunately, I now realize the frustration of off-axis guiding. I lost a lot of time trying to find a decent guide-star. Many times, I had to rotate the camera assembly to locate one only to have the assembly slip while imaging because I couldn't get it tightened down properly. Even so, I got one of the deepest, longest and most beautiful images I've ever gotten of M42, the Great Nebula of Orion.

From midnight on, the night was dedicated to visual observing. After some more looks at the comet and a few of the well-known Messier Objects overhead, I decided to look for some rather more obscure objects. Among the things seen overhead were Abell 262, a galaxy cluster in Andromeda. Although faint, at about 13th magnitude, I was able to count 3 tiny fuzzy galaxies. Another faint object was Quasar 13747 in Gemini. Not too remarkable in itself but interesting to note that it's a very distant, very active galaxy.

After that I concentrated on an area I hadn't really explored very much; the low southern sky. The sky conditions were really good which allowed me to see some very small and faint objects even as they dipped lower into the light dome of LA. I spent a long time searching through Puppis and Columba. One of the more challenging objects here was PK 254+5.1, also known as the Medusa Nebula. I wasn't sure I'd found it until switching to the 12mm Nagler which showed a faint, tiny, oddly-shaped gray object. NGC 2440 is a small planetary nebula in Puppis. It seemed much brighter than its listed 10.8 magnitude. Perhaps there's a variable star at the center? NGC 1851 is a small but amazingly bright globular cluster in Columba. Being very low on the horizon, I could only resolve the outermost edge of stars. The core was extremely bright. NGC 1808 and 1792 were a pair of faint galaxies in Columba that appeared to be nearly edge on spirals. It was just amazing to me that the sky conditions were so good as to permit such clear observations as such low elevations.

I finished the night's observing by swinging up to Mars and Saturn, now both high in the sky. For once, Mars was more than just a watery blob! I got my best view of Mars since 2003. With patience I could make out some significant surface detail, one of which I thought resembled something I'd seen one good night back in 2003. Later research showed I was correct and I had once again seen Solis Lacus. I'd used my orange filter to cut down the glare and increase the contrast. Saturn was magnificent, showing some cloud bands and the rings, now getting close to being edge-on. Curiously, it seemed a bit misshapen on the top side. It made me wonder if the angle of the sun on Saturn was casting the ring shadow across the polar region giving it this slightly odd shape.

After such a highly successful night, it was at last time to take a rest before the long trip back home.

- Ken Munson

Cottonwood Springs - I got a later start than anticipated so sunset was quickly approaching when I arrived at Cottonwood Spring. The campground was full so Craig Gates and I set up at the parking lot for the springs themselves further up the road from the campground. Unfortunately Ken Munson did not know about this alternative and set up elsewhere in the park.

After drift aligning I decided to try photographing Comet Holmes 17P. First I shot prime focus with the Megrez 90, but decided that the image would be better larger, so I inserted my 2X Powermate. The image scale was just about perfect with an effective focal length of 1200 mm.

Next I started to set up for a sequence of NGC1499 (California Nebula). Just as I started my first exposure, Craig noticed something strange in Orion. It was a diffuse object to the naked eye. Training the 15 inch Dob on it showed that it looked like a V shaped comet tail with an adjacent diffuse blob. I immediately stopped the photos I was taking and attempted to photograph the object. Unfortunately I had to remove the camera and inset an eyepiece to find it and lost focus on the camera. By the time I reinserted the camera and was back in focus the object seemed to be gone. Then I looked in the Dob, which had not been moved and found it was still in the field. Whatever this was it was geostationary! Further observation showed something glinting brightly at an irregular rate as if something was tumbling. We were able to observe the V expand and diffuse for the better part of an hour. Finally it dissipated and the tumbling object could no longer be observed. I was never able to locate it in the camera again. I wish I had been able to get a photo of it. After reporting the experience to Steve Lindsey, he came up with an explanation on SpaceWeather.com. It was a fuel dump of a Delta-4 Rocket that was launched earlier that evening. If you go to the SpaceWeather.com archive for Nov. 12, 2007, there are links to photos taken by other amateurs.

After that I decided not to go back to the California but to go for the Rosetta Nebula instead. I was able to get a few winks while the computer ran the exposure sequence and the autoguider kept thing tracking nicely. Boy, it is nice to have all this technology. Soon it was twilight and time to pack up.

- Greg Benecke

Scientists Determine Origin of Cosmic Rays

UPI 8 Nov 2007 - An international group of scientists announced the still-under-construction Auger Cosmic Ray Observatory in Argentina has found the origin of cosmic rays.

The Auger collaboration of scientists said the initial finding of the observatory involves the tracing of high-energy cosmic rays that continually pelt the Earth to the cores of nearby galaxies, which emit prodigious quantities of energy.

This is a fundamental discovery, said Nobel laureate James Cronin, a professor emeritus in physics at the University of Chicago. "The age of cosmic-ray astronomy has arrived. In the next few years, our data will permit us to identify the exact sources of these cosmic rays and how they accelerate these particles.

We have taken a big step forward in solving the mystery of the nature and origin of the highest-energy cosmic rays, he added.

The observatory consists of an array of detectors that cover 1,200 square miles of the Pampa Amarilla, a vast plain in western Argentina. The array -- now 90 percent operational -- consists of 1,600 detectors spaced at one-mile intervals.

The Auger collaboration, including 370 scientists and engineers from 17 nations, announced the discovery in the Friday issue of the journal Science.

Why Progress Takes Forever

'Tis the season, for science professors to softly weep as they grade the final exams of their students, and see the knowledge of astronomy so carefully taught come back to them, fractured beyond recognition. Here are some of the answers that I have collected over the years; you can almost hear the synapses snapping, as students struggle to recall what they have heard:

- Ptolemy believed the Earth was the center of the other planets.
- The Romans traveled through Europe, spreading the Pox Romana.
- Tycho Brahe (from whom we get the derivative "Tychoon")...
- Planets move in an elliptical orbit within the Sun.
- A light-year occurs when the Sun rotates fast around the Earth.
- Galileo was the first one to use a microscope up in the sky.
- Galileo saw sunspots on the Moon.
- Mercury's atmosphere has a lot of craters.
- The Sun's core has 4 hydrogen atoms and 1 helium atom.
- The Sun has 99.9% the mass of the entire Universe.
- Heat moves out from the core of the Sun, by the power of convection.
- The Earth is an average main-sequence star.
- Newton discovered gravity by dropping something.
- Spring tides occur during the first and last quarter of the new moon.
- An object in motion will remain at rest, until some force is applied to it.
- For every direction, there is an equal and opposite direction.
- Speed is movement with no direction.
- Speed measures speed.
- Scientists use the scientific method to seek answers to questions they do not know.
- There are 92 atoms in the Earth.
- Heat cannot be transferred from one object to another.
- Plants take chlorophyll from the Sun.
- The greenhouse effect is like a greenhouse effect inside a greenhouse.
- Temperature is the measure between two objects in heat.
- When simple harmonic motion is graphed it is in the graph of sin.
- When seen through a telescope Brownian motion looks small and brown.
- Brownian motion is seen as floating crystals in water. The crystals are seen as rapidly jiggling.

-Dr. Steven Morris

Schedule of Coming Events

1 December Saturday Night	<p>In Town Dark Sky Observing Session at Ridgecrest Middle School– 28915 Northbay Rd. RPV, Weather Permitting: Please contact Greg Benecke to confirm that the gate will be opened!</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 (3rd stop sign from Hawthorne Blvd.), 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 not drip anything you can park with your equipment. Drive with care to avoid steel pillars supporting basketball nets. Note: If you a visitor, not bringing a scope, it is requested that you park in the small parking lot on Northbay Rd.</p>
6 December Thursday Evening	<p>Von Kármán Auditorium (Thursday) & Vosloh Forum at Pasadena City College (Friday)</p> <p>“CHICOS: Detecting Ultra High Energy Cosmic Rays” by Dr. Robert McKeown. The California High School Cosmic Ray Observatory (CHICOS) project is a research array for the detection of ultra-high-energy cosmic rays — single subatomic particles that slam into Earth’s atmosphere with the energy of a brick falling from a rooftop. The particles produce huge showers of secondary particles when they collide with atomic nuclei in the upper atmosphere. In the CHICOS project, schools across the Los Angeles area provide a network of detector sites and a valuable population of participating teachers and students.</p>
7 December Friday Night 7:30 PM	<p>Monthly General Meeting</p> <p>Speaker: Gene Rogers</p> <p>Topic: The Road Not Taken...Yet</p>
8 December Saturday	<p>Out-of-Town Dark Sky Observing Session</p> <p>Contact Greg Benecke to coordinate a location.</p>
10 December 7:30 PM Monday	<p>Monthly Planning Meeting</p> <p>Location: See Page 4.</p>
29 December Saturday Night	<p>In Town Dark Sky Observing Session at Ridgecrest Middle School</p> <p>See directions above.</p>
4 January Friday Night	<p>Monthly General Meeting</p> <p>Speaker: TBA</p> <p>Topic: TBA</p>
5 January Saturday	<p>Out-of-Town Dark Sky Observing Session</p> <p>Contact Greg Benecke to coordinate a location.</p>

South Bay Astronomical Society

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

Guest Speaker: Gene Rogers

“The Road Not Taken...Yet”

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**South Bay Astronomical Society
P.O. Box 1937
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