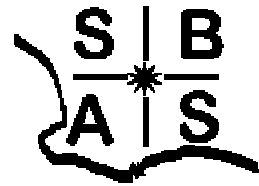


# **FIRST LIGHT**



*Journal of the South Bay Astronomical Society – November 2007*  
on line at [www.geocities.com/sbas\\_elcamino](http://www.geocities.com/sbas_elcamino)

**Monthly General Meeting: Friday, November 2<sup>nd</sup>, 7:30 PM**

**Guest Speaker: Dr. Mike Gruntman**

**“The Road to Space”**

***The Mother of All Local Star Parties!***



*SBAS @ El Segundo 10 | 20 | 07*

Thanks to the efforts of Elliot Silverstein SBAS was invited to provide a star party for the City of El Segundo on Sat Oct 20. And what a party it was! The crowd was estimated to be between 200 and 300 people due to the wide advertising provided by the city. The venue was unique being on the roof of a parking garage in Hilltop Park on Grand Ave in E.S. This put us above the street lights. The lights in the parking lot were turned off as well which also helped the viewing. At first I didn't know what the loud noise was that I kept hearing. Then I realized that we were less than a mile from LAX and could see the planes taking off and landing. Now I know why the local residents protested the expansion of the airport. Despite this distraction it was a clear night and although the winds came up later in the evening we managed to capture a number of interesting objects for everyone to view. The two "stars" of

the evening were the moon and Jupiter, but the Andromeda Galaxy, Ring Nebulae, Alberio and other deep sky objects were also on display. SBAS did us all proud by turning out in force. By my count there were at least 15 members that participated. Among them Mike Harrison showed his recently completed 6 in Dob, Elliott Silverstein with a newly acquired 3.5in Questar - a gem of an instrument, and Lisa & Derek Lilly with their 16 in Hummer mounted scope and TV display. We also had support from the LA Astronomers and Sidewalk Astronomers. During the evening we were visited by the mayor of E.S. Kelly Mc Dowell who is also an amateur astronomer, and some of his staff from the Parks and Rec. Dept. Thanks to every one who helped make this a fun and enjoyable evening. I wouldn't be surprised if we were invited back.

- Joe Fierstein

## ***The October 5 Meeting***

President Ken Rossi opened the meeting at 7:40 by welcoming our newest member, Tom Bash. The SBAS will be holding a star party on October 20 in the city of El Segundo, and the city is advertising this event widely. A large turnout is expected, and volunteers were encouraged to bring telescopes.

President Rossi then asked for approval of a membership rate increase, to \$36 for a one-year membership with First Light obtained online, and \$42 for members who wish to continue receiving our monthly newsletter through the mail. Bill Eisele proposed that this motion be accepted, Walter Pruitt seconded the motion and it passed with much more than the two-thirds vote required by our constitution. **The increase goes into effect for membership renewals beginning November 1<sup>st</sup>.**

Ken Munson is on the advisory committee for the 'Stars 4 Kids' program, which brings schoolchildren to Los Angeles Harbor College on Fridays for planetarium shows. If anyone wishes to help out, please contact Mr. Munson. A visitor asked if anyone could identify a few rocks in his possession that might be meteorites, and President Rossi promised to help him contact experts who would be able to help. Walter Pruitt reported on his recent trip to Mt. Pinos, and the excellent view he had of many Messier objects.

After a ten-minute social break, President Rossi introduced John Hoot, who delivered a lecture on "Recent Discoveries About Minor Planets". Asteroids are no longer considered the 'vermin of the sky', and this last decade has seen a remarkable growth in the number of known asteroids, and information about them. Affordable CCD cameras and personal computers in the 1990's created a tremendous increase in the discovery rate, up to 10,000 discoveries per year. There are now 325,000 asteroids now known to exist in our Solar System, many discovered by amateur astronomers.

With such huge numbers, statistical analyses can be used to understand their formation and history. For example, a graph of the orbital inclination vs. the semi-major axis shows several discrete families of asteroids. The far-distant objects in the Kuiper Belt are also becoming better-studied. Spacecraft have imaged such asteroids as Eros, Gaspra, Ida and Borreley in the last ten years, and radar observations have also determined the shape of many asteroids.

Indeed, one of the most productive collaborations between professional and amateur astronomers has been between radar astronomers and careful amateur photometrists who have obtained high-quality light curves over many months. These variations of brightness over time can be inverted to model the shape of the asteroid unambiguously, when combined with the radar information.

Spacecraft have done more than just pass by a few asteroids to photograph them. The DAWN spacecraft was launched on September 27 from Cape Canaveral, and will orbit the asteroids Vesta and Ceres, using ion propulsion. The spacecraft Stardust collected particles of a comet and returned them to Earth. Finally, the comet Tempel 1 was visited by the Deep Impact spacecraft on July 4, 2005 and a copper projectile was sent crashing into its nucleus. The resulting spectrum is still being analyzed by scientists to determine the comet's chemical composition.

President Rossi thanked the speaker, who answered a few questions from the 45 people in attendance. The meeting then ended at 9:42.

- Dr. Steven Morris

## ***Telescopes in Education***

Our very own Matthew Ota, who set up the SBASTRO group on Yahoo, has been selected as the new telescope

operator and scheduler for a 14-inch telescope located at Los Campanis Observatory in Chile for the Telescopes in Education Foundation. As the telescope operator he will be responsible for protecting the equipment. That is the prime responsibility of any professional telescope operator. In addition he will be responsible for opening the roll-off roof, focusing and setting up the telescope for remote operation by clients.

In order to determine if the weather is acceptable for observing, Matthew uses an internet link to a weather station located at the observatory. This weather station is utilized by all clients that use the Las Campanis Observatory telescopes, and is funded and operated by the Carnegie Institute of Washington D.C. The Las Campanis Observatory is managed by the Carnegie Observatories, whose headquarters are on Santa Barbara Street in Pasadena, California.

The scope comes equipped with CCD cameras. Remote users can log onto the site and collect images of whatever celestial target they wish. Images will be automatically downloaded to their browser. As the name of the foundation implies, this telescope and internet link is dedicated for the use of teachers and schools to provide K-14 grade educators and students the opportunity to remotely operate an astronomical telescope in the same manner that professional astronomers operate modern telescopes at major observatories. This allows the students to learn how modern astronomical research is performed.

Of course, the schools will need to provide some resources. These will consist of a high-speed internet connection and a web browser (Internet Explorer, Netscape, etc.) and an interest in teaching science and astronomy. The SOTIE telescope will be available for use at no cost to the client. The SOTIE telescope is reserved by scheduling, and is available only to accredited educators and their students. The SOTIE program will resume operations on or about January 2008 when funding will be available.

## ***History of The Telescopes In Education Foundation***

The mission of the TIE foundation is to provide K-14 grade educators and students the opportunity to remotely operate an astronomical telescope in the same manner that professional astronomers operate modern telescopes at major observatories. This allows the students to learn how modern astronomical research is performed.

TIE was founded in 1993 by Gil Clark, a US Navy veteran and the director of the JPL Table Mountain Observatory. Gil Clark, along with Mount Wilson Observatory Director Dr. Robert Jastrow, found a dismantled 24 inch telescope in storage in the basement of the 200 inch telescope dome at Palomar Observatory.

The 24 inch Cassegrain telescope was designed in 1963 by Jim Westphal and Bruce Rule of Caltech for the Apollo space program. Completed in Caltech workshops in 1964, it was installed on White Mountain in the Sierra Nevada Range where it was used by Westphal and Bruce Murray of JPL in infrared studies of the Moon's surface. Having successfully determined that the surface of the Moon would support the landing of the Apollo Lunar Module and subsequent astronaut moonwalks, the telescope was moved to the Mount Wilson Observatory where it was used for two decades by Caltech graduates.

Other major projects carried out with the telescope include the first infrared study of a comet and the first mapping of the center of our Milky Way galaxy. The 24 inch telescope has also been used to determine the rotational periods of a number of asteroids.

In 1988 the telescope was dismantled and stored in the Hale telescope dome at Palomar Mountain. In 1993 Dr. Jastrow acquired the telescope from Caltech for the TIE Project.

With the reinstallation of the telescope on Mount Wilson, Gil Clark's dream of the Telescopes in Education Project became a reality. The 24 inch telescope was refurbished and fitted with a Newtonian focus cage, and an advanced computer controlled drive mechanism was installed. The telescope and its new auxiliary equipment, including the CCD camera system, were placed into service and students immediately started using the system.

The 24" telescope was completely computer controlled and was operated remotely through the use of computer and a high speed internet link. Remote Astronomy Software from Software Bisque, Golden, Colorado, was used to bring control of the TIE telescope into the classroom. One component of this software, "TheSky," also allowed teachers and students to prepare an observing schedule based on the date and time of the scheduled observation.

A team of volunteer operators was recruited to operate the telescope at the dome, located just down the road to the monastery at Mount Wilson Observatory. Located next to a commemorative plaque at the site of the Michaelson

experiment to measure the speed of light, the dome provided a base of operations for the TIE 24 inch Cole telescope for the next eleven years. The volunteer operators came from the ranks of amateur astronomers in the greater Los Angeles area, ranging from professional actors and script writers to a print shop worker and a sign designer. All shared a passion for astronomy and science education. Working in the wee hours of the night, the operators kept busy focusing the telescope, setting up the camera and rotating the dome after telescope control was handed over to the clients.

In 2002, an additional facility was put into operation at the Mount Wilson Observatory by utilizing an abandoned roll-off roof observatory, located next to the Berkley Infrared Spatial Interferometer trailer telescopes. Software Bisque donated their first prototype Paramount Robotic German Equatorial Mount, Celestron donated a 14 inch Schmidt Cassegrain Optical Tube Assembly, and an Apogee CCD camera was installed. This telescope operated through 2004 and offered clients the opportunity to use a completely unmanned observatory. In theory, no human telescope operator was required on site to operate the system.

In September 1999, an investigative team visited Chile to begin a formal collaboration to begin the process of setting up a telescope aimed at the southern skies. The observatories of the Carnegie Institution of Washington and NASA Ames agreed to establish the Southern TIE effort at Las Campanis Observatory. NASA signed a memorandum with the Carnegie Institution of Washington to formalize the project. In 2003 funding was acquired from NASA's Learning Technology Project at Ames Research Center. A Software Bisque Paramount robotic mount with a 14 inch telescope was set up in an abandoned and reconditioned roll-off roof observatory.

In addition a partnership with the Queensland University of Technology opened up opportunities with an additional remote controlled 14 inch telescope located in Australia. As of this date this is still a project in development.

In July of 2004 TIE operations at Mount Wilson Observatory came to an end due to funding difficulties. The 24 inch was put into storage again, this time on a trailer next to the 10 inch Hooker telescope dome. Gil Clark moved the foundation's headquarters to the Arizona Sky Village. The SOTIE program continued on a limited budget. In 2006, after negotiations, the custody of the dismantled 24 inch telescope was formally turned over from CalTech to the TIE foundation. This enabled Meinte Veldhuis and Larry Westrum to transfer the telescope cross county to a new location, the Little Thompson Observatory in Berthoud, Colorado. The 24 inch telescope is now on long-term loan to the Little Thompson Observatory, a non profit educational foundation. Current plans are to operate the telescope both locally and remotely through the internet, allowing educators and students the opportunity to once again use a research-grade telescope for their astronomy studies.

In January 2008 operations of the SOTIE telescope in Chile will resume with funding secured through the Ahmanson Foundation. With remote telescope operations based at Arizona Sky Village, Italy and Gardena, California, the TIE project will continue to schedule observing sessions with schools located around the world. Teachers and students will be able to operate the telescope and download images from it's Apogee CCD camera directly through their internet browser.

## ***SBAS Executive Board***

<b>President</b>	Ken Rossi	515-1586	<a href="mailto:ken_a_rossi@yahoo.com">ken_a_rossi@yahoo.com</a>
<b>Vice-President</b>	Greg Benecke	217-1512	<a href="mailto:beneckerus@aol.com">beneckerus@aol.com</a>
<b>Secretary</b>	Steve Pedersen	378-6479	<a href="mailto:epsonstlyusc82@earthlink.net">epsonstlyusc82@earthlink.net</a>
<b>Treasurer &amp; Astronomical League Rep.</b>	Arnie Stodolsky	937-0220	<a href="mailto:astodols@ix.netcom.com">astodols@ix.netcom.com</a>

## ***SBAS Committees***

<b>Program Chairman</b>	Greg Benecke	217-1512	<a href="mailto:beneckerus@aol.com">beneckerus@aol.com</a>
<b>Astronomical League Liaison</b>	Bill Eisele	542-5070	<a href="mailto:Astronomy131@msn.com">Astronomy131@msn.com</a>
<b>Newsletter Reproduction</b>	John Collins	- - -	<a href="mailto:westcoast@runbox.com">westcoast@runbox.com</a>
<b>Publications Committee:</b>			
<b>SBAS Website Webmaster</b>	Alex Athas	- - -	<a href="mailto:sbas_elcamino@yahoo.com">sbas_elcamino@yahoo.com</a>
<b>First Light Editor</b>	Ken Munson	782-0873	<a href="mailto:kenmunson333@sbcglobal.net">kenmunson333@sbcglobal.net</a>
<b>Observing Committee</b>	Greg Benecke	217-1512	<a href="mailto:BeneckeRUs@aol.com">BeneckeRUs@aol.com</a>
	Craig Gates	376-6387	- - -

**Membership Committee**

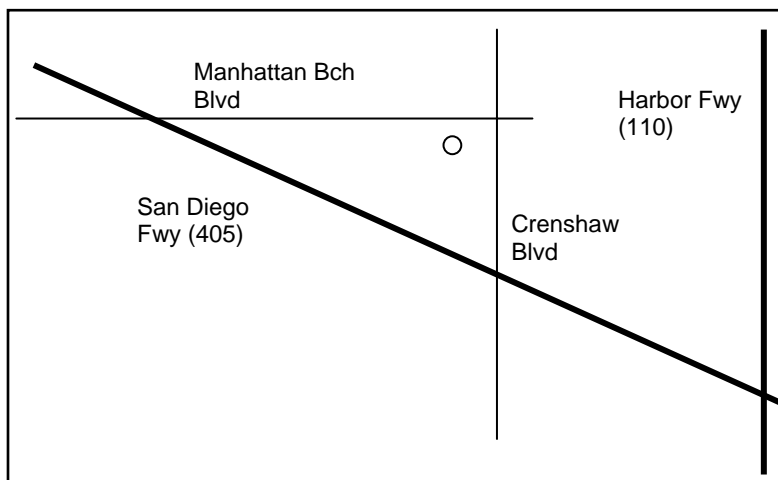
**Publicity Committee**

**Property Committee**

**Outreach Committee**

Ray Grace 370-1913  
Joe Fierstein 377-9834  
Arnie Stodolsky 937-0220  
Arnie Stodolsky 937-0220  
Joe Fierstein 377-9834

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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 November 5<sup>th</sup> planning meeting will be held at 7:30 PM at the home of Greg Benecke. From Crenshaw Blvd., head West on 182nd St. Shortly after going under the 405 overpass you will see a Fire Station on the right. Turn right into the cul-de-sac just after the Fire Station. From Prairie Ave., head East on 182nd St. Go one block past the second traffic light (Yukon Ave.) and make a left into the cul-de-sac just before the Fire Station. You are making the correct turn if you see a sign saying "Park Place" on the white fence on the Northwest corner next to the Fire Station. Greg's house is the first one on the left side of the cul-de-sac 18161 Patronella Ave., Torrance.

## **SBAS Membership News**

Welcome new member Stamford Hill of Manhattan Beach.

**Reminder: Membership dues increase 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!

### **November – Comets & Asteroids**

**Visible Comets:**

Comet	Mag	Constellation(s)
8P/Tuttle	13.0 – 10.3	UMi-Dra-Cep

**Asteroid Occultations:**

Event Summary for Torrance

Local Date	Dur	Star	Mag	Star	Planet	Alt	R.A.	Dec.				
Hr	Min	m/sec	mag	drop	No.	Name	h	m	s	o	'	"
18	59	4.9s	10.7	2.6	TYC 5660-00308-1u	130 Elektra	17	39	28.325	-8	56	36.16
2	12	12.4s	9.3	5.6	2UCAC 34626175	903 Nealley	6	59	54.345	8	24	28.47
21	40	1.2s	10.3	5.3	TYC 5803-01056-1u	1084 Tamariwa	22	16	2.233	-9	53	14.45

**Planetary Occultations:**

Check the JPL Ephemeris Generator page for coordinates of these objects at: <http://ssd.jpl.nasa.gov/horizons.cgi#top>

## **Tulita Elementary School Solar Day**



On Thursday October 18th SBAS members Matthew Ota, Ken Lehmer, Jacques Linder and Arnie Stodolsky attended Solar Day at Tulita Elementary School in Redondo Beach. Matt made a presentation to 60 Fifth Graders on the Solar System. Following the presentation the students observed the Sun through telescopes brought by the Club members. Ken Lehmer showed Venus in his scope to the students. As school let out an additional 100 or so students and their parents were able to view the Sun and Venus.

### **Observing Reports**

**Inyokern Road** - Due to other obligations on the regular out-of-town session, I made the trip out to the Inyokern Road site on the weekend of October 6<sup>th</sup>. It was predicted to be clear skies but not the best seeing. As it turned out, the prediction was reasonably accurate for a change. It was not a night for using high magnification on much of anything. Still, wide-angle, low power views were really great. The transparency was excellent and afforded some really good views of large star clusters and nebulae. The nighttime temperature stabilized at a balmy 42 degrees by about 10 PM.

During the course of the night I was able to observe all the planets, starting with Mercury and Jupiter in the early evening. Mercury was a bright, watery speck in the bright glow of the sunset. Jupiter was a bigger watery blob, still high in the sky. Although, Uranus and Neptune were clearly disks, I couldn't make out any moons. The planet survey was completed just before dawn when Venus and Saturn, as well as the Moon, all rose into view. Venus and Saturn made a nice equilateral triangle with Regulus.

Early in the evening, I spent some time working with my camera setup trying to re-discover the settings I'd used a couple of years ago when I first achieved some good astrophotos. This was complicated a bit when I found my USB cable missing from the camera bag! Eventually, that turned out to be a good thing. At last, I do seem to have discovered the right settings again, achieving a moderately good image of M2. It seems that the camera takes far better pictures when not connected to the laptop. The camera control software from Nikon seems to reduce its functionality somehow. I also have noticed a consistent drop in performance of the DSI after about 4 hours of use. After that time, the image from the DSI just seems to turn to noise and I couldn't get it to recognize, much less guide, on any stars. Even switching it to a prime-focus imager resulted in nothing but noise.

During this time, while the scope, camera and computer were all engaged in lively conversation and completely ignoring me, I scanned the sky with binoculars. At about 11:03 PM an extremely bright meteor flashed across the constellation Auriga, going southwest to northeast. It was like a bright welding torch in the dark sky and lit up the desert floor like a lightning bolt! Throughout the night there were several more very bright meteors with no consistent direction.

I had planned to spend the night doing mostly visual astronomy so didn't mind the fussiness of the DSI. For a while, I went off the beaten path, looking up some objects from the Arp List of Peculiar Galaxies. I was hunting down spirals with companions. Arp 41 and 77, in Eridanus were easy to spot but their companies were very difficult. As Sirius and Canis Major rose high, I spent a lot of time there, shuffling through the various star clusters and Galaxies. In spite of the wavy sky, the view of large star clusters in this area was magnificent. M46, M47, M41 were awesome to see with such a dark background. Among the more obscure ones was NGC 2335 which is notable for having a band of dark nebular passing below it. Turns out this cluster is part of the very large Seagull Nebula (IC 2177). M1 in Taurus shown so brightly I didn't need any filter at all. Even the Eskimo Nebula (NGC 2392) showed brightly with moderate detail without a filter. I also took a look at NGC 2419, aka the Intergalactic Wanderer. This globular cluster is the most distant one associated with our galaxy, lying at a distance of approximately 300,000 light-years.

As a final target of the night, I was able to see Comet 2007 F1 as it rose in the pre-dawn northeastern sky. It is at about magnitude 7 now but I couldn't see a noticeable tail. I had placed the scope on it, even though it was below the horizon, and went to take a nap for an hour. Sure enough, it was right where it was predicted to be when I got up. I never did see it with the binoculars, though.

Having had a very satisfying night under the stars, I packed up and headed for home.

- **Ken Munson**

**Nightfall** - I decided to give Nightfall a try this year. It was an opportunity to have my wife join my on an astronomical outing to a dark site. We reserved a room for Friday through Sunday nights, which was one day out of sync with the Nightfall schedule that started on Thursday. The Palm Canyon Resort is a nice facility with spacious hotel rooms and RV spaces with full hookups. There were two group areas for astronomers to set up scopes without being able to have your vehicle right there. Or you could rent an RV space for an extra fee. Dan Trimble had arrived Thursday night and obtained an RV slot. These are pull through slots long enough for a class A rig pulling a trailer, so there was plenty of room for Dan's, Steve Lindsey's, and my car, all our



**M33 by Greg Benecke**

imaging rigs and my 15 inch Dob.

The seeing Friday night was not very good and it was a bit windy but we all set out to do some imaging. I took the time to do a careful drift alignment. By the time I was finished with this I only had time to capture two image sequences, IC1805 and the Veil Nebula along with dark frames.

Saturday night the seeing was as least up to average, which was much better than the night before. It was nice not to have to do a drift alignment and just move right to getting the imaging going once it was dark. I was able to image X77, IC1499, and IC1848. I would have gotten in one more but I somehow captured nearly two hours of exposures of X77 as JPEGs instead of RAW format and had to start the sequence over again for another two hours.

At one point we were able to walk over to where the Televue representative, John Rhoads, was demonstrating the Ethos eyepiece. The 100 degree apparent field is quite amazing. And I thought the Nagler's required you to move your head around to take in the whole field! The stars were pinpoint across the amazing field. But what do you expect for over \$600 for a 13mm eyepiece? I talked to John about speaking to the club sometime about Televue products. It just so happens that he lives in Torrance and his daughter goes to El Camino, though she is not studying astronomy.

Nightfall was officially over Sunday morning, but I found there were a few other astronomers sticking around for Sunday night and the management of the Palm Canyon Resort planned to leave the red lights in throughout the facility. Steve and Dan were gone so I was alone much of the night in the RV slot, but it I was a nice night with average or better seeing. I failed at getting an image of IC432 but had better luck with IC5068 and M33. In between setting up exposures on all three night I was able to spend some time at the Dob as well.

All in all it was a very enjoyable weekend. There is definitely something to be said about being able to cover up the scope and put the camera and eyepieces in the car and crawling into bed without a long drive. Now the challenge is to process the images to best take advantage of the data collected.

- **Greg Benecke**

## Schedule of Coming Events

<p><b>2 November Friday Night 7:30 PM</b></p>	<p><b>Monthly General Meeting</b> Speaker: Gene Rogers Topic: TBA</p>
<p><b>3 November</b></p>	<p><b>Taurid Meteor Shower Peak</b></p>
<p><b>3 November Saturday Night</b></p>	<p><b>In Town Dark Sky Observing Session at Ridgecrest Middle School</b>– 28915 NorthBay Rd. RPV, Weather Permitting: Please contact Greg Benecke to confirm that the gate will be opened! 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. <b>Note: If you a visitor, not bringing a scope, it is requested that you park in the small parking lot on Northbay Rd.</b></p>
<p><b>5 November 7:30 PM</b></p>	<p><b>Monthly Planning Meeting</b> Location: See Page 4.</p>
<p><b>10 November Saturday Evening</b></p>	<p><b>Out of Town Dark Sky Observing Session</b> Contact Greg Benecke to coordinate a location.</p>
<p><b>15 November Thursday Evening</b></p>	<p><b>Von Kármán Auditorium (Thursday) &amp; Vosloh Forum at Pasadena City College (Friday)</b> “The Hidden Ocean of Europa” by Dr. Robert Pappalardo. Jupiter's moon Europa may be a habitable world. Evidence points strongly to a global subsurface ocean beneath an ice shell. The paucity of large craters argues for a surface age of only 60 million years, implying that Europa is still geologically active.</p>
<p><b>17 November</b></p>	<p><b>Leonid Meteor Shower Peak</b></p>
<p><b>29 November Thursday Evening</b></p>	<p><b>Star Party at Whaley Middle School (tentative)</b> 14401 South Gibson Ave. From the 710, exit at Rosecrans, head west. Turn left at Gibson and go one block to the school.</p>
<p><b>1 December Saturday Night</b></p>	<p><b>In Town Dark Sky Observing Session at Ridgecrest Middle School</b>– 28915 NorthBay Rd. RPV, Weather Permitting: Please contact Greg Benecke to confirm that the gate will be opened! See directions above.</p>
<p><b>7 December Friday Night 7:30 PM</b></p>	<p><b>Monthly General Meeting</b> Speaker: TBA Topic: TBA</p>
<p><b>10 December Monday Night 7:30 PM</b></p>	<p><b>Monthly Planning Meeting</b> Location: TBA.</p>

# South Bay Astronomical Society

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*General Meeting at El Camino College Planetarium:  
Friday, November 2<sup>nd</sup>, at 7:30 P.M.*

*Guest Speaker: Dr. Mike Gruntman*

**“The Road to Space”**

\* \* \* \* \*

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