FIRST LIGHT

*Journal of the South Bay Astronomical Society – May 2006*
**on line at www.geocities.com/sbas_elcamino**

## Monthly General Meeting: Friday, May, 5th, 7:30 PM

### Guest Speaker: Glen Rosenthal

## *"Ionospheric Research in the Northern Latitudes"*

# *The April 7th Meeting*

President Ken Rossi opened the meeting at 7:36 by pointing out that name tags were available at the front door, and that by wearing them, we might become better acquainted with our fellow club members. Several newcomers introduced themselves, and Ken went over some of the upcoming events. Fifteen video tapes of an astronomy course have been donated to the club, and are available to members. The 12-inch equatorial telescope that was donated to the club is being refurbished, and volunteers to help would be welcome. Ron Rennie described his recent visit to Africa to see the total solar eclipse nine days earlier, as did David Pierce.

Ken then announced a 10-minute break to allow the members to chat among themselves. This innovation is being introduced to help the club members get to know each other better. David Pierce then introduced the evening¹s speaker, Dr. David W. Dunham of the International Occultation Timing Association, or IOTA.

Dr. Dunham first observed a close approach of a star to the Moon¹s limb in 1957, which sparked his life-long interest in lunar occultations. In the early 1960¹s, he wrote the first computer program (in FORTRAN) to predict the path of grazing occultations across the Earth¹s surface, and he organized the first expeditions to accurately time the disappearances and reappearances of the occulted star during these events. He went on to help found IOTA in 1975, which helps to predict, observe and analyze occultations of the stars by the Moon, planets and asteroids.

Lunar occultations have been used to discover very close double stars, measure some stellar angular diameters, and help map the profile of the lunar limb with great accuracy. Dr. Dunham showed several videos of lunar occultations, including the grazing occultation of Aldebaran in April of 1990, as the star flashed in and out of view as it passed behind mountains and shone through valleys. Visual timings remain a popular technique with amateur astronomers, but many now arm themselves with video equipment, high speed photometers or CCD¹s to improve their accuracy. The video camera of choice is currently the PC164C, available for $130, but new brands are constantly appearing.

The first known observation of an asteroid occultation occurred in India in 1961, and for many years occultations were difficult to predict accurately because of the small size of asteroids. The situation improved in 1997 with the release of the Hipparcos dataset, and the size and shapes of several asteroids are now accurately known thanks to teams of observers who scatter across the countryside, each accurately measuring the part of the asteroid¹s shadow that sweeps over them. Dr. Dunham showed the profiles of several asteroids, and some video clips of their occultations.

The most unusual high-speed phenomenon that IOTA has monitored was the set of lunar impacts observed during the Leonid meteor shower of 1999, when several widely-separated observers saw the same flashes of light on the dark side of the Moon. The lecture ended with a video of Bailey¹s beads that Dr. Dunham took during the March 29 solar eclipse. On that high note, the meeting ended at 10:01.

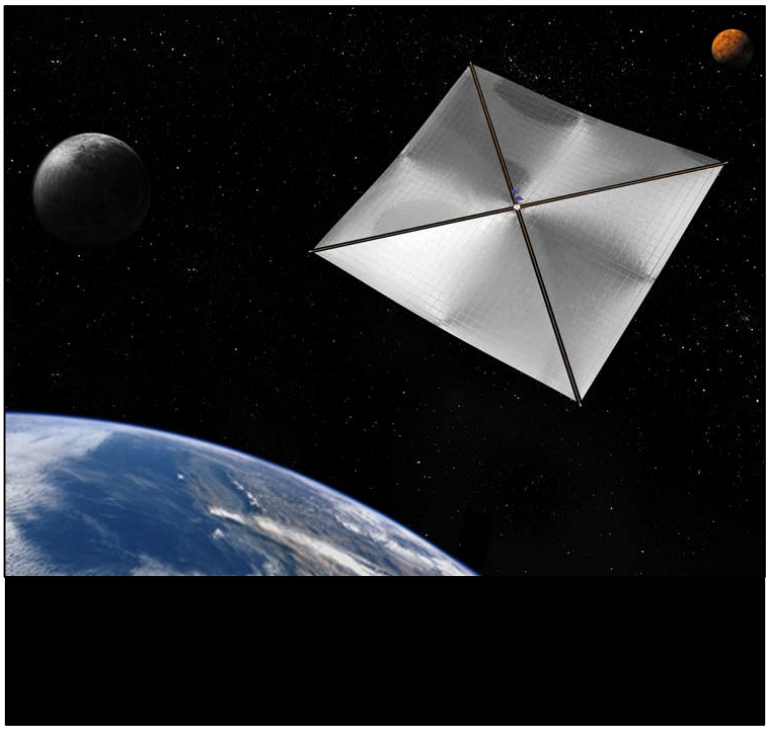
***- Dr. Steven Morris***

# NASA Space Place

## *Who Wants to be a Daredevil?*

*By Patrick L. Barry and Dr. Tony Phillips*

When exploring space, NASA naturally wants to use all the newest and coolest technologies—artificial intelligence, solar sails, onboard supercomputers, exotic materials.



But "new" also means unproven and risky, and that could be a problem. Remember HAL in the movie "2001: A Space Odyssey"? The rebellious computer clearly needed some pre-flight testing.

Testing advanced technologies in space is the mission of the New Millennium Program (NMP), created by NASA's Science Mission Directorate in 1995 and run by JPL. Like the daredevil test pilots of the 1950s who would fly the latest jet technology, NMP flies new technologies in space to see if they're ready for prime time. That way, future missions can use the technologies with much less risk.

Example: In 1999, the program's Deep Space 1 probe tested a system called "AutoNav," short for *Autonomous Navigation*.

AutoNav used artificial intelligence to steer the spacecraft without human intervention. It worked so well that elements of AutoNav were installed on a real mission, Deep Impact, which famously blasted a crater in Comet Tempel 1 on July 4, 2005. Without AutoNav, the projectile would have completely missed the comet.

Some NMP technologies "allow us to do things that we literally could not do before," says Jack Stocky, Chief Technologist for NMP. Dozens of innovative technologies tested by NMP will lead to satellites and space probes that are smaller, lighter, more capable and even cheaper than those of today.

Another example: An NMP test mission called Space Technology 9, which is still in the planning phase, may test-fly a solar sail. Solar sails use the slight pressure of sunlight itself, instead of heavy fuels, to propel a spacecraft. Two proposed NASA missions would be possible only with dependable solar sails—L1 Diamond and Solar Polar Imager—both of which would use solar sails to fly spacecraft that would study the Sun.

"The technologies that we validate have future missions that need them," Stocky says. "We try to target [missions] that are about 15 to 20 years out."

A menagerie of other cool NMP technologies includes ion thrusters, hyperspectral imagers, and miniaturized electronics for spacecraft navigation and control. NMP focuses on technologies that have been proven in the laboratory but must be tested in the extreme cold, vacuum, and high radiation environment of space, which can't be fully recreated in the lab.

New NMP missions fly every year and one-half to two years, taking tomorrow's space technology for a daredevil test drive.

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

# Our SBAS Committee

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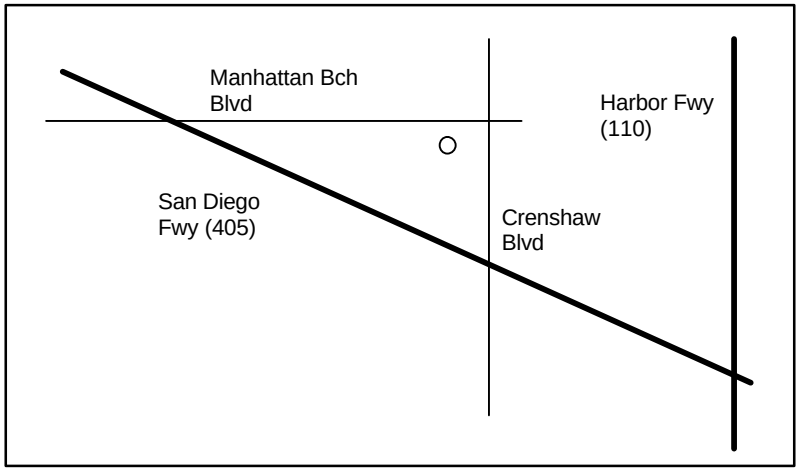
# Monthly General Meetings




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 **May 8th** planning meeting will be held at 7:30 PM at the home of Laura Lucas, 2005 Mathews Ave. #A, in Redondo Beach. Take Artesia Blvd., west from Hawthorne Blvd. and turn right on Aviation Way. Turn right at the stop sign onto Mathews Ave. and go down the hill. Park on the street just past

Green and Laura's house is on the left side in the back past the gates.

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# 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! Make your check payable to SBAS and mail the payment and your subscription / renewal form directly to South Bay Astronomical Society, P.O. Box 1937, Redondo Beach, CA 90278.

Part of your SBAS membership dues 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.**

# May – Comets & Asteroids

**Comets Visible in April**

| Comet | Magnitude | Constellation |
|---|---|---|
| Schwassman-Wachman (73P) | 4.0 and fainter | Boo-Ser-CrB-Her |
| McNaught (2005 E2) | 10.1 – 10.5 | Per-Aug |

***Asteroid Occultations***

No asteroid occultations visible from LA in May.

# Astronomy Day

May 6 is the day to celebrate astronomy with the general public. SBAS will once again set up some scopes and displays at the Farmer's Market in Palos Verdes. Room for our telescopes may be a bit less than usual this year, but anyone who can bring a solar-filtered telescope is urged to join Joe Fierstein at the Market. Plan on arriving early morning around 7:30 to set up. The Market closes about 1 PM. Even if you don't have a scope to bring, it helps to have people there just to talk to all the visitors.

# RTMC

The 38th annual RTMC Astronomy Expo will take place on Friday, May 26, through Sunday, May 28, 2006 (Memorial Day weekend). It will be held at YMCA Camp Oakes, five miles southeast of Big Bear City on State Route 38 at Lake Williams Road between mileposts 44 and 45. This location is about 50 miles northeast of Riverside in the San Bernardino mountains.

The Keynote Speaker for 2006 will be Dr. Mike Brown, Associate Professor of Planetary Astronomy at Caltech. For the past seven years Dr. Brown and his colleagues have been scanning the skies for planets beyond Pluto. In 2005,

after a search of about half of the sky and the discovery of dozens of objects almost the size of Pluto, they finally found 2003 $UB_{313}$, the first trans-Neptunian object larger than Pluto to be discovered, and the first that might be called a new planet. In addition to a new avalanche of scientific questions, this discovery drives home the need to answer a question that astronomers have been debating for years: "What is a planet?" He will discuss the story of the discovery and try to give a perspective on why the question of planethood is difficult and what the real answer should be.

## *MaxDSLR*

For those with Digital SLR cameras who have been trying to use them to do a little astrophotography, there is now a new tool available. From the makers of MaxImDL, comes MaxDSLR. This software promises to do for DSLR users what the Meade DSI software does for webcam astrophotography. A 30-day free, fully-functional copy is available for download at the Cyanogen website (http://www.cyanogen.com/products/maxdslr_main.htm). Since I have Nikon D100 DSLR camera, I decided to check it out. Currently, this software supports the Canon EOS, Meade DSI, Meade LPI, Nikon D70, Olympus E-1/E-300/E-500, and Orion Star Shoot. They have begun adding some software to include the Nikon D100 but that is not yet working in the version I downloaded. It has an excellent built-in tutorial system for guiding you through the process of setting up the software and interfacing it to the camera. It even includes a simulated camera so that you can go through all the motions and get used to the routine of configuring the software to work with a camera. There is even more detailed information for getting the best digital astrophotos you can in the help documentation. It is somewhat more complicated that the Meade DSI software I'm familiar with but it doesn't look too daunting. Since it doesn't interface to a Nikon D100 and the sky has not been very cooperative, I haven't been able to spend the time I'd like to in checking it out further. Since it does work with the Meade DSI that will be the next step in checking it out. Hopefully, that will happen prior to the expiry of my temporary license! With a download price of $249 it's not completely out of reach of the average amateur astronomer. It shows a lot of promise and I'll be checking it out more soon.

***- Ken Munson***

## *Astronomy Videos*

Thanks to Shawn Belveal SBAS has received a donation of 15 video tapes that comprise a course on astronomy. The title of the series is: "Understanding the Universe; An Introduction" . Part 1 is titled "Unlocking the Secrets of the Heavens" and is presented by Prof. Alex Filippenko of UC Berkley. The tapes are produced by "The Teaching Co." and are professionally done and of very good quality. Professor Filippenko is well known and is particularly noted for his efforts in education and for bringing astronomy to the masses. He has often been compared to the late Carl Sagan. As a board member of the Astronomical Society of the Pacific he was instrumental in developing Project Astro in which professional astronomers are paired with local schools to bring hands on astronomy to K-12 kids. What follows is a brief synopsis of tape 1. Each tape consists of three 45 minute lectures. Lecture 1 states the objectives of the course and an outline of the entire 15 part series. As such, it covers the history and development of astronomy from ancient times to the present and includes some wonderful deep sky photos. It's a great survey of astronomy today and how it developed.

Lecture 2 starts with an introduction to scientific notation as a means of discussing the very large distances involved in the make up of our universe and the macro and micro extremes of it's basic building blocks. Then it gets into the detail starting with the "Big Bang", the expansion of the universe, the age of the universe (14 billion years), and the start of life from single cells to dinosaurs to humans.

Lecture 3 deals mainly with light, the energy spectrum from ultraviolet to infra red and how it applies to astronomy including the HR diagram. If you would like to borrow some of these tapes just give Joe Fierstein a call (310-377-9834). They are pretty much self standing and you could start with any one and get something out of it. It would also be appreciated if you would give us a brief summary with your comments. They are a valuable resource for the club and should not go to waste.

***- Joe Fierstein***

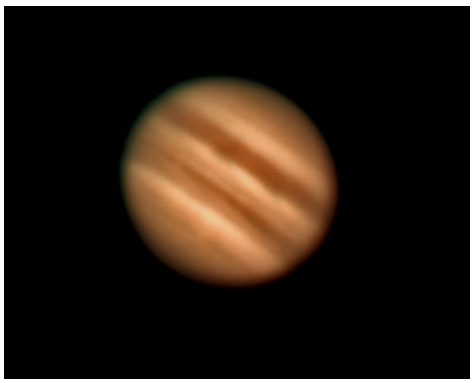
# *Observing Reports*

***Backyard Observing***

Fed up with waiting for the weekend only to have it clouded and/or rained out, I decided to throw caution to the winds and set up the scope in the backyard on clear sky weeknights. Even though it left, me a little tired the next work day, the results were worth it. I recently got a new laptop computer and interfaced it to the scope. This laptop has not one, like my old laptop, but three USB ports, all of them high speed 2.0 versions. For the first time I can finally work the scope and even two cameras at the same time! The first night I set up was to check out the interface with the scope via Starry Night. Happily that worked very well.

The next night was the first time to plug my Meade Deep-Sky Imager into the new laptop. It had worked fairly well on the old, 1.0 USB port laptop and so I was expecting even better performance on the new faster PC. Alas, it wasn't to be so. For some reason, although the PC detected the DSI, it steadfastly refused to install the driver no matter which USB port I used. To be honest I did have a USB extension cable in-line with it. I took it out and tried again still with no luck. Then I remembered that this laptop is wired for wireless. Even out in the backyard I was able to access my wireless LAN and went to the Meade website and downloaded an all-new software package for the DSI. After that, it finally started working. Naturally, by the time I got through all of this, it was nearly midnight on a Tuesday. I took a few test shots of the moon which was nearly full then and was amazed at how well it worked! It really makes a big difference using the high-speed USB port with the DSI. I then swung the scope over to Jupiter which was rising but low on the horizon. Visually, it was a watery mess. Amazingly, a hundred quick pics stacked did an amazing job of cleaning up the mess. Not a great picture but it showed promise. As a last test, I put my 3.3 focal reducer on and then tried a deep-sky shot. I swung to M3 and started the DSI. The final image was made up of 100 1.4 second exposures stacked. Even though I hadn't really bothered to do a decent polar alignment, the software's ability to align and stack the photos was amazing.

On Monday, the 17th, I set up once again after the weekend clouds and rain had cleared away. The wind died down nicely after dark. This time I decided to do a better polar alignment. As I was setting the scope up and trying to get it pointed towards Polaris, I got treated to double Iridium flares – two magnitude -8 flares near Polaris just seconds apart. It was a good omen for a great evening. The first target was Saturn which was high overhead. After a lot of experimenting with different focus settings, I got a couple of fairly good pictures of Saturn. I realized finally that you can't expect great photos in the first hour or so after sunset!



The next target was Jupiter. Again, being still fairly low at 10 PM and having to look through the rising heat from an oil refinery, it looked like a watery mess to my eye. Surprisingly, the Meade DSI and its software was very patient at catching just the right moments when the seeing was reasonably clear. I was able to stack about 400 images in the space of about 10 minutes. Thanks to the speed of the new laptop I was finally able to get a handle on how to set the gain and histogram slider bars to get a better image. Even though it has a 'planet' setting, you really have to tweak the slider bars to keep the image from being overexposed. After doing some touch up in Photoshop, the pictures turned out surprisingly well.

After all my bad experiences with dew and the heater taking all my battery power, I finally went to Radio Shack and bought a small 13 volt power supply with a 12 car adapter outlet. On the evening of the 24th, I had a chance to test this out. The day had been very good and clear but the marine layer began moving in after sunset. With the dew heater powered by the power supply, it kept the scope free of dew all night as the sky slowly deteriorated Even though the sky was not very good, I did manage to get a reasonably good picture of Jupiter that night (see above).

***- Ken Munson***

# *Schedule of Coming Events*

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|---|---|
| **5 May Friday Evening 7:30 PM** | **Monthly General Meeting**<br>Guest Speaker: Glen Rosenthal<br>Topic: |
| **5-6 May** | **Eta Aquarid Meteor Shower Peak**<br>Radiant for this shower appears to emanate from around Eta Aquarius. Meteors may be seen through the night although Aquarius doesn't rise until just before dawn. |
| **7 May** | **Astronomy Day**<br>Join Joe Fierstein at the Palos Verdes Farmer's Market for some early morning solar viewing! |
| **8 May Monday Evening 7:30** | **Monthly Planning Meeting**<br>See directions on Page 4. |
| **11 May Thursday Evening 7:00 PM** | **Von Kármán Auditorium (Thursday) & Vosloh Forum at Pasadena City College (Friday)**<br>**"Future Robots, Rovers and other Moveable Explorers"** Dr. Ashley Stroupe. The robotics engineers at JPL are currently developing new robotics technologies to provide scientists and astronauts access to new kinds of planetary terrain. This talk will present the current state of the art in planetary robotics and discuss where we are going in the future. |
| **20-21 May** | **JPL Open House**<br>NASA's Jet Propulsion Laboratory in Pasadena, Calif., will hold an open house on Sat. and Sun., May 15 and 16, from 9 a.m. to 5 p.m., taking visitors on a virtual ride through the solar system with this year's theme, "The Spirit of Exploration." |
| **20 May Saturday Evening** | **In Town Dark Sky Observing Session –** Weather Permitting**:** Please contact Greg Benecke to confirm that the gate will be opened!<br>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 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.** |
| **26-29 May** | **RTMC**<br>See the website http://www.rtmcastronomyexpo.org/ for details and directions. |
| **27 May Saturday Evening** | **Out-of-Town Dark Sky Observing Session**<br>For those not going to RTMC, the Inyokern Road site has tentatively named as a meeting site for the dark-sky observing session. |
| **2 June Friday Evening** | **Monthly General Meeting**<br>Guest Speaker: TBD |

# South Bay Astronomical Society

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

***Guest Speaker: Glen Rosenthal***

## *"Ionospheric Research in the Northern Latitudes"*

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