FIRST LIGHT

*Journal of the South Bay Astronomical Society – April 2008*
**on line at www.geocities.com/sbas_elcamino**

**Monthly General Meeting: Friday, April 4th, 7:30 PM**

**Members Night – Share Your Astrophotos**

# *The March 7 Meeting*

Vice-President Ron Rennie started the meeting at 7:30 by welcoming guests Vincent, Michael and Jeff, who were attending for the first time. The recent Ridgecrest observing session was clouded out, but Greg Benecke reported that a recent star party at a local high school was a success, with good seeing and approximately fifty students in attendance. More than a dozen members indicated that they had seen the recent lunar eclipse. Upcoming observing events were discussed, including next month's Mt. Wilson trip.

After a ten-minute social break, Ron Rennie introduced our guest speaker Dr. Michelle Thaller from JPL, who described her work on "The Spitzer Telescope and Exoplanets". Dr. Thaller brought an infrared camera with her, giving us the opportunity to see what we look like in the infrared. With the aid of this camera, she spent several minutes discussing the differences between what we see visually, and what the world looks like at infrared wavelengths. A handprint on the floor remained visible long after the hand had been removed, and a boy rubbing an ice cube across his shirt created a temporary abstract artwork.

The Spitzer telescope (also known as SIRTF) is an infrared telescope circling the Sun in an orbit similar to Earth's orbit. The beryllium mirror is kept at a temperature of 15 K (fifteen Kelvin degrees above absolute zero), and the instrumentation is kept at a temperature of 2 K. In the near-infrared, this telescope can peer through dust clouds to image stars that aren't seen in visible light, and in the far-infrared we see the cold gas clouds themselves.

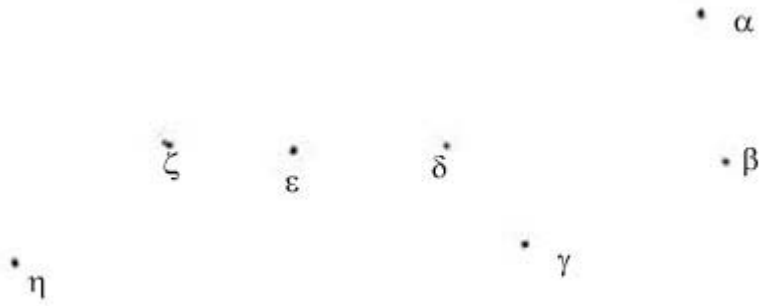
One of the more exciting projects undertaken by the Spitzer telescope has been the search for planets beyond the Solar System. For example the star HD 189733b, 70 light-years away, has a planet that periodically passes behind the star as seen from Earth. When Spitzer's infrared spectrum of the system during eclipse was subtracted from the spectrum when star and planet were both visible, the spectrum of the planet alone was obtained, including the spectral signature of water vapor in the planet's atmosphere.

Even when planets cannot be detected directly, they can be deduced to exist by their effect on a disk of gas and dust orbiting a star. Once a planet forms from a disk, it sweeps up the local gas and dust or ejects this material from the planet's vicinity gravitationally. A spectrum of the system shows a lack of infrared radiation from the dust that would have been heated by the star, but is now missing.

Dr. Michelle Thaller ended her talk by looking at the future of planetary science, including the provocative claim that microbial life may yet be detected on Mars by the next generation of landers under development. Vice-President Rennie thanked the speaker and presented her with a plaque to show our appreciation for her efforts, and the meeting ended at 9:30.

***- Dr. Steven Morris***

# *Covering All the Angles*




A little spherical trigonometry goes a long way. This thought came to me in the early morning of February 9, watched the Big Dipper rising in the north-east, and pondered the description of this asterism on page 96 of 'Star-Hopping for Backyard Astronomers', written by Alan M. MacRobert and published by Sky Publishing Corp.:

> "Although you'd never guess it from a casual glance, five of its stars - all but the two on the ends - belong to the closest open cluster to our solar system. Nicknamed the Ursa Major Moving Cluster and formally cataloged as Collinder 285, this sparse grouping probably holds only 17 stars within its weak gravitational grip. They're widely scattered across a large oval area of space roughly 18 light-years wide by 30 long. The cluster's proximity - it's only about 75 light- years from Earth - spreads the stars across more than 20° of our spring sky."

One of the pleasures of observing open clusters is noticing the straight lines and curved arcs that the mind insists on seeing, as our pattern-seeking brains refuse to accept the chaos of stellar scattering. And while I thought of that, I noticed that even in so sparse a grouping, four of the five Cluster stars formed an almost-straight line! We are so used to viewing the seven-starred asterism as a kitchen utensil that it's easy not to notice that $\zeta$, $\varepsilon$, $\delta$ and $\beta$ are aligned.

But how straight is this line? Here's where spherical trigonometry comes in. The Bright Star Catalogue provides accurate positions for all these stars, and deriving the necessary equations whiled away an hour. Starting from $\zeta$ Ursae Majoris, better known as the double star Mizar in the middle of the Dipper's handle, you can draw a great circle (the celestial sphere's analog to a straight line in plane geometry) to $\beta$ at the other end of this four-star line. As measured from Mizar, the star $\varepsilon$ deviates from this line by only 2.07°, and $\delta$ deviates from it by only 0.59°.

Other angles can be calculated as well. The two stars at the end of the Dipper's bowl are often called the Pointers, as they are used to find Polaris near the North Celestial Pole. They do this surprisingly well; the line formed by the two Pointer stars needs to be rotated by only 3.4° to strike Polaris. The distance from $\alpha$ UMa to Polaris is 5.34 times the distance between the Pointers, so the usual advice to prolong this distance "about 5 times" to get to Polaris turns out to be pretty accurate.

One side of the Dipper's bowl is clearly taller than the other, but its openness from the bottom of the Bowl is surprisingly symmetrical. From $\gamma$ UMa, the angle between $\delta$ and $\beta$ is 105.3°, and from $\beta$ UMa, the angle between $\gamma$ and $\alpha$ is 102.0°. Ironically, the two stars that aren't in the Ursa Major Moving Cluster help form the straightest line of all: a great circle through $\eta$ UMa needs to shift by only 0.15° to move from $\alpha$ UMa to $\varepsilon$ UMa.

The paragraph in MacRobert's book that started all this ends with the following intriguing sentence:

> "Additional, more widely separated stars that suspiciously share the same space motion include Sirius, Alpha Ophiuchi, Beta Aurigae, Alpha Coronae Borealis, and about 100 fainter stars."

Sirius! Could I include this brightest of stars in my original straight-line asterism? It certainly seemed possible, gazing from the north-east to the south-west, but the human mind is notoriously poor at judging angles over great lengths of sky. And so it proved; sadly, the Mizar-to-$\beta$-UMa great circle is at a 20.9° angle to the Mizar-to-Sirius great circle. All is not lost, however. Starting again from Mizar and heading through $\gamma$, the other Cluster star at the bottom of the Dipper's bowl, a great circle is formed that has to be rotated only 1.9° to pass through Sirius. This three-star lineup is a minimal asterism, but can lay claim to maximal size; it stretches over 109° of sky!

***- Dr. Steven Morris Morris***

# Tracking Wildlife from Space

By Patrick Barry

It's 10 o'clock, and do you know where your Oriental Honey Buzzard is?

Tracking the whereabouts of birds and other migrating wildlife across thousands of miles of land, air, and sea is no easy feat. Yet to protect the habitats of endangered species, scientists need to know where these roving animals go during their seasonal travels.

Rather than chasing these animals around the globe, a growing number of scientists are leveraging the bird's-eye view of orbiting satellites to easily monitor animals' movements anywhere in the world.

The system piggybacks on weather satellites called Polar Operational Environmental Satellites, which are operated by the National Oceanic and Atmospheric Administration (NOAA), as well as a European satellite called MetOp. Sensors aboard these satellites pick up signals beamed from portable transmitters on the Earth's surface, 850 kilometers below. NOAA began the project—called Argos—in cooperation with NASA and the French space agency (CNES) in 1974. At that time, scientists placed these transmitters primarily on buoys and balloons to study the oceans and atmosphere. As electronics shrank and new satellites' sensors became more sensitive, the transmitters became small and light enough by the 1990s that scientists could mount them safely on animals. Yes, even on birds like the Oriental Honey Buzzard.


*The ARGOS program tracks the whereabouts of endangered migrating animals via miniature transmitters on the animals and the POES satellites in orbit.*

"Scientists just never had the capability of doing this before," says Christopher O'Connors, Program Manager for Argos at NOAA.

Today, transmitters weigh as little as 1/20th of a pound and require a fraction of a watt of power. The satellites can detect these feeble signals in part because the transmitters broadcast at frequencies between 401 and 403 MHz, a part of the spectrum reserved for environmental uses. That way there's very little interference from other sources of radio noise.

"Argos is being used more and more for animal tracking," O'Connors says. More than 17,000 transmitters are currently being tracked by Argos, and almost 4,000 of them are on wildlife. "The animal research has been the most interesting area in terms of innovative science."

For example, researchers in Japan used Argos to track endangered Grey-faced Buzzards and Oriental Honey Buzzards for thousands of kilometers along the birds' migrations through Japan and Southeast Asia. Scientists have also mapped the movements of loggerhead sea turtles off the west coast of Africa. Other studies have documented migrations of wood storks, Malaysian elephants, porcupine caribou, right whales, and walruses, to name a few.

Argos data is available online at www.argos-system.org, so every evening, scientists can check the whereabouts of all their herds, schools, and flocks. Kids can learn about some of these endangered species and play a memory game with them at spaceplace.nasa.gov/en/kids/poes_tracking.

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

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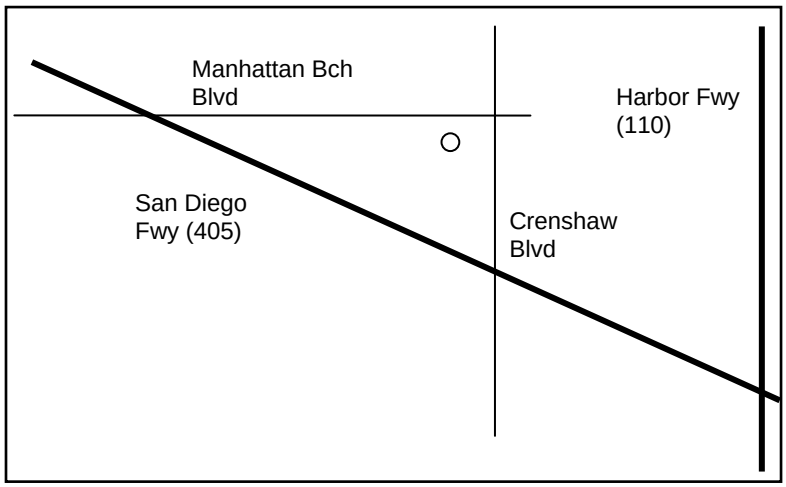


# Monthly General Meetings

We normally meet on the first Friday of each month at 7:30 p.m. in the Planetarium at El Camino College (16007 Crenshaw Bl. In Torrance). If the first Friday is on or close to a holiday, we usually defer the meeting until the second Friday of the month. The Planetarium is on the south side of Manhattan Beach Blvd., one block west of Crenshaw Blvd. (near the center of the map at left).

The planetarium is the only round, domed building on campus. There is on-street parking, and we can often use campus parking: check inside to see if you need a FREE parking permit for your car.

We enjoy the planetarium facilities through the courtesy of the El Camino College Administration, and have several faculty members of the Astronomy Department as members of our Club. Our meetings always include an informal opening, when new attendees are invited to introduce themselves and let us know about their interests in astronomy. Members share their latest news and observations at this time. The rest of the evening is devoted to guest speakers, who range from amateur astronomers to professional astronomers to representatives from local aerospace companies to college professors. We are fortunate to have all these talented people in our area, willing to come and talk to us.

# Monthly Planning Meeting

Committee members (and anyone else with an interest in Society activities) meet each month, usually on the Monday following the general meeting. Meetings are sometimes rescheduled due to travel and other circumstances. Exact date and time of each month's meeting will be announced in the schedule of events in FIRST LIGHT each month, and should also be verified with a committee member. The March 10th 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 YAHOO GROUP*

Join our own YAHOO group for up-to-the-minute club news; see astro photos taken by members and be part of the growing online community of the South Bay Astronomical Society. A YAHOO userid is needed (free) then click on GROUPS and search for SBASTRO. Use the JOIN function and you will get notification from the Group's administrator that your application has been accepted. This group is limited to SBAS members. You can specify to have emails sent to your normal email address when you signup. The Executive Board is working to use this vehicle more and more this coming year to deliver information to our members. 25% of our membership has joined. Don't be left out. If you need assistance or have any questions, contact any Board member.

# *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!

Note: S&T subscribers at the club rate renew their subscriptions by mailing their renewal notice and check or calling the 800# on the renewal notice.

Only new subscribers or subscribers converting their subscription to the club rate need to contact Arnie or send a check to the PO Box. Astronomy subscriptions and renewals still go through Arnie or via the PO Box.

# *April – Comets & Asteroids*

**Visible Comets:**

**Comet** **Mag** **Constellation(s)**

**Asteroid Occultations:**

Event Summary for Torrance

| Local Time | | | Durn | Star | Mag-Drop | Star | Planet | |
|---|---|---|---|---|---|---|---|---|
| D M Y | Hr | Min | sec/m | mag | V | No. | No | Name |
| 15-Apr-08 | 1 | 45.4 | 4.3s | 10.7 | 3.1 | TYC 0274-00305-1u | 808 | Merxia |

**Planetary Occultations:**

**Near-Earth Asteroids:**

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

# *Members Night Rules*

Bring your astrophotos to the April meeting to share with other club members. There are just four simple rules to make it fun:

1) All entries must include an astronomical subject

2) All photos must be the work of the entrant

3) No entrant can win more than 1 award. The judges will decide who wins which award.

4) Entries must be by electronic media (CD, DVD, USB, etc). No photographic prints.

# *Observing Reports*

***Observing from Down Under –*** For the second time in three months, I made another business trip to Sydney Australia. This time, with the weather finally cooperating a bit more, I was determined to visit the Sydney Observatory. Built in 1858, this observatory was the residence and workplace of astronomers until 1982 when it was turned into a museum. The museum houses many fine exhibits of antique telescopes, clocks, shipboard chronometers and orreries.

Although the sky was more cloudy than partly, I signed up for the daytime solar observing session and was treated to the occasionally sharp image of the sun viewed in h-alpha light through a 3 in refractor. A family was there with small children and the two little girls were very enthusiastic about seeing the sun in such a 'pretty red color'. After the solar viewing, I signed up for the evening session as well.

I returned to the observatory at 8 PM as the glow from the sunset slowly faded, the clouds disappeared, and thousands of large fruit bats filled the sky. Since a large number of people had come to the show, we were organized into two groups of about 25 each. The first group was led in and my group was led to the rear courtyard where a 12 inch Meade scope had been set up. Our guide used a laser pointing to the northern hemisphere visitors, the Southern Cross, Canopus and the location of the South Celestial Pole. There were several gasps of astonishment when he pointed out that Sirius, the brightest star in the sky, was only 8 light-years away, while Canopus, the second brightest, was over 300 light-years away. He then proceeded to provide some views through the telescope of Saturn, the Jewel Box (NGC 4755), and Alpha Centauri. The Jewel Box is aptly named. This cluster contains a number of bright white/blue stars with one large red star in the center. Alpha Centauri was a nice double star similar to Castor in Gemini.

After everyone had had a look at those objects, we trooped upstairs into the dome and the other group took our place in the courtyard. There, with the 16 inch Meade we took a look at Mars, which showed a surprising amount of detail. The next object was M42, the Great Nebula of Orion. The final object to see was the Southern Pleiades, IC 2602. This is a beautiful cluster with a faint suggestion of haze from a dust cloud the stars are passing through. Long exposure photos show its remarkable similarity to M45. I had hoped to get a look at the Eta Carinae nebula but unfortunately, we ran out of time. I had to get back to the wharf before the last ferry to Manly left or it would be a long walk back to the hotel.

As the ferry headed out across the large open bay that makes Sydney harbor, we got away from the worst of the immediate light pollution and my eyes became better adapted to the dark sky. Looking up, I was able to quickly identify the Southern Cross again, Centaurus, Vela, and Argo and, finally in mid-harbor, I was able to spot the fuzzy extended object known as the Eta Carinae nebula. Sadly, the Magellanic Clouds, although overhead, were too faint to be seen even in mid-harbor.

***- Ken Munson***

# *Schedule of Coming Events*

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|---|---|
| **29 March Saturday Night** | **In Town Dark Sky Observing Session at Ridgecrest Middle School–** 28915 NortbBay Rd. RPV, Weather Permitting**:** Please contact Greg Benecke to confirm that the gate will be opened!<br><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 (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. |
| **4 April Friday Night 7:30 PM** | **Monthly General Meeting**<br><br>Member's Night – Share Your Astrophotos |
| **5 April Saturday Night** | **Out-of-Town Dark Sky Observing Session**<br><br>Contact Greg Benecke to coordinate a location. |
| **7 April Monday Night 7:30 PM** | **Monthly Planning Meeting**<br><br>See directions on page 4. |
| **11 April Friday Night 6:00 PM** | **Science Night at Point Vicente School (star party) has been corrected to be Friday April 11th.**<br><br>SBAS is invited to a star party at Pt Vicente School on Fri April 11 not April 10 as noted in the newsletter. The school is located at 30540 Rue de la Pierre in RPV. To get there head South on Hawthorne Blvd toward the ocean. Turn right on Via Riviera. Via Riviera runs into Rue de la Pierre. The school will be on your right shortly after reaching la Pierre. The event starts at 6pm which gives an hour to set up before dark. Please let me know if you will be coming. Joe f |
| **24 April Thursday Night 7:00 PM** | **Beckman Auditorium at CalTech (Thursday) & Vosloh Forum at Pasadena City College (Friday)**<br><br>**The Importance of Sample Return.** Dr. Don Burnett.<br><br>NASA's Genesis sample-return mission collected solar-wind samples outside of Earth's magnetosphere and returned them to Earth for analysis. Isotopic and elemental relative abundances of the solar wind will provide a cornerstone data set for theories on how, starting some 4.6 billion years ago, the solar nebula transformed into the present solar system. |
| **26 April Saturday Evening** | **In Town Dark Sky Observing Session at Ridgecrest Middle School**<br><br>See directions above |
| **2 May Friday Night 7:30 PM** | **Monthly General Meeting**<br><br>Speaker: TBA |
| **3 May Saturday Night** | **Out-of-Town Dark Sky Observing Session**<br><br>Contact Greg Benecke to coordinate a location. |

# South Bay Astronomical Society

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***General Meeting at El Camino College Planetarium:***
***Friday, April 4th, at 7:30 P.M.***

***Member's Night***

## "Share Your Astrophotos"

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