FIRST LIGHT

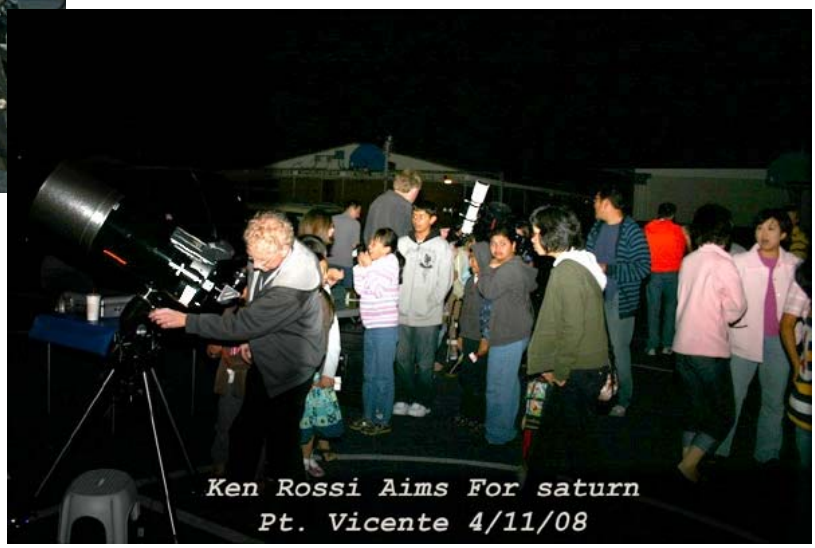
Journal of the South Bay Astronomical Society – May 2008
on line at www.geocities.com/sbas_elcamino

Monthly General Meeting: Friday, May 2nd, 7:30 PM

Woodland Hills Camera & Telescopes

Science Night at Point Vicente School

SBAS members Ken Rossi, Joe Fierstein, Greg Benecke and Ken Munson were on-hand to provide views of celestial wonders for the students and their families at the Point Vicente Elementary School in Rancho Palos Verdes on April 11. As the sun set the seeing was remarkably stable but deteriorated as the evening progressed. Ken Munson had his scope up and operating before the sunset, treating some early visitors to a special treat: a star visible in the scope even though the sun was still well above the horizon! Over 100 students and families came out to the playground area to take a look through the telescopes. Being past half-moon, the moon was a primary target for many people but they were also treated to some nice colorful double stars, a few of the brighter Messier Objects, the Eskimo Nebula, and Mars. One little girl was very happy that she got to accomplish her goal of finally seeing her favorite planet, "Saturanin", as she called it. A very successful evening brought to a close by the need to skedaddle across the grassy playground before the sprinklers came on!



The April 4 Meeting

President Ken Rossi used his newly-acquired gavel to open the meeting at 7:34, and began by thanking various members of the SBAS such as Steven Morris, Ken Munson, Arnie Stodolsky, Ron Rennie and others who keep the SBAS going. Ken reviewed the past and upcoming observing sessions, and reminded everyone about the Astronomy for City Dwellers course by Craig Gates. He also read from a card sent by the Lynwood Howe Elementary School in Culver City thanking us for the astronomy talks and solar viewing provided to them recently by some of our members.

A representative of the SBAS executive has met with the assistant superintendent of the Palos Verdes Unified School District, to discuss erecting a roll-off-roof observatory at Ridgecrest School. This is just the first step of what will likely be a long and complicated process, to create a permanent observatory that would benefit both the Ridgecrest School students and the SBAS.

After a twelve-minute social break, the astrophotography contest began. The three judges were Dicie Sizemore (a member of the Los Angeles 8 mm Movie Club), Steven Morris (an astronomy professor at Los Angeles Harbor College) and Steve Pedersen (a member of the SBAS executive board). First up was Ken Munson, with pictures of the Sydney Observatory as well as the Moon, Comet Holmes and Comet Bradfield, and such deep-sky objects as the Swan Nebula and the Trifid Nebula.

Greg Benecke was next, with pictures of Comet Holmes and several deep-sky objects. Tom Bash then showed his high-magnification views of Mars and Saturn, and some remarkable color-enhanced photographs of the Moon. The fourth and last entrant was Professor Perry Hacking, whose solar eclipse pictures illustrated magnetic-field structure in the solar corona.

The judges conferred, then gave the Best Presentation Award to Tom Bash, and the Best Astrophoto Award to Greg Benecke for his stunning mosaic of the North American and Pelican Nebulae. The 35 people present applauded all four for their efforts, and President Rossi gaveled the meeting to a close at 9:42.

- Dr. Steven Morris

Stellar Compass for Space Explorers

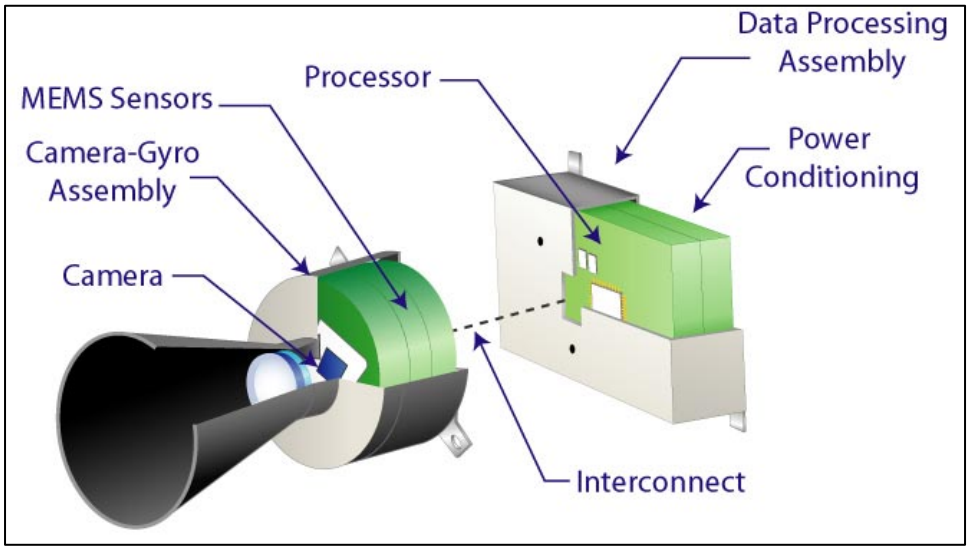
by Patrick L. Barry

In space, there's no up or down, north or south, east or west. So how can robotic spacecraft know which way they're facing when they fire their thrusters, or when they try to beam scientific data back to Earth?

Without the familiar compass points of Earth's magnetic poles, spacecraft use stars and gyros to know their orientation. Thanks to a recently completed test flight, future spacecraft will be able to do so using only an ultra-low-power camera and three silicon wafers as small as your pinky fingernail.

"The wafers are actually very tiny gyros," explains Artur Chmielewski, project manager at JPL for Space Technology 6 (ST6), a part of NASA's New Millennium Program.

Traditional gyros use spinning wheels to detect changes in pitch, yaw, and roll—the three axes of rotation. For ST6's Inertial Stellar Compass, the three gyros instead consist of silicon wafers that resemble microchips. Rotating the wafers distorts microscopic structures on the surfaces of these wafers in a way that generates electric signals. The compass uses these signals—along with images of star positions taken by the camera—to measure rotation.



Compass is built as two separate assemblies, the camera-gyro assembly and the data processor assembly, connected by a wiring harness. The technology uses an active pixel sensor in a wide-field-of-view miniature star camera and micro-electromechanical system (MEMS) gyros. Together, they provide extremely accurate information for navigation and control.

Because the Inertial Stellar Compass (ISC) is based on this new, radically different technology, NASA needed to flight-test it before using it in important missions. That test flight reached completion in December 2007 after about a year in orbit

aboard the Air Force's TacSat-2 satellite.

"It just performed beautifully," Chmielewski says. "The data checked out really well." The engineers had hoped that ISC would measure the spacecraft's rotation with an accuracy of 0.1 degrees. In the flight tests, ISC surpassed this goal, measuring rotation to within about 0.05 degrees.

That success paves the way for using ISC to reduce the cost of future science missions. When launching probes into space, weight equals money. "If you're paying a million dollars per kilogram to send your spacecraft to Mars, you care a lot about weight," Chmielewski says. At less than 3 kilograms, ISC weighs about one-fifth as much as traditional stellar compasses. It also uses about one-tenth as much power, so a spacecraft would be able to use smaller, lighter solar panels.

Engineers at Draper Laboratory, the Cambridge, Massachusetts, company that built the ISC, are already at work on a next-generation design that will improve the compass's accuracy ten-fold, Chmielewski says. So ISC and its successors could soon help costs—and spacecraft—stay on target.

Find out more about the ISC at nmp.nasa.gov/st6. Kids can do a fun project and get an introduction to navigating by the stars at http://spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml.

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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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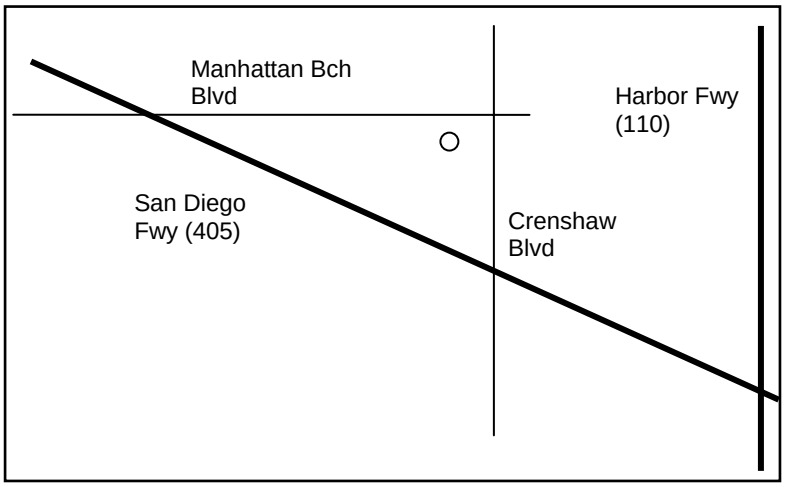
Monthly General Meetings

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 Joe & Miriam Fierstein. Take Hawthorne Blvd. south past Pacific Coast Hwy. up the hill passing Silver Spur Rd. and Highridge until you get to the light at Eddinghill Dr., then turn right and go downhill to the 'T' intersection at Golden Meadow where you turn left up 2 blocks and turn left on Willow Tree Dr. to 3rd house on the right side from the corner – 7022 Willow Tree Dr., Rancho Palos Verdes.

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.

New Members

Welcome new club member Wayne Bonner from Gardena.

May – Comets & Asteroids

Visible Comets:

Name	Magnitude	Constellation
2007 W1	9 – 7.8	Hydra

Asteroid Occultations:

Local Time Date	Hr	Min	Durn sec/m	Star mag	Mag-Drop V	Star No.	Planet No	Alt Name
14-May-08	4	2.6	7.3s	10.4	3.1	TYC 6751-01807-1u	303	Josephina

Planetary Occultations:
None

Near-Earth Asteroids:

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

Observing Reports

Backyard Observing – After what seems to have been a rather lengthy, agonizing effort, I finally had gotten all the parts necessary to assemble a guide scope system for my Nexstar 11. The guide scope is a Celestron Onyx80ED. Having finally gotten the dovetail plates, brackets and counter-weights and brackets, I assembled it all one fine Friday evening in my back yard to check it out. Hopes fizzled out rapidly when it turned out the Onyx focuser was loose and it couldn't be focused unless the scope was level. That was fixed the next day and the next opportunity was the in-town viewing session at Ridgecrest. Got it all set up and wouldn't you know we got socked in with one of the thickest fogs I've ever seen at Ridgecrest!

The third time's the charm, as they say. I set it up in my backyard to do some tests and the system performed surprisingly well. I was able to get the two scopes aligned very well with each other, did a rough polar alignment of the whole assembly and then started testing. Since the nearly full moon was up, there wasn't much chance of doing deep-sky stuff so I practiced using the Onyx as a photography platform. After playing with the focuser a bit, I was able to get a very nice, sharp image of the moon.

Then with the camera still in place, I put the Meade DSI on the Nexstar 11 and used it as the guider while doing some deep sky photo/tracking tests. I wasn't shooting anything specific, just an area of sky where I had some decently bright starts. I must have gotten lucky with my alignment. I was able to do up to 1 minute exposures without any noticeable star trails. Then, I switched the whole thing around, putting the camera on the Nexstar and the DSI on the Onyx. It turned out I had to use a 2x Barlow on the Onyx to get a star bright enough for the DSI to track in the highly light-polluted sky. Still, the whole assembly did a good job of tracking, allowing exposures slightly more than a minute without seeing any star trails.

Having finally purchased some astrophotography-oriented photo processing software (ImagesPlus), I am finally ready to get serious!

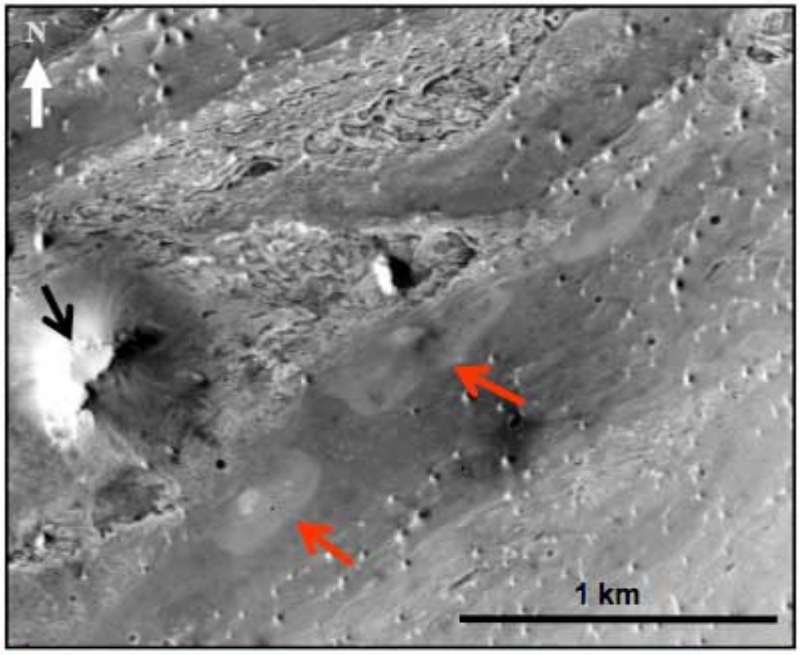
- Ken Munson

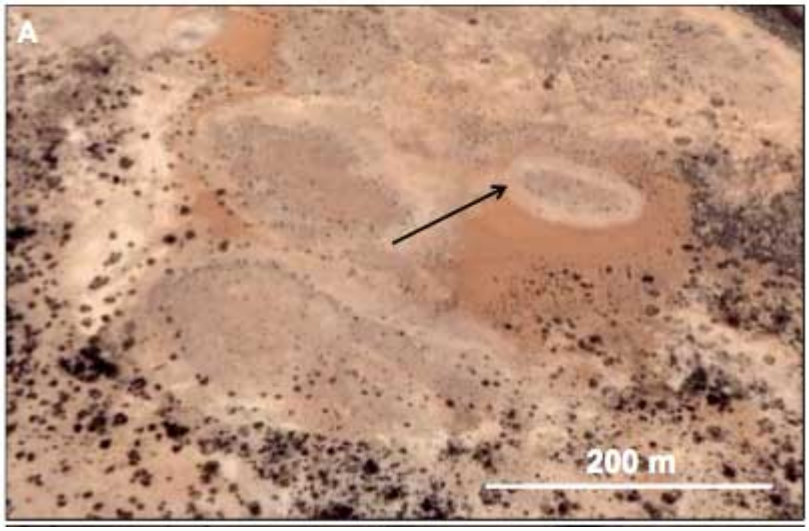
Mars Features Resemble Hydrothermal Springs

By Leonard David

There's a growing buzz in the astrobiology community that ancient hydrothermal springs may have been spotted on Mars.

Thanks to the eagle-eyed work of Carlton Allen and Dorothy Oehler of NASA's Johnson Space Center, "spring-like" mounds have been found in Vernal Crater in Arabia Terra on the red planet.





The high-powered zoom lens of NASA's Mars Reconnaissance Orbiter (MRO) has picked up the features - two possible ancient hydrothermal springs are viewed as light-toned, elliptical structures.

The martian features have a striking similarity to spring mounds here on Earth, such as those in Dalhousie, Australia.

The potential big news here is that, if true, hydrothermal spring deposits on Mars might preserve evidence of martian life. These features would not only have supplied energy-rich waters in which martian life may have evolved, but also would have provided warm, liquid water to martian life forms as the climate on the red planet became colder and drier.

At present, whether life has existed on Mars in the past or may still dwell there today, remains an open question.

Allen said more work is needed to better analyze these features and also look for other similar spots on Mars. In particular, use of MRO's Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) can sort out the composition of the features in Vernal Crater. However, due to the dusty nature of Arabia Terra, that has crimped mineralogical assessment of the mounds.

Meanwhile, the prospect of identifying ancient thermal springs on Mars would be a boost for astrobiologists, Allen and Oehler report.

These could be sites where martian life evolved, sought refuge as the climate on Mars became colder and drier...and where evidence of that life may be preserved.

- Reprinted from Space.Com

Schedule of Coming Events

26 April 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! 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.
2 May Friday Night 7:30 PM	**Monthly General Meeting** Woodland Hills Camera and Telescopes. See samples of telescopes and astrophoto equipment.
3 May Saturday Night	**Out-of-Town Dark Sky Observing Session** Contact Greg Benecke to coordinate a location.
6 May Monday Night 7:30 PM	**Monthly Planning Meeting** See directions on page 4.
15 May Thursday Night 7:00 PM	**Beckman Auditorium at CalTech (Thursday) & Vosloh Forum at Pasadena City College (Friday)** **Landing a Backhoe on Mars** by Robert Manning The Phoenix spacecraft's landing system hearkens back to the Mars landing system design used by the Viking landers of the 1970s - and closer still to its cousin, the lost Mars Polar Lander of late 1999. How does it work and why does it land so differently than the Mars rovers?
24 May Saturday Evening	**In Town Dark Sky Observing Session at Ridgecrest Middle School** See directions above

South Bay Astronomical Society

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General Meeting at El Camino College Planetarium:
Friday, May 2nd, at 7:30 P.M.

Woodland Hills Camera and Telescopes

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South Bay Astronomical Society
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