

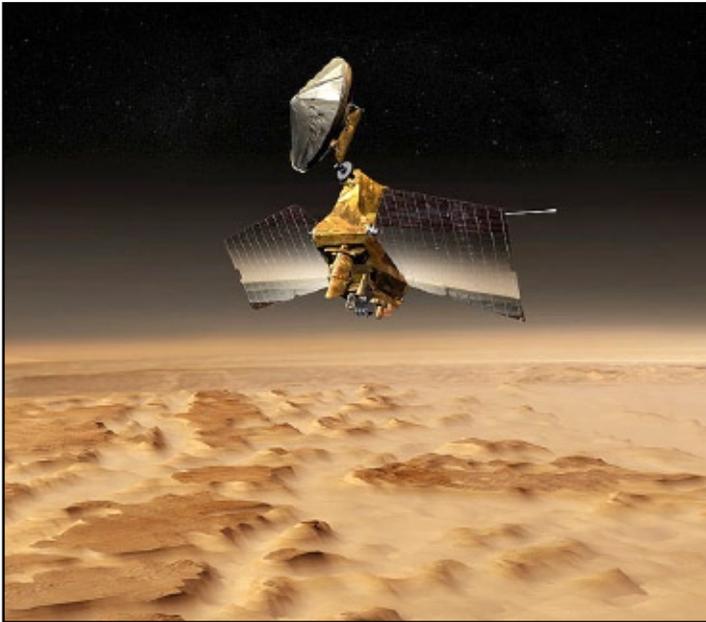
Sonoma Skies

Newsletter of the Sonoma County Astronomical Society
A nonprofit scientific and educational organization

May 2008

www.sonomaskies.org

Volume XXXI No. 5



NASA/JPL-Caltech

The Mars Reconnaissance Orbiter is helping to plan landing sites.

Earth Set to Invade Mars!

Countless science fictions books and films have shown Martian armies attacking the Earth, marching across our planet and enslaving or eradicating any humans they come across. Obviously this hasn't happened ... yet!

In fact, Earth is preparing for an invasion of Mars, but not in the conventional sense. Right now a flotilla of space probes are assembling to storm our neighboring planet, but rather than being armed with heat rays, they're kitted out with the latest in scientific equipment.

Their mission? To learn all they can about the red planet, and perhaps even answer the question of whether it harbors alien life.

It's certainly an exciting time for Mars exploration. The rovers Spirit and Opportunity are still scouting out the surface and sending back incredible images. The Phoenix Lander is on its way to Mars right now, and should arrive at the Martian north pole on May 25. After this will come NASA's Mars Science Laboratory, a large rover that will launch next year and arrive in 2010. Finally, the European Space Agency's ExoMars mission is expected to hit the ground in 2014.

continued Page 3

What motivates the Amateur Astronomer?

Allan Stern

SCAS May 14 Meeting, 7:30 PM
at Proctor Terrace School

Allen Stern's presentation discusses the subtle things that keep us going as amateur astronomers. What motivates people to become amateur astronomers and therefore causes people to join an astronomy club? A review and reflection on the motivators can help us get other people interested in joining SCAS.

The original presentation was given at the symposium "Amateur-Professional Partnerships in Astronomical Research and Education" which was part of a joint meeting of the Royal Astronomical Society of Canada (RASC), the American Association of Variable Star Observers (AAVSO), and the Astronomical Society of the Pacific (ASP) annual meeting, Universe 1999, held in Toronto Canada in July 1999. The audience of the symposium was about 200 people including amateur astronomers, professional astronomers, members of the mass media and the specialized press, educators and students in about equal numbers.



Al Stern at Stellafane

Allan has been interested in astronomy since the early 1970s. Using a planisphere he started learning the night sky while camping with his family in the High Sierras. He started reading about astronomy in several popular science magazines.

Then, he began and yet walks the path in an interesting and colorful life. He graduated from

Bradley University in Peoria, Illinois with a BS in Building Construction Technology in 1962. Joined the Navy and was assigned to Damage Control. In 1966 it was on to IBM as a Systems Engineer and then Computer Systems Analyst for 25 years. Since then, he has been pursuing his life-long love of astronomy and other areas of interest.

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Young Astronomers See page 6

Sonoma County Astronomical Society (SCAS)

Membership Information

Meetings: 7:30 PM on the second Wednesday of each month, in the Multipurpose Room of Proctor Terrace Elementary School, 1711 Bryden Lane at Fourth Street, Santa Rosa, unless otherwise announced in this publication. The public is invited.

Dues: \$25, renewable June 1 of each year. New members joining between December 1 and May 31 pay partial-year dues of \$12.50.

Star Parties: See the Events section for dates and times.

Rental Telescope: Members are eligible to borrow the club's 80mm refractor with tripod. Contact any Board member listed below.

Egroup URL: Connect with other members about going observing, observing reports and chat about astronomy and news items from AANC and *Sky & Telescope*. Hosted by Robert Leyland at r.leyland@verizon.net. Any SCAS member is welcome to join. Visit <http://groups.yahoo.com/group/scas> and click the "Join" button, or send an email to scas-subscribe@yahoogroups.com

Discount Subscriptions: For *Sky & Telescope*, new subscribers may send a check for \$32.95 payable to "SCAS", with your complete mailing address, directly to: Larry McCune, 544 Thyme Place, San Rafael, CA 94903. Once you have received the discount rate, you may renew your subscription by sending your personal check with the renewal notice directly to Sky Publishing. Discount subscriptions to *Astronomy* Magazine occur annually in October. Check *Sonoma Skies* for details.

Library: SCAS Librarian David Simons hosts a library of astronomy books that may be checked out by members at SCAS meetings, to be returned at the next meeting. Videotaped lectures on astronomy may be rented for \$3 per month.

Sonoma Skies is the monthly newsletter of the Sonoma County Astronomical Society (SCAS). Subscription is included as part of membership. Articles and member announcements are welcome and are published on a first come, first served basis, space permitting, and may be edited. **The deadline for submissions is 10 days prior to the end of each month.** Mail to: Editor, SCAS, P.O. Box 183, Santa Rosa, CA 95402, or email publications@sonomaskies.org

SCAS Elected Board

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sfollett@sonic.net

Librarian: David Simons 537-6632 davidsimons@planetatm.com

Visit us on the web at:
www.sonomaskies.org

May Observing Notes

- 5/1 Mercury in West thru 5/20. Best Mercury apparition of the year.
- 5/3 Saturn Stationary. Ends retrograde motion
- 5/5 New Moon 5:30 AM
Moon at Perigee 8 PM, Large Tides
- 5/6 Thin Crescent Moon close to Mercury
- 5/9 Jupiter Stationary. Begins retrograde motion.
- 5/10 Moon near Mars, 9:30 PM
- 5/12 Saturn and Regulus a few degrees N of Moon
- 5/13 Mercury greatest elongation East, 9 PM
- 5/22 Mars passes through M44 (Beehive Cluster) from about 10 PM to 12:30 AM.
- 5/24 Moon near Jupiter, 4 AM

—Some of above courtesy of Jack Welch

FREE TELESCOPE-MAKING PARTS!

Mirror blanks in various sizes, grit and assorted supplies are being given away.

Steve Follett, the person who is grinding the RFO's 40" mirror, needs to clear parts out of his garage right away. If you're interested, please contact him directly at 707/542-1561.

Steve also has a 6" F6 Dobsonian Reflector which needs a home. He figured the mirror, so you know the optics are excellent. It stands 3-1/2-4' tall, has a plywood rocker box and fiberboard tube. Call Steve if you want it.

Amateur Astronomy *(from Page 1)*

A very brief summary of but a 'few' of his astronomical accomplishments would include:

Helped create slide shows for school presentations; started Starlab presentations with a friend; was heavily engaged in the Stellafane star parties and has helped coordinate about 10 of the Stellafane conventions; was lead coordinator of the Stellafane convention for several years; became involved in the Astronomical Society of the Pacific (ASP) and was involved in special projects for the ASP. One document prepared in 1995 was the seed that years later became the Night Sky Network. He helped facilitate Project Astro classes. Presented planetarium shows at the Morrison Planetarium. Joined the SFAA (San Francisco Amateur Astronomers, TVS (Tri-Valley Stargazers) and EAS (East Bay Astronomy Society) (EAS) and was VP of SFAA for 2 years; President of SFAA for 5 years; Coordinated Mt. Tam star parties for SFAA for about 5 or 6 years; did sidewalk astronomy with John Dobson; did Starlabs for NASA space camp in Mountain View for several years and now owns a business doing Starlabs for schools.

At present, he is an SCAS member and is now becoming a docent at the Robert Ferguson Observatory (RFO). He does lots of reading too especially in the followings areas: Copernican revolution era, cosmology, particle physics and the history of the large telescopes.

In sum, Al is a well rounded amateur astronomer and one that you will want to hear discuss the motivational aspects of astronomy to people like you and me.

Earth to Invade Mars (from Page 1)

It's certainly an attack in force, and two generals planning this assault are Michael Meyer, a lead scientist for NASA's Mars Exploration Program and Luann Becker, a University of California, Santa Barbara geochemist.

To test for alien life the missions will look for organic chemicals — strong clues that living organisms are there. Becker has developed the Mars Organic Molecule Analyzer, or MOMA. She explains, "MOMA is like a Star Trek tricorder because we can use it to cover the full gamut of measurements that will answer the question of life. Then we'll be able to address the difficult question of whether something interesting is there."

This kind of thing has been tried before with the Viking missions of the 1970s, although the results were frustratingly ambiguous. Says Meyer, "Part of the controversy was with Viking's Labeled Release Experiment. The concept was that if we added organics and water to the Martian soil, all the Martian organisms in that soil would go to town eating the organic matter. The organics would in the process be broken down into carbon dioxide gas, and we could measure that."

Basically, samples were warmed up and given food-like chemicals and then watched to see if any microbes reacted. Becker laments, "Viking was an excellent experiment if you think about the strategy behind it: going to Mars and heating a sample, something we do everyday in our laboratory. [But] we got ambiguous results — something might be there, but it might not be there. Anytime you get an ambiguous result, that's considered a non-result."

The same idea of hunting for organic materials is used for modern missions. Half the battle is knowing where to look by deciding which areas are most likely to give interesting results. "Location, location, location," says Becker. "That really is key. We're going to have to use every bit of information we get from the satellites currently flying."

NASA's Mars Reconnaissance Orbiter is taking high resolution photos of the Martian surface, providing valuable intelligence about landing sites. However, a "shotgun approach" is in the cards — scattering the various machines over different areas to sample a range of locations. Says Meyer, "We are sending missions to three different places. Phoenix is going to dig into the ice near the north pole. Mars Science Laboratory has a little drill, so it's going to go to wherever there's exposed bedrock and rocks lying around. ExoMars has a big drill, so it's going to go deeper down into the surface."

With all these missions on the way, hopes are high that we'll soon conquer Mars by uncovering its most guarded secrets. However, past attempts like Viking have proven that Mars is a difficult enemy to overcome. Still, lessons have been learned and many are optimistic. Victory could well be within our sights.

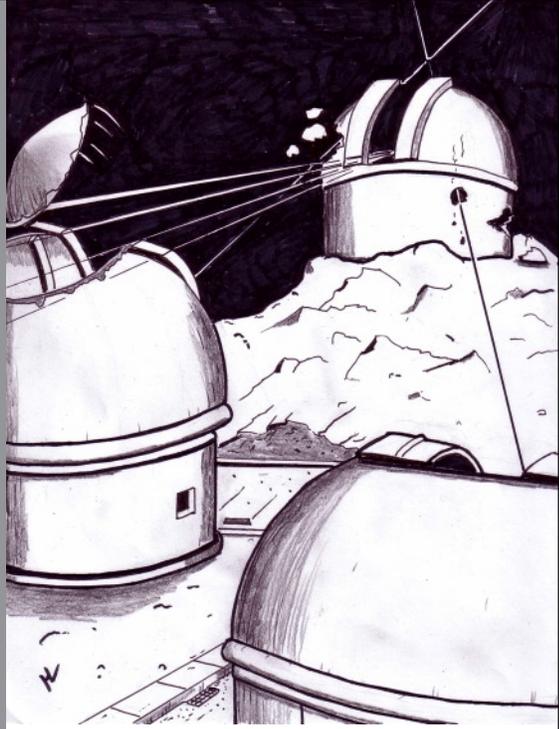
—by Lee Pullen, *Astrobiology Magazine*

OBSERVING LINK

Sky & Tel's Observing Almanac for precise rise, set, transit times of planets and featured phenomena. Cut and paste this address (<http://www.skyandtelescope.com/observing/objects/javascript/3305541.html#>) into your browser, or click on the one below to link directly from this newsletter:

<http://www.skyandtelescope.com/observing/objects/javascript/3305541.html#>

Sonoma Skies, May 2008



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by
Herb
Larsen

Robotic Laser Adaptive Optics gone mad!

IT'S MEMBERSHIP RENEWAL TIME!

Please send your dues in by June 1 for the 2008-2009 Membership Year. You can use the form on Page 7 if you wish to make any changes. **Important:** Please consider receiving the newsletter electronically. The cost of printing and mailing is rising dramatically. Help us keep the membership dues low by signing up for your online copy instead.

SOCIAL AMENITIES

Many thanks to Derek Braud for providing coffee at the April meeting. You can contribute too...just pick a month and sign up with one of the Board members.

Scope City

NEW MEMBER BONUS!

Scope City at 350 Bay Street, San Francisco, is offering a **\$25 merchandise discount to new members.**

Manager Sam Sweiss has supported SCAS and Striking Sparks and offers a huge selection of telescopes, accessories and more. Obtain a receipt from Walt Bodley, Membership Director, showing you have paid the \$25 SCAS membership dues. To arrange for your merchandise discount, contact Sam at 415/421-8800 or at sanfrancisco@scopecity.com

Events

ROBERT FERGUSON OBSERVATORY PUBLIC VIEWING

Saturdays, May 3, May 10 and May 31

Solar Viewing: Noon - 4:00 PM

Night Viewing begins 9:00 PM

The Observatory features three telescopes: A 14-inch SCT with CCD camera in the East wing, an 8-inch refractor under the dome and a 24-inch Dobsonian in the West wing. SCAS members may set up telescopes in the observatory parking lot to assist with public viewing. Auto access closes at dusk; late arrivals must carry equipment from the horse stable parking area.

Fees: No admission fee for the solar viewing, but donations are appreciated. The Park charges \$6 per vehicle for entry. A \$3 donation is requested from adults 18 and over for admission to the observatory during night viewing sessions.

NIGHT SKY SUMMER SERIES

Session #1—June 2; Session #2—June 9;

Session #3—June 30

Classes held Mondays at 7:30 PM. Each class includes a lecture on the constellations of the season, their history and mythology, and how to find objects within them. **Fees:** \$75 for the series of six presentations. (Single session fee is \$23). 10% discount for VMOA members. Classes are held at the Observatory. For information or to register: (707) 833-6979, <http://www.rfo.org> or nightsky@rfo.org

OBSERVING LABS

Sunday, June 1—“Diffuse Nebulae, Star Formation and Open Clusters (Summer)”—Raincheck June 4

Sunday, June 29—“Binaries and Multiple Stars (Summer)”—Raincheck July 2

“Diffuse Nebulae, Star Formation, and Open Clusters” - An intensive telescope observing session after a brief presentation on the night’s theme. Handouts/Observing Lists provided. Attendance limited to 6. Fee: \$30. Seasonal sessions on each topic occur during year with different observing lists. Lab begins 8:30 PM. For reservations, email: nightsky@rfo.org

RESERVE THE FERGUSON OBSERVATORY!

Groups of up to 50 can be accommodated. Astronomer docents provide sky interpretation and operate telescopes, and you can stay up as late as you want! Make your reservation at least two weeks prior to your event. Best times for optimal sky gazing are any time more than a week away from a Full Moon.

In addition to \$111 charged by the RFO for use of the observatory facilities, the State Park System charges \$111 for use of the *Group Campground*. Because it is adjacent to the Observatory, the group camp must be reserved for private events. Total Cost: \$222. For information on how to reserve, visit www.rfo.org or contact George Loyer at gloyer@rfo.org.

SRJC PLANETARIUM

**“Our Star the Sun”
Through May 25**

We certainly are aware of the Sun, but how often do we think of it as the nearest star? Join us as we learn about our star, how it formed, how it works, how it affects us, and many of its features such as: sun spots, flares, prominences, etc. May 4, Day Under The Oaks, half-hour show only.



Shows are held at Santa Rosa Campus, Lark Hall, Room 2001, on Fridays and Saturdays at 7:00 PM and 8:30 PM, Sundays at 1:30 PM and 3:00 PM during the Fall and Spring semesters. Admission is \$5 General; \$3 Students and Seniors (60+). Tickets are sold at the door only, beginning 30 minutes before show time. A parking permit is required and is included in the Planetarium admission price. Pick it up at the planetarium when you pay admission. Please arrive early enough to place your permit on your vehicle’s dashboard before the show starts.

Info: 527-4372, <http://www.santarosa.edu/planetarium/>

2008 GOLDEN STATE STAR PARTY JULY 2-6

Registration is in full swing, and it looks like we will have a great turn out at this year’s Golden State Star Party. The unrivalled new site near Adin, California, is as good as it gets. The site features a huge observing field with minimal dust and no rocks, ideal for camping and equipment set-up. There are ample amenities and conveniences.

All are welcome, including people new to the hobby or don’t own their own telescope. We have many seasoned astronomers who would be thrilled to share views, knowledge, and their sheer joy of the night sky. The whole idea behind GSSP is simply to provide the best possible venue for the pure enjoyment of Astronomy. The cost is \$55 for registration, camping, and site amenities (excluding food). Your equipment can remain set up for the entire event. For registration and more information, visit <http://www.goldenstatestarparty.org>.

SONOMA STATE UNIVERSITY SERIES “WHAT PHYSICISTS DO”

Mondays at 4:00 PM

Darwin Hall Room 103 (Coffee at 3:30 PM)

May 5—Lighting Up the Dark: Galaxies as Probes of the Dark Universe

Dr. Risa Wechsler of Stanford University will describe how the dark matter that pervades our Universe is connected to the galaxies observed with telescopes, and how galaxy surveys can be used to understand the contents of our Universe.

Contact <http://phys-astro.sonoma.edu/wpd/>

Events

SCAS IN YOSEMITE AUGUST 8 & 9

This year our weekend in Yosemite is August 8 & 9. For once the Yosemite weekend does not conflict with an RFO Public Night. Lynn Anderson will be out of the country for several weeks before the Yosemite weekend, so Len Nelson (lennelsn@comcast.net) will coordinate the sign-ups for this event. Let him know who you are, how many in your party and how many telescopes you will be bringing. The National Park Service allows us only 5 campsites, with each site limited to 6 people and two vehicles. While sometimes people can go to Yosemite and secure extra campsites, last year there were no extra campsites available, so sign up early or be wait listed.

LICK OBSERVATORY

In 2008, Lick Observatory will offer public viewing through both the 36-inch Great Lick Refractor and Nickel 40-inch Reflecting Telescope on six Friday evenings. Each evening will also feature two speakers, who present programs even if clouds or fog prohibit viewing.

Dates are **June 27, July 11, July 25, August 8, August 22, and Sept 5**. Speakers and talk titles will be announced on the website when determined.

Lick astronomers will present multimedia lectures on their research or topics of current interest. A "History of Lick Observatory" talk will also be presented. Amateur astronomer volunteers will provide additional outside viewing and informal talks. The first talk will begin at sunset and when it gets dark observing will continue until everyone has had the opportunity to view through both telescopes.

May is the month to purchase tickets for any of the program dates. Go to <http://www.ucolick.org/public/sumvispro.html> to order tickets or contact the Lick Observatory Gift Shop at 408-274-5061 or giftshop@ucolick.org if you have further questions about the Summer Visitors Program.

MORRISON PLANETARIUM DEAN LECTURE SERIES

May 19, 7:30 PM: "Near-Earth Objects: Finding Them Before They Find Us"—Dr. Don Yeomans, Manager, NASA Near Earth Object Program Office

Near-Earth comets and asteroids have both seeded the early Earth with the building blocks of life and altered the evolutionary process with major extinction events. Recent ground-based and space-based observations of these objects make it less likely that we will go the way of the dinosaurs.

Location: Kanbar Hall, Jewish Community Center, 3200 California Street (at Presidio). Parking in the UCSF Laurel Heights campus parking lot is \$1.25/night. Parking in the JCC garage is \$1.25 per half-hour. Tickets \$5 at the door or by email. Contact: 415/321-8000.

<http://www.calacademy.org/events/>

PUBLIC ASTRONOMY IN THE MERRY MONTH OF MAY

Astronomy Day, Saturday May 10: This is a major event and our chance to gather at selected sites around the county to share a view of the five-day old moon which will be very close to Mars, Saturn and anything else the street lamps will allow to be seen in Petaluma at McDowell Elementary School and in Healdsburg on the north-west and south-west corners of Healdsburg Avenue and North Street. As of this writing (April 20), we know of no Santa Rosa location. Len Nelson will be heading up the Petaluma site. If you live in the south county and have time to join him, email lennelsn@comcast.net to let him know how many of you will be joining him. If you live in Santa Rosa or the north county, contact Lynn Anderson at astroman@sonic.net. There is also a Public Viewing Night at the RFO.

Taking astronomy to the public on the street corners in the manner of John Dobson, is a lot of fun. Many people just look at you and keep walking, as if you were a telemarketer, and others will step right up. One of the most challenging aspects is convincing the skeptics that you are only there to share a view of the night sky for free. Of course, you can "twist their arms" by sharing information about the club and the RFO.

School Star Party, Friday May 9: We have been asked to have volunteers with telescopes at Guerneville Elementary School the day before Astronomy Day. There will be telescope viewing of the four-day old moon and Saturn, and whatever else we can find in the canyon, beginning around 8:00. Contact Lynn at astroman@sonic.net if you can help out at this event.

Day Under the Oaks, Sunday May 4: Held at Santa Rosa Junior College. Members of SCAS and RFO docents will be setting up telescopes for solar viewing and answering questions about astronomy on the grassy area to the east of the Planetarium. You don't have to have a solar filter to help out at this event, people are needed to organize the lines and answer general questions at this popular event. Contact Colleen Ferguson at nebulous@sonic.net to volunteer for this ever popular activity.

MT. TAMALPAIS ASTRONOMY

May 10, 8:00 PM: "Climate Change: Observational Evidence, the Role of Humans and Societal Impacts"—Dr. Philip Duffy, Lawrence Livermore Lab

An overview of scientific evidence for global warming and for a human role in this process, followed by a discussion of possible consequences for society.

Sponsored by the Mt Tamalpais State Park and coordinated by volunteers of the Mt Tam Interpretive Association. FREE and open to the public. Families and students encouraged to come. Presentations held in the Mountain Theatre. Viewing afterwards in Rock Springs Parking Area, provided by San Francisco Amateur Astronomers. Dress warmly and car pool if possible. Bring a flashlight! Info: 415/455-5370; <http://www.mttam.net/>

Young Astronomers



Planetarium Visit for Young Astronomers

*Tentative Date: Sunday, May 18, 1:30 PM
SRJC Planetarium, Santa Rosa*

All young astronomers are invited to conclude this year's YA season by attending a public showing of the SRJC Planetarium's current program "Our Star the Sun." An anonymous donor has once again offered to cover half the cost of admission for YA members and their families.

This "meeting" is tentatively scheduled for the 1:30 PM public Planetarium showing on Sunday, May 18th. As we will be attending with the general public, seating will be limited, and will be available on a first-come, first-served basis.

If you plan to attend, please e-mail YA advisor Gary Jordan at sieramolloy@comcast.net. An email with details such as arrival time, parking arrangements, etc., will be sent in reply.

Many thanks to all YA members for making this a great YA season!

New Laser Technology May Help Astronomers Find Earth-like Planets

Currently, the primary method used to find planets orbiting distant stars is able to detect mostly Jupiter-sized (or larger) worlds. However, scientists and engineers at the Harvard-Smithsonian Center for Astrophysics (CfA), working in association with colleagues at MIT, are developing a new laser technology which could enable scientists to spot Earth-sized worlds in Earth-like orbits.

Planets orbiting other stars (known as extrasolar planets, or exoplanets) are much too faint and distant to be seen directly. Instead, astronomers look for the planet's gravitational effect on its star. While the gravity of a star pulls on a planet and holds the planet in orbit, the planet's gravity also tugs on the star, making the star wobble slightly back and forth. If the wobble happens to lie along our line of sight from Earth, sensitive spectrographs may be able to detect it.

The size of a star's wobble depends on the planet's mass, along with its distance from the star. The larger the mass of the planet, the bigger the star's wobble will be. This makes larger planets easier to find. Also, planets that are in a tight, short-period orbit are easier to find than those with a wide, long-period orbit. This explains why most of the exoplanets detected so far are of Jupiter-size or larger, and tend to orbit fairly close to their star. So far, astronomers have been able to detect planets with as low as 5-Earth-masses in tight, Mercury-like orbits, but our current technology isn't capable of finding Earth-sized planets in Earth-like orbits.

The new device being developed by the CfA colleagues, called an astro-comb, should open the door to finding the elusive Earth-sized planets. It uses ultra-short, one millionth of one billionth of a second, pulses of laser light, linked to an atomic clock. This provides a precise standard against which light from a star can be measured. The astro-comb can make measurements accurate to one part in a trillion, giving astronomers the potential to increase the resolution of the wobble planet-hunting technique by about 100 times.

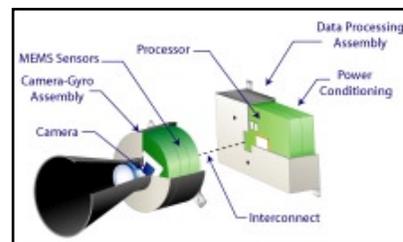
A prototype astro-comb will undergo testing this summer at CfA's Mount Hopkins Observatory in Arizona. Those initial tests will be used to refine the design of the device. The upgraded version of the astro-comb is planned for a project being built in the Canary Islands called the New Earths Facility. It is currently scheduled to go into service in 2010.

NASA SpacePlace

Stellar Compass for Space Explorers

by Patrick 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?



Compass is built as two separate assemblies, the camera-gyro assembly and the data processor assembly, connected by a wiring harness.

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

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.

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.

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 <http://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>.

—Article provided by JPL/NASA

YA INFORMATION

Meetings: 7:30 PM the second Friday of each month of the school year, at Apple Blossom School, 700 Water Trough Road, Sebastopol, in the Multipurpose Hall. Open to all Sonoma County students. Telescope viewing is held in the upper parking lot after the meeting. Directions: From Hwy. 116 in Sebastopol, go west onto Bodega Ave. Continue almost two miles to Water Trough Rd. Turn left and go about 1/3 mile to the school, on your right.

YA ELECTED OFFICERS

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VP/PROGRAM DIRECTOR: Geoffrey Knoll

RECORDER: Open

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Sonoma County Astronomical Society Membership Application/Renewal

The \$25.00 Annual Membership fee for 2008-2009 is due June 1.

Please complete this form and give it to Walt Bodley with your check, payable to "SCAS," at the next meeting, or mail them to: SCAS, P.O. Box 183, Santa Rosa, CA 95402

New **Renewal** (If renewing, provide name only, plus any information that has changed).

Name: _____

Address: _____

City/State/Zip: _____

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**Sonoma County
Astronomical Society**

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Sonoma Skies
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MAY 14

Allen Stern

**What Motivates the
Amateur Astronomer?**