

Sonoma Skies

Newsletter of the Sonoma County
A nonprofit scientific and educational organization



www.sonomaskies.org

September 2005

Volume XXVIII No. 8



JOHN DOBSON'S 90TH BIRTHDAY AT AANC-CON 2005

A beautiful, sunny day greeted more than 700 attendees at the AANC-Con Conference and Workshops held in San Francisco



Photo: Sam Sweiss & Art Rosch

Left to right: Daryll Stanford, Astronomer of the Year; John Dobson; Sam Sweiss

August 27. There were lots of activities, food, vendors selling products, and demonstrations, including members from Chabot Telescope Makers Workshop who showed folks how to grind mirrors. Everybody got their hands on the huge 20-inch mirror guided by Dave Barosso.

Speakers included Timothy Ferris, Lynette Cook, Steve Gottlieb, Richard Crisp, and Chad Moore with presentations by Bob Schalck and ASP's Marne Berendsen.

The "Valley of the Dobs" was filled with people who had built their own telescopes using John Dobson's model.

Sam Sweiss of Scope City represented Parks Optical, Lumicon International, Meade, Celestron, William Optics, JMI and TeleVue, all of whom donated some wonderful raffle items. Within the first 5 minutes of the raffle he had sold \$200 worth of tickets and the raffle netted over \$1,000. By the way, there are some "Celebrating John Dobson's 90th Birthday" buttons left,



so if you want one, contact Sam sanfrancisco@scopecity.com. Price is \$5 and proceeds go directly to AANC. Commemorative T-shirts and mugs are available at Cafe Press <http://www.cafepress.com/aanc>

Members of our own Santa Rosa Girl Scout Troop 83 showed off their prize-winning 8-inch f/5 Dobsonian reflector with homemade mirror. Katie Barmazel, Ivy White and Sarah Davis won

(continued page 2)



Left to Right: Janet Davis (Troop Leader), Ivy White, Sam, Sarah Davis, Bob Schalck, Katie Barmazel

Photo: Sam Sweiss & Art Rosch

Caring for Your Fine Optics with Bob Schalck

SCAS September 14 Meeting,
Proctor Terrace School

Part of the allure of post-Galilean astronomy is being able to observe the heavens with optical aid. I'm sure we all remember our first glimpses of planets, stars and nebula through a telescope. Even a small pair of binoculars augments the seeing power of our naked eyes tremendously. But with using our "big eyes" as our windows to the stars one thing becomes obvious: It's a dirty world out there, folks. Eventually a telescope care-giver wants to know how to ameliorate the effects of our environment on our precious glass. How best to clean and care for our optics?

Longtime SCAS member Bob Schalck will be giving us the low-down on what he calls the "Classical Cleaning Method of Optics." You may have heard Bob talk about optical systems, and you should listen to him.



Bob Schalck caring for "Rachel," Chabot Observatory's 20" refractor objective.

Bob is a Master Optician with over 35 years in the optical industry. He has taught at the Chabot Telescope Makers Workshop for much of that time, and has been a judge at the Riverside Telescope Makers' Conference for 30 years. He still works in the trade, but volunteers his

time caring for the old refractors at Chabot Observatory. His pictures and articles have been published in *Sky and Telescope*, *Astronomy* and *Telescope Making* magazines, and he has received a number of awards for his work in telescope making and astronomy.

Bob will give a presentation on optical cleaning methods, then finish with a "round table" demonstration, with time for members to bring their questions. Members may bring their own small optics (no 200" mirrors, please!) along with their questions. Bob may be able to give some pointers if time allows. (He asks you not to disassemble your optics unless you are confident you can reassemble them).

So please join us September 14, and clear up some cloudy issues on caring for our windows to the universe.

Young Astronomers: See page 6

Sonoma Skies

STAR-B-QUE 2005

by Keith Payea

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 the last Wednesday of each month.** Mail to: Editor, SCAS, P.O. Box 183, Santa Rosa, CA 95402, or email Editor: Cecelia Yarnell, ceceliay@sbcglobal.net

SCAS Membership Information

MEMBERSHIP MEETINGS: 7:30 PM on the second Wednesday of each month, in the Multipurpose Room of Proctor Terrace Elementary School on Bryden Lane near Fourth Street in 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 may pay partial-year dues of \$12.50.

SCAS STAR PARTIES: See the Events section for dates and times. The Geysers observing site is locked to public access. For use during monthly star parties, SCAS members may obtain the combination to the gate lock at the site by contacting any board member listed below.

RENTAL TELESCOPES: Members are eligible to borrow telescopes for a \$10 per month donation, or **FREE** each month you participate in a SCAS-related Public Star Party. Five telescopes are available: 8" and 5" Celestron SCTs, 8" and 12.5" Newtonians on Dobsonian mounts; and an 80mm refractor. Contact John Roush.

SCAS EGROUPE URL: Any SCAS member is welcome to join. Hosted by Robert Leyland at r.leyland@verizon.net the majority of traffic is about going observing, observing reports and astronomy-related news. We get news items from AANC and Sky & Telescope and chat about astronomy. To join, either visit <http://groups.yahoo.com/group/scas> and click the "Join" button, or send an email to scas_subscribe@yahoo.com

DISCOUNT SUBSCRIPTIONS: For *Sky & Telescope Magazine*, 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. For renewals, send him your check with the completed renewal card and return envelope. Discount subscriptions to *Astronomy Magazine* occur annually in October. Check *Sonoma Skies* for details.

LIBRARY: SCAS Librarian Joan Thornton 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.

SCAS Elected Board

President: Keith Payea, 566-8935, kpayea@bryantlabs.net

Vice-President & Program Director: John Whitehouse, 539-5549, jmw@sonic.net

Treasurer: Larry McCune, (415)492-1426, llmccune@comcast.net

Secretary: Loren Cooper, 525-8737, lorenco@sonic.net

Membership Director: Walt Bodley, 823-5268, wbodley@sonic.net

Community Activities Director: Len Nelson, 763-8007, lennelson@comcast.net

Publications Director: Cecelia Yarnell, 569-9663, ceceliay@sbcglobal.net

SCAS Appointed Positions

Amateur Telescope Making: Steve Follett, 542-1561, sfollett@sonic.net

Young Astronomers Advisor: Gary Jordan, 829-5288, SieraMolly@aol.com

Striking Sparks Program Coordinator: Dickson Yeager, 539-2385, deep6@sonic.net

Librarian: Joan Thornton, 762-0594, phonyjoanie@earthlink.net

Public Star Party Coordinator: Bruce Lotz, 576-7833, ablots@sonic.net

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We had another wonderful day for our Star-B-Que this year. I arrived early in the afternoon and chatted with Merlin for a while as I helped him on his wasp patrol. These insects have been very busy this year so there are always new nests to be dealt with. Merlin had the solar telescope set up in the East wing, but there wasn't much to see. The sun has been pretty quiet recently as we approach the "bottom" of the sunspot cycle in 2007.

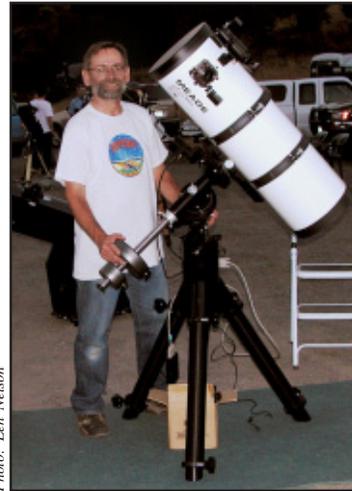


Photo: Len Nelson

John Whitehouse, SCAS Vice President

By the way, did you know that the cycle is not sinusoidal? The rate of increase in the number of sunspots in a given cycle is quite a bit faster than the rate of decrease. Take a look at <http://science.msfc.nasa.gov/ssl/pad/solar/sunspots.htm> for a lot more information about the current cycle and the historical data.

As we got closer to the lighting of the barbecue, more and more people began arriving. Many took advantage of the hiking trails around

the RFO to explore the Earth a little before exploring the heavens. The shade under the oak trees was just too inviting for me, so I took the opportunity to get to know some of our club members a little better. As usual, once the fire was ready, there was a big crowd around it to cook their meals. The potluck was really nice, thanks to Kay Johnston who brought table cloths and decorations for the picnic tables. Everybody brought their best potluck food to share.

After dinner, the telescopes came out in earnest. There were all types and sizes, and even "First Light" for a new scope that Steve Follett had just completed. I didn't get much time to spend with all of them, as I had committed to run the 24" scope in the west wing for the evening. I was far from lonely up there, as most everyone came up to take in the views of the deep sky objects in Sagittarius, among others. We had to play hide and seek with some high clouds as the evening went on, but as one area clouded over, another opened up.

Sometime around midnight, I was all by myself again, so I got ready to head home. There was still a small group in the parking lot, including Jack Welch who offered to lock up the observatory. Everyone had pitched in to clean up the picnic area and leave everything looking pristine again despite the large turnout we had.

I know I had a great time, and I hope you all did too. Thanks to everyone who helped, and I hope to see you there again next year.



Photo: Len Nelson

Young Astronomer David Elder

Striking Sparks: On the Move

by Dickson Yeager

Mark Saturday, March 18, 2006 on your calendar for the Striking Sparks potluck dinner and the awarding of the 2006 Striking Sparks telescopes. Your Board has approved the purchase of ten Orion 6", f8 telescopes on Dobsonian mounts to be awarded to the ten winners of the essay contest.

Sponsorships are \$200 again this year, and of course you can donate more if you choose. We also accept non-sponsorship donation, to go toward accessories for the telescopes and raffle prizes. They are tax deductible, and we are ready to accept your sponsorships and donations now. Contact me at 539-2385 or deep6@sonic.net to sign up as a sponsor or make a donation .

Your Board and I think it is very important that each winner receive mentoring during the first year. Some sponsors are able to provide this mentoring and some are not. Therefore, this year we are looking for SCAS members to volunteer for this role. You will be assigned to a student whose sponsor is unable to fill that role. Here's what's involved:

- Contact the Student to introduce yourself prior to the program.
- Be present to sit with the student and sponsor at the dinner.
- Weather permitting, assist the student in setting up the scope in the schoolyard after the program. Go over the basic use of the scope. The Moon will be a waning gibbous Moon rising later in the evening.
- Offer ongoing assistance during the next several months.
- Invite the student to a Young Astronomers meeting.
- Invite the student to join you at a SCAS and RFO public night and the SCAS Star-B-Que.

Last but not least, here are other volunteer opportunities:

- Seek raffle prize donations and items to be included with each scope.
- Create and install (with the help of SCAS members) decorations for the program. Who can forget Joan's "Asteroid Belt" from last year?
- Provide storage and assembly space for the ten Orion scopes and Dobsonian mounts.
- Help with tasks that need to be done the day of the event.
- And of course, all of you can bring food for the potluck. So drag out one of your favorite recipes.

So step forward and volunteer. You'll be glad you did.

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

The
Semi-Astronomer
S
by
Herb
Larsen



Frankly, I think Fred is
a trifle overdressed for these
casual starparties.

AANC-Con 2005 from Page 1

the Merit Award and the top prize: Astronomer's Choice Award at the Riverside Telescope Makers Conference. Troop Leader Janet Davis took the girls to Scope City earlier this year to collect parts donated by Maurice and Sam Sweiss. Bob Schalck generously helped the girls with grinding and polishing their mirror and mounting the secondary mirror and focuser.

The Western Astronomical Association's special "John Goodricke Award 2005" was awarded to Maurice and Sam Sweiss for promoting astronomy to the public and to children, for their support of astronomy clubs and events in the Bay Area and, as presenter Walter Heiges put it, for being "astrosaints."



Walt Heiges presenting award to Sam Sweiss

The "AANC 2005 Commercial Award" was awarded to Vic Maris of Stellarvue in Auburn, CA.

As twilight ended observing began, with over 40 telescopes operating. Pizzas were on hand (in mouth) later.

It was a great day and the perfect celebration of the love of astronomy fostered by the ingenuity and generosity of John Dobson.

Special thanks go to AANC VP Kenneth Frank for his tireless work organizing the entire event, with the help of John Dillon, President of San Francisco Amateur Astronomers and Walt Heiges, President of AANC. More photos: photos.yahoo.com/sanfranscopecity

Events

ROBERT H. FERGUSON OBSERVATORY

Public Viewing: Saturdays, September 24 and October 1

Solar Viewing: 12:00 AM - 4:00 PM

Night Viewing: Begins 8:00 PM

The Observatory: Three scopes are operating: The 14-inch SCT with CCD camera in the East wing, the 8-inch refractor under the dome and the 24-inch Dobsonian in the West wing. No admission fee for the solar viewing, but donations are appreciated. The Park charges \$6 per vehicle for entry. A \$2 donation is requested from adults 18 and over for admission to the observatory during night viewing sessions.

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.

Classes

Sept. 27 Night Sky Fall Series, 7:00 PM

Oct. 4 Night Sky Fall Series, 7:00 PM

Classes are held at the Observatory. Reservations recommended. (707) 833-6979, <http://www.rfo.org> or nightsky@rfo.org

MT. TAMALPAIS ASTRONOMY

Saturday, September 10, 8:00 PM

“Black Holes: The Science Behind the Science Fiction”

What are black holes? How are they discovered? How do they give rise to some of the most remarkable and bizarre phenomena in the universe? Sponsored by the Mt Tamalpais State Park and coordinated by volunteers of the Mt Tam Interpretive Association. All programs are 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! Hotline: 415/289-6636; Info: <http://www.mttam.net/>

NASA AMES RESEARCH CENTER

Sept. 20: Exploration Lecture Series presents: “The 2005 Grand Challenge—Racing for The Future”—Author Dr. William “Red” Whittaker

Dr. Whittaker leads the Red Team. He is the Fredkin Research Professor of Robotics at Carnegie Mellon University’s Robotics Institute and the founder of the Field Robotics Center and the Robotics Engineering Consortium. This series of lectures is focused on three main themes: ‘explore, discover and understand,’ and will include everything from new technologies that support human missions to the Moon and Mars, to autonomous robots and Earth analog research.

The free public lecture begins at 7 PM at the Parade Ground, Shenandoah Plaza, Moffett Field. Take the Moffett Field exit off Highway 101. <http://researchpark.arc.nasa.gov>

SCAS PUBLIC STAR PARTIES

These are public events—all are invited. Members with scopes are encouraged to attend.* Great for planetary astronomy with fellow observers at an easily accessible site.

SATURDAY, SEPTEMBER 10

Sunset: 7:26 PM PDT

End Astronomical Twilight: 8:57 PM PDT

Moonset: 11:07 PM PDT

SANTA ROSA: Youth Community Park in Santa Rosa, on the west side of Fulton Road, between Guerneville Road and Piner Road, just opposite Piner High School. Contact: Bruce Lotz, Coordinator (707) 576-7833, ablotz@sonic.net

HEALDSBURG: Corner of Healdsburg Ave. and North St., one block north of the Plaza, between 8:00 and 10:00 PM. Contact Bob Schalck at bob.schalck@jdsu.com **The Healdsburg group needs help!** Bring your scope, or borrow one listed on Page 2 for *free* each month you participate.

THE GEYSERS STAR PARTIES

NO observing at this site in September: Hunting season continues through Sept. 25. Observing schedule will resume in October.

SILICON VALLEY ASTRONOMY LECTURE SERIES

Oct. 5, 7:00 PM: “Jupiter’s Tantalizing Moon: Water (and Life?) Under the Ice of Europa—Astronomer Cynthia Phillips, Principal Investigator for a number of projects investigating Europa and Mars at the SETI Institute.

Ever since robot spacecraft have been exploring the Jupiter system, Europa has especially captured the interest of astronomers. Although it’s surface is cold and frozen, there is evidence that under the ice is an ocean of warmer, liquid water. In her talk, Dr. Phillips will explore Europa’s geology, focusing on the prospects for water and the possibilities of life.

Arrive early—seating is limited. Location: Smithwick Theater, Foothill College, Los Altos Hills. Free and open to the public. Parking \$2. Info: 650/949-7888 <http://www.earthsky.com/shows/profiles/cabrol.php>

THE PLANETARY SOCIETY LECTURE

Sept. 27, 7:30 PM —“Titan Through the Eyes of Huygens: A Quiet Little Place With a Nice Atmosphere” — Dr. Chris McKay, Planetary Scientist, Astrobiologist, Space Sciences Division of NASA/Ames Research Center

Saturn’s largest moon is the only moon in the solar system with a substantial atmosphere. New results from Cassini/Huygens have shown us the surface of Titan and will help us understand this world that is strange and yet in many ways similar to our own.

Free and open to the public. Location: The Randall Museum, 199 Museum Way. San Francisco. Directions: <http://randallmuseum.org/planvisit.cfm>

Events

SRJC PLANETARIUM

“Beauty in the Sky”—Through October 9

Beauty in the sky can be found in both the daytime and nighttime. Come with us as we see and learn about such sights as rainbows, halos, phases of the Moon, solar & lunar eclipses, comets, meteor activity, auroras, and the motions of the Earth, Moon, and planets.



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/>

SAN FRANCISCO AMATEUR ASTRONOMERS SPEAKERS

Sept. 21, 7:30 PM: “Cosmic Butterflies”—Sun Kwok, University of Calgary, investigator of submillimeter wave astronomy on the Odin Space Mission

He has written two books on planetary nebulae: *The Origins and Evolution of Planetary Nebulae* and *Cosmic Butterflies* along with articles for *Sky and Telescope* and *Astronomy* magazines. Bring your books for signing. We are fortunate to have him speak to us while he is at NASA Ames this month.

Meetings are held at the Randall Museum, 199 Museum Way, San Francisco. Contact: Linda Mahan at doublestar@comcast.net

MORRISON PLANETARIUM DEAN LECTURE SERIES

Sept. 19: “Dark Energy and the Runaway Universe”—Dr. Alex Filippenko, University of California at Berkeley

There is now strong evidence that over the largest distances, our Universe is dominated by “dark energy” that makes space expand faster and faster with time. Einstein postulated “cosmic antigravity” of this type in 1917; ironically, he later retracted the idea as his “biggest blunder.”

Location: During reconstruction, lectures are held at the 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. Programs begin at 7:30 PM in Kanbar Hall at the JCC. Tickets \$4 at the door or by email. Contact: 415/750-7141, <http://www.calacademy.org/planetarium/dean.cfm>

SONOMA STATE UNIVERSITY SERIES “WHAT PHYSICISTS DO”

Mondays at 4:00 PM

Schulz Hall Room 3001 (Coffee at 3:30 PM)

Sept. 12—Extreme Neutrinos: Using a cube of 50,000-year-old South Pole ice to peer into space

Dr. Kurt Woschnagg of UC Berkeley will explain how and why physicists go to the end of the world to build the world's largest and strangest telescope (IceCube, successor to AMANDA) in hopes of seeing nearly undetectable cosmic neutrinos.

Sept. 19—Titan Results from the Huygens Probe

Dr. Chris McKay of NASA Ames Research Center will present results from the probe that landed on the largest moon of Saturn—the only moon in our Solar System with an atmosphere.

Sept. 26—Nano Y Mano: The Basics of Nanoscale Science

Dr. Ramamoorthy Ramesh of UC Berkeley will talk about the exciting field of nanoscale materials and phenomena.

Oct. 3—Cooling the Cities to Reduce Energy Use and Improve Urban Air Quality

Dr. Hashem Akbari of the Lawrence Berkeley National Laboratory will provide a detailed discussion of methods to reduce urban heat islands and their effects in reducing urban cooling energy use and improving ozone air quality.

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

SSU OBSERVATORY PUBLIC VIEWING

Sept. 9, 8:00 PM: Clusters of stars, Cocoon Nebula

Observatory located inside the football field at the SE corner of campus (E. Cotati Ave. and Petaluma Hill Rd., two miles east of US 101 at Cotati). Follow signs to campus. Parking Lot F is most convenient. Call 707/664-2267 before coming if it appears weather may force cancellation. <http://www.phys-astro.sonoma.edu/observatory/pvn.html>

CHABOT SPACE & SCIENCE CENTER

Sept. 18, 7:30 PM: Adult Observational Astronomy Class

The first meeting of a six-week astronomy course designed especially for adults who want to learn more about observing with telescopes and binoculars. This hands-on class will cover the mechanics and characteristics of telescopes & binoculars, constellation and object identification, and the use of star charts. Using Chabot's portable telescopes, participants will learn the skills used to enjoy the night sky.

Fee: \$65 members, \$75 non-members; reservations required. Limited space—register early: Call 510-336-7311 or email ngillespie@chabotspace.org

Daily shows at Chabot Planetarium's new digital projection system. Find out about feature shows and events at <http://www.chabotspace.org/visit/planetarium.asp>

Young Astronomers



Mars Discoveries!

with Gary Jordan

YA September 16 Meeting, 7:30 PM
at Apple Blossom School

Welcome back Young Astronomers to another great year of excitement and fascination!



Kicking it off at our first meeting will be a presentation by YA Adult Advisor Gary Jordan on the continuing discoveries being made on Mars.

We all know about the rovers Spirit and Opportunity, but what have we learned from these missions, and what's in store next for the red

planet? Learn the answers to these questions and more at the September 16 YA Meeting. Remember, Young Astronomers meetings are usually held on the second Friday of each month; however, with the beginning of the school year so close, the September meeting is being held on the third Friday instead.

We'll go back to our regular schedule in October. Plan to attend the October 14 meeting, when Melissa Downey will be presenting.

As always, there will be a star party afterwards, so bring a telescope if you can. We will also be electing officers for the year so come to the meeting and get involved!

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, turn west onto Bodega Ave. Continue on Bodega Ave. almost two miles to Water Trough Rd. Turn left and go about 1/3 mile to the school, on your right. From Hwy. 12, go straight through Sebastopol, past Main Street, and continue as above.

YA ELECTED OFFICERS

PRESIDENT: Melissa Downey 632-5661

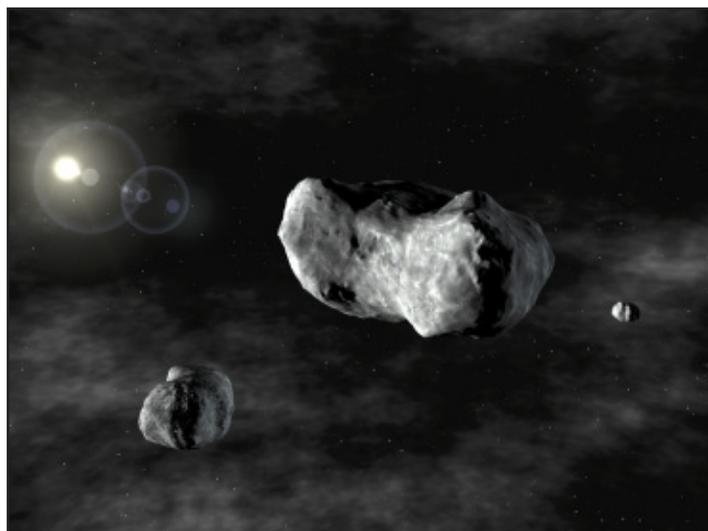
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LIBRARIAN: Jacob Gaynor

ADULT ADVISER: Gary Jordan 829-5288

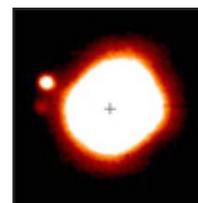


The asteroid 87 Sylvia and its two moons appear in this illustration, along with the sun (far left).

Asteroid Moons

Three's company? In the realm of asteroids, that's something new. For the first time, astronomers have found an asteroid with more than one moon. The asteroid, called 87 Sylvia, is one of the largest in the asteroid belt, a collection of rocky objects that orbit the sun between Mars and Jupiter. The lumpy, potato-shaped asteroid is about 280 kilometers (174 miles) wide. In 2001, astronomers announced finding a moon orbiting 87 Sylvia, making it one of about 60 asteroids known to have a moon. After the announcement of 87 Sylvia's first moon, an astronomer from the University of California, Berkeley and several coworkers wanted to see if there were additional moons.

Asteroid moons probably form when large asteroids collide and break apart. Scientists have suspected that the process could end up leaving more than one moon around certain asteroids. The astronomers looked through 2 months of images of 87 Sylvia. They spotted the second moon in images taken by an infrared camera on the European Southern Observatory's Very Large Telescope in Chile. The first moon measures about 18 kilometers (11 miles) across and orbits about 1,360 kilometers (845 miles) from 87 Sylvia. The newly discovered moon is smaller—about 7 kilometers (4.3 miles) across. It orbits 710 kilometers (441 miles) away.



Telescope image of 87 Sylvia and the two moons.

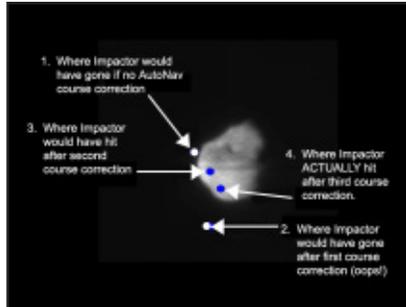
By analyzing the orbits of 87 Sylvia's moons, the astronomers were able to learn more about the asteroid itself. Like some other asteroids, it has lots of holes in it. Up to 60 percent of it, in fact, is empty space. The asteroid and its moons appear to be the result of a collision between two large asteroids. Gravity keeps the lightweight objects loosely bound together. Astronomers call this kind of system a "rubble pile."

Discovered in 1866, 87 Sylvia was named after Rhea Sylvia, a figure in Roman mythology. In the same spirit, the astronomers who discovered 87 Sylvia's moons propose naming the moons Romulus and Remus, after Rhea's two mythical sons who supposedly founded Rome.—E. Sohn, courtesy of *Science News for Kids*

Improbable Bulls-Eye

by Dr. Tony Phillips

Picture this: Eighty-eight million miles from Earth, a robot spacecraft plunges into a billowing cloud almost as wide as the planet Jupiter. It looks around. Somewhere in there, among jets of gas and dust, is an icy nugget invisible to telescopes on Earth—a 23,000 mph moving target. The ship glides deeper into the cloud and jettisons its cargo, the “impactor.” Bulls-eye! A blinding flash, a perfect strike.



Comet Tempel 1, as seen by the Deep Impact impactor's camera. Three last-minute AutoNav-controlled impact correction maneuvers enabled the Impactor to hit the bulls-eye.

As incredible as it sounds, this really happened on the 4th of July, 2005. Gliding through the vast atmosphere of Comet Tempel 1, NASA's Deep Impact spacecraft pinpointed the comet's 3x7-mile wide nucleus and hit it with an 820-lb copper impactor. The resulting explosion gave scientists their first look beneath the crust of a comet. *That's* navigation.

Credit the JPL navigation team. By sending commands from Earth, they guided Deep Impact within sight of the comet's core. But even greater precision would be needed to strike the comet's spinning, oddly-shaped nucleus.

On July 3rd, a day before the strike, Deep Impact released the impactor. No dumb hunk of metal, the impactor was a spaceship in its own right, with its own camera, thrusters and computer brain. Most important of all, it had “AutoNav”—short for *Autonomous Navigation*—a computer program full of artificial intelligence. It uses a camera to see and thrusters to steer—no humans required. Keeping its “eye” on the target, AutoNav guided the impactor directly into the nucleus.

The system was developed and tested on another “Deep” spacecraft: Deep Space 1, which flew to asteroid Braille in 1999 and Comet Borrelly in 2001. The mission of Deep Space 1 was to try out a dozen new technologies, among them an ion propulsion drive, advanced solar panels and AutoNav. AutoNav worked so well it was eventually installed on Deep Impact.

En route to the nucleus, AutoNav executed three maneuvers to keep the impactor on course: 90, 35, and 12.5 minutes before impact. The nearest human navigators were 14 light-minutes away (round trip) on Earth, too far and too slow to make those critical last-minute changes. Having proved itself with comets, AutoNav is ready for new challenges: moons, planets, asteroids...wherever NASA needs an improbable bulls-eye.

Dr. Marc Rayman, project manager for Deep Space 1, describes the validation performance of AutoNav in his mission log at <http://nmp.nasa.gov/ds1/arch/mrlog13.html> (also check mrlog24.html and the two following). Also, for junior astronomers, the Deep Impact mission is described at <http://spaceplace.nasa.gov/en/kids/deepimpact/deepimpact.shtml>

—Article provided by JPL and NASA

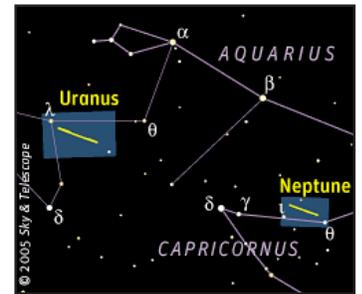
September Observing Notes

- Sept. 6 Venus, Jupiter, Spica, Moon form close encounter.
- Sept. 10 Antares 0.2° S of Moon
- Sept. 11 First Quarter Moon
- Sept. 14 Saturn 1° SSW of Beehive Cluster, but doesn't rise until after 2 AM—look for it in early morning sky
- Sept. 16 Uranus 2° N of Moon, best seen around midnight
- Sept. 18 Full Moon
- Sept. 22 Moon near Pleiades; Fall Equinox
- Sept. 25 Last Quarter Moon

OBSERVING TREATS

Mars brightens steadily, rising around 10:30 PM, reaching opposition late October—our last great view until 2018!

Uranus can be fairly easily found in Aquarius and Neptune is in neighboring Capricornus. See the chart here provided by *Sky and Telescope* magazine. The yellow lines show the paths of each planet, including stars to magnitude 10.0 (much dimmer than either planet).



Uranus stays brighter than magnitude 6.0 throughout the year, reaching 5.7 during September. Watch it move from week to week. In a telescope at medium powers, its 3½", greenish white disk is featureless but obviously nonstellar.

Neptune attains magnitude 7.8. The chart shows two naked-eye stars of the “boat” figure of Capricornus, 4th-magnitude Theta (q) and Iota (i) Capricorni. If you make them straddle your binocular field, Neptune will be in there too. Barely more than 2" across, the planet's pale bluish-gray disk is distinguishable from a star only at fairly high powers.

FEATURED LINKS

3D artist Akira Inaka of Japan has rendered Hubble images in such a way that you can see depth, luminosity the transparency of nebulae and much more. His work was featured in *Sky and Telescope* last year. Go to this link, click on “3-D Arts” and start with the nebula section. Be sure you're at the optimum focal length from your monitor (for me it's about 14 inches and I have to wear my reading glasses) and let your eyes relax and cross. You'll see 3 images instead of 2. Look at the one in the middle and let the wonders begin! Once you get used to it, you can look around the image. Fascinating and delightful. <http://pro.tok2.com/%7Eaq6a-ink/mac/usbr.htm>

Fog Views from Satellite: This link will take you directly to the Northern California view showing whether fog is invading your viewing site. The actual link is too long to show here, so click below and once you get there, bookmark it (this shortened version will only link from this publication, so cut-and-paste won't work): <http://www.nrlmry.navy.mil/sat-bin/>

Events

UC BERKELEY ASTROPHYSICS CLUB

Institute for Particle Astrophysics Journal Club Seminars

Sept. 6 (Tuesday)—**Stefan Funk** (MPI-Heidelberg): The Galaxy in very high-energy gamma-rays as seen by H.E.S.S.

Sept. 9—**Tad Patzek** (UCB/LBNL) speaking on ethanol production efficiency

The Journal Club schedule is tentative, becoming final usually a few days before the Friday of the talk. Seminars are on Fridays (unless otherwise noted) at 12:00 Noon with a brief presentation of current scientific news. Talks end 13:00. Location: Bldg. 50, room 5026 (INPA common room), Lawrence Berkeley National Laboratory, 1 Cyclotron Rd., Berkeley. Info: Vitaliy Fadeyev VAFadeyev@lbl.gov. Abstracts on the talks: <http://stokstad.lbl.gov/INPA/journalclub.html#aboutjclub>

LICK OBSERVATORY

Sept. 9, 7:30 PM—**Public viewing** through 36-inch refractor and 40-inch reflector. Two speakers. 408-274-5061

WELCOME, NEW MEMBERS!

The SCAS is happy to welcome our newest members: Michelle Denham, Daniel Gunyan and Rem Roberti.

Sonoma County Astronomical Society

P.O. Box 183
Santa Rosa, CA 95402



Sonoma Skies

September 2005

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OTTEWELL, YEAR IN SPACE CALENDARS

Guy Ottewell's *2006 Astronomical Calendar* and *The Year in Space 2006 Desk Calendar* can be purchased at discounts for volume numbers. Copies will be available to examine at the September meeting. Minimum volume prices are in the range of \$22 for the *Astronomical Calendar* (versus about \$31 for single copies) and \$11 for the *Desk Calendar* (versus about a \$15 single copy price). Place your order with Merlin Combs (mdcombs@penngrove.com or 795-1448) by September 30 if you wish to be included in the SCAS order this year.

OBSERVERS GUIDES AND CALENDARS

Are you interested in getting a *2006 Observer's Handbook* (about \$15.70) or a *2006 Royal Astronomical Society of Canada Wall Calendar* (about \$7.70)? If you have not already advised Len Nelson of your order, do so soon. Supply is limited.

ASTRONOMY MAGAZINE RENEWALS

It's time to get your discounted subscription to *Astronomy Magazine*. The charge for renewal or new club member subscriptions is \$34 for one year or \$60 for two years. Mail your check (payable to SCAS) to Larry McCune, SCAS Treasurer, 544 Thyme Place, San Rafael, CA 94903. Do so soon, as the club subscription will be sent to the publisher on September 30.