

# Sonoma Skies

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

[www.sonomaskies.org](http://www.sonomaskies.org)



March 2006

Volume XXIV No. 2

## Striking Sparks: The Home Stretch

by Dickson Yeager, 2006 Striking Sparks Coordinator

As this issue of Sonoma Skies goes to press, we are preparing to judge the student essays. By Saturday afternoon, February 25, we will have chosen the ten winners.

Now the focus turns to the Striking Sparks Awards potluck dinner. As usual the location will be Proctor Terrace Elementary School, where we hold our regular meetings. So, if you haven't already, mark your calendars for:

- ◆ Saturday, March 18, 2006
- ◆ 5:00 to 6:00 PM: Open house, viewing the raffle prizes and, most importantly, getting acquainted with the Striking Sparks candidates.
- ◆ 6:00 to 7:00 PM: Dinner, with a raffle beginning at 6:30.
- ◆ 7:00 to 8:00 PM: Awarding of the Sparks Telescopes
- ◆ 8:00 to 9:00 PM: Star Party (weather permitting) and basic operating instruction to winners.

**SPONSORS:** We need one more sponsor. Might that be you?

**MENTORS:** Len Nelson raised his hand at the last meeting. We need two more. This is a great way to contribute to our club and to an award-winning student. It would be great to see some new faces step forward and take on this essential duty.

**RAFFLE:** Don't forget those raffle items—*many more are needed*. Please have them there by 5 PM so everyone will have plenty of time to peruse the prizes and buy raffle tickets.

**Volunteers needed to coordinate or assist in these areas:**

1. Welcome committee and raffle tickets sales: Gary Jordan, Melissa Downey and Christine Churchill.
2. Table setting and table decorations: Joan Thornton.
3. Kitchen coordination—receiving all food items and their table placement: *Need volunteers.*

(continued back page)



The new Sparks telescope from Orion

## The Bad Astronomer & High-Energy Outreach

with Phil Plait

SCAS March 8 Meeting, Proctor Terrace School

Phil Plait, an astronomer at Sonoma State University, and creator of the Bad Astronomy website ([www.badastronomy.com](http://www.badastronomy.com)) returns to SCAS to present a program about the Education and Public Outreach offerings available through SSU. This outreach program, backed by NASA grants, develops materials used to teach students and the public about science and mathematics.



...at Kennedy Space Center in 2002

The Outreach Program concentrates on training teachers to be the facilitators, thereby reaching thousands of learners. The program has partnered with the Astronomical Society of the Pacific's Night Sky Network, which provides materials to amateur astronomy clubs across the nation to help the

public understand astronomy. Phil also promises to demonstrate at least one of the activities the program has developed.

Since moving to Sonoma County in December of 2000, Phil has been a speaker at SCAS twice in the recent past, once on disproving the moon landing skeptics and the other on the scientific evidence regarding the so-called



Phil at the Valley of the Moon Boys and Girls Club in Sonoma

“Face on Mars.” Those of you who have heard him speak will enjoy hearing him again. Those of you who have not, can look forward to a lively and enjoyable presentation.

—Lynn Anderson

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 Telescopes:** Members are eligible to borrow telescopes from the club. Five telescopes are available: 8" and 5" SCTs, 8" and 12.5" Newtonians on Dobsonian mounts; and an 80mm refractor. Contact John Roush at 792-1199, [jroush@spamlion.com](mailto:jroush@spamlion.com).

**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](http://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](mailto: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. 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.

*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 [publications@sonomaskies.org](mailto:publications@sonomaskies.org)

## SCAS Elected Board

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**Librarian:** Joan Thornton, 762-0594 [phonyjoanie@earthlink.net](mailto:phonyjoanie@earthlink.net)

[www.sonomaskies.org](http://www.sonomaskies.org)

## AN ACRE OF GLASS, BY J.B. ZIRKER

*Conclusion of last month's review by Ralph Mansfield*

Zirker inserts an important new concept of observation in Chapter 10 where he alludes to the 30 cm footprint left in moon dust by Neil Armstrong. He computes this for the moon distance from Earth of 380,000 km to span an angle of 160 micro-arcseconds. Then he notes that the Hubble Space Telescope, with a resolution about 200 times larger, could not observe that footprint. But the Sydney University Stellar Interferometer, SUSI, could resolve Armstrong's footprint as well as the disks of distant stars.

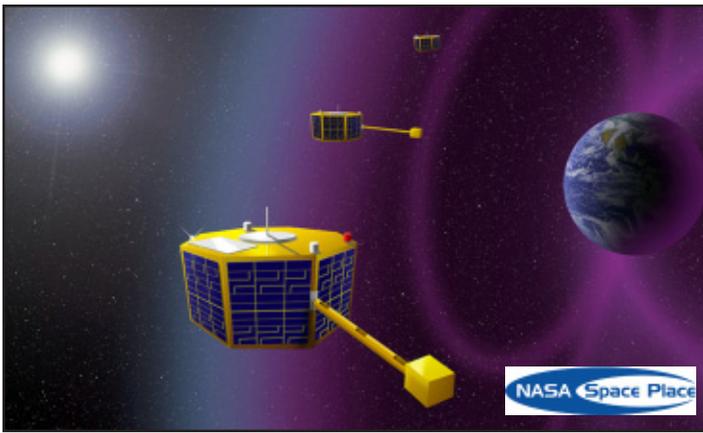
This leads to a discussion of interferometers applied to cosmological investigations. Despite the construction of 8- and 10-meter telescopes, optical astronomers lacked the angular resolution to further their investigations and turned to interferometry. Zirker explains the bases of constructive and destructive interferometry using Thomas Young's experiments with light fringes. Then he summarizes the interferometry of Fizeau, Stephan, Michelson-Morley. Radio astronomy and radar developments added technical refinements to interferometry.

Zirker's descriptions, exciting and revealing, should be left for the readers' enjoyment, like the concept of aperture synthesis, and the work of Antoine Labeyrie at the Meudon Observatory in Paris. Jacques Becker, a Dutch astronomer, set the goal of converting an optical telescope to an optical interferometer. There is excitement and adventure in Zirker's descriptions that should enthuse amateur astronomers to reach for greater comprehension of the challenges confronting observational astronomy.

The first optical array to employ aperture synthesis was built at Cambridge University—the Cambridge Optical Synthesis Telescope (COAST). Construction took three years and cost £850,000. It consisted of four 50 cm siderostats arranged in a Y that fed fixed horizontal telescopes. A siderostat is a flat mirror tilted at the proper angle for the observed star to track it and is moveable on rails. COAST obtained images of the binary Capella which resolved their disks and orbital motion with a resolution of 20 milli-arcseconds and a baseline of 6 meters. Accompanying photographic images are revealing.

There is a detailed description of CHARA, the Center for High Angular Resolution Astronomy interferometer and the NPOI, the Navy Prototype Optical Interferometer, and the KI, the Keck Interferometer. There is a great deal of new information presented here by Zirker that offers amateur astronomers challenging reading, including much information about the southern hemisphere observatories at Cerro las Campanas, Cerro Tololo, Atacama and the Canary Islands observatories.

He concludes with a survey of the large telescopes now in planning stages. The ELTs and the OWLs, extremely large telescopes and overwhelmingly large telescopes, and the need to place them in outer space. The JWST, James Webb Space Telescope will replace the Hubble in about 10 years but it will be a segmented telescope, about twice the diameter of Hubble, and to reduce its weight, the reflector will be cast Beryllium. The descriptions of the space interferometer and the terrestrial planet finder satellites offer new perspectives to astronomy, but the culminating concept is the segmented 300-meter version of the Arecibo telescope sited in the Shackleton Crater of the Moon, where the Sun never shines, to be assembled by robots. □



# Micro-sats with Macro-potential

by Patrick L. Barry

Future space telescopes might not consist of a single satellite such as Hubble, but a constellation of dozens or even hundreds of small satellites, or “micro-sats,” operating in unison.

Such a swarm of little satellites could act as one enormous telescope with a mirror as large as the entire constellation, just as arrays of Earth-bound radio telescopes do. It could also last for a long time, because damage to one micro-sat wouldn’t ruin the whole space telescope; the rest of the swarm could continue as if nothing had happened. Micro-sats are smaller and lighter than normal satellites, so they’re much cheaper to launch into space.

In February, NASA plans to launch its first experimental micro-sat mission, called *Space Technology 5*. As part of the New Millennium Program, ST5 will test out the crucial technologies needed for micro-sats—such as miniature thrust and guidance systems—so that future missions can use those technologies dependably. Measuring only 53 centimeters (20 inches) across and weighing a mere 25 kilograms (55 pounds), each of the three micro-sats for ST5 resembles a small television in size and weight. Normal satellites can be as large and heavy as a school bus.

“ST5 will also gather scientific data, helping scientists explore Earth’s magnetic field and space weather,” says James Slavin, Project Scientist for ST5. Slavin suggests some other potential uses for micro-sats: A cluster of micro-sats between the Earth and the Sun—spread out in space like little sensor buoys floating in the ocean—could sample incoming waves of high-speed particles from an erupting solar flare, thus giving scientists hours of warning of the threat posed to city power grids and communications satellites. Or perhaps a string of micro-sats, flying single file in low-Earth orbit, could take a series of snapshots of violent thunderstorms as each micro-sat in the “train” passes over the storm.

This technology would combine the continuous large-scale storm monitoring of geosynchronous weather satellites—which orbit far from the Earth at about 36,000 kilometers’ altitude—with the up-close, highly detailed view of satellites only 400 kilometers overhead. If ST5 is successful, these little satellites could end up playing a big role in future exploration. The ST5 Web site at [nmp.jpl.nasa.gov/st5](http://nmp.jpl.nasa.gov/st5) has the details. Kids can have fun with ST5 at [spaceplace.nasa.gov](http://spaceplace.nasa.gov), by just typing ST5 in the site’s Find It field.

—Article provided by JPL

# The Semi-Astronomer

by Herb Larsen



He’s recharacterizing the Messier catalogue galaxies to Smudge #1, Smudge #2, Smudge #3...

## 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](mailto:sanfrancisco@scopecity.com)

## SOCIAL AMENITIES

Many thanks to Jack Cranston for providing high-octane coffee and refreshments at the February SCAS meeting.



SCAS 2006 Board L to R: Larry McCune, Lynn Anderson, Loren Cooper, John Whitehouse, Walt Bodley, Len Nelson, Cecelia Yarnell, Dickson Yeager (not shown)

# Events

## ROBERT H. FERGUSON OBSERVATORY

**Public Viewing Saturday, March 18**

Solar Viewing: 11:00 AM - 3:00 PM

Night Viewing begins 7:00 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, OTHER EVENTS

**Mar. 1** 2/26 Observing Lab raincheck, 6:30 PM

**Mar. 21** Night Sky Spring Series, 7:00 PM

**Mar. 26** Shared Docent Observing, 2:00 PM

**Mar. 28** Night Sky Spring Series, 7:00 PM

**Mar. 28** New Docent Training begins

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

## MT. TAMALPAIS ASTRONOMY

**Saturday, April 1, 8:00 PM: "How Stars are Made"—**  
Dr. Steve Stahler, UC Berkeley

Stars are the natural outcome of processes that occur throughout galaxies. Research has led to a good understanding of the basic evolutionary process, but deep mysteries still remain.

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/>

## WORLDWIDE ASTRONOMY 101

Free online Astronomy and Planetary Science Course. Hosted by *The Planetary Society's* Director of Projects, Bruce Betts. He'll cover everything from galaxies and stars to each of the bodies in our solar system. This is a 13-week college course that began February 7. Previous broadcasts are archived and accessible through the website.

Classes are broadcast live on the Internet every Monday and Wednesday from 3-4 PM. Internet viewers can log on to the webcast live to ask questions. Read the syllabus and find out more at: <http://planetary.org/special/bettsclass/>

## SONOMA STATE UNIVERSITY SERIES "WHAT PHYSICISTS DO"

**Mondays at 4:00 PM**

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

### **Mar. 6—Rotating Galaxies: Clues to Galaxy Formation**

Dr. Anne Metevier of the University of California, Santa Cruz will describe her efforts to measure how fast distant disk-shaped galaxies rotate, and what this information can tell us about how galaxies formed.

### **Mar. 13—Einstein's Universe and Beyond**

Dr. Lynn Cominsky of Sonoma State University will show how high-energy observations of radiation from exploding stars, blazing galaxies and monstrous black holes illuminate Einstein's vision in ways that Einstein could only imagine. (Note change from printed poster.)

### **Mar. 20—Nanowiring the Future**

Dr. Peidong Yang of the University of California at Berkeley will discuss how semiconductor nanowires will impact photonics, energy conversion, nanoelectronics, and other areas.

### **Mar. 27—Optics with Slow Light**

Dr. Mukund Vengalattore of the University of California at Berkeley will discuss the basics of "slow light" and present some recent results on using laser-cooled atoms to create optic elements such as amplifiers, switches and slow light waveguides.

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

## SSU OBSERVATORY PUBLIC VIEWING

### **Mar. 24, 8-10 PM: Galaxies, Saturn**

Observatory located inside the stadium area 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>

## MORRISON PLANETARIUM DEAN LECTURE SERIES

### **Mar. 13, 7:30 PM: "Beyond Pluto: Discovery of the 10th Planet"—**Dr. Mike Brown, California Institute of Technology

For the past seven years we've been scanning the skies for planets beyond Pluto. In 2005, after a search of about half of the sky and the discovery of dozens of objects almost the size of Pluto, we finally found 2003 UB313, the first object larger than Pluto, and the first that might be called a new planet. What is a planet? Why is the question of planethood difficult? What should the real answer be?

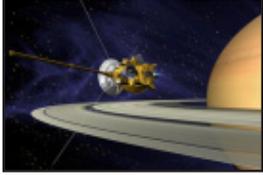
**Location:** Kanbar Hall, Jewish Community Center, 3200 California Street (at Presidio). Parking in the UCSF Laurel Heights campus parking lot is \$1.25/night. Parking in the JCC garage is \$1.25 per half-hour. Tickets \$4 at the door or by email. Contact: 415/321-8000, <http://www.calacademy.org/planetarium/dean.cfm>

# Events

## SRJC PLANETARIUM

### “Lord of the Rings”—Through April 9

Rings are found around all four of our giant gas planets. One stands out as the lord of the rings. To the ancient Greeks he was Cronus, the father of the gods and leader of the Titans. His Roman name is Saturn. In this program we will investigate the world of planetary ring systems and look specifically at Saturn and its system of rings and moons.



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

### Mar. 15, 7:30 PM: “The Dirt Surrounding Exosolar Planets” —Dr. Paul Kalas

Dirt is the most detectable component of an exosolar planetary system due to its collectively large surface area. Though the mass is insignificant, this dirt can be seen in reflected light as huge nebulosities resembling disks or belts. I'll show you the observing tricks that are used to uncover these nebulosities, and review the most recent discoveries, including a spectacular ring of material surrounding the bright star Fomalhaut, and a double disk around Beta Pictoris. Whether simple or complex, the architecture of each nebulosity yields solid evidence that some of stars closest to the Sun may have planets.

Meetings are held at the Randall Museum, 199 Museum Way, San Francisco. For more information go to: <http://www.sfaa-astronomy.org/sfaa/lectures/index.shtml>

## SILICON VALLEY ASTRONOMY LECTURE SERIES

**Mar. 1, 7:00 PM: “Bringing Home a Comet: Stardust Mission Update”**—Astronomer Scott Sandford, NASA Ames  
Dr. Sandford, an expert on meteorites and the material between the planets, is co-investigator on the Stardust mission, and was actively involved in the January 2006 recovery of the Stardust capsule in the Utah desert. He will fill us in on what this historic mission accomplished and what the initial analysis of the samples is revealing.

Arrive early—seating is limited. Location: Smithwick Theater, Foothill College, El Monte Road and Freeway 280, Los Altos Hills. Free and open to the public. Parking \$2. Info: 650/949-7888

## SCAS SCHOOL STAR PARTIES

The school star party season is in full swing and the SCAS fully supports astronomy outreach to our local Sonoma county schools. Your help is needed. If you can volunteer in any capacity at these functions, please email me, Len Nelson, at [lennelsn@comcast.net](mailto:lennelsn@comcast.net). I'll then add you to my volunteer roster and contact you about the details of upcoming events. Here's the schedule:

- Mar. 2** Sonoma Mountain Elementary in Petaluma, Thurs. at 6:45 PM
- Mar. 7** Miwok Elementary in Petaluma, Tue. at 6:45 PM (alternate date Mar. 9)
- Mar. 22** Evergreen Elementary in Rohnert Park, Wed. at 6:45 PM (alternate Mar. 24)
- Mar. 29** Grant Elementary in Petaluma, Wed. at 6:45 PM (alternate date Mar. 30)
- Apr. 6** Bernard Eldridge Elementary in Petaluma, Thurs. at 8:00 PM (alternate Apr. 7)
- Apr. 24** Sequoia Elementary in Santa Rosa, Mon. at 8:30 (alternate Apr. 26)

There is no obligation to commit yourself to all the events. Come and see what it's all about. You do not even have to have a telescope—you can assist those who do. Contact me with any questions. These are fun events and educational for everyone!

## SCAS YOSEMITE PUBLIC STAR PARTY

July 28 and 29

Are you up for some serious public astronomy this summer at Glacier Point in Yosemite? This year, we are scheduled just 3-4 days after the New Moon and during the peak of the Delta Aquarid meteor shower. It's a fun experience and, of course, the views are out of this world.

Park admission is free (\$20 otherwise) as is free camping at the group camp site at Bridalveil Campground, about 8.5 miles from Glacier Point. If you wish to come, you are obligated to bring your professional telescope to both the Friday and Saturday star parties at Glacier Point.

More details will be published as we get closer to the event. The campground can accept only 30 people, so sign up early and join us. Please contact Len Nelson at 763-8007 if you are interested or have questions.

## NASA AMES RESEARCH CENTER

**Mar. 15: “Extreme Exploration—The Moon, Mars and Beyond: The Science of Risk”**—Author/Explorer John F. Ross  
Our speaker will discuss NASA's upcoming missions to the moon and Mars and the challenges that lie ahead from space radiation, micro-meteorites and other environmental hazards.

The free public lecture begins at 7 PM in the Eagle Room, Bldg. 943, Moffett Field. Take the Moffett Field exit off Highway 101. <http://researchpark.arc.nasa.gov>

# Young Astronomers

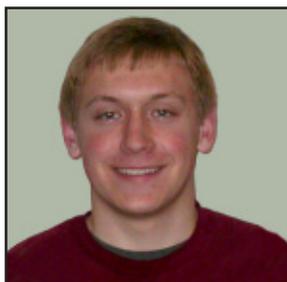


## Messier Objects!

with Scott Grubb, YA March 10 Meeting  
7:30 PM at Apple Blossom School

Over two-hundred and fifty years ago, French astronomer Charles Messier compiled a list of 110 of the most spectacular deep-sky objects visible in small telescopes. Today, young and old amateur astronomers alike consider the goal of observing all the objects on Messier's list as a virtual rite of passage.

At the March Young Astronomers meeting, presenter Scott Grubb will not only relate his own experiences in observing the Messier list, but will also talk about how such amazing objects as the Andromeda Galaxy and the Great Orion Nebula (both being Messier objects) can be seen in your own backyard with nothing more than binoculars or a small telescope! Structures of galaxies, nebulae, and star clusters will also be discussed.



Afterwards, there will be a star party held to try and view some of the actual objects discussed during the presentation, so be sure to bring a telescope and a friend. This is one meeting you will not want to miss!

## 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

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## Sizing Up Pluto's Moon

Pluto's moon Charon recently took a trip on the dark side. On July 10, 2005, the moon passed in front of a star, briefly blocking the star's light. This brief blockage, however, was long enough to give astronomers new information about Pluto's rocky partner.

Passing in front of a star is a rare event for Charon. The trip lasted less than a minute, and it was visible only from a 980-kilometer (609-mile) stretch of land in South America. The passage of one celestial body in front of another is known as an occultation.

Two teams of astronomers watched the event through telescopes in Chile and Brazil. One team works at the Massachusetts Institute of Technology and Williams College. The other is from the Paris Observatory. The observations show that Charon has a radius of 606 kilometers (377 miles). In other words, it measures about 754 miles across. This new size estimate, combined with data obtained by the Hubble Space Telescope, indicates that the moon is 1.71 times as dense as water. Earth's density is about three times that of Charon, suggesting that, unlike Earth, Charon is largely made up of rock and ice.



Artist's impression of what Charon might look like as seen from Pluto.

The scientists couldn't tell for sure whether Charon has an atmosphere. If there is one, however, it's less than one-millionth as dense as Earth's atmosphere is. The new data support the theory that Charon formed when a big object collided with Pluto and flung off a chunk. Earth's moon probably formed in the same way.—E. Sohn

## FEBRUARY YA MEETING UPDATE

At the February 10 YA meeting, Young Astronomers Marie-Pier Frigon and Alex White gave a presentation on sunspots. Afterwards, Gary Jordan gave a brief talk on spiral, elliptical, and irregular galaxies, at which point he quizzed everyone to see if they could identify the different types. The entire group then shifted its attention outside for a star party. Although parts of the sky were obscured by clouds, members were still able to get great views of the Moon, Saturn, and the Orion Nebula. Thanks to everybody who brought a telescope and made the hands-on portion of the meeting a success!



Photo by Len Nelson

SWIFT Model Builders at the February YA meeting. Left to right: Christopher O'Connor, Geoffrey Knoll, Jesse Burnette, Benjamin Cosby. All are Striking Sparks candidates but for Geoffrey Knoll who was a Striking Sparks winner in 2005.

# Capturing the Stuff of Space

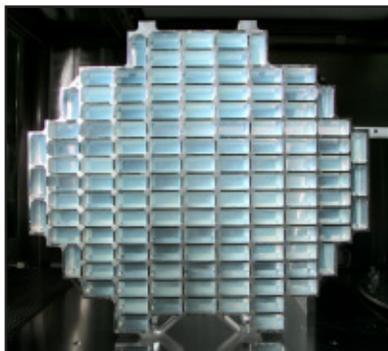
Comet dust and the remains of exploded stars hurtled into Earth's atmosphere and landed safely in the Utah desert in January. The material arrived inside a capsule ejected by the Stardust spacecraft.

Scientists are now teasing out tiny comet fragments from a protective gel inside the Stardust capsule. In addition, they're asking for your help to spot the grains of stardust that the capsule also captured and brought back to Earth. By studying these bits of space material, the investigators hope to learn more about comets, stars, and the origin of the solar system.

The Stardust spacecraft was launched from Earth in February 1999. Since then, it's traveled 2.88 billion miles. In January 2004, on its second loop around the sun, Stardust brushed past the comet Wild 2. The spacecraft came within 149 miles of the comet, snapped its picture, and captured bits of comet dust in a special sample-collection tray.

Catching comet dust isn't an easy task. Even though they're small, the particles fly toward a spacecraft at a rate up to seven times as fast as that of a speeding bullet. To slow down, trap, and cushion the dust, scientists filled the grids in the sample tray with a material known as aerogel, sometimes called "blue smoke." Aerogel is a strong but extremely light substance that is 99.8 percent air.

Scientists didn't know what to expect when they opened the Stardust capsule on Jan. 17. They were excited to see thousands of tracks left by fragments of Wild 2. "We were relieved that anything survived at all," says Don Brownlee. He's the lead scientist with the Stardust project and a professor at the University of Washington in Seattle. "We didn't know how the particles would survive during capture."



This set of aerogel tiles collected comet grains and interstellar dust.



In an experiment on Earth, researchers used a special gun to fire particles into an aerogel. As the particles slowed to a stop, they left carrot-shaped tracks.

Some particles went straight into the gel, leaving a carrot-shaped track as they slowed and eventually came to rest, Brownlee says. Other comet grains came apart when they hit the gel, creating a bulbous hole at the surface before narrowing to a turnip shape. Sometimes, little pieces broke off from the main comet grain, changing a turnip-shaped track into one that resembled a hairy, heavily branched root.

The particles that Stardust collected date to the time when Wild 2 was created—4.5 to 4.6 billion years ago. "We believe that [these particles are] the original building blocks of the solar system," Brownlee says.

The particles could provide answers to questions not only about comets but also about the origins of our sun, Earth, and the other planets.

*(continued back page)*

## March Observing Notes

- Mar. 5** Moon 0.3° N of Pleiades (M45)
- Mar. 6** First Quarter Moon, Mars 3° S of Moon
- Mar. 14** Full Moon
- Mar. 17** Zodiacal Light visible in W after evening twilight for next two weeks; Moon near Spica
- Mar. 20** Vernal Equinox 10:26 AM
- Mar. 22** Last Quarter Moon, Antares .2° N of Moon
- Mar. 25** Venus at greatest elongation W (47°)
- Mar. 26** Venus 1.9° N of Neptune (47°W)
- Mar. 27** Uranus 1.4° N of Moon  
Mercury 2° N of Moon
- Mar. 28** Double shadow transit on Jupiter 9:53 PM
- Apr. 2** Daylight Savings Time Begins 2:00 AM

### OBSERVING TREATS

**Jupiter** rises SE 11:15 PM early March and by 9 PM toward the end of the month. It begins retrograde motion in Libra March 4. The planet grows to more than 40" across during the month.

**Saturn** is tilted very favorably (+20°) for viewing the Cassini division between the A and B rings. With Saturn high in the sky, a clear, steady night shows excellent detail.

**Pi Scorpio Occultation March 20**, 6:00 to 8:00 AM. Data below is exact for the RFO viewing site (thanks to Jack Welch).

pi Sco = m2.9  
0620 DB (Alt/Az = 19/209)  
0736 rD (Alt/Az = 10/224)

Key: 1st letter = Disappear/Reappear (lower case = nr obs limit @ 8" app); 2nd letter = Dark limb/Bright limb.

**Jupiter Shadow Transits March 28**, beginning 9:53 PM. Requires clear SE horizon (not viewable from RFO site). Ganymede shadow transit begins before Jupiter rises.

UT Time	Alt/Az	Event
2153	2/113	Io shadow transit begins
2242	11/121	Io transit begins
2326	18/129	Ganymede shadow transit ends
0003	23/137	Io shadow transit ends
0049		Io transit ends
0106		Ganymede transit begins
0217	35/171	Ganymede transit ends

### FEATURED LINKS

**Messier Marathon:** It's that time of year! Look here for charts, forms, etc.: [http://www.jotabout.com/sfaa/marathon\\_2006.html](http://www.jotabout.com/sfaa/marathon_2006.html)

**The Astronomy Connection:** List of observing sites with lat/long info and current weather: <http://observers.org/sites/>

**Great Red Spot Transit Times:** As Jupiter begins to grace the night sky, use this calculator: [http://skyandtelescope.com/observing/objects/planets/article\\_107\\_1.asp](http://skyandtelescope.com/observing/objects/planets/article_107_1.asp)

**Globe at Night** has an interactive that allows users to match local light pollution conditions for observing Orion. <http://www.globe.gov/GaN/>

**Ed's ISS Transit Page:** Movie of the Space Station crossing in front of the Moon: <http://pictures.ed-morana.com/ISSTransits/>

## Capturing the Stuff of Space *from Page 7*

Scientists with the Stardust mission will also investigate interstellar dust—stardust, for short. These particles are created when a star is dying or explodes. The Stardust capsule collected samples of interstellar dust using the back of the comet-dust collector.

First, however, the researchers have to find the stardust. There will probably be only 45 or so particles in the aerogel. The width of each particle is less than that of a human hair, Mendez says. Looking for these particles in the sample tray is like looking for 45 ants on a football field.

So, Mendez and other scientists are seeking the public's help.

The researchers will produce about 1.5 million "movies," each one a set of images of a microscopic aerogel section no bigger than a grain of salt. Volunteer dust finders, who will be trained to spot stardust tracks, can then download and watch the micromovies on their Internet browsers.

Volunteers will be using their computers to do real science, Mendez says. "We need to find these particles in order to study them. With an army of volunteer scientists, we can do it pretty quickly."

The micromovies won't be ready until late March. But you can register to be a volunteer right now. Just go to [stardustathome.ssl.berkeley.edu/](http://stardustathome.ssl.berkeley.edu/). Astronomy buffs of any age can participate, Mendez says. All they need is a little bit of patience.

As a bonus, Mendez adds, anyone who finds a star speck will get to name it! ☐

## Sonoma County Astronomical Society

P.O. Box 183  
Santa Rosa, CA 95402



## Sonoma Skies

March 2006

MARCH 8

Phil Plait

The Bad Astronomer &  
High-Energy Outreach

## Striking Sparks Home Stretch *from Page 1*

4. Photography: Merlin Combs: *Needs an Assistant.*
5. Stage Setting—Larry McCune coordinates: *Need Volunteers.*
6. Assemble poster boards with winning essays: *Need Volunteers.*
7. Coordinate the evenings' raffle and set up the prize table: Melissa Downey and Gary Jordan.

To volunteer, please contact me at [sparks@sonomaskies.org](mailto:sparks@sonomaskies.org) or phone 707-539-2385.

SCAS appreciates the generous support of Orion Telescopes and Binoculars who provide the Striking Sparks Telescopes at substantial discounts and Sam Sweiss of Scope City for his generous support in many areas of this endeavor. ☐

## WELCOME, NEW MEMBER!

The SCAS is happy to welcome our new member, Arnold Davis, Jr. of Santa Rosa.

## TELESCOPE FOR SALE

Celestron Nextstar 8 automated telescope in mint condition. Original cost: \$1,500. Will sell for best offer over \$1,000. Call (707) 894-0426 or email Fred Mann at [dcfred30@yahoo.com](mailto:dcfred30@yahoo.com)