Sonoma Skies

Newsletter of the Sonoma County Astronomical Society
A nonprofit scientific and educational organization
www.sonomaskies.org

March 2005 Volume XXVIII No. 2

STRIKING SPARKS
AWARDING OUR 200TH TELESCOPE!
Saturday, March 19

By Len Nelson - 2005 Striking Sparks Coordinator

Plan to come to our Striking Sparks awards dinner at Proctor Terrace Elementary. This is our 20th year for this program and our '200th' telescope will be awarded. It will be a real blast and you'll certainly want to come to this event!

It's best to arrive at about 3:30 if you are planning to help out. We always need a lot of able hands and minds. The Striking Sparks candidates are expected to arrive at 5:00 so everything needs to be in place when they come. The dinner bell will ring at 6:00. The raffle will be held between 6:30 and 7:00, after which our awards celebration will begin. The event should be completed by about 8:00. If weather permits, we'll have a Star Party with the new Striking Sparks scopes!

Final assembly of the telescopes will be on Saturday, March 5. If interested in helping out, contact me.

Volunteers are needed to coordinate or assist in these areas:

1. Welcome committee and raffle ticket sales: Gary Jordan, Melissa Downey and Christine Churchill.

2. Table setting and theme organization: Joan Thornton.

3. Organization of the coffee and beverage area: ***Need Volunteer***.

4. Kitchen coordination—directing where all the various food items that come in should be placed: ***Need Volunteer***.

5. Photography: Merlin Combs.

6. Stage setting—Larry McCune coordinates: ***Need Volunteer***.

7. Assemble poster boards with winning essays: ***Need Volunteer***.

8. Coordinate the evening's raffle and set up the prize table: Melissa Downey and Gary Jordan.

9. Worthy Raffle Prizes: ***Many more are needed!***

Please call me at 763-8007 if you can help with any of the areas noted.

SCAS appreciates the generous support provided by Sam Sweiss of Scope City, Parks Optical and Lumicon. Among Sam's donations: Astronomy books, software and Mars DVDs for raffle prizes.

Young Astronomers: See pages 6 & 7

Caring for Your Fine Optics
with Bob Schalck
SCAS *March 9* 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?

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

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 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 March 9, and clear up some cloudy issues on caring for our windows to the universe.

Sonoma Skies

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 Joan Thornton at 707-762-0594.

SCAS Egroup 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@yahoogroups.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*
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Membership Director: Walt Bodley, 823-5268, *wbodley@sonic.net*
Community Activities Director: Len Nelson, 763-8007, *lennelsn@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: Len Nelson, 763-8007, *lennelsn@comcast.net*
Librarian: Joan Thornton, 762-0594, *phonyjoanie@earthlink.net*
Public Star Party Coordinator: Bruce Lotz, 576-7833, *ablotz@sonic.net*

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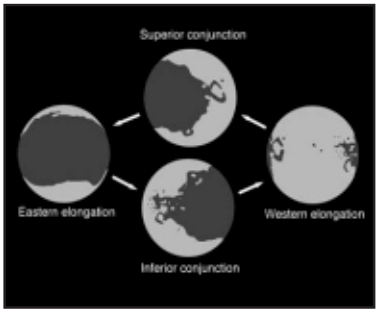
Iapetus: East is Least and West is Best

by Jane Houston Jones, JPL Cassini Outreach
jane.h.jones@jpl.nasa.gov

Saturn's moon Iapetus is brighter at western elongation and fainter at eastern elongation, which makes it a great observing project when the Saturn system is in our evening skies...like right now. I was reading about Saturn's satellites in the RASC 2005 Observers Handbook in early January, just as I was observing the Cassini orbiter's first close-up images of Iapetus on my computer. Not everyone who takes a look at Saturn observes Iapetus, although it's Saturn's third largest moon.



This graphic shows the bright and dark features on Iapetus, and was derived from Voyager data. Remember that Iapetus is tidally locked with Saturn, so as Iapetus orbits; the same side is always facing Saturn.

Iapetus is easier to locate near Saturn at both inferior and superior conjunction, when it is closest to the planet and visible to the north and south of the planet, respectively. But its 79-day orbit takes Iapetus far outside the usual planetary eyepiece view. In fact Iapetus is 3 times further from Saturn than Titan, or 12 ring diameters from Saturn when it shines the brightest. The magnitude of Iapetus varies from 10.1 at western elongation to 11.9 at eastern elongation.

We have known for a long time that the leading side of Iapetus is dark as coal, while the trailing side is bright as snow. We are looking at the bright trailing side of tidally locked Iapetus when it is at western elongation, and we are looking at the dark leading side of the moon at eastern elongation. Why this is so is still under debate, as it has been for the past 334 years.

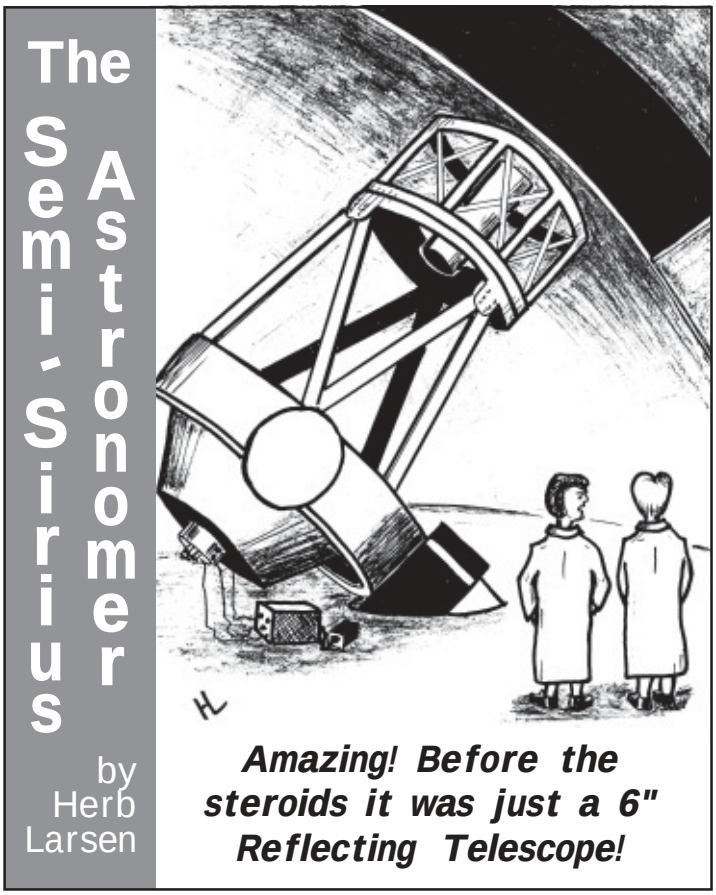

NASA/JPL/Space Science Institute

Cassini discovered Iapetus in 1671 and he noted that he could only see Iapetus on one side of Saturn and not on the other side. The dark area of Iapetus is called Cassini Regio, in his honor, and may be dark because the leading side of Iapetus collides with or alters dust from the moon Phoebe. Stay tuned as the Cassini instrument teams study the Iapetus data, Cassini will have one more flyby of Iapetus in September 2007. The 2007 flyby will be from a distance of 763 miles.

To find Iapetus at either conjunction or elongation, and compare its brightness to nearby stars, use your favorite planetarium program to calculate the extreme magnitudes of Iapetus, and to compare it to nearby stellar magnitudes. SJAA's Akkana Peck created some Iapetus charts which should help you find Iapetus on March 15 and April 24. Read her monthly column in the SJAA *Ephemeris* at *http://ephemeris.sjaa.net/* You'll find a few other dates charted here as well: *http://www.shallowsky.com/iapetus*

Here is a list of key Iapetus observing dates:

Eastern Elong. Dark side faces Earth	**Inferior Conj.** Iapetus N. of Saturn	**Western Elong.** Bright side faces Earth	**Superior Conj.** Iapetus S. of Saturn
—	Jan. 16	Feb. 4	Feb 23
Mar. 15	Apr. 5	Apr. 24	May 14
Jun. 4	Jun. 25	Jul. 14	Aug. 3
Aug. 25	Sep. 14	Oct. 4	Oct. 23
Nov. 13	Dec. 3	Dec. 22	—



SOCIAL AMENITIES

Many thanks to Jennifer Shipp for providing coffee and cookes at the February SCAS meeting. Her delicious cookies generated spontaneous applause.

We're still looking for signups for the September, November and December meetings, so if you'd like to volunteer please call or email Cecelia Yarnell.

WELCOME, NEW MEMBERS!

SCAS welcomes our new members who joined this month: Nancy Cummings of Santa Rosa, David Cranford of Petaluma, and Stephen Wishny of Sonoma. Also, welcome back to Carl Weber who has renewed after an extended absence.

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 the Striking Sparks project by donating merchandise for the awards. He 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*

Einstein 1905 Centenary

An Introductory Tribute by Ralph Mansfield

The year 2005 marks the 100th anniversary of Albert Einstein's "annus mirabilis," when Einstein published three remarkable papers that proved the existence of the atom, the validity of quantum physics, and the theory of special relativity. These publications demonstrated Einstein's unique ability to invent new physics and to philosophize about cosmology in ways not previously contemplated by other scientists.

Sometimes physics students play a game, "Who was the greater genius? Kepler or Galileo? (Galileo) Maxwell or Bohr? (Maxwell) Hawking or Heisenberg? (Heisenberg)." But Isaac Newton and Albert Einstein are off the charts. Newton's claim is obvious, the creation of modern physics that accounted for the observed behavior of the cosmos. His theories were mathematical, capable of specifying planetary positions. Einstein admired Newton and in his *Autobiographical Notes* wrote, "Newton, forgive me. You found the only way which, in your age, was just about possible for a man of highest thought and creative power." Einstein was apologizing for replacing Newton's system with his own.

"The eternal mystery of the world is its comprehensibility."

In 1905 Einstein was 26 years old, working as a patent examiner in Switzerland, but also working after hours to create the Special Theory of Relativity. He demonstrated that time and distance vary systematically as objects move relative to anything else. This was contradictory of Newton's concept that space and time are absolute and, thus, the relativistic universe we observe differs from the one Newton propounded. But Einstein did more.

In March 1905 Einstein explored the quantum theory of light—that light exists as photons as well as waves. This work established the idea that we exist in a quantum universe constituted of discrete bits of energy and matter. Then in April-May, Einstein published a paper in which he invented a method of counting and determining atomic or molecular size in a given space and in then he explains Brownian motion, proving that atoms do exist.

In June 1905 Einstein completed his theory of special relativity in which light is seen as a continuous field of waves. Considering light as particle and wave, Einstein chose the wave to complete his theory. But he still was not finished. So, later, he proposed an extension of special relativity to prove that energy and matter are linked by the most famous science equation, $E=mc^2$, the energy of a physical entity equals the product of its mass by the square of the speed of light.

This awesome output of physical discoveries is rightfully named the miracle year of Einstein, the annus mirabilis. Amazingly, this was accomplished in an era when Einstein was fully employed as a patent clerk. His science papers brought attention to his scientific genius and he was invited to teach at various universities, finalizing his career at the Institute for Advanced Study at Princeton University.

(Due to space constraints, a discussion of Einstein's "greatest error" in his relativity equations is postponed to a later time. Suffice it to say that even in his "error" Einstein was right and pointed the way to search for dark matter and antigravity in the expanding universe).

Events

Robert H. Ferguson Observatory

Public Viewing: Saturday, March 12
Solar Viewing: 11:00 AM - 3:00 PM
Night Viewing: Begins 6:30 PM

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.

There is 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 the night viewing sessions.

SCAS members may set up telescopes in the observatory parking lot to assist with public viewing. Automobile access closes at dusk, late arrivals must carry equipment in from the horse stable parking area.

Classes

Mar. 3	Intro to Astronomy & Observing, 7:00 PM
Mar. 4	Observing Lab, 7:00 PM
Mar. 10	Intro to Astronomy & Observing, 7:00 PM
Mar. 31	Intro to Astronomy & Observing, 7:00 PM
Apr. 5	Night Sky Winter/Spring Series, 7:00 PM
Apr. 7	Intro to Astronomy & Observing, 7:00 PM

Classes are held at the Observatory. Reservations required for classes. Contact: (707) 833-6979, *http://www.rfo.org* or email *nightsky@rfo.org*

Morrison Planetarium Dean Lecture Series

Mar. 7—Catching Stardust From a Comet and Bringing it Home—Dr. Don Brownlee, University of Washington, Principal Investigator, Stardust Mission

In January 2004 the NASA Stardust spacecraft made a daring close flyby of comet Wild 2 and grabbed thousands of samples for return to Earth. The precious cargo is now speeding home for a January 2006 landing in the Utah desert. During the flyby, Stardust's camera provided a view with unprecedented detail. The comet's highly complex surface and dozens of jets of gas and dust streaming into space exceeded all expectations.

New 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. All programs begin at 7:30 PM in Kanbar Hall at the JCC. Contact: 415/750-7141, *http://www.calacademy.org/planetarium/*

SCAS School Star Parties

Mar. 7 Meadows Elementary in Petaluma (8th if rain)
Mar. 14 Evergreen Elementary in Rohnert Park
Mar. 15 Bernard Eldridge Elementary, Petaluma (16th if rain)
Apr. 6 Grant Elementary in Petaluma
Apr. 11 Cub Scouts in Petaluma

Star parties are given free to any school or organization that requests them. To make arrangements, contact SCAS Community Activities Director, Len Nelson, at 707/763-8007, *lennelsn@comcast.net*. Get on his volunteer list if you are interested in being notified of upcoming school star parties.

SCAS Yosemite Public Star Party

July 15 and 16

Our dates fall one day after the quarter Moon. The public likes to see the Moon, and to see where they're walking. The Moon will transit the meridian at 8:00 PM on July 15, at 11:00 PM on July 16. Jupiter will be viewable in the West until about 9:00 PM. Watch *Sonoma Skies* for more information and to sign up.

Mt. Tamalpais Astronomy

Saturday, March 19, 7:00 PM

"Healdsburg Glass and the Tektite Question," Dr. Rolfe C. Erickson, Sonoma State University

Are dark, glassy rocks found locally evidence that an ancient asteroid impacted the Western United States?

Presentations held in the Mountain Theatre. Viewing afterwards in Rock Springs Parking Area, provided by San Francisco Amateur Astronomers. The Madrone Picnic Area (next to the Mt. Theater) is reserved 1-1/2 hours before each program for informal gathering. Bring your picnic supper and meet the speakers before the talk. Information: *http://www.mttam.net/*

SJAA Astronomy Auction

Sunday, April 25, Registration at Noon, Auction 1PM

Sponsored by the San Jose Astronomical Association, it's a great opportunity for beginners to purchase their first telescope at a great price! Experienced observers can find equipment from OIII filters to finders to star charts. The swap meet will follow to allow additional selling and haggling.

Directions: From Hwy. 17, take the Camden Avenue exit. Go east .4 mile, turn right at the light onto Bascom Avenue. At the next light, turn left onto Woodard Road. At the first stop sign, turn right onto Twilight Drive. Go three blocks, cross Sunrise Drive, then turn left into Houge Park.

For more info or to preregister, visit *auction@sjaa.net*, *http://www.sjaa.net* or email Jim Van Nuland at *jvn@svpal.org*

Events

The Geysers Star Parties

Excellent dark sky observing at ~2700' for members and guests. **Location:** Palmieri Observatory, Mercuryville (near The Geysers). Longitude: 122deg 49min., Latitude: 38deg 46min.

Saturday, March 12

Sunset: 6:15 PM PST
End Astronomical Twilight: 7:43 PM PST
Moonset: 9:14 PM PST

Note: **Alternate date February 12** if weather prohibits. Dress warm. If it's your first time to the Geyser site, go with someone who has gone before, or contact Mario Zelaya at (707) 539-6423, *zelayadesigns@sbcglobal.net*

Sonoma State University Series "What Physicists Do"

Tuesdays at 4:00 PM

Stevenson Hall Room 2006 (Coffee at 3:30 PM)

Mar. 8—Frontiers of Nanolithography: The Science of Making the Small Stuff

Dr. Keith Jackson of the Lawrence Berkeley National Laboratory will explore the use of photons and electrons for lithographic applications and the devices fabricated at the Center for X-ray Optics for diffractive optics used in the extreme ultraviolet (EUV) portion of the electromagnetic spectrum.

Mar. 15—New Eyes on the Expanding Universe: The SNAP Satellite

Dr. Natalie Roe of the Lawrence Berkeley National Laboratory will describe a proposed new space telescope designed to chart the expansion of the universe, using both supernovae and gravitational weak lensing.

Mar. 22—Einstein and the Riddle of His Creativity

Dr. Tilman Sauer of the Einstein Papers Project at Caltech will discuss some of Einstein's scientific achievements and offer some thoughts as to how a study of his papers and manuscripts can give us a better understanding of his exceptional creativity.

Contact *http://phys-astro.sonoma.edu/wpd/*

SSU Observatory Public Viewing

Mar. 11—8PM-10PM: Comet Machholz, Saturn, Flaming Star 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. Call 707/664-2267 before coming if it appears weather may force cancellation. *http://www.phys-astro.sonoma.edu/observatory/pvn.html*

SCAS Public Star Party

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, March 12

Sunset: 6:15 PM PST
End Astronomical Twilight: 7:43 PM PST
Moonset: 9:14 PM PST

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*

Note! Rental telescopes listed on Page 2 are ***free*** each month you participate in a SCAS-related Public Star Party. Join us in introducing the night sky to eager participants.

Shingletown Star Party

Preregistration is now being accepted for the Shingletown Star Party 2005. Dates are July 6 - 11. See all the info at *www.shingletownstarparty.org*

SRJC Planetarium

"The Moon"

Through April 3

The lure and mystery of the earth's satellite has fascinated Earthlings for thousands of years. In this show we'll tell some of the legends about the moon and describe imaginary journeys to this fascinating world. Discover astronomers' latest theory of how the moon formed. Learn why we always see the same features on the moon and what causes the phases of the moon. We will take an imaginary journey to the moon with the Apollo astronauts. You'll see close-ups of the moon's surface and hear about future missions to Earth's closest neighbor.

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 $4 General; $2 Students and Seniors. 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. Contact: (707) 527-4465 or 527-437 *http://www.santarosa.edu/planetarium/*

Lawrence Hall of Science

March 20—"Alien Earths" Lectures

The next set of lectures, Searching for Extra Terrestrial Life—connected with the exhibit "Alien Earths" at UC Berkeley's Lawrence Hall of Science, is on March 20.

12:30 Dr. Margaret Race: "Looking for ET—Bring 'em Back Alive...and Carefully" - perspectives from an expert in the field of planetary protection, analyzing issues of cross-contamination both in space and on Earth.

1:30 Dr. William Borucki, NASA Ames Research Center - "The Search for Habitable Planets Around Other Stars" - Over 100 giant planets orbiting other stars have already been found by ground-based telescopes. Dr. Borucki will describe future space-based missions necessary to find habitable Earth-sized planets, including the upcoming Kepler mission based at NASA Ames Research Center.

2:30 Dr. Emma Bakes - "How does life evolve? An exploration of Titan and Europa as possible alien habitats" Water has always been nominated as one of the essential ingredients for life and our own planet Earth yields conclusive proof. However, the main requirements for sources of extraterrestrial life might be thought of as a substance as the triple point (i.e. existing as a solid, a liquid and a gas at the same time) and a source of energy to fuel its organization into single celled organisms. We discuss the types of potential life which may inhabit Europa and Titan and how this may predict the nature of extraterrestrial life in other star systems.

The "Alien Earths" Exhibit invites visitors to join the search for habitable worlds. The exhibit runs at Lawrence Hall of Sciences through May 8.

LHS is on Centennial Drive below Grizzly Peak in the Berkeley Hills. General information: (510) 642-5132.

Admission to LHS is $8.50/adults; $6.50/ youth (5-18), full-time students, senior citizens, and the disabled; $4.50/children 3-4; and free for children two and under. For more information visit *www.lawrencehallofscience.org*

2005 Desert Sunset Star Party

AANC Notice: Pat and Arleen Heimann will again be hosting the Desert Sunset Star Party May 4-8, 2005, at the Caballo Loco RV Ranch southwest of Tucson. Check their website for details: *http://www.chartmarker.com/sunset.htm*

Classified Ads

FOR SALE: Meade LX 200 8-inch F/10 with many accessories, i.e.: Solar filter, ocular Televue, reticle eyepiece, focal reducer, Skyglo broadband, Barlow, off-axis guider, EZ finder, reflex sighter, battery, etc. Original value $3876, asking $1000 or BAO. Contact Norma Starner at 526-7439 mornings and evenings.

WANTED DEAD OR ALIVE: Celestron C-11 or C-11 OTA. Contact Howard Hansen at 707-575-7484.

Young Astronomers

Striking Sparks

YA March 19 Meeting, 5 PM, Proctor Terrace School

Although there will be no general Young Astronomers meeting in March, everyone is invited to attend Striking Sparks night, one of the most rewarding events of the year. This year is particularly special because the SCAS will be giving out their 200th telescope! As members of the YA, we need to show our enthusiasm for the club and astronomy in order to inspire the incoming members to get involved. Dinner is at 6:00 PM. See Page 1 for details. Plan to attend this record event because it is sure to be a lot of fun!

Black Holes

YA April 8 Meeting, 7:30 PM, Apple Blossom School

What is a black hole? How does one form? Could our own sun ever become a black hole? All these questions and more will be answered at our April YA meeting on black holes. Be sure to come to our closing meeting of the year on one of the most puzzling and captivating subjects in all of astronomy. As always, bring a telescope for viewing afterwards and bring a friend.

February Meeting Recap

At our February 11 meeting, everyone rolled up their sleeves and made their own comet using dry ice! First we hammered dry ice pellets into tiny bits. Then we added the bits to a mixture of organic chemicals, dirt, ammonia, and water. Working with our hands, we molded the mass into a ball. When the final product was revealed everyone's comet hissed from the seeping gasses trying to escape—much like what happens on a real comet. This hands-on meeting was informative, but it also was a lot of fun!

YA Information

Meetings: 7:30 PM the second Friday of each month, 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. For directions, contact any of the officers listed below.

YA Elected Officers

President: Melissa Downey 632-5661
VP/Program Director: Olivia Turnross *jtec@sonic.net*
Recorder: Open
Newsletter Editor: Scott Grubb *fivegees@sonic.net*
Librarian: Jacob Gaynor
Adult Adviser: Gary Jordan 829-5288

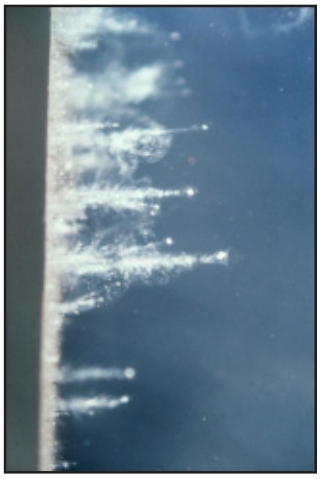
Stardust Up Close

by Patrick L. Barry and Dr. Tony Phillips

Like discarded lumber and broken bricks around a construction site, comets scattered at the edge of our solar system are leftover bits from the "construction" of our solar system. Studying comets can help scientists understand how our solar system formed, and how it gave rise to a life-bearing planet like Earth.

But comets have long been frustratingly out of reach—until January 2004 when NASA's Stardust probe made a fly-by of the comet Wild 2 (pronounced "vilt"). This fly-by captured some of the best images and data on comets yet...and the most surprising.

Scientists had thought that comets were basically "rubble piles" of ice and dust—leftover "construction materials" held together by the comet's feeble gravity. But that's not what Stardust found. Photos of Wild 2 reveal a bizarre landscape of odd-shaped craters, tall cliffs, and overhangs. The comet looks like an alien world in miniature, not construction debris. To support these shapes against the pull of gravity, the comet must have a different consistency than scientists thought:



The Stardust spacecraft used a grid holding aerogel to capture dust particles from comet Wild 2. In this test, high velocity dust particles are stopped unharmed at the end of cone shaped tracks in a sample of aerogel.

"Now we think the comet's surface might have a texture like freeze-dried ice cream, so-called 'astronaut ice cream': It's solid and can assume odd, gravity-defying shapes, but it's basically soft and crumbles easily," says Donald Brownlee of the University of Washington, principal investigator for Stardust.

Scientists are currently assembling a 3-D computer model from the Stardust photos. They show the sunlit side of the comet from many angles, so its 3-dimensional shape can be inferred. The result will be a "virtual comet" that scientists can examine from any angle. They can even perform a virtual fly-by. Studying the details, scientists will learn a lot about the material from which the comet is made: how strong or dense or brittle it is, for example.

In January 2006, a capsule from Stardust will parachute to Earth carrying samples of comet dust captured during the flyby. Once scientists get these tiny grains under their microscopes, they'll get their first glimpse at the primordial makings of the solar system.

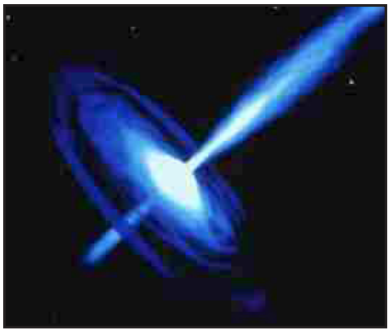
It's heading our way: ancient, hard-won, possibly surprising and definitely precious dust from the construction zone. Find out more about the Stardust mission at *stardust.jpl.nasa.gov* Kids can read about comets, play the "Tails of Wonder" game about comets, and hear a rhyming story about aerogel at *http://spaceplace.nasa.gov/en/kids/stardust/*

—Article provided by the Jet Propulsion Laboratory

Black Hole Journey

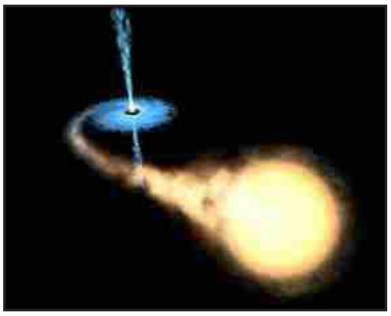
Adapted from an article by Emily Sohn

There are all sorts of holes: big ones and little ones, deep ones and shallow ones. Then, there are black holes. These mysterious, bizarre objects pack a huge mass into a tiny volume. Their gravity is so strong that they gobble up anything that comes near them, even stars, gas, and light. They're like cracks in space, and they lurk all over the universe. "If you were to fall in, what remains of you would eventually come out as light and other particles," says physicist Tom Banks. "There wouldn't be much left of you that we could recognize," Banks says. "It would be as if we had burned you up in a fire. Everything in the body would come out as nothing more than radiation and ashes."



An invisible, massive, spinning black hole may lie at the center of this galaxy, as shown in an artist's illustration. The black hole would pull in material from a swirling disk of nearby gas and stars. The extremely high temperatures and pressures produced near the black hole would cause gas to be ejected, creating a huge galactic jet.

Black Holes form when a huge star reaches the end of its life and runs out of fuel. First, the inner part of the star collapses. Then there's an enormous explosion called a supernova, sending light and matter into space. Eventually, the entire mass of what's left of the star gets squeezed into the tiniest space imaginable—forming a black hole.



This artist's illustration shows a black hole, together with its whirling disk of matter, hurtling like a cannonball through the disk of our own galaxy. Astronomers say that such a black hole, only several times more massive than the sun, is created when a dying, massive star explodes in a violent supernova.

The more mass an object has, the more gravity it has. Black holes formed in a supernova may be only a few times the mass of our sun. On the other hand, black holes at the centers of galaxies may have a billion times as much mass as the sun, all crammed into a very small space.

A complicated set of ideas called "string theory" has also led some physicists to suggest that the universe once held a whole bunch of black holes, all scrunched together. Eventually, these black holes grew and separated, and each one formed a galaxy around itself. It's possible that every galaxy visible today has a massive black hole at its center.

But researchers so far have only provided part of the picture. With string theory and other ideas, scientists hope to come up with a grand explanation for how everything came to be. "We weren't there at the beginning of the universe," Banks says. "We can't go look. We make theories to predict what we see today. We don't yet have a good enough theory to pin it all down."

Sonoma County Astronomical Society
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Sonoma Skies

March 2005

MARCH 9

Bob Schalck

Caring for Your Fine Optics

March Observing Notes

Mar. 1	**Jupiter** rises 9:30 PM, transits 2:00 AM
Mar. 10	New **Moon**
Mar. 10-14	**Mercury** at maximum angular separation E 18 deg. (17 deg. above horizon at sunset), in crescent phase. Sets 90 mins. after sunset. Best apparition of the year for us, at -0.4 mag.
Mar. 17	First quarter **Moon**
Mar. 20	**Spring Equinox**
Mar. 21	**Saturn** direct (East) in Gemini, 70 deg. high at end of twilight
Mar. 25	Full **Moon**
Mar. 28	**Zodiacal light** visible in West after twilight for next two weeks. Look for a faint column of light along the ecliptic.
Mar. 31	**Jupiter's** moons Io, Ganymede and Callisto form compact grouping West of Jupiter near 7:30 PM

Links featured this issue:

Panoramas of the Apollo missions: Excellent composites—you get a real sense of the Moon's landscape as you scan: *http://www.panoramas.dk/fullscreen3/f29.html*

Need observing challenges? Visit the American Association of Variable Star Observers website at *www.aavso.org*

VOLUNTEER FOR PROJECT ASTRO

The Astronomical Society of the Pacific's Project ASTRO is looking for amateur and professional astronomers who would like to work with teachers and students in 3rd - 9th grade classrooms. This is a great opportunity to share your love of astronomy with an enthusiastic audience and help kids learn about science.

Through Project ASTRO, you will be paired in a one-on-one partnership with a Bay Area teacher at a school near you. Together, educators and astronomers attend a 2-day summer workshop where participants learn to do hands-on, inquiry-based astronomy activities that involve students in the excitement of scientific discovery. Participants often report that being a Project ASTRO Volunteer has been one of the most satisfying volunteer endeavors they have undertaken.

Astronomer applications are now being accepted for the 2005 - 2006 school year. The deadline is May 6 and space is limited to 35 partnerships. Astronomer application forms are available from: Christina de Leon, Project ASTRO, Astronomical Society of the Pacific, 390 Ashton Avenue, San Francisco, CA 94112, Tel. 415-337-1100 ext. 101, *cdeleon@astrosociety.org*

Information and forms can also be found on the Web at: *http://www.astrosociety.org/education/astro/bayarea/volunteer.html* ASTRO Volunteers' Discussion Forums at: *http://www.astrosociety.org/phpBB2/index.php*