

Sonoma Skies

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

September 2008

www.sonomaskies.org

Volume XXXI No. 9

Mini-Messier Marathon

August 29, 7:47 PM
Lone Rock Flat, Lake Sonoma

Come Join the SFAA and SCAS in a Joint Event: The First Mini-Messier-Marathon. The San Francisco Amateur Astronomers and the Sonoma County Astronomical Society will co-host a Mini-Messier-Marathon at Lone Rock Flat, Lake Sonoma, on Friday, August 29th 7:47 p.m.

Directions: Take 101 N to Geyserville (about 20min north of Santa Rosa), take the Canyon Rd. exit and turn left (go under the freeway). Take Canyon Road until it ends at a T with Dry Creek Road. Turn right onto Dry Creek Road and continue until it reaches the Lake Sonoma Recreation Area.

Make a sharp left turn, over the spillway bridge, to the park entrance. Drive through the lower park area, and continue up the hill past the Skaggs Spring turnoff, onto Rockpile Road. Follow Rockpile Road, over the bridge across the rey Pine Flat turnout, on the right, (the alternate observing site). Contine to Lone Rock Flat about 1mile further on the right. Lone Rock is the preferred site, as it has better elevation horizons.

Radar link:

<http://radar.weather.gov/radar.php?rid=dax&product=NOR&overlay=11101111&loop=no>

Lake Sonoma is an Army Corps of Engineers facility:

<http://www.spn.usace.army.mil/lakesonoma/index.htm>

THANK YOU, MEMBERS!

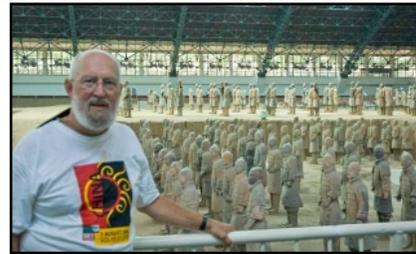
Many of you have opted to receive your newsletter online, saving your club money and helping the environment. Thank you for helping us keep our dues low. If you haven't opted for online receipt, contact our Membership Director, Walt Bodley, at membership@sonomaskies.org to make the change. Thanks!

Young Astronomers See page 6

The Umbra Lover

SCAS September 10 Meeting, 7:30 PM
at Proctor Terrace School

Lynn Anderson has been a member of SCAS since the mid 80s. He experienced his first total solar eclipse in February 26, 1998, from the upper deck of Celebrity Cruise Lines, Galaxy, along with several other SCAS members who had made the pilgrimage to the Caribbean for the event.



Terracotta Warrior World Cultural Heritage Site, Xi'an, China

Retiring form teaching in 2005 has freed him from the restrictions of the school year and he has ventured to Egypt in 2006 for the eclipse of 29 March and most recently to China, where he viewed last month's August first eclipse. He also traveled to Spain for the October 3, 2005 annular eclipse. Lynn claims to have 14 minutes, 11 seconds standing in the moon's shadow. To express his joy of eclipse experiences his personalized license plate reads UMBRA♥R (Umbra Lover).

Lynn is currently putting together a program about his eclipse travels. Come to the September 10th SCAS meeting to hear and see what he has to share.

Working as a public school teacher made it difficult to take time off to travel during the school year, Lynn found time in the summers to go to Austria for the August 11, 1999 eclipse, and to Zambia for the eclipse of 21 June 2001.



Second Contact Diamond Ring, 1 August 2008, Near Yiwu, China



Sextant (circa 1673) at the Ancient Beijing Observatory, China



Sonoma County Astronomical Society (SCAS)

Membership Information

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

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

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

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

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

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

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

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

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

September Observing Notes

9/1 Crescent Moon, Mercury, Venus, Mars in West. Early twilight conjunctions continue through first half of the month. Difficult to observe; use binoculars or scopes. Locations at 2000:

Obj	alt/az
Ven	7/264
Mer	6/261
Moon	4/257
Mar	9/258

9/6 Moon very near Antares

9/7 Jupiter Stationary

9/9 Moon nr Jupiter

9/10 Mercury near Venus. Difficult; use binoculars. Dimmer Mars is very near Venus. Spica is about 11° south and slightly higher. Locations at 1955:

Obj	alt/az
Ven	6/259
Mar	6/278
Mer	4/256

9/11 Venus very near Mars. Difficult; use binoculars or scope. Spica is 10° S and slightly higher. Locations at 1955:

Obj	alt/az
Ven	5.7/258.5
Mar	5.4/258.4
Mer	3/256

9/12 Uranus Opposition. Magnitude 5.7; disk 3.7"; located near 96 Aqr

9/12 Mercury nr Mars. Difficult; use binoculars or scope. Spica is about 9° south and slightly higher. Locations at 1950:

Obj	alt/az
Ven	6.4/257.2
Mar	5.9/257.6
Mer	4/255

9/15 Full Moon

9/22 Autumnal Equinox

9/26 Crescent Moon near Regulus. Occultation of 31 Leo, 5:30AM. Twilight event. Disappearance on bright limb requires at least 3" aperture to observe. Reappearance on dark limb easy but requires accurate determination of point on limb. Times are for RFO site.

Time	Event	Moon alt/az
0549	Disapp	17/ 90
0649	Reapp	28/100

Reappearance limb location:

Cusp angle = 71° from south cusp

Position angle = 274°

Vertex angle = 326° (CCW from highest point above horizon)

Axis angle = 255° (E from lunar N)

9/27 Zod Light in East thru 10/10, 4:30 - 5:30AM. Tall tapering triangle of light along Ecliptic viewable from very dark locations just before astronomical twilight.

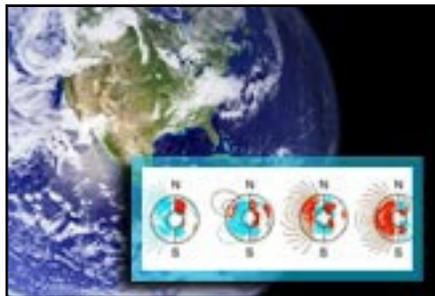
9/29 New Moon, 1 AM

—Above courtesy of Jack Welch

Sloshing Inside Earth Changes Protective Magnetic Field

Something beneath the surface is changing Earth's protective magnetic field, which may leave satellites and other space assets vulnerable to high-energy radiation.

The gradual weakening of the overall magnetic field can take hundreds and even thousands of years. But smaller, more rapid fluctuations within months may leave satellites unprotected and catch scientists off guard, new research finds.



A new model uses satellite data from the past nine years to show how sudden fluid motions within the Earth's core can alter the magnetic envelope around our

planet. This represents the first time that researchers have been able to detect such rapid magnetic field changes taking place over just a few months.

"There are these changes in the South Atlantic, an area where the magnetic field has the smallest envelope at one third [of what is] normal," said Mioara Mandea, a geophysicist at the GFZ German Research Center for Geosciences in Potsdam, Germany.

Even before the newly detected changes, the South Atlantic Anomaly represented a weak spot in the magnetic field — a dent in Earth's protective bubble.

The Earth's magnetic field extends about 36,000 miles (58,000 km) into space, generated from the spinning effect of the electrically-conductive core that acts something like a giant electromagnet. The field creates a tear-drop shaped bubble that has constantly shielded life on Earth against much of the high-energy radiation flowing from the sun.

The last major change in the field took place some 780,000 years ago during a magnetic reversal, although such reversals seem to occur more often on average. A flip in the north and south poles typically involves a weakening in the magnetic field, followed by a period of rapid recovery and reorganization of opposite polarity.

Some studies in recent years have suggested the next reversal might be imminent, but the jury is out on that question.

Measuring interactions between the magnetic field and the molten iron core 1,864 miles (3,000 km) down has proven difficult in the past, but the constant observations of satellites such as CHAMP and Orsted have begun to bring the picture into focus.

Mandea worked with Nils Olsen, a geophysicist at the University of Copenhagen in Denmark, to create a model of the fluid core that fits with the magnetic field changes detected by the satellites.



WELCOME NEW MEMBERS!

Welcome aboard to Fred Bassett of Sebastopol, Sandra Short of Petaluma, and Catherine Poloynis of Santa Rosa.

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

However, the rapid weakening of the magnetic field in the South Atlantic Anomaly region could signal future troubles for such satellites. Radiation storms from the sun could fry electronic equipment on satellites that suddenly lacked the protective cover of a rapidly changing magnetic field.

"For satellites, this could be a problem," Mandea told SPACE.com. "If there are magnetic storms and high-energy particles

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Events

ROBERT FERGUSON OBSERVATORY PUBLIC VIEWING

Saturday, September 27

Solar Viewing: Noon - 4:00 PM

Night Viewing begins 8:00 PM

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

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

NIGHT SKY FALL SERIES

Session #1—Sept. 22

Session #2—Sept. 29

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

OBSERVING LAB: STAR DEATH

September 26, 7PM

“Star Death: The End of Stellar Fusion” - An intensive telescope observing session after a brief presentation on the night’s theme. Handouts/Observing Lists provided. Attendance limited to 10. Fee: \$30. [Raincheck date: Wed., 10/1].

For reservations, email: nightsky@rfo.org

RESERVE THE FERGUSON OBSERVATORY!

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

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

SRJC PLANETARIUM

“Sky Phenomena”

September 12 - October 12

The sky holds many beautiful sights including rainbows, haloes, phases of the Moon, eclipses, meteor showers, comets, auroras, etc. Join us as we tour sky phenomena and explore their origins. “First Friday Night Sky” shows on October 3rd; no planetarium shows on October 4th and 5th.



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/>

“First Friday Night Sky”

First Friday Night Sky shows are a new feature offered on the first Friday of the months October through December of 2008; and, February through May of 2009. These shows, offered at the regular times of 7:00 and 8:30 pm will be the only shows given on those first Friday weekends. Show content will vary with emphasis on the stars, constellation, planets, and other interesting facts in or about the sky that night. These shows will be offered by SRJC’s Planetarium free of charge as a thank you to all our customers. Seating will be on a first-come, first-served basis; so arrive early enough to pick up your free parking permit, return it to your vehicle, and arrive back in the planetarium by the scheduled show start time.

MT. TAMALPAIS ASTRONOMY

Sept. 6, 8:00 PM: “Demarcation: Is There a Sharp Line Between Science and Pseudoscience?”—Dr. Raymond Hall, CSU Fresno

A look at ways to discern the difference between astronomy and astrology, and the application of these distinctions in the areas of law, public policy, and education policy.

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

Events

SONOMA STATE UNIVERSITY SERIES “WHAT PHYSICISTS DO”

Mondays at 4:00 PM

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

Sept. 8—Physics for Future Presidents

Dr. Richard Muller of the University of California at Berkeley, will tell us what every world leader needs to know, the subject of his course (voted “Best Class at Berkeley”) and of his new book.

Sept. 15—First Results from the Phoenix Lander Mission

Dr. Carol Stoker of NASA Ames Research Center will present information obtained from the spacecraft that landed in the icy northern region of Mars in May 2008.

Sept. 22—Fundamental and Applied Antineutrino Physics

Dr. Adam Bernstein of the Lawrence Livermore National Laboratory will discuss the surprising utility of antineutrinos for addressing practical and fundamental problems, including cooperative monitoring of nuclear reactors, mapping the Earth’s crust and mantle distributions, sensitive detection of supernovae, and deepening our understanding of the mysterious nature of the neutrino.

Sept. 29—The Simplest Chemistry There Is: Doing Reactions One Molecule at a Time

Dr. Miquel Salmeron of the Lawrence Berkeley National Laboratory will describe the use of simple, yet powerful microscopes to push and pull molecules and to stretch and bend their chemical bonds.

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

NIGHTFALL

Oct. 30—Nov. 2, 2008

Palm Canyon Resort, Borrego Springs, California

Nightfall is a unique star party because it takes place at a desert resort that cooperates in creating a dark, red-light only environment throughout its sprawling property.

This is a great opportunity to bring family and friends to a star party with amenities such as pools, high-speed Internet access, and air conditioned rooms, as well as dark, steady skies. In the daytime, the nearby Anza Borrego Park is a terrific place for hiking or off-roading.

Nightfall is hosted by the Palm Canyon Resort. You can make reservations to stay there at <http://www.pcreort.com> or by calling (800) 242-0044. Be sure to mention that you are with the “astronomy event.”

Want More Information? Click on the following link to a PDF file with more information. You may also email the event committee at nightfall@jamiesongroup.us.

MORRISON PLANETARIUM DEAN LECTURE SERIES

Sept. 22, 7:30 PM: “Both Eyes Wide Open - The Large Binocular Telescope”—Richard Pogge, Professor and Vice Chair for Instrumentation, The Ohio State University, Department of Astronomy

After more than a decade of construction, the Large Binocular Telescope (LBT) opened both of its massive eyes on the night sky for the first time earlier this year. Located high atop Mount Graham in southeastern Arizona, the LBT is the first of a new generation of extremely large optical telescopes. Its two 8.4-meter diameter primary mirrors are mounted side-by-side on a single mount, giving it a light gathering power equivalent to a single 11.8-meter circular mirror, making it currently the world’s most powerful optical telescope. This talk will introduce the LBT and its suite of powerful instruments, highlight some of the early scientific results, and describe its future capabilities.

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

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

GRAND OPENING CALIFORNIA ACADEMY OF SCIENCES

September 27 and 28

Join us for a weekend-long celebration of historic proportions in Golden Gate Park — with family-friendly activities and entertainment from morning to night. Enjoy live music and dance performances. Sample sustainably-sourced food from all over the world. Marvel at Chinese acrobats. Browse the latest in green technologies. Scale the rock-climbing wall. And so much more!

And this is just what’s outside the Academy in the Music Concourse. Admission inside the Academy is free on Saturday, September 27th. Plus, hours are extended both days.

Join the SFAA and other bay area clubs to host an activity such as: solar observing, telescope demonstration, planet and galaxy distance demonstration, and general astronomy information. Time slots are: Saturday 8:30am-11am 11am-1pm 1pm-3pm 3pm-5pm 5pm-7pm 7pm-9pm. Sunday 8:30am-11am 11am-1pm 1pm-3pm 3pm-5pm

To volunteer, email academyevent@sfaa-astronomy.org and indicate the time slots and the activities you would like to support or organize.

Young Astronomers



Avoiding the Fate of the Dinosaurs—The Search for Near Earth Asteroids

September 19 YA Meeting

Most scientists now believe that an asteroid impact off the coast of Mexico 65 million years ago led to the eventual extinction of the dinosaurs. Earlier impacts may have also been responsible for other mass extinctions on our planet. Since it is widely accepted that such impacts have happened on a fairly regular basis throughout Earth's history, what can humans do to avoid the fate that befell the dinosaurs? Come to the first Young Astronomers meeting of the new school year (on September 19th) to find out! We'll learn about ongoing efforts to discover and track near Earth asteroids, as well as what options humans may have to try to prevent another disastrous impact.

Important Notice: This year the Young Astronomers plan to meet on the third Friday of each month. Although we hope to be meeting at the same location as in the past few years, we are still awaiting final confirmation that this will be possible. An e-mail will be sent out to YA members as soon as our meeting location has been confirmed. If you don't think you're on our e-mail list, contact Gary Jordan at Sieramolly@Comcast.net, and he will be sure you are added. Thanks for your patience! See you on September 19th!

YA INFORMATION

Meetings: 7:30 PM the second Friday of each month of the school year, at location to be announced. Open to all Sonoma County students.

YA ELECTED OFFICERS

PRESIDENT: Blaine Eldred

VP/PROGRAM DIRECTOR: Geoffrey Knoll

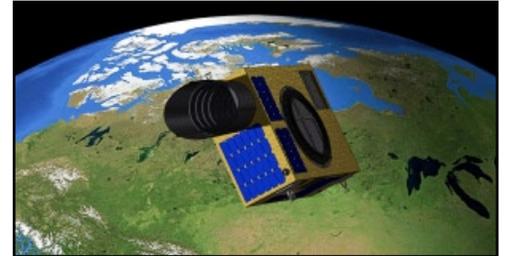
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NEOSSat to Search for Threatening Asteroids

The world's first space telescope designed specifically to hunt asteroids that threaten to slam into Earth is scheduled for launch in 2010. Although no larger than a suitcase, the Canadian satellite named NEOSSat – for Near Earth Object Surveillance Satellite, may soon help protect Earth from a catastrophic collision with an asteroid. Currently the search for near Earth asteroids is carried out by several ground-based telescopes located around the planet. These telescopes regularly scan the sky for potential dangers, but they can only hunt at



night, and poor weather blocks their view. NEOSSat will be in a sun-synchronous, pole-to-at orbit at an altitude of about 500 miles above Earth. It will operate nonstop, twirling hundreds of times a day as it photographs different sections of space. And when it isn't asteroid hunting, NEOSSat will track satellites and space debris to prevent collisions.

Using a six-inch wide telescope that has a sunshade, NEOSSat will be able to search close to the sun, where potentially hazardous asteroids are most concentrated. This is a region that ground-based telescopes are unable to cover, so NEOSSat will help make us a little bit safer.

Although asteroid collisions are rare, we only need to look at the surface of the Earth, the moon, and Mars to see craters left behind by previous impacts. It is estimated that asteroids larger than 1,000 yards wide smash into Earth every million years or so. Many scientists believe just such an impact left a 150-mile wide crater 65 million years ago off the coast of Mexico, leading to the severe climate change that wiped out the dinosaurs.

However, asteroids don't have to be that big to cause a disaster. Every few centuries smaller asteroids hit Earth. Scientists now believe that 100 years ago a small asteroid exploded just a few miles above the ground near the Tunguska River in a remote part of Siberia. Scientists think that asteroid was about half the size of a football field, but the explosion devastated a 1,200-square-mile area. If such an explosion happened over a city, the city would be flattened, resulting in one of the greatest disasters in human history.

Since they started cataloging them about 20 years ago, scientists have discovered more than 5,400 near-Earth asteroids. (Near-Earth means within 120 million miles.) Some 800 of those asteroids are larger than 1,000 yards wide, but scientists estimate there may be more than 200,000 smaller asteroids. If NEOSSat does find an asteroid likely to hit Earth, we will only have a couple of options to deal with it. If given relatively short notice, governments can only move people out of the way. However, if given an early warning, a space mission could be sent to deflect the asteroid.

Even though movies like "Armageddon" and "Deep Impact" have made for exciting disaster stories, this threat isn't science

fiction, and must be taken seriously. Asteroid impacts are real events that have happened before, and they are bound to happen again. NEOSat's job is to see the asteroids coming.

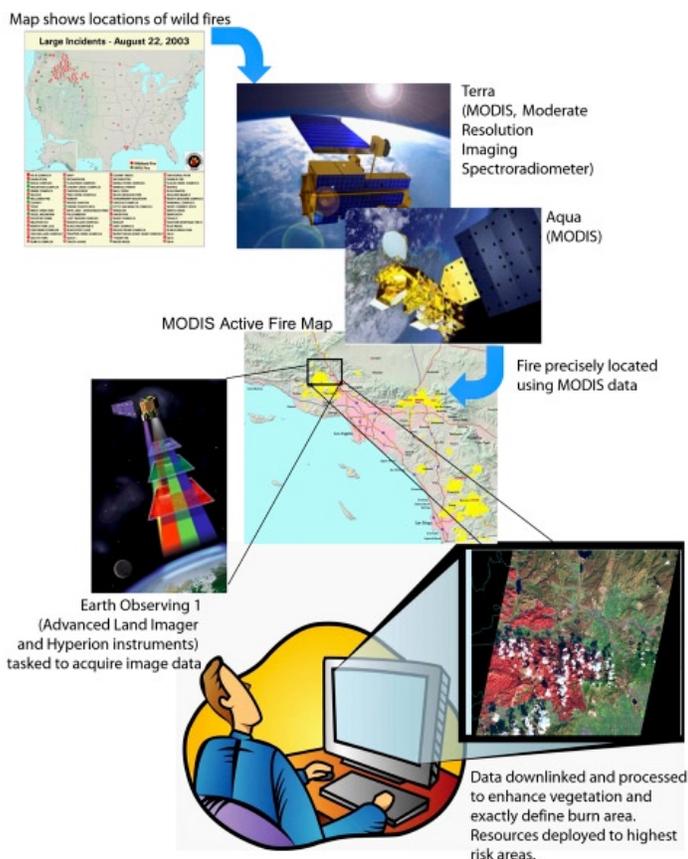
—Adapted from an article by Patti Lane

NASA SpacePlace

A Google for Satellites: Sensor Web 2.0

If you could see every satellite passing overhead each day, it would look like a chaotic meteor shower in slow motion.

Hundreds of satellites now swarm over the Earth in a spherical shell of high technology. Many of these satellites gaze at the planet's surface, gathering torrents of scientific data using a dizzying array of advanced sensors — an extraordinary record of our dynamic planet.



A "Google for satellites" type of web portal will allow users to request real-time data from Earth observing satellites.

To help people tap into this resource, NASA researchers such as Daniel Mandl are developing a "Google for satellites," a web portal that would make requesting data from Earth-observing satellites almost as easy as typing a search into Google.

"You just click on it and it takes care of all the details for you across many sensors," Mandl explains.

Currently, most satellites are each controlled separately from the others, each one dauntingly complex to use. But starting with NASA's Earth Observing-1 (EO-1) satellite, part of the agency's

New Millennium Program, Mandl and his team are building a prototype that stitches these satellites together into a seamless, easy-to-use network called "Sensor Web 2.0."

The vision is to simply enter a location anywhere on Earth into the website's search field along with the desired information types — wildfire maps, vegetation types, floodwater salinity, oil spill extent — and software written by the team goes to work.

"Not only will it find the best sensor, but with proper access rights, you could actually trigger a satellite to take an image in the area of interest," Mandl says. Within hours, the software will send messages to satellites instructing them to gather the needed data, and then download and crunch that raw data to produce easy-to-read maps.

For example, during the recent crisis in Myanmar (Burma) caused by Cyclone Nargis, an experimental gathering of data was triggered through Sensor Web 2.0 using a variety of NASA satellites including EO-1. "One thing we might wish to map is the salinity of flood waters in order to help rescue workers plan their relief efforts," Mandl says. If the floodwater in an area was salty, aid workers would need to bring in bottled water, but if flood water was fresh, water purifiers would suffice. An early and correct decision could save lives.

Thus far, Mandl and his team have expanded Sensor Web 2.0 beyond EO-1 to include three other satellites and an unmanned aircraft. He hopes to double the number of satellites in the network every 18 months, eventually weaving the jumble of satellites circling overhead into a web of sensors with unprecedented power to observe and understand our ever-changing planet.

To learn more about the EO-1 sensor web initiatives, go to <http://eo1.gsfc.nasa.gov/new/extended/sensorWeb/sensorWeb.html>. Kids (and grown-ups) can get an idea of the resolution of EO-1's Hyperion Imager and how it can distinguish among species of trees—from space at:

http://spaceplace.nasa.gov/en/kids/eo1_1.shtml.

—Article provided by JPL/NASA

Magnetic Field (from Page 3)

coming from the sun, the satellites could be affected and their connections could be lost."

The constant radiation bombardment from the sun blows with the solar wind to Earth, where it flows against and around the magnetic field. The effect creates the tear-drop shaped magnetosphere bubble, but even the powerful field cannot keep out all the high-energy particles.

A large sunspot set off a major radiation storm in 2006 that temporarily blinded some sun-watching satellites. Astronauts on the International Space Station retreated to a protected area as a precaution to avoid unnecessary radiation exposure.

The Earth's overall magnetic field has weakened at least 10 percent over the past 150 years, which could also point to an upcoming field reversal.

Mandea and Olsen hope to continue refining their model with updated observations, and perhaps to eventually help predict future changes in the Earth's magnetic field.

The study was detailed in the May online edition of the journal Nature Geoscience.

--by Jeremy Hsu, Staff Writer, Space.com

**Sonoma County
Astronomical Society**

P.O. Box 183
Santa Rosa, CA 95402



Sonoma Skies
September 2008

SEPTEMBER 10

The Umbra Lover

with Lynn Anderson