# Sonoma Skies

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

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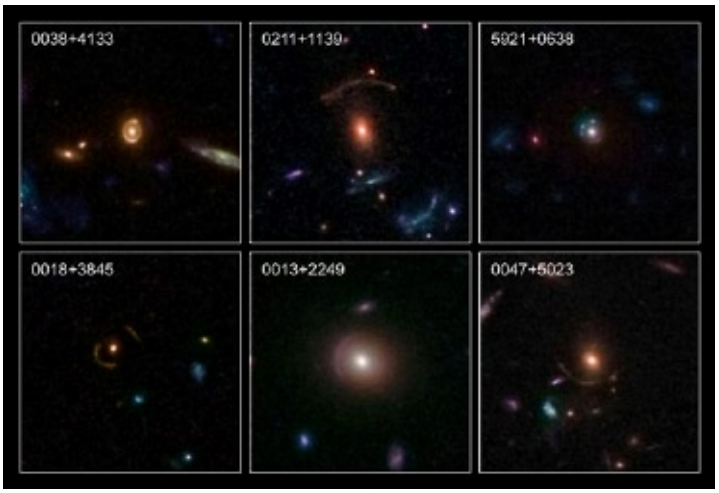


*Six examples of the rich diversity of 67 strong gravitational lenses found recently by Hubble. Credit: NASA, ESA, C. Faure (Zentrum für Astronomie, University of Heidelberg) and J.P. Kneib (Laboratoire d'Astrophysique de Marseille)*

# Universe Loaded with Natural Magnifying Glasses

One of the best tools astronomers have to glimpse the distant universe is a technology that nature invented. Cosmic magnifying glasses called gravitational lenses help scientists zoom in on far-away scenes they could never spot otherwise.

In a recent survey of a section of the universe, researchers counted 67 new gravitational lenses, leading them to believe there are nearly half a million similar lenses in the rest of the universe.

"Gravitational lenses amplify the signal," said Peter Capak, an astronomer at California Institute of Technology who worked on the study. "It's like a second telescope in front of your telescope. We can see things that are much fainter than we can normally see."

These natural telescopes are created when massive objects distort the space-time around them through the strength of their gravitational pull, causing light to bend as it travels through the warped space.

If a gravitational lens lies between us and a distant object, then the image of the object we see can be distorted and magnified. In the rare case that a gravitational lens is perfectly aligned

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Young Astronomers See page 6

# Mapping the Heavens
## from Ancient to Modern Times

**Nick Kanas, UC San Francisco**
**SCAS April 9 Meeting, 7:30 PM**
**at Proctor Terrace School**

Dr. Nick Kanas will trace the development of celestial cartography from the classical Greeks to modern day, focusing on important historical and contemporary star atlases. His presentation at this month's SCAS meeting will be illustrated with pictures that are mostly from his collection.

Dr. Kanas is Professor of Psychiatry at the University of California, San Francisco. He has been interested in astronomy since childhood and has been a member of the San Francisco Amateur Astronomers since 1978 and a member of the Astronomical Society of the Pacific since 2004. He has collected and researched antiquarian celestial books, atlases, and prints for 25 years, and he is a member of several cartographic societies.

He has published 9 articles on the history of celestial cartography for a number of astronomy and cartography journals and magazines, including Sky & Telescope, Mercury, Imago Mundi, Mercator's World, and the Journal of the International Map Collectors' Society. He has presented invited talks on the history of celestial cartography at 18 scientific and non-scientific meetings of organizations such as the Sydney (Australia) Observatory, the 20th International Conference on the History of Cartography, the Under the Southern Cross International Cartographic Conference, the California Map Society, the Northern California Historical Astronomy Luncheon and Discussion Association (NCHALADA), the Palo Alto Art Center, and numerous amateur astronomy societies (e.g., San Francisco, San Jose, East Bay, Peninsula).

For his "day job", Dr. Kanas does NASA-funded research on psychosocial issues affecting astronauts in space. Together with his professional publications, Dr. Kanas has written nearly 200 articles and 4 books. His book "Space Psychology and Psychiatry" (N. Kanas and D. Manzey, Kluwer/Springer, 2003) won the 2004 International Academy of Astronautics Life Science Book Award. Last year he published his book "Star Maps: History, Artistry, and Cartography", copies of which will be available for purchase at the meeting.

Come join us to find out how we map the heavens. The public is welcome.

# Sonoma County Astronomical Society (SCAS)

## Membership Information

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

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

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

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

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

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

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

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

### SCAS Elected Board

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

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

# April Observing Notes

**4/5** New Moon, 9 PM

**4/9** Moon 1.0° NNW of center of Pleiades

**4/13** Moon 0.43° ENE of center of Beehive Cluster

**4/11** Moon near Mars, 11 PM

Saturn graces the evening skies this spring. The rings are now tilted at a low angle and will mostly disappear from view for the next two years, a situation that occurs twice during Saturn's 29.5 year orbit, or about every 15 years. Saturn, retrograde (moving west) approaches the bright star Regulus until 5/3, when it will be closest. Then, it ends retrograde motion and begins moving back to the east. It will be easy to note this change if you keep watching these two objects this spring.

***—Some of above courtesy of Jack Welch***

# *Gravitational Lenses* *(from Page 1)*

between Earth and a distant object, "typically you can get at least a factor of 10 – 50 magnification," said Jean-Paul Knieb, an astronomer at Laboratoire d'Astrophysique de Marseille, France, leader of the study.

The effect was predicted in the 1930s by Einstein's general theory of relativity, and was first observed in 1979.

The 67 newly discovered lenses are caused by large galaxies, although clusters of galaxies often produce strong gravitational lenses too.

A team of astronomers used the NASA/ESA Hubble Space Telescope, along with follow-up observations from the ground, to image a 1.6 square degree field of sky (about nine times the area of the full Moon) in great detail. The researchers then pored over the images by eye to spot the tell-tale circular warping signatures of gravitational lenses.

In addition to giving scientists a better idea of how many gravitational lenses are out there, the discovery will help researchers study the spread of dark matter around the galaxies causing the lenses.

"The main thing the gravitational lenses do for us is they allow us to study the mass distribution in individual galaxies," Capak told SPACE.com. "A lot of the mass is contained in dark matter. We want to understand how the dark matter is distributed."

By analyzing patterns in the warping of space-time caused by the gravitational lenses, the scientists hope to gain a better understanding of the structure of galaxies.

"You can think of the lenses as glass beads," Capak said. "If you hold up a glass bead and look thorough it, it distorts the picture behind it. The shape of the glass bead is what's causing the different distortions. The shape of the mass distribution in galaxies is distorting the background in different ways."

***— By Clara Moskowitz, Staff Writer, Space.com***

# "Pocket" Solar System

Here's a good activity for school or scout groups, from the Night Sky Network. Lynn Anderson kindly typed out the instructions, and I thought you'd all like to know how to do this. Materials needed: Cash register or adding machine paper tape and pencils.

1. Have each audience member pull out a strip of paper that will reach from fingertip to fingertip with the arms stretched wide (this should be approximately as long as they are tall – this works with children as well as adults).
2. Have them fold over the ragged ends to make square ends and label one end "SUN" and the other end "KAIPER BELT (PLUTO)".
3. Then bring the ends together and crease the middle.
4. Ask the audience which planet is approximately half way between the sun and Pluto? (With a more mature group <not younger than 6th grade> you can hold the strip over your head and behind your back, and ask them which body part is closest to the crease – the planet is URANUS). Label this crease URANUS.
5. Now have them fold and crease from the Kaiper Belt to Uranus. This marks the approximate location of NEPTUNE.
6. Next fold and crease from the sun to Uranus. This marks SATURN.
7. Mention that there is a SUN at the center of our solar system and a S-U-N (Saturn, Uranus, Neptune) at the outside of the solar sustem.
8. The next fold is to bring the sun to Saturn and crease. This marks JUPITER.
9. Between Jupiter and the sun marks the ASTROID BELT.
10. Between the Astroid Belt and the Sun is MARS.
11. Now fold between Mars and the Sun, then without unfolding, fold again to make three creases. (There is typically only an inch or so between Mars and the Sun). These mark (going toward the Sun) EARTH, VENUS & MERCURY.

The main purpose of the activity is to demonstrate a more accurate model of the "space" between the planets than is typically displayed on a poster. The Night Sky Network training video ends with "There is a reason why it is called 'Space'." You then tell the audience to roll up the strip of paper and put it in their pocket. Hence the name, POCKET SOLAR SYSTEM.

If you use this activity, please let Lynn Anderson know so he can log it as a Night Sky Network activity. The more we use them the more we'll receive!

## Interesting Link

**Satellite tracking website:** You can view selectd satellites, see their orbital paths, get information on them and a lot more. Your browser needs Java installed for the applet to run. Pretty cool! Courtesy of Derek Braud.

*http://science.nasa.gov/Realtime/jtrack/3d/JTrack3D.html*


## Social Amenities

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

## Welcome New Members!

Welcome aboard to Thomas Duggan of Rohnert Park and Tim Steers of Napa.

# Events

## Robert Ferguson Observatory
### PUBLIC VIEWING

**Saturday, April 5**
Solar Viewing: Noon - 4:00 PM
Night Viewing begins 9:00 PM

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

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

### NIGHT SKY SPRING SERIES
**Session #6—April 7**

**Classes held Mondays at 7PM.** 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*

## 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*.

## SSU Observatory Public Viewing

**Apr. 4, 9-11 PM: Saturn, Leo Triplets, Markarian's Chain**

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). Follow signs to campus. Parking Lot F is most convenient. Call 707/664-2267 if it appears weather may force cancellation. *http://www.phys-astro.sonoma.edu/observatory/pvn.html*

## SRJC Planetarium
### "Our Star the Sun"
**March 7 - April 13**

We certainly are aware of the Sun, but how often do we think of it as the nearest star? Join us as we learn about our star, how it formed, how it works, how it affects us, and many of its features such as: sun spots, flares, prominences, etc.

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/*

## Sonoma State University Series
## "What Physicists Do"
**Mondays at 4:00 PM**
***Darwin Hall*** Room 103 (Coffee at 3:30 PM)

**Apr. 7—The Warming Will Accelerate the Warming**

Dr. Inez Fung of the University of California at Berkeley will describe how climate change will alter the processes that store carbon in the land and the oceans, and hence accelerate climate change itself.

**Apr. 14—LIGO: Laser Optics and Interferometry in the Search for Gravitational Waves**

Dr. Shailendhar Saraf of Sonoma State University will discuss the technological challenges in the detection of gravitational waves with a terrestrial instrument and describe the laser technology and interferometric techniques used in LIGO.

**Apr. 21—A Physicist's Playground: From Dolphins to Touchscreens**

Dr. James Aroyan ('87) of JRJ Simulation & Design will discuss computational modeling applications ranging from marine mammal sound reception to Rayleigh wave scattering and solar cell design.

**Apr. 28—Fabrication and Studies of Magnetic Nanostructures**

Dr. Hongtao Shi of Sonoma State University will discuss the fabrication of macroscopic masks with nanometer-scaled pores by anodization of aluminum.

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

# Events

## SCAS Yosemite Star Party August 8 & 9

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

## Morrison Planetarium Dean Lecture Series

**Apr. 28, 7:30 PM: "The X-Ray Universe"**—Dr. Chris Mauche, Lawrence Livermore National Laboratory

Progress in the field of X-ray astronomy has been rapid since the dawn of the space age: we knew of only a single cosmic X-ray source in 1962, but we had discovered nearly 19,000 by 1999. This talk will be a general overview of the many different—but (almost) always extremely hot, violent, and variable—sources that populate the X-ray sky: our Sun and other stars, X-ray binaries, supernova remnants, galaxies, clusters of galaxies, and million- to billion-solar-mass black holes.

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/*

## SJAA Auction and Swap Meet April 20

The San Jose Astronomical Association will hold its 28th annual astronomical auction and swap meet at Houge Park in San Jose. This is a great opportunity for beginners to purchase their first telescope at a great price! Experienced observers often find equipment they need for their next observing project, from O-III filters to finders to star charts.

Doors open at 11:30 AM to register material for the auction. The Auction begins at 1:00 PM and will run as long as needed, typically ending about 3 PM.

For more about SJAA, visit their web site at *http://www.sjaa.net*, or email *auction@sjaa.net*.

See you there!

## It's Membership Renewal Time!

Please send your dues in by June 1 for the 2008-2009 Membership Year. You can use the form on the back page if you wish to make any changes. Your prompt response is much appreciated.

## SCAS Community Activities Slowing Down

As most public schools head into the fourth quarter (and all of that state and federal testing) coupled with daylight savings time robbing us of early darkness, the request for school star parties has all but disappeared.

Healdsburg Elementary School was clouded out for the third time on Friday, March 7, but Lynn Anderson presented the Eames' POWERS OF TEN video and a general astronomy slide show to about 150 students and parents. With typical luck, the Thursday prior and the Saturday after were both clear.

The last SCAS school event is the Mark West District Science fair on Saturday, March 29 at Reibli Elementary School. Should you read this before Saturday the 29th and have time or interest in participating in this event, which runs from 10:00-3:00, contact Lynn Anderson at *astroman@sonic.net*.

## 2008 Golden State Star Party July 2-6

Early Registration is in full swing, and it looks like we will have a great turn out at this year's Golden State Star Party. The unrivalled new site near Adin, California, is as good as it gets, and has generated a lot of excitement in the astronomy community. GSSP now offers the darkest skies available to large groups in California, with virtually no light domes. The site features a huge observing field with minimal dust and no rocks, ideal for camping and equipment set-up. There are ample amenities and conveniences including showers, sanitary facilities, many nearby attractions, and on-site food service. RV's and imagers with their special needs can be easily accommodated this year. GSSP is non-profit and organized 100% by astronomers for astronomers. We believe that GSSP will rapidly become one of the best star parties in the country, rivaling OSP and TSP.

All are welcome, including people who are new to the hobby or don't own their own telescope. We have many seasoned astronomers who would be thrilled to share views, knowledge, and their sheer joy of the night sky. The whole idea behind GSSP is simply to provide the best possible venue for the pure enjoyment of Astronomy. The cost is $45 for registration, camping, and site amenities (excluding food). After April 15, the fee increases to $55. Your equipment can remain set up for the entire event. For registration and more information, visit *http://www.goldenstatestarparty.org*.

# Young Astronomers

# Rediscovering Saturn: An Update on the Cassini-Huygens Mission

***YA Meeting Friday, April 11, 7:30 PM***
***Apple Blossom School, Sebastopol***

Do you know how to calibrate and align your telescope so that it is functioning at its peak performance level? If not, or if you are not sure, do plan to come to this meeting! Bring your Sparks telescope and if you have a red laser calibration instrument that came with it, bring it too. We will also cover planispheres (how they work); cleaning your optics (and keeping them clean); how a reflecting telescope works.

Lastly, we will discuss the solar system. Do you really know how far apart the planets are? Learn a new gimmick for keeping some details in mind. Prepare to be entertained and educated. If clear after the meeting, we will relocate to the hill above the school to find some cool stuff in our heavens!

## One Position Still Open on Young Astronomers Board

At the March YA meeting, Blaine Eldred was elected YA president, joining Geoffrey Knoll, vice-president, and Max Eliaser, newsletter editor, on the YA board. Welcome, Blaine!

That leaves one board position open, that of recorder. The recorder is responsible for taking brief notes at our monthly YA board meetings (held 30 minutes before the general meeting), providing a summary of decisions and discussions held by the board. As a board member, the recorder also participates and votes in the planning / decision-making process. If you are interested in being the YA recorder, please contact YA adult advisor Gary Jordan at sieramolly@comcast.net, or 829-5288. We'd love to have you as a member of the Young Astronomers board!

# Caught in the Act: Supernova

Unless you just happen to look at the right spot at exactly the right time, it's virtually impossible to catch a star in the act of exploding. Now, for the first time, scientists have actually caught a star in the act of going supernova. Supernovas are dramatic explosions that happen when a star at least eight times as big as our sun runs out of fuel. A supernova can glow for days or even months after its initial explosion, allowing astronomers to detect these explosions only after they've happened, by observing the "remains" left behind by the initial event. However, this recently-observed supernova is the first where the process has been seen from the beginning.

Exploding stars release a lot of energy, much of it in the form of X-rays. A team of astronomers was using NASA's Swift spacecraft to study a galaxy called NGC 2770. They had aimed the spacecraft's X-ray telescope at a recently discovered supernova. Just as the telescope began observing the target supernova, the spacecraft recorded a fresh batch of X-rays coming from another region in the same galaxy. This X-ray burst lasted for about seven minutes.

Although no supernova was visible at the time, the team of scientists suspected they had just witnessed the beginning of a star about to undergo such a catastrophic explosion. Using the Gemini North telescope on Mauna Kea in Hawaii, the researchers took a look at the same spot in the sky as where the X-ray burst had been. There they saw a visible-light display, which confirmed that a supernova had indeed occurred.

Astronomers usually can't spot supernovas until the stars send out large amounts of visible light. By then, however, key information about early stages of the explosion has vanished. In this case, the energy and length of the initial release of X-rays suggest that the star was compact. Also, it hurled out lots of gas—called a stellar wind—from its surface just before it went supernova.

For decades, astronomers predicted that supernovas would behave this way, emitting large amounts of X-rays right before exploding. Now they feel they have evidence that they were right. This new discovery suggests that astronomers should use wide-angle X-ray telescopes to catch the very beginnings of the hundreds of supernova explosions that happen each year.

***—Adapted from an article by Emily Sohn in Science News***

## Gummy Greenhouse Gases!

The new "Gummy Greenhouse Gases" activity on The Space Place web site makes it fun and easy to learn a bit of chemistry and to find out why too many of these kinds of molecules in the air are likely to cause Earth to get warmer.

At *http://spaceplace.nasa.gov/en/kids/tes/gumdrops*, kids use gumdrops and toothpicks to make simple molecules of ozone, nitrous oxide, carbon dioxide, water vapor, and methane. The curious can go on to *http://spaceplace.nasa.gov/en/kids/tes/gases* to learn more about the greenhouse effect and about the "good and bad" roles of ozone. A short video shows how new space technology can literally paint a 3-D picture of these gases all around the globe.

*NASA SpacePlace*

# Tracking Wildlife from Space

***by Patrick Barry***

It's 10 o'clock, and do you know where your Oriental Honey Buzzard is?

Tracking the whereabouts of birds and other migrating wildlife across thousands of miles of land, air, and sea is no easy feat. Yet to protect the habitats of endangered species, scientists need to know where these roving animals go during their seasonal travels.

Rather than chasing these animals around the globe, a growing number of scientists are leveraging the bird's-eye view of orbiting satellites to easily monitor animals' movements anywhere in the world.

The system piggybacks on weather satellites called Polar Operational Environmental Satellites, which are operated by the National Oceanic and Atmospheric Administration (NOAA), as well as a European satellite called MetOp. Sensors aboard these satellites pick up signals beamed from portable transmitters on the Earth's surface, 850 kilometers below. NOAA began the project—called Argos—in cooperation with NASA and the French space agency (CNES) in 1974. At that time, scientists placed these transmitters primarily on buoys and balloons to study the oceans and atmosphere. As electronics shrank and new satellites' sensors became more sensitive, the transmitters became small and light enough by the 1990s that scientists could mount them safely on animals. Yes, even on birds like the Oriental Honey Buzzard.

"Scientists just never had the capability of doing this before," says Christopher O'Connors, Program Manager for Argos at NOAA.

Today, transmitters weigh as little as 1/20th of a pound and require a fraction of a watt of power. The satellites can detect these feeble signals in part because the transmitters broadcast at frequencies between 401 and 403 MHz, a part of the spectrum reserved for environmental uses. That way there's very little interference from other sources of radio noise.

"Argos is being used more and more for animal tracking," O'Connors says. More than 17,000 transmitters are currently being tracked by Argos, and almost 4,000 of them are on wildlife. "The animal research has been the most interesting area in terms of innovative science."

For example, researchers in Japan used Argos to track endangered Grey-faced Buzzards and Oriental Honey Buzzards for thousands of kilometers along the birds' migrations through Japan and Southeast Asia. Scientists have also mapped the movements of loggerhead sea turtles off the west coast of Africa. Other studies have documented migrations of wood storks, Malaysian elephants, porcupine caribou, right whales, and walruses, to name a few.

Argos data is available online at www.argos-system.org, so every evening, scientists can check the whereabouts of all their herds, schools, and flocks. Kids can learn about some of these endangered species and play a memory game with them at spaceplace.nasa.gov/en/kids/poes_tracking.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

***—Article provided by JPL/NASA***


*The ARGOS program tracks the whereabouts of endangered migrating animals via miniature transmitters on the animals and the POES satellites in orbit.*

## YA Information

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

YA ELECTED OFFICERS
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# Sonoma County Astronomical Society MembershipApplication/Renewal

**The $25.00 Annual Membership fee for 2007-2008 is due June 1.**

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

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

Name: _____

Address: _____

City/State/Zip: _____

Telephone: _____ Email: _____

❑ Check here if you are willing to receive the newsletter via email only. Save a tree, keep your dues low!

Your renewal dues include membership in the Astronomical League, our monthly newsletter Sonoma Skies, discounted subscriptions for Sky and Telescope and Astronomy magazines, great guest speakers at our monthly meetings, and opportunities to meet new and interesting people who share your interest in many aspects of astronomy and science.

**Sonoma County Astronomical Society**
P.O. Box 183
Santa Rosa, CA 95402

***Sonoma Skies***
**April 2008**

**APRIL 9**

**Dr. Nick Kanas, UC S.F.**

## Mapping the Heavens from Ancient to Modern Times