

Sonoma Skies

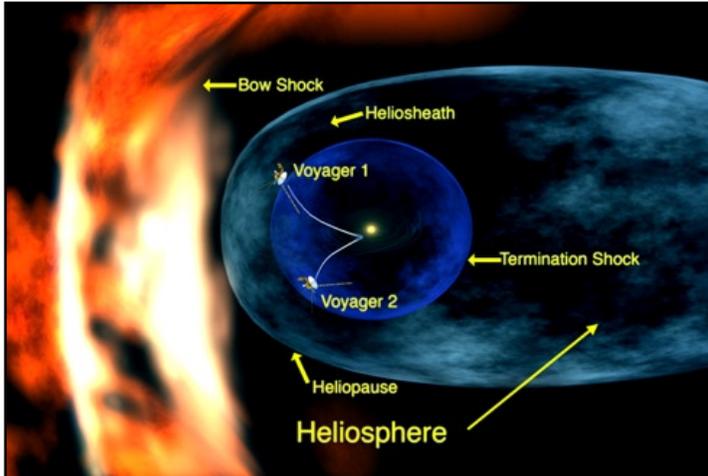
Newsletter of the Sonoma County Astronomical Society
A nonprofit scientific and educational organization

www.sonomaskies.org



June 2007

Volume XXX No. 6



This image shows the locations of Voyagers 1 and 2. Voyager 1 is traveling a lot and has crossed into the heliosheath, the region where interstellar gas and solar wind start to mix. Credit: NASA

Solar System Sails Sideways Through Milky Way

Our solar system is hurtling through space while angled nearly perpendicular to the plane of the Milky Way, new computer models suggest.

"It's almost like we're sailing through the galaxy sideways," said study team leader Merav Opher, an astrophysicist at George Mason University in Virginia.

The findings, detailed in the May 11 issue of the journal *Science*, suggest the magnetic field in the galactic environment surrounding our solar system is pitched at a sharp angle and not oriented parallel to the plane of the Milky Way as previously thought.

The heliosphere: The clue to the angle was found in the charged cocoon-like shroud around the solar system, called the heliosphere and comprised of the Sun's solar wind, the stream of charged, low-energy particles it emits. As our Sun and its planets travel through space, interstellar gases press against the heliosphere, stretching this steady cosmic gale lengthwise into a bullet shape that stretches far past Pluto.

Data recently received from the Voyager 1 and 2 spacecraft reveal the heliosphere's shape is deformed in another way: the northern hemisphere bulges outward while the southern hemisphere is pressed inward.

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Art of Digiscoping Birds and Nature

SCAS June 13 Meeting, Proctor Terrace School

Using photography to capture the things of beauty and wonder about us in nature and in our celestial sphere is a pursuit of many of us. Some people spend their lifetimes striving to see and behold what others in passing take for granted. Beginning with cave drawings, art has been a medium for specialists to capture how their minds have interpreted what they see about them. Photography has made that much easier. Astronomers no longer needed to draw what they saw through their telescopes. Naturalists no longer had to draw their quarry, bring it back as a pet or worse, to stuff it...they could bring back an image for others to marvel at. Photography left that idol of their fascination alive and available for others to see in its natural setting, if they would but venture forth, suffer the possible hardships and expenses and then seek out a better image of their own...if they could find it.

To that end, we are honored to have as our guest presenter on Wednesday, June 13, Dr. Bryant Hichwa of Sonoma State University's Physics & Astronomy Department. He will demonstrate the "Art of Digiscoping Birds and Nature." He will discuss helpful tips and techniques of the trade for photographing wildlife and sports. Where does astronomy enter into this, you may wonder? Well, the advent of the digital camera has made astrophotography a far easier and more popular pursuit than it was with film cameras, where one could spend considerable time tracking an object while the camera's film collected photons that may or may not be in focus. Now, short-exposure images can be stacked to produce a thing of wonder.

Many amateur astronomers like myself, for instance, take great pleasure in pursuing images of things of beauty on the Earth as well as in the sky. I have used my digital camera in conjunction with my astronomy telescope for photographing the Moon and the near planets. I have used the same digital camera in conjunction with a spotting telescope for photographing birds, insects, sunsets and other things that inspire and bring a sense of awe to my mind.

Dr. Hichwa gave this presentation to a standing-room-only

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Young Astronomers See page 6

Sonoma County Astronomical Society (SCAS)

Membership Information

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

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

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

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

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

Sonoma Skies is the monthly newsletter of the Sonoma County Astronomical Society (SCAS). Subscription is included as part of membership. Articles and member announcements are welcome and are published on a first come, first served basis, space permitting, and may be edited. **The deadline for submissions is 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

Astrophotography (from Page 1)

crowd in Sonoma on Wednesday, May 9. I would have been there, but that was the very night that the SCAS met to hear Dr. Adrienne Cool's wonderful presentation on globular clusters. What a choice! But, the opportunity has returned for us to listen and learn what we can do to improve our digital photography skills.

Member Note: We are expecting a number of people to come to this meeting who are into birding and not necessarily astronomy. Please make them welcome and do tell them it would be worth their time to come to the RFO for a night under the stars.

—Len Nelson, Vice President

IN MEMORIAM: MATTHEW WALKER

Matthew (Matt) Walker passed away May 2. My fondest memories of him come from the trip many from SCAS (Bob Ferguson and June Ferguson, Ed and Cindy Megill, I and my 15-year-old son, and others) took to the solar eclipse of 1991 in southern Baja, Mexico. He was kind enough to share some great stories at the meal table. He was a quiet, gentle man with a great way of sharing his memories. I especially remember stories he told of his Navy flying years, flying across northern Canada and the atrocious flying conditions that he encountered there.

Before the Robert Ferguson Observatory was built in 1997, SCAS held their yearly Star-B-Que at the group camp site where the RFO is now located. He would arrive with his 2 dogs, plus his scope and camping gear in a small trailer he pulled behind his car. Matt was one of the charter subscribers for the Observatory.

He had a great sense of humor, very nicely exemplified by a sentence from the Press Democrat's May 5 Obituary: "He loved to engage in civil discourse, debate and discussion. His first speeches were to the goats on the family farm, who listened with great interest."

—Merlin Combs

Interesting Links

Silicon Valley Astronomy Lecture Series Podcasts of recent nontechnical talks by noted astronomers, including former astronaut Dr. Janice Voss talking about the Kepler project, and Dr. Alex Filippenko of UC Berkeley. I listened to this one while working on the newsletter! <http://www.astrosociety.org/education/podcast/index.html>

"Sky News" Our own Jack Welch provides a monthly email with excellent and detailed observing information, plus a schedule of upcoming events at the Robert Ferguson Observatory. You can get on the "Sky News" list by sending a request with your full name and email address to nightsky@rfo.org

Universe in the Classroom—Astronomy Society of the Pacific's online newsletter, with archives covering many topics in depth: <http://www.astrosociety.org/education/publications/tnl/tnl.html>

June Observing Notes

- 6/1 Moon near Jupiter, 4 AM
- 6/2 Mercury greatest elongation E, 3 AM
- 6/5 Jupiter Opposition, 4 PM. Mag. -2.6 in Ophiuchus. Disc: 45.8"
- 6/8 Venus greatest elongation E, 8 PM
Last Quarter Moon, 4:43 AM
Double Shadow Transit of Jupiter, 11:30 PM
- 6/12, 13 Venus near M44, 10 PM
- 6/14 New Moon, 8:13 PM
- 6/17 Moon near M44 & Venus, 10 PM
- 6/18 Moon near Saturn, 10 PM
Pluto Opposition, 12 Midnight. Mag. 13.9 in Sagittarius.
- 6/19 Occultation of Regulus, 4:30 PM.
- 6/21 Summer Solstice, 11:06AM.
- 6/22 First Quarter Moon, 6:15 PM
- 6/28 Moon near Jupiter & very near Antares, 1 AM
- 6/30 Full Moon, 6:15 AM

Observing Treats

Asteroid Vesta: From now until early July, the asteroid Vesta will be at magnitude 6.0 or brighter, reaching magnitude 4.4 at opposition on 5/30. This means that it can be viewed with the naked eye in dark skies. Using binoculars, you should be able to track the rapid motion of Vesta against the background stars during this period. Here are the magnitudes of some nearby stars for reference: 24 Oph (5.6); 29 Oph (6.3); and phi, chi, omega, upsilon, psi and 20 Oph are all about 4.4.

Double shadow transit of Jupiter: On June 8, there is a double shadow transit on Jupiter viewable locally. A larger aperture telescope is a must to observe this. The shadow transits are easiest to observe. I am also providing information on the satellite transits, though these are much more difficult. Jupiter will be high in the south at about 11:35 PM when Ganymede starts to transit (all times are approximate). At 11:49, Ganymede's shadow begins to transit. Io begins to transit at 1:12am and its shadow begins transiting at 1:16. Ganymede's transit ends at 1:35 and its shadow exits Jupiter's disk at 2:02. Io completes its transit at 3:22, and its shadow at 3:27. By this time, Jupiter is fairly low in the southwest.

Occultation of Regulus, June 19 at 4:30 PM. Daytime occultation of mag 1.4 brilliant blue main sequence star Regulus by 26% waxing crescent moon.

1637: Disappear, dark limb; Alt/Az = 61°/154°.

1801: Reappear, bright limb, 79° from the northern vertex, or at Watts Angle = 282°; Alt/Az = 62°/198°

—Observing information courtesy of Jack Welch

COMING TO SCAS IN JULY

Meteors: A video hosted by Al Stern



SOCIAL AMENITIES

Thanks to Dave Simons for providing coffee and refreshments at the May meeting.

You can sign up to provide refreshments at a meeting, too. It's easy! Just contact any Board member and choose a month.

WELCOME NEW MEMBER!

Welcome aboard to William Wheeler of Santa Rosa.

SILENT AUCTION

Bring any astronomy-related items you wish to sell to a SCAS meeting. Another member might be looking for that very thing!

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

Events

ROBERT FERGUSON OBSERVATORY

PUBLIC VIEWING

Saturdays, June 9 and June 16

Solar Viewing: 12:00 AM - 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 SUMMER SERIES

Session #1—Tuesday, June 5, 7:30 PM

Session #2—Tuesday, June 12, 7:30 PM

Session #3—Tuesday, June 19, 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. Learn the bright stars, deep-sky objects, and visiting planets of the spring skies. After each presentation (sky conditions permitting), enjoy a review of the constellations in the actual night sky and learn how to find them for yourself. Viewing through telescopes follows.

Fees: \$75 for the series of six presentations. (Single session fee is \$23). 10% discount for VMOA members. Classes are held at the Observatory.

OBSERVING LABS

Sunday, June 10, 8:30 PM

“Diffuse Nebulae, Star Formation, and Open Clusters”

Friday, July 13, 8:00 PM

“Binaries and Multiple Stars”

Observing Labs are one-night events centered around an intensive telescope observing experience based on that session's theme. After an informative presentation of about 40 minutes, attendees will head to various telescopes for a night of docent guided observing.

Attendance is very limited in order to assure that everyone can get both significant eye-time on the telescopes and lots of personal docent guidance. We will provide informative handouts, plus observing lists of objects selected to illustrate the night's topic. Our goal is for you to see these cosmic wonders in a new way, noticing details that are usually overlooked and appreciating what is actually taking place in the objects you are viewing. We want to “open your eyes and your mind” in these labs!

Fees: \$30 per person per event (\$27 for VMOA Subscribers).

For information or to register: (707) 833-6979,
<http://www.rfo.org> or nightsky@rfo.org

SCAS COMMUNITY OUTREACH

Day Under the Oaks Report by Len Nelson:

We had a perfectly clear day for observing one large sunspot and numerous small prominences along one edge of the Sun near the sunspot. We estimated that we entertained about 150 people.

There to serve and to support Ed Megill's Santa Rosa Junior College Planetarium operation were: June and Colleen Ferguson, Derek Braud, Gary Jordan, Bob Johnston (pictured right), Dickson Yeager (pictured right), and Len Nelson. While the latter three did solar viewing the others spoke with interested people who came by, and promoted the RFO, SCAS and the Young Astronomers.



Young Astronomer/Striking Sparks winner Blaine Eldred and his family came to the event and spent quite some time at the solar viewing. It was interesting to watch the prominences change from one view to the next. Blaine is pictured

here viewing through Len Nelson's 130mm Astro-Physics refractor outfitted with a DayStar solar filter.

MORRISON PLANETARIUM DEAN LECTURE SERIES

June 4, 7:30 PM: “Cosmic Jackpot”—Dr. Paul Davies, Arizona State University

Scientists have long known that the universe is so well suited for life it looks like a fix. How can we explain this? Are we winners in a cosmic lottery of co-existing universes? Using recent scientific discoveries and radical thought about the cosmos—Davies discovers a more subtle process at work.

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

Events

SCAS STAR-B-QUE AUGUST 18

Plan to join your fellow members for a day of picnicking, solar viewing, fun and conversation, and an evening of stargazing at the Robert Ferguson Observatory. Bring the family and your friends and stay all night! We'll have it all to ourselves. Details in next month's *Sonoma Skies*.

MT. TAMALPAIS ASTRONOMY

June 23, 8:30PM: "The Birth of the Universe"—Prof. Alex Filippenko of UC Berkeley. He will present evidence in favor of a Big Bang origin for the cosmos: a hot, dense beginning with an inflationary expansion. And he will also discuss recent theories suggesting that our universe may be only one of many. Prof. Filippenko is a favorite repeat speaker on the mountain, and his talks always entertain and elucidate.

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/>



On May 22, 2007, Johannes Schedler shot this stunning mosaic of Saturn hiding behind the Moon from Wildon, Austria, using his 16-inch Cassegrain telescope.

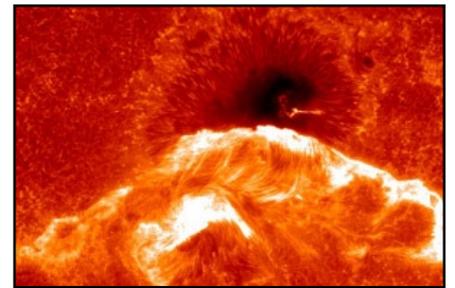
SOLAR FLARE OR PROMINENCE?

by Merlin Combs

I am often asked what a solar flare looks like, as compared to a prominence/filament, which is just ionized gas rising off the surface of the Sun in order to follow a magnetic loop that has formed above the surface of the Sun. These prominences/filaments can last hours, days, weeks and sometimes more than a month. These features can be seen in our H-Alpha scope as fairly long-lived features. However, flares are usually short-lived—maybe about 20 minutes.

The major flare aspect which is the subject of the following website lasts about a full hour: http://science.nasa.gov/headlines/y2007/24apr_hubble4sun.htm?list200977. Go to the website and scroll down to "4.24.2007."

We need to remember the normal temperature of the surface of the Sun (the red part) is about 10,000 degrees Fahrenheit, and the cooler sunspots are about 7,000 degrees Fahrenheit. While the sunspots look black, they are actually extremely bright, but the normal surface is so much brighter that we cannot accurately depict the dynamic range of brightness between the two. However, the flare's great brightness again exceeds the visual dynamic range when compared to the normal surface temperatures.



Astronomers are calling the Japanese Hinode spacecraft a "Hubble for the sun." Watch the movie and you'll see why.

The magnetic movie of sunspot 930 (halfway down the webpage) nicely shows the positive and negative polarity of the pair of sunspots. It is thought that nearly all sunspots occur in pairs like this.

SFAA

June 20, 7:30 PM: "The Latest in Solar Astrophysics, and News From Japan's Hinode Mission"—Thomas Berger, Lockheed Martin. The latest in Solar astrophysics, including the discovery of "solar moss" on the Sun's near surface from NASA's extreme ultraviolet TRACE Spacecraft. Also a report on Japan's Hinode Solar Mission.

San Francisco Amateur Astronomer meetings are held at the Randall Museum, 199 Museum Way, San Francisco. For more information go to: <http://www.sfaa-astronomy.org>

SHINGLETOWN STAR PARTY 2007

The sixth annual Shingletown Star Party will be held at the Shingletown airport, about 30 miles east of Redding during the week of July 9–16. Registration is \$40 for members of astronomy clubs through June 30. See <http://www.shingletownstarparty.net> for all the details.

Young Astronomers



YA SUMMER

YA members are encouraged to attend the general SCAS meetings, particularly the annual Star-B-Que. Read your monthly issue of *Sonoma Skies* for more information about these meetings.

The Young Astronomers will resume their monthly meetings in September, once the new school year begins. We'll send an e-mail announcement in late August to let you know about our first meeting. Meanwhile, keep using those telescopes to observe the night sky this summer. Happy viewing!

Astronomers Discover an Extrasolar Planet Made of "Hot Ice"

Astronomers have found a Neptune-size planet outside the solar system that's made mostly of water—water in solid "hot ice" form, that is. With a scorching surface temperature of 600 kelvins, the planet definitely can't support life. But its existence increases the likelihood of finding watery planets that could provide a safe haven for life, according to Frédéric Pont and his colleagues of the Geneva Observatory in Sauverny, Switzerland.

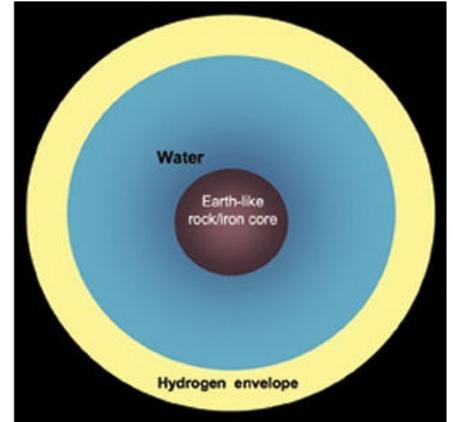
This is the first time that researchers have determined the size, mass, and composition of such a small extrasolar planet, only about 22 times as massive as Earth. The planet, which closely orbits the dwarf star GJ 436, has a diameter about four times that of Earth. It appears to be a hot version of the ice giants Neptune and Uranus.

"This provides the proof that we have found at least two classes of extrasolar planets similar to those seen in our solar system—namely, gas giants and ice giants," says theorist Alan Boss of the Carnegie Institution of Washington, D.C.

A different team reported in 2004 that an unseen planet at least as massive as 22 Earths whips around GJ 436 every 2.6 days. A tiny wobble in the motion of the star revealed the planet's existence. But the wobble method revealed only the minimum mass of the orbiting planet and nothing about its size or density. Now, jump forward to April of this year. Pont's team found that the star's brightness dims by six-tenths of a percent, for about an hour during each orbit of the planet. That happens when the planet passes in front of the star, creating a mini-eclipse, as seen

from Earth. Because the eclipse reveals the orbit's orientation, the team could determine the precise mass and size of the planet. This enabled the scientists to calculate its average density. The density suggests that the planet is a water world, possibly enveloped by a thin layer of hydrogen and helium, as shown in the accompanying diagram.

Because of the planet's close orbit around its star, the water at its surface would be steam. But beginning about 300 kilometers below the planet's surface, intense pressure would turn the water solid, even at extremely high temperatures, hence the term "hot ice." Calling the planet's discovery "a big breakthrough," theorist Sara Seager of the Massachusetts



PLANET UNDER PRESSURE. Proposed structure of an extrasolar planet that may contain hot water that remains solid under high pressure.

Institute of Technology cautions that for now, scientists know only the planet's average density, not the specific materials it contains.

Dwarf stars such as GJ 436, which is less than half the sun's mass, are the most common stars. Last month, members of Pont's team announced that they had found a planet orbiting a dwarf star in the habitable zone—a region in which the planet's average temperature would allow for liquid water. But because astronomers don't know that planet's composition, they can't say whether it can actually support life. Pont says he's optimistic that the search for planets that eclipse dwarf stars will soon identify one with the right stuff—the proper composition and temperature for liquid water to exist, providing an hospitable environment for life.

—Adapted from an article by Ron Cowen in *Science News*

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

PRESIDENT: Melissa Downey 632-5661

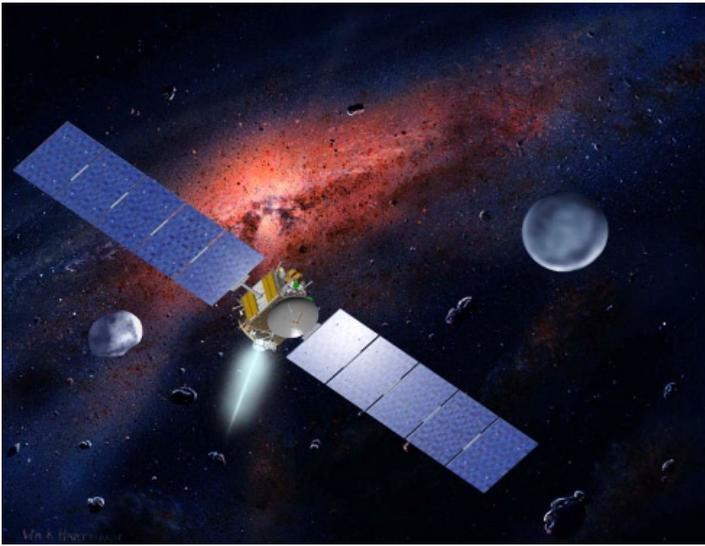
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Artist's rendering of Dawn spacecraft, with asteroids. Largest are Vesta and Ceres. Credits: Dawn spacecraft—Orbital Sciences Corporation; background art—William K. Hartmann, courtesy UCLA.

NASA SpacePlace

The Ions of Dawn

by Patrick L. Barry

This summer, NASA will launch a probe bound for two unexplored worlds in our solar system's asteroid belt—giant asteroids Ceres and Vesta. The probe, called Dawn, will orbit first one body and then the other in a never-before-attempted maneuver. (*Ed. note: Vesta is visible naked-eye this month—see Page 3 for notes on where to look for it.*)

It has never been attempted, in part, because this mission would be virtually impossible with conventional propulsion. “Even if we were just going to go to Vesta, we would need one of the largest rockets that the U.S. has to carry all that propellant,” says Marc Rayman, Project System Engineer for Dawn at JPL. Traveling to both worlds in one mission would require an even bigger rocket.

This is a trip that calls for the unconventional. “We’re using ion propulsion,” says Rayman.

The ion engines for the Dawn spacecraft proved themselves aboard an earlier, experimental mission known as Deep Space 1 (DS1). Because ion propulsion is a relatively new technology that’s very different from conventional rockets, it was a perfect candidate for DS1, a part of NASA’s New Millennium Program, which flight-tests new technologies so that missions such as Dawn can use those technologies reliably.

“The fact that those same engines are now making the Dawn mission possible shows that New Millennium accomplished what it set out to,” Rayman says.

Ion engines work on a principle different from conventional rockets. A normal rocket engine burns a chemical fuel to produce thrust. An ion engine doesn’t burn anything; a strong electric field in the engine propels charged atoms such as xenon to very high speeds. The thrust produced is tiny—roughly equivalent to the weight of a piece of paper—but over time, it can generate as much speed as a conventional rocket while using only about 1/10 as much propellant.

And Dawn will need lots of propulsion. It must first climb into Vesta’s orbit, which is tilted about 7 degrees from the plane of the solar system. After studying Vesta, it will have to escape its gravity and maneuver to insert itself in an orbit around Ceres—the first spacecraft to orbit two distant bodies. Dawn’s up-close views of these worlds will help scientists understand the early solar system.

“They’re remnants from the time the planets were being formed,” Rayman says. “They have preserved a record of the conditions at the dawn of the solar system.”

Find out about other New Millennium Program validated technologies and how they are being used in science missions at <http://nmp.jpl.nasa.gov/st7/ABOUT/concept.html>. While you’re there, you can also download “Professor Starr’s Dream Trip,” a storybook for grown-ups about how ion propulsion enabled a scientist’s dream of visiting the asteroids come true. A simpler children’s version is available at <http://spaceplace.nasa.gov/en/kids/nmp/starr>.

—Article provided by JPL/NASA

Heliosphere *(from Page 1)*

Using computer simulations, Opher and her team concluded that this asymmetry is best explained if the local galactic magnetic field, located just outside our solar system, is angled some 60 to 90 degrees to the plane of the Milky Way.

The galactic magnetic field influences the orientation of the solar system’s heliosphere, causing it to incline at a sharp angle, Opher said. An analogy is a bullet hurtling through the air with its nose turned toward the ground.

“If you assume that you have a magnetic field in the plane of the galaxy, you get the wrong distortion,” Opher told SPACE.com.

The new study is the first to look at the local galactic magnetic field, Opher said. Previous research involved measuring the galactic field over massive distances, more than a thousand times the scale of the heliosphere.

“It’s like instead of measuring continents, you’re measuring countries,” Opher said.

Turbulence: The source of our galaxy’s magnetic field is a mystery. The most accepted idea, Opher said, is that the large cloud of interstellar dust and gas from which our galaxy formed had a magnetic field, and that the field got squished when the cloud collapsed into a disk to form the Milky Way.

“But you can also ask ‘What formed the magnetic field of this cloud?’” Opher said.

Randy Jokipii, an astrophysicist at the University of Arizona who was not involved in the new study, suggests in an accompanying *Science* article that the findings of Opher’s team can be explained if the galactic magnetic field is thought of as a turbulent fluid. Turbulence is a phenomenon whereby a fluid breaks down randomly into eddies and no longer flows smoothly, like creamer poured into a cup of coffee.

Opher says the idea of a turbulent galactic magnetic field is not new to scientists. “We’ve thought about it, but [our findings] indicate it might really exist,” she said.

—Ker Than, Staff Writer, *Space.com*

Sonoma County Astronomical Society Membership Application/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
June 2007

JUNE 13

Dr. Bryant Hichwa
Art of Digiscoping
Birds and Nature