

# PRIME FOCUS

Tri-Valley Stargazers



October 2005



## Meeting Info:

### What

*Amateur Astronomy in the National Parks*

### Who

Ron Bissinger

### When

October 21, 2005  
Conversation 7:00 p.m.  
Lecture at 7:30 p.m.

### Where

Unitarian Universalist  
Church in Livermore  
1893 N. Vasco Road

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## October Meeting

### Amateur Astronomy in the National Parks

*Ron Bissinger*

Our national park system provides a showcase for nature's wonders to millions of visitors each year. Only recently has there been an increasing awareness that the night skies of the parks are an important resource to be protected and preserved along with the land and historical cultures. A few rangers at Bryce Canyon National Park in southern Utah have pioneered the efforts to educate the public about the value of dark sky preservation for the nation's public lands. To help reach its 1.7 million annual guests Bryce has developed a unique program that enlists amateur astronomers and astronomy educators to serve as volunteers during their busy summer season. In addition to working star parties during the evenings, these volunteers also lead hikes, conduct daytime

solar viewing, staff the visitor center, and do other outreach programs at neighboring federal and state parks. This past summer Ron spent over a month at Bryce as an astronomy volunteer, interacting with thousands of visitors and undertaking night time film and digital imaging projects under the park's magnitude 7.4 skies.

In his presentation he will discuss his often humorous experiences as a volunteer and talk about the efforts underway to hold back the tide of light pollution that threatens our national parks. He'll also display some of the images he took at Bryce.



A composite of a daytime image shot on 35mm Velvia ISO 50 slide film, and a composite of eleven 5-minute exposures of the Milky Way shot with a Canon 10D at ISO 1600, both using the same Canon 16-35mm zoom lens set at 16mm f/2.8.

*Photo: Ron Bissinger*

## News & Notes

### Welcome!

TVS would like to welcome our newest member, **Randy Chinn**.

### 2005 TVS Meeting Dates

Below are the TVS meeting dates for the next few months. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month's issue (e.g., the October 9th deadline is for the October issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Oct. 21	Oct. 24	Oct. 9
Nov. 18	Nov. 21	Nov. 6
Dec. 16	Dec. 19	Dec. 4

### Money Matters

At the September Board meeting, Treasurer **Gary Steinhour** reported the TVS account balances (as of September 18, 2005):

Checking	\$1,359.05	
CD #1	\$3,482.64	matures 11/17/05
CD #2	\$2,461.46	matures 11/27/05

### TVS Elections

It's that time of year again—time for the annual club elections. We have quite a selection of positions TVS members can vie for in their quest for power and prestige.

If you have a way with numbers and can balance a checkbook in your sleep, consider running for the position of Treasurer. Our current Treasurer, Gary Steinhour, would love to hand over the reins to someone else. He would help the next Treasurer in getting started in the world of high finance.

Are you the kind of person who takes copious amounts of notes no matter what it is you do? You're in luck, as we're in need of a Secretary! As the Secretary, you'd be responsible for taking the board meeting minutes as well as general correspondence. That's it!

Our current President and Vice President will be running for their respective offices once again. If you're interested in either of those positions, toss your name into the hat and let the membership decide which leaders will take them into the next year.

The above officer positions require attendance at the majority of the board meetings (always the Monday following the lecture meeting).

We also have some non-elected positions available as well.

If you like networking, the Program Director job just may be your ticket. The Program Director is responsible for

getting speakers for the monthly lectures (10 speakers a year—the Summer BBQ and Winter Potluck take care of the other two meetings per year).

Like food? Maybe the Refreshments Coordinator is for you. All it entails is bringing the refreshments and setting up the tea and coffee for the monthly meetings. You would also be responsible for coordinating the Summer BBQ and Holiday Potluck food purchases.

To top it off, we have openings on the Board of Directors. If you'd like to help chart the course of the club, consider adding your voice to the Board.

### RASC Handbooks and Calendars

We've got handbooks and calendars on order and should have them in time for the November meeting. The handbooks will sell for \$20, the calendar for \$10. They make great holiday presents for your favorite amateur astronomer (including yourself!).

*continued page 5*

## Calendar of Events

### October 27, 7:00 - 9:00 p.m.

**What:** *Introduction to Celestial Navigation*

**Who:** Chabot Staff

**Where:** Chabot Space & Science Center, Oakland

**Cost:** \$95 non-members, \$85 members

The first of four sessions for this evening class. You will learn the basics of the centuries-old technique of celestial navigation, the art and science of finding one's way around on the Earth by observing celestial object.

Reservations required. Class space is limited, so reserve your space early. To register, call 510-336-7421 or e-mail [srogers@chabot.space.org](mailto:srogers@chabot.space.org).

### November 4, 7:00 p.m.

**What:** *Einstein for Everyone: His Strange Ideas Explained in Everyday Language*

**Who:** Andrew Fraknoi

**Where:** Newman Auditorium, Santa Rosa Jr. College

**Cost:** Free

An illustrated non-technical talk by astronomer and popular lecturer Andrew Fraknoi, hosted by The Physics Chanteuse, Lynda Williams. The Santa Rosa Junior College is at 1501 Mendocino Ave. in Santa Rosa. For more information, call 707-527-4372

#### Newsletter header image: Partial Solar Eclipse

We missed it here on the West Coast, but folks in Europe got a chance to see an annular eclipse on October 3rd. This was the view from Sibylle's garden in Berlin (thanks Sibylle!).

*Photo by: Sibylle Fröhlich.*

2005 is the 100th anniversary of Einstein's "Miracle Year"—the period when the 26-year old scientist revolutionized our ideas of space, time, matter, and light.

Astronomer Andrew Fraknoi will discuss Einstein's theories of relativity and how they changed the way we look at the universe. Using humor, analogies, and no mathematics, he will show what Einstein's ideas mean to the average person, and how new astronomical observations are confirming some of Einstein's craziest suggestions. These observations include black holes, amazing warps in the fabric of space and time itself, which are now turning out to be more common than anyone dared to think.

The host of the evening will be SRJC physics instructor Lynda Williams, who doubles as the science cabaret singer, The Physics Chanteuse. Ms. Williams will open the show with a few songs about Einstein. According to People Magazine, "Williams puts the fizz back in physics."

**November 5, 7:00 p.m.**

**What:** *Latest Theories About the Universe and Its Governing Laws*

**Who:** Multiversal Journeys

**Where:** Lawrence Hall of Science

**Cost:** Free

This seminar is aimed to educate the public about the latest theories in theoretical physics. Please check the following web page for more details about the seminar. [www.multiversaljourneys.com/html/events.htm](http://www.multiversaljourneys.com/html/events.htm)

The mission of Multiversal Journeys is to "Make Theoretical Physics Easy for the Public". If you have any questions about our lecture series, please contact Farzad Nekoogar, Ph.D., President of Multiversal Journeys—925-519-1319.

**November 5, 7:00 p.m.**

**What:** *The Big Bang—Lecture & Book Signing*

**Who:** Simon Singh

**Where:** Chabot Space & Science Center, Oakland

**Cost:** \$7 non-members, \$6 members

From early creation myths to the orbiting of space telescopes, Dr. Simon Singh, best selling author and award-winning documentary film maker, will give a history overview of the scientific effort that resulted in the theory of the Big Bang. Singh gives a colorful history of the people behind the theory, where the ideas came from and how the theory developed over the years.

**November 12, 7:00 p.m.**

**What:** *Skywatchers of Ancient Mexico*

**Who:** Dr. Anthony Aveni

**Where:** Chabot Space & Science Center, Oakland

**Cost:** \$8 non-members, \$7 members

Dr. Aveni, one of the foremost authorities on Maya archaeoastronomy, will talk about the roll that Venus played in the Maya culture and the role of astronomical alignments in their architecture.

**November 19, 7:00 p.m.**

**What:** *Celestial Triple Feature*

**Who:** John Dobson-ophiles

**Where:** El Campanil Theatre in Antioch

**Cost:** \$5.00, \$4.00 for seniors (over 62)

**Celestial Triple Feature**

The El Campanil Theatre in Antioch presents a three-part astronomy evening: a film, a personal appearance by John Dobson, and telescopic viewing of the sky itself.

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<p><b>Officers</b></p> <p><b>President:</b> Chuck Grant cg@fx4m.com 925-422-7278</p> <p><b>Vice-President:</b> Rich Campbell r_photon@yahoo.com</p> <p><b>Treasurer:</b> Gary Steinhour garyjane1@yahoo.com</p> <p><b>Secretary:</b> Mike Rushford rushford@eyes-on-the-skies.org</p> <p><b>Board of Directors</b> Alane Alchorn, Jim Alves, Debbie Dyke, Gert Gottschalk, Stan Isakson, Mike Rushford, John Swenson.</p>	<p><b>Volunteer Positions</b></p> <p><b>Librarian:</b> Jim Alves jim_alves_engr@yahoo.com 925-634-0220</p> <p><b>Newsletter Editor:</b> Debbie Dyke ddfam@pacbell.net 925-461-3003</p> <p><b>Program Director:</b> unfilled</p> <p><b>Loaner Scope Manager:</b> John Swenson johnswenson1@comcast.net</p> <p><b>Webmaster:</b> Chuck Grant</p> <p><b>Observatory Director/ Key Master:</b> Chuck Grant</p> <p><b>School Star Party Chair:</b> Rich Campbell r_photon@yahoo.com 925-586-6453 (after 9 p.m.)</p>	<p><b>Public Star Party Chair:</b> Rich Campbell</p> <p><b>Historian:</b> Debbie Dyke</p> <p><b>Mentor:</b> Mike Rushford rushford@eyes-on-the-skies.org</p> <p><b>Addresses</b></p> <p><i>Mailing:</i> Tri-Valley Stargazers P.O. Box 2476 Livermore, CA 94551</p> <p><i>Lecture Meeting:</i> Unitarian Universalist Church 1893 N. Vasco Road, Livermore</p> <p><i>Board &amp; Discussion Meetings:</i> Round Table Pizza 1024 E. Stanley Blvd., Livermore</p>	<p><b>Web &amp; E-mail</b> <a href="http://www.trivalleystargazers.org">www.trivalleystargazers.org</a> tvs@trivalleystargazers.org</p> <p><b>Eyes on the Skies</b> Eyes on the Skies is a robotic solar telescope run by Mike Rushford (rushford@eyes-on-the-skies.org). You may access it by visiting <a href="http://www.eyes-on-the-skies.org">www.eyes-on-the-skies.org</a>.</p> <p><b>TVS E-Group</b> So how do you join the TVS e-group you ask? Just send an e-mail message to the TVS e-mail address (tvs@trivalleystargazers.org) asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.</p>
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## Calendar of Events *continued*

### A Sidewalk Astronomer

*A Sidewalk Astronomer* is a documentary film featuring John Dobson, the one-time Vedanta monk who revolutionized amateur astronomy, whose invention, the now ubiquitous “Dobsonian” telescope, brought hands-on telescopic observing to multitudes around the world. Not one to be content with past accomplishments, the 90-year-old Dobson now devotes himself to bringing astronomy to the public by personal appearances and through the organization he founded in 1968, the “San Francisco Sidewalk Astronomers”.

Produced and directed by Jeffrey Fox Jacobs, this 78-minute independent film will have its first Eastbay showing at 7:00 p.m. tonight.

### John Dobson In Person

Immediately following the showing of *A Sidewalk Astronomer*, John Dobson will appear personally on the theatre’s stage, describing his life and his multifaceted interests and activities, and to answer questions from, and interact with, the audience. You can expect entertainment and enlightenment; the New York Times review of his film described John as “spreading his gospel of curiosity about the stars” and having “a gift for explaining scientific concepts in the form of wry one-liners.”

### Telescopic Skygazing

Continuing the evening’s theme, at about 9:30 p.m., just after the film showing and John’s appearance, you can move outdoors to a site by the theatre to enjoy telescopic viewing of the heavens yourself. One target will be Mars, now high in our sky and particularly close to the Earth. And there will be plenty of other objects to be viewed: double stars, clusters of stars and even galaxies. (This portion of the evening will of course be dependent on the weather.) The telescopes are kindly provided by members of the Mount Diablo Astronomical Society.

### The El Campanil Theatre

The El Campanil is located in the historic Rivertown Business District of Antioch, at 602 W. Second Street. To reach the theatre take Hwy 4 to the “A” Street exit in Antioch, then turn off (left if you’re going east, right if you are headed west). Follow “A” Street north toward the San Joaquin River. Once you pass Wilbur Avenue, “A” Street curves to the left along the waterfront and turns into Second Street, now heading west. The El Campanil is located at the corner of Second and “G” Streets. Public parking is located a few yards past the theatre, with lots on both the right and left sides of Second Street.

You may purchase tickets next to the theatre, at 604 W. Second Street, starting at 6 p.m.. Tickets are \$5.00 per person, and \$4.00 for seniors (over 62).

## First Light: Beginners’ Astronomy

by Richard Campbell

### Star Cleansing

Whoooooosh. Swish swish swish. Splink! These are the sounds of telescope cleaning. Just like a pet, your telescope needs a bath now and then to stay active and frisky among the photons. How often? When? When not to clean? Let’s get our feet wet. . .

The #1 most cleaned component, by far, is the *telescope eyepiece*. It is the most touched, exposed, moved part of your system, so it follows you will clean it often. The good news is the outside glass of the eyepiece is durable, with hard coatings designed for repeated, gentle passes with a cleaning tissue. First, blow (or whoosh) compressed air over the outer eyepiece glass, removing eye gunk, dust or pollen particles. If you blow air first, you will assure that no particles will scratch the glass when you wipe later. Next, you will need the disposable white cleaning tissues that come with standard cleaning kits (they are suspiciously similar to eyeglass cleaning tissues) Drop cleaning fluid *onto a cleaning tissue* (not the eyepiece) then make gentle wiping motions to remove eyelash oil deposits, fingerprints. . . any smudgyness you encounter. Some prefer straight wipes from the center outward, others say circular motions. . . others rub the bejeezus out of it! Now your eyepiece is squeaky clean. If not, you may attack persistent glops of goop with a LensPen, a specialized wand with an impregnated head for deep cleaning.

Now the magic questions: What about the Objective lens? What about the mirror? Again, good news. . . fantastic news even. . . you *don’t have to clean them!* These coatings are *far more sensitive* than eyepiece coatings and are designed to be left alone. This seems counter-intuitive until you consider: the dust particles that accumulate on an objective lens or mirror are a *tiny percentage* of the total light gathering area, and are therefore negligible. You would do far more damage by cleaning than you would by leaving it alone. However, after 3 years, and exposure to super dusty conditions, it would behoove you to clean your newtonian telescope’s mirror. Orion Telescopes recommends submerging the primary mirror in distilled water, moving a cotton ball across the primary mirror in a straight line while the mirror is underwater (use no pressure), discarding that cotton ball, and continuing in this striping fashion up the mirror until you have cleaned the whole thing. Once you take the mirror out of the water, you can blow the remaining water droplets off the mirror with a rubber blower bulb.

Refractor lenses and Cassegrain correctors need only be cleaned at the factory, however, it wouldn’t hurt to blow compressed air over those surfaces periodically. Keeping lenses and correctors *dew-free* helps as well, for we know evil dew carries filmy goop onto your lens. (Goop is the bane of the Astronomer’s eye!)

For that oh-so-precious Apochromatic lens, get this: Baader planetarium just released “TurboFilm”—an optically transparent, temporary use mylar that can place over your objective to prevent *any dirt* from ever accumulating! If the inexpensive TurboFilm gets dirty, simply replace it! One astronomer in the South Bay says he used it on his \$20,000 refractor at 400X and saw no degradation of the image. . . Mercy. . . wouldn’t that be sweet!

So if you keep it sparkling with a whoosh, a swoosh, and a plink, you will see clean across the light-years.

## Astronomical insights

by David Feindel

One of my business trips this month was to Taiwan. I’ve been there many times, but never spent any time in Taipei. I should have. They have the best astronomical museum that I’ve seen anywhere. Four floors (think half a WalMart in size), an Omni-Max that doubled as a planetarium, and a serious exhibit on telescopes and optics, including four Tak fluorite doublets to look through! The one disappointment was that there was little on Chinese astronomy; almost all of the space was devoted to Western astronomers. And why did they have an exhibit on Goddard, but not even show the Chinese invention of rockets???

Heartily recommended, even if you don’t understand Chinese (as I don’t).



The grand foyer of the Taipei Taiwan Astronomical Museum, with their to-scale planet exhibit (at least I think its to-scale!) and three floors of exhibits.

I took the opportunity to join a star party in Blue Canyon, CA this past month. This was the second night of a two-night class given by the Learning Exchange ([www.learningexchange.com](http://www.learningexchange.com)). It was held at a small air-strip in the Sierra foothills right off of I-80, at 5,280 feet altitude (suspicious, but that’s what the sign says). But good horizons all around, and the Sacramento/Auburn

light done only extended 10 degrees or so. So I was expecting a good night. But the weather, as always, has the final say. Winds of 10-20 mph, sprung up at dusk and blew steadily all night, bringing the chill factor down to about freezing, and making telescopes low-power instruments. The Coat Hanger, Double Cluster, M11, and the brighter globulars all proved hits for the 45 newbie astronomers attending. The students all bailed by 9:30; the five of us with scopes stayed until 11:00, but did more talking than observing after 10:00 (who said astronomy is a solitary hobby?).

The best observing this month turned out to be this past Thursday and Friday mornings (September 29 and 30), with exceptional transparency and seeing. The Clear Sky Clock forecasted excellent conditions, and they were. Getting up at 5 am Thursday and then at 4 am Friday for observing might be regarded as madness. But the seeing made it worthwhile. I could easily see features on Mars (at that time, its just past the meridian), including the south polar ice cap. Reported to be tough to see in an 8" telescope in late September by *Sky & Telescope*, it proved easy in my 8" scope, and even visible in my 115mm refractor.

The seeing both days permitted 50x/inch magnification, although a bit less than that proved optimal—around 300x through my SCT, 200x through my refractor. Saturn’s moons proved revealing; my SCT at 286X clearly showing six moons (Titan, Rhea, Iapetus, Tethys, Dione, and Enceladus), and hints of Mimas at mag 12.9 with direct vision. The 115 showed five moons, with Enceladus at magnitude 11.7 dropping out. Both scopes showed four obvious belts on the planet, the first time I’ve ever seen more than two. The crepe ring was visible, although not obvious.

I also took a lengthy look at the Trapezium, another frequently used target for judging scopes and seeing. Stars “E” and “F” at about mag 10.2 were both easily visible and well separated in both scopes. “G” and “H”, both (all three?) are mag 15, and out of my reach with either scope. We then stared at M42 until the sun started to make its appearance known, gradually erasing it from the sky.

## News & Notes *continued*

### Membership Has Its Rewards

Did you know that as a member of TVS you are eligible for discounts at several astronomy stores? Scope City in San Francisco gives a 10% discount, as does Oceanside Photo & Telescope in Southern California (Give them the TVS membership number of 70090). *Sky & Telescope’s* online shop also gives discounts to club members.

## What's Up *by Debbie Dyke*

All times Pacific Daylight Saving Time unless otherwise noted.

### October

- 8 Sat Draconid meteors peak. 10:00 a.m.  
1873 Elindr Hertzsprung born.
- 9 Sun 1604 A supernova appears between Jupiter and Saturn. Kepler notices it on the 17th and studies it.
- 10 Mon Columbus Day.  
**First Quarter Moon.** 12:01 p.m.
- 12 Wed Yom Kippur begins at sundown.
- 14 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,  
1893 N. Vasco Road, Livermore.  
Moon at perigee (226,578 miles). 7:00 a.m.  
Uranus 3.5° North of the Moon. 9:00 p.m.
- 16 Sun **Tri-Valley Stargazers discussion meeting.** 2:00 p.m. at the Round Table Pizza on 1024  
E. Stanley Blvd., Livermore. Discuss astro stuff with your fellow members.
- 17 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza in Livermore.  
**Full Moon** (Hunter Moon). 5:14 a.m.  
Venus 2° North of Antares. 7:00 p.m.
- 18 Thurs The almost full Moon 4.5° from the ever brightening Mars.
- 19 Wed Moon 2° South of M45 (Pleiades). 9:00 p.m.
- 21 Fri Orionid meteors peak at 2:00 a.m.
- 22 Sat Jupiter in conjunction with the Sun. 6:00 a.m.  
4000 BC The world was created, according to James Ussher, archbishop of Ireland.  
1975 Venera 9 becomes first spacecraft to return images of the surface of Venus.
- 24 Mon **Last Quarter Moon.** 6:27 p.m.  
3936 BC According to Johannes Hevelius, the world was created on this date at 6:00 p.m.
- 25 Tues Saturn, the Moon and the Beehive Cluster make a nice grouping. 6:00 a.m.
- 26 Wed Moon at apogee (250,786 miles). 3:00 a.m.
- 29 Sat **Mars at closest approach.** 7:00 p.m.
- 30 Sun **Daylight Saving Time ends.** Fall back one hour. 2:00 a.m.
- 31 Mon **Halloween. Set up your scope and give celestial treats to trick-or-treaters.**  
For the next two weeks, look for the Zodiacal Light in the East before morning twilight.  
1992 The Vatican absolves Galileo of all heresy charges.

### November

- 1 Tues **New Moon.** 5:25 p.m.
- 2 Wed 1885 Harlow Shapley born.  
1917 First light for Mt. Wilson's 100-inch Hooker telescope.
- 3 Thurs Ramadan ends (Eid-al-Fitr).  
Mercury at greatest heliocentric latitude South and at greatest elongation East (24°). 8:00 a.m.  
Venus at greatest elongation East (47°). 11:00 a.m.  
1957 First dog in space (Laika). She is put to sleep 10 days later while still in orbit aboard Sputnik 2.
- 5 Sat S. Taurid meteors peak. 2:00 a.m.  
Venus 4° North of the moon. 6:00 p.m.
- 6 Sun Venus at extreme declination -27° 05'

## Where No Spacecraft Has Gone Before

by Dr. Tony Phillips

In 1977, Voyager 1 left our planet. Its mission: to visit Jupiter and Saturn and to study their moons. The flybys were an enormous success. Voyager 1 discovered active volcanoes on Io, found evidence for submerged oceans on Europa, and photographed dark rings around Jupiter itself. Later, the spacecraft buzzed Saturn's moon Titan—alerting astronomers that it was a very strange place indeed!—and flew behind Saturn's rings, seeing what was hidden from Earth.

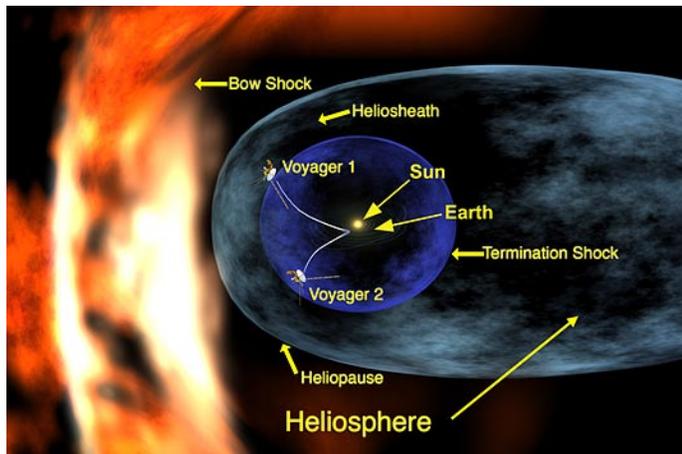
Beyond Saturn, Neptune and Uranus beckoned, but Voyager 1's planet-tour ended there. Saturn's gravity seized Voyager 1 and slingshot it into deep space. Voyager 1 was heading for the stars—just as NASA had planned.

Now, in 2005, the spacecraft is nine billion miles (96 astronomical units) from the Sun, and it has entered a strange region of space no ship has ever visited before.

“We call this region ‘the heliosheath.’ It’s where the solar wind piles up against the interstellar medium at the outer edge of our solar system,” says Ed Stone, project scientist for the Voyager mission at the Jet Propulsion Laboratory.

Out in the Milky Way, where Voyager 1 is trying to go, the “empty space” between stars is not really empty. It’s filled with clouds of gas and dust. The wind from the Sun blows a gigantic bubble in this cloudy “interstellar medium.” All nine planets from Mercury to Pluto fit comfortably inside. The heliosheath is, essentially, the bubble’s skin.

“The heliosheath is different from any other place we’ve been,” says Stone. Near the Sun, the solar wind moves at a million miles per hour. At the heliosheath, the solar wind slows eventually to a dead stop. The slowing wind becomes denser, more turbulent, and its magnetic field—a remnant of the sun’s own magnetism—grows stronger.



Voyager 1, after 28 years of travel, has reached the heliosheath of our solar system.

So far from Earth, this turbulent magnetic gas is curiously important to human life. “The heliosheath is a shield against galactic cosmic rays,” explains Stone. Subatomic particles blasted in our direction by distant supernovas and black holes are deflected by the heliosheath, protecting the inner solar system from much deadly radiation.

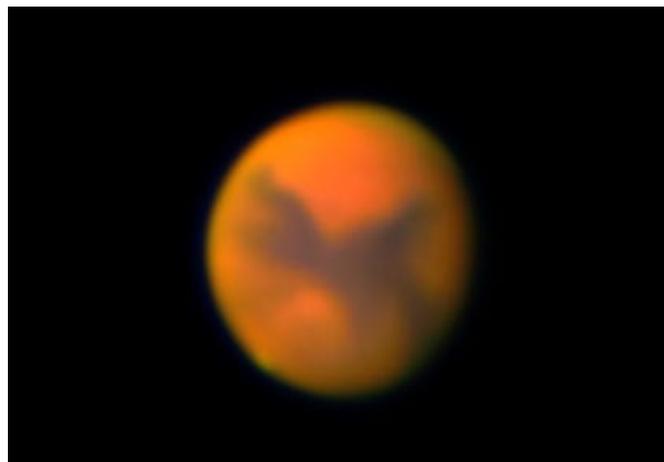
Voyager 1 is exploring this shield for the first time. “We’ll remain inside the heliosheath for 8 to 10 years,” predicts Stone, “then we’ll break through, finally reaching interstellar space.”

What’s out there? Stay tuned...

For more about the twin Voyager spacecraft, visit [voyager.jpl.nasa.gov](http://voyager.jpl.nasa.gov). Kids can learn about Voyager 1 and 2 and their grand tour of the outer planets at [spaceplace.nasa.gov/en/kids/vgr\\_fact3.shtml](http://spaceplace.nasa.gov/en/kids/vgr_fact3.shtml).

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

## Astro Events



Mars as seen on the morning of September 9, 2005, through Rachel, Chabot’s 20” refractor. The image is a composite of 161 images taken with a Canon 20D digital camera. The 161 images were combined using Registax, with resulting image processed in Photoshop. Photo: Conrad Jung

## Mars Mania

Batten down the hatches, Mars is fast approaching Earth at about 23,500 mph and will make its closest approach on Saturday, October 29th when it gets as close as about 43 million miles away.

The dark features are already visible, but alas, the south polar cap has dwindled to a tiny spot, making it very difficult to see. The north polar cap is somewhat larger, but is tipped away from us making it difficult to spot as well. So far, the dust storms have stayed away and there is no indication of them forming. Yet.

Tri-Valley Stargazers  
P.O. Box 2476  
Livermore, CA 94551



## PRIMEFOCUS

### Tri-Valley Stargazers Membership Application

Member agrees to hold Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function.

Name \_\_\_\_\_ Phone \_\_\_\_\_ e-mail \_\_\_\_\_

Address \_\_\_\_\_

Do not release my: \_\_\_\_\_ address, \_\_\_\_\_ phone, or \_\_\_\_\_ e-mail information to other TVS members.

- Membership category: \_\_\_\_\_ \$5 Student.  
\_\_\_\_\_ \$25 Basic. You will receive e-mail notification when the PDF version of *Prime Focus* is available for download off the TVS web site.  
\_\_\_\_\_ \$30 Regular. You will receive a paper version of *Prime Focus* in the mail.  
\_\_\_\_\_ \$32.95 One year subscription to *Sky & Telescope* magazine.  
\_\_\_\_\_ \$34 One year subscription to *Astronomy* magazine.  
\_\_\_\_\_ \$60 Two year subscription to *Astronomy* magazine.  
\_\_\_\_\_ \$20 Hidden Hill Observatory (H2O) refundable key deposit (key property of TVS).  
\$ \_\_\_\_\_ Tax deductible contribution to Tri-Valley Stargazers.  
\$ \_\_\_\_\_ TOTAL – Return to: Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551

Membership information: Term is one calendar year, January through December. Student members must be less than 18 years old or still in high school.