

# PRIME FOCUS

Tri-Valley Stargazers

January 2009



## Meeting Info:

### What

*IceCube: A billion-ton telescope at the South Pole*

### Who

Justin Vandenbroucke

### When

January 16, 2009  
Doors open at 7:00 p.m.  
Lecture at 7:30 p.m.

### Where

Unitarian Universalist  
Church in Livermore  
1893 N. Vasco Road

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## January Meeting

IceCube: A billion-ton telescope at the South Pole

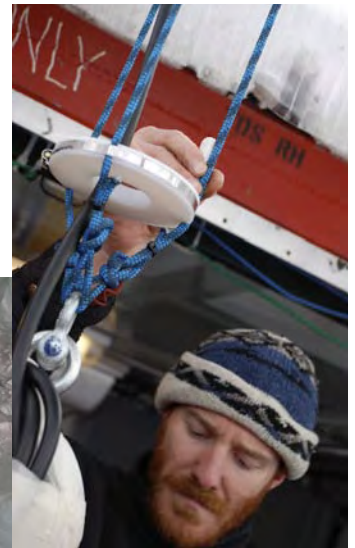
*Justin Vandenbroucke*

Neutrino astronomy is a new field combining astrophysics and particle physics. Detecting (or not detecting) neutrinos from gamma-ray bursts and active galactic nuclei will be an essential piece of understanding

what they are and how they work. Neutrinos may also tell us the nature of dark matter. IceCube, a neutrino telescope under construction at the South Pole, exploits the crystal-clear ice located a mile deep in the ice at the South Pole, to detect flashes of light produced by high-energy neutrinos. The detector will span a cubic kilometer (a billion tons) of ice. Halfway complete, IceCube is already producing exciting data we are busy



IceCube being lowered into the ice. Justin operating equipment.



A colleague heads back to the office.



Justin trying to stay warm.

analyzing, and the first results have been published. I will describe the science and technology of IceCube and show photos of life and science at the South Pole.

Justin Vandenbroucke is a PhD candidate at the University of California, Berkeley. He has spent the past three summer seasons at the South Pole helping build IceCube.

## News & Notes

### New Members

TVS would like to welcome our newest member, **Thomas Treadway**.

### 2009 TVS Meeting Dates

The following lists the TVS meeting dates for the start of the year. The lecture meetings continue to be 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 March 8th deadline is for the March issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Jan. 16	Jan. 19	Jan. 4
Feb. 20	Feb. 23	Feb. 8
Mar. 20	Mar. 23	Mar. 8

### Money Matters

Treasurer David Feindel reported the TVS account balances as of December 22, 2008.

Checking	\$3,373.11 + \$608 deposit made 12/22
CD #1	\$3,752.01 matures 2/17/09
CD #2	\$2,647.37 matures 2/27/09

### TVS Membership Renewal Time

January is the start of TVS' membership year. You can find the renewal form on the back page of the newsletter. Please fill it out and send it in with your check (made out to Tri-Valley Stargazers) to PO Box 2476, Livermore, CA 94551. You can also give your check and form to our Treasurer, David Feindel, at the club meetings.

If you are a subscriber to *Sky & Telescope* magazine and need to renew, follow whatever instructions *S&T* sends you. If you are a new subscriber to *S&T*, fill out the membership renewal form and submit your payment to TVS. *Astronomy* magazine will continue to follow the procedure for subscribing or renewing through the club.

Rates continue to be \$32.95 for a 1-year subscription to *S&T*, and \$34/\$60 for a 1- or 2-year subscription to *Astronomy*. If you have questions regarding the subscriptions, contact club Treasurer David Feindel.

### RASC Handbooks & Calendars

We have the RASC (Royal Astronomical Society of Canada) Handbooks and Calendars available for purchase. You can pick them up at the lecture meeting. If you need a copy before then, please contact our Treasurer, David Feindel, to make arrangements for an early delivery.

The Handbooks are \$22, Calendars \$15. Cash or checks (made out to Tri-Valley Stargazers) accepted.

The Handbook is a useful book filled with all kinds

of astronomical data. The calendar features photos taken by amateur astronomers. You can find more information at <http://www.rasc.ca/publications/index.shtml>.

### International Year of Astronomy



The International Year of Astronomy (IYA2009) is a global celebration of astronomy and its contributions to society and culture, highlighted by the 400th anniversary of the first use of an astronomical telescope by Galileo Galilei. The aim of IYA is to stimulate worldwide interest, especially among youth, in astronomy and science under the central theme: "The Universe: Yours to Discover".

For more information about all the activities planned for this year, visit the IYA2009 web site: <http://www.astronomy2009.org>.

To celebrate IYA, UC Berkeley's Astronomy Department will be hosting a series of public talks by members of the UC Berkeley Astronomy Department. The talks will be on the third Saturday of each month. To get the full schedule, visit <http://astro.berkeley.edu/iya>.

The first talk in the series will be on Saturday, January 17th at 11:00 a.m., in the Genetics and Plant Biology Building, Room 100, northwest corner of the campus. The speaker is none other than **Geoff Marcy**, who will be talking about "The Search for Habitable Planets and Life in the Universe".

Jane Houston-Jones, Senior Outreach Specialist with the Cassini Program, submits the following:

Each month during 2009 we'll be celebrating International Year of Astronomy in the 2-minute *What's Up* podcasts. We'll focus on night sky wonders you can see, related NASA missions, and space science discoveries.

January 2009 is all about Venus, the featured NASA IYA Celestial object. You can find the podcast in 640 x 360, HD1280x720, Standard 640 x480, and HD Podcast 1280 x 720. <http://www.jpl.nasa.gov/video/index.cfm>

It is also available on You Tube in two formats: [http://www.youtube.com/profile\\_videos?user=JPLnews&pr=r&page=1](http://www.youtube.com/profile_videos?user=JPLnews&pr=r&page=1). The NASA IYA website: <http://astronomy2009.nasa.gov/observe.htm>.

**Newsletter header image:** The Center of the Milky Way

This composite infrared image of the center of our galaxy (in Sagittarius, about 26,000 light years away) shows a new population of massive stars. The image reveals details in objects as small as 20x the size of our solar system. The image was taken by Hubble's NICMOS and Spitzer's IRAC cameras. *Photo: Hubble (NASA, ESA, Q.D. Wang) / Spitzer (NASA, JPL, S. Stolovy)*

# Calendar of Events

## January 12, 7:30 - 9:00 p.m.

**What:** *Dark Energy and the Runaway Universe*

**Who:** Alex Filippenko (UC Berkeley)

**Where:** Morrison Planetarium, San Francisco

**Cost:** Adults \$10, Seniors \$8, Members \$5

Tickets available at the door.

Observations of very distant exploding stars (supernovae) show that the expansion of the Universe is now speeding up, rather than slowing down due to gravity as expected. Other, completely independent data strongly support this amazing conclusion. Over the largest distances, our Universe seems to be dominated by a repulsive “dark energy,” stretching the very fabric of space itself faster and faster with time. The physical nature of dark energy is often considered to be the most important unsolved problem in physics; it probably provides clues to a unified quantum theory of gravity.

## January 15, 5:45 - 6:00 p.m.

**What:** *Night Sky Network: The Solar System*

**Who:** Dr. Mark Showalter

**Where:** Your phone

**Cost:** Free

Dr. Mark Showalter, a SETI Institute planetary astronomer, will do a telecon talk about our Solar System. Dr. Showalter is a specialist in the moons and rings of our Solar System.

Join the teleconference on Thursday, January 15th. To log into the Telecon call between 5:45 - 6:00 p.m. by using the toll-free conference call line: 1-888-455-9236. An operator will answer and will ask for the passcode: NIGHT SKY NETWORK. You will be asked to give your NAME and the CLUB you belong to, and number of people listening with you.

The PowerPoint file to go along with the talk will be available a few days before the telecon here: [http://night-sky.jpl.nasa.gov/download-view.cfm?Doc\\_ID=359](http://night-sky.jpl.nasa.gov/download-view.cfm?Doc_ID=359).

## February 5, 6:30 - 8:30 p.m.

**What:** *Space Pop Classes - Invasion of the Space Robots: Earthlings Investigate the Planets*

**Who:** Everyone

**Where:** Chabot Space & Science Center

**Cost:** Regular \$25, Members \$22

Call the Box Office at 510-336-7373 to register

In only 40 or so years, our perception of the planets in our Solar System has gone from blurry glimpses of fuzzy disks to magnificent, up-close vistas of captivating worlds in their own right. We will take a look at a pair of planets that have received great attention from Earthly robotic explorers in recent years—Mars and Saturn—and survey advancements in our understanding of them since the dawning of the Space Age.

## February 6, 6:00 - 10:00 p.m.

**What:** *eXo Party*

**Who:** Everyone

**Where:** Chabot Space & Science Center

**Cost:** Adults \$20, Students \$18, Members \$15

Get your tickets through the

Box Office at 510-336-7373.

eXo Party is a special evening celebration of all things X-tra-terrestrial. Special live planetarium presentations, live music, food and activities for the whole family including telescope viewing (weather permitting). Tickets include an all-access pass to the hands-on interactive exhibits at Chabot, a special scientific presentation about exoplanets and much more, even a Moonlight hike.

### Officers

#### **President:**

Chuck Grant  
cg@fx4m.com  
925-422-7278

#### **Vice-President:**

unfilled

#### **Treasurer:**

David Feindel  
feindel1@comcast.net

#### **Secretary:**

David Woolsey  
fatdawg@comcast.net

#### **Board of Directors**

Alane Alchorn, Jim Alves,  
Debbie Dyke, Gert Gottschalk,  
Mike Rushford, John Swenson.

### Volunteer Positions

#### **Librarian:**

Jim Alves  
Ajaengr@yahoo.com  
209-833-9623

#### **Newsletter Editor:**

Debbie Dyke  
astrodeb@comcast.net  
925-461-3003

#### **Program Director:** unfilled

#### **Loaner Scope Manager:**

John Swenson  
johnswenson1@comcast.net

#### **Webmaster:**

Debbie Dyke

#### **Observatory Director/**

**Key Master:**  
Chuck Grant

#### **School Star Party Chair:**

unfilled

### **Public Star Party Chair:**

unfilled

#### **Historian:**

Debbie Dyke

#### **Mentor:**

Mike Rushford  
rushford@eyes-on-the-skies.org

### Addresses

#### Mailing:

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

#### Lecture Meeting:

Unitarian Universalist Church  
1893 N. Vasco Road, Livermore

#### Board & Discussion Meetings:

Round Table Pizza  
1024 E. Stanley Blvd., Livermore

### Web & E-mail

[www.trivalleystargazers.org](http://www.trivalleystargazers.org)  
[trivalleystargazers@gmail.com](mailto:trivalleystargazers@gmail.com)

### Eyes on the Skies

Eyes on the Skies is a robotic solar telescope run by Mike Rushford ([rushford@eyes-on-the-skies.org](mailto:rushford@eyes-on-the-skies.org)). You may access it by visiting [www.eyes-on-the-skies.org](http://www.eyes-on-the-skies.org).

### TVS E-Group

So how do you join the TVS e-group, you ask? Just send an e-mail message to the TVS e-mail address ([trivalleystargazers@gmail.com](mailto:trivalleystargazers@gmail.com)) asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.

## What's Up *by Debbie Dyke*

All times Pacific Standard unless otherwise noted.

### January

- 2 Fri For the next two weeks, look for Mercury low in the WSW sky just after sunset.
- 4 Sun **First Quarter Moon.** 3:56 a.m.  
Earth at perihelion (91,199,061 miles). 7:00 a.m.
- 7 Wed Moon 5.5° north of Pleiades (M45). 6:30 p.m.  
1610 Galileo discovers Jupiter's moons Io, Europa, and Callisto.
- 10 Sat **Full Moon.** 7:27 p.m. Largest in 2009.  
Moon at perigee (221,648 miles). 3:00 a.m. Expect large tides.  
Mercury stationary. 11:00 p.m.
- 11 Sun Moon 1° 19' south of the Beehive Cluster (M44). 8:00 p.m.
- 13 Tue Mercury at perihelion.  
1610 Galileo discovers Ganymede.
- 14 Wed Venus at greatest elongation east (47°). 1:00 p.m.
- 15 Thur Saturn 6° north of the Moon. 11:00 p.m.
- 16 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,  
1893 N. Vasco Road, Livermore.
- 17 Sat **Last Quarter Moon.** 6:46 p.m.  
Ceres stationary. 10:00 a.m.
- 19 Mon **Tri-Valley Stargazers Board meeting.** 7:30 p.m. at the Round Table Pizza in Livermore.
- 20 Tue Mercury in inferior conjunction. 8:00 a.m.
- 21 Wed Mercury at greatest elongation east (19°). 9:00 p.m.  
Antares 1° south of the Moon. 6:00 a.m.
- 22 Thur Moon at apogee (251,793 miles). 4:00 p.m.  
Venus 1° 14' from Uranus. 8:00 p.m.
- 23 Fri Mercury at greatest heliocentric latitude north.  
Jupiter in conjunction with the Sun. 10:00 p.m.
- 24 Sat 1986 Voyager 2 flyby of Uranus.
- 25 Sun New Moon. 11:55 p.m.  
Annular solar eclipse, visible in Sumatra and Borneo.
- 27 Tue 1967 Apollo 1 capsule catches fire while sitting on launch pad, killing all three astronauts on board.
- 28 Wed 1986 Space Shuttle Challenger explodes soon after liftoff, killing all seven on board.
- 29 Thur Venus 4° 28" south of Moon. 7:00 p.m.

### February

- 1 Fri 2003 Columbia breaks apart during reentry, killing all seven on board.
- 5 Tue Mercury at greatest heliocentric latitude north.
- 6 Wed **New Moon.** 7:44 p.m.  
Mercury in inferior conjunction. 10:00 a.m.  
Venus, Mercury, and Uranus low in the west right after sunset.
- 7 Thur Chinese New Year  
Venus and Uranus 0.75° from each other, low in the west. 7:00 p.m.  
1889 The Astronomical Society of the Pacific is formed.
- 10 Sun Neptune in conjunction with the Sun. 6:00 p.m.

## Superstar Hide and Seek

by Dr. Tony Phillips

It sounds like an impossible task: Take a star a hundred times larger in diameter and millions of times more luminous than the Sun and hide it in our own galaxy where the most powerful optical telescopes on Earth cannot find it.

But it is not impossible. In fact, there could be dozens to hundreds of such stars hiding in the Milky Way right now. Furiously burning their inner stores of hydrogen, these hidden superstars are like ticking bombs poised to 'go supernova' at any moment, possibly unleashing powerful gamma-ray bursts. No wonder astronomers are hunting for them.

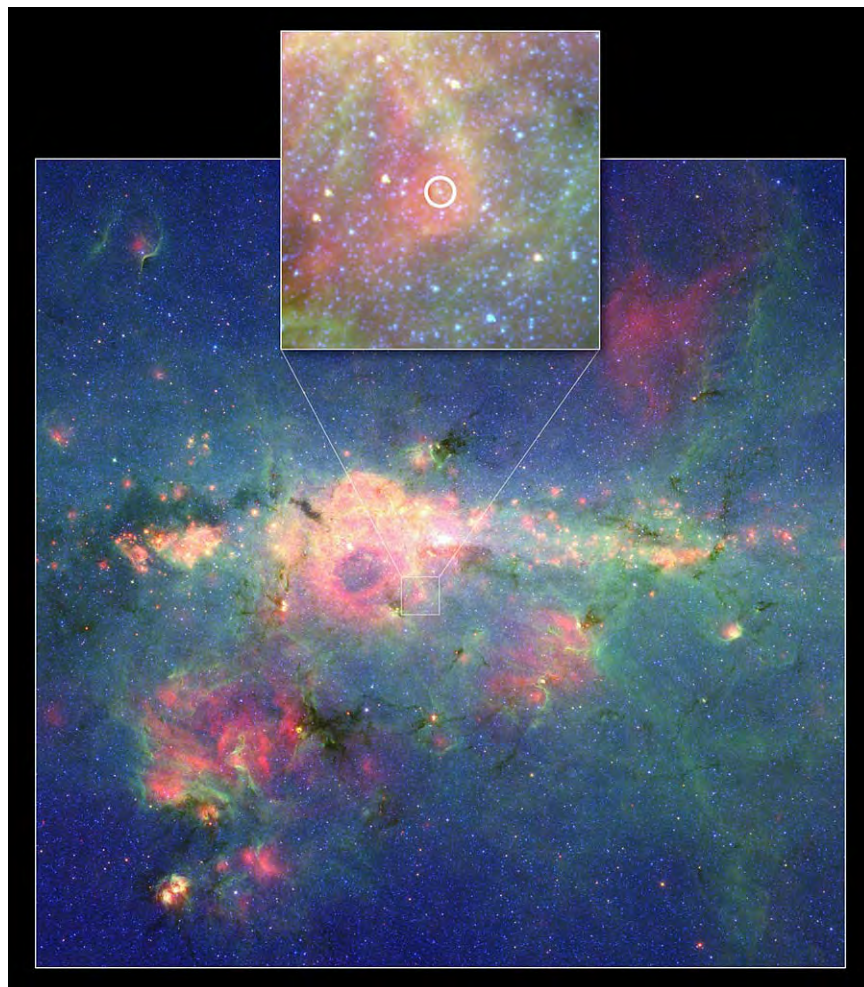
Earlier this year, they found one.

"It's called the Peony nebula star," says Lidia Oskinova of Potsdam University in Germany. "It shines like 3.2 million suns and weighs in at about 90 solar masses."

The star lies behind a dense veil of dust near the center of the Milky Way galaxy. Starlight traveling through the dust is attenuated so much that the Peony star, at first glance, looks rather dim and ordinary. Oskinova's team set the record straight using NASA's Spitzer Space Telescope. Clouds of dust can hide a star from visible-light telescopes, but Spitzer is an infrared telescope able to penetrate the dusty gloom.

"Using data from Spitzer, along with infrared observations from the ESO's New Technology Telescope in Chile, we calculated the Peony star's true luminosity," she explains. "In the Milky Way galaxy, it is second only to another known superstar, Eta Carina, which shines like 4.7 million suns."

Oskinova believes this is just the tip of the iceberg. Theoretical models of star formation suggest that one Peony-type star is born in our galaxy every 10,000 years. Given that the lifetime of such a star is about one million years, there should be 100 of them in the Milky Way at any given moment.



The "Peony Nebula" star is the second-brightest found in the Milky Way Galaxy, after Eta Carina. The Peony star blazes with the light of 3.2 million suns.

Could that be a hundred deadly gamma-ray bursts waiting to happen? Oskinova is not worried.

"There's no threat to Earth," she believes. "Gamma-ray bursts produce tightly focused jets of radiation and we would be extremely unlucky to be in the way of one. Furthermore, there don't appear to be any supermassive stars within a thousand light years of our planet."

Nevertheless, the hunt continues. Mapping and studying supermassive stars will help researchers understand the inner workings of extreme star formation and, moreover, identify stars on the brink of supernova. One day, astronomers monitoring a Peony-type star could witness with their own eyes one of the biggest explosions since the Big Bang itself.

Now that might be hard to hide.

Find out the latest news on discoveries using the Spitzer at [www.spitzer.caltech.edu](http://www.spitzer.caltech.edu). Kids (of all ages) can read about "Lucy's Planet Hunt" using the Spitzer Space Telescope at [spaceplace.nasa.gov/en/kids/spitzer/lucy](http://spaceplace.nasa.gov/en/kids/spitzer/lucy).

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

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.  
\_\_\_\_\_ \$30 Basic. You will receive e-mail notification when the PDF version of *Prime Focus* is available for download off the TVS web site.  
\_\_\_\_\_ \$40 Regular. You will receive a paper version of *Prime Focus* in the mail.  
\_\_\_\_\_ \$10 Hidden Hill Observatory (H2O) yearly access fee. You need to be a key holder to access the site.  
\_\_\_\_\_ \$20 H2O key holder fee. (A refundable key *deposit*—key property of TVS).  
\_\_\_\_\_ \$40 Patron Membership. Must be a member for at least a year and a key holder.  
\_\_\_\_\_ \$34 One year subscription to *Astronomy* magazine.  
\_\_\_\_\_ \$60 Two year subscription to *Astronomy* magazine.  
\_\_\_\_\_ \$32.95 One year subscription to *Sky & Telescope* magazine. **Note:** Subscription to *S&T* is for new subscribers only. Existing subscribers please renew directly through *S&T*.  
\$ \_\_\_\_\_ 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.