PRIMEFOCUS

Tri-Valley Stargazers

September 2009

Meeting Info:

What
Radio Ears and X-Ray Eyes: Astronomical Superheroes

Who
Dr. Steve Croft

When
September 18, 2009
Doors open at 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist Church in Livermore
1893 N. Vasco Road

Inside

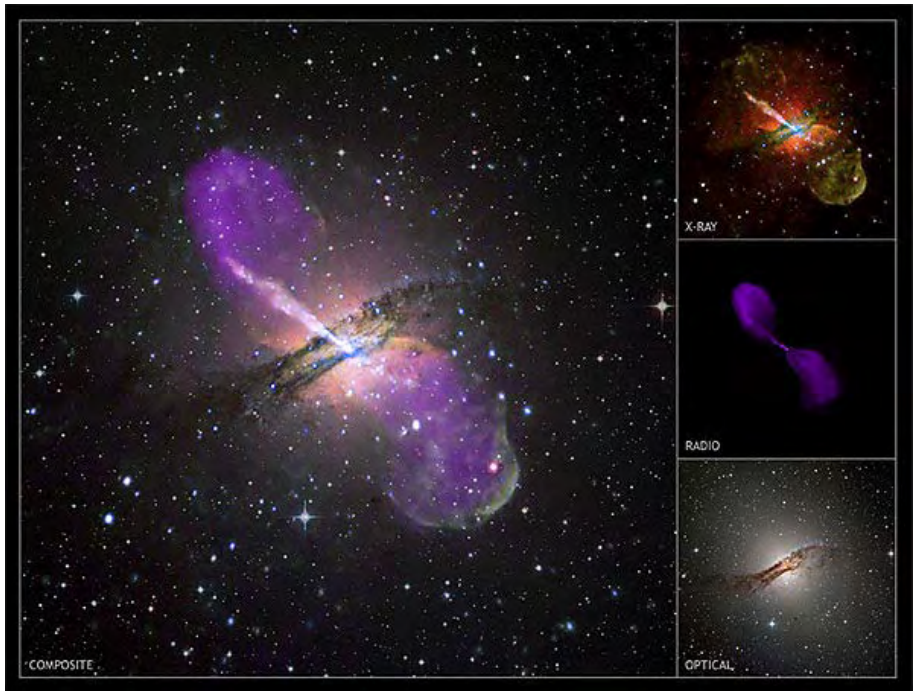
News & Notes	2
Calendar of Events	3
Astronomical Events	5
What's Up	6
NASA's Space Place	7
Membership/Renewal Application	8

September Meeting

Radio Ears and X-Ray Eyes: Astronomical Superheroes
Dr. Steve Croft

400 years ago, Galileo first turned his telescope to the heavens. But he could not have imagined that he saw just a small part of a huge Universe, both in terms of its size, and of the frequencies of light which it emits. Modern astronomy surveys the Universe from radio to X-rays, using groundbreaking technology to explore the mysteries of diverse and wonderful objects: from supernova explosions to the monster black holes at the centers of galaxies.

M82 galaxy as seen in visible, x-ray, and infrared light. M82 is 12 million light years away in Ursa Major. *Photo: X-ray: NASA/CXC/JHU/ D.Strickland; Optical: NASA/ESA/STScI/AURA/The Hubble Heritage Team; IR: NASA/JPL-Caltech/Univ. of AZ/C. Engelbracht*



Centaurus A as seen in x-ray (top right), radio (middle right), optical (bottom right) and all three images combined (center). *Photo: X-ray - NASA, CXC, R.Kraft (CfA), et al.; Radio - NSF, VLA, M.Hardcastle (U Hertfordshire) et al.; Optical - ESO, M.Rejkuba (ESO-Garching) et al.*

News & Notes

2009 TVS Meeting Dates

The following lists the TVS meeting dates for the rest of the year. 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 December 6th deadline is for the December issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
Sept. 18	Sept. 21	Sept. 6
Oct. 16	Oct. 19	Oct. 4
Nov. 20	Nov. 23	Nov. 8
Dec. 18	Dec. 21	Dec. 6

Money Matters

At the August Board Meeting, Treasurer David Feindel reported the TVS account balances as of August 23, 2009, were:

Checking	$3,754.85	
CD #1	$3,758.00	matures 11/17/09
CD #2	$2,652.35	matures 8/27/09

The Tri-Valley Stargazers at Yosemite 2009

by David Feindel

TVS's weekend at Yosemite this year was July 31st to August 1st. A fair group of members brought their scopes ranging from 90mm to 300mm in size to show visitors the celestial highlights. Moon sets after midnight both days kept faint fuzzies off the list, but Jupiter's presence in the SE sky and a collection of asterisms, satellites, and double stars provided sufficient "magic" to delight one and all.

A nearly-full amphitheater of visitors was treated to David Woolsey providing some interesting facts and trivia about the planets, the space program, and what we expected to see that night as the introduction. (He's the ghostly blue-jeaned legs underneath the screen.) David was pinch-hitting for the AstroWizard, who could not appear due to personal reasons. Thanks, David!

The observing highlights came after most of the visitors had left, and the chocolate chip cookies had appeared. We caught the Great Red Spot transiting, followed two hours and six minutes later by the Small Temporary Black Spot, where a comet or asteroid had apparently crashed into Jupiter about a week earlier. Jupiter's moons were also performing a dance, with shadow transits and transits visible. Views of the moon were spectacular, with it transiting a little bit after David's presentation ended. Seeing was very good, allowing us to apply ludicrous power to capture surface detail of both Jupiter and the Moon (in my case, 268X thru a 4.5" scope).

Yosemite also provided some late night visitors, included the known felon Yellow 47. Yellow happens to be an approximate 130 pound mature female bear, who according to the ranger, has been known to break into cars for food. She was quite the mellow Yellow for us, ambling in when the cookies came out, and sauntering away about 10 minutes later when she decided it wasn't worth waiting around to see if the humans would leave the cookies behind. We were also blessed with a pair of deer strolling through the amphitheater early Sunday morning.

Read A Good Book Lately?

Sometimes there's just nothing as cozy as curling up with a good storybook. Whether you prefer turning real pages or virtual pages, you will enjoy the five spacey storybooks on The Space Place. Joining our classic stories in verse *Professor Starr's Dream Trip* and *Lucy's Planet Hunt* are the new *What's in Space*, *Supercool Space Tools*, and *The*

continued page 4

Newsletter header image: M8 - The Lagoon Nebula

M8 (NGC 6523) is an emission nebula located in the constellation Sagittarius, approximately 5,000 light years away. The Lagoon is roughly 110 x 50 light years across. Open cluster NGC 6530 is surrounded by the nebula.

At magnitude 6.0, it is easy to see in binoculars and is visible naked eye from dark locations.

Image taken with Nellie, Chabot Space & Science Center's 36" reflector. *Photo: Conrad Jung*

Calendar of Events

AANC / ASP Conference - September 12-16

There's still time to sign up for the Amateur Astronomers of Northern California (AANC) and the Astronomical Society of the Pacific (ASP) conference in Millbrae.

The AANC meeting is only on Saturday the 12th. Events include lectures, workshops, solar viewing, art projects for kids, and a star party at night. The cost is $39.95 for adults, kids are free (but must be accompanied by an adult). For more information, visit their web site at http://aancstars2009.org.

The ASP conference runs from September 12 through the 16th and includes lectures and workshops. Scheduled speakers include Frank Drake, Seth Shostak, Margaret Race, and John Jenkins. Visit http://www.astrosociety.org/events/meeting.html for more information.

September 14, 7:30 p.m.

What: *The Voyager Journey to Interstellar Space*
Who: Ed Stone (California Institute of Technology and Voyager Project Scientist)
Where: California Academy of Sciences, SF
Cost: $12 Adults, $19 Seniors, $6 Academy Members. Seating is limited. To purchase tickets in advance go to https://www.calacademy.org/event_tickets/index.php or call 800-794-7576.

Launched in 1977 to explore Jupiter, Saturn, Uranus, and Neptune, the two Voyager spacecraft revealed the remarkable diversity of these giant planetary systems. Now eight and ten billion miles from Earth, the Voyagers are exploring the outermost layer of the bubble created by Sun as they continue their journey to interstellar space that lies beyond.

September 16, 12:00 - 1:00 p.m.

What: *HST Imaging of Fomalhaut: Direct Detection of an Exosolar Planet and Kuiper Belt Around a Nearby Star*
Who: Paul Kalas (SETI Institute and UC Berkeley)
Where: SETI in Mountain View
Cost: Free

Advances in high-contrast imaging have produced a new sample of spatially resolved debris disks with morphologies attributed to the dynamical effects of planets. Paul will briefly review several cases, including the recent non-detection of Beta Pictoris b using Keck adaptive optics at L-prime. Then he will focus on the case for a planetary system around the nearby A star Fomalhaut. Optical coronagraphic observations using the Advanced Camera for Surveys aboard HST shows a vast dusty debris belt offset from the star and cleanly sculpted at its inside border. Follow-up HST images have further revealed a co-moving point source with apparent orbital motion 18 AU interior to the dust belt. He'll discuss both the observational and theoretical evidence that the point source is a planet with < 3 Jupiter masses, making Fomalhaut b the lowest mass planet candidate detected via direct imaging. He'll give alternate explanations and discuss future plans for the detailed mapping of Fomalhaut's planetary system.

September 19, 8:30 p.m.

What: *Astrobiology: What is Life & Where is It?*
Who: Wil van Breugel, Ph.D (UC Merced)
Where: Mt. Tamalpais
Cost: Free

Astrobiology combines astronomy, biology, physics and chemistry to investigate the origin and evolution of life in

continued page 4

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Lecture Meeting:
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1893 N. Vasco Road, Livermore

Board & Discussion Meetings:
Round Table Pizza
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Web & E-mail

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Eyes on the Skies

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 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 asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.

Calendar of Events *continued*

extreme environments, including early Earth, and guides the search for alien life on other planets in our Solar System and beyond. Dr. vanBreugel will discuss how our perception and understanding of life has evolved, and the close connection of life to the cosmos.

September 19, 11:00 a.m. - 12:00 p.m.
What: *Live Fast - Die Young: Monster Stars and Their Temper Tantrums*
Who: Nathan Smith
Where: UC Berkeley, Genetics and Plant Biology Building, Room 100
Cost: Free

This talk will discuss the properties of the most massive stars known, born with masses of 30 to 150 times the mass of our Sun. Massive stars dominate many of the physical processes in interstellar space when they explode as brilliant supernovae, but these stars also wreak havoc on their surroundings before they die, leading short lives that are very different from that of the Sun. Early on, their ultraviolet radiation and fast winds carve huge cavities in the dark clouds that gave birth to them, disrupting the cradles where many other less massive stars are quietly trying to begin their lives. Such regions are likely to be the birthplace of solar systems like our own. Later on, as these monster stars become violently unstable, they can erupt repeatedly like volcanoes or undergo violent encounters with companion stars before they finally meet their end in a supernova explosion, ending up as either a compact neutron star or black hole.

Nathan Smith is a postdoctoral researcher in astronomy at UC Berkeley, where he works on the life and death of massive and violently unstable stars such as Eta Carinae. He earned Bachelor's degrees in music and astronomy from Minnesota in 1997, received a Master's in astronomy from Boston University in 1999, and came back to Minnesota to finish a PhD in astronomy in 2002. He was then a NASA Hubble Fellow at the University of Colorado in Boulder, before moving to Berkeley. He's passionate about skateboarding, music (having studied classical music in India for a while, as well as touring the US with a painfully loud rock band), and unlike some astronomers whose office blackboards are covered with scrawled equations and scientific diagrams, most of Nathan's is taken up with names and star ratings of the single malt scotch whiskies he is partial to tasting with friends and colleagues at an informal weekly after-work 'scotch hour'. He is also responsible for producing some of the most dramatic images taken with the Hubble Space Telescope.

This talk is presented as part of the astronomy department's International Year of Astronomy monthly speaker series. Doors open at 10:30 and seating is on a first-come, first-served basis. Limited hourly pay parking is available on weekends on and nearby campus - please check the signs. You are encouraged to take public transport - BART and bus lines are within walking distance.

September 23, 12:00 - 1:00 p.m.
What: *Where is Mars' Ice? Constraints from Impact Craters and Lobate Debris Aprons on a Mid-latitude Reservoir*
Who: Reid Parsons (UC Santa Cruz Earth and Planetary Sciences Dept.)
Where: SETI Institute, Arecibo Room, Mountain View
Cost: Free

Ancient features such as outflow channels and phyllosilicate mineral outcrops, suggest a large amount of water was once present on the Martian surface. The volume of water required to form these features exceeds the current inventory of water frozen at the Martian poles. Observations of surface craters and large flow features known as lobate debris aprons provide insight into the amount of water ice stored in mid-latitudes.

This lunchtime talk is part of the SETI Institute Colloquium Series. Location is 515 N. Whisman Road, Mountain View, CA 94043. For more info, visit their web site http://www.seti.org/csc/lectures, e-mail info@seti.org, or phone 650-961-6633.

October 9, 1:00 p.m.*
What: *Shoot the Moon!*
Who: The Exploratorium Web Cast
Where: At a computer near you
Cost: Free

Is water ice present or absent in a crater near the moon's polar region? Join the Exploratorium for a live webcast of the LCROSS (Lunar Crater Observing and Sensing Satellite) mission. LCROSS is a NASA mission investigating the presence of water ice. The Exploratorium Web team will cover the mission, the explosion on the moon, and the plume of matter that will shoot 40 feet into the air from the moon's surface, visible from Earth! Watch live online at: www.explo.tv or at the Exploratorium.

*Time and date subject to change; please check www.explo.tv for the latest information.

Go to: http://press.exploratorium.edu/shoot-the-moon-october-2009/ for more information.

News & Notes *continued*

First Annual Planet Awards. All are available as richly illustrated online "books" with interactive page turning or viewable and printable Adobe Reader files. So settle down with a good and fun book at http://spaceplace.nasa.gov/en/kids/storybooks.

Astronomical Events

LCROSS Mission Impact - October 9

On October 9th, 2009, at 4:30 a.m. (+/- 30 minutes), a part of the Centaur rocket that carried the Lunar Crater Observation and Sensing Satellite (LCROSS) to the Moon will impact the lunar surface, on purpose. The impact should be visible with telescopes 10-12" or larger.

The selected impact spot will be announced at a press conference on Friday, September 11, at 10:00 a.m. PDT and will be carried by NASA TV, as well as their web site (http://www.nasa.gov/ntv).

An observation campaign has been started to encourage amateur astronomers to watch and record the impact and report what they were able to see through their telescopes. If you would like to participate, visit http://lcross.arc.nasa.gov/observation.htm to get all the details. Another web site with information about the program is http://www.nasa.gov/mission_pages/LCROSS/main/observing_the_impacts.html.

The LCROSS team is encouraging everyone to try to view this event. If you are lucky enough to be able to see the debris cloud rise up from the Moon, please be sure to submit your observations to the team. This is a wonderful opportunity for amateurs to contribute to science.

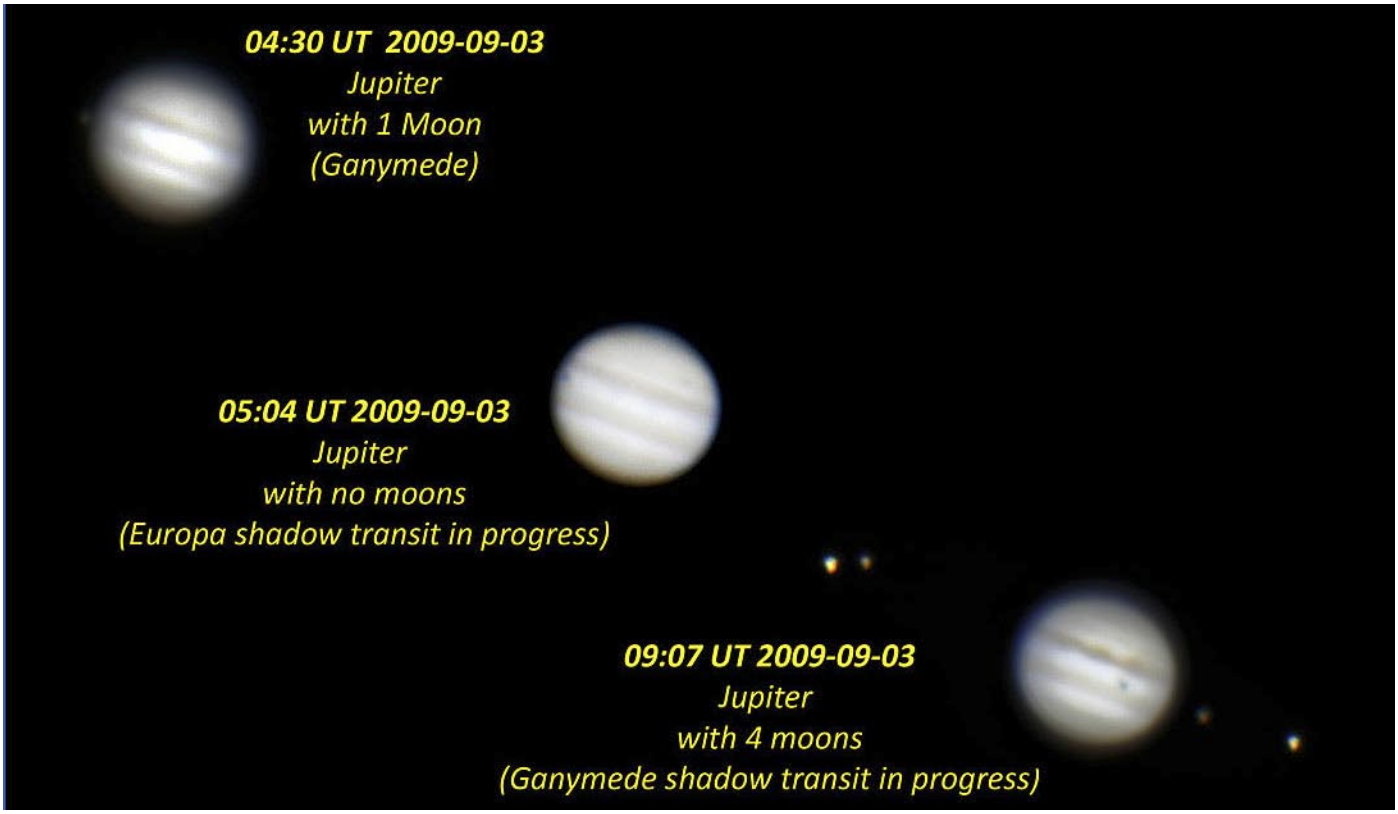
Jupiter Transits

The following are a few listings of transit times for various Jupiter related objects. The abbreviations are: G=Ganymede, C=Callisto, I=Io, E=Europa, GRS=Great Red Spot, and if you see a 's' next to one of the moons, it means its shadow (e.g., Is=Io's shadow); na means Jupiter is below the horizon or it is daylight at that time.

September

Fri 11	GRS	na	7:38p	9:25p
Sat 12	GRS	11:25p	1:20a	3:10a
Sun 13	GRS	na	9:08p	11:00p
Tue 15	GRS	8:55p	10:45p	12:45a
Thur 17	I	9:30p	10:38p	11:47p
	Is	10:18p	11:19p	12:35a
	GRS	10:35p	12:24a	2:20a
Fri 18	GRS	na	8:15p	10:15p
Sun 20	GRS	8:00p	9:55p	11:55p
Tue 22	GRS	9:30p	11:30p	1:40a
Thur 24	I	11:17p	12:25a	1:35a
	GRS	11:25p	1:15a	3:10a
	Is	12:14a	1:10a	2:30a

continued page 7



A rare view of a Jovian Moon Dance. This series of images was taken at the Chabot Space & Science Center and shows Jupiter starting out with one moon at the beginning of the evening, then having no moons, and finally having four moons. The last time anyone at Chabot saw somthing like this, it was by former Director Charles Burckhalter on October 21, 1913. *Photo: Conrad Jung*

What's Up *by Debbie Dyke*

All times Pacific Daylight unless otherwise noted.

September

11	Fri	**Last Quarter Moon**. 7:16 p.m.
12	Sat	1758 Messier sees the Crab Nebula, making it the first item in his list of fuzzy comet-like objects.
13	Sun	Mars 2° south of the Moon. 5:00 a.m.
14	Mon	1915 John Dobson born in China.
15	Tue	The Moon 3° south of M44. 5:00 a.m.
16	Wed	Look for the Zodiacal light in the east before morning twilight for the next two weeks. Moon at perigee (225,712 miles). 1:00 a.m. Venus 3°16' north of the Moon, low on the eastern horizon. 6:00 a.m.
17	Thur	Uranus at opposition. 3:00 a.m. Saturn in conjunction with the Sun. 11:00 a.m.
18	Fri	**Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore. **New Moon**. 11:44 a.m. Rosh Hashanah begins at sundown and starts the Jewish year 5770. It ends September 20th.
20	Sun	Venus 27' north of Regulus, low in the east. 6:00 a.m. Mercury in inferior conjunction. 3:00 a.m. Ramadan ends (Eid al-Fitr) at sundown.
21	Mon	**Tri-Valley Stargazers Board meeting**. 7:30 p.m. at the Round Table Pizza on 1024 E. Stanley Blvd., Livermore.
22	Tue	**Autumal Equinox**. 2:19 p.m.
23	Wed	1791 Johann Franz Encke born. 1846 Gale and d'Arrest discover Neptune near the locations predicated by Adams and Le Verrier.
25	Fri	**First Quarter Moon**. The Moon is 2°45' from the Lagoon Nebula (M8). 9:50 p.m.
27	Sun	Moon at apogee (250,747 miles). 9:00 p.m. Yom Kippur begins at sundown.
29	Tue	The Moon is 3°16' NE of Jupiter and 4°26' NW of Neptune. 8:30 p.m.
30	Wed	1880 Using an 11-inch Alvan Clark, Henry Draper takes the first photograph of the Orion Nebula.

October

1	Thur	1958 NASA established by an act of Congress.
2	Fri	1608 J. Lippershey patents the telescope.
3	Sat	**Full Moon**. 11:10 p.m.
4	Sun	Mercury and Venus at perihelion. 1957 Sputnik 1 is launced by the Soviet Union, becoming the first artificial satellite to orbit the Earth.
5	Mon	Mercury at greatest elongation west (18°). 7:00 p.m.
6	Tue	1995 Discovery of the first extrasolar planet (orbiting 51 Pegasi) announced.
7	Wed	The Moon is 6° north of the Pleiades. 5:00 a.m.
8	Thur	Draconid meteor shower peaks. 12:00 a.m. Mercury 26' from Saturn low in the east. Venus is 5°47' to the south. 7:00 a.m.
9	Fri	1604 A supernova appears between Jupiter and Saturn. Kepler notices it on the 17th and studies it.
11	Sun	1968 First manned Apollo flight launched.

A Planet Named Easterbunny?

You know Uranus, Neptune, and Pluto. But how about their smaller cousins Eris, Ceres, Orcus, and Makemake? How about Easterbunny?

These are all names given to relatively large "planet-like" objects recently found in the outer reaches of our solar system. Some were just temporary nicknames, others are now official and permanent. Each has a unique story.

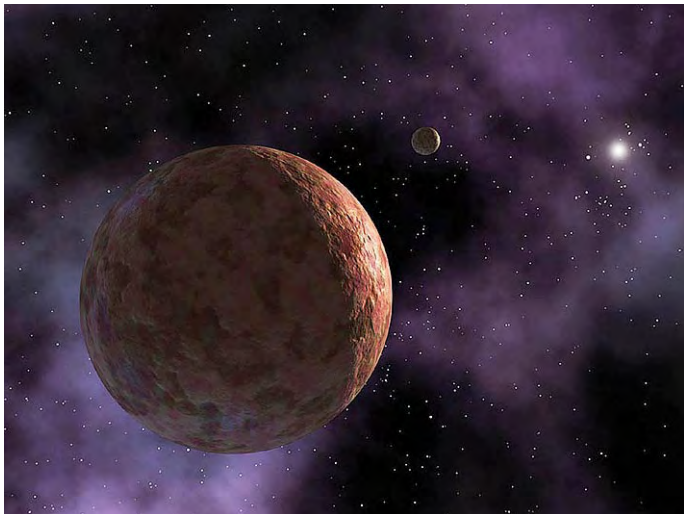
"The names we chose are important," says Caltech astronomer Mike Brown, who had a hand in many of the discoveries. "These objects are a part of our solar system; they're in our neighborhood. We 'gravitate' to them more if they have real names, instead of technical names like 2003 UB313."

Nearby planets such as Venus and Mars have been known since antiquity and were named by the ancient Romans after their gods. In modern times, though, who gets to name newly discovered dwarf planets and other important solar-system bodies?

In short, whoever finds it names it. For example, a few days after Easter 2005, Brown and his colleagues discovered a bright dwarf planet orbiting in the Kuiper belt. The team's informal nickname for this new object quickly became Easterbunny.

However, ever since its formation in 1919, the International Astronomical Union (IAU) ultimately decides whether to accept or reject the name suggested by an object's discoverers. "Easterbunny" probably wouldn't be approved.

According to IAU guidelines, comets are named after whoever discovered them—such as comet Hale-Bopp, named after its discoverers Alan Hale and Thomas Bopp. Asteroids can be named almost anything. IAU rules state that objects in the Kuiper belt should be given mythological names related to creation.



Artist's rendering of dwarf planet MakeMake, discovered around Easter 2005. Unlikely to gain acceptance their nickname Easterbunny, the discoverers named it for the god of humanity in the mythology of Easter Island.

So Brown's team started brainstorming. They considered several Easter-esque names: Eostre, the pagan mythological figure that may be Easter's namesake; Manabozho, the Algonquin rabbit trickster god.

In the end, they settled on Makemake (pronounced MAH-kay MAH-kay), the creator of humanity in the mythology of Easter Island, so named because Europeans first arrived there on Easter 1722.

Other names have other rationales. The dwarf planet discovered in 2005 that triggered a fierce debate over Pluto's status was named Eris, for the Greek goddess of strife and discord. Another dwarf planet with an orbit that mirrors Pluto's was dubbed Orcus, a god in Etruscan mythology that, like Pluto, ruled the underworld.

Brown says he takes "this naming business" very seriously and probably spends too much time on it. "But I enjoy it." More tales of discovery and naming may be found in Brown's blog MikeBrownsPlanets.com.

Constellations have also been named after ancient gods, human figures, and animals. Kids can start to learn their constellations by making a Star Finder for this month at spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml. There you will also find a handy explanation of why astrology has no place in science.

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

Astronomical Events *continued*

Fri 25	GRS	7:20p	9:00p	11:00p
Sat 26	I	na	na	8:02p
	Is	na	7:40p	8:58p
Sun 27	GRS	1:00a	2:50a	4:50a
	Es	na	8:15p	9:48p
	GRS	9:05p	10:40p	12:40a
	Cs	11:05p	1:10a	na

October

Fri 2	GRS	8:00p	9:50p	11:45p
Sat 3	I	7:34p	8:41p	9:50p
	Is	8:38p	9:37p	10:54p
Sun 4	Es	9:35p	10:48p	12:25a
	GRS	9:35p	11:28p	1:30a
Thur 8	Gs	7:52p	9:20p	11:25p

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.