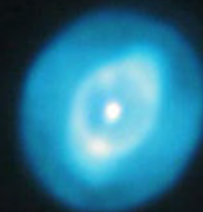


# PRIME FOCUS

Tri-Valley Stargazers



March 2008



## Meeting Info:

### What

*Big Black Holes and the Evolving Universe*

### Who

Dr. Steve Croft

### When

March 21, 2008  
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
What's Up	6
NASA's Space Place	7
Membership/Renewal Application	8

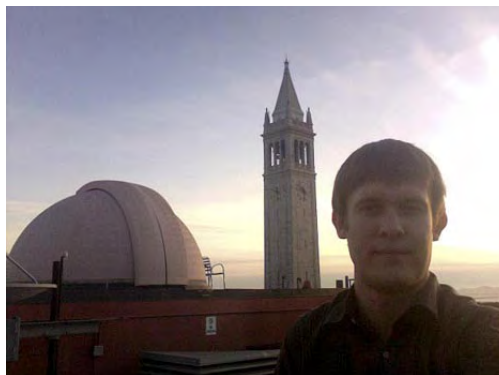
## March Meeting

Big Black Holes and the Evolving Universe  
*Dr. Steve Croft*

Almost 14 billion years ago, the Big Bang created the seeds of the vast structures that we see in the present-day Universe. But how did a sea of scorching hot gas evolve to form the cosmic web of galaxies, clinging together in huge filaments and sheets, and separated by enormous voids? Modern astronomers use telescopes and computers as time-machines, compressing millions of years of history into the blink of an eye, and studying the inexorable forces that draw galaxies together, fueling the gargantuan black holes at their hearts—black holes that, in turn, influence their parent galaxies in strange and surprising ways.



After an undergraduate degree in astrophysics at University College, London, Steve studied for a PhD at the University of Oxford, where he used data from the Very Large Array (VLA) radio telescope to find clusters of galaxies in the distant Universe. In 2002, he moved to California, where he spent five years as a postdoctoral researcher at Lawrence Livermore National Laboratory, studying the host galaxies and environments of active supermassive black holes. Since September 2007, he has been working at the University of California, Berkeley, on projects with the new Allen Telescope Array radio telescope. Steve



is an experienced observational astronomer, and has observed with the VLA, Keck, Hubble Space Telescope, Spitzer Space Telescope, and many others, including over 100 nights on the 3-m class telescopes at the Lick and McDonald Observatories. He lives in Oakland with his wife Lori Andrus, a lawyer, and their two dogs, and enjoys travel, music, and good food and wine.

## News & Notes

### 2008 TVS Meeting Dates

The following lists 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 May 16th deadline is for the May issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Mar 21	Mar 24	Mar 9
Apr 18	Apr 21	Apr 6
May 16	May 19	May 4
June 20	June 23	June 8

### Money Matters

At our February board meeting, Treasurer **David Feindel** left word of the TVS account balances as of February 17, 2008.

Checking	\$3,233.03	
CD #1	\$3,712.17	matures 05/17/08
CD #2	\$2,599.00	matures 02/27/08

### TVS Membership Renewal Time

Not to sound like a broken record, but TVS is at its membership renewal period. For those members who have already renewed, thank you! For those who like to procrastinate, now is the time to send in your renewal. You can find the renewal form on the back page of the newsletter. Please fill it out and send it in with your check to PO Box 2476, Livermore, CA 94551.

If you are renewing your *Sky & Telescope* subscription, you will need to do so through the magazine. They will be sending you notices when your subscription is coming to an end. Subscription rate is \$32.95 this year.

If you are renewing your *Astronomy* magazine subscription, please do so through the club. A one year subscription is \$34, two years is \$60. If you have questions regarding the subscriptions, contact club Treasurer David Feindel.

### RASC Handbooks & Calendars

Believe it or not, we have a few RASC (Royal Astronomical Society of Canada) Handbooks and Calendars still available for purchase. The Handbooks are \$21, Calendars \$13. Cash or checks (made out to Tri-Valley Stargazers) accepted. If you wish a Handbook or Calendar (or both!) and won't be able to attend the March meeting, contact Treasurer David Feindel to reserve a copy. What ever is left will be making an appearance on Astromart.

### Award Winning TVS Member

The American Astronomical Society (AAS) awards the 2007 Chambliss Amateur Achievement Medal to Ronald H. Bissinger of Racoon Run Observatory, Pleasanton, California, for his many contributions to the photometric study of transiting extrasolar planets. He has been involved with NASA and University of California scientists since 2001, via the transitsearch.org team, recording transits of exoplanets across the disks of their parent stars. These observations require exquisite precision for ground-based observations, often at a level rarely achieved even by professional astronomers. Among his many contributions, Bissinger was codiscoverer of the exoplanet XO-1b; he provided the first external confirmation for several exoplanet discoveries, including HD 149026b, which produces only a 3-millimagnitude dip in its star's TMs brightness; he discovered anomalies in the transit light-curve shape of TrES-1; and he developed techniques now used by other researchers in their photometric studies of low-amplitude variability.

While this award is made specifically in recognition of contributions to research, we also note Bissinger's positive service to astronomy in other ways. For example, he has worked as a docent for the National Park Service, explaining astronomy and the night sky to the public; he has advised UCSC undergraduates on observing techniques; and he was an interviewee on the Timothy Ferris PBS special *Seeing in the Dark* and on an American Institute of Physics video on amateur photometry.

You can find more about the Chambliss Awards on the AAS web site: <http://aas.org/grants/awards.php#amateur>. You can read Ron's musings regarding the production of *Seeing in the Dark* at <http://home.comcast.net/~ronbissinger>.

### Yosemite Star Party Dates

TVS has been selected to take the July 25 and 26 slot for the annual summer star parties at Yosemite. Moonrise on the 25th is at 11:47 p.m., and 12:28 a.m. Sunday morning, the 26th. The dates for Barcroft have yet to be selected.

*continued page 4*

#### Newsletter header image: NGC 3242 - The Ghost of Jupiter

This ghost is actually a planetary nebula in the constellation Hydra, about 1,400 light years away. The Ghost got its name due to its resemblance in apparent size to the planet Jupiter. It was originally discovered in 1785 by William Herschel and sits just south of Mu Hydrae.

The picture was taken with Nellie, the 36-inch Classic Cassegrain telescope at the Chabot Space & Science Center (free viewing Friday and Saturday nights!). *Photo: Conrad Jung*

## Calendar of Events

### March 29, 11:00 a.m. - 5:00 p.m.

**What:** *Sun and Earth Day Celebrations*  
**Who:** Chabot Visitors  
**Where:** Chabot Space & Science Center  
**Cost:** General Admission

Join Chabot in a combined celebration of the annual Sun-Earth Day and Earth Day with fun and illuminating hands-on activities focused on the Sun, the Earth, and the special relationship between these two celestial bodies. Enjoy solar viewing, demonstrations of Sun and Earth sciences, make-and-take activities, and a special showing of the film Solarmax.

### March 29, 1:00 p.m.

**What:** *Hunting Planets with Gravity's Telescope*  
**Who:** Dr. Grant Christie & Jennie McCormick  
**Where:** The comfort of your own home  
**Cost:** Free

For this World AstroCast web event, Dr Grant Christie and Jennie McCormick will be giving their presentation *Hunting Planets with Gravity's Telescope*. They were major contributors to the team that recently confirmed the existence of two planets orbiting a star 5,000 light years away. The telescope used was a 10" (250mm) Schmit-Cassegrain. Learn just how they did it, and of exciting discoveries that are to come.

All you need to do is visit the web site listed below. The password, which is only active on the 29th, is: nova

<http://www.ustream.tv/channel/world-astrocast-astronomy->

### March 31, 7:30 p.m.

**What:** *The Dark Side of the Universe*  
**Who:** Dr. Rachel Bean (Cornell University)  
**Where:** Kanbar Hall, Jewish Community Center  
**Cost:** \$4.00

Recent cosmological observations have provided an extremely puzzling insight into the nature of the universe. 95% of the universe's contents are invisible or "dark," with 25% being "dark matter" and the majority in a mysterious form labeled "dark energy." Understanding the origins of the dark universe requires collaboration between theory and observation, and between astronomy and fundamental particle physics. This interdisciplinary endeavor represents one of the major challenges in physics today.

Program begins at 7:30 pm in Kanbar Hall at the Jewish Community Center of San Francisco, 3200 California Street (at Presidio Avenue). Ticket prices: \$5 per lecture or \$20 for the complete series.

Parking is available across the street in the UCSF Laurel Heights campus parking lot for \$1.25 per night. Parking in the JCC garage is \$1.25 per half-hour. The #1 California, #3 Jackson, #4 Sutter, and #43 Masonic MUNI lines stop directly in front of the building. The #38 Geary and #24 Divisadero buses stop only a few blocks away.

You can purchase tickets online at <http://www.calacademy.org/lectures/tickets> or buy them at the door. For more information, call 415-321-8000.

#### **Officers**

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 Debbie Dyke, Gert Gottschalk,  
 Mike Rushford, John Swenson.

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

Rich Campbell

**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)  
[tvst@trivalleystargazers.org](mailto:tvst@trivalleystargazers.org)

#### **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 ([tvst@trivalleystargazers.org](mailto:tvst@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.

## News & Notes *continued*

### 2008 G. Bruce Blair

WAA (Western Amateur Astronomers) held its mid-winter meeting in February at the home of John Sanford, in Springville, California. At the mid-winter meeting the representatives of WAA put forth nominations for The G. Bruce Blair Award.

After voting, a nominee was selected and was contacted by the WAA president. The nominee has accepted the G. Bruce Blair Award nomination

The 2008 G. Bruce Blair Award goes to Marni Berendsen. Marni is employed by the Astronomical Society of the Pacific (ASP), and is also a member of the Mount Diablo Astronomical Society (MDAS).

### Sierra Summer Star Party

The 2nd annual Sierra Summer Star Party is scheduled for September 26th through 28th. Please visit <http://www.sierrastar.org> or e-mail [sssp@charter.net](mailto:sssp@charter.net) for information. To receive a call-back, please leave a message at 1-775-626-5884. For scheduled GWA (Great Western



The partially eclipsed Moon rising over the Fremont hills.  
*Photo: Gert Gottschalk*

Astronomers) star parties and other events for 2008, and other information to assist you in your enjoyment of the astronomical hobby, please visit the weblog <http://gwastro.blogspot.com>.

### Science Fun Fair

Once again, TVS has been invited to participate in the Pleasanton School District's Science Fun Fair on Wednesday, March 19th, at the Alameda County Fairgrounds in Pleasanton.

TVS has been doing this event for a number of years now, and have always had a positive response to our presence. Kids and adults are excited to be able to look through our scopes at the Moon, Saturn, and other celestial delights.

We will need at least two people at our designated table to stamp student's cards and answer questions about astronomy and telescopes. We also need as many volunteers outside with their telescopes to share the view to the thousands of people that attend the Science Fair.

Providing it's clear, we'll have an almost full Moon about 8.5° below Saturn low in the east. Mars will be almost directly over head.

If it's cloudy/rainy, we won't need telescopes outside, but we'll still need people inside. If you wish to help out, please contact Debbie Dyke at 925 ~ 461 ~ 3003 or at [astrodeb~at~comcast~dot~net](mailto:astrodeb~at~comcast~dot~net).

There are two parking passes available for parking in the main area, and one pass for parking close to the building.

### SJAA Auction

Mark your calendar—the famous San Jose Astronomical Association's (SJAA) annual auction and swap meet will be held this year on Sunday, April 20 at Hogue Park in San Jose. The SJAA Auction is a great opportunity for beginners to purchase their first telescope at a great price! Experienced observers often find equipment they need for their next observing project, from O-III filters to finders to star charts. All kinds of interesting items are found in the auction. You do not have to be an SJAA member to attend.

Doors open at 11:30 a.m. to register material for the auction. Registration will end by 12:30 p.m. There will be a total limit of 100 items for the auction so the auction does not last too long. Please limit yourself to about four items maximum for the auction.

SJAA strongly suggest you pre-register your items so that people know what you are bringing. The club reserves the right to accept only appropriate material for the auction. SJAA offers free advertising if you pre-register your items for the auction. Please e-mail the auction team at [auction@sjaa.net](mailto:auction@sjaa.net) with a description of the item and a pic-

## News & Notes *continued*

ture if possible. All items submitted by 6 p.m. on Friday, April 18th, will be added to the auction web site. This allows the bidders to find out how much that APO scope is really worth, so you will be more likely to sell it.

Sellers may specify a minimum bid, which, if not met, will return the item back to the seller with no donation requested. They strongly recommend you set a minimum price if you have any expectations on how much you will net

from your sale. You are not permitted to bid on your own items.

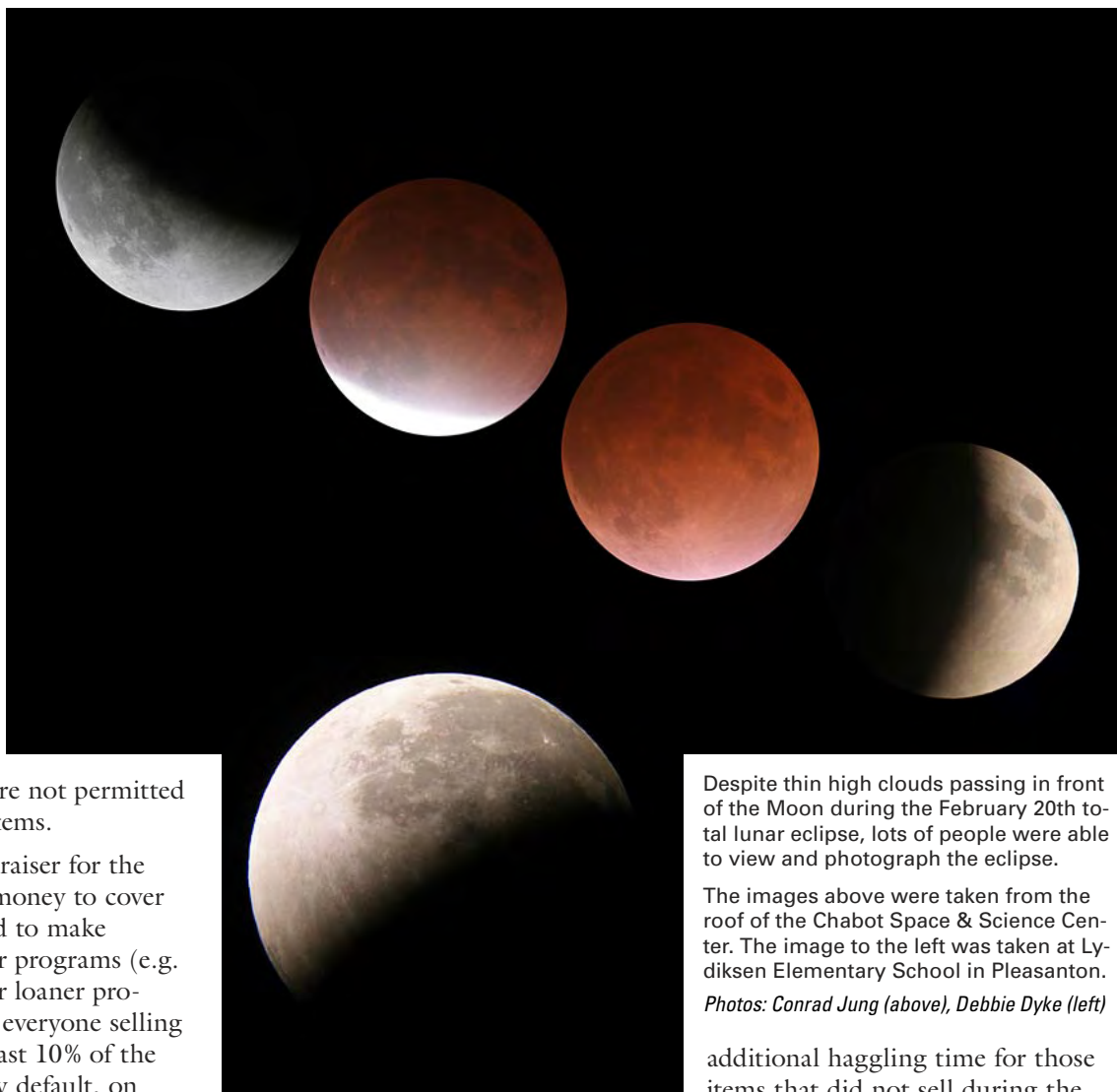
The auction is a fundraiser for the SJAA. They use the money to cover their annual costs and to make improvements in their programs (e.g. improvements in their loaner program). They ask that everyone selling items contribute at least 10% of the sale price to SJAA. By default, on expensive items they will limit your contribution to \$50 on each item sold. If you want to help SJAA more you can donate more! SJAA receives almost 80% of its donations from people that elect to donate the full price of the item to SJAA. You can also elect to split the proceeds with SJAA to any degree you feel comfortable doing. Just ask them. All donations from the auction and the swap are tax-deductible, as SJAA is a 501(c)(3) educational organization.

The auction will begin at 1 p.m., and will run as long as needed (typically ending about 3 p.m.).

After the auction, buyers and sellers settle up using one check to (or from) SJAA and claim their items. SJAA does not handle charge cards. There is no fee for bidder cards, nor for entrance to the hall.

### **Swap Meet**

After the auction, material for the swap meet will be allowed into the hall. The swap also allows people some



Despite thin high clouds passing in front of the Moon during the February 20th total lunar eclipse, lots of people were able to view and photograph the eclipse.

The images above were taken from the roof of the Chabot Space & Science Center. The image to the left was taken at Lydiksen Elementary School in Pleasanton.

*Photos: Conrad Jung (above), Debbie Dyke (left)*

additional haggling time for those items that did not sell during the auction. Sellers are encouraged to

bring items that would interest the astronomical audience such as astronomical, science, computer, or tech items. Vendors typically attend the swap as well selling their own merchandise. At the swap, each buyer pays the seller. SJAA asks Sellers to keep track of their sales, and ask them to make a donation (10% is suggested) as during the auction. There are no table fees.

Part of running a successful auction is to make sure that there are people who are new to astronomy in attendance. SJAA can use your help to make this so! Go to the auction web site linked off the main page (<http://sjaa.net/auction08.htm>), download, and print a auction poster to display. Post them at the bulletin boards at work, at church, at your local library, or where you think people might be interested. Hand it out to a friend who has expressed interest in getting a telescope. You get the idea! Thanks for your assistance!

## What's Up *by Debbie Dyke*

All times Pacific Daylight Saving Time unless otherwise noted.

### March

- 9 Sun **Daylight Saving Time begins.** 2:00 a.m.  
Mars 1.75° from M35. 11:00 p.m.
- 13 Thur 1781 Wilhelm Herschel discovers Uranus using a 6-inch scope he built himself.
- 14 Fri **First Quarter Moon.** 3:46 a.m.  
The Moon 1.5° from Mars. 10:00 p.m.  
1879 Albert Einstein born.  
1986 Giotto spacecraft encounters Comet Halley.
- 16 Sun The Moon 5° from the Beehive Cluster (M44). 11:00 p.m.  
1926 Robert Goddard launches first liquid-fuel rocket.
- 17 Mon St. Patrick's Day.
- 18 Tue 1965 First walk in space by Cosmonaut Alexei Leonov from the Voskhod 2.
- 19 Wed Saturn 3.5° above the Moon. 5:00 a.m.  
**Vernal Equinox.** Spring has sprung! 10:49 p.m.
- 21 Fri **Full Moon.** 11:40 a.m.  
**Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,  
1893 N. Vasco Road, Livermore.
- 23 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.  
For the next two weeks, look for the Zodiacal Light in the west after evening twilight.  
Easter.  
1840 First photo of the Moon taken.
- 24 Mon **Tri-Valley Stargazers Board meeting.** 7:30 p.m. at the Round Table Pizza in Livermore.  
1993 Eugene and Carolyn Shoemaker and David Levy take a picture of what turns out to be  
comet Shoemaker-Levy 9.
- 25 Tue 1655 Christiaan Huygens discovers Saturn's largest moon, Titan.
- 26 Wed Moon at apogee (251,157 miles). 1:00 p.m.
- 27 Thur The Moon 1.5° from Antares. 5:00 a.m.
- 29 Sat **Last Quarter Moon.** 2:47 p.m.  
1974 Mariner 10 makes first flyby of Mercury and sends pictures home.
- 30 Sun The Moon 5° from Jupiter. 5:00 a.m.

### April

- 1 Tue 1949 Gerald Kuiper discovers Neptune's moon Neried.
- 2 Wed 1845 First photo taken of the sun by Louis Fizeau and Leon Foucault.
- 5 Sat **New Moon.** 8:55 p.m.
- 6 Sun 1852 Sir Edward Sabine announces that the 11 year sunspot cycle coincides with the geomagnetic cycle.
- 7 Mon Moon at perigee (223,869 miles) 12:00 p.m.
- 10 Thur The Moon is 3° from M35. 11:00 p.m.
- 11 Fri Venus 2.75° from the Pleiades (M45). 9:00 p.m.  
Mars just 0.5° from the Moon. Midnight.

## Invisible Spiral Arms

by Patrick L. Barry

At one time or another, we've all stared at beautiful images of spiral galaxies, daydreaming about the billions of stars and countless worlds they contain. What mysteries—and even life forms—must lurk within those vast disks?

Now consider this: many of the galaxies you've seen are actually much larger than they appear. NASA's Galaxy Evolution Explorer, a space telescope that "sees" invisible, ultraviolet light, has revealed that roughly 20 percent of nearby galaxies have spiral arms that extend far beyond the galaxies' apparent edges. Some of these galaxies are more than three times larger than they appear in images taken by ordinary visible-light telescopes.

"Astronomers have been observing some of these galaxies for many, many years, and all that time, there was a whole side to these galaxies that they simply couldn't see," says Patrick Morrissey, an astronomer at Caltech in Pasadena, California, who collaborates at JPL.

The extended arms of these galaxies are too dim in visible light for most telescopes to detect, but they emit a greater amount of UV light. Also, the cosmic background is much darker at UV wavelengths than it is for visible light. "Because the sky is essentially black in the UV, far-UV enables you to see these very faint arms around the outskirts of galaxies," Morrissey explains.

These "invisible arms" are made of mostly young stars shining brightly at UV wavelengths. Why UV? Because the stars are so hot. Young stars burn their nuclear fuel with impetuous speed, making them hotter and bluer

than older, cooler stars such as the sun. (Think of a candle: blue flames are hotter than red ones.) Ultraviolet is a sort of "ultra-blue" that reveals the youngest, hottest stars of all.

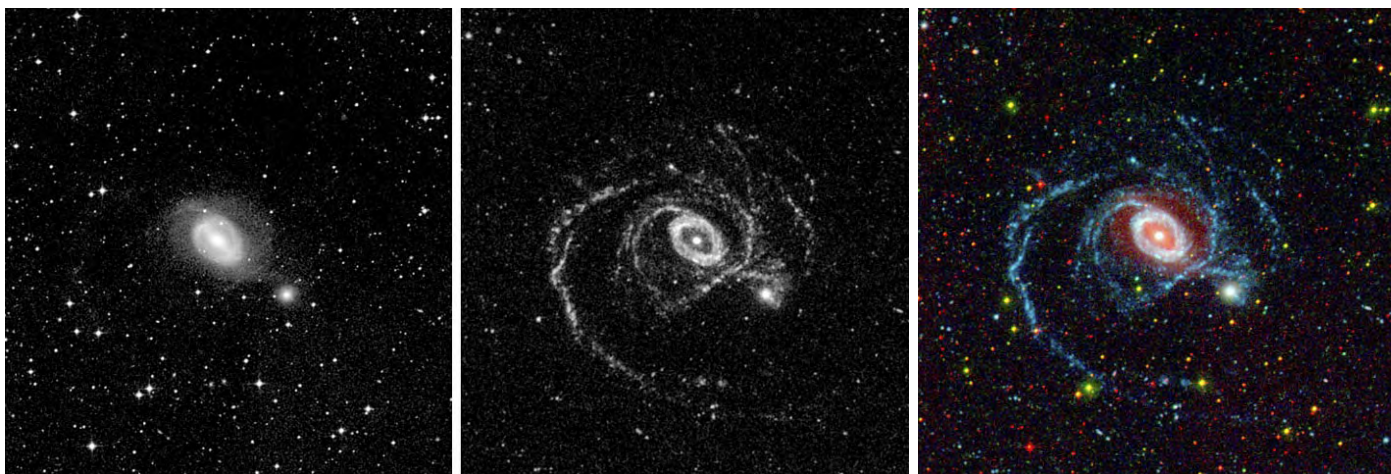
"That's the basic idea behind the Galaxy Evolution Explorer in the first place. By observing the UV glow of young stars, we can see where star formation is active," Morrissey says.

The discovery of these extended arms provides fresh clues for scientists about how some galaxies form and evolve, a hot question right now in astronomy. For example, a burst of star formation so far from the galaxies' denser centers may have started because of the gravity of neighboring galaxies that passed too close. But in many cases, the neighboring galaxies have not themselves sprouted extended arms, an observation that remains to be explained. The Galaxy Evolution Explorer reveals one mystery after another!

"How much else is out there that we don't know about?" Morrissey asks. "It makes you wonder."

Spread the wonder by seeing for yourself some of these UV images at [www.galex.caltech.edu](http://www.galex.caltech.edu). Also, Chris Martin, principle scientist for Galaxy Evolution Explorer—or rather his cartoon alter-ego—gives kids a great introduction to ultraviolet astronomy at [spaceplace.nasa.gov/en/kids/live#martin](http://spaceplace.nasa.gov/en/kids/live#martin).

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



(grayscale images-left & middle): Galaxy NGC 1512 is represented in both images. The visible light image on the left shows the glow of older stars, while the Galaxy Evolution Explorer ultraviolet image on the right shows the ring and long, spiral arms, tracing primarily younger stars. (Credit: NASA/JPL-Caltech/DSS/GALEX).

(color image-far right): In this image of galaxy NGC 1512, red represents its visible light appearance, the glow coming from older stars, while the bluish-white ring and the long, blue spiral arms show the galaxy as the Galaxy Evolution Explorer sees it in ultraviolet, tracing primarily younger stars. (Credit: NASA/JPL-Caltech/DSS/GALEX).

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.