PRIMEFOCUS
Tri-Valley Stargazers

December 2004

Meeting Info:

What
Holiday Potluck

Who
TVS Members & Guests

When
December 17, 2004
Set up at 6:30 p.m.
Dinner at 7:00 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

December Meeting

Holiday Potluck
TVS Members

Our December meeting is our annual holiday pot-luck. Our start time has changed — set up starts at 6:30, dinner is served at 7:00. TVS will provide hot and cold drinks, and all the paper and plastic stuff (paper plates, plastic utensils, etc.) you could possibly need. Members are asked to bring the food stuffs. Using the first letter of your last name, follow the guide below.

A-F	Dessert
G-L	Main Dish
M-R	Veggie or fruit side dish
S-Z	Rice or potato side dish

Family and friends are welcome to attend our potluck dinner—the more the merrier!

Membership Renewal Time

The TVS membership year runs from January to December—which means it's time to renew! You'll find the membership form on the back of this newsletter. You can also download it off our web site.

The membership categories are:
Student (18 years old or younger) - $5
Basic - $25 (you download your copy of *Prime Focus.*)
Regular - $30 (you receive a paper version of *Prime Focus* in the mail.)

You can also subscribe to *Sky & Telescope* and/or *Astronomy* magazine at a discounted club rate - *S&T* is $32.95/year, *Astronomy* is $29/year.

For those who have held Patron membership in the past, we still are holding off collecting Patron dues until the Marling scope is back on line (which hopefully will be in a few months).

News & Notes

Welcome

TVS welcomes our newest member—**Ken Marx**.

2004-05 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 December 5th deadline is for the December issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
Dec. 17	Dec. 20	Dec. 5
Jan. 21	Jan. 23	Jan. 9

Money Matters

At the November Board meeting, Treasurer **Gary Steinhour** gave us the account balances (as of November 20, 2004) of TVS's accounts:

Checking	$1,601.47	
CD #1	$3,449.61	matures 02/17/05
CD #2	$2,438.11	matures 02/27/05
CD #3	$1,074.96	matures 01/16/05

TVS Elections

The TVS elections that were suppose to take place at the November meeting have been postponed until this month's potluck dinner meeting.

Seeking re-election are the President (Chuck Grant) and Vice-President (Rich Campbell). We also have some openings in our Board of Directors.

We're still looking for volunteers to step forward and nominate themselves for the vacant positions of Treasurer and Secretary.

The President conducts the lecture and board meetings, and is responsible for getting everything done (usually by delegating it to others).

The Vice-President does the President's job when the President is unavailable.

The Treasurer handles the memberships and reimbursements, maintains the financial records, prepares the club's budget, pays the rent and insurance. The Treasurer also works with the newsletter editor by providing the mailing label file and sending out the *Prime Focus* e-mail notification messages each month.

The Secretary takes the minutes at the board meetings and takes care of general correspondence.

All these positions (Officer and Board) require attendance at the majority of the boards meetings, which are held every Monday following the general meeting, at the Round Table Pizza restaurant on Stanley Blvd in Livermore.

We are also looking for a volunteer to fill the position of Program Director. The Program Director is responsible for getting speakers for our monthly lecture meetings

Our election slate is as follows:

President
Nominee: Chuck Grant
Write In: _____

Vice President
Nominee: Richard Campbell
Write In: _____

Treasurer
Write In: _____

Secretary
Write In: _____

Board of Directors
The following people are candidates for the 2005 Board of Directors.

Alane Alchorn	Stan Isakson
Jim Alves	Mike Rushford
Paul Caswell	John Swenson
Debbie Dyke	write in_____
Gert Gottschalk	write in_____

If you are interested in any of the positions, or wish to become a board member, come to the December meeting.

Congratulations!

A big congratulations to TVS member Stan Isakson, who recently tied the knot. Stan and his fiancee, Mary, got married on September 25 in an outdoor wedding at his daughter's home in Livermore. The couple honeymooned in Pacific Grove.

2005 RASC Handbooks & Calendars

We still have a few 2005 Royal Astronomical Society of Canada calendars and Observer's Handbooks available for sale. The Handbooks go for $18.00, the calendars are $10. They will be available for purchase at the meeting.

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Newsletter header image: Shadow transit on Jupiter. Hubble took this snapshot of a triple shadow transit on Jupiter on March 28, 2004. Io's shadow is located just above center and to the left; Ganymede's on the planet's left edge; and Callisto's near the right edge. Only two of the moons are visible in this image. Io is the white circle in the center of the image, and Ganymede is the blue circle at upper right. Callisto is out of the image and to the right.

Photo by: NASA, ESA, and E. Karkoschka (University of Arizona)

Calendar of Events

December 21, 10:00 a.m. to 9:00 p.m.
What: *Winter Solstice Event*
Who: You
Where: Chabot Space & Science Center, Oakland
Cost: All activities are free with General Admission

The dark days are over! Celebrate the Winter Solstice and meet "Saturn-Claus", see a holiday planetarium show, make a space-related holiday ornament, be entertained by master magician Ashkenazi the Pretty Good, visit hands-on exhibits and view Saturn (weather permitting) through Chabot's telescopes—Leah, the 8" Alvan Clark refractor, Rachel, the 20" John Brashear refractor, and Nellie, the 36" classic Cassegrain.

December 31, 3:45 p.m. to 6:00 p.m.
What: *New Year's Eve Balloon Drop*
Who: You
Where: Chabot Space & Science Center, Oakland
Cost: All activities are free with General Admission

Join the Chabot staff for their fifth annual Balloon Drop in the Rotunda to cheer the arrival of New Year 2005. At the strike of 4:00 pm (midnight Greenwich Mean Time) celebrate the start of the real New Year with balloons dropping from their Rotunda, many filled with prizes. For the wee folks, there will be a separate balloon drop in the Biology Lab.

January 5, 2005, 8:00 p.m.
What: *The Fabric of the Universe*
Who: Dr. Brian Greene (Columbia University)
Where: The San Jose Center for the Performing Arts
Cost: $40

Dr. Brian Greene will be discussing his latest book, The *Fabric of the Universe*. Dr. Greene has become famous as a public expositor on string theory in his book *The Elegant Universe* which was made into a three part PBS/Nova episode on TV. Tickets are $40 but are $20 each if three or more tickets are purchased together. Group purchases are highly suggested! More on this at www.cityboxoffice.com, under the lectures tab at the top.

January 11, 2005, 6:00 p.m.
What: *Surviving the End of the Universe: An Escape Plan*
Who: Dr. Michio Kaku (City University of N.Y.)
Where: TBA (possibly Palo Alto)
Cost: Free


Dr. Michio Kaku

Dr. Michio Kaku, author of *Hyperspace, Beyond Einstein*, and the upcoming *Parallel Worlds* will give a free discussion on *Surviving the End of the Universe: An Escape Plan* at a location yet to be announced, but probably in Palo Alto. Check the Cafe Scientifique web site at: www.cafescipa.org for further updates. Register early as spots fill up fast. This group started a scientific discussion group in a Palo Alto coffee shop this past spring with Stanford Nobelist Dr. Doug Osheroff as the main guest talking about the Columbia Accident Investigation and has covered numerous other topics of interest during the year including nanotechnology and genetically modified plants just to name a few.

Officers

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

Vice-President:
Rich Campbell
r_photo@hotmail.com

Treasurer:
Gary Steinhour
steinhour1@juno.com

Secretary:
Maggie Halberg
925-736-8627

Board of Directors

Alane Alchorn, Jim Alves, Paul Caswell, Debbie Dyke, Gert Gottschalk, Stan Isakson, Mike Rushford, John Swenson.

Volunteer Positions

Librarian:
Jim Alves
jim_alves_engr@yahoo.com
925-634-0220

Newsletter Editor:
Debbie Dyke
ddfam@pacbell.net
925-461-3003

Program Director: unfilled

Loaner Scope Manager:
John Swenson
johnswenson1@comcast.net

Webmaster:
Chuck Grant

Observatory Director/ Key Master:
Chuck Grant

School Star Party Chair:
Rich Campbell
r_photo@hotmail.com
925-586-6453 (after 9 p.m.)

Public Star Party Chair:
Rich Campbell

Historians:
Paul Caswell & 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

tvs@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). 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 (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.

Cassini Spacecraft Update

The Cassini spacecraft that is currently orbiting Saturn is scheduled to release the Huygens probe on December 25. The probe will take several weeks before reaching its target, Saturn's moon Titan, on January 14, 2005. Five days after separation, Cassini will maneuver itself so that it will be positioned correctly for receiving data when Huygens enters into Titan's atmosphere.

The probe's radio link will be activated early in the descent phase. Cassini will listen to the probe for the next 3 hours, from when Huygens descends until 30 minutes after impact. Not long after the end of this three-hour communication window, Cassini's high-gain antenna will be turned away from Titan and toward Earth.

Huygens carries six instruments to analyze the atmosphere and its dynamics during its descent into the Titan atmosphere. If the probe survives the impact on the moon's surface, it will also analyze the environment around it.

Comet Machholz

As those of you who attended the November meeting found out, there is an approaching comet that may become a naked eye object within the next month. Comet Machholz (C2004 Q2) is already visible in telescopes and binoculars. A nice photo op will occur during January 6 through 8 as the comet will pass by the Pleiades. To know where to look for this comet, see the map below.

First Light: Beginners' Astronomy

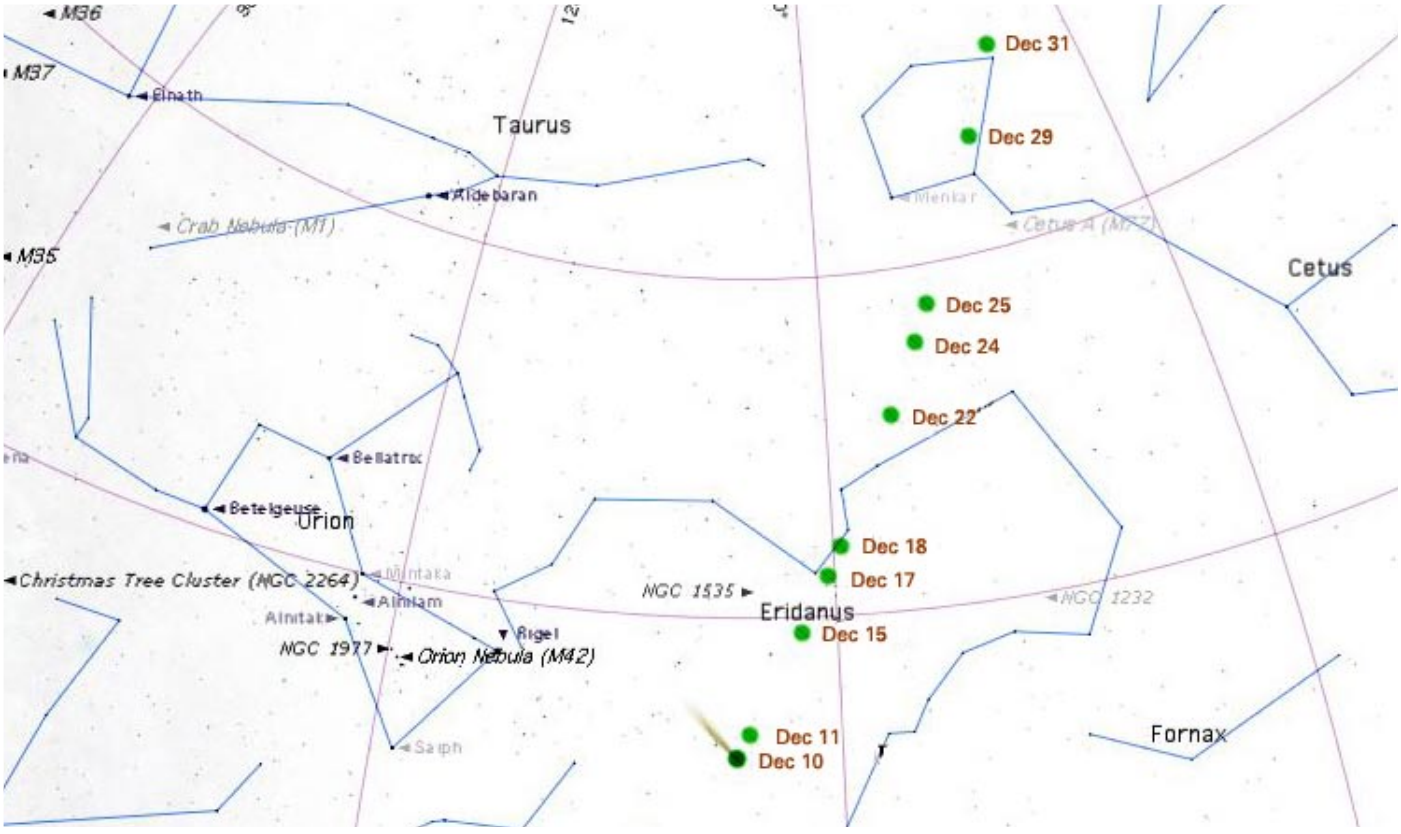
by Richard Campbell

Jazz it up!

I had an epiphany. I was watching an outreach training disc, and heard an astronomer give 2 different descriptions of a galaxy, as a visitor looked through his telescope. One said, This galaxy is 5 million light years away! The visitor said, "Uh...yeah...mmmmhmmm...thanks!" and walked away bewildered. The next scene showed the same astronomer and visitor, but with a dramatically improved presentation: "The galaxy you're looking at has 200 billion stars! There are as many stars in that galaxy as there are grains of sand in a sandbox! The visitor gasped, "Waaaaow!" and looked up enthralled.

What a difference when you jazz it up!

I heard my "star party self" in both examples: sometimes arcane and complex, other times lucid and engaging. I think anyone who has done astronomy outreach can relate: We all share the wonder of the night sky but sometimes struggle when sharing it. What are the right words in the right amount? How can we strike a balance, and jazz it up?



I've found the down-to-earth metaphor is a life-saver. Here are some winners from recent TVS star parties:

The Moon and Sun:

Ho-hum: There are craters of various sizes on the moon—some big, some small.

Jazzed: "You see that little crater to the left? The one left by a meteor exploding on the surface? That's the size of Livermore! You could walk from one side to the other in a day. The bigger ones are the size of Northern California.

Jazzed: It would take 6 months to drive to the moon @ 60 miles per hour. How fast to take a jet plane to the Sun? 18 years. Yet its light reaches us in 8 minutes.

The Stars:

Ho-hum: "That's a star cluster. Millions of stars clumped together."

Jazzed: Imagine you had a house in the country, and your nearest neighbor was 20 miles away. And you had a million neighbors equally spaced, 20 miles from each other.

That's what a globular cluster is like. A giant city of stars. Kinda looks like a ball of diamonds...what do you think?

Jazzed (for adults): Hot blue stars are like 1960's rock stars—they live fast, consume a lot, and die young ["Better to burn out than to fade away"]. Our sun is more of a yuppie—it saves energy and lives to a ripe old age.

The Planets:

Mars:

Ho-hum: The red planet reaches opposition every 2 years, and puts on quite a show.

Jazzed: Although Mars is smaller than the Earth, it has about the same area of land as we do because it has no oceans. You could ski on its polar ice caps, and hold a handful of its rocky soil in your hand.

Jupiter:

Ho-hum: "Jupiter is encircled by 4 moons....."

Jazzed: "Jupiter is a mini-solar system, with a massive central body, and dozens of moons whizzing around at different speeds."

Saturn:

Yawn: This is everyone's favorite—the ringed planet. The rings are thousands of miles wide.

Jazzed: Spectacular Saturn is so inspiring through a telescope, it has launched the career of several astronauts. The rings are expansively wide, but paper thin. If you could shrink the rings to the thickness of a CD, the resulting disc would be *300 feet wide!*

This list is merely a beginning. I am eager to hear and publish your words that have fired the interest of new-found astronomers. Show us your jazz!

Astronomical Insights

by David Feindel

One of the things I've dabbled a bit in recently is afocal astrophotography. That's when you use your digital camera shooting through an eyepiece. I found a Scopetronix 14mm eyepiece which allows me to directly attach my Coolpix 4500 to it. With my SCT, this provides between about 110X and 440X, depending on the camera's zoom setting. But this is misleading; there is considerable vignetting at 110X, and 440X is way over what the viewing will support here other than those few nights each year with exquisite seeing. The camera's inherent noise and my alt-az mount also limit me to < 30 second exposures, so its really for planets, the moon, and a few of the brighter DSOs. But having figured that out, I set out to capture some lunar and Saturn images. One of the simplifying things about solar system photography is that theoretically you can use the camera's automatic controls for focus, exposure, and color balancing. So I took numerous pictures, checking focus on the camera's LCD panel and using a remote control to trigger the shutter to reduce vibrations. But none of the 30+ photos I took looked very good; certainly not even close to what you see in the back of the astro magazines. After playing around with varying focus, exposure, and color balancing, the results didn't improve.

So I gave up for awhile. But lo and behold, in perusing the postings on the Yahoo chat board for TMB this week, I found the solution—or at least one piece of it. Take a look at Philippe Vercoutter's lunar photos at http://astrid.astrolab.be/jsp/zoek.jps?arg=HP6X9764. It shows the original and after-digital-processing images taken by a respected astrophotographer through a large apo telescope. The difference between the two is stunning (as is the final version!) My pictures weren't all that bad—at least a few of them—but what was missing was the skilled digital processing in Photoshop. So that will become a project for one of the rainy/cloudy nights we're sure to have in December. It appears there are significant changes in color filtering, brightness/contrast levels, and most obvious of all, sharpening. It will take awhile to learn….

This month's book read is the classic *Star Testing Astronomical Telescopes*, by Harold Richard Suiter. Its reputation is well deserved. A bit heavy at times in mathematics, but the book is well-organized and the many illustrations help immensely. I will read it at least once more so that I begin to understand; its clearly a book you'll refer back to. You'll undoubtedly see me star-testing my 'scope again as soon as I can get observing time with very good seeing conditions!

What's Up *by Debbie Dyke*

All times Pacific Standard Time unless otherwise noted.

December

9 Thurs First Day of Hanukkah

10 Fri Mercury in inferior conjunction.

11 Sat **New Moon** 5:29 p.m.
1863 Annie Jump Cannon born. She catalogued over 300,000 stars and completed the Henry Draper Catalogue.

12 Sun Moon at perigee (221,949 mi/357,983 km) 1:00 p.m. Expect large tides.

13 Mon Pluto in conjunction with the Sun 5:17 a.m.
Geminid meteors peak 2:00 p.m.

14 Tues 1972 Gene Cernan (Apollo 17) becomes the last man on the Moon.

17 Fri **Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.

18 Sat **First Quarter Moon** 8:40 a.m.

19 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.

20 Mon **Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.

21 Tues **Winter Solstice** 4:42 a.m.
Ursid meteors peak at 11:00 p.m.
1978 Venera 12 lands on Venus. Temps hover in the 860° F range.

24 Fri 1968 Apollo 8 astronauts (Frank Borman, Frank Lovell, William Anders) are first to orbit the Moon.

25 Sat **Christmas Day.**
1642 Isaac Newton born.

26 Sun **Full Moon** 7:06 a.m.

27 Mon Moon at apogee (252,023 mi/406,489 km) 11:00 a.m.
Saturn less than 5° S of the Moon as they rise together in the east around 7:00 p.m.

28 Tues Mercury 1.2° N of Venus in the west. 7:00 a.m.
The Moon is just 3.5° from the Beehive Cluster (M44).

29 Wed Mercury at greatest elongation W (22°) 1:00 p.m.
1566 Tycho Brahe loses his nose in a duel with Manderup Parsberg. He starts a fashion trend by wearing a metal nose.

January

1 Sat New Year's Day
Saturn at opposition 1:00 p.m.

3 Mon Moon at apogee (251,538 mi/405,707 km) 12:00 p.m.
Quadrantid meteors peak at 10:00 p.m.

4 Tues Earth at perihelion (closest to the sun) at 91,198,466 mi/147,094,300 km.

6 Thurs Saturn 5° S of Moon in the evening.

7 Fri **Full Moon** 7:40 a.m.
1610 Galileo discovers Jupiter's moons Io, Europa, and Callisto.

8 Sat The Moon is 3° N of the Beehive Cluster (M44).

12 Wed Jupiter 2.5° S. of Moon 5:00 a.m.

13 Thurs 1610 Galileo discovers Ganymede.

NASA's Space Place

Galactic Surprise

by Patrick L. Barry and Dr. Tony Phillips

Open an old astronomy textbook. The basic sketch you'll find there of galaxy formation is fairly simple: a vast cloud of diffuse hydrogen and helium gas condenses under gravity, and dense spots in the cloud collapse to form stars. Voila! A galaxy.

But real galaxies are much more complex than that. A galaxy is a swirling "soup" of billions of stars and roaming black holes, scattered clouds of gas and dust, random flashes of star birth and exploding supernovas, and an unseen and mysterious substance called "dark matter." Over time, all these ingredients mix and interact—pulling and compressing and colliding—and somehow that interplay leads to the galaxies we see today. No wonder it's such a hard problem to solve!

Just over one year into its three-year mission, GALEX is already shedding some new light on the problem.

"Some of the discoveries GALEX has made will change our understanding of how galaxies develop and when, where, and why stars form in galaxies," says Peter Friedman, a researcher at Caltech and Project Scientist for GALEX.

This small space telescope, called the Galaxy Evolution Explorer (GALEX for short), makes its discoveries by taking pictures of millions of galaxies scattered over the whole sky. Some of these galaxies are close by (at least by astronomical standards of "close"), while others are as much as 10 billion light-years away. Because light takes time to travel through space, we see these distant galaxies as they appeared billions of years ago. Comparing young galaxies from the distant past with older, modern galaxies will teach scientists about how galaxies change over time.

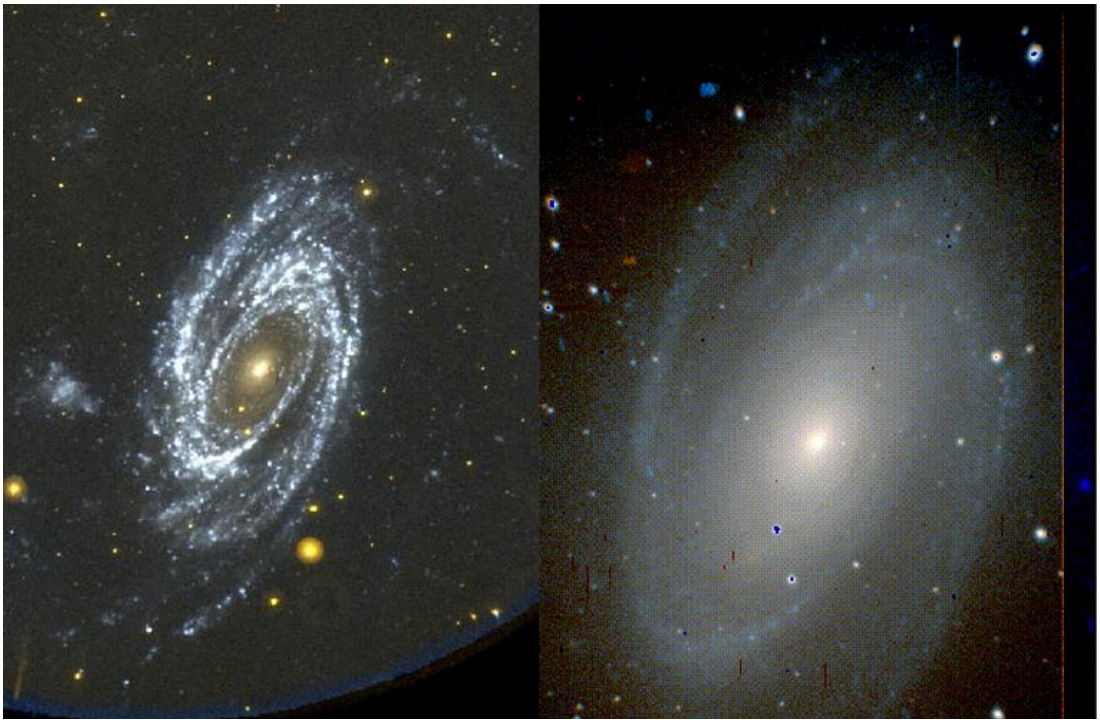
Looking at these pictures, scientists were surprised to find many newborn stars in the outer parts of old, mature galaxies. Scientists had assumed that as a galaxy ages, the clouds of gas needed to form new stars in these outer reaches either got used up or blown away. Finding so many new stars in these regions of old galaxies (such as Centaurus A, Messier 101, and Messier 81) shows that, apparently, they were wrong.

Friedman says that astronomers don't know yet how to explain these new findings. Rethinking and improving theories to explain unexpected discoveries has always been the way science makes progress—and GALEX is certainly making progress.

One thing is certain: It's time to re-write some old textbooks.

For more information, see www.galex.caltech.edu. Kids can do a galaxy art project and learn more about galaxies and GALEX at http://spaceplace.nasa.gov/en/kids/galex/art.shtml.

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



M81 is 10 million light years away. The image on the left was made from GALEX data and shows UV light from hot, new stars. These star forming regions are not detectable in the visible light image on the right (McGraw-Hill Observatory, Kitt Peak, Arizona, Greg Bothum, Univ. of Oregon.)

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.
_____ $29 One year subscription to *Astronomy* magazine.
_____ $55 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.