PRIMEFOCUS
Tri-Valley Stargazers

November 2004

Meeting Info:

What
The Discovery of Comet Machholz (Comet 2004 Q2)

Who
Don Machholz

When
November 19, 2004
Conversation at 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist Church in Livermore
1893 N. Vasco Road

Inside

November Meeting

The Discovery of Comet Machholz (Comet 2004 Q2)

Don Machholz

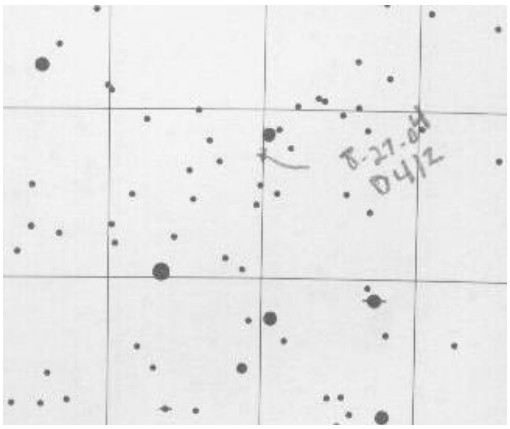
On the morning of Friday, August 27, 2004, Don Machholz awoke at 3:20 a.m. to do a little comet hunting. Normally Don would use his 10" reflector in his homemade observatory to look for comets, but not this morning. Instead, he used his 1968 vintage 6" f/8 Criterion Dynascope (purchased new for $200) on his back deck.

For the previous two mornings, Don had been searching half the southern sky for comets. This morning his goal was to finish his search. Slowly he swept the skies southward to the horizon. At the end of each sweep he would raise the telescope to the beginning position, move it slightly east, and sweep again.

Don's 1968 6" Criterion Dynascope.

There are a lot of galaxies in the part of the sky that Don was searching. He picked off NGC 1316, 1398, 1395, 1399, 1404, and planetary nebula NGC 1360, checking each one against his *Atlas of the Heavens* star chart to confirm that they weren't comets.

At 4:12 he picked up a small, faint, fuzzy object. He looked closely to see if it was a double star or a small grouping of stars that appeared fuzzy. It wasn't. He checked his star chart—there was nothing marked at that location. He went to his observatory and got out his *Uranometria 2000* atlas (a more detailed atlas than the *Atlas of the Heavens*). The charts showed nothing there. He marked the location of his mystery object on the map with the date and time. He also made a drawing of



The comet's location marked on Don's Uranometria 2000

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News & Notes

Welcome

TVS welcomes our newest member—**Jason Lee**.

2004 TVS Meeting Dates

Below are 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 5th deadline is for the December issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
Nov. 19	Nov. 22	Nov. 7
Dec. 17	Dec. 20	Dec. 5

Money Matters

At the October Board meeting, Treasurer **Gary Steinhour** gave us the account balances (as of October 17, 2004) of TVS's accounts:

Checking	$1,593.18	
CD #1	$3,442.22	matures 11/17/04
CD #2	$2,432.89	matures 11/27/04
CD #3	$1,074.96	matures 01/16/05

TVS Elections

The election for the President for the United States is over. However, the election for the President of Tri-Valley Stargazers has yet to take place. TVS will hold its yearly elections at this month's meeting.

Fortunately, voting at our elections doesn't require listening to months of political ads or standing in long lines to cast your vote. What it does require is some active participation at the club meeting in deciding who should be our President, Vice-President, Treasurer, Secretary, and Board of Directors members.

Seeking re-election are the President (Chuck Grant) and Vice-President (Rich Campbell). Our current Treasurer (Gary Steinhour) and Secretary (Maggie Halberg) are stepping down from their posts so we are in need of some volunteers to take over those positions. We also have some openings in our Board of Directors.

The Treasurer maintains the records of the club's checking and CD accounts, financial assets and liabilities, and transactions. S/he pays the bills and deposits any monies coming in (primarily from membership dues), and prepares a monthly report for the board meetings.

The Treasurer also sends in member subscriptions for *Sky & Telescope* and *Astronomy* magazines, functions as the Membership Chairperson, maintains the membership data base, sends membership updates to the newsletter editor, and sends out e-mail notification when the newsletter is posted on line.

The Treasurer also picks up the mail from the club's PO box in Livermore, sends quarterly updates of our membership roster to the Astronomical League (for Reflector Magazine mailings), and orders and sells the RASC Handbooks and Calendars.

Attendance at General and Board Meetings is a high priority. The Treasurer position is one of the most time consuming positions. Our outgoing Treasurer will help with the transition and give instructions to whomever takes on this important position.

The Secretary needs to write up the minutes from the monthly board meetings, handle a limited amount of correspondence related to board activities, and act as the liaison with the Unitarian Church. Attendance at the Board Meetings is necessary (hard to take meeting notes if you're not there). The amount of time required, in addition to attendance at the board meetings, is one to two hours per month.

Our election slate is as follows:

President
Nominee: Chuck Grant
Write In: _____
The President conducts the lecture and board meetings, and is responsible for getting everything done (usually by delegating it to others).

Vice President
Nominee: Richard Campbell
Write In: _____
The Vice President does the President's job when the President in unavailable.

Treasurer
Write In: _____

Secretary
Write In: _____

Newsletter header image: The Eclipsed Moon. Did you see it? The Bay Area witnessed a total Lunar eclipse on the night of October 27. TVS had scopes set up at Dublin High School for a Project Astro group (and any passersby). The next total Lunar eclipse visible from the Bay Area won't be until August of 2007.

The picture was taken at 8:56 p.m. as the Moon started coming out of eclipse. Equipment used was an 80mm f/8 APO refractor, 18mm LV eyepiece, and a Canon G1 camera.

Photo by: Gert Gottschalk

News & Notes *continued*

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	_____
Gert Gottschalk	_____

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

All these positions (Officer & Board) require attendance at the majority of the board meetings.

We're still looking for someone to fill the volunteer position of Program Director. The Program Director is responsible for getting speakers for our monthly lectures.

2005 RASC Handbooks & Calendars

We still have the 2005 Royal Astronomical Society of Canada calendars and Observer's Handbooks available for sale. The Handbooks go for $18.00, a savings of $5.95 from the list price. The calendars are $10, a savings of $3.95. They will be available for purchase at this month's meeting and the following meetings until they are all gone. They both sold out quickly last year, so get your copy now as they may not last very long.

AstroInsights & First Light

Our two monthly column contributors, David Feindel and Richard Campbell, are taking a break from their column writing duties this month. Have no fear, they will return next month.

School Star Party

We have a school star party coming up soon. Scopes and their operators are needed at the Pleasanton Middle School on Sunday, November 14. There will be no talk preceding the observing. Clouds cancel. If you'd like to help out, please let our school star party coordinator, Richard Campbell, know. His contact info is in the box at the bottom of the page.

Calendar of Events

December 6, 7:30 p.m.

What: *The Chandra X-ray Observatory*
Who: Dr. Harvey Tananbaum (Chandra X-ray Center, Smithsonian Astrophysical Observatory)
Where: Kanbar Hall, Jewish Community Center, San Francisco
Cost: $4 (non-refundable tickets)

The Chandra X-ray Observatory has provided an unprecedented view of the Universe at x-ray wavelengths. Recent results include spectacular images of diverse astrophysical systems such as supernova remnants and galaxy clusters, shedding (x-ray) light on mysteries involving exploding stars, dark matter, dark energy, and black holes.

For information call the Dean Lecture Info Line at 415-321-8593. Parking across the street in the UCSF Laurel Heights campus parking lot for $1.25 per night. http://www.calacademy.org/planetarium/dean.html

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

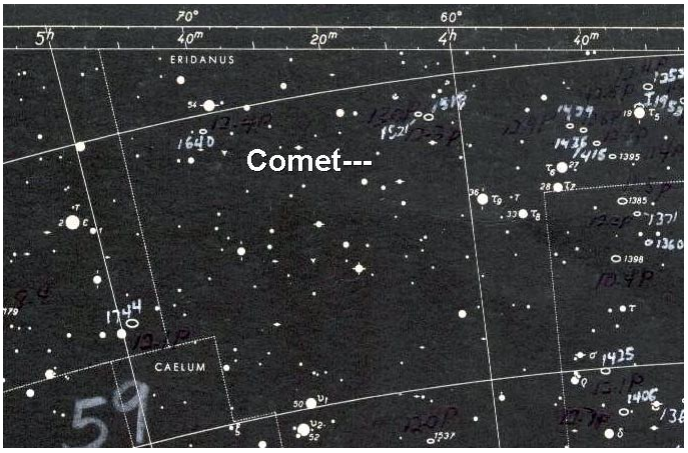
tvs@trivalleystargazers.org

Eyes on the Skies

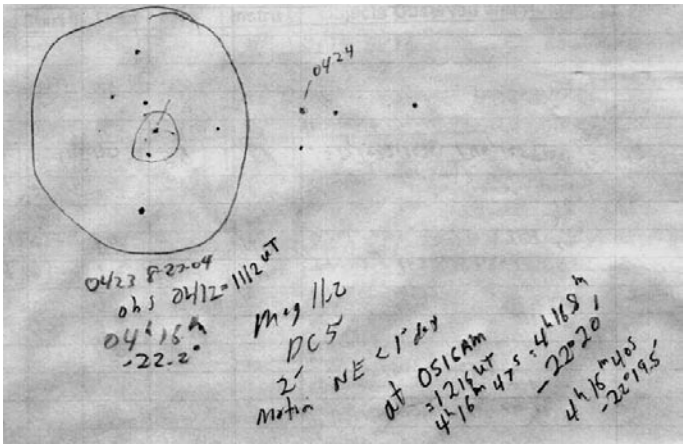
Eyes on the Skies is a robotic solar telescope run by Mike Rushford (rushford@eyes-on-the-skies.org). You may access it by visiting www.eyes-on-the-skies.org.

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.



Location of the comet on the *Atlas of the Heavens* chart.



Don's notes of the surrounding star field.

the area showing the surrounding stars. If the object was a comet, it would appear to move relative to the background stars within an hour's time. Marking the object's location every hour or so would help determine which direction the comet is travelling and at what speed.

To be extra sure it wasn't a known star, Don went into the house and checked his *The Sky* software program. *The Sky* showed that there were a couple of 15th magnitude stars in the area, but 15th mag was too faint to see in his scope so he knew they weren't his object.

It was entirely possible that the object could be a known comet, as at that time there were several known comets in the sky. Don went online to www.aerith.net to check if his comet was one of the known comets. It wasn't.

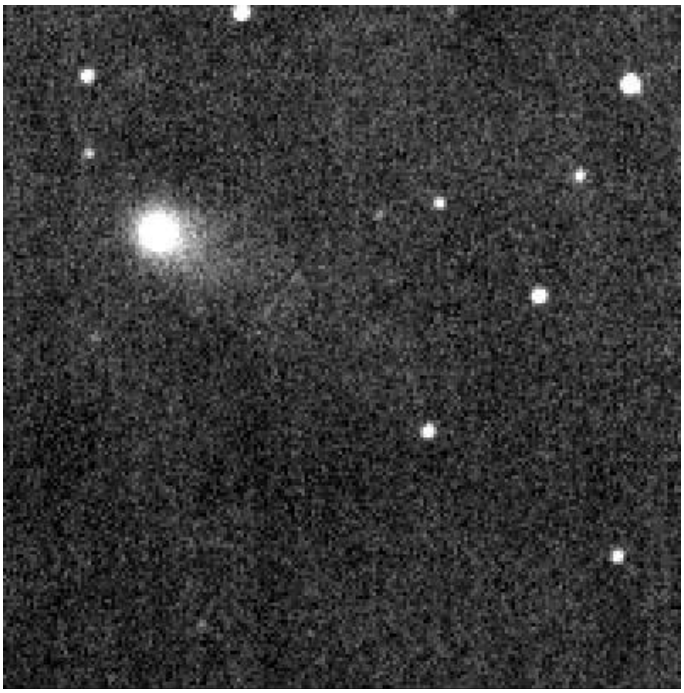
Don went back out to his observatory and trained his 10" reflector on it. At 64x he could see a round fuzzy object. It looked to him that it had moved in the 25 minutes since he'd last looked at it. He got out his homemade 5" binoculars—it was very faint, but was still visible.

He went back into the house to wake everyone up and get them out into the observatory. His two sons just wanted to sleep. His wife went out, but couldn't see the comet as it was too faint for her eyes.

Back into the house he went and started writing up the report he would have to send to the Smithsonian Astrophysical Observatory's Central Bureau for Astronomical Telegrams (CBAT) in order to get his discovery confirmed. While at the computer he checked a web site (http://scully.harvard.edu/~cgi/SkyCoverage.html) to see if that part of the sky had been covered by an automated search program. It wasn't.

Just after 5 a.m. he was back in the observatory, calculating the comet's brightness, size and shape. He noted that it had no tail and showed some movement toward the east and maybe slightly to the north. In one hour's time he calculated that it had moved less than an arcminute. Later he learned that the comet's motion was 20 arcminutes per day. Daylight was fast approaching and he had to give up his observing and turn to reporting it.

He put together an e-mail and sent it off to the Central Bureau for Astronomical Telegrams (CBAT). He also faxed the message just in case the e-mail went amiss, and called CBAT to make sure the fax was received. By then it was time for him to get ready for work. It was six hours before he heard from CBAT—the comet was confirmed and had been imaged by Robert McNaught and G. Garradd. A few days later the comet was given the name Comet C/2004 Q2 Machholz.



Comet Machholz imaged on August 28, 2004. Coma diameter is about 70", tail 5' in p.a. 240°. Image is made up of two 30 second exposures, enlarged 2x. Scope used was a 0.3m f/6.3 Schmidt-Cassegrain. Field of view is 10' x 10'. *Photo by: P. Birtwhistle*

Don's Biography

I was born in Portsmouth Virginia, October, 7, 1952. I became interested in astronomy at age 8. I received my first telescope on October 7, 1965—a 2-inch refractor. Later I received a 6-inch Criterion Dynascope and found all the Messier Objects in one year (1968-9).

Then I spent some time with astrophotography (1972-4), having a few photos published in small astronomy magazines. I decided to attempt a comet hunting program, which I began on January 1, 1975. I found my first comet on September 12, 1978 after 1,700 hours of searching. My second find took an additional 1,742 hours. I have now spent 7,055 hours comet hunting during which I've discovered a total of ten comets which bear my name.

In 1990 my wife, son and I moved from San Jose to Colfax, where we live on six acres. The main reason for this move was to transfer from two incomes to one so that my wife could stay home with our children. In August 1993 I built an observatory on our property. From here I conduct all my comet hunting, which continues at a rate of 100 hours (70 nights) per year. I use mainly inexpensive, homemade equipment.

One of my joys has been in sharing the hobby with others. A dozen times a year I'll set up a few telescopes in Colfax, Auburn and in the Sierras and invite the public out to look at the planets and moon. Each year I hold astronomy classes at the Placer Nature Center. I also write articles for the local newspapers and radio stations for special astronomical events.

From 1978 until 2000 I wrote writing a monthly column called *Comet Comments*. It was designed for astronomy club newsletters and interested individuals around the world. Between 1988 and 2000 I was the Comets Recorder for the Association of Lunar and Planetary Recorders.

I have two two-year college degrees. One is in general education (1976) and the other in Laser Technology (1989). I am employed as a Research and Development technician in Auburn and as a real estate appraiser.

I've written and published several books. One, *A Decade of Comets*, is a study of the visual comet discoveries between 1975 and 1984. The second covers the Messier Marathon and is based on my 16 years of helping to develop and run Messier Marathons. The third, published in early 1996, is a book about Comet Hale-Bopp. In 2002 my Messier Marathon book was re-written by me and published by Cambridge University Press.

Astro Events

Leonid Meteor Shower

The Leonid meteor shower takes place this month. The Leonids are the result of the Earth passing through the debris trail left behind from Comet Tempel-Tuttle's orbit around the Sun.

The Earth will pass through two comet debris sections this year—the debris left behind during the comet's pass in 1333 and 1733. Earth last passed through the 1733 section in 2002. The 1333 stream may have been the cause of the 1998 storm, but that hasn't been confirmed.

The peak for the 1333 stream will be at 10:42 p.m. on the 18th, with about 10 meteors per hour predicted. The 1733 stream will peak at 1:45 p.m. on the 19th, with about 65 meteors per hour.

There may be an extra peak to the Leonids as the Earth is expected to pass through the 1001 AD stream on November 8. It's possible that 50 to 100 meteors per hour may be seen during that peak, although the peak will be at 3:00 p.m. at our location.

Mid-eclipse, October 27, 2004. *Photo by: Conrad Jung*

What's Up *by Debbie Dyke*

All times Pacific Standard Time unless otherwise noted.

November

10 Wed In the morning, Venus, Jupiter, Mars, and the crescent Moon are grouped together.
Mars 7° N of the Moon in the East at dawn.

11 Thurs Veterans' Day.
Mercury low in the SW at 5:00 p.m.
N. Taurid meteors peak 7:00 p.m.
1572 Tycho Brahe discovers a supernova in Cassiopeia. The remnant wasn't discovered until the 1960's.

12 Fri **New Moon** 6:27 a.m.
1782 John Goodricke discovers variability of Algol.
1980 Voyager 1 flies by Saturn.

13 Sat Mercury 2.3° N of the very thin crescent Moon very low in the SW 5:00 p.m.
1971 Mariner 9 becomes the first spacecraft to orbit Mars.

14 Sun Moon at perigee (224,632 mi/362,311 km) 6:00 a.m.

15 Mon 1738 Wilhelm Herschel born.

16 Tue 1974 Arecibo radio telescope sends a 3-minute message towards M13—it should arrive in about 24,000 years.

17 Wed **Leonid meteors peak 1:00 a.m.**
1970 Luna 17 lands on the Moon and sends Lunokhod 1 (a wheeled vehicle) to ramble along the surface.

18 Thurs **First Quarter Moon** 9:50 p.m.

19 Fri **Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.
1969 Apollo 12 lands at Oceanus Procellarum on the Moon.

20 Sat Mercury at greatest elongation E (22°) 5:00 p.m.
1889 Edwin Powell Hubble born.
1998 The first section of the International Space Station is launched from Baikonur.

21 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.
Asteroid 1988xb flies by Earth today.

22 Mon **Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.
1682 Edmond Halley sees the comet that will later bear his name.

25 Thurs Thanksgiving Day.

26 Fri **Full Moon** 12:07 p.m. The Moon is just 2° from the Pleiades (M45) in the morning.

28 Sun 1967 Jocelyn Bell discovers pulsars.

30 Tues Moon at apogee (251,690 mi/405,953 km) 3:00 a.m.

December

2 Thurs 1993 Hubble Space Telescope gets corrective optics.

3 Fri 1971 USSR's Mars 3 becomes the first spacecraft to make a soft landing on Mars.
1973 Pioneer 10 becomes the first spacecraft to fly by Jupiter.

4 Sat **Last Quarter Moon** 4:53 p.m.
1901 Werner Heisenberg born.

7 Tues Jupiter 1° S of the Moon 3:00 a.m.

9 Thurs First Day of Hanukkah
Look low in the SE just before dawn to see Mars 5° N of the crescent Moon. Venus is just north of Mars

NASA's Space Place

A Summer Vacation Tracking Down UFOs

by Diane K. Fisher

Erin Schumacher's summer job for NASA was to look for UFOs. Erin is a 16-year-old high school student from Redondo Beach, California, attending the California Academy of Mathematics and Science in Carson. She was one of ten students selected to work at NASA's Jet Propulsion Laboratory (JPL) in Pasadena as part of the Summer High School Apprenticeship Research Program, or SHARP.

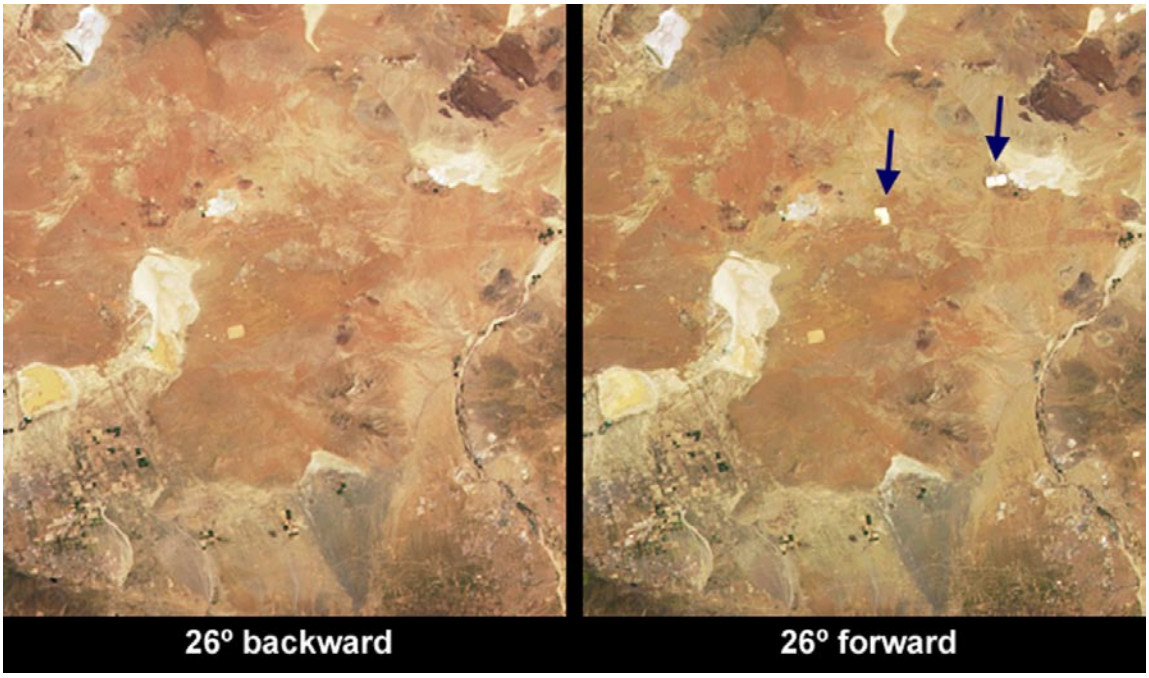
But is studying UFOs a useful kind of NASA research? Well, it is when they are "unidentified flashing objects" that appear in certain images of Earth from space. Erin worked with scientists on the Multi-angle Imaging SpectroRadiometer (MISR) project to track down these mysterious features. MISR is one of five instruments onboard the Earth-orbiting Terra satellite. MISR's nine separate cameras all point downward at different angles, each camera in turn taking a picture of the same piece of Earth as the satellite passes overhead. Viewing the same scene through the atmosphere at different angles gives far more information about the aerosols, pollution, and water vapor in the air than a single view would give. Ground features may also look slightly or dramatically different from one viewing angle to another.

Erin's job was to carefully examine the pictures looking for any flashes of light that might be visible from just one of the nine angles. Such flashes are caused by sunlight bouncing off very reflective surfaces and can be seen if a camera is pointed at just the right angle to catch them. Because the satellite data contain precise locations for each pixel in the images, Erin could figure out exactly where a flashing object on the ground should be. Her job was then to figure out exactly what it was that made the flash- in particular, to see if she could distinguish man-made objects from natural ones.

When Erin began working at JPL, scientists on the MISR project had already identified two large flashes out in the middle of the Mojave Desert in Southern California. These turned out to be from solar power generating stations. Soon, Erin began finding flashes all over the place. She learned how to apply her math knowledge to figuring out how the objects would have to be oriented in order to be seen by a particular MISR camera. One time, she and a team of MISR scientists and students went on a field trip to the exact locations of some flashes, where they found greenhouses, large warehouses with corrugated metal roofs, a glass-enclosed shopping mall, and a solar-paneled barn. For some flashes, they could find nothing at all. Those remain "UFOs" to this day!

Learn more about SHARP at www.nasasharp.com and Earth science applications of MISR at www-misr.jpl.nasa.gov. Kids can do an online MISR crossword at spaceplace.nasa.gov/en/kids/misr_xword/misr_xword1.shtml.

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



Two cameras on MISR made these images of the same part of the Mojave Desert. The camera pointed at an angle of 26 forward saw the flashes from two solar electric power generating stations. These objects are nearly invisible at the other angle.

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.