

PRIMEFOCUS

Tri-Valley Stargazers

June 2008



Meeting Info:

What

Mars Reconnaissance Orbiter

Who

Dr. Adrian Brown, NASA

When

June 20, 2008
Doors open at 7:00 p.m.
Lecture at 7:30 p.m.

Where

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

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June Meeting

Mars Reconnaissance Orbiter
and the Water in the Martian
Poles

Dr. Adrian Brown, NASA

The Mars Reconnaissance Orbiter spacecraft has collected stunning images on the Red planet since it arrived at Mars last year. Scientists like Dr. Adrian Brown at the NASA Ames Research Center are poring over the data to work out what Mars is telling them about its history as a planet through the eyes of the CRISM (Compact InfraRed Imaging Spectrometer for Mars) and the HiRISE (High Resolution Imaging Science Experiment) camera.

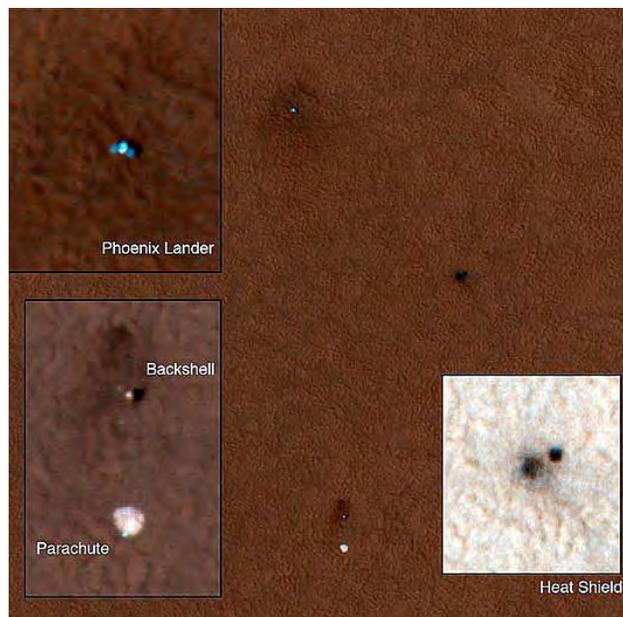
Dr. Brown will give an overview of MRO, and talk about Martian polar research that is shedding light on the most active regions on Mars today, where oceans of water are locked away in perpetuity at the polar caps.

Or are they?

Visit MRO's web site:
<http://mars.jpl.nasa.gov/mro/>



Mars Reconnaissance Orbiter's HiRISE camera captured avalanches in progress near Mars' north pole.



The HiRISE camera was able to photograph the Mars Phoenix lander, heat shield, backshell, and parachute, where they landed on the Martian surface.

News & Notes

New Members

TVS would like to welcome our newest member, **Curtis Macchioni**.

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 August 3rd deadline is for the August issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
June 20	June 23	June 8
July 18	July 21	July 6
Aug. 15	Aug. 18	Aug. 3

Money Matters

At the May board meeting, Treasurer **David Feindel** reported the TVS account balances as of May 18, 2008.

Checking	\$3,583.03	
CD #1	\$3,712.17	matures 05/17/08
CD #2	\$2,619.26	matures 05/27/08

H2O Open House - June 21

We have another Open House scheduled for Saturday, June 21st. Our Open Houses are meant to give members an idea of what our dark sky site is like, and to be able to get a guided tour (of sorts) of the site.

For those members who have yet to check out the site, it is about an hour's drive south of Livermore, along a very windy road. It is a primitive site—no water or electricity, with a couple of outhouses. What it lacks in amenities, it makes up for in dark skies.

Plan to meet at the corner of Mines and Tesla at 6:45 p.m. The caravan will depart at 7:00. There is a \$3 per car entrance fee (exact change is a good idea). Sunset is at 8:31 p.m.

Yosemite - July 25-26

As mentioned before in a previous issue of *Prime Focus*, the TVS' annual Yosemite star party will take place July 25-26. TVS will host a public star party at Glacier Point in exchange for free camping at the Bridalveil Campgrounds. Once the public leaves, members can view and photograph until the sun comes up. However, equipment can't be left at the site during the day.

Dave Rodrigues will be the coordinator for the trip. If you have any questions, please contact him at davevrod-at-aol-dot-com. Note, Dave will be on vacation during the month of June, so any queries probably won't be responded to until July.

Camp Shelly Star Party is a Go!

After a long absence, the LARPD Camp Shelly Star Party is back on. This year the event takes place Friday and Saturday, August 15-16. Camp Shelly is located off of Highway 89 near South Lake Tahoe, about a mile from Baldwin Beach.

Rich Combs will be giving a talk on Friday and Saturday evenings, with telescope viewing right after the talk. TVS members can camp for free in exchange for allowing the public to look through their scopes. The campground is full, so we're guaranteed to have many people come to the event.

TVS has camp site #5 (near the restrooms), which has room for tents and/or a small trailer. The site can easily hold eight people, more if we squeeze in tight. For more information about the Camp, visit http://www.larpd.dst.ca.us/cshelly_fs.html.

If you'd like to participate, please contact Rich at comb-richard-at-sbcglobal-dot-net.

White Mountain Star Party

This year's high altitude star party will take place the last week of August and first week of September. If you're interested in attending, you can stay for however many days and nights you wish—you're not required to stay for the full two weeks.

Cost has not been determined, but it should be similar to last year's cost (about \$63/day). The cost includes a cot in the dormitory, hot showers, and amazingly good food. There's even an oxygen tank in the dining hall for after dinner air intake. Due to the altitude, only those 16 and over can attend.

For those unfamiliar with our annual White Mountain star party, it takes place at the Barcroft High Altitude Research Station at 12,400' elevation. White Mountain is located east of the Sierras, about due east (and up) from Bishop. It is advised to spend a night at a slightly lower elevation (like at Mammoth Lakes, or the Grandview Campgrounds) getting acclimated to the higher altitude before heading up to the station.

The skies at Barcroft are very dark, with the Milky Way so bright that it casts shadows. It's the ideal place for photography and general observing.

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Newsletter header image: The Phoenix Lander Landing

An amazing photo of the Mars Phoenix spacecraft parachuting down to the surface of Mars. Phoenix is still inside its protective backshell and heat shield. The image was captured by the HiRISE camera on board the Mars Reconnaissance Orbiter, which itself is orbiting Mars.

Photo: NASA / JPL / U. Arizona

Calendar of Events

June 21, 10:00 a.m. to 6:00 p.m.

What: *Chabot Space Games: 125th Anniversary Community Celebration*

Who: Everyone

Where: Chabot Space & Science Center

Cost: Free!

What do Mars Drop, Space Bingo and Solar Ball have in common? They are just a few of the games you can play at the Chabot Space Games on June 21, celebrating Chabot's 125th anniversary! Special guests include Bill Nye The Science Guy, along with music, costumed characters, refreshments and fun, all free of charge!

The pre-games ceremony will start on Friday, June 20th with the dedication of a commemorative marker at Chabot's original site and they'll kickoff the Games with a torch run to their current location. Special guest runners include local Olympians, Marilyn King, Pamela Jiles and Eddie Hart. Ms. King is a two-time Olympic pentathlete, Ms. Jiles won silver in the 4 x 400 relay and Mr. Hart won gold in the 4 x 100 relay. Join them for the dedication and line the streets to cheer their "torch"!

June 23, 7:30 p.m.

What: *Planetary Nebulae: Death Shrouds of Lonely Stars or Aftermaths of Binary Interactions?*

Who: Dr. Orsola de Marco (American Museum of Natural History)

Where: Kanbar Hall, Jewish Community Center

Cost: \$5.00

Some of the most beautiful objects in the sky, planetary nebulae are thought to be the death shroud of single, middle-weight stars, much like our own sun; however, evidence has been steadily accumulating that this picture

might have fundamental flaws. Complex shapes, jets, and other structures suggest a new scenario, with planetary nebulae shaped by the action of a companion star, or even a large planet, orbiting the primary star at some distance. But theoretical plausibility is not enough to prove a conjecture, and observations are ongoing to find the binary stars in the center of the planetary nebulae and to finally show that it takes two to tango.

Program begins at 7:30 p.m. 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 available in advance or at the door.

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.

July 12, 8:30 p.m.

What: *The Microwave Background - A Cosmic Time Machine*

Who: Dr. Adrian Lee (UC Berkeley)

Where: Mt. Tamalpais

Cost: Free

Researchers use telescopes in stratospheric balloons, at the South Pole, and in the high Andes to map the faint cosmic

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Board of Directors

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

Answers to Quiz

A=M5; B=M3; C=M13

Volunteer Positions

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Debbie Dyke

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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
tvts@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 (tvts@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.

Calendar of Events *continued*

background radiation that give a baby picture of the Universe just after the Big Bang.

Following the lecture, members of the San Francisco Amateur Astronomers will provide telescopes for viewing in the Rock Spring parking lot. June is the time to take a good look at the beautiful summer sky with objects in the Milky Way. Viewing continues until about 11:00 p.m., weather permitting.

This program is part of a series of FREE programs sponsored by the Mt Tamalpais State Park. Lectures and viewing are held each Saturday evening between a new and a first quarter moon through October. The general public is welcome. Families and school and youth groups are encouraged to attend. For driving directions and additional information call the hotline: 415-455-5370 or check out www.mttam.net.

News & Notes *continued*

Final Announcement—GSSP 2008

The GSSP Organizing Committee

The Golden State Star Party is less than three weeks away. With nearly 300 astronomers already registered to take part in GSSP 2008 at our new observing site in Adin, California, we are anticipating a truly amazing star party this year. With input from the astronomy community and superb cooperation from the towns and residents in the area, we have what we expect to be the best TAC summer star party ever. There are a just a few things remaining that we want to remind you about at this point.

First, the deadline for those of you who wish to purchase GSSP T-shirts or on-site meals is midnight, June 15. So get your orders in soon. Secondly, we have opened up a few more slots to allow last-minute on-line registrations until midnight, June 28. We also have decided to have a Group Photo Project, whereby all attendees are invited and encouraged to participate in photo-documenting the star party. It should fun, so bring your digital cameras! Full details are on our web site.

Finally, we would like to announce that Dr. Russel M. Genet will give a presentation entitled *Gallileo's Legacy* on Friday night. Dr. Genet is a Scholar in Residence at California Poly. His research specialties are binary stars and cosmic evolution. Dr. Genet, who pioneered the world's first fully robotic observatory and was featured in the PBS special *The Perfect Stargazer*, was the 51st President of the Astronomical Society of the Pacific. He teaches astronomy at Cuesta College, and is the Director of the Orion Observatory (www.orionobservatory.org).

This is *your* star party, so we encourage all of you to con-

tinue to give us your input and ideas and ask us any questions you may have. Keep checking our web site at <http://goldenstatestarparty.org>. We'll see you all in just a few short weeks!



Mars and the Beehive Cluster (M44). Photo: Conrad Jung

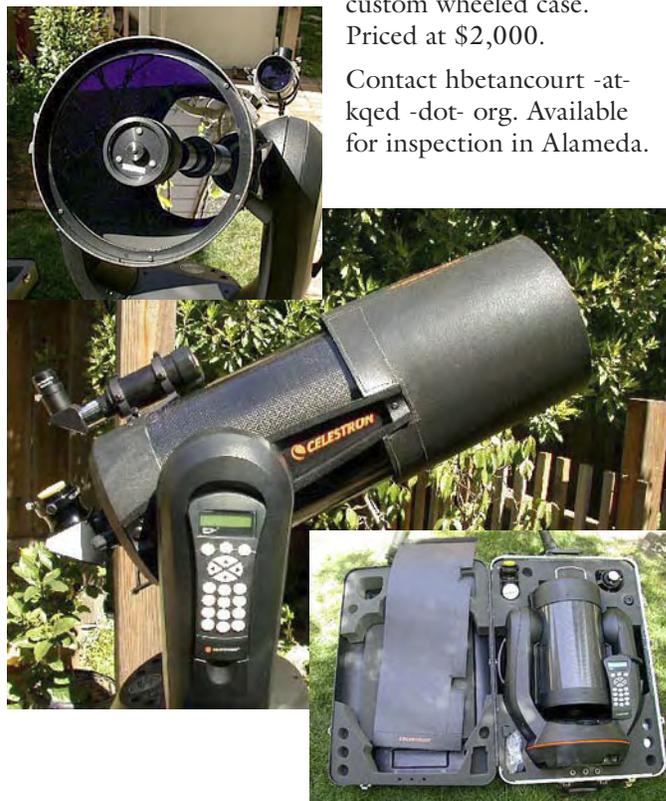
Scope For Sale

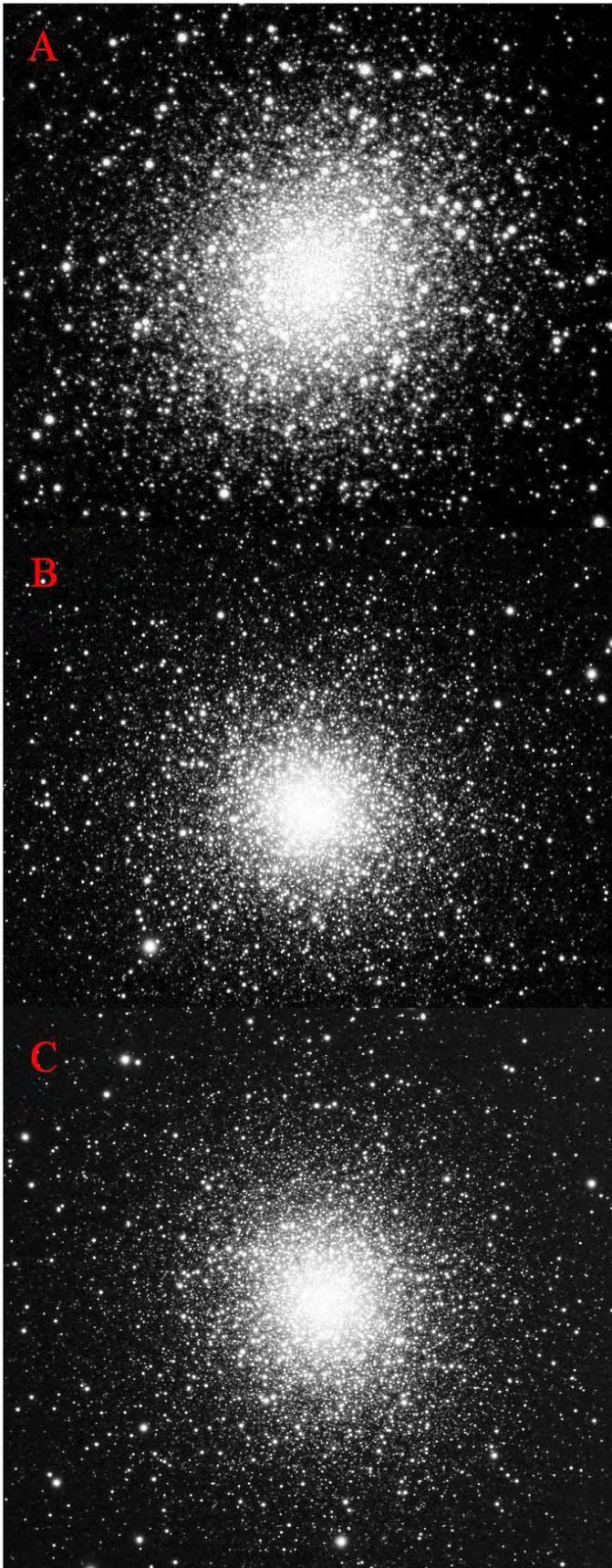
If you've been thinking about getting a scope for the upcoming summer viewing season (and beyond), local amateur astronomer Harry Betancourt has one for sale.

It's a 2003 Celestron 8" Nexstar GPS (CarbonTube) with Fastar assembly....flawless glass, Starizona Landing Pad and a custom cut Flex Dew Shield. Everything is in pristine condition. It also comes with a Lumicon 50mm Finderscope with right angle Amici and 25mm Kelner with crosshairs, William Optics 2" diagonal, and a JMI custom wheeled case.

Priced at \$2,000.

Contact [hbetancourt -at- kqed -dot- org](mailto:hbetancourt-at-kqed-dot-org). Available for inspection in Alameda.





Guess the Globular Cluster!

Ken Sperber

With the spring and impending summer upon us, there are many beautiful globular clusters splashed across the night-sky. Globular Clusters suggest a sprinkling diamond dust on black velvet, with each having its own personality, as evidenced by distinct trails of stars snaking their way about the heavens.

On the left is a sampling of three globular clusters imaged by Ken Sperber in 2007. Can you guess their identity? Here are a few hints: they are all currently visible, and all images were taken using the same equipment and focal length. To make identification a bit more difficult, north is not necessarily in the same direction in all images, and the images have been cropped (to the same scale) to cutoff bright stars that would make for an easy ID. Good Luck! You can find the answers to the quiz on page 2, in the contact information section.

By the way, as much as I enjoy imaging, in the case of globular clusters I think the view through a telescope is more impressive and magical than that derived from counting photons with silicon.

The Goods on Globular Clusters

As Ken mentioned above, globular clusters are wonderful objects to observe. The larger the aperture telescope, the more you can make out individual stars in the clusters. In some cases, you can even see color in the stars.

Globulars are fascinating objects, partly because there is so much we don't know about them. There are about 150 globulars orbiting the Milky Way Galaxy, and we see globulars orbiting other galaxies as well (like the Andromeda Galaxy).

Globulars contain anywhere from a couple hundred thousand to several million stars. The stars are predominately Population II stars, meaning that they have low amounts of metals in their composition and are of an older generation than our own sun (which is a Population I star). Population II stars are approximately 12.7 billion years old—almost the same age as the Universe. Super massive cores have been detected in the middle of several globulars, suggesting that globulars may contain medium sized black holes.

Scientists aren't entirely sure how globulars formed, but they do have several theories. One involves the possibility that globulars are cores of galaxies that had collided with the galaxy they now orbit. Another is that globulars formed the same time the host galaxy formed, although the process by which that occurred is still unknown.

We'll have the opportunity to learn more about globulars at our September meeting with speaker Adrienne Cool.

What's Up *by Debbie Dyke*

All times Pacific Daylight Saving Time.

June

- 12 Thur Venus 1° from the Beehive Cluster. 10:00 p.m.
- 13 Fri 1944 JPL was formed, originally called Air Corps Jet Propulsion Research Project.
- 15 Sun Father's Day.
- 16 Mon Moon at apogee (251,861 miles). 11:00 a.m.
Try to spot Mercury and an exceedingly thin crescent Moon very low in the northwest. 9:00 p.m.
The Moon 1° from Antares. 11:00 p.m.
1963 Valentina Tereshkova becomes the first woman in orbit.
- 18 Wed **Full Moon.** 10:30 a.m.
- 19 Thur The Moon is 4.5° from Jupiter. 11:00 p.m.
- 20 Fri **Summer Solstice.** 5:00 p.m.
Tri-Valley Stargazers general meeting. 7:30 p.m. at the Unitarian Universalist Church,
1893 N. Vasco Road, Livermore.
Pluto at opposition.
- 22 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.
1675 Royal Greenwich Observatory founded.
1978 James Christy discovers Pluto's satellite Charon.
- 23 Mon The **Moon occults Neptune** while just below the horizon. The Moon rises at 11:28 p.m., and Neptune
reappears at 12:59 a.m.
Tri-Valley Stargazers Board meeting. 7:30 p.m. at the Round Table Pizza in Livermore.
- 26 Thur **Last Quarter Moon.** 5:10 a.m.
1730 Charles Messier born.
- 27 Fri Mercury at greatest heliocentric latitude south.
Uranus stationary. 1:00 a.m.
- 30 Mon The thin crescent Moon 3° from the Pleiades (M45). 5:00 a.m.
Venus and Saturn pass 0.75° from each other. 10:00 p.m.
The Shingletown Star Party starts today and runs through the July 7th.

July

- 1 Tue Mercury at greatest elongation west (22°). 11:00 a.m.
Moon at perigee (222,898 miles). 2:00 p.m.
- 2 Wed **New Moon.** 7:19 p.m.
The Golden State Star Party begins and goes through the 6th.
- 4 Fri Earth at aphelion (94,304,564 miles). 12:00 a.m.
Independence Day.
1054 Chinese astronomers, and possibly Native Americans, observe the Crab Nebula supernova.
1997 Mars Pathfinder lands on Mars.
- 9 Wed Jupiter at opposition. 1:00 a.m.
First Quarter Moon. 9:35 p.m.
1979 Voyager 2 passes by Jupiter.
- 11 Fri Venus at perihelion.
1979 Skylab re-enters the Earth's atmosphere.

Ozone, the Greenhouse Gas

We all know that ozone in the stratosphere blocks harmful ultraviolet sunlight, and perhaps some people know that ozone at the Earth's surface is itself harmful, damaging people's lungs and contributing to smog.

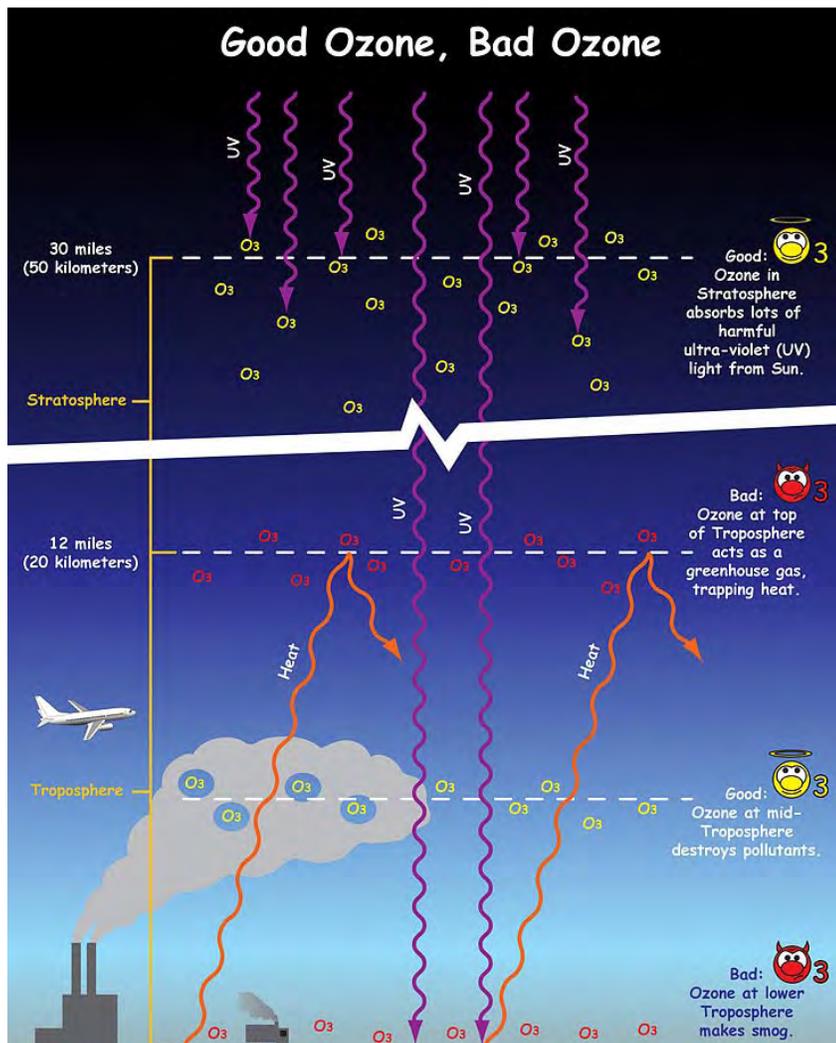
But did you know that ozone also acts as a potent greenhouse gas? At middle altitudes between the ground and the stratosphere, ozone captures heat much as carbon dioxide does.

In fact, pound for pound, ozone is about 3000 times stronger as a greenhouse gas than CO₂. So even though there's much less ozone at middle altitudes than CO₂, it still packs a considerable punch. Ozone traps up to one-third as much heat as the better known culprit in climate change.

Scientists now have an unprecedented view of this mid-altitude ozone thanks to an instrument aboard NASA's Aura satellite called the Tropospheric Emission Spectrometer—"TES" for short.

Most satellites can measure only the total amount of ozone in a vertical column of air. They can't distinguish between helpful ozone in the stratosphere, harmful ozone at the ground, and heat-trapping ozone in between. By looking sideways toward Earth's horizon, a few satellites have managed to probe the vertical distribution of ozone, but only to the bottom of the stratosphere.

Unlike the others, TES can measure the distribution of ozone all the way down to the heat-trapping middle altitudes. "We see vertical information in ozone that nobody else has measured before from space," says Annmarie Eldering, Deputy Principal Investigator for TES.



The global perspective offered by an orbiting satellite is especially important for ozone. Ozone is highly reactive. It is constantly being created and destroyed by photochemical reactions in the atmosphere and by lightning. So its concentration varies from region to region, from season to season, and as the wind blows.

Data from TES show that ozone's heat-trapping effect is greatest in the spring, when intensifying sunlight and warming temperatures fuel the reactions that generate ozone. Most of ozone's contribution to the greenhouse effect occurs within 45 degrees latitude from the equator.

Increasing industrialization, particularly in the developing world, could lead to an increase in mid-altitude ozone, Eldering says. Cars and coal-fired power plants release air pollutants that later react to produce more ozone.

"There's concern that overall background levels are slowly increasing over time," Eldering says. TES will continue to monitor these trends, she says, keeping a careful eye on ozone, the greenhouse gas.

Learn more about TES and the science of ozone at tes.jpl.nasa.gov/. Kids can get a great introduction to good ozone and bad ozone at spaceplace.nasa.gov/en/kids/tes/gases.

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

Ozone behaves differently at different altitudes in the atmosphere. High in the stratosphere and at mid-troposphere it has positive effects on life at the surface. At the top of the troposphere ozone is a greenhouse gas and at the surface it makes smog.

Tri-Valley Stargazers
P.O. Box 2476
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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.