PRIMEFOCUS
Tri-Valley Stargazers

August 2005

TVS
Tri-Valley Stargazers

Meeting Info:

What
Astronomy's "Little Unificaiton"

Who
Norm Sperling

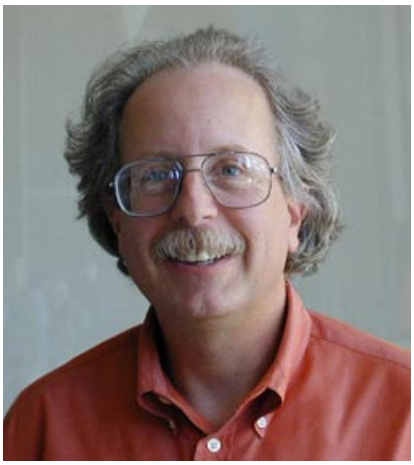
When
August 19, 2005
Conversation 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist Church in Livermore
1893 N. Vasco Road

Inside

August Meeting

Astronomy's "Little Unification"
Norm Sperling



While cosmologists still hunt for "Grand Unification" of the forces of Nature, astronomers have figured out how everything from stars on down fit. They're not the sideshow of freaks we used to be taught. The categories were discovered in different ways at different times. "Planets" go around the Sun. "Moons" go around planets. Both labels only deal with objects' motions, and not with their components and processes—or even diameters, since 7 moons are bigger than Pluto, and 2 moons are even bigger than Mercury. Originally, "comet" meant "fuzzy" and "asteroid" meant "star-like", just from their appearance, not motions or components or processes. And "meteor" meant "in the air", with no clue about what it's made of.

Space age research reveals that the Solar System's members are all cousins. They started with the same ingredients in the same nebula, and underwent related processes. The recipe for stars, planets, moons, asteroids, comets, and meteoroids is the same: "Take a Nebula, Condense and Stir."

Their masses, and how hot they got inside, govern which processes made them the way they are today. When plotted by their masses, versus how hot they got, some of the old categories stand out. Comets (retaining original ices) plot together because they're frozen. Meteorites huddle together because (by cosmic standards) they're small. Stars shine in a top corner because they're hot and heavy.

But "planets" includes some objects that are physically like brown-dwarf almost-stars, other objects more akin to the 7 big moons, and one cometary object. "Asteroids" have borderline-cases with comets, meteoroids, and moons. Small moons are probably captured asteroids and comets, not original equipment. So the terms "planet", "asteroid", and "moon" don't tell objects' physical nature or evolution. Those labels are outdated curiosities that get in the way of understanding.

Norm Sperling teaches freshman astronomy at the University of California, Berkeley, and edits *The Journal of Irreproducible Results*, the *Science Humor Magazine*. He also speaks on *Irreproducible Results*, and *What Your Astronomy Textbook Won't Tell You*. Norm will have his magazine and book available for purchase after the presentation.

News & Notes

Welcome!

TVS would like to welcome our newest members, **Mike & Vivian Reed**, **Richard Kramer**, and **Bill Drelling**.

2005 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 October 9th deadline is for the October issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
Aug. 19	Aug. 22	Aug. 7
Sept. 16	Sept. 19	Sept. 4
Oct. 21	Oct. 24	Oct. 9

Money Matters

At the July Board meeting, Treasurer **Gary Steinhour** reported the TVS account balances (as of July 17, 2005):

Checking	$513.78	
CD #1	$3,469.59	matures 08/17/05
CD #2	$2,452.23	matures 08/27/05
CD #3	$1,085.25	matures 07/16/05

H2O Closed House

Our President reports: The observing site will be closed for two nights (on August 19th and 20th) while a private function is renting the ranch. It is is full moon anyway that weekend. We will still be having the open house the next weekend on August 27th.

This is the first time I know of that the ranch has ever made a request like this. Luckly it is well timed. Our combination lock on the gate will be removed for that weekend.

H2O Open House

Our last Open House of the year is on Saturday, August 27. Meeting time has yet to be determined, but usually it's around an hour and a half before sunset. We'll post details on the TVS web site as they become available.

The Open House is a chance for non-keyholding members to visit the TVS dark sky site. It is a primitive site, with pit toilets as the only ammenity. Make sure you bring whatever food and drink you'll require, as the nearest store is about a 45-minute drive away. There is a $3 per car entrance fee (exact change required).

The Marling Scope is on the mount, but it's lacking power. The little solar panel that had been powering the scope before is no longer functioning. Until we get a replacement solar panel a 12 volt battery will be needed to run the scope. If you are a Patron Memeber and plan to use the scope, bring a 12 volt battery with you as there is none at the site.

Calendar of Events

August 17, 7:30 p.m.
What: San Francisco Amateur Astronomers
Who: Janice Voss, NASA Astronaut
Where: Randall Museum, San Francisco
Cost: Free

Our speaker will be Janice Voss, a veteran of five space flights, logging over 49 days in space. Currently at NASA Ames, she is the Science Director of the Kepler Spacecraft mission. She will share her fantastic images of Earth from space and her personal experiences with NASA as an astronaut. Bring the family to this one.

Meetings are held at the Randall Museum, 199 Museum Way, San Francisco.

August 20, 11:00 a.m. to 2:00 p.m.
What: *Happy Birthday Chabot!*
Who: Chabot visitors
Where: Chabot Space & Science Center, Oakland
Cost: Free with General Admission

Join the Chabot staff for free ice cream as Chabot Space & Science Center celebrates the fifth anniversary of its newest home on Skyline Boulevard in Joaquin Miller Park. Win a prize in a raffle! www.chabotspace.org

August 27, all day
What: *AANC-Con 2005*
Who: You
Where: Randall Museum, San Francisco
Cost: $25

The AANC (Astronomical Association of Northern California) is pleased to announce AANC-CON 2005 conference and workshop to be held Saturday, August 27th, from 10:00 a.m. to 5:00 p.m. at the Randall Museum, 199 Museum Way, San Francisco.

The conference will be hosted by the San Francisco Amateur Astronomers (SFAA), the San Francisco Sidewalk Astronomers (SFSA), and sponsored by the AANC, the Western Amateur Astronomers (WAA), and the San Jose Amateur Astronomers (SJAA).

Newsletter header image: Space Shuttle Discovery
This image of Discovery was taken on Day 3 of the mission. Before Discovery docked with the Space Station, it made a full backflip, exposing its heat shield for high-resolution digital photography by the Station crew. *Photo by: NASA*

This year's theme is "Celebrating Bay Area Astronomy", and we'll also be celebrating John Dobson's 90th birthday!

Our speakers include Timothy Ferris, Lynette Cook, Steve Gottlieb and Richard Crisp; with additional presentations by Bob Schalk and Marni Berendsen, of the Astronomical Society of the Pacific. That evening, we'll have a star party at the Randall and deliver our 2005 AANC Awards.

Visit the conference web site at www.planitarium.net/aanc/aanc-con2005/program_guide for details.

The $25 registration fee includes admission to all speakers and workshop, as well as a boxed lunch. We appreciate pre-registration, as it helps us plan the number of meals needed. Register for the event either online via PayPal or send your $25 check payable to: "AANC-CON 2005", c/o Don Stone, AANC Treasurer, 19047 Robinson Rd., Sonoma, CA 95476-5517

Paying at the door? Please notify us in advance by emailing aancregistration@pacbell.net.

VOLUNTEERS...we need 'em! Contact Stacy Jo McDermott at aanc2005volunteers@hotmail.com if you want to help out. Volunteers get to hear all the speakers and attend the workshop for free!

September 3, 5:30 p.m.

What: *Lick Observatory Tour*
Who: Astronomical Society of Nevada
Where: Lick Observatory
Cost: $25

The Astronomical Society of Nevada, based in Reno Nevada, has a tour scheduled at Lick Observatory on Saturday, September 3rd. A maximum of 40 people are allowed on this trip, and because spaces are still available, they opened it up to others who may be interested! If you are interested in joining them on this trip, please check the following link for additional information: www.astronomynv.org/phpBB2/viewtopic.php?t=95

If you have questions, contact Tim Burns at burnstm@astronomynv.org or 775-825-4278.

September 9, 5:30 p.m.

What: *UC Merced Star Party*
Who: Wil VanBreugel
Where: UC Merced
Cost: Free

Will VanBreugel will be hosting a UC Merced star party for the several hundred incoming freshmen on September 9th. He would like this to be a BIG event, hopefully drawing in many other people from the valley. He will give a talk for about 1 hour while the sun sets and then go on to have people look through telescopes and get explanations from astronomy club members. The site, on the new campus near Merced, would not be great for good seeing, but it is the outreach and excitement that count most. If you want to help, contact Wil at wil@igpp.ucllnl.org.

September 10, 8:00 p.m.

What: *Black Holes: The Science Behind the Science Fiction*
Who: Dr. Eliot Quataert (UC Berkeley)
Where: Mt. Tam
Cost: Free

What are black holes? How are they discovered? How do they give rise to some of the most remarkable and bizarre phenomena in the universe?

Calendar of Events *continued*

Program is held in the Mountain Theater on Mt. Tam. Weather permitting, after the lecture there will be telescope viewing in the Rock Spring parking lot. For more information visit www.mttam.net and the SFAA web site www.sfaa-astronomy.org/sfaa/starparties/index.shtml.

September 29 - October 1
What: *CalStar*
Who: SJAA and You
Where: Lake San Antonio
Cost: Free

Registration is now open for the sixth edition of SJAA's dark sky star party CalStar.

CalStar will be held at Lake San Antonio the nights of Thursday Sept 29 through Saturday Oct 1, 2005. This is a nice low key way to end the summer observing season; a reasonable sunset time, catered dinners on Friday and Saturday, and some of the darkest skies in California. To register or for more information see the web page www.sjaa.net/calstar2005.html. Sponsored by the San Jose Astronomical Association.

September 26, 1:40 p.m. - 2:30 p.m.
What: *Astronomy for Recreation*
Who: Andrew Fraknoi
Where: Foothill College, Los Altos
Cost: Free

Starting in the Fall of 2005, Foothill College will offer a new 1-unit astronomy seminar to accompany its popular beginning course, *Astronomy 10B (Stars, Galaxies, and the Universe)*.

The seminar, called *Astronomy 105: Astronomy for Recreation*, will be an overview of astronomy as a hobby or avocation, for those who would like to find more ways to enjoy the cosmos. It is offered Monday afternoons, from 1:40 to 2:30 p.m., starting September 26. No background in science or special equipment will be required.

Among the topics the seminar will cover are:

* Where are the best places in the Bay Area to look through a telescope?
* Family Astronomy: Doing fun, hands-on astronomy projects with your kids or grand-kids.
* Constellation lore and constellation finding
* Astronomy and science fiction (movies and books)
* Eclipses and eclipse "chasing": Where and when to go
* Buying and using binoculars or a telescope
* Local groups and projects you can get involved with
* Help getting your mind around the "big astronomy issues" in the news: black holes, the big bang, dark matter

To take Astronomy 105, students must sign up for *Astronomy 10B* at the same time (or must have taken 10B within the last three years). In the fall of 2005, A*stronomy 10B*, which is designed for non-science majors and does not require math, will be available both during the day and in the evening at Foothill. With all the exciting astronomical discoveries in the news, this is the perfect quarter in which to take such a starting astronomy class.

Astronomy 105 is especially recommended for students who are retired or working part-time, and are interested in spending a bit more time exploring their personal interests in astronomy. An optional Friday evening session at the Foothill College Observatory will be available for students in the course.

Both courses are taught by instructor Andrew Fraknoi, who appears frequently on Bay Area radio programs explaining science in everyday language. His *Physics for Poets* class recently won the national *Innovation of the Year* Award of the League for Innovation in the Community Colleges.

For more information about *Astronomy 105*, see the web site: www.foothill.fhda.edu/ast/ast105.htm.

Astro Events

Jupiter Transits

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

August

Tues 9	GRS	8:44p	10:28p	na
Wed 10	I	na	9:13p	10:22p
	Is	9:13p	10:05p	na
Fri 12	GRS	na	na	10:07p
	E	na	9:10p	na
	Es	9:57p	na	na
Sun 14	GRS	na	9:37p	na
Tues 16	GRS	9:20p	na	na
Thurs 18	Gs	na	na	9:47p
Fri 19	GRS	na	8:50p	na
Thurs 25	G	na	9:02p	na
Fri 26	Is	na	na	9:40p
	GRS	na	9:40p	na
Sun 28	GRS	9:20p	na	na
Wed 31	GRS	na	8:50p	na

September

Fri 2	GRS	8:30p	na	na
	I	8:39p	na	na
Mon 5	GRS	na	8:00p	na

Astronomical Insights

by David Feindel

The TVS weekend at Yosemite's Glacier Point is aptly summed up by Charles Dickens quote: "It was the best of times, it was the worst of times…" In the space of 48 hours, I had the best Yosemite skies I've seen in my four visits, and also the worst.

First, the best. Friday night's skies were wonderfully clear and calm. And of course dark. The Milky Way was out, easily visible almost from horizon to horizon. As usual, it takes a few minutes to get oriented; the multitude of mag 5 and 6 stars now visible distort the mental map I have of the sky based on my normal backyard and Del Valle observing. M13 was easily visible naked eye, and M92 and M4 were visible with a bit of concentration. Andromeda, M31, was very clear to the naked eye, and filled a 3-1/4° field of view. I've never seen it that well before. M32 and M110 (aka NGC205), its companion galaxies, were also clearly visible in the scope. M51, the Whirlpool, looked as good in my 8" SCT as I remember it last year in a 20" dob.

The real highlights of the night, though, were all naked eye. Watching summer thunderstorms over the horizon—never hearing thunder or seeing the lightening, just seeing a sudden brightening along the eastern horizon—was neat. Even better was watching an eerie, spooky backlighting of Half Dome starting around 1:30 a.m., courtesy of a just-rising moon. The perfect venue and effect for a remake of *Close Encounters of the Third Kind*.

The worst was Saturday night; you had to feel a bit sorry for the crowd who came to look though scopes (and the TVS'ers who drove up Saturday!). We got a bit of viewing of Jupiter in before Dave's talk started at 8:30, but it wasn't dark yet, and the air showed signs of turbulence. My views started deteriorating at 77x, likely due to over the recently sun-baked rocks of the amphitheater as well as all the people milling about. After Dave's talk finished, it was a race with the clouds, finding holes to view through until the openings closed. The Veil, M51, M11, Albireo, and the other usual star party favorites made cameo appearances, but by 10:45, the Cloud Nebula (rumors are that this is the oft-mentioned but never-announced M111 of Messier's object list) was the main feature visible. By 11:45, even us die-hards were packing it in.

This was also my seriously dark "first light" for a 115mm f/7 refractor I just acquired. I was anxious to see the difference in how the heavens look between a narrow-view SCT and a wide field refractor. The quick verdict: they are very different, sometimes in surprising ways. The refractor setup is 10 lbs heavier, despite no motors/encoders, no computer control, and only 60% of the aperture. Refractor setup time is only a bit shorter, although perhaps familiarity will improve its advantage. The focuser is beyond comparison (the next person praising the manual focus mechanism on an SCT will likely be the first). My refractor has a Feathertouch focuser, and it is all it is reported to be; there is one point that things are in focus, and it is usually obvious. I'm holding off my comments on the optical comparison pending more experience with them, but mechanically, there is a noticeable difference in quality. Until next month!

Dave Rodrigues sets up his Coronado solar telescope for public viewing at Yosemite.

First Light: Beginners' Astronomy

by Richard Campbell

Did you hear that star?

For some odd reason, many astronomers tend to be musicians. We have an exquisite sense of hearing and harmony, yet experience few *audio* epiphanies at the eyepiece. If we listen carefully, though, there are sounds abound—symphonies of incidental music in our hobby.

The most famous harmony between astronomy and music may be the Pioneer 10 golden disc which held a cross-section of humanity's aural experience in its grooves. This disc was sent on the Pioneer spacecraft many years ago and is now beyond the solar system—waiting to be

continued page 7

What's Up *by Debbie Dyke*

All times Pacific Daylight Saving Time unless otherwise noted.

August

1	Mon	1818 Maria Mitchell born. She receives a gold medal from the king of Denmark for being the first to discover a comet by using a telescope.
4	Thurs	Moon at apogee (252,111 miles). 3:00 p.m.
5	Fri	**New Moon**. 8:05 p.m. 1930 Neil Armstrong born.
6	Sat	Mercury in inferior conjunction.
7	Sun	Mercury at greatest heliocentric latitude South. Venus 1° from Moon as they set in the West.
8	Mon	Neptune at opposition. 9:00 a.m. Jupiter 2.5° from the Moon. 9:00 p.m. St. Dominic - patron saint of astronomers.
11	Thurs	1877 Asaph Hall Sr. discovers Mars' moon Deimos.
12	Fri	**Perseid meteors** peak. 10:00 a.m. **First Quarter Moon**. 7:38 p.m. 1912 Victor Hess discovers cosmic rays. 1977 Prototype shuttle Enterprise makes its first free flight.
17	Wed	1877 Asaph Hall discovers Mars' other moon, Phobos.
18	Thurs	Moon at perigee (221,583 miles). 11:00 p.m. Expect large tides.
19	Fri	**Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore. **Full Moon**. 10:53 a.m. Uranus 5.5° North of the Moon. 10:00 p.m.
20	Sat	1977 Voyager 2 launched toward Jupiter and Saturn.
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. 1609 Galileo shows off his telescope to the Doge's navy.
22	Mon	**Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.
23	Tues	Mercury at greatest elongation west (18°). 4:00 p.m.
24	Wed	Mars 6° South of the Moon. 12:00 a.m.
25	Thurs	1981 Voyager 2 flies past Saturn. 1989 Voyager 2 flies past Neptune.
26	Fri	Moon 1° South of the Pleiades (M45). 1:00 a.m. **Last Quarter Moon**. 8:18 a.m.
29	Mon	1864 William Huggins discovers that nebulae are gas clouds.
30	Tues	1983 Guion Bluford Jr. becomes the first African American in space.
31	Wed	Mercury at perihelion. Saturn 5° South of the Moon. 6:00 a.m. Uranus at opposition. 8:00 p.m. Moon at apogee (251,852 miles). 8:00 p.m.

Newest Weather Sentry Takes Up Watch

by Patrick L. Barry

Today, we've become accustomed to seeing images of the Earth's swirling atmosphere from space every night on the evening news. Before 1960, no one had ever seen such images. The first-ever weather satellite was launched that year, kicking off a long line of weather satellites that have kept a continuous watch on our planet's fickle atmosphere—45 years and counting! The high-quality, extended weather forecasts that these satellites make possible have become an indispensable part of our modern society, helping commercial aircraft, recreational boaters, and even military operations avoid unnecessary risk from hazardous weather. But satellites don't last forever. Parts wear out, radiation takes its toll, and atmospheric drag slowly pulls the satellite out of orbit. Many weather satellites have a design life of only 2 years, though often they can last 5 or 10 years, or more. A steady schedule of new satellite launches is needed to keep the weather report on the news each night. In May 2005, NASA successfully launched the latest in this long line of weather satellites. Dubbed NOAA-N at launch and renamed NOAA-18 once it reached orbit, this satellite will take over for the older satellite NOAA-16, which was launched in September 2000. "NOAA always keeps at least two satellites in low-Earth orbit, circling the poles 14 times each day," explains Wilfred E. Mazur, Polar Satellite Acquisition Manager, NOAA/NESDIS. "As Earth rotates, these satellites end up covering Earth's entire surface each day. In fact, with two satellites in orbit, NOAA covers each spot on the Earth four times each day, twice during the day and twice at night," Mazur says.

By orbiting close to Earth (NOAA-18 is only 870 km above the ground), these "low-Earth orbit" satellites provide a detailed view of the weather. The other type of weather satellite, "geosynchronous," orbits much farther out at 35,786 km. At that altitude, geosynchronous satellites can keep a constant watch on whole continents, but without the kind of detail that NOAA-18 can provide. In particular, low-Earth orbiting satellites have the ability to use microwave radiometers to measure temperature and moisture in the atmosphere—two key measurements used for weather prediction that, for technical reasons, cannot be sensed by distant geosynchronous satellites. With NOAA-18 successfully placed in orbit, the 45-year legacy of high-tech weather forecasts that we're accustomed to will go on.

NOAA-18, the newest in a long line of weather and environmental satellites, launched May 20, 2005.

Find out more about NOAA-18 and the history of polar-orbiting weather satellites at http://goespoes.gsfc.nasa.gov/poes. For kids and anyone else curious about the concept, the difference between polar and geosynchronous orbits is explained at http://spaceplace.nasa.gov/en/kids/goes/goes_poes_orbits.shtml.

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

First Light *continued*

by Richard Campbell

discovered and played in some alien's living room. You can listen to the tracks and explore the images in the "Murmurs of Earth" software package. The aliens will enjoy every form of music, from the Beatles to Beethoven, IF they can decipher our directions printed on the disc.

Locally, you can enjoy the "Music of the Spheres" concert at Lick Observatory. First a Renaissance concert in its cavernous halls, then a view through its elegant 36-inch telescope. You can hear a song that Copernicus might have heard as he walked on a cobblestone path.

And at every Tri-Valley star party, we have the concert of "ooohs," "ahhhs" and "wows" as we explore the cosmos accompanied by our telescopes' almost musical sounds. Personally, I've always liked the "Fwwwwwip" of a Nagler slipping into the focuser drawtube, the "Shhhhhshhhh" of the altitude bearing of a Dob, the "tuk a tuk a tuk a" of the motor drive buttons, and the "ka toink a toink a toink" of the roll-a-table being assembled. Less inviting is the "vweeeeeeeeee..rhee hee heee" of the GoTo motors, the "vrahhooom" of a car starting up with headlights pointed at me, or the dreaded "taink!" of an eyepiece hitting the ground. All we need now is a musician to sample these sounds and make a synthesized star party soundtrack.

Until next sky, here's to more "Fwwwwip" and less "taink."

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.