



# THE OBSERVER

SAN BERNARDINO VALLEY AMATEUR ASTRONOMERS

Member THE ASTRONOMICAL LEAGUE

*"Celebrating Forty-Seven Years of Amateur Astronomy"*

VOLUME #47 ISSUE #12

DECEMBER 2005

## **Holiday Get-Together December 10, 2004: 2PM-6PM Roberto's Italian Dining & Pizza, Highland, CA**

### **Fountains of Enceladus**

November 28, 2005

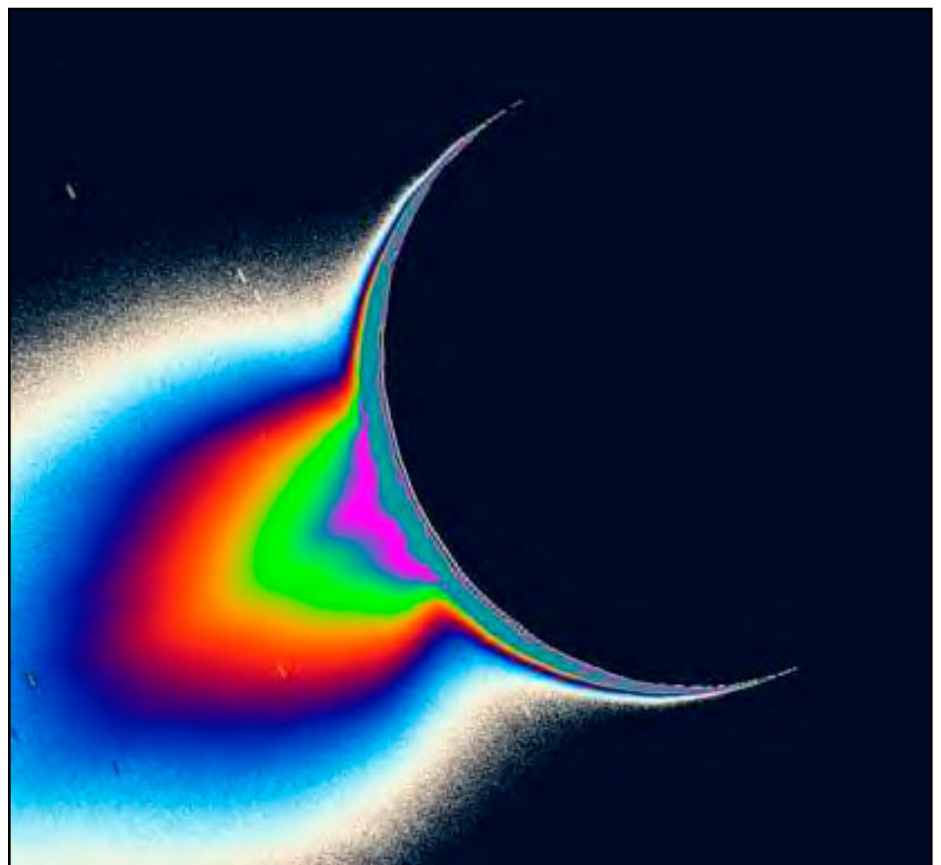
Recent Cassini images of Saturn's moon Enceladus backlit by the sun show the fountain-like sources of the fine spray of material that towers over the south polar region. The image was taken looking more or less broadside at the "tiger stripe" fractures observed in earlier Enceladus images. It shows discrete plumes of a variety of apparent sizes above the limb of the moon.

The greatly enhanced and colorized image shows the enormous extent of the fainter, larger-scale component of the plume.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington, D.C. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging operations center is based at the Space Science Institute in Boulder, Colo.

For more information about the Cassini-Huygens mission visit <http://saturn.jpl.nasa.gov> . The Cassini imaging team homepage is at <http://ciclops.org> .

Credit: NASA/JPL/Space Science Institute



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[www.sbvaa.org](http://www.sbvaa.org)

# SBVAA

## CALENDER OF EVENTS 2005

Meetings held at the  
 San Bernardino County Museum  
 For information, call Chris Clarke at (909)  
 888-6511, ex.1458

December 10.....Holiday Get-Together  
 (2nd Saturday)

Note: New Calender of Events will appear  
 in January, 2006 Newsletter.

## Holiday Get-Together

by Tom Lawson

This years Holiday Get-Together is going to be held at  
 Robert's Italian Restaurant in Highland California. The  
 Date and Time December 10th between 2 and 6 pm.

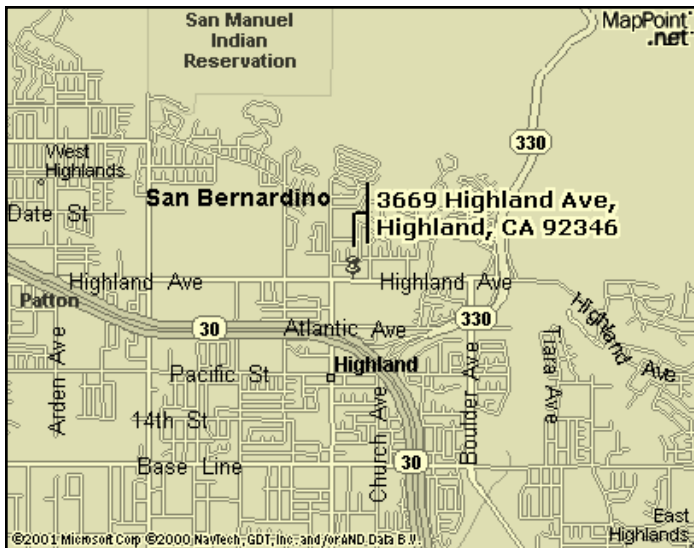
Roberto's Italian Dining & Pizza  
 3669 East Highland Ave.  
 Highland, CA 92346  
 909-862-8999  
<http://www.robertositaliandining.com/>

# Holiday Get-Together

Dec 10, 2002  
 2PM-6PM

Please bring  
 your inexpensive  
**Not Junk**  
 "White Elephant Gift"  
 To exchange!!!

Nothing over  
**\$20.00**



## President's Message

By Martin L. Carey  
martincarey@sbcglobal.net

We now have some cool, very dry air that has given us some sparkling nights. Last Saturday night, December 3rd, Rudy Rodriguez, about a half dozen of his high school students, and a few of us adults, headed out to Johnson Valley for a rather cold but rewarding night. The forecast on Weather Underground was accurate, and as predicted, the temperature dropped to the mid-thirties as we were leaving close to midnight. No Chris, you would not have liked it at all.

With a 12.5", 16", and 20" scopes, we had plenty of light for our bleary eyes, and the students had a good time looking, shivering, and earning extra credit for objects that their teacher assigned them to find in the 12.5". Mike's 16" was picking up faint galaxies with ease, and gave a wonderful view of NGC 253, a big edge-on galaxy in Sculptor, which shows some dusty details in scopes as small as 6". We noticed that the sky transparency was good but not great.

Take a look at the Clear Sky Clock web site, which makes some surprisingly accurate forecasts for darkness, transparency, seeing, clouds, wind, etc. You can plan observing sessions with it 24 to 36 hours ahead. They also have some great links with animated satellite weather maps and road maps. Using their dark sky maps link, I was able to find the darkest places in all the western states.

We need to have a moon and planet-viewing party soon, and Sharon and I would like to offer our home for this event. We are thinking of either the night of December 10th after the holiday party, or the January 7th star party, which will have a first quarter moon. Going out to Owl Canyon for bright moonlight may not be in your plans. Let me know which of the two dates you prefer.

Some of you may have noticed the little news item in Sky and Telescope about the starless galaxy they found with radio telescopes. Now there's something to ponder when you're feeling cold and lonely in the dark—an entire galaxy of dark matter and no stars! The only visible light would come from other galaxies millions of lights years away. How could such a vast collection of matter

not condense into protostars and create fusion for stars? And there are many more dark places out there to make up the missing matter. Makes me shiver.

But we don't live in such a place, and I am looking forward to the light spirited friends and good food on December 10th. Stay well and I'll see you at Roberto's.

## SETI and Intelligent Design

By Seth Shostak  
SETI Institute  
posted: 01 December 2005  
06:37 am ET

If you're an inveterate tube-o-phile, you may remember the episode of "Cheers" in which Cliff, the postman who's stayed by neither snow, nor rain, nor gloom of night from his appointed rounds of beer, exclaims to Norm that he's found a potato that looks like Richard Nixon's head.

This could be an astonishing attempt by taters to express their political views, but Norm is unimpressed. Finding evidence of complexity (the Nixon physiognomy) in a natural setting (the spud), and inferring some deliberate, magical mechanism behind it all, would be a leap from the doubtful to the divine, and in this case, Norm feels, unwarranted.

Cliff, however, would have some sympathizers among the proponents of Intelligent Design (ID), whose efforts to influence school science curricula continue to swill large quantities of newspaper ink. As just about everyone is aware, these folks use similar logic to infer a "designer" behind such biological constructions as DNA or the human eye. The apparent complexity of the product is offered as proof of deliberate blueprinting by an unknown creator—conscious action, presumably from outside the universe itself.

What many readers will not know is that SETI research has been offered up in support of Intelligent Design.

**READ THE ENTIRE ARTICLE ON THE SETI AND INTELLIGENT DESIGN IN THE ONLINE COLOR PDF NEWSLETTER.**

# MARS ROVERS UPDATES

## **OPPORTUNITY UPDATE: Stalled Motor, Stowed Arm - sol 649-660, Dec 01, 2005:**

Opportunity drove 43 meters on sol 649 (Nov. 20, 2005) and then bumped 10 meters to an outcrop for work with its robotic arm (instrument deployment device) over the Thanksgiving holidays. Opportunity's commands for sol 654 (Nov. 25, 2005) included unstowing the arm to begin using the tools on it for examining the layered outcrop that the rover had driven to three sols earlier. The arm is always stowed during drives. This time, a shoulder-joint motor that is needed for unstowing the arm stalled, and the arm stayed stowed. In subsequent sols, engineers worked to narrow the range of possibilities for the cause of the stall. Among the remaining possibilities is that, after working more than seven times longer than originally planned, the lubrication is degrading. One possible fix would be to increase the duration of the allowed motor start-up, to overcome the increased initial friction. The first diagnostic activity for the arm was performed sol 659, where a very small motion was recorded. Future diagnostic activities and continuing analysis will be performed to further characterize the shoulder-joint motor in upcoming sols. As of sol 659 (Nov. 30, 2005), Opportunity has driven 6,502 meters (4.04 miles).

## **SPIRIT UPDATE: Downhill Progress - sol 668-680, Dec 01, 2005:**

Spirit is healthy and making good progress downhill. The short-term goal is to drive toward couple of interesting features dubbed "Comanche" and "Miami." A decision on which target to choose for close examination will be made after the drive images come down from sol 680 (Dec. 1, 2005).

Over the Thanksgiving weekend, Spirit used all four devices on its robotic arm -- the alpha particle X-ray spectrometer, the Mössbauer spectrometer, the microscopic imager, and the rock abrasion tool (the brush on the abrasion tool) -- to study an outcrop area called "Seminole. The two targets for use of those tools on this outcrop were informally named "Abiaka" and "Osceola". The names refer to native American tribes in Florida. The investigations of the targets' composition identified abundant olivine and indicated that the outcrop is mafic (bearing a class of usually dark-colored minerals rich in magnesium and iron).

As of sol 679 (Nov. 30, 2005), Spirit has driven 5,463 meters (3.39 miles).

# CASSINI UPDATE

## **Pandora on a String**

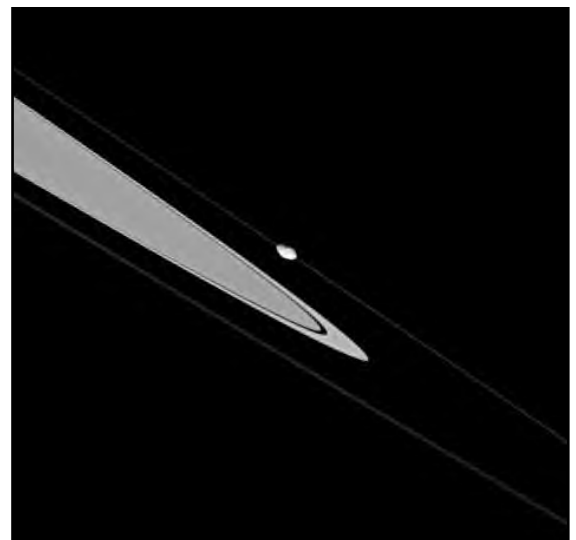
December 7, 2005

This dramatic image shows Saturn's craggy moon Pandora skimming along the F ring's outer edge. Pandora orbits about 1,000 kilometers (620 miles) exterior to the ring, but in this view is projected onto the ring. The moderately high-resolution of the image reveals the moonlet's odd shape. Pandora is 84 kilometers (52 miles) across.

The image was acquired from less than a degree below the ringplane.

The image was taken in visible light with the Cassini spacecraft narrow-angle camera on Oct. 29, 2005, at a distance of approximately 455,000 kilometers (283,000 miles) from Pandora. The image scale is 3 kilometers (2 miles) per pixel.

Credit: NASA/JPL/Space Science Institute



# COLORADO RIVER STAR-STARE

John deems VP

Star date: 11.04.05

Yes Virginia, there are very dark skies at the river. On the forth Martin and myself decided to take the Colorado River Astronomy club up on their invite to the First Annual "Star Stare", and what a grand time we had. The skies were very very dark, transparent to the "T", and the seeing was to die for. Oh and yes Chris it was nice and warm. We met people from the Las Vegas, Phoenix, Mesa, and Blythe clubs, all were nice friendly folks, and the hospitality was out standing. The local club supplied dinner, snacks, drinks and home made egg burritos in mass for breakfast. The trip was easy as it was all on straight paved roads, except for the last \_ of a mile was a maintained dirt road. Although there were a few light domes they did not interfere with the observing, as none reached higher than 8-10 degrees above the horizon. All in all I believe we, as a club, should make plans to attend this star party next year, and maybe even coordinating a deep winter star party with the Colorado River club this winter, I know for me it is well worth the trip!

## An Invitation To Join

### The San Bernardino Valley Amateur Astronomers

- Monthly Meetings/Speakers
- Monthly Star Party
- The Observer Newsletter
- Learn about Astronomy
- Learn about Telescopes
- Learn about Astrophotography

Fill out and mail this form along with \$30.00 Annual Membership Fee. Add an additional \$33.00 to include a one (1) year subscription to "Sky and Telescope" magazine and or \$29.00 for one (1) year subscription to "Astronomy" Magazine.

Make check payable to: San Bernardino Valley Amateur Astronomers.

Mail to: **Fidel Hernandez, SBVAA Treasurer,  
27799 21st St, Highland, CA, 92346**

Name \_\_\_\_\_

Address \_\_\_\_\_

City and State \_\_\_\_\_

Zip \_\_\_\_\_ Phone \_\_\_\_\_

Internet E-mail Address \_\_\_\_\_

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What many readers will not know is that SETI research has been offered up in support of Intelligent Design.

The way this happens is as follows. When ID advocates posit that DNA—which is a complicated, molecular blueprint—is solid evidence for a designer, most scientists are unconvinced. They counter that the structure of this biological building block is the result of self-organization via evolution, and not a proof of deliberate engineering. DNA, the researchers will protest, is no more a consciously constructed system than Jupiter's Great Red Spot. Organized complexity, in other words, is not enough to infer design.

But the adherents of Intelligent Design protest the protest. They point to SETI and say, "upon receiving a complex radio signal from space, SETI researchers will claim it as proof that intelligent life resides in the neighborhood of a distant star. Thus, isn't their search completely analogous to our own

line of reasoning—a clear case of complexity implying intelligence and deliberate design?" And SETI, they would note, enjoys widespread scientific acceptance.

If we as SETI researchers admit this is so, it sounds as if we're guilty of promoting a logical double standard. If the ID folks aren't allowed to claim intelligent design when pointing to DNA, how can we hope to claim intelligent design on the basis of a complex radio signal? It's true that SETI is well regarded by the scientific community, but is that simply because we don't suggest that the voice behind the microphone could be God?

### Simple Signals

In fact, the signals actually sought by today's SETI searches are not complex, as the ID advocates assume. We're not looking for intricately coded messages, mathematical series, or even the aliens' version of "I Love Lucy." Our instruments are largely insensitive to the modulation—or message—that might be conveyed by an extraterrestrial broadcast. A SETI radio signal of the type we could actually find would be a persistent, narrow-band whistle. Such a simple phenomenon appears to lack just about any degree of structure, although if it originates on a planet, we should see periodic Doppler effects as the world bearing the transmitter rotates and orbits.

And yet we still advertise that, were we to find such a signal, we could reasonably conclude that there was intelligence behind it. It sounds as if this strengthens the argument made by the ID proponents. Our sought-after signal is hardly complex, and yet we're still going to say that we've found extraterrestrials. If we can get away with that, why can't they?

Well, it's because the credibility of the evidence is not predicated on its complexity. If SETI were to announce that we're not alone because it had detected a signal, it would be on the basis of artificiality. An endless, sinusoidal signal – a dead simple tone – is not complex; it's artificial. Such a tone just doesn't seem to be generated by natural astrophysical processes. In addition, and unlike other radio emissions produced by the cosmos, such a signal is devoid of the appendages and inefficiencies nature always seems to add – for example, DNA's junk and redundancy.

## SETI and Intelligent Design(cont)

Consider pulsars – stellar objects that flash light and radio waves into space with impressive regularity. Pulsars were briefly tagged with the moniker LGM (Little Green Men) upon their discovery in 1967. Of course, these little men didn't have much to say. Regular pulses don't convey any information—no more than the ticking of a clock. But the real kicker is something else: inefficiency. Pulsars flash over the entire spectrum. No matter where you tune your radio telescope, the pulsar can be heard. That's bad design, because if the pulses were intended to convey some sort of message, it would be enormously more efficient (in terms of energy costs) to confine the signal to a very narrow band. Even the most efficient natural radio emitters, interstellar clouds of gas known as masers, are profligate. Their steady signals splash over hundreds of times more radio band than the type of transmissions sought by SETI.

Imagine bright reflections of the Sun flashing off Lake Victoria, and seen from great distance. These would be similar to pulsar signals: highly regular (once every 24 hours), and visible in preferred directions, but occupying a wide chunk of the optical spectrum. It's not a very good hailing-signal or communications device. Lightning bolts are another example. They produce pulses of both light and radio, but the broadcast extends over just about the whole electromagnetic spectrum. That sort of bad engineering is easily recognized and laid at nature's door. Nature, for its part, seems unoffended.

Junk, redundancy, and inefficiency characterize astrophysical signals. It seems they characterize cells and sea lions, too. These biological constructions have lots of superfluous and redundant parts, and are a long way from being optimally built or operated. They also resemble lots of other things that may be either contemporaries or historical precedents.

So that's one point: the signals SETI seeks are really not like other examples drawn from the bestiary of complex astrophysical phenomena. That speaks to their artificiality.

### The Importance of Setting

There's another hallmark of artificiality we consider in SETI, and it's context. Where is the signal found? Our searches often concentrate on nearby Sun-like star systems – the very type of astronomical

locale we believe most likely to harbor Earth-size planets awash in liquid water. That's where we hope to find a signal. The physics of solar systems is that of hot plasmas (stars), cool hydrocarbon gasses (big planets), and cold rock (small planets). These do not produce, so far as we can either theorize or observe, monochromatic radio signals belched into space with powers of ten billion watts or more—the type of signal we look for in SETI experiments. It's hard to imagine how they would do this, and observations confirm that it just doesn't seem to be their thing.

Context is important, crucially important. Imagine that we should spy a giant, green square in one of these neighboring solar systems. That would surely meet our criteria for artificiality. But a square is not overly complex. Only in the context of finding it in someone's solar system does its minimum complexity become indicative of intelligence.

In archaeology, context is the basis of many discoveries that are imputed to the deliberate workings of intelligence. If I find a rock chipped in such a way as to give it a sharp edge, and the discovery is made in a cave, I am seduced into ascribing this to tool use by distant, fetid and furry ancestors. It is the context of the cave that makes this assumption far more likely than an alternative scenario in which I assume that the random grinding and splitting of rock has resulted in this useful geometry.

In short, the champions of Intelligent Design make two mistakes when they claim that the SETI enterprise is logically similar to their own: First, they assume that we are looking for messages, and judging our discovery on the basis of message content, whether understood or not. In fact, we're on the lookout for very simple signals. That's mostly a technical misunderstanding. But their second assumption, derived from the first, that complexity would imply intelligence, is also wrong. We seek artificiality, which is an organized and optimized signal coming from an astronomical environment from which neither it nor anything like it is either expected or observed: Very modest complexity, found out of context. This is clearly nothing like looking at DNA's chemical make-up and deducing the work of a supernatural biochemist.

## Spray Above Enceladus



November 28, 2005

A fine spray of small, icy particles emanating from the warm, geologically unique province surrounding the south pole of Saturn's moon Enceladus was observed in a Cassini narrow-angle camera image of the crescent moon taken on Jan. 16, 2005.

Taken from a high phase angle of 148 degrees - a viewing geometry in which small particles become much easier to see - the plume of material becomes more apparent in images processed to enhance faint signals.

Imaging scientists have measured the light scattered by the plume's particles to determine their abundance and fall-off with height. Though the measurements of particle abundance are more certain within 100 kilometers (60 miles) of the surface, the values measured there are roughly consistent with the abundance of water ice particles made by other Cassini instruments (reported in September 2005) at altitudes as high as 400 kilometers (250 miles) above the surface.

At present, it is not clear if the plume particles emanating from the south pole arises because of water vapor escaping from warm ice that is exposed to the surface. Another possibility is that at some depth beneath the surface, the temperatures are hot enough for water to become liquid, which then, under pressure, escapes to the surface like a cold Yellowstone geyser.

The image at the left was taken in visible green light. A dark mask was applied to the moon's bright limb to make the plume feature easier to see.

The image at the right has been color-coded to make faint signals in the plume more apparent. Images of other moons, such as Tethys and Mimas, taken in the last 10 months from similar lighting and viewing geometries, and with identical camera parameters, were closely examined to demonstrate that the plume towering above Enceladus' south pole is real and not a camera artifact.

The images were acquired at a distance of about 209,400 kilometers (130,100 miles) from Enceladus. Image scale is about 1 kilometer (0.6 mile) per pixel.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington, D.C. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging operations center is based at the Space Science Institute in Boulder, Colo.

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Credit: NASA/JPL/Space Science Institute



## Voices from the Cacophony

By Trudy E. Bell and Dr. Tony Phillips

Around 2015, NASA and the European Space Agency plan to launch one of the biggest and most exacting space experiments ever flown: LISA, the Laser Interferometer Space Antenna.

LISA will consist of three spacecraft flying in a triangular formation behind Earth. Each spacecraft will beam a laser at the other two, continuously measuring their mutual separation. The spacecraft will be a mind-boggling 5 million kilometers apart (12 times the Earth-Moon distance) yet they will monitor their mutual separation to one billionth of a centimeter, smaller than an atom's diameter.

LISA's mission is to detect gravitational waves—ripples in space-time caused by the Universe's most violent events: galaxies colliding with other galaxies, supermassive black holes gobbling each other, and even echoes still ricocheting from the Big Bang that created the Universe. By studying the shape, frequency, and timing of gravitational waves, astronomers believe they can learn what's happening deep inside these acts of celestial violence.

The problem is, no one has ever directly detected gravitational waves: they're still a theoretical prediction. So no one truly knows what they "sound" like.

Furthermore, theorists expect the Universe to be booming with thousands of sources of gravitational waves. Unlike a regular telescope that can point to one part of the sky at a time, LISA receives gravitational waves from many directions at once. It's a cacophony. Astronomers must figure how to distinguish one signal from another. An outburst is detected! Was it caused by two neutron stars colliding over here or a pair of supermassive black holes tearing each other apart in colliding galaxies over there?

"It's a profound data-analysis problem that ground-based astronomers don't encounter," says E. Sterl Phinney, professor of theoretical physics at the California Institute of Technology in Pasadena.

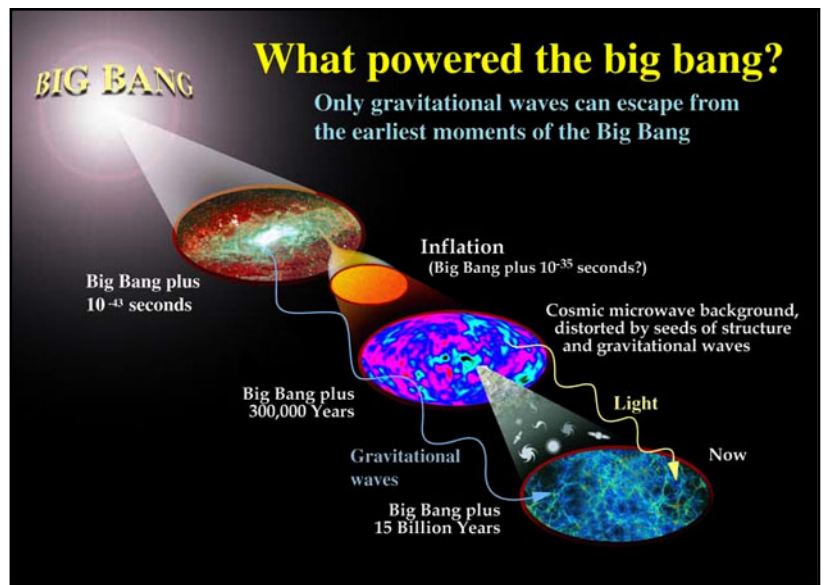
Profound, but not hopeless: "We have lots of good ideas and plans that work—in theory," he says. "The goal now is to prove that they actually work under real conditions, and to make sure we haven't forgotten something."

To that end, theorists and instrument-designers have been spending time together brainstorming, testing ideas, scrutinizing plans, figuring out how they'll pluck individual voices from the cacophony. And they're making progress on computer codes to do the job.

Says Bonny Schumaker, a member of the LISA team at the Jet Propulsion Laboratory: "It's a challenge more than a problem, and in fact, when overcome, a gift of information from the universe."

For more info about LISA, see [lisa.nasa.gov](http://lisa.nasa.gov). Kids can learn about black holes and play the new "Black Hole Rescue!" game on The Space Place Web site at <http://spaceplace.nasa.gov/en/kids/blackhole/>.

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



LISA will be able to detect gravitational waves from as far back as  $10^{-36}$  second after the Big Bang, far earlier than any telescope can detect.

## MEMBER GALLERY: JERRY DAY



Subject: FW: Night pics - Alabama Hills

Best thing about this digital camera is that you see the results almost immediately, unlike film. You can learn from & correct your mistakes or improve technique rapidly. Closest you could come with film would be to work in parallel with a Polaroid. Also, in compari-

son with film, Kodak 160T, in this case, the digital wins - shorter exposures (4 min, ISO 100, f/5.6 digital vs. normal 5 min, ISO 160, f/5.6 film) for these near-full moonlit conditions. Digital records the light painting so much more effectively & vibrantly than the film. On the brink of a true Renaissance in photography... Jerry



**Note: New Calender of Events  
will appear in January, 2006 Newsletter.**

See Tom Lawson, Star Party Coordinator,  
to receive club online updates and color PDF Newsletter.

## **Holiday Get-Together Party**

**December 10, 2004**

**2:00PM--6:00PM**

**Roberto's Italian Dining and Pizza  
Highland, CA**

**-White Elephant Gift (\$20.00) Exchange-**



**SAN BERNARDINO VALLEY  
AMATEUR ASTRONOMERS**

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Ste 17  
Riverside, Ca 92501