Current Astronomy

NOVEMBER
2005

RIVER BEND ASTRONOMY CLUB NEWSLETTER

Millions of ice crystals glint from high altitude (3 to 5 miles) cirrostratus haze, forming a Sun halo on September 24. Even in the hottest of climates, cold clouds contain ice crystals that refract (bend) light. PHOTO BY MARK BROWN

California Dreamin'

Member represents club during JPL open house

BY MARK BROWN

River Bend Astronomy Club (RBAC) was one of over 175 clubs that logged at least five NASA Night Sky Network outreach events in 2004. In January, 2005, RBAC was one of five clubs to win a trip to the Jet Propulsion Laboratory (JPL) Open House weekend (May 13–15). RBAC selected me, as outreach coordinator, to be the lucky traveler.

It was a dream trip for an amateur astronomer interested in the space program and science education. As a guest of the Astronomical Society of the Pacific (ASP), I had the opportunity to meet NASA scientists and take a personal tour of JPL and the Mount Wilson Observatories. I joined individuals from four other clubs: Dave Hutchison, Texas Astronomical Society of Dallas; Doug Decker, Starlight Astronomy Club of Altoona, Pennsylvania; Reagan Herman, Amarillo Astronomy Club of Texas; and Becky Lowder, Statesboro Astronomy Club of Georgia. Here is my story:

May 13, 2005 I took an early morning flight from St. Louis to Burbank — it was Friday the 13th, and my first flight after 9/11. I arrived safely and met up with Reagan Herman at the baggage claim. Marni Berendsen of the ASP arrived moments later with a car and off we went to the hotel to greet folks from the other clubs. We did our introductions, grabbed lunch and made our way to JPL. When we arrived the place was bustling with activity. Booths, exhibits and demonstrations were being set up. Among the exhibits were the search for extra-solar planets, the Mars Rovers, and the Cassini mission to Saturn. Over 50,000 visitors were expected to attend the event. Because we arrived a day early, we received a behind-the-scenes tour of JPL. A few NASA scientists and engineers were waiting to greet us and our treatment was celebrity-like.

Activity in the Deep Space Operations room (Mission Control) at JPL

Pictured from left to right: Richard Alvidrez, Chris Lowder, Doug Decker, Reagan Herman, Dave Hutchison, Mark Brown, Becky Lowder, and Dr. Michelle Thaller (front) — SIM project scientist.

After we got credentials, we were escorted through a maze of hallways in several secure buildings. We saw where JPL's ongoing research and space exploration is conducted and learned of the Laboratory's many accomplishments. Richard Alvidrez who works in JPLs education office acted as our tour guide. Later, we were joined by Steve Edberg, a NASA scientist and astronomer on the Space Interferometry Mission (SIM). Both were extremely enthusiastic about their work and thrilled that amateur astronomers around the country were taking part in outreach programs.

During the tour we saw some of the clean rooms where spacecraft components and electronics are designed. We learned that there are different levels of cleanliness when putting a spacecraft together. From outside the glass windows, we observed working scientists and engineers dressed in "bunny suits" to preserve the clean nature of the laboratory. We saw computerized robots working feverishly to place circuitry on components less than a millimeter in diameter. Photographs were not allowed in this part of the laboratory due to the security level. We then made our way into the Spacecraft Assembly Facility and walked floors where Cassini, Mars Pathfinder, and the Mars Exploration Rovers had been assembled. We also visited the Project Design Center, Spacecraft Fabrication Facility and the Deep Space Operations Center (Mission Control).

Next we walked to the Mars Exploration Rover Test Bed Facility. This is where JPL scientists and engineers work with the full model mock-ups of the Mars rovers. This was probably the most exciting part of the tour because prior to our visit the Opportunity rover on Mars had plowed into a 15-inch dune and gotten stuck for several weeks. We were able to watch and observe the engineers placing the rover model into various configurations to mimic the conditions on the Martian landscape and dune. Engineers were using materials such as diatomaceous earth, kitty litter, soda ash, and talcum powder. The dust was so fine in the facility that the walls, light fixtures and air ducts were caked with the material. The engineers had to use breathing masks so they wouldn't inhale the fine particles.

Our three-plus hour tour of the Disneyland-sized complex ended and we returned to the hotel, which was situated in downtown Pasadena and within walking distance of several restaurants. Marni Berendsen had already made reservations at Café Santorini — an open-air Mediterranean restaurant. She invited Richard Alvidrez and Steve Edberg for dinner. In addition, Stephen Gillam who is the Cassini program and PlanetQuest Public Engagement scientist at JPL joined us. It was quite fitting to be sitting at dinner with Jupiter, Saturn and the crescent moon hovering over us and to converse with scientists who've worked on the Galileo, Cassini, and SIM projects/missions. Over dinner, conversational topics varied and some even led to friendly bickering between the scientists about what the "rocks" really were on the surface of Titan. They still do not completely know the answer but have some very clever hypothesis. We'll have to stay tuned.

May 14, 2005 We awoke early the next day, ate breakfast and traveled back to JPL to attend the open house. The original plan was for the members of the five participating clubs to take part in public outreach during open house and conduct demonstrations with the Night Sky Network kits. However, due to security issues and red tape, JPL decided that their staff would conduct the demonstrations and engage the public. Oh well. As such, we were left to explore the hundreds of exhibits and shows on the JPL grounds at our leisure. That gave us more time to shop for souvenirs, take photos and talk with the scientists. It was a fabulous day.

The Santa Barbara Astronomical Unit (SBAU) had invited us to their monthly public star party held at the Santa Barbara Museum of Natural History — a two-hour trip from Pasadena. During our drive we found

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our way through coastal communities nestled alongside the Pacific Ocean. For some it was the highlight of their trip seeing the Pacific Ocean for the first time. We arrived at the museum and spent hours inside the newly renovated Gladwin Planetarium. Becky Lowder and myself were the planetarians of the group and very interested in some of the programming that went on in their facility.

The planetarium uses the Digistar 3 SP projector for their simulated night sky. As with all projectors, it has limitations. The biggest drawback of the Digistars is that they are digital — stars on the dome appear pixelated and larger than they are in the sky. You can really tell the difference between a golf ball-sized Digistar star and a pinpoint star from the Zeiss Mark IX in the McDonnell Planetarium. However, the 3D animations and graphics of the Digistar's all-dome technology were incredible. It all depends on how the facility wants to use the projector and how much money can be spent on equipment.

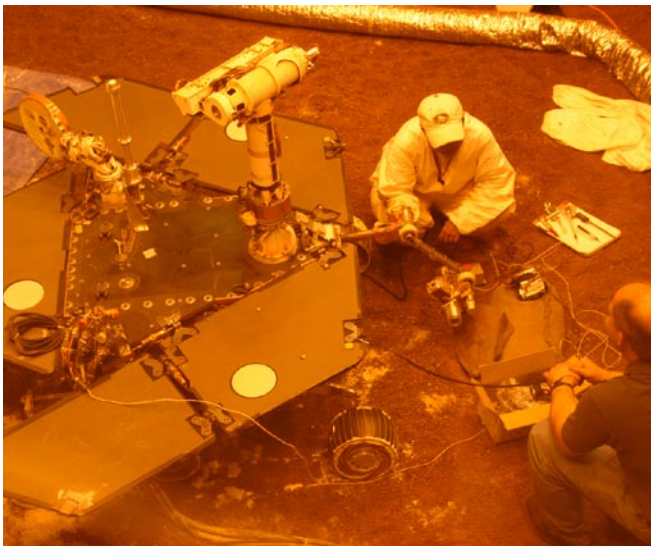
We spent more time than anticipated in the planetarium and didn't have time for a nice sit-down dinner. So, we grabbed some deli sandwiches and made our way to the beach. We were anticipating seeing a beautiful Pacific sunset, but there's one thing you have to realize about Santa Barbara, they are located on a protruding point off the California Coast. As such, we were actually looking southeast out over the ocean and were unable to see the setting sun. That will certainly get your bearings mixed up. We did manage to get a couple of images of sunset over the palm trees and the city of Santa Barbara.

After our time on the beach, we returned to the museum to meet up with SBAU. Chuck McPartlin, club president welcomed our group and invited us to enjoy a few hours of observing and mingling with their members. We also received an introduction to a new NSN kit due to be released this fall. Although we were dealing with a nearly first quarter moon, I was surprised at how dark the skies were from Santa Barbara and able to see some favorite Messier objects. We saw a number of satellite passes including one that brightened to at least magnitude –9! It was part of a satellite pair making a trek from north to south. After searching for the satellites on a variety of websites and not finding any information, we concluded it was part of a Navy reconnaissance program that kept watch on the Pacific coast.

During that same weekend a very large CME (coronal mass ejection) was making its way toward Earth and an aurora warning had been issued for the mid-latitudes. At 9:30 p.m. I thought I saw the tale-tale signs of an aurora which looked like pillars stretching from the northern sky to the zenith. I snapped a few pictures which I dismissed as airplane contrails. (The CME did indeed impact shortly before midnight PDT and auroras were seen as far south as San Diego.)

It had been a long day both at JPL and in Santa Barbara. We traveled back to Pasadena to rest for our trip to Mount Wilson.

Next: The journey to Mount Wilson.



Mars Rover (Opportunity) mock-up undergoing tests by JPL engineers.

NASA Space Place

BY TRUDY E. BELL

A wrinkle in space-time

When a massive star reaches the end of its life, it can explode into a supernova rivaling the brilliance of an entire galaxy. What's left of the star fades in weeks, but its outer layers expand through space as a turbulent cloud of gases. Astronomers see beautiful remnants from past supernovas all around the sky, one of the most famous being the Crab Nebula in Taurus.

When a star throws off nine-tenths of its mass in a supernova, however, it also throws off nine-tenths of its gravitational field.

Astronomers see the light from supernovas. Can they also somehow sense the sudden and dramatic change in the exploding star's gravitational field?

Yes, they believe they can. According to Einstein's general theory of relativity, changes in the star's gravitational field should propagate outward, just like light — indeed, at the speed of light. Those propagating changes would be a gravitational wave.

Einstein said what we feel as a gravitational field arises from the fact that huge masses curve space and time. The more massive an object, the more it bends the three dimensions of space and the fourth dimension of time. And if a massive object's gravitational field changes suddenly — say, when a star explodes — it should kink or wrinkle the very geometry of space-time. Moreover, that wrinkle should propagate outward like ripples radiating outward in a pond from a thrown stone.

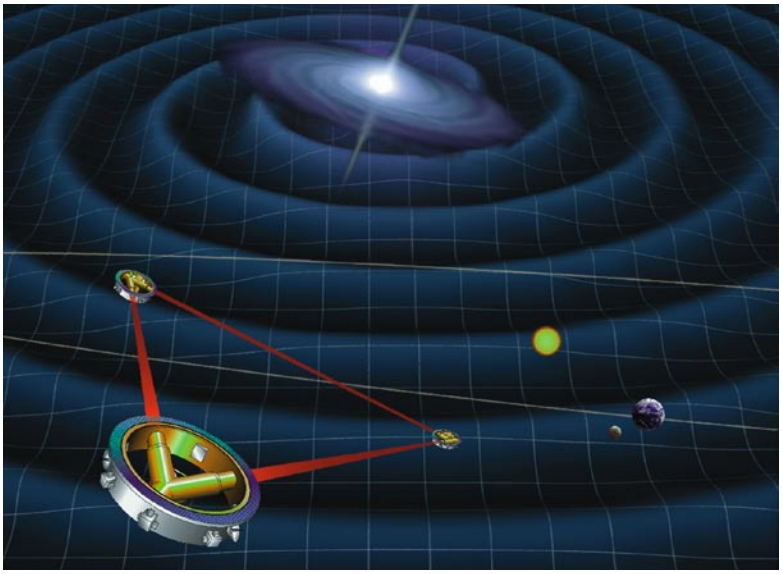
The frequency and timing of gravitational waves should reveal what's happening deep inside a supernova, in contrast to light, which is radiated from the surface. Thus, gravitational waves allow astronomers to peer inside the universe's most violent events — like doctors peer at patients' internal organs using CAT scans. The technique is not limited to supernovas: colliding neutron stars, black holes and other exotic objects may be revealed, too.

NASA and the European Space Agency are now building prototype equipment for the first space experiment to measure gravitational waves: the Laser Interferometer Space Antenna, or LISA.

LISA will look for patterns of compression and stretching in space-time that signal the passage of a gravitational wave. Three small spacecraft will fly in a triangular formation behind the Earth, each beaming a laser at the other two, continuously measuring their mutual separation. Although the three craft will be 5 million kilometers apart, they will monitor their separation to one billionth of a centimeter, smaller than an atom's diameter, which is the kind of precision needed to sense these elusive waves.

LISA is slated for launch around 2015.

To learn more about LISA, go to http://lisa.jpl.nasa.gov. Kids can learn about LISA and do a gravitational wave interactive crossword at http://spaceplace.nasa.gov/en/kids/lisaxword/lisaxword.shtml.



LISA's three spacecraft will be positioned at the corners of a triangle 5 million kilometers on a side and will be able to detect gravitational wave induced changes in their separation distance of as little as one billionth of a centimeter.

The River's Edge

BY TERRY MENZ

Different venue offers a mostly dark sky

OCTOBER 1, 2005 The club met for the first time at the home of Jeff and Terry Menz.

BACK IN THE SADDLE AGAIN Reminiscent of his former teaching role at Greenville College, Jamie gave a great constellation tour of the sky to club visitors, Dan Chamberlin and his son Zach, and Zach's friend Logan, both 6th graders at Signal Hill School. Zach is working on his Boy Scout Badge and sought out RBAC as a venue to earn his merit badge. Both boys were eager listeners, interested, attentive, and very polite. It was a delight to have them at our meeting. Dan was able to gather insights from members on what to look for in a good telescope for his son. Byron Barker gave the boys the opportunity to operate his Orion Intelliscope, as well.

ALL IN A DAY'S WORK Jeff Sjoquist, an officer in the Air National Guard, related his experience flying supplies into Katrina ravaged Louisiana. His mission was to fly MREs and water into the area; however, he was skeptical as he approached the pitch black airstrip as to whether he would have runway lights! Fortunately, he did see some barely visible lights to help him land safely! Thanks Jeff, for all you do! And thanks also to Bruce Kryfka, who we were told fixes the airplanes that Jeff breaks!

WHO'S EXPECTING? Bruce Kryfka is expecting his new Celestron CPC1100 GPS in December, and can't wait to take it for a spin! Bruce was happy to make such a "long" drive to attend the meeting, just to escape Wal-Mart's lights! (Bruce also lives in Highland).

IT'S A SMALL WORLD AFTER ALL... After a successful evening of stargazing, the group gathered for refreshments and conversation. Randy Brown mentioned that his roommate in flight training school was from Highland, but he had long ago lost track of him. As it turns out, Randy went to Air Force flight school with Byron's best man and Jeff Menz's childhood neighbor! Randy brought along his daughter Erica, who shared her impressions of the Kitt Observatory with Terry.

A NIGHT TO REMEMBER

"What a great night for viewing. Thanks to Jeff and Terry for their hospitaliy and the use of their "observatory" grounds. When my new telescope shows up (hopefully in December) I'll have to make another trip up there and try it out." — ***Bruce Kryfka***

"The Menz's yard is a really nice location for a meeting. It's large and has a great view to all locations except West, because of the skyglow from Highland. The excellent viewing to the North, South and East more than makes up for what you lose to the West." — ***Jamie Goggin***

"I don't get to make it to too many meetings lately, but was able to attend last evening. It was a great night. Jamie did a great job with his sky tour. Mars was a big hit and as it got later we began to pick up some details. M31 was also wonderful late in the evening. The weather held off until we quit (around 12:30) even though we could see the clouds off to the west right from the start of the meeting. Thanks again to Jeff and Terry for a great night." — ***Jeff Sjoquist***

LOOKING UP/LOOKING DOWN The skies were wonderfully cooperative as club members viewed objects like the Ring, Dumbell, and Blinking Nebulas; and M31, M33, and M13. Those who cast their eyes in the direction of the Earth were treated with the sight of numerous glowworms…both the small insect-size as well as the child-size varieties (equipped with glow sticks of various colors)! In all, there were eight adults and six children present…a pretty good showing considering all of the scheduling conflicts!

November 2005

October 2005

S	M	T	W	T	F	S
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

December 2005

S	M	T	W	T	F	S
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Holidays | Moon Phases | RBAC | Space Mission | Observing | Trivia

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30 DST ends	31 Halloween	1 New Moon 7:25 p.m.	2 Harlow Shapley's 120th B.D.	3 Mercury E. Elongation Venus E. Elongation	4 Taurids at max 4th –7th	5 Venus close to crescent moon RBAC meeting 7 p.m.
6 Mars at opposition	7	8 Election Day First quarter 7:57 p.m.	9	10 35th ann. Luna 17	11 Veteran's Day MARS VIEWING, ST. JACOB PARK, 7 P.M.	12 25th ann. Voyager 1 Saturn flyby MARS VIEWING, RAIN DATE
13	14 Mars close to moon	15 Full Moon 6: 58 p.m. (Called the Frost Moon)	16	17 Leonids peak at 13: 17 UT	18	19
20 Spirit on Mars for 1 year	21	22	23 Last quarter 4:12 p.m.	24 Thanks-giving	25	26 Cassini: Rhea flyby
27	28	29	30	1 New Moon 9:01 a.m.	2	3 RBAC meeting 7 p.m.

CALENDAR BY ED CUNNIUS

RIVER BEND ASTRONOMY CLUB

***River Bend Astronomy Club** serves astronomy enthusiasts of the American Bottom region, the Mississippi River bluffs and beyond, fostering observation, education and a spirit of camaraderie.*

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Affiliated with the Astronomical League, dedicated to fostering astronomical education, providing incentives for astronomical observation and research, and assisting communication among amateur astronomical societies.
www.astroleague.org

Affiliated with the NASA Night Sky Network, a nationwide coalition of amateur astronomy clubs bringing the science, technology and inspiration of NASA's missions to the general public.
nightsky.jpl.nasa.gov

Current Astronomy CLUB NEWSLETTER

EDITOR	Eric Young younger@wustl.edu

Monthly Meeting

Saturday, November 5th, 2005 • 7:00 p.m.

132 Jessica Drive, St. Jacob, IL 62281 Phone 618/644-2308

Next meeting: December 3rd

Mars viewing • St. Jacob Park • November 11th

Looked up lately?

Join River Bend Astronomy Club

Want to learn more about astronomy? The members of River Bend Astronomy Club invite you to join. You won't need expensive tools or special skills — just a passion for observing the natural world.

• Meetings offer learning, peeks through great telescopes and fun under the stars.

• You will receive the club newsletter, *Current Astronomy*, packed with news and photos.

• Get connected with our member-only web site and discussion group.

• Borrow from the club's multimedia library.

• And that's not all! Through club membership you also join the Astronomical League, with its special programs and a colorful quarterly newsletter to enrich your hobby.

We meet monthly, observe regularly, e-mail news and quips constantly, and generally have a good time. Won't you join us?

Name(s) _____

Address _____

City _____ State _____ Zip _____

Phone (Day)_____ (Evening)_____

Email address (to receive club news and information):

_____

Where did you hear of our club?

_____

How long have you been interested in astronomy? _____

Do you have optical equipment? ___ Telescope ___ Binoculars

Are you afraid of the dark? ___ Yes ___ No (just kidding)

I am submitting my application for:

_____ Adult membership(s) @ $20.00/year (18 years or older)

_____ Youth membership(s) @ $15.00/year (under 18)

I enclose a check for a total of $_____
made out to "Mike Veith, Treasurer, RBAC."

Signature _____

Date _____

River Bend Astronomy Club
c/o Gary Kronk, 132 Jessica Drive, St. Jacob, IL 62281
web: riverbendastro.org e-mail: riverbendastro@charter.net

AUGUST 05