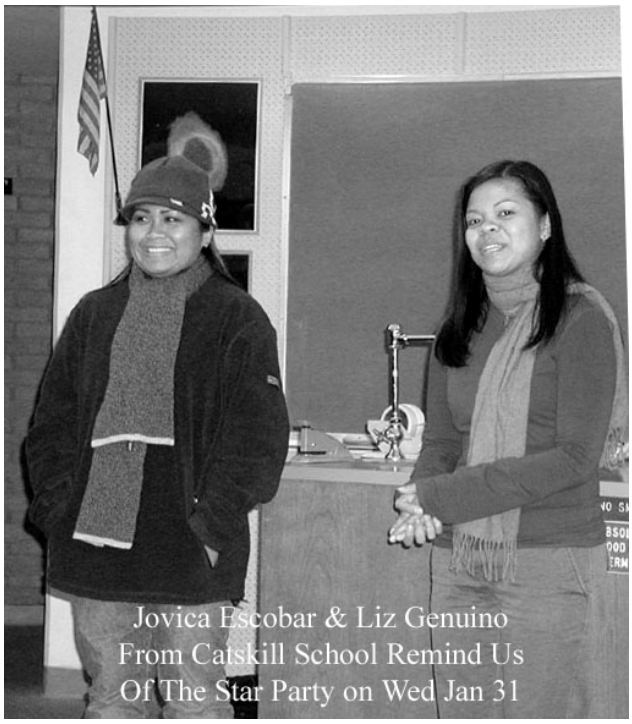
FIRST LIGHT

Journal of the South Bay Astronomical Society – February 2007
on line at www.geocities.com/sbas_elcamino

Monthly General Meeting: Friday, February, 2nd, 7:30 PM

"TBA"

The January 12 Meeting



Jovica Escobar & Liz Genuino
From Catskill School Remind Us
Of The Star Party on Wed Jan 31

President Ken Rossi opened the meeting at 7:35 by welcoming two newcomers, and introducing two teachers from Catskill Elementary School. The teachers described the enthusiasm that their students have for using telescopes, and President Rossi asked for volunteers for the upcoming star night at Catskill. Dr. Perry Hacking reminded members of the telescope-making class that he has scheduled for the spring semester at El Camino College, and invited them to enroll.

Steven Morris reported observing the Mercury-Mars-Jupiter conjunction in the dawn sky last month, and observing the December 14 rocket launch of a military reconnaissance satellite from the Vandenberg Air Force Base, seen from Wilmington. Two members reported seeing Comet McNaught as clearly visible to the naked eye low in the southwest, soon after sunset.

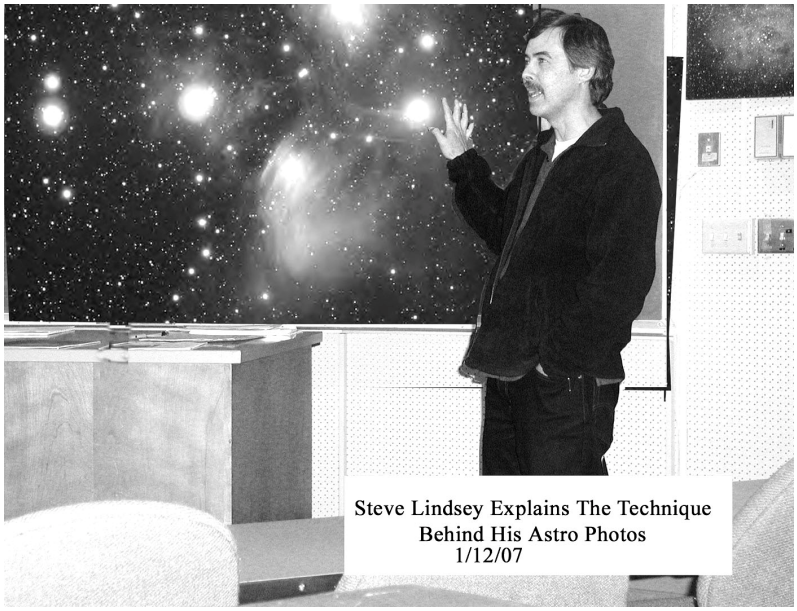
After a ten-minute break for socializing, President Rossi introduced Steven Lindsey as the night's featured speaker, on "Astrophotography". The simplest way to photograph the sky is to leave a camera pointed upwards with its shutter open. The stars slowly move across the sky, and the resulting image of star trails can be quite attractive. The next level of difficulty comes from piggybacking the camera on the back of an equatorial telescope. With the camera firmly fixed to a telescope that tracks the stars in their courses, each star forms a dot instead of a trail. Such constellation pictures show much more detail than the star-trail pictures, and Steven Lindsey showed some very nice examples taken with his Nikon 50-mm camera of Leo, Orion and the Milky Way.

Prime-focus photography places the film at the focal-point of the telescope objective, using the light-gathering power and superior resolution of the telescope instead of just its ability to follow the stars. The drawback is that you now have to track the stars very accurately to avoid blurred images. To photograph faint objects, various types of specialty films can be used, along with techniques such as hypering to make the film more sensitive. Another technique is eyepiece projection, in which the light is allowed to pass through the eyepiece before being photographed. This works best on planets, which have high surface brightness but very small angular size.

The next step along the path to advanced astrophotography is the transition from film to digital cameras and CCD's. These electronic devices and the powerful computer software available on modern high-speed computers to process the images has lead to a revolution in the quality of work done by amateurs in the last decade. Instead of taking a

single multi-hour exposure, many short exposures can be stacked in the computer to reduce image noise. Some of the disadvantages of CCD's such as hot pixels and uneven sensitivity can be overcome by obtaining dark frames (with zero illumination)and flat frames (with uniform illumination), and including them in the computer processing.

Steven Lindsey ended his presentation by showing some of his photographs of the Veil Nebula, the Pleiades nebulosity and the Orion Nebula that rival the images produced by professional astronomers a generation ago. Subtle nuances of color and detail add to the beauty of these objects, and are well worth capturing by astrophotographers with patience and skill at the telescope and the computer terminal.



Steve Lindsey Explains The Technique Behind His Astro Photos
1/12/07

After a question-and-answer period, President Rossi ended the meeting at 9:30.

- Dr. Steven Morris

A Great Big Wreck

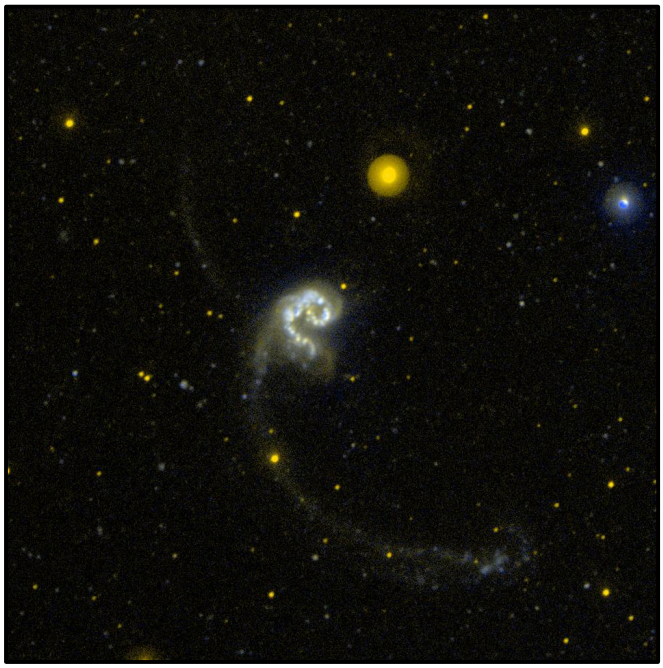
by Dr. Tony Phillips

People worry about asteroids. Being hit by a space rock can really ruin your day. But that's nothing. How would you like to be hit by a whole galaxy?

It could happen. Astronomers have long known that the Andromeda Galaxy is on a collision course with the Milky Way. In about 3 billion years, the two great star systems will crash together. Earth will be in the middle of the biggest wreck in our part of the Universe.

Astronomer John Hibbard isn't worried. "Galaxy collisions aren't so bad," he says. A typical spiral galaxy contains a hundred billion stars, yet when two such behemoths run into each other "very few stars collide. The stars are like pinpricks with lots of space between them. The chance of a direct hit, star vs. star, is very low."

Hibbard knows because he studies colliding galaxies, particularly a nearby pair called the Antennae. "The two galaxies of the Antennae system are about the same size and type as Andromeda and the Milky Way." He believes that the Antennae are giving us a preview of what's going to happen to our own galaxy.



This GALEX UV image of the colliding Antennae Galaxies shows areas of active star formation, which is not in the tidal tails as one might expect.

The Antennae get their name from two vast streamers of stars that resemble the feelers on top of an insect's head. These streamers, called "tidal tails," are created by

gravitational forces—one galaxy pulling stars from the other. The tails appear to be scenes of incredible violence.

But looks can be deceiving: “Actually, the tails are quiet places,” says Hibbard. “They’re the peaceful suburbs of the Antennae.” He came to this conclusion using data from GALEX, an ultraviolet space telescope launched by NASA in 2003.

The true violence of colliding galaxies is star formation. While individual stars rarely collide, vast interstellar clouds of gas *do* smash together. These clouds collapse. Gravity pulls the infalling gas into denser knots until, finally, new stars are born. Young stars are difficult to be around. They emit intensely unpleasant radiation and tend to “go supernova.”

GALEX can pinpoint hot young stars by the UV radiation they emit and, in combination with other data, measure the rate of star birth. “Surprisingly,” Hibbard says, “star formation rates are low in the tidal tails, several times lower than what we experience here in the Milky Way.” The merging cores of the Antennae, on the other hand, are sizzling with new stars, ready to explode.

So what should you do when *your* galaxy collides? A tip from GALEX: head for the tails.

To see more GALEX images, visit www.galex.caltech.edu. Kids can read about galaxies and how a telescope can be a time machine at spaceplace.nasa.gov/en/educators/galex_puzzles.pdf.\

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

NASA Telescope Picks Up Glow of Universe's First Objects

New observations from NASA's Spitzer Space Telescope strongly suggest that infrared light detected in a prior study originated from clumps of the very first objects of the universe. The recent data indicate this patchy light is splattered across the entire sky and comes from clusters of bright, monstrous objects more than 13 billion$ light-years away.

"We are pushing our telescopes to the limit and are tantalizingly close to getting a clear picture of the very first collections of objects," said Dr. Alexander Kashlinsky of NASA's Goddard Space Flight Center, Greenbelt, Md., lead author on two reports to appear in the Astrophysical Journal Letters. "Whatever these objects are, they are intrinsically incredibly bright and very different from anything in existence today.

Astronomers believe the objects are either the first stars -- humongous stars more than 1,000 times the mass of our sun – or voracious black holes that are consuming gas and spilling out tons of energy. If the objects are stars, then the observed clusters might be the first mini-galaxies containing a mass of less than about one million suns. The Milky Way galaxy holds the equivalent of approximately 100 billion suns and was probably created when mini-galaxies like these merged.

This study is a thorough follow-up to an initial observation presented in Nature in November 2005 by Kashlinksy and his team. The new analysis covered five sky regions and involved hundreds of hours of observation time.

Scientists say that space, time and matter originated 13.7 billion years ago in a tremendous explosion called the Big Bang. Observations of the cosmic microwave background by a co-author of the recent Spitzer studies, Dr. John Mather of Goddard, and his science team strongly support this theory. Mather is a co-winner of the 2006 Nobel Prize for Physics for this work. Another few hundred million years or so would pass before the first stars would form, ending the so-called dark age of the universe.

With Spitzer, Kashlinsky's group studied the cosmic infrared background, a diffuse light from this early epoch when structure first emerged. Some of the light comes from stars or black hole activity so distant that, although it originated as ultraviolet and optical light, its wavelengths have been stretched to infrared wavelengths by the growing space-time that causes the universe's expansion. Other parts of the cosmic infrared background are from distant starlight absorbed by dust and re-emitted as infrared light.

"There's ongoing debate about what the first objects were and how galaxies formed," said Dr. Harvey Moseley of Goddard, a co-author on the papers. "We are on the right track to figuring this out. We've now reached the hilltop and are looking down on the village below, trying to make sense of what's going on."

The analysis first involved carefully removing the light from all foreground stars and galaxies in the five regions of the sky, leaving only the most ancient light. The scientists then studied fluctuations in the intensity of infrared brightness, in the relatively diffuse light. The fluctuations revealed a clustering of objects that produced the observed light pattern.

"Imagine trying to see fireworks at night from across a crowded city," said Kashlinsky. "If you could turn off the city lights, you might get a glimpse at the fireworks. We have shut down the lights of the universe to see the outlines of its first fireworks."

Mather, who is senior project scientist for NASA's future James Webb Space Telescope, said, "Spitzer has paved the way for the James Webb Space Telescope, which should be able to identity the nature of the clusters."

This analysis was partially funded through the National Science Foundation. Science support to NASA Goddard is supplied by Science Systems and Applications, Inc. NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Spitzer mission for NASA. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology in Pasadena. The observations were made by Spitzer's infrared array camera, which was built by NASA's Goddard Space Flight Center, Greenbelt, Md. The instrument's principal investigator is Dr. Giovanni Fazio of the Harvard-Smithsonian Center for Astrophysics.

For graphics and more information about Spitzer: http://www.nasa.gov/mission_pages/spitzer/main/index.html.

Radar Love: Asteroid Detection and Science

They are the celestial equivalent of sonograms. But their hazy outlines and ghostly features do not document the in-vivo development of a future taxpayer. Instead, they chronicle the exo-planetary comings-and-goings of some of Earth's least known, most nomadic, and at times most impactful neighbors.

They are radar echoes that are bounced off of asteroids. Scientists from NASA's Jet Propulsion Laboratory and around the world rely on their ethereal images to tell some out-of-this-world tales of near-Earth objects.

"The standard ground-based tools for asteroid science require a night's sky, and what you come away with in the end is an image of a dot," said JPL radar astronomer Dr. Steve Ostro. "With radar astronomy, the sky at high noon is just as inviting as that at midnight, and without launching a full-blown space mission we can actually get valuable information about the physical makeup of these objects."

In some respects, radar astronomy utilizes the same technology as your microwave oven. But do not bother to haul your glorified croissant warmer outside -- it will just confuse the neighbors. Radar astronomy employs the world's most massive dish-shaped antennas, which beam directed microwave signals at their targets, which can be as close as our moon and as far away as the moons of Saturn. These pulses bounce off the target, and the resulting "echo" is collected and precisely collated. The results can be astounding.

"The closer the target, the better the echo," said Ostro. "From them we can generate detailed three-dimensional models of the object, define its rotation precisely and get a good idea of its internal density distribution. You can even make out surface features. A good echo can give us a spatial resolution finer than 10 meters."

Radar astronomy has detected echoes from over 190 near-Earth asteroids to date and has found that, like snowflakes, no two are the same. The returning echoes have revealed both stony and metallic objects, some flying through the cold, dark reaches of space alone, while others have their own satellites. The data indicate that some asteroids have a very smooth surface, while others have very coarse terrain. And finally, their shapes are virtually anything that can be imagined.

One thing that does not have to be imagined is radar astronomy's ability to nail down the location of an object in time and space. This invaluable capability came in handy in the winter of 2004 when JPL's Near-Earth Object office was looking for a potentially hazardous asteroid called Apophis.

Discovered by astronomers using optical telescopes, Apophis quickly drew the interest of the near-Earth object monitoring community when its initial orbital plots indicated there was a possibility the1,300-foot-wide chunk of space rock could impact Earth in 2029. The Near-Earth Object office knew what was needed was more detailed information about Apophis' location, which they could then use to plot out a more accurate orbit.

Under the watchful eye of Ostro and three other radar astronomers, microwaves from the Arecibo Observatory in Puerto Rico reached out and touched asteroid Apophis on Jan. 27, 29, and 30, 2005. The Arecibo data significantly improved the asteroid's orbital estimate, ruling out a potential Earth collision in 2029.

The 1,000-foot diameter Arecibo telescope is one of only two places in the world where radar astronomy is effectively performed. The other is at the 70-meter Goldstone antenna in California's Mojave Desert. The two instruments are complementary. The Arecibo radar is not fully steerable (while Goldstone is), but it is 30 times more sensitive. Together they make a formidable asteroid reconnaissance team.

The future of radar astronomy may be just as amazing as some of the images and shape models of nearby space objects that its practitioners have already obtained. There is new technology in the pipeline that will allow imaging of surface features with up to four times more detail than what exists today. And then there are proposals on the table for a potential space mission to a near-Earth asteroid. Candidate asteroids for said mission will need to be pre-approved via detail scientific analysis. The kind of scientific analysis you can only get with radar astronomy.

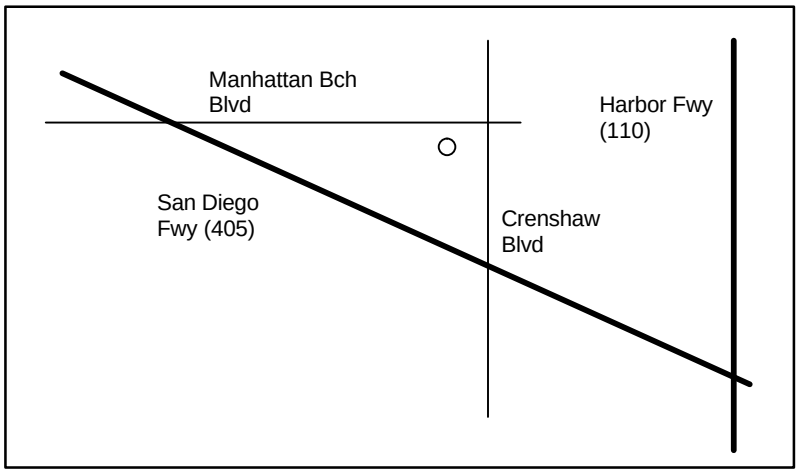
SBAS Executive Board

President	Ken Rossi	515-1586	ken_a_rossi@yahoo.com
Vice-President	Greg Benecke	217-1512	beneckerus@aol.com
Secretary	Deanna Chafe	329-1371	Martin5lynn3@sbcglobal.net
Treasurer & Astronomical League Rep.	Arnie Stodolsky	937-0220	astodols@ix.netcom.com

SBAS Committees

Program Chairman	Greg Benecke	217-1512	beneckerus@aol.com
Astronomical League Liaison	Bill Eisele	542-5070	Astronomy131@msn.com
Newsletter Reproduction	John Collins	- - -	westcoast@runbox.com
Publications Committee:			
SBAS Website Webmaster	Alex Athas	- - -	sbas_elcamino@yahoo.com
***First Light* Editor**	Ken Munson	782-0873	kenmunson333@sbcglobal.net
Observing Committee	Greg Benecke	217-1512	BeneckeRUs@aol.com
	Craig Gates	376-6387	- - -
Membership Committee	Ray Grace	370-1913	Rgrace1@adelphia.net
Publicity Committee	Joe Fierstein	377-9834	Joefiers@verizon.net
	Arnie Stodolsky	937-0220	astodols@ix.netcom.com
Property Committee	Arnie Stodolsky	937-0220	astodols@ix.netcom.com
Outreach Committee	Joe Fierstein	377-9834	Joefiers@verizon.net

Monthly General Meetings



We normally meet on the first Friday of each month at 7:30 p.m. in the Planetarium at El

Camino College. If the first Friday is on or close to a holiday, we usually defer the meeting until the second Friday of the month.

The Planetarium is on the south side of Manhattan Beach Blvd., one block west of Crenshaw Blvd. (near the center of the map at left).

The planetarium is the only round, domed building on campus. There is on-street parking, and we can often use campus parking: check inside to see if you need a

FREE parking permit for your car.

We enjoy the planetarium facilities through the courtesy of the El Camino College Administration, and have several faculty members of the Astronomy Department as members of our Club. Our meetings always include an informal opening, when new attendees are invited to introduce themselves and let us know about their interests in astronomy. Members share their latest news and observations at this time. The rest of the evening is devoted to guest speakers, who range from amateur astronomers to professional astronomers to representatives from local aerospace companies to college professors. We are fortunate to have all these talented people in our area, willing to come and talk to us.

Monthly Planning Meeting

Committee members (and anyone else with an interest in Society activities) meet each month, usually on the Monday following the general meeting. Meetings are sometimes rescheduled due to travel and other circumstances. Exact date and time of each month's meeting will be announced in the schedule of events in FIRST LIGHT each month, and should also be verified with a committee member. The February 5th planning meeting will be held at 7:30 PM at the home of Ray Grace, 2706 Spreckels Lane in Redondo Beach (310) 370-1913. Take Hawthorne Blvd to 190th St., turn West to Inglewood Ave., then turn North (right) and proceed two blocks to Spreckels Lane and turn Right. If driving South on Inglewood Ave., Spreckels Lane is two blocks south past the light at Ralston Ave., and turn Left, to the 4th house on the right (South side). Parking is available on both sides of the street.

.

NexStar 8 Available to SBAS Members

All members in good standing (with at least six months of continuous membership) can borrow the club's Nexstar8 for up to 7 days. The fee of $5 for a weekend, or $10 for an entire week, is nonrefundable and will be added to the club's Accessories Fund "Wish List" for future purchases. A fully refundable deposit of $200 cash or check is required. Loss or damage is the responsibility of the borrower. A copy of the complete South Bay Astronomical Society Nexstar 8 Borrowing Rules and Agreement is available upon request. The **Accessories Fund "Wish List"** – Member contributions of any amount or donations will be appreciated, as will any suggestions for new purchases!

SBAS Membership Benefits

Contact Arnie Stodolsky for magazine subscriptions at club rates: "Sky & Telescope" $32.95 and "Astronomy" $34.00/1 year or $60.00/2 years! Make your check payable to SBAS and mail the payment and your subscription / renewal form directly to South Bay Astronomical Society, P.O. Box 1937, Redondo Beach, CA 90278.

Part of your SBAS membership dues goes toward membership in the Astronomical League. All paid members should be receiving the "Reflector", the league's newsletter, four times a year. As a member organization, we can participate in a number of award programs they offer. These are based on completing various observing challenges. Check out the Astronomical League website at www.astroleague.org.

February – Comets & Asteroids

Comets Visible in September:

Comet	**Mag**	**Constellation(s)**
None		

Asteroid Occultations:

Date (local) m/d/yyyy	Hr	Min	Durn m/sec	Star mag	Mag drop	Star No.	Planet No	Name
2/17/2007	22	13.3	4.8s	9.9	2.2	TYC 1421-00289-1u	55	Pandora
2/28/2007	0	43.2	15.8s	8.6	1.9	HIP 45653	51	Nemausa

Check the JPL Ephemeris Generator page for coordinates of these objects at:
http://ssd.jpl.nasa.gov/horizons.cgi#top

Welcome New Members.

Everyone please welcome new members to the club:

Claudine “Elizabeth” Coria from Lawndale, Daniel R. Kopti from Palos Verdes Peninsula. Edward A. (Andrey) Bashay from Torrance, and Derek and Lisa Lillie from Redondo Beach.

Telescope for Sale

Approximately 1 yr old Meade 12" LX200GPS Schmidt-Cassegrain telescope with Autostar II hand controller, includes small planetary camera, computer software, automatic tracking, new Scope Buggy rolling stand, new weather protection cover, 2X Barlow, Variable eyepiece, new 1.25" ALP/Nebular filter, new 1.25" color filters (#11, #121, #80A, ND25). Used only a very few times and in excellent condition, stored in house. $4200. Contact Roy Warkentin at 661-242-2060..

Renovation of the Mt. Wilson 60-Inch Telescope

Several times over the last few years, members of the club have had the privilege of enjoying a night of observing with the 60-inch telescope atop nearby Mt. Wilson. When it was built in 1908 and for the next 10 years it was the largest telescope in the world. The success of the 60-inch telescope led George E. Hale, the founder of the Mt. Wilson Observatory to build the 100-inch telescope on the same site and then the 200-inch scope atop Mt. Palomar. Today the 60-inch scope is, in fact, the largest telescope in the world made available to the public on a regular basis.

The Observatory is now in the process of making improvements to the 60-inch scope. These improvements will enable it to find objects more quickly and track them more accurately across the night sky. This will greatly reduce the amount of time visitors have to wait as it moves from one object to the next. Other improvements will make the telescope and dome area safer for visitors (remember the bare wires that carry the current for the motors that turn the dome?). All of this is being done by retired engineers who are donating their time. However, as always, such refurbishments will require the purchase of various supplies. So, they are seeking donations to help with the refurbishment.

To that end, SBAS has decided to donate $50 from its club funds. If other members would like to contribute as well, please make out checks payable to the Mount Wilson Institute (that way it is tax deductible), bring them to the February or March meetings or send them to the club’s PO box (address is on the Newsletter)..

Observing Reports

A Night on Kitt Peak - Kitt Peak National Observatory is in the Sonoran Desert, 55 miles southwest of Tucson, Arizona at an elevation of 6875 feet. Most of its 23 telescopes are strictly for research, but a few of the smaller telescopes are available to the public. As I was visiting relatives in Tucson over Christmas, I decided to rent the 20-inch f/8.1 Richey reflector for the night of December 23-24.

The 11-mile drive from the Ajo (86) Highway to the top of the mountain offers some wonderful views of the surrounding desert. As I drove up the mountainside in the late afternoon, listening to a CD of various Beatles songs (I was saving the CD of John Philip Sousa's marches for the drive back the next morning),

I reflected that I was following in the footsteps of almost every famous astronomer of the last 50 years. I checked in, had dinner with the night assistant in the cafeteria, and rested in my dormitory room for the next couple of hours.

The telescope I was assigned to was in use for the Nightly Observing Program until 9:30 pm. For $39 per person, you can join several others for a guided telescopic tour of the Universe. I had signed up for the more expensive Advanced Observing Program ($375, plus $75 for the dormitory room and three meals), so at 9:30 I took over the use of the 20-inch.

Fortunately, the sky was cloudless and the seeing was so stable that the stars appeared motionless, even at high power. I started out with the "Deep-Sky Challenge Objects" list from the RASC Observer's Handbook. The Pleiades nebulosity, far from being a challenge, was conspicuous in such a dark sky. The Coma Berenices galaxy cluster showed 20 galaxies in the Nagler 21-mm eyepiece, and 12 galaxies were visible in the Perseus galaxy cluster. I had brought my electro-optic eyepiece with me, which greatly exaggerated the visibility of these objects.

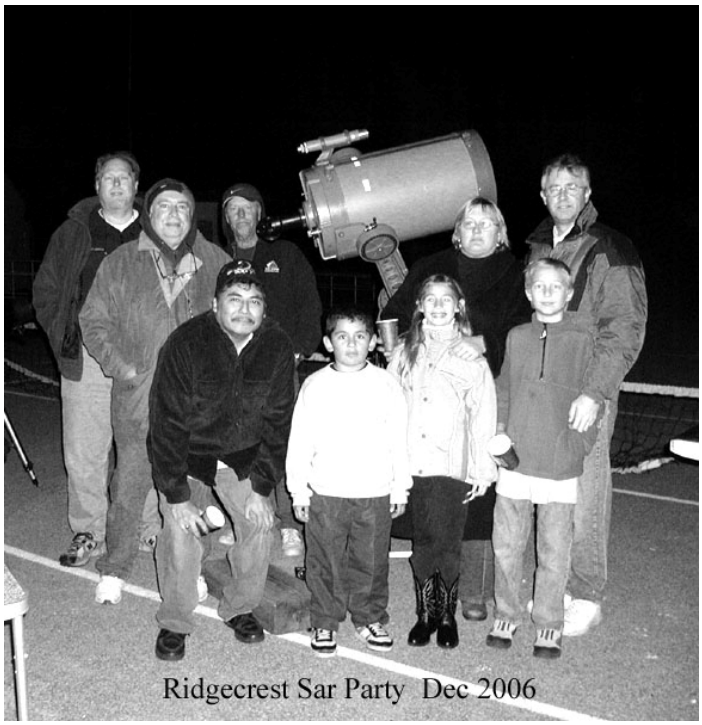
The telescope operator, John Zum Vrunnen, was delighted to spend the night performing visual observations instead of CCD photography, as it gave him the chance to see these objects through an eyepiece instead of on the computer screen. By midnight, I had switched to the Observer's Handbook's\ list of "The Finest NGC Objects", and threw in some Messier objects for good measure. Saturn's Crepe Ring was faint but clearly visible, as were six of Saturn's moons. The Sombrero Galaxy (M 104) really looked like a sombrero, and the Black-Eye Galaxy (M 64) lived up to its name as well. The star Canopus had made a brief appearance far in the southern sky.

Morning was heralded by the Zodiacal Light, and I finished by looking at 3C 273, the first quasar discovered, and the brightest. It is remarkable to see this dot in space, and realize that you are looking at light that is more than 2 billion

years old, and is farther away than anything you have ever seen. As the eastern sky brightened, Jupiter and Mars could be seen low on the horizon.

Outside of the two galaxy clusters, we had seen 40 deep-sky objects. This may not seem like much of a haul, with a motorized Goto telescope on one of the longest nights of the year, but it was nice to linger over the many beautiful sights and chat about them, rather than indulge in a feeding frenzy. Was it worth the time and money? That's the nice thing about a hobby; it is, if you think it is.

- ***Dr. Steven Morris***



Ridgecrest School – What little warmth there had been in the day was fading quickly as the sun set on Saturday the 13th of January. Early arrivals were able to catch a last glimpse of Comet McNaught before it disappeared below the horizon shortly after sunset. In fact, some were able to observe it earlier in the day with the sun still high in the sky!

Even though the temperature was dropping fast, it was at least a dry night so there wasn't the usual problem with dew. There was a good turn-out of scopes with at least 8 or 9 set up. We had several visitors during the evening. Some 7th grade students from Palos Verdes Intermediate school came by to conduct interviews with the telescope owners and get a look through the scopes. Even though the sky was clear, the transparency was not as good as one might have liked. Still, the kids and their parents were treated to some very nice views of the more spectacular sights in the winter sky, including the Great Nebula in Orion, various Messier open star clusters, double stars and a couple of planetary nebulas.

One interesting object I checked out was R Leporis, one of the reddest stars in the sky. It's also a variable star. The last time I saw it, it was very faint and barely visible in-town. Now it has brightened again, showing off its very distinct, deep red hue. Quite a pretty object to see in a field of silvery-white stars!

In spite of the cold it was one of the best in-town observing sessions in recent months.

- ***Ken Munson***

Schedule of Coming Events

31 January Wednesday Evening	**Catskill Elementary School Star Party** 6-9 PM 23536 Catskill Ave, Carson.
2 February Friday Night 7:30 PM	**Monthly General Meeting** Speaker: TBA
5 February Monday Night 7:30 PM	**Monthly Planning Meeting** Location: See Page 6.
10 February Saturday Evening	**In Town Dark Sky Observing Session –** Weather Permitting**:** Please contact Greg Benecke to confirm that the gate will be opened! Take Hawthorne Blvd. south across Pacific Coast Hwy.; continue up the hill past Silver Spur and turn left at Highridge. Go one mile and turn left on Whitley Collins, up one block and turn left on Northbay Rd., the new parking lot is at the end on the left. Enter parking lot and turn left, the gate is at the east end (it should be open about 15 minutes before sunset) and a paved road leading into the playground where we have traditionally set up. If at all possible, drop your equipment off and park your car in the new parking lot (less than 200 feet away). If you are absolutely certain that your vehicle does not drip anything you can park with your equipment. *Drive with care* to avoid steel pillars supporting basketball nets**. Note: If you a visitor, not bringing a scope, it is requested that you park in the small parking lot on Northbay Rd.**
17 Febuary Saturday Evening	**Out of Town Dark Sky Observing Session** Contact Greg Benecke to coordinate a location.
22 February Thursday Evening	**Von Kármán Auditorium (Thursday) & Vosloh Forum at Pasadena City College (Friday)** “Dawn Mission to the Asteroid Belt” by Dr. Marc Rayman NASA's next venture into the solar system is the Dawn mission, planned for launch in June 2007. The spacecraft will orbit Ceres and Vesta, the two most massive residents of the asteroid belt and among the last unexplored worlds in the inner solar system. Remnants from the time planets formed, Ceres and Vesta hold clues that will help scientists understand the beginnings of the solar system.

South Bay Astronomical Society

* * * * * * * * *

General Meeting at El Camino College Planetarium:
Friday, February 2nd at 7:30 P.M.

"TBA"

* * * * * * * * *

South Bay Astronomical Society
P.O. Box 1937
Redondo Beach, CA 90278