FIRST LIGHT

Journal of the South Bay Astronomical Society - December 2003
on line at www.geocities.com/sbas_elcamino

Monthly General Meeting: Friday, December 5, 7:30 PM

Guest Speaker: Dr. Steven Morris (SBAS)

"Einstein's Special Theory of Relativity"

A Book Review

Starlight Nights

The Adventures of a Star Gazer

By: Leselie C. Peltier

Starlight Nights was first published in 1965. It was out of print for many years until Sky Publishing reprinted it in 1999. Having recently read it, I understand why it is considered a classic. In the forward of the new edition, David Levy writes:" Many books explain how to observe the sky, Starlight Nights explains why." I couldn't agree more.

Leselie Peltier, (1900-1980) was born in Delphos Ohio, a small farming community in the northwest corner of the state. The book is essentially his autobiography. It covers not only his experiences as a stargazer, but provides a window on the world - a rapidly changing world, as seen through the eyes of a meticulous observer. Mr. Peltier is credited as the discoverer or co-discoverer of 12 comets and six Nova. His first love however, was variable stars. In more than four decades of observing there was never a month that he failed to send a report to the AAVSO. He amassed a record of 132,000 variable star observations.

His first telescope was a 2-inch folding" spyglass" which he purchased from a catalog for $18. The money was earned picking strawberries on his father's farm at the rate of 2 cents/quart. This may have been the only telescope he ever purchased. The AAVSO, recognizing his skill and dedication as an observer, "loaned" him a 4-inch 'scope. A 6-inch refractor followed, loaned to him by the director of the Princeton Observatory. Some years later, the University of Miami donated a 16-foot long refractor with a 12-inch lens. His home-built observatory was always open to the public and over the years he played host to thousands of school children and local citizens as well as many prominent astronomers and dignitaries from all over the country.

Leselie Peltier was more than an astronomer, this self taught man was an accomplished naturalist in many fields including entomology. Most of all he was an observer, not only of nature, but of human nature. His insightful yet subtle remarks on the events in his life and on the ever-changing world around him mark him as a "man for all seasons". Through all this, his passion and love of the night sky shines as a beacon, urging us to carry on in his footsteps. To me, this book was an inspiration and I hope it will be for you. It is available at the P.V. Library or from the publisher. It's an easy and delightful read. Enjoy!

- Joe Fierstein

Final Death Throes of Nearby Star Witnessed First-Hand

It takes only a few hundred to a thousand years for a dying Sun-like star, many billions of years old, to transform into a dazzling, glowing cloud called a planetary nebula. This relative blink in a long lifetime means that a Sun-like star's final moments - the crucial phase when its planetary nebula takes shape - have, until now, gone undetected. In research reported in the Nov. 20 issue of Nature, astronomers led by Dr. Raghvendra Sahai of NASA's Jet Propulsion Laboratory, Pasadena, Calif., have caught one such dying star in the act. This nearby star, called V Hydrae, has been captured by the Space Telescope Imaging Spectrograph onboard NASA's Hubble Space Telescope in the last stages of its demise, just as material has begun to shoot away from it in a high-speed jet outflow. While previous studies have indicated the role of jet outflows in shaping planetary nebulae, the new findings represent the first time these jets have been directly detected.

"The discovery of a newly launched jet outflow is likely to have a significant impact on our understanding of this short-lived stage of stellar evolution and will open a window onto the ultimate fate of our Sun," said Sahai. Other institutions contributing to this paper include: University of California, Los Angeles; Princeton University, Princeton, New Jersey; Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachusetts; and Valdosta State University, Valdosta, Georgia. Low-mass stars like the Sun typically survive around ten billion years before their hydrogen fuel begins to run out and they start to die. Over the next ten to hundred thousand years, the stars slowly eject nearly half of their mass in expanding, spherical winds. Then in a poorly understood phase lasting just 100 to 1,000 years - the stars evolve into a stunning array of geometrically shaped glowing clouds called planetary nebulae. The Hourglass Nebula, imaged by the Wide Field Planetary Camera 2 onboard the Hubble Space Telescope, is one example of the stunning shapes planetary nebulae can take.

Just how these extraordinary "star-clouds" are shaped has remained unclear, though Sahai, in several previous papers, put forth a new hypothesis. Based on results from a recent Hubble Space Telescope imaging survey of young planetary nebulae, he proposed that two-sided, or bipolar, high-speed jet-like outflows are the primary means of shaping these objects. The latest study will allow Sahai and his colleagues to test this hypothesis with direct data for the first time. "Now, in the case of V Hydrae, we can observe the evolution of the jet outflow in real-time," said Sahai, who together with his colleagues will study the star with the Hubble Space Telescope for three more years.

The new findings also suggest what may be driving the jet outflows. Past models of dying stars predict that accretion discs - swirling rings of matter encircling stars - may trigger jet outflows. The V Hydrae data support the presence of an accretion disc surrounding, not V Hydrae itself, but a companion object around the star. This companion is likely to be another star or even a giant planet too dim to be detected. The authors have also found evidence for an outlying large dense disc in V Hydrae, which could enable the formation of the accretion disc around the companion. Further support in favor of a companion-driven jet outflow comes from the scientists' observation that the jet fires in bursts: because the companion orbits the star in a periodic fashion, the accretion disc around it is expected to produce regular spurts of material rather than a steady stream.

NASA's Hubble Space Telescope

NASA's Jet Propulsion Laboratory celebrates 10 years of dazzling imagery of the universe from the Wide Field and Planetary Camera 2 onboard NASA's Hubble Space Telescope. The main camera for most of the mission has been JPL's Wide Field and Planetary Camera 2, installed in December 1993. To mark the 10th anniversary of the Wide Field and Planetary Camera 2, NASA has invited the public to cast a vote for the camera's most impressive image. Astronomers at JPL have narrowed the field to their top ten favorite pictures, but it is up to you to choose the most spectacular image. Voting will continue throughout November and the most popular image will be unveiled December 5 on the JPL website. Vote for your favorite snapshot at **http://www.jpl.nasa.gov/flash/wfpc2**

The Advanced Camera for Surveys, managed by Johns Hopkins University, Baltimore, Md., was installed on Hubble in March 2002, and now serves as the main camera. Scientists, meanwhile, continue to pore over images from the Wide Field and Planetary Camera 2, regularly unveiling new discoveries. The Space Telescope Science Institute is operated by the Association of Universities for Research in Astronomy, Inc., for NASA, under contract with the Goddard Space Flight Center, Greenbelt, Md. The Hubble Space Telescope is a project of international co-operation between the European Space Agency and NASA. The California Institute of Technology in Pasadena manages JPL for NASA. Additional information about the Hubble Space Telescope is available at **http://hubblesite.org**

- NASA News Releases

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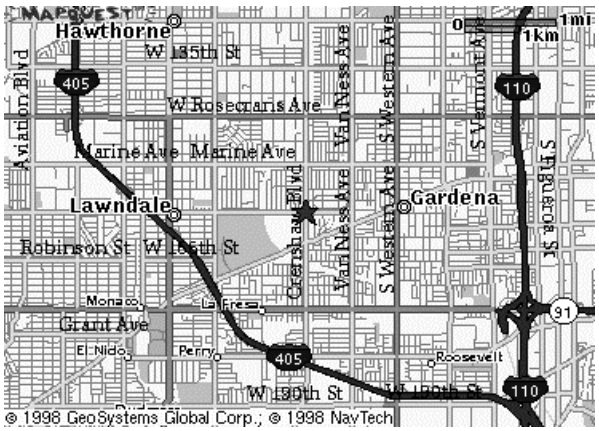
Monthly General Meetings



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). Click on the map to get a display that can be zoomed out for a regional view. The zoom display appears in a separate browser window, which can be closed to return to this page.

The domed roof of the planetarium is visible from the street. 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. Park in northeast corner lot, temporarily, due to the construction project.

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 Meetings

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 by any member or visitor wishing to attend. All are welcome!

We will meet on Monday, December 8th at 7:30 PM at the home of Laura Lucas, 2005 Mathews Ave. #A, in Redondo Beach. Take Artesia Blvd., west from Hawthorne Blvd. and turn right on Aviation Way. Turn right at the stop sign onto Mathews Ave. and go down the hill. Park on the street just past Green and Laura's house is on the left side in the back past the gates.

SBAS Membership Benefits

Contact John Collins for magazine subscriptions at club rates: "Sky & Telescope" $32.95 and "Astronomy" $29.00! Make your check payable to SBAS and mail the payment and your subscription / renewal form directly to SBAS, c/o John Collins, 1904 Clark Lane #4, 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**

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!

Annual Membership Renewal

Renew your SBAS membership – Keep this amazing newsletter coming plus meetings and observing trips!
Now would be a great time to renew your membership in the group that brings you great monthly programs, the company of fellow observers, and many chances throughout the year to share the excitement of the night sky with students and new friends.

If you just joined us this year, then you can renew your membership on a pro-rated basis to adjust your membership term to the standard calendar-year schedule. What a deal: you renew for less than full price. The renewal cost, as a function of when your membership expires, is as follows:

Membership	**Renewal Fee Due Now**	
Expiration	**Individual/Family**	**Student**
Dec. '04 or later	$ 0.00	$ 0.00
Nov. '04	$ 2.50	$ 2.08
Oct. '04	$ 5.00	$ 4.17
Sept. '04	$ 7.50	$ 6.25
Aug. '04	$10.00	$ 8.33
July '04	$12.50	$10.42
June '04	$15.00	$12.50
May '04	$17.50	$14.58
Apr. '04	$20.00	$16.67
Mar. '04	$22.50	$18.75
Feb. '04	$25.00	$20.83
Jan. '04	$27.50	$22.92
Dec. '03 or before	$30.00	$25.00

To renew, check your membership expiration date in the upper right corner of the mailing label on the back page of this newsletter. This is what our records show for your membership expiration date. Please renew, according to the schedule above, by check to: South Bay Astronomical Society, c/o John Collins, 1904 Clark Lane #4, Redondo Beach, CA 90278. (Payments will also be accepted at the general meeting on Dec. 5th!)

Excerpts from "Einstein's Legacy and The Einstein Papers Project Symposium"

With the launching of the Einstein Archive Online web site **www.alberteinstein.info** on May 19, 2003, many of Einstein's papers became available to the general public in digital format. In time, the entire archive will be available online with corresponding text in German and English. The Museum of Natural History hosted a symposium on Einstein's Legacy and The Einstein Papers Project. The speakers were the world's foremost authorities on Einstein and his research including Science Historians and Physicists from Harvard, Yale, Caltech, Boston University, Columbia University, and the University of Jerusalem. The daytime lectures centered on Einstein's scientific discoveries, his politics, his personal life and the Einstein Archive Online web site. The night session consisted of a lively debate between scholars on Einstein's scientific and humanitarian contributions.

The history of Einstein's archive began shortly after the Nazis rise to power in 1933, when Einstein's papers were rescued from Berlin. Einstein's son-in-law, Rudolf Kayser, with the help of the French Embassy, was able to smuggle Einstein's papers out of the country, where they were brought to Princeton. After Einstein's death in 1955, the trustees of his estate, Helen Dukas (Einstein's personal assistant since 1928) and Dr. Otto Nathan, maintained Einstein's papers for more than a quarter of a century, while acquiring additional material. In the 1960s, Professor Gerald Holton of Harvard, with the indispensable assistance of Helen Dukas, reorganized the archive to render it accessible to scholars and to prepare it for publication. The Princeton archive consisted of more than 40,000 documents. In 1982, the archive was transferred to the National University Library & Hebrew University in Jerusalem, as had been requested in Einstein's 1950 will. During the last twenty years, more than 15,000 additional documents have been added to the collection.

Einstein's legacy and impact during the twentieth century was enormous and in admiration of his accomplishments, Time magazine selected Albert Einstein as 'Man of the Century.' His most notable contributions were his scientific discoveries, but he also received recognition for his political and humanitarian concerns. He is most famous for his theories on special relativity and general relativity, which he made comprehensible through his famous 'thought experiments.' He started formulating his theory of special relativity at the age of sixteen, when he envisioned himself riding on a beam of light. In 1905 at the age of twenty-six, he published his theory of special relativity while working as a clerk at the Swiss Patent Office in Bern and received worldwide acclaim. Later in 1916, Einstein would publish his theory on general relativity. However, relativity presented a conflict with quantum mechanics and Einstein was to spend decades working on a solution. Einstein proposed the Unified Field Theory (UFT), which he researched for nearly three decades. In the end, his efforts on UFT proved fruitless and to this day, the conflict between relativity and quantum theory has never been resolved. Since UFT has been largely regarded as a failure, there was little interest by researchers in the mounds of UFT data in the archive. Ze'ev Rosenkranz, curator of the Albert Einstein Archives in Jerusalem, is now translating three decades worth of UFT documents. It is the hope of scholars that these documents will provide previously unknown information about Einstein or a possible solution to UFT.

1905 would be called the 'Miracle Year' in which Einstein published his theory of special relativity. He also published; statistical analysis on Brownian motion, which led to the proof of the existence of molecules through microscopic observation; probability aspects of radiation of light, which was the basis for lasers; and the photoelectric effect, for which he received the Nobel prize. These discoveries would make Einstein the most important scientist since Isaac Newton. From 1914 to 1915 Einstein became absorbed in his theory of general relativity and he published his results in 1916. However, "theories are not proven, they are only tested," explained John Stachel of Boston University. To this date, relativity has only been tested and not proven. The first test of general relativity was in March 29, 1919 when scientists compared observations of a star field, during a solar eclipse at Príncipe Island. The apparent location of the stars had shifted as was predicted by Einstein when the incoming light from the stars was bent as it passed near the Sun. Since that time, there had been little testing of general relativity until 1960, because the technology at the time was inadequate.

As technology improved in the 1960s, general relativity was tested further, but the segments pertaining to 'frame dragging' and the 'wave aspect' of gravity still has yet to be proven. Frame dragging is one of the last frontiers in relativity. More familiar and already proven are the conversion of mass into energy (as seen in atomic bombs and stars) and back, the Lorentz transformations that make objects near the speed of light grow thinner and heavier and stretch time, and the warping of space by gravity (as seen when light is bent by a massive object). Einstein also predicted that the rotation of an object would alter space and time, dragging a nearby object out of position compared to predictions by the simpler math of Sir Isaac Newton. Gravity in a 'non-linear state' also has not been proven and it is hoped that with the building and launching of the proposed Gravity Probe B satellite, proposed by NASA and Stanford University, space-time reference can be further tested.

Einstein's true obsession in his life was science, but his involvement in humanitarian issues would place him in the political spotlight. Max Weber described Einstein as a 'charismatic scientist' as were Maxwell, Faraday and Newton. At the request of physicist Leo Szilard, Einstein wrote his famous letter on Aug 2, 1939 to President Roosevelt, which led to the production of the American atomic bomb. Einstein, a long-life pacifist, agreed to write the letter only out of fear that Germany was on the verge of developing an atomic weapon. He would regret this decision later in life since Germany was on the wrong path towards atomic weapon development. For the most part, Einstein made a conscious effort to be political for positive causes and was an outspoken critic of militarism or what Betrand Russel described as 'Naked Power.'

To understand the humanitarian aspects of Albert Einstein we should consult his Nov. 4, 1943 speech, The Goal of Human Existence. "Our age is proud of the progress it has made in man's intellectual development. The search and striving for truth and knowledge is one of the highest of man's qualities. The intellect has a sharp eye for methods and tools, but is blind to ends and values. Our Jewish forbears, the prophets and the old Chinese sages understood and proclaimed that the most important factor in giving shape to our human existence is the setting up and establishment of a goal, a community of free and happy human beings, who by constant inward endeavor, strive to liberate themselves from the inheritance of antisocial and destructive instincts. In this effort the intellect can be the most powerful aid. The fruits of intellectual effort, together with the striving itself, in cooperation with the creative activity of the artist lend content and meaning to life."

Notes on additional information:

The Albert Einstein Archives at the Jewish National & University Library
http://www.albert-einstein.org/archives2.html
Satellite observations of Black Holes confirm frame-dragging effect 80 years after prediction.
http://science.msfc.nasa.gov/newhome/headlines/ast06nov97_1.htm
Albert Einstein “On the Goal of Human Existence” Nov. 4, 1943
http://www.tearsofllorona.com/einstein.html

December - Comets & Asteroids

Comets Visible In December:

Name	**Constellation**	**Magnitude**
2001 HT 50	Pisces	11.5
2002 T7	Perseus-Triangulum-Pisces	9
2003 T3	Microscopium	11

Comets at Perihelion:	**Identification**	**Magnitude**
December 9	West-Hartley	14
December 14	2002 T7	10
December 29	2P/Encke	6

Near-Earth Asteroid Flybys:	**Identification**	**Magnitude**
December 1	2003 UC20	15
December 4	2003 UB5	15.7

Occultations:

December 15	Asteroid 1153 Wallenbergia Occults HIP 43613
December 31	Asteroid 208 Lacrimosa Occults TYC 1397-01764-1

- Ken Munson

Schedule of Coming Events

5 December Friday 7:30 P.M.	**Monthly General Meeting:** Dr. Steven Morris of SBAS will discuss "Einstein's Special Theory of Relativity".
8 December Monday 7:30 P.M.	**Monthly Planning Meeting** Refer to page 3 for directions to Laura Lucas's home.
11 (JPL) 12 (PCC) December 7:00 P.M.	**Von Karman Auditorium Lecture Series** – FREE "Pointing the Way to Exoplanetary Systems: New Initiatives in Space Astronomy and the Legacy of the Hubble Space Telescope". Dr. John Trauger, JPL senior research scientist: How soon will we see planetary systems orbiting the stars in our nearby galactic neighborhood? For more information call: (818) 354-0112. Current and archived webcasts can be viewed at **http://www.jpl.nasa.gov**
13 December Saturday Evening	**In-Town Dark Sky Observing at Ridgecrest School** – Weather Permitting: If the weather conditions are marginal, contact Greg Benecke to confirm that he will be opening the gate! 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…
20 December Saturday Evening	**Out-of-Town Dark Sky Observing** – New Moon Contact Greg Benecke to arrange site location.
9 January Friday 7:30 P.M.	**Monthly General Meeting:** The speaker for the evening is Dr. William C. Patzert on the topic "Satellite Oceanography".
12 January Monday 7:30 P.M.	**Monthly Planning Meeting** The location of this meeting will be announced in the January Newsletter.
17 January Saturday Evening	**In-Town Dark Sky Observing at Ridgecrest School** – Weather Permitting. Refer to November 15th entry for directions to the site & instructions on weather conditions.
24 January Saturday Evening	**Out-of-Town Dark Sky Observing** – New Moon Jan. 21st Contact Greg Benecke to arrange site location.
30 January Friday Evening	**Whaley School Star Party** SBAS attended this star party last year, but it was clouded out. We hope to have clear weather this year to make it a great night for the kids! Details will be published in the January newsletter.

Best Wishes for a Happy New Year 2004!

South Bay Astronomical Society

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General Meeting at El Camino College Planetarium:
Friday, December 5th at 7:30 P.M.

Guest Speaker: Dr. Steven Morris (SBAS)

"Einstein's Special Theory of Relativity"

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South Bay Astronomical Society
c/o John Collins
1904 Clark Lane #4
Redondo Beach, CA 90278

**** Annual Membership Renewal Schedule Included (see page 4)****