July-August
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CVA Calendar

June 26-27 CVA Weekend at Galcier Point

July 3-RiverPark Public Star-watch

July 17-19 Courtright Star-watch Weekend

July 18-Starwatch at Hensley Lake

July 31-RiverPark Public Starwatch

Aug 8 CVA Meeting CSUF 7Pm

Aug 21-Courtright Weekend

Aug 22-Hensley Lake Star-watch

Aug 29-RiverPark Public Starwatch

CVA's Glacier Point Weekend June 26-27, 2009 See inside for signing up!

Quote of the Month:

I do not know what others may think of me, but I see myself as no more than a boy wandering along the seashore and occasionally stopping to pick up a smoother pebble or a prettier shell, while all around me the great ocean of truth lay undiscovered.

Isaac Newton, 1727, shortly before he died.

○ Full Moon July 7 ● New Moon July 22 ○ Full Moon August 5 ● New Moon August 20

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Number of extra-solar planets found so far-347
How many more are out there?

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On it, we have a wide variety of merchandise with the CVA logo, including shirts, sweatshirts, hats, mugs magnets, and other mementos. Some of the clothing items come in several colors, but you have to go to the individual product pages to see them.

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Profiles in Astronomy

Urbain Jean Joseph Le Verrier 1811-1877



Le Verrier was born in St. Lo, Normandy, France, and studied at the prestigious Ecole Polytechne. He majored in chemistry, and showed unusual brilliance in mathematics. After a few years, though, he switched his interests to astronomy, took a position at the Paris Observatory, and stayed there for the rest of his life. He eventually became the observatory's director.

Le Verrier specialized in celestial mechanics, and is best known for mathematically predicting the position of the then unknown planet Neptune. After the discovery of Uranus by William Herschel in 1783, scientists realized that its orbit was slightly irregular, and concluded that another planetary body was influencing it. Le Verrier was among those who took up the quest. After months of working on complex calculations, Le Verrier submitted his predictions on the new planet's position to the French Academy of Sciences on August 31, 1846. Unknown to him, English scientist John Couch Adams had come up with essentially the same figures at the same time, and submitted them to the Royal Observatory at Greenwich. Le Verrier then sent his calculations to a friend, Johann Galle, an astronomer at the Berlin Observatory. On September 18, 1846, Galle and an assistant found Neptune; it was exactly where LeVerrier's numbers said it would be. For a long time afterwards, controversy raged over who should be awarded credit for the discovery; today, all three men are given co-credit for finding Neptune (ironically, years later, it was discovered that LeVerrier's calculations were wrong; he had made errors in them, but Galle found the planet anyway).

Le Verrier also noted irregularities in the orbit of Mercury, and mathematically predicted a planet even closer to the Sun, which he called Vulcan. However, it has never been found, and most scientists believe that it does not exist. Many years later, Mercury's irregularities were explained using Einstein's theory of relativity. Le Verrier spent much of the rest of his life working on calculations of the orbits of all of the known eight planets, a project he only partially completed before his death in 1877.

Central Valley Astronomers Glacier Point Weekend June 26-27, 2009

For more information and to sign up, contact Dave or Bonnie Dutton At 658-7642 or at twodocs@sierratel.com

Dave and Bonnie will need to know;

1. Your name
2. Your address
3. Number of people in your group

Astronomers get into and camp at Yosemite free!



CVA Calendar for July and August 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3 CVA at RiverPark	4 Independence Day
5	6	7 Full Moon Partial Lunar Eclipse ○	8	9	10	11
12	13	14	15	16	17 CVA weekend star party at Courtright	18 CVA star party at Hensley Lake
19	20 40th anniversary of the First Walk on the Moon-Apollo 11	21 Total solar eclipse in SE Asia and the Pacific ● New Moon	22	23 Pluto at Opposition	24	25
26 Delta Aquarid meteor shower	27	28	29	30	31 CVA star party at RiverPark	August 1
2	3	4	5 Full Moon Partial Lunar eclipse ○	6	7	8 CVA meeting at CSUF 7pm
9	10	11	12 Perseid Meteor Shower	13	14	15
16	17	18	19	20 New Moon ●	21 CVA weekend star party at Courtright	22 CVA star party at Hensley Lake First day of Ramadan
23	24	25	26	27	28	29 CVA star party at RiverPark
30 Adromedid Meteor Shower	31					

What's New in Space

The Russian Moon Program Part 3

In January 1969, a dual Soyuz mission took place. On January 14, Vladimir Shatalov was launched in Soyuz 4. The next day, Soyuz 5, carrying three cosmonauts, was launched. Shatalov docked his craft with Zoyuz 5, then Yevgeny Khrunov and Aleksei Yeliseyev made spacewalks to transfer from 4 to 5. Both craft landed safely several days later. Although the Russians lauded this as a great "first," it was in fact the mission that had been planned for the ill-fated Soyuz 1.

After the success of Soyuz 4-5, Soviet officials began talking more openly about manned Moon landings. During the spring of 1969, several leading Soviet scientists said that their country was definitely going to put men on the Moon within the next year. In February 1969, Vladimir Shatalov said at a press conference that the Russians would land men on the moon "in the near future "; in April 1969, his cosmonaut colleague Alexi Leonov went a step further and told Western reporters that his country would attempt a manned Moon mission by the end of the year, and would display moon rocks gathered by cosmonauts at the 1970 World's Fair in Osaka, Japan.



While the U.S successfully proceeded with the Apollo 9 and 10 missions, and announced that Apollo 11 would attempt a lunar landing in July, the Russians kept up their own Moon landing efforts. Mischim and his team realized that, unless something drastic happened, the U.S. would probably be the first to land men on the Moon. Nevertheless, by early 1969, they had made their own Moon plans, which, according to documents and records released after the fall of the Soviet Union in 1991, would have made it a very close race indeed.

According to various sources, the January 1969 Soyuz 4-5 dual mission set the stage for a Moon landing by the end of the year by successfully testing several major elements: rendezvous and docking, and crew transfer from one craft to another. Shortly after Soyuz 4-5, Mischim attempted the first launch of the giant N-1, on February 26, 1969. The rocket lifted off its launch pad successfully, but broke apart two minutes later. Mischim was not discouraged, however, and scheduled another launch. In the meantime, the LOK and LK lander were almost ready. Mischim planned for a second N-1 launch in July, and if that was successful, a manned L-3 Moon landing attempt as early as September. If Apollo 11 was successful, the Russians could still have the second manned Moon landing; if not, they would have the first.

The most plausible scenario for the initial Russian lunar landing is a near copy of the American LOR (Lunar Orbit Rendezvous) plan. The N-1 would be launched carrying a manned LOK-LK, and a lunar insertion module would put it into lunar trajectory. Once the "lunar train," as it was called, got to the Moon, a braking module would put it into orbit. When the time came to descend to the moon, the LOK's orbital module would be depressurized, and the mission commander would make a spacewalk over to the lunar lander(the LOK-LK had no internal tunnel, unlike the American system). Then he would undock and fly down to the Moon's surface; once there, he would prepare for a Moon walk. It is believed that the lunar cosmonaut would not have a backpack like the ones that the Americans used; he would have oxygen bottles strapped to his chest or legs. His Moon walk would be only about 30-40 minutes, enough time to plant a flag, collect a few rock and soil samples, and take some photographs. After returning to the lander, he would prepare for assent; the initial stay on the lunar surface would last no more than 5-6 hours total. Back in space, he would dock with and return to the LOK, then discard the lander. Afterwards, the LOK's service-propulsion module engine would boost the craft out of lunar orbit and back to Earth. The first L-3 mission, and indications are that at least four were planned, would have two cosmonauts, with one flying the LK to a lunar landing. Later L-3 flights would carry three cosmonauts, and two would go to the Moon in the LK.

Who would have made up the first LOK-LK crew? It is now known that the moon landing program cosmonauts included Georgi Grechko, Pavel Belyeyev, Valeri Bykovsky, Oleg Makarov, Vitali Sevastyanov, Anatoli Filipchenko, Pavel Popovich, and Alexi Leonov. In particular, Leonov's name stands out. Although he has never talked about it, space experts believe that he was to have been the commander of the first L-3 mission and his flight partner was Oleg Makarov. If the L-3 program had been successful and Apollo 11 a failure, Leonov might have been the first man to walk on the Moon, not Neil Armstrong. If it had been successful....

The July 4, 1969(July 3 in the U.S.) N-1 launch is still today wrapped in some mystery. Western experts now know that its payload was an unmanned Zond with an LOK propulsion module; it is believed that its goal was to go into lunar orbit and then return to Earth after several days, but the exact purpose remains vague. One story is that it was to have imaged the lunar surface for suitable landing sites; another, that it would test various Moon landing components(there are also stories that the N-1 attempt was intended to "fake" either a manned lunar orbiting flight or a Moon landing in order to steal the spotlight from Apollo 11, but no evidence has been found to verify this).

Whatever the mission may have been, the N-1 was launched in the early morning hours of July 4. At first, the liftoff appeared successful,

and the rocket rose to an altitude of about 200 meters. Then a fuel pump in one of the first stage engines apparently exploded, damaging the main fuel tank, and causing the engines to shut down. The rocket came crashing back down on the launch pad, setting off a huge explosion and fire. The pad was completely destroyed, and the second N-1 pad several hundred yards away was damaged as well. The next day, the September L-3 mission was cancelled; it was the end of the Russians' efforts to beat the U.S. to the Moon.

Twelve days later Apollo 11 was launched.

...to be concluded

Obama Orders Review of Space Program-and Announces a New Chief Administrator

In April, President Obama ordered acting NASA chief administrator Chris Scolese to conduct a complete review of NASA's manned space program and have the results ready by August. Included in it will be the rest of the Shuttle program, and especially the Orion CEV program, which is part of NASA's Constellation Program, intended to send Americans back to the Moon by 2020. Indications are that the Obama Administration is taking a second look at the end of the Shuttle program and a possible three to five year hiatus in U.S. manned space flights. Following the Columbia tragedy in 2003, then President Bush decreed that the Shuttle program be ended no later than the end of 2010, to be followed by the Orion CEV program, eventually leading to manned Moon missions. However, Obama may be rethinking that schedule. Currently, the last shuttle mission is scheduled to be launched in September 2010, but Obama has indicated that he will probably approve funding if shuttle flights are delayed into 2011 or even 2012. One of NASA's main problems is that, if the shuttle program is going to be extended into 2012 or beyond, it needs to know as soon as possible. Already, anticipating the end of the program next year, it is starting to lay off personnel, and also starting to convert facilities for the Orion program. In particular, NASA wants to start converting shuttle launch pad 39B into an Orion launch pad no later than the middle of next year. As it is, any additional shuttle flights beyond the ones already scheduled will take a lead time of at least eighteen months to two years, in order to plan the missions, choose and train crews, and prepare the vehicles.

NASA had originally planned to have the first manned Orion CEV launch in July 2012; now, due to budget cuts, that has been pushed back to at least March 2015, and probably later. In addition, the Orion capsule was originally configured to hold up to six astronauts; now that has been reduced to four in the early capsules , with the hope of being restored back to six eventually.

Also, on May 23, President Obama officially announced his choice of former astronaut and retired Marie Corps general Charles Bolden to be NASA's new chief administrator; at the same time, former NASA administrator Lori Garver was chosen to be NASA's deputy administrator. They are expected to be easily confirmed by the Senate. Both former and current astronauts praised the fact that one of their own will head up the space agency.

The Fortieth Anniversary of Apollo 11

Believe it or not, forty years has passed since that historic night in July 1969 ,when Neil Armstrong and Edwin Aldrin walked on the Sea of Tranquility. Since that event, the highlight of the twentieth century, so much has happened. Americans walked five more times on the Moon, the Russians disavowed their own Moon program(see above), and started sending space stations up, the shuttle took off, America and Russia came together in space exploration, and are now finishing up the International Space Station, the Chinese are ready to launch their own manned station, and the Indians and Europeans may also follow them into space. But nothing will change the achievement of that July night, and there's nothing more I can add to it.



What has happened to the three Apollo 11 astronauts? Neil Armstrong, the first man to walk on the moon, became a NASA administrator shortly after the Apollo 11 flight. He left NASA in 1971 to teach engineering at the University of Cincinnati, and in 1982, left that to become a software company executive. In 1986, he was vice-chairman of the Challenger investigation committee. Afterwards, he continued to keep a low profile, eventually retired, and today, at 79, lives on a farm in New Lebanon, Ohio, not far from where he was born and raised. Edwin "Buzz" Aldrin left NASA in 1971 and the Air Force in 1973, and spent much of the next fifteen years having off-and-on emotional problems. For a time in the late 70s, he was a virtual recluse, living in an isolated cabin in the San Gabriel Mountains north of Los Angeles. Since the 1980s, he has been involved with several organizations promoting spaceflight and future space goals. Today, 78, he lives near Reston, Virginia. Michael Collins left NASA and the Air Force shortly after Apollo 11 and went to work for the State Department as an assistant secretary for public relations. In 1972, he left it to become the director of the National Space and Air Museum in Washington, D.C. He oversaw the construction and opening of the new Museum building on the Mall, and then left to establish Michael Collins Associates, an engineering consulting firm. Today, at 79, he is retired and lives in Washington, D.C.

Astronomical Trivia

Last issue's astronomical trivia question:

The question of what two findings in his notebook may have made Galileo even more famous than he already is was partly answered by Chris Denny. One was Galileo's observation of Neptune in 1612. However, Galileo noted it simply as a brighter-than-usual star, and did no further investigation of it. The second was another observation at about the same time, which some experts now believe was of Uranus, but Galileo also noted it as star. It was not observed again until 1783, when "discovered" by William Herschel.

This issue's Astronomical Trivia question-

What was the original title of the paper that Albert Einstein published in 1905, which introduced to the world Relativity Theory?

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Deadline for articles submission for the September-October 2009 issue-

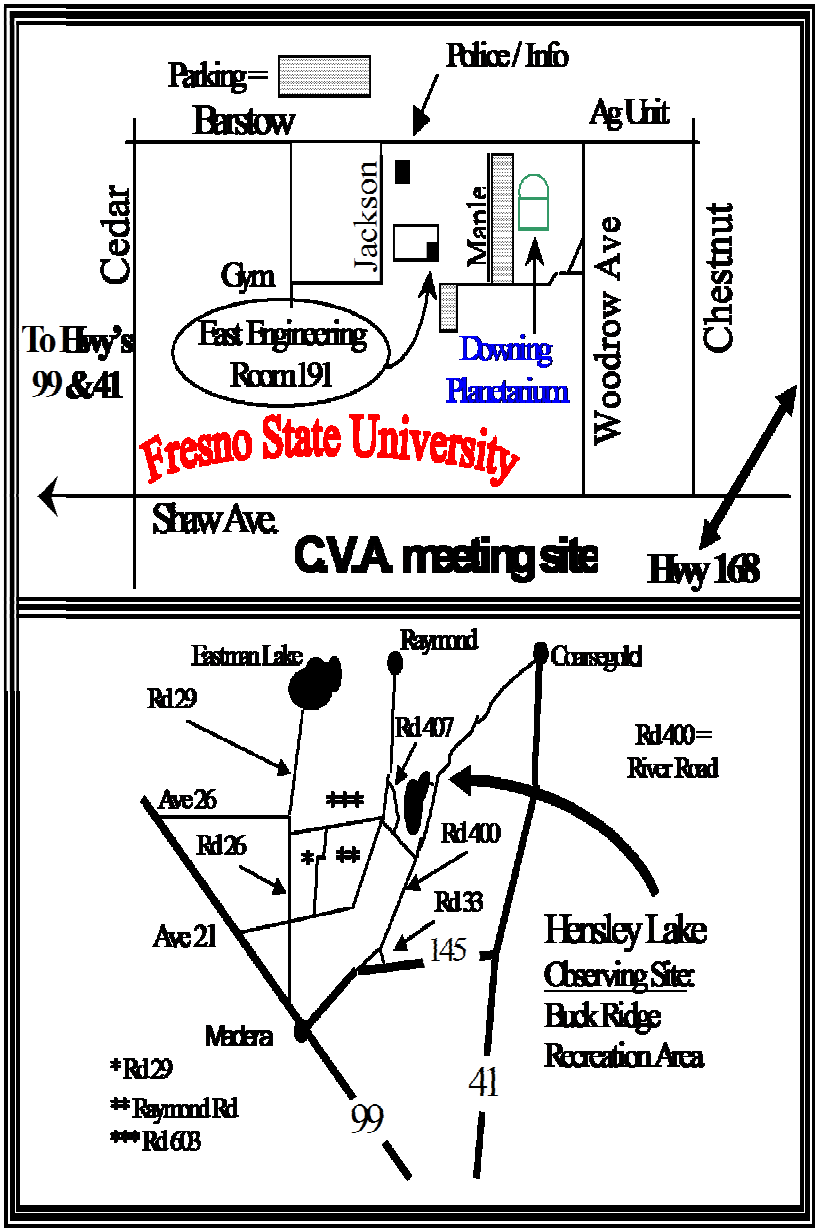
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The issue will be mailed

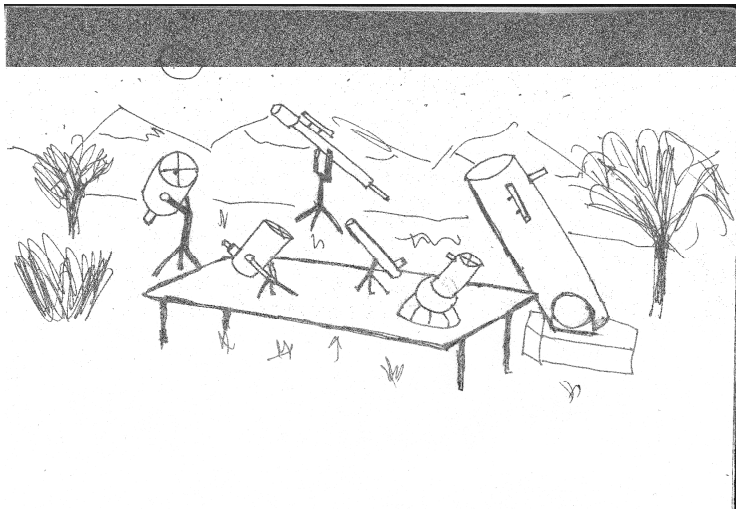
On August 27

Astronomy Short

Galileo wasn't the only one who missed Neptune. John Flamsteed, the English astronomer, observed Neptune on at least six occasions starting in 1690, but also thought it was a star. It wasn't until 1846 that Neptune was "discovered," and identified as a planet.



Telescope Talk by Parmeter



"Looks like Jack has the kids this weekend"

MESSENGER SPACECRAFT REVEALS A VERY DYNAMIC PLANET MERCURY

A NASA spacecraft gliding over the surface of Mercury has revealed that the planet's atmosphere, the interaction of its surrounding magnetic field with the solar wind, and its geological past display greater levels of activity than scientists first suspected. The probe also discovered a previously unknown large impact basin about 430 miles in diameter -- equal to the distance between Washington and Boston.

Analyses of these new findings and more are reported in four papers published in the May 1 issue of Science magazine. The data come from the Mercury Surface, Space Environment, Geochemistry, and Ranging spacecraft, known as MESSENGER. On Oct. 6, 2008, the probe flew by Mercury for the second time, capturing more than 1,200 high-resolution and color images of the planet. The probe unveiled another 30 percent of the planet's surface that had never been seen by previous spacecraft, gathering essential data for planning the remainder of the mission.



"This second Mercury flyby provided a number of new findings," said Sean Solomon, the probe's principal investigator from the Carnegie Institution of Washington. "One of the biggest surprises was how strongly the dynamics of the planet's magnetic fieldâ€"solar wind interaction changed from what we saw during the first Mercury flyby in January 2008. The discovery of a large and unusually well preserved impact basin shows concentrated volcanic and deformational activity."

The spacecraft also made the first detection of magnesium in Mercury's thin atmosphere, known as an exosphere. This observation and other data confirm that magnesium is an important constituent of Mercury's surface materials. The probe's Mercury Atmospheric and Surface Composition Spectrometer instrument detected the magnesium. Finding magnesium was not surprising to scientists, but seeing it in the amounts and distribution observed was unexpected. The instrument also measured other exospheric constituents, including calcium and sodium.

"This is an example of the kind of individual discoveries that the science team will piece together to give us a new picture of how the planet formed and evolved," said William McClintock, co-investigator and lead author of one of the four papers. McClintock, who is from the Laboratory for Atmospheric and Space Physics at the University of Colorado at Boulder, suspects that additional metallic elements from the surface, including aluminum, iron and silicon, also contribute to the exosphere.

The variability that the spacecraft observed in Mercury's magnetosphere, the volume of space dominated by the planet's magnetic field, so far supports the hypothesis that the great day-to-day changes in Mercury's atmosphere may be a result of changes in the shielding provided by the magnetosphere.

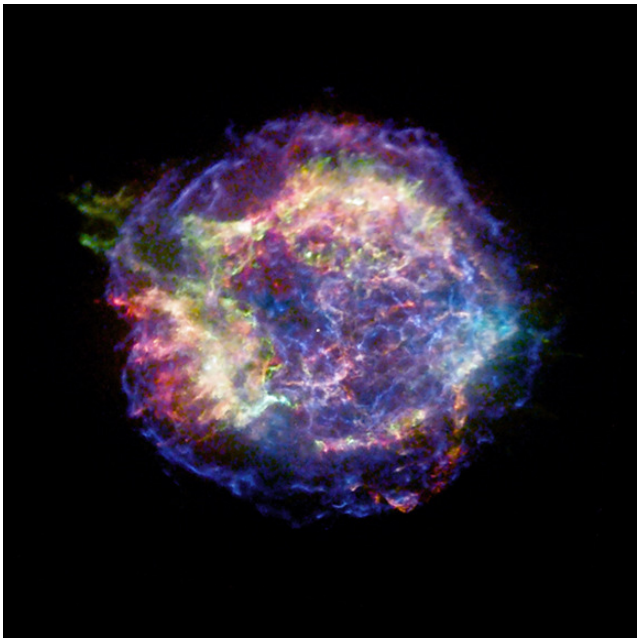
"The spacecraft observed a radically different magnetosphere at Mercury during its second flyby compared with its earlier Jan. 14 encounter," said James Slavin from NASA's Goddard Space Flight Center in Greenbelt, Md. Slavin is a mission co-investigator and lead author of one of the papers. "During the first flyby, important discoveries were made, but scientists didn't detect any dynamic features. The second flyby witnessed a totally different situation."

The spacecraft's discovery of the impact basin, called Rembrandt, is the first time scientists have seen terrain well exposed on the floor of a large impact basin on Mercury. Landforms such as those revealed on the floor of Rembrandt usually are buried completely by volcanic flows. "This basin formed about 3.9 billion years ago, near the end of the period of heavy bombardment of the inner solar system," said Thomas Watters from the Smithsonian Institution in Washington, a participating scientist and lead author of one paper. "Although ancient, the Rembrandt basin is younger than most other known impact basins on Mercury."

Half of Mercury was unknown until a little more than a year ago. Globes of the planet were blank on one side. Spacecraft images have enabled scientists to see 90 percent of the planet's surface at high resolution. The spacecraft's nearly global imaging coverage of the surface after the second flyby gives scientists fresh insight into how the planet's crust was formed.

From NASA, May 2009

Cassiopeia A Comes Alive Across Time and Space



Two new efforts have taken a famous supernova remnant from the static to the dynamic. A new movie of data from NASA's Chandra X-ray Observatory shows changes in time never seen before in this type of object. And, an unprecedented and dramatic three-dimensional visualization of the same remnant by a separate team is being released.

Nearly ten years ago, Chandra's "First Light" image of Cassiopeia A (Cas A) revealed previously unseen structures and detail. Now, after eight years of observation, scientists have been able to construct a movie that tracks the remnant's expansion and changes over time.

"With Chandra, we have watched Cas A over a relatively small amount of its life, but so far the show has been amazing," said Daniel Patnaude of the Smithsonian Astrophysical Observatory in Cambridge, Mass. "And, we can use this to learn more about the aftermath of the star's explosion."

A separate, but equally fascinating visualization featuring Cas A was presented, along with the Patnaude team's results, at a press conference at the American Astronomical Society meeting in Long Beach, Calif. Based on data from Chandra, NASA's Spitzer Space Telescope, and ground-based optical telescopes, Tracey Delaney and her colleagues have created the first threedimensional fly-through of a supernova remnant.

"We have always wanted to know how the pieces we see in two dimensions fit together with each other in real life," said Delaney of the Massachusetts Institute of Technology. "Now we can see for ourselves with this 'hologram' of supernova debris."This ground-breaking visualization of Cas A was made possible through a collaboration with the Astronomical Medicine project based at Harvard. The goal of this project is to bring together the best techniques from two very different fields, astronomy and medical imaging.

"Right now, we are focusing on improving three-dimensional visualization in both astronomy and medicine,"said Harvard's Alyssa Goodman who heads the Astronomical Medicine project. "This project with Cas A is exactly what we have hoped would come out of it."

While these are stunning visuals, both the data movie from Patnaude and the 3-D model from Delaney are, more importantly, rich resources for science. The two teams are trying to get a much more complete understanding of how this famous supernova explosion and its remnant work.

Patnaude and his team have measured the expansion velocity of features in Cas A from motions in the movie, and find it is slower than expected based on current theoretical models. Patnaude thinks the explanation for this mysterious loss of energy is cosmic ray acceleration. Using estimates of the properties of the supernova explosion, including its energy and dynamics, Patnaude's group show that about 30% of the energy in this supernova has gone into accelerating cosmic rays, energetic particles that are generated, in part, by supernova remnants and constantly bombard the Earth's atmosphere. The flickering in the movie provides valuable new information about where the acceleration of these particles occurs.

Likewise, the new 3-D model of Cas A provides researchers with unique ability to study this remnant. With this new tool, Delaney and colleagues found two components to the explosion, a spherical component from the outer layers of the star

Notable features of the model are high-velocity plumes from this internal material that are shooting out from the explosion. Plumes, or jets, of silicon appear in the northeast and southwest, while plumes of iron are seen in the southeast and north. Astronomers had known about the plumes and jets before, but did not know that they all came out in a broad, disk-like structure.

The implication of this work is that astronomers who build models of supernova explosions must now consider that the outer layers of the star come off spherically, but the inner layers come out more disk like with high-velocity jets in multiple directions.

Cassiopeia A is the remains of a star thought to have exploded about 330 years ago, and is one of the youngest remnants in the Milky Way galaxy. The study of Cas A and remnants like it help astronomers better understand how the explosions that generate them seed interstellar gas with heavy elements, heat it with the energy of their radiation, and trigger blast waves from which new stars form.

From NASA http://chandra.harvard.edu/press/09_releases/press_010609.html

Organization

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From: NASA Jet Propulsion Laboratory



Caption describing picture or graphic.