Catskills Astronomy Club News
October 2008

Catskills Astronomy Club News

10/1/08

Club News:

The observation sessions scheduled for September 6th and 27th were canceled due to poor weather. Our next observation sessions will be on October 4th and 25th.

Anyone interested in submitting an astronomical observation or photograph for the newsletter, please contact John at kocis@verizon.net.

The club has selection of astronomy books and DVDs as well as a Meade eight inch reflector and an Edmund three inch reflector for members to borrow. Please contact John at 791-5240 or kocis@verizon.net if you are interested in borrowing any of these.

Astronomy News:

Here are some articles from various NASA sources that might be of interest.

Feature September 18, 2008

Water Hit With Young Star's Best Shot

Water is being blasted to pieces by a young star's laser-like jets, according to new observations from NASA's Spitzer Space Telescope.

The discovery provides a better understanding of how water -- an essential ingredient for life as we know it -- is processed in emerging solar systems.

"This is a truly unique observation that will provide important information about the chemistry occurring in planet-forming regions, and may give us insights into the chemical reactions that made water and even life possible in our own solar system," said Achim Tappe, of the Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.

A young star forms out of a thick, rotating cloud of gas and dust. Like the two ends of a spinning top, powerful jets of gas emerge from the top and bottom of the dusty cloud. As the cloud shrinks more and more under its own gravity, its star eventually ignites and the remaining dust and gas flatten into a pancake-like disk, from which planets will later form. By the time the star ignites and stops accumulating material from its cloud, the jets will have died out.

Tappe and his colleagues used Spitzer's infrared eyes to cut through the dust surrounding a nascent star, called HH 211-mm, and get a better look at its jets. These particular jets are exceptionally young at 1,000 years old, and they are some of the most collimated, or focused, known. An instrument on Spitzer called a spectrometer analyzed light from one of the jets, revealing information about its molecules.

To the astronomers' surprise, Spitzer picked up the signature of rapidly spinning fragments of water molecules, called hydroxyl, or OH. In fact, the hydroxyl molecules have absorbed so much energy (through a process called excitation) that they are rotating around with energies equivalent to 28,000 Kelvin (27,700 degrees Celsius). This far exceeds normal expectations for gas streaming out of a stellar jet. Water, which is abbreviated H**2**O, is made up of two oxygen atoms and one hydrogen; hydroxyl, or OH, contains one oxygen and one hydrogen atom.

The results reveal that the jet is ramming its head into a wall of material, vaporizing ice right off the dust grains it normally coats. The jet is hitting the material so fast and hard that a shock wave is also being produced.

"The shock from colliding atoms and molecules generates ultraviolet radiation, which will break up water molecules, leaving extremely hot hydroxyl molecules," said Tappe.

Tappe said this same process of ice being vaporized off dust occurs in our own solar system, when the sun vaporizes ice in approaching comets. In addition, the water that now coats our world is thought to have come from icy comets that vaporized as they rained down on a young Earth.

Tappe is the lead author of a paper on this topic, which was published in a recent issue of the Astrophysical Journal. Co-authors on the paper include Charlie Lada, and August Muench, also of the Harvard-Smithsonian Center for Astrophysics; and J. H. Black, of the Chalmers University of Technology, in Onsala, Sweden.

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NEWS RELEASE: 2008-179 Sept. 23, 2008

NASA's Kepler Spacecraft Baked and Ready for More Tests

NASA's planet-hunting Kepler mission, scheduled to launch in 2009, has survived an extreme

temperature test.

The thermal vacuum test is part of a series of environmental tests the spacecraft will undergo before it blasts into space aboard a Delta II rocket from the Cape Canaveral Air Force Station, Fla.

"Kepler functioned extremely well at the intense temperatures it will encounter in space," said James Fanson, Kepler project manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

The test, which was performed at Ball Aerospace & Technologies Corp. in Boulder, Colo., simulates the vacuum of space, and the extreme temperatures Kepler will face once launched. The spacecraft is tucked into a vacuum chamber and surrounded by a cold shroud to mimic the deep chill of space. One side of the spacecraft -- the side with solar panels -- is then baked as if it were being heated by the sun.

The goal is to make sure that the spacecraft and its detectors operate properly in the space-like environment. An electromagnetic compatibility test, to ensure Kepler's electronics are sound, will begin soon.

Kepler will monitor 100,000 stars, searching for signs of planets -- including ones as small as or smaller than Earth. To date, no Earth-sized planet has been discovered.

"The results of these tests are now being used to prepare for the science operations that will start after the spacecraft launches and undergoes in-orbit checkout," said Bill Borucki of NASA Ames Research Center, Moffett Field, Calif., the science principal investigator for the Kepler Mission.

Kepler is a NASA Discovery mission. In addition to being the home organization of the science principal investigator, NASA Ames Research Center is responsible for the ground system development, mission operations and science data analysis. Kepler mission development is managed by JPL. Ball Aerospace & Technologies Corp. is responsible for developing the Kepler flight system and supporting mission operations.

More information about the Kepler mission is at http://kepler.nasa.gov/ . More information about extrasolar planets and NASA's planet-finding program is at **http://planetquest.jpl.nasa.gov .**

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NEWS RELEASE: 2008-178 September 23, 2008

Ulysses Reveals Global Solar Wind Plasma Output at 50-Year Low

PASADENA, Calif. -- Data from the Ulysses spacecraft, a joint NASA-European Space Agency

mission, show the sun has reduced its output of solar wind to the lowest levels since accurate readings became available. The sun's current state could reduce the natural shielding that envelops our solar system.

"The sun's million mile-per-hour solar wind inflates a protective bubble, or heliosphere, around the solar system. It influences how things work here on Earth and even out at the boundary of our solar system where it meets the galaxy," said Dave McComas, Ulysses' solar wind instrument principal investigator and senior executive director at the Southwest Research Institute in San Antonio, Texas. "Ulysses data indicate the solar wind's global pressure is the lowest we have seen since the beginning of the space age."

The sun's solar wind plasma is a stream of charged particles ejected from the sun's upper atmosphere. The solar wind interacts with every planet in our solar system. It also defines the border between our solar system and interstellar space.

This border, called the heliopause, is a bubble-shaped boundary surrounding our solar system where the solar wind's strength is no longer great enough to push back the wind of other stars. The region around the heliopause also acts as a shield for our solar system, warding off a significant portion of the cosmic rays outside the galaxy.

"Galactic cosmic rays carry with them radiation from other parts of our galaxy," said Ed Smith, NASA's Ulysses project scientist at the Jet Propulsion Laboratory in Pasadena, Calif. "With the solar wind at an all-time low, there is an excellent chance the heliosphere will diminish in size and strength. If that occurs, more galactic cosmic rays will make it into the inner part of our solar system."

Galactic cosmic rays are of great interest to NASA. Cosmic rays are linked to engineering decisions for unmanned interplanetary spacecraft and exposure limits for astronauts traveling beyond low-Earth orbit.

In 2007, Ulysses made its third rapid scan of the solar wind and magnetic field from the sun's south to north pole. When the results were compared with observations from the previous solar cycle, the strength of the solar wind pressure and the magnetic field embedded in the solar wind were found to have decreased by 20 percent. The field strength near the spacecraft has decreased by 36 percent.

"The sun cycles between periods of great activity and lesser activity," Smith said. "Right now, we are in a period of minimal activity that has stretched on longer than anyone anticipated."

Ulysses was the first mission to survey the space environment over the sun's poles. Data Ulysses has returned have forever changed the way scientists view our star and its effects. The venerable spacecraft has lasted more than 17 years, or almost four times its expected mission lifetime. The Ulysses solar wind findings were published in a recent

edition of Geophysical Research Letters.

The Ulysses spacecraft was carried into Earth orbit aboard space shuttle Discovery on Oct. 6, 1990. From Earth orbit it was propelled toward Jupiter, passing the planet on Feb. 8, 1992. Jupiter's immense gravity bent the spacecraft's flight path downward and away from the plane of the planets' orbits. This placed Ulysses into a final orbit around the
sun that would take it over its north and south poles.

The Ulysses spacecraft was provided by ESA, having been built by Astrium GmbH (formerly Dornier Systems) of Friedrichshafen, Germany. NASA provided the launch vehicle and the upper stage boosters. The U.S. Department of Energy supplied a radioisotope thermoelectric generator to power the spacecraft. Science instruments were provided by U.S. and European investigators. The spacecraft is operated from JPL by a joint NASA-ESA team.

More information about the Ulysses mission is available at http://ulysses.jpl.nasa.gov .

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NEWS RELEASE: 2008-176 Sept. 22, 2008

NASA's Mars Rover to Head Toward Bigger Crater

PASADENA, Calif. -- NASA's Mars Rover Opportunity is setting its sights on a crater more than 20 times larger than its home for the past two years.

To reach the crater the rover team calls Endeavour, Opportunity would need to drive approximately 12 kilometers (7 miles) to the southeast, matching the total distance it has traveled since landing on Mars in early 2004. The rover climbed out of Victoria Crater earlier this month.

"We may not get there, but it is scientifically the right direction to go anyway," said Steve Squyres of Cornell University, principal investigator for the science instruments on Opportunity and its twin rover, Spirit. "This crater is staggeringly large compared to anything we've seen before."

Getting there would yield a look inside a bowl 22 kilometers (13.7 miles) across. Scientists expect to see a much deeper stack of rock layers than those examined by Opportunity in Victoria Crater.

"I would love to see that view from the rim," Squyres said. "But even if we never get there, as we move southward we expect to be getting to younger and younger layers of rock on the surface. Also, there are large craters to the south that we think are sources of cobbles that we want to examine out on the plain. Some of the cobbles are samples of layers deeper than Opportunity will

ever see, and we expect to find more cobbles as we head toward the south."

Opportunity will have to pick up the pace to get there. The rover team estimates Opportunity may be able to travel about 110 yards each day it is driven toward the Endeavour crater. Even at that pace, the journey could take two years.

"This is a bolder, more aggressive objective than we have had before," said John Callas, the project manager for both Mars rovers at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "It's tremendously exciting. It's new science. It's the next great challenge for these robotic explorers."

Opportunity, like Spirit, is well past its expected lifetime on Mars, and might not keep working long enough to reach the crater. However, two new resources not available during the 4-mile drive toward Victoria Crater in 2005 and 2006 are expected to aid in this new trek.

One is imaging from orbit of details smaller than the rover itself, using the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter, which arrived at the Red Planet in 2006.

"HiRISE allows us to identify drive paths and potential hazards on the scale of the rover along the route," Callas said. "This is a great example of how different parts of NASA's Mars Exploration Program reinforce each other."

Other advantages come from a new version of flight software uplinked to Opportunity and Spirit in 2006, boosting their ability to autonomously choose routes and avoid hazards such as sand dunes.

During its first year on Mars, Opportunity found geological evidence that the area where it landed had surface and underground water in the distant past. The rover's explorations since have added information about how that environment changed over time. Finding rock layers above or below the layers already examined adds windows into later or earlier periods of time.

NASA's JPL built and manage the rovers and the Mars Reconnaissance Orbiter for NASA's Science Mission Directorate, Washington.

For images and information about Spirit and Opportunity, visit:

http://www.nasa.gov/rovers

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News release: 2008-172 Sept. 5, 2008

Cassini Images Ring Arcs Among Saturn's Moons

PASADENA, Calif. -- NASA's Cassini spacecraft has detected a faint, partial ring orbiting with one small moon of Saturn, and has confirmed the presence of another partial ring orbiting with a second moon. This is further evidence that most of the planet's small, inner moons orbit within partial or complete rings.

Recent Cassini images show material, called ring arcs, extending ahead of and behind the small moons Anthe and Methone in their orbits. The new findings indicate that the gravitational influence of nearby moons on ring particles might be the deciding factor in whether an arc or complete ring is formed.

Both Anthe and Methone orbit Saturn in locations, called resonances, where the gravity of the nearby larger moon Mimas disturbs their orbits. Gravitational resonances are also responsible for many of the structures in Saturn's magnificent rings. Mimas provides a regular gravitational tug on each moon, which causes the moons to skip forward and backward within an arc-shaped region along their orbital paths, according to Nick Cooper, a Cassini imaging team associate from Queen Mary, University of London. "When we realized that the Anthe and Methone ring arcs were very similar in appearance to the region in which the moons swing back and forth in their orbits due to their resonance with Mimas, we knew we had a possible cause-and-effect relationship," Cooper said.

Scientists believe the faint ring arcs from Anthe and Methone likely consist of material knocked off these small moons by micrometeoroid impacts. This material does not spread all the way around Saturn to form a complete ring, because of the gravitational resonance with Mimas. That interaction confines the material to a narrow region along the orbits of the moons.

This is the first detection of an arc of material near Anthe. The Methone arc was previously detected by Cassini's Magnetospheric Imaging Instrument, and the new images confirm its presence. Previous Cassini images show faint rings connected with other small moons either embedded within or near the outskirts of Saturn's main ring system, such as Pan, Janus, Epimetheus and Pallene. Cassini had also previously observed an arc in the G ring, one of Saturn's faint, major rings.

"This is probably the same mechanism responsible for producing the arc in the G ring," said Matthew Hedman, a Cassini imaging team associate at Cornell University in Ithaca, N.Y. Hedman and his Cassini imaging team colleagues previously determined that the G-ring arc is maintained by a gravitational resonance with Mimas, much like the new, small moon arcs. "Indeed, the Anthe arc may be similar to the debris we see in the G-ring arc, where the largest particles are clearly visible. One might even speculate that if Anthe were shattered, its debris might form a structure much like the G ring," Hedman said.

Additional analysis by scientists indicates that, while the gravitational influence of Mimas keeps the Anthe, Methone and G-ring arcs in place, the material that orbits with the moons Pallene,

Janus and Epimetheus is not subject to such powerful resonant forces and is free to spread out around the planet, forming complete rings without arcs.

The intricate relationships between these ring arcs and the moons are just one of many such mechanisms that exist in the Saturn system. Cassini Imaging Team Member and Professor Carl Murray, also from Queen Mary, University of London, said, "There are many examples in the

Saturn system of moons creating structures in the rings and disturbing the orbits of other moons. Understanding these interactions and learning about their origins can help us to make sense of what we are seeing in the Cassini images."

Images of Anthe and Methone with their ring arcs are available at: http://www.nasa.gov/cassini, http://saturn.jpl.nasa.gov and http://ciclops.org.

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

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News release: 2008-171 September 4, 2008

Spiky Probe on NASA Mars Lander Raises Vapor Quandary

TUCSON, Ariz. -- A fork-like conductivity probe has sensed humidity rising and falling beside NASA's Phoenix Mars Lander, but when stuck into the ground, its measurements so far indicate soil that is thoroughly and perplexingly dry.

"If you have water vapor in the air, every surface exposed to that air will have water molecules adhere to it that are somewhat mobile, even at temperatures well below freezing," said Aaron Zent of NASA Ames Research Center, Moffett Field, Calif., lead scientist for Phoenix's thermal and electroconductivity probe.

In below-freezing permafrost terrains on Earth, that thin layer of unfrozen water molecules on soil particles can grow thick enough to support microbial life. One goal for building the conductivity probe and sending it to Mars has been to see whether the permafrost terrain of the Martian arctic has detectable thin films of unfrozen water on soil particles. By gauging how electricity moves through the soil from one prong to another, the probe can detect films of water barely more than one molecule thick.

"Phoenix has other tools to find clues about whether water ice at the site has melted in the past, such as identifying minerals in the soil and observing soil particles with microscopes. The conductivity probe is our main tool for checking for present-day soil moisture," said Phoenix Project Scientist Leslie Tamppari of NASA's Jet Propulsion Laboratory, Pasadena, Calif.

Preliminary results from the latest insertion of the probe's four needles into the ground, on Wednesday and Thursday, match results from the three similar insertions in the three months since landing.

"All the measurements we've made so far are consistent with extremely dry soil," Zent said. "There are no indications of thin films of moisture, and this is puzzling."

Three other sets of observations by Phoenix, in addition to the terrestrial permafrost analogy, give reasons for expecting to find thin-film moisture in the soil.

One is the conductivity probe's own measurements of relative humidity when the probe is held up in the air. "The relative humidity transitions from near zero to near 100 percent with every day-night cycle, which suggests there's a lot of moisture moving in and out of the soil," Zent said.

Another is Phoenix's confirmation of a hard layer containing water-ice about 5 centimeters (2 inches) or so beneath the surface.

Also, handling the site's soil with the scoop on Phoenix's robotic arm and observing the disturbed soil show that it has clumping cohesiveness when first scooped up and that this cohesiveness decreases after the scooped soil sits exposed to air for a day or two. One possible explanation for those observations could be thin-film moisture in the ground.

The Phoenix team is laying plans for a variation on the experiment of inserting the conductivity probe into the soil. The four successful insertions so far have all been into an undisturbed soil surface. The planned variation is to scoop away some soil first, so the inserted needles will reach closer to the subsurface ice layer.

"There should be some amount of unfrozen water attached to the surface of soil particles above the ice," Zent said. "It may be too little to detect, but we haven't finished looking yet."

The thermal and electroconductivity probe, built by Decagon Devices Inc., Pullman, Wash., is mounted on Phoenix's robotic arm. The probe is part of the lander's Microscopy, Electrochemistry and Conductivity instrument suite.

The Phoenix mission is led by Peter Smith at the University of Arizona with project management at NASA's Jet Propulsion Laboratory in Pasadena, Calif., and development partnership at Lock-

heed Martin in Denver. International contributions come from the Canadian Space Agency; the University of Neuchatel, Switzerland; the universities of Copenhagen and Aarhus in Denmark; the Max Planck Institute in Germany; and the Finnish Meteorological Institute.

For more about Phoenix, visit: http://www.nasa.gov/phoenix or http://phoenix.lpl.arizona.edu.

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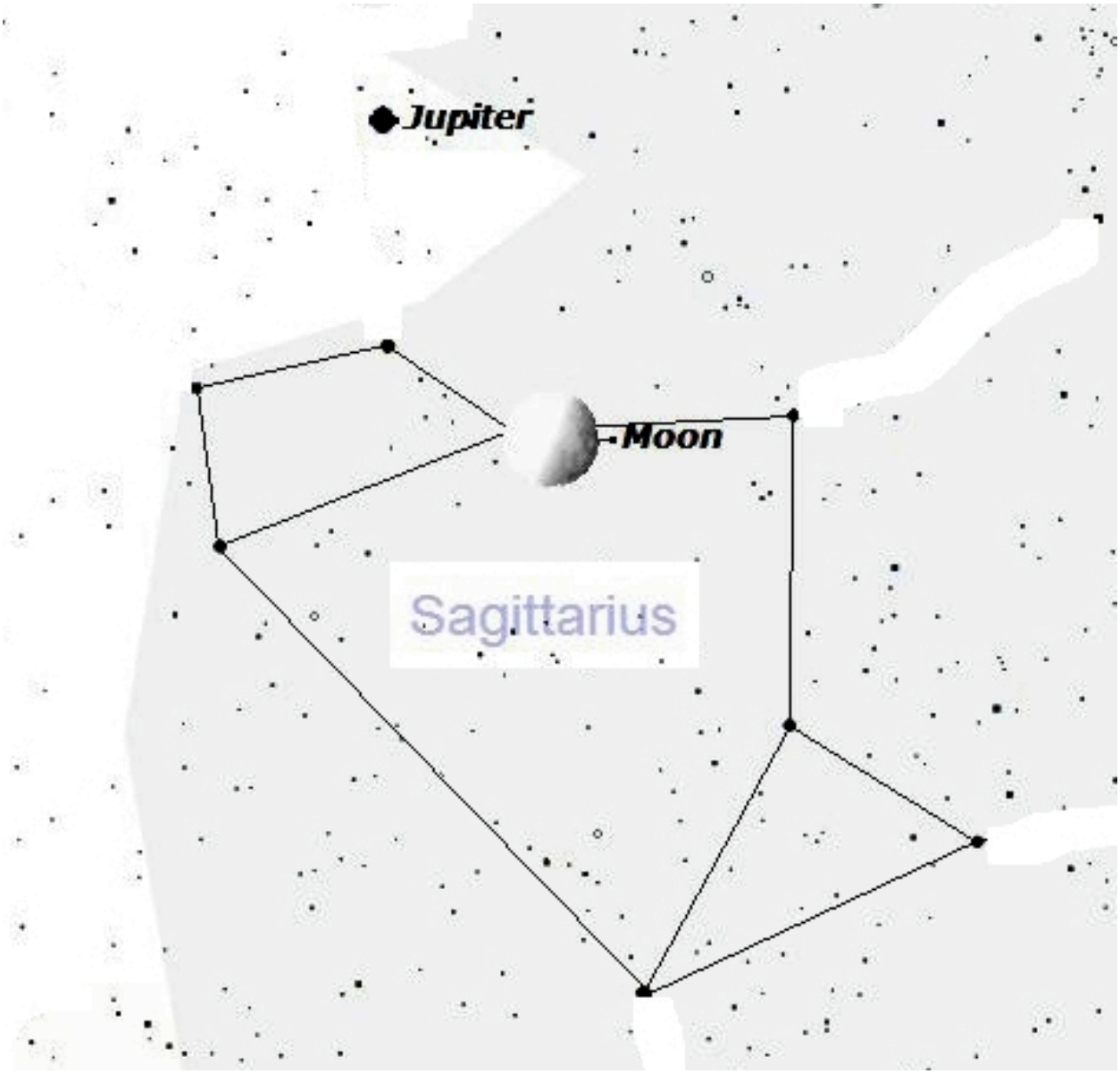
Midevening Observing Highlights for October

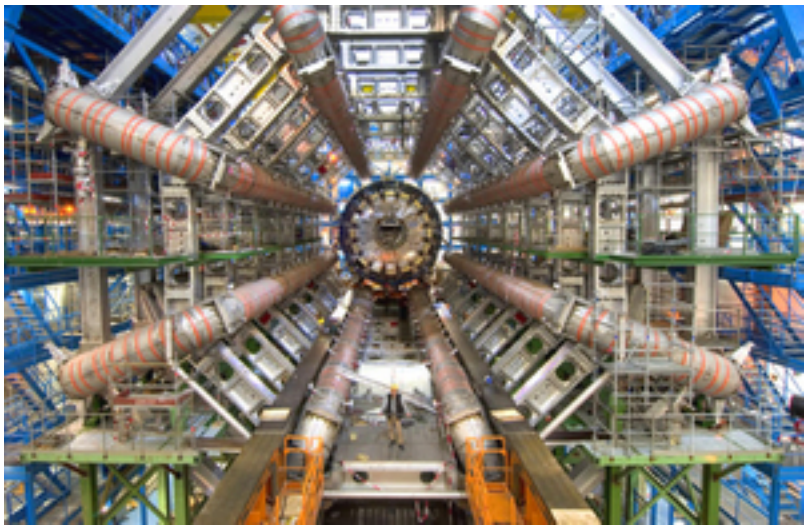
Jupiter is still dominant in the southwestern sky near Sagittarius. The Milky Way stretches across the sky from southwest to northeast. The constellation Cygnus can be found almost directly overhead. The Great Square of Pegasus is high in the east. To the northeast of the Great Square the constellation of Andromeda can be seen and just above its center is M31, the Andromeda Galaxy. The Double Cluster (NGC 869 and NGC 884) in Perseus can be seen rising in the northeast below Cassiopiea. Sagittarius is setting in the southwest. The bright stars Capella and Aldebaran are rising in the east. The Big Dipper is low on the northern horizon. Full moon is on October 14th and new moon is on October 28th. The Orionid meteor shower peaks on the morning of the 21st. The image below shows the location of the Jupiter and the Moon in Sagittarius on the evening of October 6th.



AAVSO Writers Bureau Blog
Doomsday Machines Near and Far

By Ray Villard, Cosmic Ray

In a previous blog I talked about various solutions to the Fermi Paradox (why there is no evidence of intelligent life in space). One possibility is that technological civilizations are simply wiped out due to natural or artificially produced disasters.



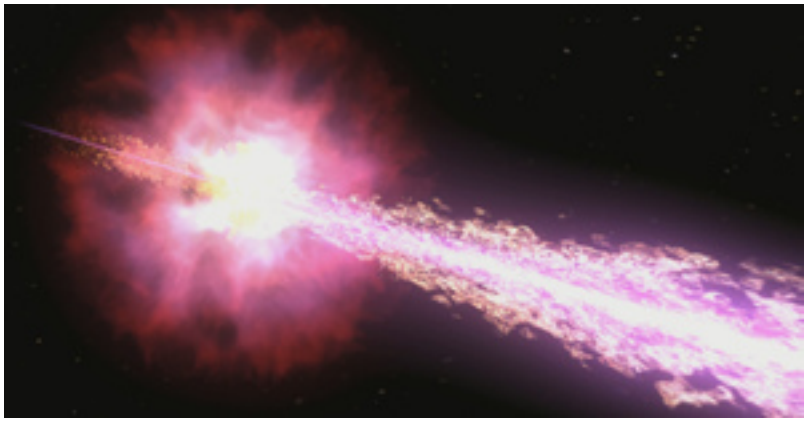
This past week there were two ironically intertwined stories that I don't think many soothsayers connected.

The first was the initial firing up of CERN's Large Hadron Collider, which has been discussed at length by my fellow bloggers at Discovery Channel. Among the most publicized paranoid fear was that of the collider fabricating a mini black hole that would swallow the Earth.

Certainly the pictures of the LHC make it look more ominous than any doomsday gizmo from a James Bond or Austin Powers movie. It looks like it really could mess up the Earth!

In fact a lawsuit in Hawaii's U.S. District Court sought a temporary restraining order that would put the LHC on hold, pending the release and review of an updated CERN safety assessment. It also called on the U.S. government to do a full environmental review of LHC project, including any potential possibility of destroying the Earth!

But our restless universe is vastly more devastating when it comes to deadly high-energy physics. On Wednesday, the same day the LHC fired up, NASA scientists announced their detailed analysis of the brightest expolsion ever to be recoded on the sky. It in fact heralded the birth of a black hole halfway across the universe.



On April 7 a brilliant burst of gamma rays and other electromagnetic radiation flashed on the sky at 2:12 a.m. EDT. For 40 seconds light from the gamma ray burst glowed as a dim 5th magnitude "star" in the spring constellation Bootes.

Robotic watchdog telescopes snagged it. But if anyone had been fortunate enough to witness it they could have told their grandchildren that they briefly saw the farthest object in the universe ever visible to the naked eye – a staggering 7.5 billion light-years away.

The scary thing is that the burst was aimed precisely at Earth, like a pencil-thin laser beam. It was produce by a powerful narrow jet of material squirted into space at nearly the speed of light from the catastrophic collapse of a supermassive star into a black hole.

For a few minutes the directed energy beam was intrinsically as bright as 200 million galaxies! A gamma-ray burst pops off somewhere in the universe once a day. Statistically, a death star beam of this magnitude should directly hit us once every decade, researchers estimate.

If an explosion like this happened in our own galaxy, say 6,000 light-years from Earth, it would briefly glow as brightly as the sun in the sky! This would be especially terrifying if it happened over the dark side of Earth. Night would briefly turn into day. People would instinctively look upward only to be immediately blinded because the intensity of the sun would be concentrated into a brilliant laser-burning pinpoint of light. Panic would ripple across the globe as some religious groups prayed, believing that the awesome lightning swift event meant that the biblical end of the world was at last at hand.

And that's just the beginning.

The Earth's atmosphere would soak up most of the gamma rays but their energy would create nitrogen oxide smog to blot out the sun. The toxic chemical mix would also destroy the ozone layer, exposing surviving humans to a dangerous overdose of ultraviolet radiation from the sun for a year or more until the ozone recovered. You couldn't leave your house without slathering on *Suncreen 2000*.

Thankfully this flavor of gamma-ray burst is a minimal threat to civilizations in our galaxy. Why? Because the universe today rarely makes the super massive stars that explode as hypernovae. Earth might get zapped like this once every 10 billion years, which is twice the current age of our planet.

Hypernovae were more frequent in the distant past when monstrous first-generation stars could be made almost purely out of hydrogen and helium without the effect of heavier elements squelching the newborn star from ballooning to become super massive. The appearance of heavier elements in the universe had to wait until they could be manufactured inside stars through nucleosynthesis.

So, this week we can scratch off black hole making machines -- both manmade and natural -- as threats to our extinction.

But there's a lot more out there in the violent universe that could be wiping out civilizations. Stay tuned, but remove "damage by gamma-ray bursts" from your homeowner's insurance policy.

NASA Space Place

Extreme Starburst

by Dr. Tony Phillips

A star is born. A star is born. A star is born.

Repeat that phrase 4000 times and you start to get an idea what life is like in distant galaxy J100054+023436.

Astronomers using NASA's Spitzer Space Telescope and ground-based observatories have found that the galaxy gives birth to as many as 4000 stars a year. For comparison, in the same period of

time the Milky Way produces only about 10. This makes J100054+023436 an extreme starburst galaxy.

“We call it the ‘Baby Boom galaxy,” says Peter Capak of NASA’s Spitzer Science Center at the California Institute of Technology in Pasadena, CA. "It is undergoing a major baby boom, producing most of its stars all at once. If our human population was produced in a similar boom, then almost all people alive today would be the same age."

Capak is lead author of a paper entitled "Spectroscopic Confirmation of an Extreme Starburst at Redshift 4.547" detailing the discovery in the July 10th issue of *Astrophysical Journal Letters*.

The galaxy appears to be a merger, a “train wreck” of two or more galaxies crashing together. The crash is what produces the baby boom. Clouds of interstellar gas within the two galaxies press against one another and collapse to form stars, dozens to hundreds at a time.

This isn’t the first time astronomers have witnessed a galaxy producing so many stars. “There are some other extreme starburst galaxies in the local universe,” says Capek. But the Baby Boom galaxy is special because it is not local. It lies about 12.3 billion light years from Earth, which means we are seeing it as it was 12.3 billion years ago. The universe itself is no older than 14 billion years, so this galaxy is just a youngster (Capak likens it to a 6-year-old human) previously thought to be incapable of such rapid-fire star production.

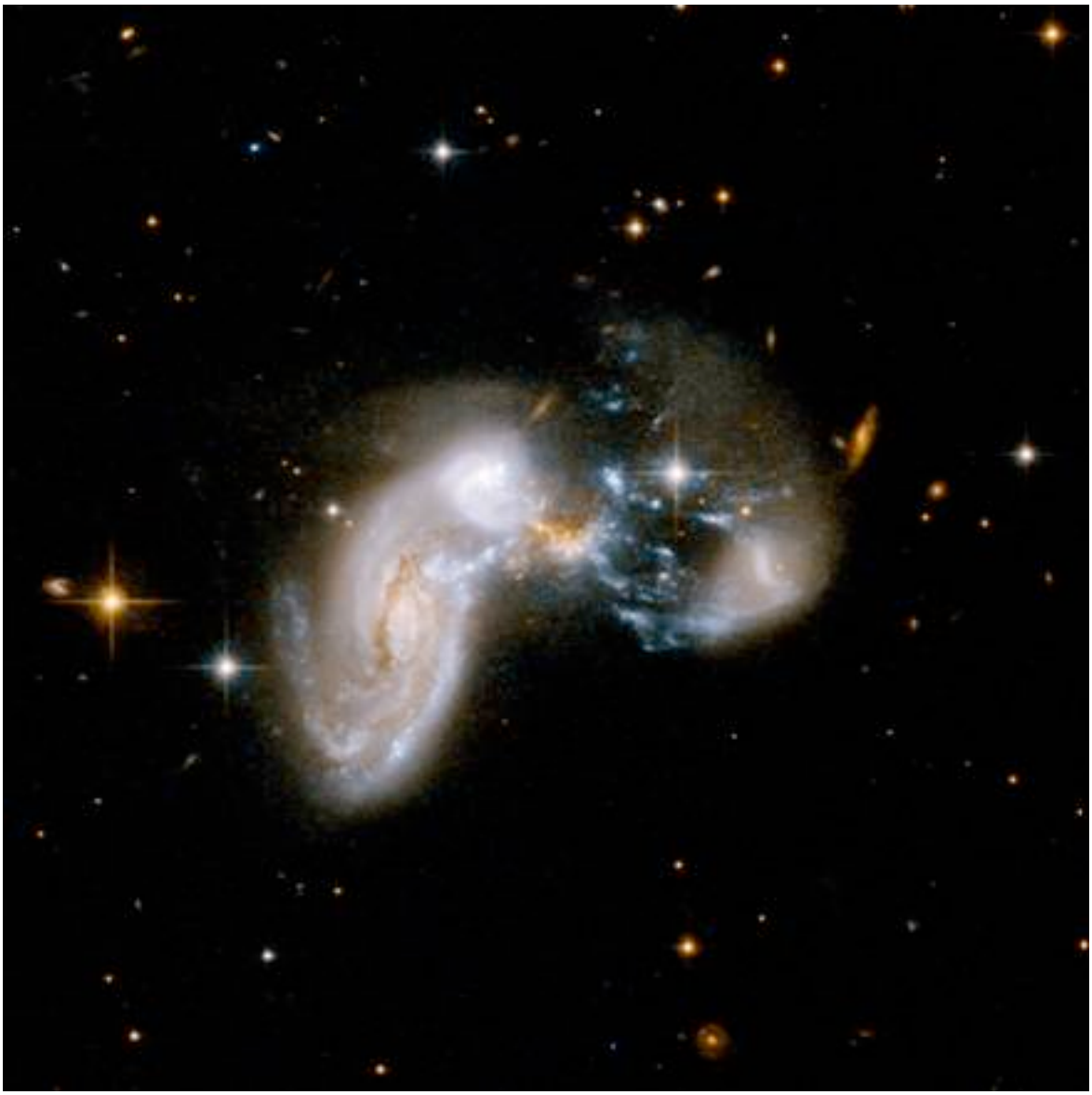
The Baby Boom galaxy poses a challenge to the Hierarchical Model of galaxy evolution favored by many astronomers. According to the Hierarchical Model, galaxies grow by merging; Add two small galaxies together, and you get a bigger galaxy. In the early years of the universe, all galaxies were small, and they produced correspondingly small bursts of star formation when they merged. “Yet in J100054+023436, we see an extreme starburst. The merging galaxies must be pretty large.”

Capak and colleagues are busy looking for more Baby Boomers “to see if this is a one-off case or a common occurrence.” The theory of evolution of galaxies hangs in the balance.

Meanwhile… A star is born. A star is born. A star is born.

See more breathtaking Spitzer images at www.spitzer.caltech.edu/Media/mediaimages. Kids can play the new Spitzer “Sign Here!” game at spaceplace.nasa.gov/en/kids/spitzer/signs.

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



Caption:
The "Baby Boom" galaxy loosely resembles the galaxy shown here, called Zw II 96, in this Hubble Space Telescope image. This galaxy is only 500 million light-years away, while the Baby Boom galaxy is 12.3 billion light-years away.