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Nearly 10 billion years ago, the black hole at the center of a galaxy known as PKS B1424-418 produced a powerful outburst. Light from this blast began arriving at Earth in 2012. Now astronomers using data from NASA's Fermi Gamma-ray Space Telescope and other space- and ground-based observatories have shown that a record-breaking neutrino seen around the same time likely was born in the same event.

"Neutrinos are the fastest, lightest, most unsociable and least understood fundamental particles, and we are just now capable of detecting high-energy ones arriving from beyond our galaxy," said Roopesh Ojha, a Fermi team member at NASA's Goddard Space Flight Center in Greenbelt, Maryland, and a coauthor of the study. "Our work provides the first plausible association between a single extragalactic object and one of these cosmic neutrinos."

Although neutrinos far outnumber all the atoms in the universe, they rarely interact with matter, which makes detecting them quite a challenge. But this same property lets neutrinos make a fast exit from places where light cannot easily escape -- such as the core of a collapsing star -- and zip across the universe almost completely unimpeded. Neutrinos can provide information about processes and environments that simply aren't available through a study of light alone.

The IceCube Neutrino Observatory, built into a cubic kilometer of clear glacial ice at the South Pole, detects neutrinos when they interact with atoms in the ice. This triggers a cascade of fast-moving charged particles that emit a faint glow, called Cerenkov light, as they travel, which is picked up by thousands of optical sensors strung throughout IceCube. Scientists determine the energy of an incoming neutrino by the amount of light its particle cascade emits.

To date, the IceCube science team has detected about a hundred very high-energy neutrinos and nicknamed some of the most extreme events after characters on the children's TV series "Sesame Street." On Dec. 4, 2012, IceCube detected an event known as Big Bird, a neutrino with an energy exceeding 2 quadrillion electron volts (PeV). To put that in perspective, it's more than a million million times greater than the energy of a dental X-ray packed into a single particle thought to possess less than a millionth the mass of an electron. Big Bird was the highest-energy neutrino ever detected at the time and still ranks second.

Where did it come from? The best IceCube position only narrowed the source to a patch of the southern sky about 32 degrees across, equivalent to the apparent size of 64 full moons.

Enter Fermi. Starting in the summer of 2012, the satellite's Large Area Telescope (LAT) witnessed a dramatic brightening of PKS B1424-418, an active galaxy classified as a gamma-ray blazar. An active galaxy is an otherwise typical galaxy with a compact and unusually bright core. The excess luminosity of the central region is produced by matter falling toward a supermassive black hole weighing millions of times the mass of our sun. As it approaches the black hole, some of the material becomes channeled into particle jets moving outward in opposite directions at nearly the speed of light. In blazars, one of these jets happens to point almost directly toward Earth.
During the year-long outburst, PKS B1424-418 shone between 15 and 30 times brighter in gamma rays than its average before the eruption. The blazar is located within the Big Bird source region, but then so are many other active galaxies detected by Fermi.

The scientists searching for the neutrino source then turned to data from a long-term observing program named TANAMI. Since 2007, TANAMI has routinely monitored nearly 100 active galaxies in the southern sky, including many flaring sources detected by Fermi. The program includes regular radio observations using the Australian Long Baseline Array (LBA) and associated telescopes in Chile, South Africa, New Zealand and Antarctica. When networked together, they operate as a single radio telescope more than 6,000 miles across and provide a unique high-resolution look into the jets of active galaxies.

Three radio observations of PKS B1424-418 between 2011 and 2013 cover the period of the Fermi outburst. They reveal that the core of the galaxy’s jet had brightened by about four times. No other galaxy observed by TANAMI over the life of the program has exhibited such a dramatic change.

"We combed through the field where Big Bird must have originated looking for astrophysical objects capable of producing high-energy particles and light," said coauthor Felicia Krauss, a doctoral student at the University of Erlangen-Nuremberg in Germany. "There was a moment of wonder and awe when we realized that the most dramatic outburst we had ever seen in a blazar happened in just the right place at just the right time."

In a paper published Monday, April 18, in Nature Physics, the team suggests the PKS B1424-418 outburst and Big Bird are linked, calculating only a 5-percent probability the two events occurred by chance alone. Using data from Fermi, NASA’s Swift and WISE satellites, the LBA and other facilities, the researchers determined how the energy of the eruption was distributed across the electromagnetic spectrum and showed that it was sufficiently powerful to produce a neutrino at PeV energies.

"Taking into account all of the observations, the blazar seems to have had means, motive and opportunity to fire off the Big Bird neutrino, which makes it our prime suspect," said lead author Matthias Kadler, a professor of astrophysics at the University of Wuerzburg in Germany.

Francis Halzen, the principal investigator of IceCube at the University of Wisconsin–Madison, and not involved in this study, thinks the result is an exciting hint of things to come. "IceCube is about to send out real-time alerts when it records a neutrino that can be localized to an area a little more than half a degree across, or slightly larger than the apparent size of a full moon," he said. "We're slowly opening a neutrino window onto the cosmos."

NASA’s Fermi Gamma-ray Space Telescope is an astrophysics and particle physics partnership, developed in collaboration with the U.S. Department of Energy and with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden and the United States.

For more information about NASA's Fermi, visit www.nasa.gov/fermi.
2. Powerful Winds Spotted From Mysterious X-ray Binaries

ESA's XMM-Newton has discovered gas streaming away at a quarter of the speed of light from very bright X-ray binaries in two nearby galaxies.

At X-ray wavelengths, the celestial sky is dominated by two types of astronomical objects: supermassive black holes, sitting at the centres of large galaxies and ferociously devouring the material around them, and binary systems, consisting of a stellar remnant a white dwarf, neutron star or black hole feeding on gas from a companion star. In both cases, the gas forms a swirling disc around the compact and very dense central object: friction in the disc causes the gas to heat up and emit light at many wavelengths, with a peak in X-rays.

Not all of the gas is swallowed by the central object though, and some of it might even be pushed away by powerful winds and jets.

But an intermediate class of objects was discovered in the 1980s and is still not well understood. Ten to a hundred times brighter than ordinary X-ray binaries, these sources are nevertheless too faint to be linked to accreting supermassive black holes, and in any case, are usually found far from the centre of their host galaxy. "We think these 'ultra-luminous X-ray sources' are somewhat special binary systems, sucking up gas at a much higher rate than an ordinary X-ray binary," explains Ciro Pinto from the Institute of Astronomy in Cambridge, UK. "Some host highly magnetised neutron stars, while others might conceal the long-sought-after intermediate-mass black holes, which have masses around 1000 times the mass of the Sun. But in the majority of cases, the reason for their extreme behaviour is still unclear."

Ciro is the lead author of a new study, based on observations from ESA's XMM-Newton, revealing for the first time strong winds gusting at very high speed from two of these exotic objects. The discovery, published in this
week's issue of the journal Nature, confirms that these sources conceal a compact object accreting matter at extraordinarily high rates.

Ciro and his colleagues delved into the XMM-Newton archives and collected several days' worth of observations of three ultra-luminous X-ray sources, all hosted in nearby galaxies located less than 22 million light-years from our Milky Way. The data were obtained over several years with the Reflection Grating Spectrometer, a highly sensitive instrument that allowed them to spot very subtle features in the spectrum of the X-rays from the sources.

In all three sources, the scientists were able to identify X-ray emission from gas in the outer portions of the disc surrounding the central compact object, slowly flowing towards it. But two of the three sources known as NGC 1313 X-1 and NGC 5408 X-1 also show clear signs of X-rays being absorbed by gas that is streaming away from the central source at an extremely rapid 70,000 km/s almost a quarter of the speed of light.

"This is the first time we've seen winds streaming away from ultra-luminous X-ray sources," says Ciro. "And there's more, since the very high speed of these outflows is telling us something about the nature of the compact objects in these sources, which are frantically devouring matter."

While the hot gas is pulled inwards by the central object's gravity, it also shines brightly, and the pressure exerted by the radiation pushes it outwards. This is a balancing act: the greater the mass, the faster it draws the surrounding gas. But this also causes the gas to heat up faster, emitting more light and increasing the pressure that blows the gas away.

There is a theoretical limit to how much matter can be accreted by an object of a given mass, called the 'Eddington luminosity'. It was first calculated for stars by astronomer Arthur Eddington, but it can also be applied to compact objects like black holes and neutron stars. Eddington's calculation refers to an ideal case in which both the matter being accreted onto the central object and the radiation being emitted by it do so equally in all directions.

But the sources studied by Ciro and his collaborators are being fed through an accretion disc that is likely being puffed up by internal pressure of the gas flowing at a fast pace towards the central object. In such a configuration, the material in the disc can shine 10 times or more above the Eddington limit and, as part of the gas eludes the gravitational grasp from the central object, very high-speed winds can arise like the ones observed by XMM-Newton.

"By observing X-ray sources that are radiating beyond the Eddington limit, it is possible to study their accretion process in great detail, investigating by how much the limit can be exceeded and what exactly triggers the outflow of such powerful winds," says Norbert Schartel, ESA XMM-Newton Project Scientist.

The nature of the compact objects hosted at the core of the sources observed in this study is, however, still uncertain, although the scientists suspect it might be stellar-mass black holes, with masses of several to a few dozen times that of the Sun. To investigate further, the team is still scrutinising the data archive of XMM-Newton, searching for more sources of this type, and are also planning future observations, in X-rays as well as at optical and radio wavelengths. "With a broader sample of sources and multi-wavelength observations, we hope to finally uncover the physical nature of these powerful, peculiar objects," concludes Ciro.

Source: Spaceref.com
We humans might not be the only ones to ponder our place in the universe. If intelligent aliens do roam the cosmos, they too might ask a question that has gripped humans for centuries: Are we alone? These aliens might even have giant space telescopes dedicated to studying distant planets and searching for life. Should one of those telescopes capture an image of our blue marble of a planet, evidence of forests and plentiful creatures would jump out as simple chemicals: oxygen, ozone, water and methane.

Many earthlings at NASA are hoping to capture similar chemical clues for Earth-like planets beyond our solar system, also known as exo-Earths, where "exo" is Greek for "external." Researchers are developing new technologies with the goal of building space missions that can capture not only images of these exo-Earths, but also detailed chemical portraits called spectra. Spectra separate light into its component colors in order to reveal secrets of planets’ atmospheres, climates and potential habitability.

"Evidence for life is not going to look like little green people -- it's going to reveal itself in a spectrum," said Nick Siegler, the chief technologist for NASA's Exoplanet Exploration Program Office at the agency's Jet Propulsion Laboratory in Pasadena, California. The program is helping to develop NASA's plans for future exo-Earth imaging missions.

**Be gone starlight**

On the road to this goal, NASA is actively developing coronagraph technology in various laboratories, including JPL. Coronagraphs are instruments introduced in the early 20th century to study our sun. They use special masks to block out light from the circular disk of the sun, so that scientists can study its outer atmosphere, or corona.

Now NASA is developing more sophisticated coronagraphs to block the glaring light of other stars and reveal faint planets that might be orbiting them. Stars far outshine their planets; for example, our sun is 10 billion times brighter than Earth. That's similar to the flood of football stadium lights next to a tiny candle.

"The search for Earth-like planets begins with the suppression of starlight," said Rhonda Morgan of JPL, a coronagraph technologist for the Exoplanet Exploration Program Office. "It's like blocking the sun with a sun visor while driving in order to see the road."

Telescopes on the ground have already used coronagraphs to take pictures of planets, but those planets are easier to photograph because they are large, bright, and orbit far from their host stars. To take a picture of Earth-size planets lying in the habitable zone of sun-like stars -- the region where temperatures are just right for possible liquid oceans and lakes -- will require a telescope in space. Out in space, the blurring effects of our blustery atmosphere can be avoided.
Several types of coronagraphs are under development for proposed space missions. One mission, led by NASA's Goddard Space Flight Center, Greenbelt, Maryland, is known as WFIRST. WFIRST stands for Wide-Field Infrared Survey Telescope. The WFIRST mission would be able to identify chemicals in the atmospheres of exoplanets as small as super-Earths, which are like Earth's bigger cousins, such as Kepler-452b, a recent discovery by NASA's Kepler mission. This would pave the way for future studies of the smaller exo-Earths. The WFIRST mission would also investigate other cosmic mysteries such as dark matter and dark energy.

**Tinkering with tiny masks**

Engineers and scientists at JPL are busily tinkering with different coronagraph technologies for WFIRST. Ilya Poberezhskiy, who manages the testbeds at JPL, explained two primary coronagraph designs while holding in his hand the tiny, starlight-blocking masks. One of them, the "shaped pupil" mask, is a few centimeters across, while the "hybrid Lyot" mask is a pinprick of a dot, barely visible at only one-tenth of a millimeter in size. Both technologies will fly together on the WFIRST mission as a part of one instrument -- the occulting mask coronagraph.

"A wheel-like mechanism will rotate to switch different masks inside the instrument and convert the coronagraph from one mode to another," said Poberezhskiy.

The main challenge for coronagraphs is controlling starlight, which has a tendency to stray. Just putting a circular mask in front of the star doesn't obstruct the light completely; starlight bends around the mask like ocean waves curving around islands in a process called diffraction. Each coronagraph type deals with this challenge differently by using multiple masks as well as mirrors that can deform to sequentially suppress starlight in various stages.

An animation explaining how the hybrid Lyot coronagraph works can be seen online at:

[https://exoplanets.jpl.nasa.gov/resources/1061/](https://exoplanets.jpl.nasa.gov/resources/1061/)

"The starlight likes to walk all over the place, and into the area where you want to image the planet," said Wes Traub, the JPL project scientist for WFIRST. "The goal now is to get more practical with the kind of telescope we will use for WFIRST."

**How to handle jitter**

Another challenge in designing coronagraphs is adjusting for a space telescope's tiny vibrations, or jitter. The team at JPL is assessing how their coronographs handle jitter by simulating the effects in a vacuum chamber. They built a table-top-size telescope simulator for the tests.

"In space, telescopes experience warping and vibrations that need to be measured and reduced inside the coronagraph," said Poberezhskiy. "Our mock telescope will let us test the WFIRST coronagraph under realistic, space-like conditions."

As WFIRST development moves forward, mission planners are already thinking about a possible next step: a space telescope designed to image true Earth analogs. Such a mission may be more than a decade away, but development of the nuts and bolts of the technology is underway at a feverish pace.

"It's an exciting time for exoplanet research," said Gary Blackwood, manager of the Exoplanet Exploration Program. "This is history in the making."

The hybrid Lyot coronagraph design team is led by John Trauger of JPL. The shaped pupil coronagraph is pioneered by Jeremy Kasdin of Princeton University, New Jersey. A third technology, called a phase-induced
amplitude apodization complex mask coronagraph, is being developed by Olivier Guyon of the University of Arizona, Tucson; Brian Kern of JPL and Ruslan Belikov and Eduardo Bendek of NASA's Ames Research Center, Moffett Field, California.

WFIRST is managed at NASA's Goddard, with participation by JPL, the Space Telescope Science Institute in Baltimore, the Infrared Processing and Analysis Center, also in Pasadena, and a science team comprised of members from U.S. research institutions across the country.

For more information about NASA's WFIRST mission, visit http://www.nasa.gov/wfirst

JPL is managed by the California Institute of Technology for NASA.

Source: NASA
The Night Sky

Friday, April 29

• Last-quarter Moon (exact at 11:29 p.m. EDT). The Moon rises tonight around 2 a.m. local daylight-saving time. It shines above dim Capricornus before the first light of dawn.

• It's a busy night at Jupiter. Io crosses the planet's face from 9:42 to 11:57 p.m. EDT, followed by its tiny black shadow from 10:44 p.m. to 12:58 a.m. EDT. Europa transits the planet from 12:28 to 3:25 a.m. EDT, followed by its shadow from 2:47 to 5:32 a.m. EDT. Meanwhile, Jupiter's Great Red Spot crosses the planet's meridian around 10:52 p.m. EDT. (Subtract three hours from all times to get PDT.)

Saturday, April 30

• These evenings, the long, dim sea serpent Hydra snakes far across the southern sky. Find his head, an asterism about the width of your thumb at arm's length, in the southwest. It's to the lower right of Regulus by about two fists at arm's length. Hydra's tail reaches all the way to Libra rising in the southeast. His star pattern, from forehead to tail-tip, is 95° long.

Sunday, May 1

• Even though May has begun, wintry Sirius still twinkles very low in the west-southwest at the end of twilight (for mid-northern skywatchers). It sets soon after. How much longer into May can you keep Sirius in view? What will be its date of "heliacal setting" as seen by you? The Mars-Saturn-Antares triangle in early dawn. (The blue 10° scale is about the width of your fist at arm's length.)

• All week, the Mars-Saturn-Antares triangle awaits intrepid skywatchers in early dawn, as shown at right.

Monday, May 2

• Two famous galaxies are detectable with good binoculars off the handle of the Big Dipper, if your skies are pretty dark. See Gary Seronik's guide to M51 and M101 in the Binocular Highlights for the May Sky & Telescope, page 43. And with a telescope, explore galaxies under the Dipper's bowl starting on page 54.

Source: Sky & Telescope
ISS Sighting Opportunities

For Denver:  No Sightings

Sighting information for other cities can be found at NASA’s Satellite Sighting Information

NASA-TV Highlights
(all times Eastern Daylight Time)

Tuesday, May 3
  8:30 a.m., ISS Expedition 47 In-Flight Event for ESA with Science Journalists and Flight Engineer Tim Peake of the European Space Agency (Starts at 8:55 a.m.) (all channels)

Watch NASA TV on the Net by going to the NASA website.
Space Calendar

- Apr 29 - Comet 53P/Van Biesbroeck Perihelion (2.427 AU)
- Apr 29 - Apollo Asteroid 2002 CX58 Near-Earth Flyby (0.043 AU)
- Apr 29 - Asteroid 10797 Guatemala Closest Approach To Earth (1.027 AU)
- Apr 29 - Asteroid 7041 Nantucket Closest Approach To Earth (1.487 AU)
- Apr 29 - Asteroid 22739 Sikhote-Alin Closest Approach To Earth (1.780 AU)
- Apr 29 - Asteroid 19631 Greensleeves Closest Approach To Earth (2.251 AU)
- Apr 29 - Seminar: Water, Hydroxyl, and Ice in the Asteroid Belt, Houston, Texas
- Apr 29 - Aleksander Wolszczan's 70th Birthday (1946)
- Apr 30 - NuNat 1 (Aleph-1 1)/Nusat 2 (Aleph-1 2) CZ-3B Launch
- Apr 30 - Comet 322P/SOHO At Opposition (2.416 AU)
- Apr 30 - Apollo Asteroid 2016 FP12 Near-Earth Flyby (0.049 AU)
- Apr 30 - Aten Asteroid 2008 PR9 Near-Earth Flyby (0.077 AU)
- Apr 30 - Asteroid 5256 Farquhar Closest Approach To Earth (1.503 AU)
- Apr 30 - Asteroid 6227 Alanrubin Closest Approach To Earth (1.965 AU)
- Apr 30 - Asteroid 30441 Curly Closest Approach To Earth (2.255 AU)
- Apr 30 - 1010th Anniversary (1006 AD), Appearance of Supernova 1006
- May 01 - Comet 180P/NEAT At Opposition (1.674 AU)
- May 01 - Comet 302P/Lemmon-PANSTARRS Perihelion (3.303 AU)
- May 01 - Comet C/2015 LC2 (PANSTARRS) At Opposition (5.463 AU)
- May 01 - Comet C/2016 E1 (PANSTARRS) Closest Approach To Earth (7.565 AU)
- May 01 - [Apr 22] Aten Asteroid 2016 HK Near-Earth Flyby (0.012 AU)
- May 01 - Apollo Asteroid 2014 US115 Near-Earth Flyby (0.024 AU)
- May 01 - [Apr 28] Amor Asteroid 2016 HO2 Near-Earth Flyby (0.043 AU)
- May 01 - [Apr 29] Aten Asteroid 2016 HE3 Near-Earth Flyby (0.070 AU)
- May 01 - Apollo Asteroid 3752 Camillo Closest Approach To Earth (1.598 AU)
- May 01 - 20th Anniversary (1996), Ulysses Crosses Comet Hyakutake's Tail
- May 02 - Comet C/2015 B2 (PANSTARRS) At Opposition (3.830 AU)
- May 02 - [Apr 29] Aten Asteroid 2016 HD3 Near-Earth Flyby (0.006 AU)
- May 02 - Apollo Asteroid 2016 GD241 Near-Earth Flyby (0.051 AU)
- May 02 - Asteroid 3917 Franz Schubert Closest Approach To Earth (1.394 AU)
- May 02 - Asteroid 29132 Bradpitt Closest Approach To Earth (1.523 AU)
- May 02 - Asteroid 916 America Closest Approach To Earth (1.851 AU)
- May 02 - Asteroid 10552 Stockholm Closest Approach To Earth (2.214 AU)
- May 02 - Asteroid 11247 Wilburwright Closest Approach To Earth (2.490 AU)
- May 02 - Asteroid 3709 Polypoites Closest Approach To Earth (4.526 AU)

SN 1006 supernova remnant

Source: JPL Space Calendar

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In 1969, NASA Ames Research Center received an unusual call for help: a local woman was still bleeding weeks after giving birth, despite every attempt to halt it — including nine surgeries. Her condition, known as postpartum hemorrhage, can result from a number of different complications during childbirth. Left untreated, it can prove fatal.

Ames researchers and engineers proposed applying pressure to the woman’s entire lower body using an inflated anti-gravity suit, or G-suit — like tightly wrapping a gash on a limb.

G-suits prevent blood from pooling in the legs through the use of air-filled bladders. NASA has long relied on them to keep test pilots from blacking out during extreme acceleration, and astronauts use them during re-entry to squeeze the arms and legs and push blood back toward the head as they readjust to the pull of Earth’s gravity.

The team at Ames quickly modified a G-suit so that it could supply a range of pressures and hurried it to the hospital. After wearing it on low pressure for just 10 hours, the woman began to recover, her body’s natural healing processes finally able to take over once the bleeding had slowed.

Three months later, doctors proclaimed her fully healed.

Under Pressure

Every year at least 70,000 women die from obstetric hemorrhage — mostly in the world's least developed countries.
In countries like the United States, effective medications, blood transfusions and surgery are readily available. But in many rural areas in developing countries, this type of care can be hours or even days away — time a hemorrhaging woman just doesn’t have.

Following the 1969 case, subsequent research at Ames led to a better understanding of the physiology of G-suits and the realization that even lower pressures could be used effectively to decrease bleeding and shift blood back to the heart and brain. Drawing on this NASA research, Palo Alto, California-based Zoex Corporation developed the first commercially available pressure garment suitable for treating shock and blood loss in the early 1990s. Since the pressure didn’t need to be as strong as in military and aviation cases, the company scrapped the old-style G-suits for a non-pneumatic version using simple elastic compression.

In a 2004 study by Ames and other researchers, the garments saved 13 out of 14 patients in Pakistan who were in shock from extreme blood loss. In another study in Egypt and Nigeria, published in 2007, the garment reduced both blood loss and mortality from postpartum hemorrhage by 50 percent.

One of the people behind the studies, Suellen Miller, is the founder of the Safe Motherhood Program, which aims to reduce pregnancy- and childbirth-related deaths and illnesses across the globe. She said the results were remarkable. “In the field of maternal health, we generally don’t see that kind of a reduction, and even more so when it’s the result of a single, simple intervention.”

By 2012, as Miller was finishing up a five-year randomized trial with the garment in Zimbabwe and Zambia, the World Health Organization and the International Federation of Gynecologists and Obstetricians both decided to officially recommend the device to treat postpartum hemorrhage.

**A Dollar for a Life**

Since then, 20 countries have purchased a lower-cost version of the pressure garment called LifeWrap, produced by a manufacturer founded by Safe Motherhood and the nonprofit PATH. “We’ve determined that these suits can be used at least 70 times,” Miller says. “So we’re looking at a life-saving device that costs less than a dollar per use.”

Around the world, the Safe Motherhood Program spreads the word about LifeWrap. In the wake of Typhoon Haiyan, which ravaged the Philippines in November 2013, the Safe Motherhood Program donated garments to midwives working in disaster zones.

More recently, Miller and her colleagues conducted training for Doctors Without Borders and the Canadian Red Cross so they could use the garment in Ebola-stricken countries in Africa. LifeWraps have also been provided for ambulances in East Timor and are being used increasingly throughout rural Tanzania.

Miller thanks the space agency for the critical role it played in getting the technology to this point. “We’re taking this suit to the village, we’re taking it to the hut, we’re taking it to the poorest, most vulnerable, voiceless, powerless people grounded into the Earth, and making a difference for them,” she says.

Miller also reports that some of the doctors and midwives she has met have voiced their own thanks for the garment, which has taken many names over the years: they like to call it the miracle suit.

To learn more about this NASA spinoff, read the original article from Spinoff 2016.

For more information on how NASA is bringing its technology down to Earth, visit http://technology.nasa.gov.

Source: NASA
Space Image of the Week

NGC 6872: A Stretched Spiral Galaxy

Explanation: What makes this spiral galaxy so long? Measuring over 700,000 light years across from top to bottom, NGC 6872, also known as the Condor galaxy, is one of the most elongated barred spiral galaxies known. The galaxy’s protracted shape likely results from its continuing collision with the smaller galaxy IC 4970, visible just above center. Of particular interest is NGC 6872’s spiral arm on the upper left, as pictured here, which exhibits an unusually high amount of blue star forming regions. The light we see today left these colliding giants before the days of the dinosaurs, about 300 million years ago. NGC 6872 is visible with a small telescope toward the constellation of the Peacock (Pavo).

Image Credit: FORS Team, 8.2-meter VLT Antu, ESO; Processing & License: Judy Schmidt

Source: Astronomy Picture of the Day