

Chapter 1 : 10 Amazing Scientific Discoveries Of - Listverse

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Are some things just better left unknown? The consequences of burning fossil fuels are already apparent. We have just begun to see the effects of human-induced climate change. But big scientific discoveries are by nature counterintuitive and sometimes shocking. Here are ten of the biggest threats to our peace of mind. The Earth is not the center of the universe. Anyone can plainly see that the Sun and stars rise in the east, sweep across the sky and set in the west; the Earth feels stable and stationary. Very few scholars saw it as a real description of the universe. He used a telescope to provide evidence for the heliocentric theory, and some of his contemporaries were so disturbed by what the new invention revealed—craters on a supposedly perfectly spherical moon, other moons circling Jupiter—that they refused to look through the device. Scripture said that the Sun revolved around the Earth, and the Holy Office of the Inquisition found Galileo guilty of heresy for saying otherwise. The microbes are gaining on us. Antibiotics and vaccines have saved millions of lives; without these wonders of modern medicine, many of us would have died in childhood of polio, mumps or smallpox. But some microbes are evolving faster than we can find ways to fight them. Hospitals are infested with antibiotic-resistant Staphylococcus bacteria that can turn a small cut into a limb- or life-threatening infection. And new diseases keep jumping from animals to humans—ebola from apes, SARS from masked palm civets, hantavirus from rodents, bird flu from birds, swine flu from swine. Even tuberculosis, the disease that killed Frederic Chopin and Henry David Thoreau, is making a comeback, in part because some strains of the bacterium have developed multi-drug resistance. The concept of extinction took a while to sink in. Thomas Jefferson saw mastodon bones from Kentucky, for example, and concluded that the giant animals must still be living somewhere in the interior of the continent. He asked Lewis and Clark to keep an eye out for them. Mastodons may have been some of the earliest victims. As humans moved from continent to continent, large animals that had thrived for millions of years began to disappear—mastodons in North America, giant kangaroos in Australia, dwarf elephants in Europe. Whatever the cause of this early wave of extinctions, humans are driving modern extinctions by hunting, destroying habitat, introducing invasive species and inadvertently spreading diseases. Things that taste good are bad for you. In , the Framingham Heart Study enrolled more than 5, residents of Framingham, Massachusetts, to participate in a long-term study of risk factors for heart disease. Very long term—the study is now enrolling the grandchildren of the original volunteers. Sure, some tasty things are healthy—blueberries, snow peas, nuts and maybe even oh, please red wine. But on balance, human taste preferences evolved during times of scarcity, when it made sense for our hunter-gatherer ancestors to gorge on as much salt and fat and sugar as possible. The Aztecs slaughtered tens of thousands of people to inaugurate the Great Pyramid of Tenochtitlan. Recent archaeological findings suggest that it was common for people around the world to ritually kill—and sometimes eat—other people. The study is currently enrolling the grandchildren of the original volunteers. Your mind is not your own. Freud might have been wrong in the details, but one of his main ideas—that a lot of our behaviors and beliefs and emotions are driven by factors we are unaware of—turns out to be correct. Sunny days make people happier and more helpful. Mating decisions are based partly on smell. Our cognitive failings are legion: Like millions of people, [neuroscientist Karim] Nader has vivid and emotional memories of the September 11, , attacks and their aftermath. But as an expert on memory, and, in particular, on the malleability of memory, he knows better than to fully trust his recollections. As clear and detailed as these memories feel, psychologists find they are surprisingly inaccurate. Cultures throughout history and around the world have engaged in ritual human sacrifice. A couple of coins for the ferryman? Some flowers, maybe, or mementos of your loved ones? Concubines were sacrificed in China to be eternal companions; certain Indian sects required human sacrifices. Ritual sacrifice is described in the Bible, Greek mythology and the Norse sagas, and the Romans accused many of the people they conquered of engaging in ritual sacrifice, but the evidence was thin. A recent accumulation of archaeological findings from around the world shows that it was surprisingly common for

people to ritually kill—and sometimes eat—other people. The consequences are already apparent: Even more disturbing is the fact that carbon dioxide lingers in the atmosphere for hundreds of years. The universe is made of stuff we can barely begin to imagine. Everything you probably think of when you think of the universe—planets, stars, galaxies, black holes, dust—makes up just 4 percent of whatever is out there. Scientists have some ideas about what dark matter might be—exotic and still hypothetical particles—but they have hardly a clue about dark energy. What is this cosmos we call home? But astronomers do know that, thanks to these dark parts, the universe is expanding. And not only expanding, but expanding faster and faster. Ultimately, everything in the universe will drift farther and farther apart until the universe is uniformly cold and desolate. The world will end in a whimper. Previously, she was a senior science editor at Smithsonian magazine.

Chapter 2 : 10 Recent Space Discoveries No One Can Explain - Listverse

The year has catapulted us into a science-fiction future, from human cell regeneration for growing organs, to banishing genetic disease through breakthrough gene-editing techniques and.

Marie Curie and Radioactivity - early s Key People: Marie Curie Marie Curie is known for her discoveries around radiation and radioactivity, a word which she coined. She discovered two new elements, polonium and radium, and helped with the development of X-rays. She became the first woman to win a Nobel Prize and eventually won two Nobels – one for chemistry and one for physics. Jonas Salk While there is still no known cure for polio, researcher Dr. Jonas Salk discovered a vaccine for the disease in Today, cases of the crippling disease are extremely rare. Guglielmo Marconi Italy pictured , Nikola Tesla Serbia While there has been a lot of debate about who is the real inventor of radio, the importance of the invention is absolutely unquestionable. Marconi, a physicist and electric engineer, invented a device that transmits Morse code using radio waves. Tesla, on the other hand, is said to have created a basic design for the radio in the late 19th century and also patented a robot boat controlled by radio waves. This theory, widely regarded as one of the greatest of all time, has been the foundation for things like global positioning systems, electromagnets and supernovas. Wilhelm Roentgen Germany In one of the most important breakthroughs in medical history, Roentgen discovered high-frequency radiations that possessed the capability of penetrating human flesh in a noninvasive manner. This discovery has made it easier for doctors to understand what is going on in a patient and prescribe treatment. Maxwell showed that all these three were same and forms of electromagnetic radiation. It is widely regarded as the greatest discovery in the field of physics in the 19th century. The process was used to create a new line of fertilizers. Alexander Fleming Scotland Simply put, penicillin is the reason behind the saving of millions of lives over the years and it holds the distinction of the maiden antibiotic drug which was made available commercially. Karl Schwarzschild Germany Black holes, one of the most mysterious phenomena of the celestial world, are collapsed stars with extremely high gravity levels. While some people consider that black holes could facilitate traveling faster than the speed of light, others believe that they will be energy sources in the future. Their invention has facilitated transportation of people and things from one place to another in an unprecedented manner. The transistor effect has been the backbone of every electrical hardware device that has been created since. Scientists and medical experts have used DNA to understand what causes deadly diseases and it has been critical in laying the foundations of molecular biology. DNA is widely used in courts as evidence. Isaac Newton England Gravity is all-pervasive concept that helped in simplifying and unifying several other phenomena, such as the falling down of objects, orbiting of planets and people having weight. Many No other device in history has augmented and elevated human ability than the computer. Karl Landsteiner Austria Before the discovery made by the Austrian physician, it was believed that all blood was same and there was no classification. Many Arguable the most significant development in history of modern day communication, the Internet has transformed the lives of people in a way nothing else has. Studies by Bort and Assmann helped in determining the existence of different layers and consequently, the understanding of clouds, wind, storms and other meteorological phenomena. Max Born Germany Born designed a system that was capable of analyzing and describing the world of subatomic particles, such as alpha, beta, electron and proton particles. This theory has become the basis for study of all solid state mechanics, nuclear and atomic physics. Many The largest particle accelerator in the world, featuring a ring that is 27 kilometers in length and is made of superconducting magnets, is regarded as the gateway to finding new information about the travelling of light along with the genesis of cosmos. Christian Doppler Austria The Doppler Effect describes how the alteration in the frequency of a wave sound or light is dependent on the direction in which the observer is moving from the source away or towards. This concept has proved to be critical for the world of astronomy, enabling scientists to decipher the properties of galaxies and stars, which are located at distances of millions of light years, along with the discovery of dark matter. Dmitri Mendeleev Russia The classification of all the elements on the face of this earth into a proper system has become a mandatory part of science education across the world. Apart from helping in understanding the properties of

elements, it has also assisted in discovering new ones. Nicolaus Copernicus Prior to Nicolaus Copernicus, the world thought the sun and the planets revolved around Earth. In the early 1500s, Copernicus stated that the Earth and all the planets revolved around the Sun – a radical concept at the time that changed our understanding of the solar system. Joseph Priestley England Oxygen is the first gas that was identified and separated as a unique element. This discovery helped in finding out that air was composed of various things and was not just one single element. Benoit Gutenberg Germany, USA The earth is not one solid homogeneous object but a complex structure comprising layers that differ in composition, density and temperature. This has helped scientists study the earth and its Geo-physical properties in a better manner despite not having the luxury of sending probes more than a few miles deep. Edward Jenner England English doctor Edward Jenner worked on an experiment in which he injected pus from a cowpox pustule into the arm of a little boy, thus showing that inoculation made children immune to smallpox. The discovery of vaccination has saved millions of lives and prevented people from getting deadly diseases like small pox or measles. Louis Pasteur French The process of destroying pathogens by simple heating has helped in the preservation of perishable food items, such as milk and juice. This concept helped in development of engines on which modern day vehicles run. Baird was able to "transmit a flickering image across a distance of 10 feet," which led to him achieving TV pictures a year later.

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Of special significance were the high-pressure syntheses of two new forms of silicates. In Sergei Stishov, while at the Institute of High-Pressure Physics. The broad aim of the Earth sciences is to understand the present features and the past evolution of the Earth and to use this knowledge, where appropriate, for the benefit of humankind. Thus the basic concerns of the Earth scientist are to observe, describe, and classify all the features of the Earth, whether characteristic or not, to generate hypotheses with which to explain their presence and their development, and to devise means of checking opposing ideas for their relative validity. In this way the most plausible, acceptable, and long-lasting ideas are developed. The physical environment in which humans live includes not only the immediate surface of the solid Earth, but also the ground beneath it and the water and air above it. Early man was more involved with the practicalities of life than with theories, and thus his survival depended on his ability to obtain metals from the ground to produce, for example, alloys, such as bronze from copper and tin, for tools and armour, to find adequate water supplies for establishing dwelling sites, and to forecast the weather, which had a far greater bearing on human life in earlier times than it has today. Such situations represent the foundations of the three principal component disciplines of the modern Earth sciences. The rapid development of science as a whole over the past century and a half has given rise to an immense number of specializations and subdisciplines, with the result that the modern Earth scientist, perhaps unfortunately, tends to know a great deal about a very small area of study but only a little about most other aspects of the entire field. It is therefore very important for the layperson and the researcher alike to be aware of the complex interlinking network of disciplines that make up the Earth sciences today, and that is the purpose of this article. Only when one is aware of the marvelous complexity of the Earth sciences and yet can understand the breakdown of the component disciplines is one in a position to select those parts of the subject that are of greatest personal interest. It is worth emphasizing two important features that the three divisions of the Earth sciences have in common. First is the inaccessibility of many of the objects of study. Many rocks, as well as water and oil reservoirs, are at great depths in the Earth, while air masses circulate at vast heights above it. Thus the Earth scientist has to have a good three-dimensional perspective. Second, there is the fourth dimension: The Earth scientist is responsible for working out how the Earth evolved over millions of years. For example, what were the physical and chemical conditions operating on the Earth and the Moon? How did the oceans form, and how did their chemical composition change with time? How has the atmosphere developed? And finally, how did life on Earth begin, and from what did man evolve? Today the Earth sciences are divided into many disciplines, which are themselves divisible into six groups: Those subjects that deal with the water and air at or above the solid surface of the Earth. In this article such fields of study are grouped under the hydrologic and atmospheric sciences and are treated separately from the geologic sciences, which focus on the solid Earth. The study of landforms geomorphology, which is concerned with the description of the features of the present terrestrial surface and an analysis of the processes that gave rise to them. Disciplines concerned with the geologic history of the Earth, including the study of fossils and the fossil record paleontology, the development of sedimentary strata deposited typically over millions of years stratigraphy, and the isotopic chemistry and age dating of rocks geochronology. Applied Earth sciences dealing with current practical applications beneficial to society. These include the study of fossil fuels oil, natural gas, and coal; oil reservoirs; mineral deposits; geothermal energy for electricity and heating; the structure and composition of bedrock for the location of bridges, nuclear reactors, roads, dams, and skyscrapers and other buildings; hazards involving rock and mud avalanches, volcanic eruptions, earthquakes, and the collapse of tunnels; and coastal, cliff, and soil erosion. The study of the rock record on the Moon and the planets and their satellites astrogeology. This field includes the investigation of relevant terrestrial features—namely, tektites glassy objects resulting from meteorite impacts and astrobles meteorite craters. With such intergradational boundaries between the divisions of the Earth sciences which, on a broader scale, also intergrade with physics

, chemistry, biology , mathematics , and certain branches of engineering , researchers today must be versatile in their approach to problems. Hence, an important aspect of training within the Earth sciences is an appreciation of their multidisciplinary nature.

Chapter 4 : Scientific Discoveries Timeline | Timetoast timelines

Scientific breakthroughs happen across the globe each year as the world's top researchers make innovative discoveries that alter life on earth and change our perception of reality. The greatest scientific discoveries are an inspiring testament to the profound capabilities of the human mind.

Share27 Shares 2K Scientific discoveries, achievements, and inventions are made all the time. This list compiles some of the most amazing discoveries science has made in the first six months of The molecule has been found to be like a molecular carabiner able to pull chromosomes together to latch them onto the inner wall of a cell membrane when division occurs. This allows cells to copy properly and avoid becoming cancerous. The fascinating discovery indicates that the ancient version of GK-PID did not behave in the same way it does currently. The only reason it became capable of working like a genetic carabiner is due to a single mutation that copied itself, suggesting that multicellular life is the result of a single, identifiable mutation. You might be asking why there is a project to determine such a number. Modern cryptography requires the use of Mersenne Prime numbers Of which only 49 have been discovered and other complex numbers to encode data. The new prime number is currently the record holder for the longest prime and is almost 5 million digits longer than its predecessor. Wikimedia Before the discovery of Pluto in the 20th century, it had been theorized that a ninth planet, Planet X, existed beyond Neptune due to the gravitational clustering that could only be caused by a massive object. It was then believed that this planet was found in Pluto, but that never fully quantified the gravitational distortion until scientists at the California Institute of Technology presented evidence that a ninth planet truly does exist with an orbital period of 15, years. If it does exist, the planet would likely be approximately 2â€”15 times the mass of Earth and orbit between and 1, Astronomical Units AU from the Sun. An AU is ,, kilometers, which means that the planet could orbit as far from the Sun as ,, kilometers. But that may no longer be true due to a discovery made by the University of Southampton. Scientists have successfully used nano-structured glass to create a process for recording and retrieving data. This means that its average shelf life when held at room temperature would be approximately Data is written on the device using an ultrafast laser via short and intense light pulses. Each file is written in three layers of nanostructured dots that are only 5 micrometers apart. When read, the data is realized in five dimensions: Wired As science has learned over the past years, vertebrate life on land evolved from fish that swam in the seas of ancient Earth. That is of course until researchers from the New Jersey Institute of Technology discovered a Taiwanese Cavefish that is capable of walking up walls and has the same anatomical capabilities as an amphibian or reptile. This is a huge discovery in terms of evolutionary adaptation because it can help scientists to better understand how land-dwelling tetrapods evolved from prehistoric fish. Because of this, government agencies like NASA and the European Space Agency have developed rockets that are either ditched in the ocean for later recovery an expensive undertaking or they are purposefully burned up in the atmosphere. The ability to successfully land a rocket vertically means that it could be cheaply and easily be reused, which would save an incredible amount of money. The private company SpaceX successfully landed a rocket vertically on April 8, and they did so on a floating autonomous drone ship. Their success will save money and also time between launches. CEO Elon Musk made this achievement a longstanding goal for the company, and even though his is a private venture, the technology will eventually spread into government agencies like NASA to help push space exploration forward. The sleeve then uses wires to stimulate specific muscles to cause the movement of the fingers in real-time. The patient was even able to play Guitar Hero , much to the surprise of the doctors and scientists in charge of the project. Nissim Benvenisty A clinical trial held at Stanford University School of Medicine injected modified human stem cells directly into the brains of several chronic stroke patients. The procedures were all successful with no negative effects described from the injection and only mild headaches as a result of the procedure, which was performed on mildly anesthetized patients. All 18 showed significant healing long after any healing is expected following a stroke a period of six months. This included increased mobility and actually allowed for patients who were previously limited to wheelchairs to walk again freely. Juerg Matter Carbon capture is an important part of maintaining the balance

of CO₂ emissions on the planet. Whenever fuels are burned, all of the CO₂ that was stored within is released into the atmosphere. Humans have been causing this problem for a long time, and we are seeing the effects of global climate change. Scientists in Iceland may have found a way to permanently capture carbon emissions so that they do not go into the atmosphere further harming the greenhouse effect. CO₂ was pumped into volcanic rock in Iceland, which sped up a natural process that turns basalt into carbonate minerals, which then become limestone. This process normally takes hundreds of thousands of years, but the scientists in Iceland were able to do it in only two years. The result is carbon capture into a rock that could be stored underground or even used as a building material so that the captured CO₂ never reenters the atmosphere. There are a lot of objects orbiting this planet—space stations, man-made satellites, and lots and lots of junk—but only one moon that we can see. The asteroid orbits very far from Earth and is more gravitationally affected by the Sun than Earth, but it does orbit Earth as well along its orbital path of the Sun. Chodas also revealed that HO₃ has been a stable quasi-satellite of Earth for more than a century. Jonathan is a graphic artist, illustrator, and game designer with a few independently published games through his game company, TalkingBull Games. He is an Active Duty Soldier and enjoys researching and writing about history, science, theology, and many other subjects.

Chapter 5 : Science News - Latest Scientific Discoveries

With one of the largest book inventories in the world, find the book you are looking for. To help, we provided some of our favorites. With an active marketplace of over million items, use the Alibris Advanced Search Page to find any item you are looking for. Through the Advanced Search Page, you.

We look back at some of the greatest discoveries that shaped this science. It is still considered the most important handbook on petrology branch of geology that studies rocks and how they are formed. Pictured Vesicular basalt, an igneous rock, with calcite-filled vesicles. Richter scale is invented Before this, earthquakes were measured on the Mercalli scale using Roman numerals, but it was considered inaccurate. The readings were registered and printed on paper through a device called seismograph, which was designed by Richter and his colleague Beno Gutenberg. Continental drift is proven through gravity Dutch geophysicist Felix Andries Vening Meinesz conducted several submarine expeditions around the world to measure the gravity field of the planet at different points. He discovered several negative gravity anomalies, mostly along oceanic trenches. He later attributed the same to continental drift, a phenomenon responsible for the movement of plates and continents over millions of years. Pictured Thematic world map of continental drift. Mid-Atlantic ridge is discovered Studying the data recorded by an observatory ship over the Atlantic Ocean, American geologist Bruce C. This also helped prove the theory of continental drift and how it is caused by plate tectonic movement on the seafloor. Moment magnitude scale is developed Seismologists Thomas C. Latest publication of Nickel&Strunz The most recent edition of Nickel&Strunz classification was published in It is used to categorize minerals based on their chemical composition and is considered a major reference source for geologists and researchers. Pioneering Bathysphere explorations Designed by American engineer Otis Barton R , the Bathysphere was a spherical deep-sea submersible that was extensively used to conduct explorations off the coast of Bermuda. Barton, along with naturalist William Beebe L , became the first researchers to attempt deep-sea observations of animals in their native environment. Equipped with echo sounders and side-scanning sonars, the system is capable of producing finely detailed images of the seafloor and its sub-bottom structures. Two year later, he and Jon Lindbergh L spent 49 hours at a depth of It comprised 10 missions lasting days and undertook in-depth ecological studies. Navy Earth Observation satellite were declassified by the government, it made way for the mapping of ocean floors worldwide for the first time. Located at the bottom of Mariana Trench, the point lies at a depth of 35, feet 10, meters and took Cameron minutes to reach from the sea surface. The method is still in use. First radiosonde is launched Soviet meteorologist Pavel Molchanov launched his invention, the radiosonde, for the first time on Jan. The radiosonde is a telemetry instrument, which is carried into the atmosphere by a weather balloon to measure several atmospheric parameters and transmitting them to a ground radio via Morse code. Pictured A radiosonde is launched via a balloon in May Global warming is connected to carbon dioxide British steam engineer and inventor Guy Stewart Callendar compiled several temperature measurements from the 19th century and correlated them with old measurements of atmospheric carbon dioxide concentrations. He drew the conclusion that over the past 50 years, the global land temperatures have increased and that this can be a resultant effect of increase in carbon dioxide. First correct tornado prediction American meteorologist Robert C. Miller became famous as the first person to correctly forecast a tornado, using an empirical method to predict twin tornado attack on Tinker Air Force Base in Oklahoma City, Oklahoma, U. Pictured A tornado spotted in Campo, Colorado, U. First successful weather satellite launch While Vanguard 2 was the first weather satellite launched a year earlier, it failed to record notable data due to technical failures. In a mission that lasted 78 days, it relayed multitudes of photographs of large-scale cloud formations and proved the importance of satellite surveillance of weather. Saffir&Simpson hurricane scale is developed Civil engineer Herbert Saffir and meteorologist Robert Simpson developed the Saffir&Simpson scale that categorized hurricanes based on their intensity. From categories 1 lowest, 64&82 knots to 5 highest, over knots , the scale is used to classify tropical storms to this day and also helps provide a tentative prediction of potential damage and flooding caused. First liquid fuel-powered rocket American engineer Robert H. Goddard pictured

launched the first liquid-fueled rocket on March 16 in Auburn, Massachusetts, U. Running on gasoline and liquid oxygen, the rocket rose to a height of 41 feet. The event triggered the Space Race between U. Gagarin completed an orbit of Earth on April. Man on the Moon After years of commendable achievements in space exploration by U. As the Apollo 11 craft touched down on the lunar surface on July 19, Neil Armstrong became the first man to walk on Moon. First strong evidence of black hole American astronomer Tom Bolton presented strong evidence of the existence of a stellar-mass black hole. He observed star HDE and noted that it appeared to be orbiting around something which was invisible but emitted powerful X-rays. The following year, the object was recognized as black hole Cygnus X. Construction begins on International Space Station. The first component of International Space Station, Zarya was launched into orbit in on an autonomous Russian rocket. A few weeks later, NASA sent another component into orbit, which was attached to the previous module, and since then new components have been added on a regular basis. Today, the International Space Station is a huge habitable artificial satellite, with modules being added to this day. The 10th planet American astronomer Michael E. Brown and his team discovered a massive body in the outer solar system. Appearing larger than Pluto, it was considered to be the 10th planet and was temporarily called UB. Recent discoveries classified the object as a dwarf planet and it was titled Eris.

Chapter 6 : 33 of the most amazing science breakthroughs in history

NSF's mission is to advance the progress of science, a mission accomplished by funding proposals for research and education made by scientists, engineers, and educators from across the country.

Share2 Shares 1K The universe loves to confuse us. And sometimes, the discoveries that benefit science the most are those that leave us severely confused and scrambling for crazy explanations. Wieczorek The Moon has remained magnetically inert for eons, but new research confirms that this was not always the case. Surprisingly, our scrawny little moon was actually able to generate a mightier field than ours. It appears the early Moon took advantage of some exotic method to produce its awesome magnetic field. It appears that the field disappeared sometime around 3. University of Tokyo The early universe was an approximation of hell—a roiling, opaquely dense stew of electrons and protons. Almost half a billion years passed before the baby universe cooled down enough to allow the formation of neutrons. Shortly thereafter, the universal landscape settled further so that stars and galaxies could come into being. A recent ultra-deep survey by the Subaru telescope—located in Hawaii and run by the National Astronomical Observatory of Japan—revealed seven of the earliest galaxies ever. Over 13 billion light-years distant, they appeared as unimaginably faint pinpricks of light. In fact, they were visible only after Subaru focused on a tiny patch of sky for over hours of exposure. Born only million years after the big bang exploded everything into existence, these galaxies are among the earliest things ever observed and are among the first evidence of organization within the universe. Termed Lyman-alpha emitters LAE, these galaxies appeared suddenly and for more or less unknown reasons. LAE galaxies are prolific star-producers, and their extreme age offers insight into the evolution of the universe. However, astronomers are at a loss to explain the physical processes responsible for the ephemeral landmass. Especially since it appears to have doubled in size—from 50 to kilometers 30 to 60 mi across—since it reappeared. And now, for the first time and quite unexpectedly, astronomers have found rings around a much smaller body. Meet Chariklo, an asteroid measuring only kilometers mi across yet boasting its own ring system. Chariklo, though the largest object in its cosmic vicinity, looked like an unremarkable chunk of space rock. Then astronomers noticed its anomalous light signature. As it eclipsed a faraway star, it caused an unanticipated dip in the amount of light reaching our telescopes. It turns out that Chariklo sports not one but two cosmic necklaces. Containing a good amount of frozen water, the larger of the rings hugging the planet is 7 kilometers 4 mi wide, while the smaller is about half that size. They are either the remnants of a foreign body that shattered itself against Chariklo or pieces of Chariklo itself that blew off during the crash. Ben Oppenheimer and Juna Kollmeier We pride ourselves on ascertaining the many universal balances that seem to occur throughout the cosmos. One such correlation has been observed between ultraviolet light and hydrogen, as the two have been found to coexist in well-defined proportions. A recent survey, however, has thrown a monkey wrench into these suppositions and reported a severe underproduction of UV photons from known sources—a percent discrepancy compared to predicted values. Lead author Juna Kollmeier likens it to walking into a dazzlingly bright room only to find several dim bulbs responsible for the disproportionate brilliance. Two accepted processes produce UV radiation—unruly young stars and massive black holes—but more UV radiation exists than could have been produced by the two. As in many times in the past, astronomers are forced back to the drawing board. Quite mysteriously, this UV underproduction is only apparent at local distances. When looking farther off into space and time, astronomers find that their predictions hold up quite well. These possibly even involve dark matter decay. So astronomers are tentatively salivating over the prospect of a scientific breakthrough, as this phenomenon could just be the first tangible sign of dark matter. Dark matter—the elusive, invisible bulk that accounts for most of the mass in the universe—might be composed of sterile neutrinos, which may or may not exist depending on whom you ask. These theorized particles supposedly produce X-rays in their death throes, and such emissions could account for the unexplained surges from the center of the aforementioned galaxies. Furthermore, since the radiation emanates from the cores of the galaxies, it corresponds to areas of highly concentrated dark matter clumps. So while nothing is certain yet, this could be a momentous discovery that would greatly increase our

understanding of a long-standing universal mystery. While the latter bodies are easily recognized by their bright, streaming tails, asteroids do not usually have such features since they possess little ice and are made mostly of heavier elements and rock. So spotting an asteroid with not one but six tails was an incredible surprise. Its tiny gravity is no match for the greater rotational forces ripping it apart. And radiation pressure from solar emissions stretches the scattering debris into dazzling, comet-like appendages. However, astronomers do know that P5 is a leftover chunk from a previous impact. This super-monster is 11 times more massive than Jupiter, and its gaping orbit highlights all sorts of flaws in our tenuous understanding of planetary formation. The incredibly lonely Neptune, our most distant planet, lumbers around the Sun at a distance of 30 AU. This is already an amazing range, but HD is so far separated from its parent that Neptune and the Sun are comparatively within hugging distance. For example, the forces responsible for making planets are usually undone by such great distances, raising the possibility that HD was created via the collapse of a debris ring. Yet HD is too massive for that to happen. And the primordial disks of raw matter that can birth planets simply do not contain enough stuff to produce giants like HD. However, the mass ratio between potential binaries is usually no more than The second-farthest member of our solar family is typically frigidly calm, but for some odd reason, the planet is currently awash in raging storms. Dazzling Uranian tempests were expected back in , during its equinox as the planet completed half of its year orbit, and the full solar fury was unleashed directly upon the equator. Yet the stormy weather was supposed to abate as Uranus continued its journey around the Sun. With no internal heat source, the green giant relies on solar exposure to fuel its storms. The northern hemisphere has plunged into shadow yet still continues to host violent storm fronts. KIC was just a run-of-the-mill triplet, two little dwarf stars orbited by a third stellar body going stag. Nothing weird so far, just three stars. For example, Kepler saw four daily dips in the light curve as the binary dwarfs crossed each other every six hours. It also saw another slight decline in the observed light every days caused by the eclipsing third star. And so did astronomers. Their first job was to pin down the stellar masses. But no matter how they crunched the numbers, they failed to produce any sensible answers, even though ascertaining the mass of the stars should have been relatively straightforward. For now, the stellar threesome has astronomers stumped. There is a potential answer that makes sense numerically yet not logically. The KIC system might contain a hidden fourth star. However, its orbit would have to perfectly mimic the orbit of the third star, giving the illusion of a single object.

Chapter 7 : Earth sciences | www.nxgvision.com

A scientific look at strange news from around the world. Featuring articles about unexplained mysteries, oddities and weird discoveries.

Chapter 8 : Earth News - Earth Science News, Earth Science, Climate Change

Scientific discoveries, achievements, and inventions are made all the time. Throughout the year, papers are published and patents are filed for any number of new 'things', but occasionally something truly incredible comes along.

Chapter 9 : years of discoveries in Earth sciences

15 amazing recent discoveries in the world of science and here they are from bionic contact lenses to reanimating dinosaur dna! Subscribe to Talltanic <http://>.