DOWNLOAD PDF DWARF PLANETS AND ASTEROIDS

Chapter 1 : Dwarf Planets - Introduction to Astronomy - Astronomy for Kids

Most of the asteroids in our Solar System live in the so-called asteroid belt between the planets Mars and Jupiter. Asteroids are remnants of the birth of our Solar System; they are minor planets that have not grown big enough to become a protoplanet or a planet.

Astronomical Journal by M. Astrologers might consider Orcus when ever considering Pluto. Pluto-Orcus Orbital Plane Crossing of Another time when significant resonances occur is when one planet passes through the orbital plane of another. This is another nodal axis, this one created by the intersection of the orbits of Pluto and Orcus. This exploration will provide significant insight into differences between Pluto and Orcus as well as their similarities. Most significantly it conjoins Zubenelgenubi of Libra. The overall image is of the Virgin giving birth into the Chelae of the Scorpion. This image articulates the birthing of the soul into reincarnational process of soul growth through the balance of experience. Thus I dub the first half of the sidereal Libra "Under the Skirt of the Virgin" to mythically articulate the long obscured secrets hidden within this part of the zodiak. To add more context: Ophiuchus is exemplar of one who has attained mastery of the forces of life and death, who has risen above the entrapment in the clutches of the Scorpion, who has mastered the path of soul growth through the balance of experience. The benevolent and wise Centaur, who stands over and protects the Souther Cross, is teacher of the right way to live to attain our evolutionary freedom. The Souther Cross embodies the unadulterated pure intent of the soulâ€”the original cardinal virtues. This entire mythological scene articulates the means for our evolutionary freedom from the perpetual re-incarnational process of soul growth through the balance of experience; as well as providing clues to our dilemma of biological degeneration, death, and rebirth. Zuben el Genubi, our primary perihelion star for Pluto, is the karmic seat for humanity. This ecliptical longitude also marks the exalted location of Saturn, our lord of karmic retribution and who demands we take responsibility for our life experience. Zuben es Chamalli is the dharmic seatâ€”the way to balance our experience and thus freeing ourselves from the patterns of the pastâ€”how to attain the Northern Crown. This is why our modern image of Libra is considered to be the scales of justiceâ€”implying the need to experience both sides a balance of human experience in order to gain self-mastery as an incarnating soul. It does not imply the guilt trip laden idea of paying for misdeeds of the past. Pluto addresses the essence of Zubenelgenubi. When we do heed Saturn law of justice, Pluto, the reductionist, intercedes and demands we are left with nothing but our need to address the essence of our life responsibility, or life ends and the soul is left only to try againâ€”to birth once again into the reincarnational claws of the Scorpion. Menkar marks the entrapping jaws of the fear-instilling technobureaucratic monster created by collective human consciousness. Conjoining Menkar are Almach the snagged foot of Andromeda; and Alpha Horologium of the pendulum clock. The theme here is that of princess Andromeda who is chained to rocks by the sea about to be devoured by Cetus. Cepheus was advised that the only way to appease Poseidon was to sacrifice is daughter to Cetus. In acquiescence, the King had Andromeda chained to the cliff at the sea to be devoured by Cetus. Andromeda, although inheriting this unfortunate sentence, has a far greater and fortuitous destiny awaiting her. Perseus eventually kills Cetus and frees Andromeda. Perseus and Andromeda marry and they go on to create a city and rule a kingdom that bores the Persian world. Alpha Horologium, in the southern heavens, adds a relentless and underlying sense that there is finite time ticking away and that more than is humanly possible must be accomplished. The Descending south Node stars reveal the nature of that which we must bring forth and express through the theme revealed by the Ascending north Node starsâ€”how to apply the south node theme through the north node theme. We can consider the south node as providing the momentum to take action through the north node. Due to the opposite and complimentary orbital tilts of Pluto and Orcus, their nodal axes lie in opposite directions. Zeta Aquila shines with the brightness of 39 of our suns and has with an amazing rotational speed, times the equatorial speed of our sun. Conjoining the tail of the Eagle Zeta Aquila is SS, an exotic and dynamic binary star system similar to Cygnus X-3, but emitting twin-corkscrew shaped jets in wavelengths ranging from the optical to the X-ray. A neutron star is a super-dense nucleus of a collapsed dead star. M57 is considered the prototype and

showpiece of a planetary nebula, also the first discovered by John Herschel. The term Planetary Nebula simply refers to a spherical nebula. M57 articulates the subsequent fragmentation of consciousness into various stellar races or rainbow rays of evolutionary unfoldment. M57, also conjoining Sheliak inspires multi-spectral creative expression. All-embracing M57 holds the memory pattern or source code of the DNA that unifies our diversityâ€”reminding us that all rays of color and creed ultimately comprise and fulfill the unbounded expression of one unified creative intelligence. Although the Twins Castor and Pollux are of communication and human betterment, they have in some legend been at odds with each other, a bit argumentative. Here is the Gemini trait of competitiveness, debate, arbitration, and negotiation, but ultimately leading to agreement and solution. Pollux is of an extraterrestrial nature while Castor is terrestrial in nature. Castor is the liaison in the world of daily human affairs, is of partnerships and cooperation and is concerned with practical affairs amongst the people of the Earth. Castor brings resources and people together that serve to get logistics accomplished in the world of business and commerce, whereas Pollux brings a greater awareness to the efforts of Castor, uniting individuals, groups and factions with concern for the greater evolutionary fulfillment of all parties. Pollux imparts more of an embracing awareness, whereas Castor has more of an intellectual emphasis. Pollux portends success, eminence and renown. Conjoining Castor is Wasat of Gemini. Wasat, the umbilical cord, embodies the essence of sidereal Gemini. Wasat is the link and liaison that unites and acts as a catalyst. Wasat brings the logistical pieces together. Wasat is of planning, coordination, assemblage of diversity into a workable functional model; the mechanics of creating the means in physical logistics. Conjoining Castor and Wasat from the south is Muliphen Mirza of Canis Major inspiring people, partners, and soul mates that have disappeared or withdrawn to re-emerge as a steady and dependable presence. Also conjoining is Delta Monoceris, a star of the Unicorn, inviting us to embrace the unique gifts and talents of all participants. Public Relations and liaison articulates the nature of the Twinsâ€”linking individuals together in larger groups or organizations that can serve a purpose far greater than the separate parties can accomplish alone. Here we find motivation for the coordination and exchange of resources and information between individuals and groups, and the planning of more encompassing joint ventures. It is here where we find Pluto actively at workâ€”in this case, with the all-embracing south node theme and the potent force driving it, ensuring we cooperate for the betterment of all, working hand in hand. Pluto in Summary At one time, Pluto was thought to be the planet that ended the limits of our solar system. It was also considered the planet that marked the end of life, with astrologers associating it death and destruction, and something malefic to abhor. We now know this is not the case, both astronomically and astrologically. With the discovery of Eris and subsequently many more planets in orbits beyond Pluto, we are invited to explore and embody realms of consciousness far more transcendent to that of Plutoâ€”while we are alive. So although Pluto was reclassified, some say demoted, to the Dwarf Planet category, in reality Pluto was elevated in stature, to be recognized not as a planet merely delineating endings and death, but as a gatekeeper and escort into deeper levels of self-empowerment. Pluto maintains its eminence associated with nuclear power, but he implores us to realize this nucleus of power is within self, rather than it being something to acquire through dominance and control over others or resources, or worse yet by judging and condemning others. Until realized, Pluto will continue to deconstruct immature and self-destructive behavioral patterns and attitudes that limit us from awakening to the power within. Pluto teaches us to look within self, rather than outside of self, to find our nuclear core of creative force. Pluto then teaches us to demonstrate the use of that force in ways that empower others and that awaken ourselves to new vistas of human potential, conscious awareness and experience waiting to be realized. This is one of the purest areas of resonance in the ecliptic; a fortuitous and beneficent area of the zodiak. Humanitarianism, altruism, and an evolved humanitarian-based society beyond conflicts based upon cultural, gender or religious differences are the hallmark of this zodiakal band. Here all are recognized as allied friends, as one human family. In the northern heavens lying upon the galactic equator we find Cygnus the Swan, also called the Northern Galactic Cross. Deneb, tail of the swan, is the principal star of Cygnus and marks the top head of the northern galactic cross. Deneb embodies our unadulterated androgynous pure soul essence before fragmentation into race, sex, or creed. Deneb inspires us to stand in the awareness of our pure soul essence, in this wholeness and to participate from the maturity of unity consciousness, unbiased and beyond the

segregations and categorizations common to modern-day mass-consciousness. Colorado , Bo Reipurth U. Fomalhaut, one of the four Royal Stars, embodies the essence of a humanitarian-based society, one in which basic human needs are met for all people. Sadachbia of Aquarius is the "lucky star of hidden things. The "Y" generally is depicted as the Urn of Aquariusâ€"from where the nourishing humanitarian waters flow. Skat is "star of the foundation," marking the shinbone of the waterbearer. Skat is of humanitarian philanthropic foundations, organizations, and business vessels through which material and financial support can flow for future-oriented humanitarian focused projects and for the nourishment of an evolved human society flourishing in the arts and sciences. Skat inspires action in support this pursuit. Of primary influence is the constellation of Pegasus, in which the perihelion lies. Pegasus, in general, is of strength and support, that which lifts humanity above the entrapping forces and scenarios common to a less than socially mature world. Enif, Baham and Homam are a group of fortuitous stars. Enif is characteristic of altruistic people, those with the intuitive awareness to recognize what is of essence, of value, and worthy of humanitarian support. It is of those who are capable of providing material and financial support and who have the sensitivity to do so. Enif asks us to follow our intuition to do that which is truly supportive to our greater well being and to those around us. Homam, Zeta Pegasus, is "lucky star of the hero," also "lucky star of the high-minded man. Homan inspires the inner drive to find a solution to our basic human needs. It is of achievement and success. Sculptor articulates the environment and type of work that is being supported by the humanitarian resources flowing from the Urnâ€"that of the arts and sciences, but also the sculpting of a beautiful and bountiful human society. Ankaa also conjoins Achernar of Eridanus not shown , the end of the river of life fulfilment , which lies a bit further south of Phoenix. Neptune, of vision and ideals, also dissolves differences into universality. Orcus was discovered in this part of the heavens in Hydra as it was moving toward its aphelion in Sextans. The sextant is a navigational instrument used to determine the "vertical" position angular distance of the sun, moon or stars from the horizon. The sextant reveals the need to reorient self so we know our position so we can plot our course, and take a new tack on our journeys in life. On a mundane level this can be in regard to changing our fundamental approach or path in life, to establish our position so we can plot or take a new tack toward our goals. Argo Navis classically is the ship in the story of Jason and the Argonauts, a version of Gilgamesh and his fifty Sirian warriors. The Argo lies reverse in the heavens, stern to the east, bow to the west, along the galactic equator, thus associated with that which moves retrograde in the heavens, the greater precessional process on Earth, the evolutionary cycle of the soul.

Chapter 2 : Planets & Dwarf Planets - Curious About Astronomy? Ask an Astronomer

Dwarf planets are satellites, but asteroids are only considered satellites if they orbit something. Comets may be considered satellites when in orbit, but they rarely orbit other structures. The term "satellite" may refer to celestial bodies, but it can also refer to human-made machines that orbit Earth.

Asteroids are also known as planetoids or minor planets. An asteroid, on the other hand, is a large chunk of rock that orbits around the sun. Hence, asteroids are effectively part of our Solar system. The term minor planet is actually preferred in some scientific communities. However, according to the IAU, an asteroid is categorized as a small Solar System body, unless it meets the requirements to be a dwarf planet. There are effectively millions of asteroids. Most asteroids in our solar system are part of the asteroid belt located between the orbits of Mars and Jupiter. The asteroid belt consists of tens of thousands asteroids. They are generally rocks that have a high metallic content but no atmosphere. The size of an asteroid can range anywhere between a few meters wide and hundreds of km wide. They are smaller than planets but like planets some even have their own moons. These trans-Neptunian objects, i. In addition, it was discovered that Pluto has some unusual characteristics such as large orbital eccentricity and a high orbital inclination. Hence, it was completely different than the other planets. According to the previous categorization, all of the newly discovered trans-Neptunian objects would also be classified as planets, even though, like Pluto, they did not fit the traditional definition of a planet. So, the new three-way categorization model was adopted. Under this model, Pluto was demoted to a dwarf planet, while other solar object that were too big to be classified as asteroids but did not meet the requirements for a planet were also classified under dwarf planets. Ceres, Pluto, Haumea, Makemake, and Eris. However, only Ceres and Pluto have been observed in enough detail to demonstrate that they fit the definition. Hence, the other may or may not be reclassified as new information is available. It is estimated that there may be dwarf planets in the Kuiper belt of the outer Solar System, and up to 10, in the region beyond. Hence, the main difference between a dwarf planet and an asteroid is that a dwarf planet is an asteroid that is big enough to have a gravitational force that has allowed the asteroid to compound itself to a spherical shape. If the gravitational force was strong enough to allow the asteroid to clear its orbit, in addition to shape itself, then the asteroid would be termed as a planet.

Chapter 3 : Asteroids - Comets - Dwarf Planets

Asteroids are rocky, airless worlds that orbit our Sun, but are too small to be called planets. Tens of thousands of these minor planets are gathered in the main asteroid belt, a vast doughnut-shaped ring between the orbits of Mars and Jupiter.

Comets, meteors, and asteroids are often grouped together since they are all basically the same thing: Comets are objects composed mostly of ice and dust that grow tails when they approach the sun. When a comet nucleus nears the sun, solar energy begins to heat the ice and vaporize it. The gas flies off the comet, sometimes violently enough to break the nucleus apart , and throws dust up with it. The gases form a cloud around the nucleus called the coma. Some of the gas is stripped of electrons and blown back by the solar wind. This forms a bluish colored ion tail. The dust particles are pushed away from the comet by solar radiation, forming a dust tail that can be many millions of miles long. The dust tail is the easiest to see with the unaided eye, but occasionally the ion tail is visible as well. Each time a comet passes close to the sun, it loses more of its ice. Eventually, after many passes, the comet may no longer have enough material to form tails. Its surface will be covered by dark dust and it will look more like an asteroid. Comets come from two places in the Solar System: The Oort Cloud is a spherical halo of comets surrounding the Solar System at a distance of around 50, Astronomical Units. One Astronomical Unit equals the distance from Earth to the Sun. Comets from the Oort Cloud have long orbital periods and can enter the solar system from many different directions. It lies more or less in the plane of the solar system and is a reservoir for the short period comets that we see. The first Kuiper Belt Objects KBOs were discovered in the early 90s, and they captured the interest of astronomers because they are probably the oldest, most pristine material in the solar system. Studying KBOs is difficult because they are distant and very small, but more have been discovered over the last few years as telescope and instrument technologies have improved. Astronomers now know of a few hundred KBOs, including a large object called Quaoar which is half the size of Pluto. Quaoar is the largest solar system object discovered since Pluto and Charon, and it reinforces the idea that there might be other large KBOs that are still undiscovered. Dawn studied Vesta from July to September The towering mountain at the south pole -- more than twice the height of Mount Everest -- is visible at the bottom of the image. The set of three craters known as the "snowman" can be seen at the top left. More information about Dawn is online at http: Asteroids are the small rocky objects in the Solar System. The largest asteroid is Ceres, which is kilometers miles across. Many asteroids, including all of the largest asteroids, orbit the sun between Mars and Jupiter in the Asteroid Belt. Near-Earth Asteroids orbit the sun in the vicinity of the rocky terrestrial planets and pose the greatest threat to Earth. We think that the total mass of all the asteroids combined is less than that of the Moon. The asteroid population is amazingly diverse - each one seems different! Some asteroids such as Mathilde are very light and are probably "rubble piles" made up of lots of small particles loosely held together. Other asteroids are metallic for example Psyche or pieces of solid rock Eros, visited by the NEAR spacecraft, is an example. Sometimes asteroids have small moons or travel in equal-sized pairs. Most asteroids have unusual shapes because they have experienced many collisions and do not have a strong enough gravity to pull themselves back into a sphere. Asteroids are not visible to the unaided eye, but some can be seen with small telescopes or even binoculars. Meteors are the short, white trails across the sky that we call "shooting stars. Meteor showers happen when Earth passes through the orbital path of a comet that left a lot of dust behind. Earth plows through the dust, and the particles form meteors as they hit the atmosphere. Occasionally a small rock may fall through the atmosphere, causing an extremely bright and colorful streak across the sky called a fireball. These are often mistaken for comets, but comets do not streak across the sky quickly; they are usually visible for many days. A rock that fell from space this way is called a meteorite.

Chapter 4 : Dwarf planet - Wikipedia

Ceres, the first and largest asteroid to be discovered (by Giuseppe Piazzi) and the closest dwarf planet to the sun, encompasses over one-third of the estimated total mass of all the asteroids in the asteroid belt.

The yellow areas are warmer, or deeper in the atmosphere, while dark areas are colder, or higher in the atmosphere. The evidence of a dark, mysterious ninth planet deep in space beyond the orbit of Neptune is mounting. Another huge asteroid has been found flung into an extreme orbit. Supplied IT may not be Nibiru. One planet is a rich source of doomsday prophecy speculation. Nibiru is an incorporeal world that has supposed to have hit us any number of times. There is no evidence it exists. But Planet Nine or Planet X, depending on whom you speak to is looking very real. We know it is out there, in the dark outer-reaches of our Solar System, because of the gravitational influence it has on other distant bodies. But another big clue has further narrowed down where it might be. A team of astronomers have found a wayward dwarf planet, dubbed BP Meet our newest planet-hunting space telescope But the gravity of Neptune really should be enough to have kept it in line with the rest of the Solar System. The wayward paths of numerous distant asteroids and dwarf planets beyond the orbit of Neptune strongly suggest there is a big, planet-sized world circling near the Kuiper Belt. The dwarf planet is just another wanderer beyond the orbit of Neptune that hints to the existence of Planet Nine. How NASA plans to divert killer asteroids In , it was noticed that the dwarf planet Sedna, object VP and other leftover pieces of rubble were following somewhat unnatural paths. By , more wayward objects were seen somewhat out of place. Astronomers Mike Brown and Konstantin Batygin gave the ghostly planet a name â€" Planet Nine â€" and offered an estimate of its characteristics. It could be about 10 times the weight of Earth. It is roughly times further out from the Sun than the Earth. It takes roughly 20, years to complete each orbit. I think the case for the existence of Planet Nine is now genuinely excellent.

Chapter 5 : Pluto & Orcus: The Astronomy and Astrology

For example, a news update at www.nxgvision.com spoke of "Pallas, the largest asteroid, and Ceres, the dwarf planet formerly classified as an asteroid", whereas an IAU question-and-answer posting states, "Ceres is (or now we can say it was) the largest asteroid", though it then speaks of "other asteroids" crossing Ceres' path and otherwise implies that.

The Universe Dwarf Planets Up until recently, there were nine planets in our solar system. The ninth, Pluto , was kicked out in August of But, we stopped calling it a planet. From then on, Pluto became a dwarf planet. Dwarf Planets It is surprisingly easy to separate planets from dwarf planets. What this means is that other things orbit along with them. If planets and dwarf planets were cars, planets would have their own lane. Dwarf planets would be stuck in traffic. Knowing this, we can separate Pluto from the planets. Pluto is part of the Kuiper Belt. This is a ring of comets and asteroids orbiting the Sun. As we started to find more objects like Pluto in the belt, scientists knew something would have to change. How Many Dwarf Planets are There? Dwarf planets are very difficult to detect, due to their size. As a result, we can only guess how many there are. Yet some scientists think there could be up to in the Kuiper Belt! Who knows how many might exist in our Universe? As a result, dwarf planets are kind of mysterious. That said, Ceres was discovered way back in The most notable thing about Ceres is its volcanic mountain , Ahuna Mons. Instead, it seems that Ahuna Mons is a sort of ice volcano! Could we one day live on Ceres? Scientists think that there might be water there. Eris Eris is a large, faraway dwarf planet. Its wide orbit makes it so that one year there equals Earth years. Planets and dwarf planets are normally named after Gods. Eventually, though, Eris did get a name from Greek mythology. Haumea Haumea is probably the strangest of the dwarf planets. This odd shape comes from its extremely fast rotation speed: Haumea spins on its axis once every four hours! A drawing of Haumea. Makemake Makemake is another dwarf planet in the Kuiper Belt. An interesting fact about Makemake is that its surface appears almost black from outer space. Pluto Pluto is, of course, the most familiar of the dwarf planets. You can read much more about Pluto on our Pluto page. Pluto, our favorite ex-planet. Dwarf Planet Facts â€” Science Kids:

Chapter 6 : Astronomy & Astrology of the Asteroids, Centaurs & Dwarf Planets

Written by a retired astronomer, the book provides a survey of the dwarf planets and asteroids, giving details of the discovery, naming, orbits, and physical characteristics of hundreds of examples of the known asteroids found by astronomers in the past two centuries.

All known possible dwarf planets have smaller discriminants than those shown for that zone. Clearing the neighbourhood Alan Stern and Harold F. There are several other schemes that try to differentiate between planets and dwarf planets, [6] but the definition uses this concept. Bodies smaller than a few kilometers are dominated by non-gravitational forces and tend to have an irregular shape. Larger objects, where gravitation is significant but not dominant, are "potato" shaped; the more massive the body is, the higher its internal pressure and the more rounded its shape, until the pressure is sufficient to overcome its internal compressive strength and it achieves hydrostatic equilibrium. At this point a body is as round as it is possible to be, given its rotation and tidal effects, and is an ellipsoid in shape. This is the defining limit of a dwarf planet. If the body does not rotate, it will be a sphere, but the faster it rotates, the more oblate or even scalene it becomes. If such a rotating body were to be heated until it melted, its overall shape would not change when liquid. The extreme example of a non-spherical body in hydrostatic equilibrium is Haumea , which is twice as long along its major axis as it is at the poles. If the body has a massive nearby companion, then tidal forces come into effect as well, distorting it into a prolate spheroid. An extreme example of this is the Plutoâ€”Charon system, where both bodies are tidally locked to each other. The mass of Makemake is a rough estimate. See plutoid for a graph of several additional likely dwarf planets without Ceres. The upper and lower size and mass limits of dwarf planets have not been specified by the IAU. There is no defined upper limit, and an object larger or more massive than Mercury that has not "cleared the neighbourhood around its orbit" would be classified as a dwarf planet. Ceres, Pluto, Eris, Haumea, and Makemake. Considered a planet for half a century before reclassification as an asteroid. Accepted as a dwarf planet by the IAU on September 13, Reclassified as a dwarf planet by the IAU on August 24, Haumea â€” discovered on December 28, Accepted by the IAU as a dwarf planet on September 17, Makemake â€” discovered on March 31, Accepted by the IAU as a dwarf planet on July 11, Eris â€” discovered on January 5, Called the " tenth planet " in media reports. Accepted by the IAU as a dwarf planet on September 13,

Chapter 7 : Ceres (dwarf planet) - Wikipedia

A dwarf planet is "a celestial body in direct orbit of the Sun that is massive enough for its shape to be controlled by gravitation, but that unlike a planet has not cleared its orbital region of other objects.".

Eris Pluto reclassified as a dwarf planet The enormity of the impact of this distinction between a planet and a dwarf planet had an immediate victim. With the new definition, Pluto , which from its discovery in up until that year was considered the ninth planet in the Solar System , would now be stripped of that position and become a dwarf planet. The main reason that relegated Pluto to the dwarf planet status is that its orbit is riddled with other celestial objects that crisscross its path around the Sun. These objects include other celestial objects in the region outside the planet Neptune known as the Kuiper Belt. Pluto and Eris , another dwarf planet, are actually part of the Kuiper Belt. In fact, the orbital paths of Eris and Pluto cross each other. They were of varying sizes and those that had been detected were smaller than Pluto. However, on October , astronomers at the Palomar Observatory in California identified a new trans-Neptunian object that was more massive than Pluto. This object also had a satellite and was initially named UB The discovery of UB led astronomers to believe that more of these massive objects existed. It also made them question whether UB could be considered a new planet or not. The important question of what makes a celestial object a planet led the IAU to form a committee that was tasked to gather the opinions of professionals from a wide range of interests including astronomers, educators, writers and planetary scientists. Based on their opinions, the committee created a draft resolution on the definition of a planet. After much debate from its members, a revised version was then put to vote during the Closing Ceremony. By the end of the General Assembly, the members had approved Resolution B5: Definition of a Planet in the Solar System. The Resolution also included the definition of a dwarf planet and thus created a new class of celestial objects that was distinct from planets. The Resolution automatically made Pluto a dwarf planet. After the Assembly, UB was given the name Eris. Pluto, Eris and Ceres an asteroid in the asteroid belt between the orbits of Mars and Jupiter were the first members of the dwarf planet class. There are currently five recognized dwarf planets, with Makemake and Haumea joining the first three members. Dwarf planet controversy The resolution that led to the classification of Pluto as a dwarf planet was not without its share of controversy. This criterion also creates a different standard for an object to be considered a planet, one that is based on size and distance: If an object is deemed too small and is too far away from the Sun, then it must not be a planet. Jupiter and terrestrial planets e.

Chapter 8 : Dwarf Planets: Interesting Facts about the Five Dwarf Planets

Dwarf planets are worlds too small to be full-fledged planets, but too big to fit in smaller astronomical categories. Pluto, the most famous dwarf planet, lost its planet status in

As Saturn travels around the Sun, we see its majestic ring system from different angles. These images were taken with the Hubble Space Telescope from the year bottom left to top right. Notice how thin the rings are! They are , km across, and only a kilometer thick at most. They are made up of chunks of ice, most of which are about the size of softballs, though there are larger bodies, some a few kilometers across, and smaller pieces, all the way down to very fine dust. Each ring particle orbits Saturn like a tiny moon. Ancient people noticed that while most of the stars did not move, certain bright "stars" wandered through the constellations of the zodiac. These were the planets. Mercury, Venus, Mars, Jupiter, and Saturn are visible to the unaided eye. The planets Uranus and Neptune and the dwarf planets Ceres, Pluto and Eris were discovered with telescopes. Many space missions have been sent to the planets, but they have all been unmanned probes. No human has yet traveled beyond our Moon to another planet, but in the coming decades, the first person may set foot on Mars. Lsmpascal Solar System planets size comparison. Planets of the Solar System to scale. The inner planets, Mercury, Venus, Earth and Mars, are called the terrestrial or earthlike planets. They are rocky planets with metal cores which have solid surfaces. The outer planets, Jupiter, Saturn, Uranus and Neptune, are jovian or jupiterlike. They have no solid surfaces, and are made mostly of hydrogen and helium, which is why they are also known as the gas giants. The dwarf planet Ceres is a cratered ball of rock and is the largest object in the asteroid belt. The dwarf planets Pluto and Eris are frigid, icy worlds, and are part of the Kuiper Belt.

Chapter 9 : Differences Between Dwarf Planets, Comets, Asteroids & Satellites | Sciencing

A dwarf planet is a planetary-mass object that is neither a true planet nor a natural www.nxgvision.com is, it is in direct orbit of a star, and is massive enough for its gravity to compress it into a hydrostatically equilibrious shape (usually a spheroid), but has not cleared the neighborhood of other material around its orbit.

A celestial body bigger than 10 m orbiting the Sun, mainly between Mars and Jupiter Meteoroid Similar to an asteroid, but significantly smaller. Mostly debris of comets, sometimes debris of asteroids. Meteor A bright tail of light caused by a meteoroid during its atmospheric flight, also called a shooting star or falling star. Fireball A very bright meteor brighter than the planet Venus. Bolide A fireball that explodes during its atmospheric flight, often with visible fragmentation. Comet A smaller celestial body mainly composed of ice and dust. Asteroids An asteroid is a celestial body - composed of rock, metal or a mixture of both - that is orbiting the Sun. Most of them are in the asteroid belt between Mars and Jupiter. Even though there are millions of asteroids with sizes up to more than km like Pallas and Vesta they are of no danger to the planet Earth. The biggest body in the asteroid belt - Ceres - is officially not called an asteroid anymore but a dwarf planet. The scale of the solar system is so immense that even inside the asteroid belt the average distance between two asteroids is above one million km - or three times the distance between Earth and the Moon. Asteroid Itokawa, an Apollo asteroid with a length of metres. The cause of these elliptical trajectories could be collisions within the asteroid belt or the gravitational influence of the massive planet Jupiter changing the orbits of some asteroids gradually over time see orbital resonance. Apollo asteroids are doomed to sooner or later collide with one of the inner planets, usually within a few million years of their orbit becoming so eccentric. The largest Apollo asteroid - Sisyphus - has a diameter of about 9 km, similar to the asteroid that caused the Chicxulub event , the giant meteorite impact that caused the extinction of the dinosaurs. Many of you will remember the Chelyabinsk event which took place on the 15th of February Fortunately no people were killed during this event and today you can even buy a Chelyabinsk meteorite. Meteoroids and meteors Generally speaking, meteoroids are all the smaller objects in orbit around the Sun. Most of them originate from comets that lose gas and dust when they approach the Sun. Other meteoroids are basically small asteroids. There is no exact diameter that distinguishes an asteroid from a meteoroid. Wikipedia states 10 metres; other trustworthy sites call anything smaller than 1 km a meteoroid. Anyhow, the vast majority of all meteoroids are just a few millimetres and less in size. Perseid meteor shower on August 12, The ones about the size of a pebble leave behind a flash of light when they completely vaporise. Most people call this flash a "shooting star" or a "falling star", but more accurately spoken this is a meteor. During so called meteor showers the rate of observable meteors per hour can increase significantly. Meteor showers are caused when the Earth crosses higher than usual concentrations of particles that are themselves in an eccentric orbit around the Sun. Since the orbit of these particles is fixed, we encounter this stream every year at the same time - just its density cannot be foreseen. This sometimes leads to sparse meteor showers and sometimes very intense meteor showers with more than meteors per hour, also called meteor outbursts or meteor storms. The meteors during these meteor showers almost all emerge from the same section of the sky; indeed the meteor showers are named for the constellations from which the meteors appear to originate. Leonid meteor, image taken during the peak of the Leonid Meteor Shower 17th November. But what causes the light path of the meteor that we can see in the sky? Smaller meteoroids will be heated by adiabatic compression until the point when they completely disintegrate. However, the light emission we observe is mainly caused by interactions between evaporated and detached components of the fast moving meteoroid and air molecules. Both the meteoroid atoms and the air molecules ionize during this encounter. When the free electrons recombine with the ionized atoms in the tail of the meteoroid they emit the light that we can observe. The light track can have a length of up to several tens of kilometres and an initial diameter of a few metres. The colour of the meteor is an indicator of the material of the meteoroid; e. A meteor that is larger and brighter than normal is called a fireball; brighter than the brightest planet in our night sky Venus. If these fireballs also break apart or explode during their atmospheric flight - sometimes accompanied by considerable audible sounds - they are called a

bolide. Meteorites are made of rock stony meteorites , metal iron meteorites or a mixture of these two materials stony-iron meteorites or pallasites. Pallasites form beautiful olivine crystals that are embedded into a metal matrix. Scientists are eager to study meteorites since they are the very first material that was formed in our early solar system, almost 4. The three main types of meteorites. The sizes of their nuclei vary between a few hundred metres to tens of kilometres in diameter; their visible tails can extend to above million km in length. When comets approach the Sun the solar radiation and solar winds cause particles to sublimate and detach from the comet, forming a tail of particles which often makes them visible in the night sky even to the naked eye. Anyhow, below its surface there can also be reservoirs of liquid water which can vaporise and feed jets of water vapour. Comets orbit as around the Sun on elliptical orbits until all of their volatile material has evaporated away. The orbital periods vary between a few years like comet Encke and tens of millions of years. The Kuiper belt is the region from where most of the short-period comets derive. Short-period comets mainly originate from the Kuiper belt, a region in the solar system with many millions of icy bodies extending from about 30 AU about the orbit of Neptune to 50 AU. If some of these icy bodies get too close to Neptune during their orbit they may be deflected and enter a new, eccentric orbit which will make them become short-period comets. Long-period comets normally originate from the Oort cloud, a region between AU and AU or about one light year away from the Sun. The Oort cloud consists of trillions of icy objects with diameters above 1 km. With these huge numbers we can be sure that there will be no shortage of comets visiting the inner part of the solar system in the future. But what causes these icy objects in the Oort cloud to leave their stable orbit and approach the inner part of the solar system? Without any "push" they would certainly continue orbiting in the Oort cloud forever. But gravitational perturbations of nearby passing stars and the galactic tide can cause these comets to change their trajectory around the Sun and approach the inner parts of the solar system. The star Gliese will approach within a distance of just 1 light year from the Sun in about 1. Comets from the Oort cloud can arrive from all different directions since the Oort cloud has a spherical shape. All text and articles published by Sun.