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Maxwell

Scottish physicist (1831–1879) James Clerk Clerk MaxwellJames MaxwellBorn (06/13/1831) June 13 1831Edinburgh, Scotland, United KingdomDied5 November 1879 (05/11/1879) (Aged 48) Cambridge, England, United KingdomResting placeParton, Kirkcudbrightshire55Â Â° 00Â Â'24Â Â³N 4 ¢ Â° 02a Â²21Â Â³WÂ¯ ¢ Â »Â¡ / AA» Â¿55.006693Â Â Â° N ° 4.039210Â Wi Â »Â¡ / 55,006,693 thousand; -4.039210NationalityScottishCitizenshipBritishAlmaÂ materUniversity EdinburghUniversity of the theorem of CambridgeKnownÂ forStatistical mechanicsMaxwell equationsDisplacement currentMaxwell relationsMaxwellÂ ¢ Betti theoremMaxwellÂ Boltzmann Boltzmann distributionMaxwellÂ ¢ ¢ statisticsMaxwellÂ Stefan diffusionMaxwell demonMaxwell constructionMaxwell couplingMaxwell discsMaxwell speed distributionMaxwell theoremMaxwell (geometry) Maxwell materialMaxwellÂ WagnerÂ ¢ ¢ Sillars polarizationMaxwell bridgeMaxwell thermodynamic surfaceControl theoryCoherent of unitsGeneralized conicSingularityStructural rigiditySpouse system (s) Katherine clerk MaxwellAwardsFRSEFRSSmith Prize (1854) Adams Prize (1857) Medal Rumford (1860) Keith Prize (1869Â ¢ 71) scientific careerFieldsPhysics and mathematicsInstitutionsMarischal college, University of the fish-eye of coilMaxwell of lensMaxwell spotMaxwell wheelMaxwell of AberdeenKing college, LondonUniversity of CambridgeAcademic advisorsWilliam HopkinsNotable studentsGeorge Chrystal Horace Lamb John Henry PoyntingInfluencesSir Isaac Newton, Michael FaradayInfluencedVirtually all subsequent physical Signature James Clerk Maxwell FRSE FRS (13 June 1831Â Â 5 November 1879) was a Scottish mathematician[1][2] and responsible scientist for the classical theory of electromagnetic radiation describing electricity, magnetism and light as different manifestations of the same phenomenon for the first time. Maxwell's equations for electromagnetism have been called the "second great unification of physics" [3], where the first one was built by Isaac Newton. With the publication of "A Dynamical of the electromagnetic field theory" in 1865, Maxwell demonstrated that electric and magnetic fields through space as waves moving at the speed of light. He proposed that light is an undulation in the same medium which is the cause of electric and magnetic phenomena. [4] The unification of light and electrical phenomena brought his prediction of the existence of radio waves. Maxwell is also regarded as one of the founders of the modern field of electrical engineering. [5] He has helped develop the distribution MaxwellÂ ¢ Boltzmann, a means to describe the statistical aspects of the kinetic theory of gases. He is also known for presenting the first photograph in durable colors in 1861 and for his fundamental work on analyzing the stiffness of the rod-articular structures (farms) like those of many bridges. The discoveries he helped usher in the era of modern physics, laying the groundwork for such fields as special relativity and quantum mechanics. Many physicists consider Maxwell as the 19th century scientist who had the greatest influence on the physics of the 20th century. The contributions him to science are considered by many to be the same size as those of Isaac Newton and Albert Einstein. [6] In the millennium Polla a survey of 100 most prominent physicistsÂ ¢ Maxwell was voted the third greatest physicist of all time, behind only Newton and Einstein. [7] On the centenary of the birth of Maxwell, Einstein described Maxwell's work as "the most profound and the most fruitful that physics has experienced since the time of Newton." [8] Einstein, when he visited the University of Cambridge in 1922, he was told by his guest that he had done great things because © stood on the shoulders of Newton; Einstein responded: "No, I can not stand on the shoulders of Maxwell.". [9] Life Early life, 1831Â ¢ 1839 Clerk Maxwell's birthplace at 14 India Street in Edinburgh is now the headquarters of the James Clerk Maxwell. James Clerk Maxwell was born June 13, 1831 [10] at 14 India Street, Edinburgh, John Clerk Maxwell Middlebe, a lawyer, lawyer, Frances Cay [11] [12] Robert Hodshon Cay daughter and John Cay cister. (The birthplace of her now houses a museum run by the James Clerk Maxwell Foundation.) Father of her was a comfortable man of Middlebe [13] of the Penicuik family, owners of the Penicuik chlork barnw. She's father's brother was the Sir Baronet. [14] "John Clerk" was born, adding Maxwell to him after having inherited (like a child in 1793) the holding of Middlebia, a Maxwell property in Dumfriesshire. [11] James was a first cousin of both the artist Jemima Blackburn [15] (his father's sister's sister) and the Civil Engineer William Dyce Cay (his mother's son of his mother). Cay and Maxwell were intimate friends and Cay acted as the best man of him when Maxwell was married. [16] Maxwell's parents met and married when they were thirty years old; [17] She was about 40 years old when he was born. They had a previous child, a daughter named Elizabeth, who died in childhood. [18] When Maxwell was young, the family of him moved to Glenlair, to Kirkcudbrightshire that his parents had built on the estate he included 1,500 acres (610 ah). [19]. All the signs suggest that Maxwell had maintained an irrequential curiosity from the tender age. [20] At the age of three, everything that moved, shone or made a noise has designed the question: "What is the go is that?" [21] In a pass added to a letter from his father to his sister Jane Jane Cay in 1834, her mother described this innate sense of inquisitivity: it's a very happy man, and it has improved a lot since the was moderate; He has a great job with doors, locks, keys, etc., and "show me how it Doos" is never out of his mouth. Also investigates the hidden course of flows and bell towers, the way in which water goes from the pond through the wall .... [22] Education, 1839 - 1847 Recognizing the potential of the boy, Maxwell's mother assumed the responsibility of the His initial education, which in the Victorian era was largely the work of the woman of the house. [23] At eight he could recite long Milton passages and all 119 Â ° Psalm (176 verses). In fact, his knowledge of writing was already detailed; She could give the chapter and the verse for almost all the quote of the Psalms. She mother was hurting with abdominal cancer and, after an unsuccessful operation, she died in December 1839, when she was eight years old. The education of him was hereafter supervised by his father and the sister-in-law of his father Jane Jane, both played punitive roles in his life. [23] The formal school of him started without success under the guidance of a 16-year-old rental tutor. Little one knows on the young man hired to educate Maxwell, except him he has hardly treated the youngest boy, avoids being slow and rebellious. [23] The tutor was fired in November 1841. The father of James led him to the demonstration of Robert Davidson of electric propulsion and magnetic force on 12 February 1842, an experience with deep implications for the boy. [24] The Edinburgh Academy, where Maxwell was educated Maxwell was sent to the prestigious Edinburgh Academy. [25] He presented himself during the times of the term at the house of his aunt Isabella. During this time his passion for drawing was encouraged by him ancient cousin Jemina. [26] The Maxwell decade, having been raised in isolation on his father's country estate, was not suitable for school. [27] The first year had been full, forcing him to join the second year with classmates a year the elderly of him. [27] The mannerisms of him and a Galloway accent hit the other boys as rustic. Having arrived his first day of school that he wears a pair of homemade shoes and a tunic, he earned the rude nickname of "Daftie". He never seemed to hear the epithet, bring him without complaint for many years. [29] Social isolation at the Academy has concluded when you met Lewis Campbell and Peter Guthrie Tait, two boys of a similar one that had to become considerable scholars later in life. [11] Maxwell was fascinated by early advance geometry Rediscovering the regular polyhedric before receiving any formal education. [26] Despite his winning Scripture award the biography of the school in his second year, his academic work was remained unnoticed [26] until, at the age of 13, he won the Mathematical Medal of the School and the first Award for English and poetry. [30] Maxwell's interests went to the school program and he did not pay particular attention to exam performance. [30] He writes his first scientific article at the age of 14. In it described a mechanical medium of mathematical curves drawing with a piece of string, and the properties of ellipses, Cartesian oval, and the related curves with more than two fires . Work, [11] [31] of 1846, "on the description of oval curves and those from where have a plurality of foci" [32] was presented at the Royal Society of Edinburgh by James Forbes, professor of natural philosophy at the University, [11] [31] because Maxwell was considered too young to present the work itself. [33] The work was not entirely original, since René Descartes â © had also examined the properties of such multifocal ellipses in the 17th century, but Maxwell had simplified their construction. [33] College University, 1847Â ¢ 1850 Old College, University of Edinburgh Maxwell left the Academy in 1847 at age 16 and started attending lessons at the Edinburgh University. [34] He had the opportunity to attend the University of Cambridge, but decided, after his first mandate, to complete the entire course of his university studies in Edinburgh. The teaching body of the university included some appreciated names: His first year Britons included Sir William Hamilton, who gave him conferences on logic and metaphysics, Philip Kelland on mathematics, and James Forbes on natural philosophy. [11] Maxwell did not find his demanding lessons, [35] and was therefore able to immerse himself in the private study during leisure time at home or in particular when to go home to Glenlair. [36] He would experiment with improved chemist, electrical, and magnetic devices; However, the main concerns of him considered the properties of polarized light. [37] He built in the jelly blocks, subjected to various stresses, and with a couple of polarizing prisms provided William Nicol, given the colored fringes that had developed inside jelly. [38] Through this practice he discovered photoelasticity, which is a means of determining the distribution of stresses within physical structures. [39] At 18, Maxwell contributed two cards for the operations of the Royal Society in Edinburgh. One of these, "on the balance of the solid elastic", threw the foundations for an important discovery later in the lives of him, which was the double temporary refraction produced in viscous liquids of cutting stress. [40] The other card of him was "rolling curves" and, just like with the "curve oval" card to have written to the Edinburgh Academy, it was again considered too young to stay at the stands to present himself . The document was delivered to the Royal Society from his Kelland tutor instead. [41] University of Cambridge, 1850â 1856 A young Maxwell at Cambridge Trinity College, University of Cambridge In October 1850, already a mathematician accomplished, Maxwell left Scotland for the University of Cambridge. Initially he attended Peterhouse, however before the end of his first mandate transferred to Trinity, where he believed he would be easier to get a scholarship. [42] At Trinity he was elected to the secret society of Elite known as the Cambridge Apostles. [43] Intellectual understanding of Maxwell of the Christian faith and science of him has grown rapidly over the years of him a He joined the "apostles", a company of exclusive debate of intellectual life, where he, through his essays he tried to resolve this understanding. Now my great plan, which was conceived by old, ... anything to be deliberately left not examined. Nothing must be a Terra Santa Consecrated to stationary faith, Positive or negative. Follow all the grounds follow and a regular notation system. ... never hide anything, be weed or not, nor does it seem to want it hidden. ... again the right of transgression affirmed on any plot of holy soil that any man is arranged. ... now i am convinced that no one, but a Christian can actually eliminate its land of these saints points. ... I don't say that no Christian closed places of this kind. Many have a great deal, and everyone has some. But there are vast and important traits in the territory of the truffle, the pantheist, the silence, formalist, dogmatic, sensualist, and the rest, which are openly and solemnly tabil. ... "Christianity - Christianity" That is the religion of the Bible - is the only scheme or form of conviction that disappears any possession on such a mandate. Here only everything is free. You can fly to the end of the world and not find God but the author of salvation. You can search for the scriptures and not find a text to stop you in your explorations. ... The Old Testament and the law of mosaic and Judaism is supposed to be "tabes" by the Orthodox. The skeptics pretend to have them read you and found certain spiritual objections ... that too many goals not orthodox, and close the subject as haunted. But a candle is coming to drive away all the ghosts and bugbears. Let's follow the light. [44] The extent to which Maxwell "plowed" his Christian convictions and put them to the intellectual test, can be judged only incomplete by him. But there is a lot of tests, especially from its university days, which has done deeply examining the faith of him. Certainly, his knowledge of the Bible was king marchable, so he trusted him in the scriptures was not based on ignorance. In the summer of his third year, Maxwell spent some time at the Suffolk house of Rev.B. Tayler, the uncle of a classmate, G.W.H. Tayler. The love of God that is the impressed Maxwell family, especially after having been healed by health problems by the Minister and his wife. [45] On his return to Cambridge, Maxwell writes to his recent guest a chat and affectionate letter, including the following testimony, [44] ... i have the capacity to be more evil from every example that man could put me, And ... if I escape, it's just from the grace of God who helps me get rid of myself, partially in science, completely in society, - but not perfectly except that I was involved in God ... in November 1851, Maxwell studied under William Hopkins, whose success in feeding the mathematical genius had earned him the nickname of "Senior Wrangler-Maker". [46] In 1854, Maxwell graduated from the trinity with a degree in mathematics. He scored according to the highest highest examination, continuing behind Edward Routh and earn the title of Second Wergler. Then he was declared the same as Routh in the most demanding calvary of the exams of the Blacksmith Prize. [47] Immediately after passing his degree, Maxwell read his document "on the transformation of the surfaces bending" to the philosophical company of Cambridge. [48] This is one of the few purely mathematical documents that has earned him the letter, demonstrating the growing stature of him as a researcher. In 1855 he returned to his research student, he would be free, apart from some tutored duties and examining, to pursue scientific interests in his own free time. [50] The nature and perception of color was such he started at the University of Edinburgh, while he was a forbes student. [51] With colored spinning peaks invented by Forbes, Maxwell could That while light would be from a mixture of red, green and blue light. [51] His document "color experiments" arranged the principles of the color scheme and was presented at the Royal Society of Edinburgh in March 1855. [52] Maxwell was this time to deliver it himself. [52] Maxwell was committed another Trinity October 10, 1855, before the rule, [52] and was asked to prepare lessons of hydrostatic and optical and fix examination documents [53]. The following February he was urged by Forbes to request the new vacant chair of Natural Philosophy at Marischal College, Aberdeen. [54] [55] Father he was assisted in the task of preparing the necessary references, but died on April 2 to Glenlair before knowing the result of Maxwell's application. [55] He has accepted a professorship at Aberdeen, leaving Cambridge in November of 1856. [53] Marischal College, Aberdeen, 1856-1860 Maxwell has shown that Saturn's rings were made of numerous small particles. The 25 year-old Maxwell was a good month for 15 years than any other scientist of Marischal. He is busy with his new responsibilities as head of a department, designing the program and preparing lessons. [56] It is committed to keep the 15 hours a week, including a weekly class pro bono work for the college of local workers. [56] He lived in Aberdeen with his cousin William Dyce Cay, a Scottish civil engineer, during the six months of the academic year and spent summers in Glenlair, which he had inherited from his father. [14] James Clark Maxwell and his wife Jemima Blackburn. He focused his attention on him, a problem that had eluded scientists for 200 years: the nature of Saturn's rings. He was unknown how could remain stable without breaking adrift or crashing into Saturn. [57] The issue has been taken on a special significance at that time because © St John's College, Cambridge had chosen as the topic for the 1857 Adams Prize [58] Maxwell has devoted two years to study the problem, showing that a normal solid ring could not be stable, while a fluid ring would be forced to break by the action wavy in Blobs. Since neither of them was observed, he concluded that the rings must consist of many small particles that he called "brick-bats", independently in each orbiting Saturn. [58] Maxwell has a great deal, and everyone has some. But there are vast and important traits in the stability of the movement of the rings of Saturn"; [59] He was the only competitor to have made enough progress enough to send an entry. [60] The work of him he's been so detailed and compelling that when George Biddell Airy read it commented "It's one of the most remarkable applications of mathematics to physics that he's ever seen." [11] It was considered the final result of the issue until Direct Direct Observations of the Voyager flyby of the 80 confirmed the prediction of Maxwell that the rings were composed of particles. [61] It is now understood, however, that the particles of the rings are not stable, are extracted by gravity on Saturn. The rings should disappear entirely in the next 300 million years. [62] In 1857 Maxwell has made friends with the Reverend Daniel Dewar, who was then the principal of Marischal. [63] Through him Maxwell incontrÂ² Dewar's daughter, Katherine Mary Dewar. They were engaged in February 1858 and were married in Aberdeen on 2 June 1858. The marriage records, Maxwell is listed as a professor of natural philosophy at Marischal College, Aberdeen. [64] Katherine had seven years of Maxwell's Senior. Comparatively little is known of her, although it is known that she helped the lab with her and worked with experiments in viscosity. [65] The biographer and friend of Maxwell, Lewis Campbell, has adopted an unusual reticence on the subject of Katherine, though describing their married life as "one of exemplary" devotion. [66] In 1860 Marischal College is merged with the nearby King's College to form the University of Aberdeen. There was no room for two professors of natural philosophy, and Maxwell, His scientific reputation found released. He has not been successful in applying the recently released chair of Forbes in Edinburgh, the post instead to attempt. Maxwell was granted the natural philosophy chair at King's College, in London instead. [67] After recovery from an almost fatal fatal of smallpox in 1860, he has moved to London with his wife. [68] King's College, London, 1860 â ¬ "1865 Commemoration of the Maxwell equations at King's College. One of the three identical IDEEE milestone plaques, others are at the birthplace of Maxwell in Edinburgh and the family home of Glenlair. [69] the Maxwell time at King's was probably the most productive of his career. He was awarded the Rumford Medal of the Royal Society in 1860 for his work in color and was subsequently elected to the company in 1861. [70] This period of his life would see the first photograph to show the world light color, will develop further his work on the picture of the displace and propose a physical amount of definition system "now known as dimensional analysis. Maxwell frequentderebbe often lectures at the Royal Institution, where he went into regular contact with Michael Faraday. The relationship between the two men can not be described as being close, because © Faraday was 40 years of Maxwell's Senior and showed signs of senility. However, they maintained a strong respect for the talents of others. [71] Blue Plate, 16 Gardens of the Palace Terrace, Kensington, Maxwell House, 1860 â ¬ "This time in 1865 is particularly noteworthy for the progress made in Maxwell fields of electricity and magnetism. EsaminÂ² the nature of the fields electric and magnetic card into two parts in its "on physical lines of force", which was published in 1861. in it has provided a conceptual model for electromagnetic induction, it consists of tiny cells rotatable magnetic flux. Other two sides have been subsequently added and published in the same paper at the beginning of 1862. in the first additional part has discussed the nature of electrostatics and the displacement current. in the second additional part, took care of the rotation of the plane of polarization of light in a magnetic field, a phenomenon that had been discovered by Faraday and is now known as Faraday effect. [72] Subsequent years, 1865-1879 the plaque in Parton Kirk (Galloway) James Cle rk Maxwell, his parents and his wife This stone memorial to James Clerk Maxwell stands on a green in front of the church, next to the War Memorial in Parton (Galloway). in 1865 Maxwell has resigned his chair at King's College, London, and moved back to Glenlair with Katherine. In his book "on governors" document he mathematically describes the behavior of governors, devices that control the speed of steam engines, so establishing the theoretical basis of control engineering. [73] In his him "document on a reciprocal figures, frames and diagrams of the forces" (1870) he has discussed the rigidity of various pattern designs. [74] [75] he has written the theory of heat textbooks (1871) and the treatment and movement of the Treaty (1876). Maxwell was also the first to make explicit use of dimensional analysis, in 1871. [76] In 1871 he went back to Cambridge to become the first Professor of Physics Cavendish. [77] Maxwell was put in charge of the development of the Cavendish Laboratory, overseeing every step in the progress of the building and purchase of the collection apparatus. [78] One of the last great contributions to science Maxwell was editing (with copious original notes) Search Henry Cavendish, from which it has appeared that Cavendish has sought, among other things, questions such as the density of land and composition of water. [79] he's been elected as a member of the James Philosophical Society in 1876. [80] In March 1879 Maxwell sent an important letter to the astronomer David Todd. [81] In April 1879 Maxwell started to have difficulty in swallowing, the first symptom of the final disease of him. [82] Maxwell died in Cambridge of abdominal cancer on 5 November 1879 at the age of 48 years. [24] mother he had died at the same age the same type of [83] The minister who visited him regularly in his last weeks was amazed to his lucidity and to the immense power and scope of his memory, but comments most particularly, ... his disease has drawn all his heart and The soul and spirit spirit Man: his firm and unwavering faith in the incarnation and all his results; in full sufficiency of the Atonement; By the Holy Spirit. He had measured and scanned all the schemes and systems of philosophy, and had found them absolutely empty and unsatisfyingÂ ¢ "Impressible" was the word of him on Thema and turned with a simple faith of the Gospel of the Savior. As Maxwell's death approached a collapse of Cambridge, [44] I thought how very gently he was always addressed. I've never had a violent boost for life. The only desire I can have is like David to serve my generation, by God's will, and then fall asleep. Maxwell is buried in Parton Kirk, near Castle Douglas in Galloway near where he grew up. [84] The extended biography of the life of James Clerk Maxwell, from his former schoolmate and friend of a lifetime Professor Lewis Campbell, was published in 1882. [85] [86] his works collected were issued in Two volumes from Cambridge University Press in 1890. [87] Maxwell's legacy performers were his doctor George Edward Paget, GG Stokes, and Colin Mackenzie, which was Maxwell's cousin. Overload of work, Stokes passed Maxwell's cards at William Garnett, which made the custody of documents up to about 1884 effectively. [88] There is a commemorative inscription to him near the Westminster choir screen. [89] James Clerk Maxwell Jemima Blackburn. Personal life as a great lover of Scottish poetry, Maxwell stored poems and wrote about him. [90] The most well-known is rigid body Sings, in close contact on the basis of "Comin 'Through the Rye" by Robert Burns, which apparently sang accompanied by guitar. He has the opening lines [91] Gin a body meet a Flyin body through the air. Gin A body hit a body, will be flying? And where? A collection of poems of him was published by a friend Lewis Campbell in 1882. [92] The descriptions of Maxwell observation on his considerable intellectual qualities of being accompanied by social discomfort. [93] Maxwell was an evangelical presbyterian and in his later years he became this conversion can have aligned it with a quotcore position. [97] Scientific Inheritance Advices Main Electromagnetism:. Maxwell's equations and electromagnetism A postcard from Maxwell to Peter Tait Maxwell had studied and commented on electricity and magnetism already in 1855, when his paper "with Faraday's strength lines" was read at Cambridge Philosophical Society [99] The document presented a simplified model of the work of Faraday and how electricity and magnetism are related. He reduced all the current knowledge in a concatenated series of differential equations with 20 equations in 20 variables. This work has subsequently been published as "on the lines of physical strength" March 1861. [100] around 1862, while issues at the college of the king, Maxwell calculated that the propagation speed of an electromagnetic field is approximately that of speed of the light. It is considered that this is more than a coincidence, commenting, "we can hardly avoid the conclusion that the light consists of the transversal undulations of the same ground which is the cause of electrical and magnetic phenomena. [1] Work on the further problem, Maxwell showed that equations provide for the existence of waves of oscillating electric and magnetic fields traveling through empty space to a speed It could be provided by simple electrical experiments, using the data available at the moment, Maxwell obtained a speed of 310.740,000 meters per second (1,0195Â ¢ 109a ft / s). [101] In his 1864 article "a dynamic theory of the electromagnetic field", Maxwell wrote, "the agreement of the It seems to show that light and magnetism are affected by the same substance, and that light is an electromagnetic disorder propagated through the field according to electromagnetic laws ". [4] Its famous twenty equations, in their modern form of four partial differential equations, first appeared fully developed in his textbook treated of electricity and magnetism in 1873. [102] Most of this work was made by Maxwell to Glenlair in the period between holding his place in London and his Take the Cavendish chair. [1] Oliver Heaviside has reduced the complexity of Maxwell's theory up to four differential equations, [103] now collectively known as Maxwell's laws or Maxwell's equations. Although potentials have become much less popular in the nineteenth anniversary. century, [104] The use of scalar and vector potential is now standard. In the solution of the Maxwell equations [105] such as Barrett and Gr IMES (1995) discusses Electromagnetism in quaternion algebra and made th and electromagnetic potential the fulcrum of Him's theory. In 1881 Heaviside replaced the electromagnetic potential field with the fields of force as the fulcrum of electromagnetic theory. According to Heaviside, the electromagnetic potential field was arbitrary and necessary to be "murdered". (Sic) A few years later there was a debate between Heaviside and [Peter Guthrie] Tate (sic) on the merits relative to vector analysis and quaternions. The result was the awareness that there was no need for more physical information provided by quaternions if theory was purely local and the vector analysis has become common. Maxwell has been shown correct, and its quantitative connection between light and electromagnetism is considered one of the great successes of the 19th century mathematical physics. [107] Maxwell also introduced the concept of the electromagnetic field compared to force the described Faraday lines. [108] Including the propagation of electromagnetism as a field issued by active particles, Maxwell could advance his work on light. At that time, Maxwell believed that the propagation of light requires a support for waves, nicknamed the ether luminifer, [108] Over time, the existence of such a means, permeating all the space and yet apparently not detectable from mechanical means, demonstrated impossible to reconcile with experiments such as Michelson - Morley Experiment. [109] Furthermore, he seemed to request an absolute reference system in which the equations were valid, with the unpleasant result that the equations changed module for a moving observer. These difficulties have inspired Albert Einstein to formulate the theory of special relativity; In the Einstein process dispensed with the requirement of a fixed luminaire ether. [110] Color Vision First color photographic image of long life, demonstrated by Maxwell at a conference 1861 along with most of the physicists of time, Maxwell had a strong interest in psychology. Following the steps of Isaac Newton and Thomas Young, he was particularly interested in studying the color vision. From 1855 to 1872, Maxwell published at intervals a series of investigations concerning the perception of color, color-cecitis and color theory, and received the Rumford medal for "on the theory of color vision". [111] Isaac Newton had demonstrated, using prisms, that white light, like sunlight, is composed of a number of monochrome components that could then be recombined in white light. [112] Newton also showed that an orange paint made of yellow and red might seem exactly like a monochrome orange light, although it is composed of two monochrome and red yellow lights. From here the paradox that displessed physicals of the Two complex lights composed of more than a monochrome light) may seem equal but to be physically different, called metanates. Thomas Young later proposed that this paradox could be explained by perceiving colors through a limited number of channels channels The eyes, which proposed to be triple, [113] Trichromatic color theory. Maxwell used the recently developed linear algebra to demonstrate the theory of young people. Any monochrome light stimulating three receptors should be equally stimulated by a set of three different monochrome lights (in fact, from any set of three different lights). He has shown that to be the case, [114] inventing color correspondence experiments and colorimetry. Maxwell was also interested in applying his color perception theory, ie in a color photograph. Steming directly from his psychological work on the perception of color: if a sum of three lights could reproduce any perceptible color, color photographs would be produced with a set of three colored filters. During his card from 1855, Maxwell proposed that, if three black and white photographs of a scene were taken through the red, green and blue filters and the transparent prints of the images were projected on a screen using three projectors equipped with similar filters, when overlapping on the screen the result would be perceived by the human eye as a complete reproduction of all colors in the scene. [115] During a real 1861 institution session on the color theory, Maxwell presented the first demonstration of the world of color photography from this principle of analysis and three-color synthesis. Thomas Sutton, inventor of the Single Lens Reflex Camera, took the picture. He photographed a tartan ribbon three times, through red, green and blue filters, also making a fourth photograph through a yellow filter, which, according to Maxwell's account, was not used in the demonstration. As Sutton's photo dishes were insensitive to red and barely sensitive to greenery, the results of this pioneering experiment were far from perfect. It has been observed in the published account of the conference that "if the red and green images had been completely photographed like blue," would have been a truly colored image of the Riband. Finding more sensitive photographic materials in lesserifiable rays, the representation of the Object colors could be greatly improved. "[70] [116] [117] Researchers in 1961 concluded that the seemingly impossible partial success of red filtered exposure was due to ultraviolet light, which is strongly reflected by some red dyes , not entirely blocked by the red filter used and within the range of sensitivity of the damp trial process employed. [118] Kinetic theory and thermodynamics Demon Maxwell, a thought experiment in which the entropy decreases the kinetic gas theory. Originally from Daniel Bernoulli, this theory has been advanced by the successive labors of John Herapath, John James Waterton, James Joule, and in particular Rudolf Clausius, to do to put his general precision beyond a doubt: But he received a huge development from Maxwell, who in this field appeared as an experimenter (on the laws of gaseous friction), as well as a mathematician. [119] Between 1859 and 1866, he developed the theory of speed distributions in gas particles, works subsequently generalized by Ludwig Boltzmann. [120] [121] The formula, called Maxwell - distribution of Boltzmann, gives the fraction of gas molecules that move to a speed specified at any temperature. In kinetic theory, temperatures and heat only involve molecular movement. This approach generalized the laws of the thermodynamics previously established and explained existing observations and experiments in a better way than it was previously reached. The work of him on the He led him to devise the experiment of the thought that was known as the Demon of Maxwell, where the second law of thermodynamics is violated by an imaginary being able to order particles for energy. [122] In 1871, he established Maxwell's thermodynamic relations, which are equality of equality between the second second of potential thermodynamics compared to different thermodynamic variables. In 1874, a thermodynamic display plaster was built as a way of exploring phase transitions, based on the American thermodynamic scientist graphics cards by Josiah Willard Gibbs. [123] [124] Theory control Main article: Maxwell's theory control has published the document "on governors" in the acts of the Royal Society, vol. 16 (1867Â ¢ 1868). [125] This document is considered a central document on the regulator or centrifugal regulator used to regulate steam engines. Main legacy article: List of things taking the name of James Clerk Maxwell The James Clerk Maxwell Monument to Edinburgh, opposite, from Alexander Stoddart. Commissioned by the Royal Society of Edinburgh; Opened in 2008. 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