PHILOSOPHY OF SCIENCE OF A.S. EDDINGTON. pdf

1: Arthur Eddington - Wikipedia

En , l' Academie Internationale de Philosophie des Sciences couronnait, a Bruxeiles, 1'etude de M. Yolton, intitulee The PhiÂ- losophy o/Science 0/ Arthur S. Eddington, etude dont le present ouvrage est la reprise.

He died in the typhoid epidemic which swept England in His mother was left to bring up her two children with relatively little income. The family moved to Weston-super-Mare where at first Stanley as his mother and sister always called Eddington was educated at home before spending three years at a preparatory school. In Eddington entered Brynmelyn School. He proved to be a most capable scholar, particularly in mathematics and English literature. His performance earned him a scholarship to Owens College, Manchester what was later to become the University of Manchester in , which he was able to attend, having turned 16 that year. He spent the first year in a general course, but turned to physics for the next three years. Eddington was greatly influenced by his physics and mathematics teachers, Arthur Schuster and Horace Lamb. At Manchester, Eddington lived at Dalton Hall, where he came under the lasting influence of the Quaker mathematician J. His progress was rapid, winning him several scholarships and he graduated with a B. Based on his performance at Owens College, he was awarded a scholarship to Trinity College, Cambridge in His tutor at Cambridge was Robert Alfred Herman and in Eddington became the first ever second-year student to be placed as Senior Wrangler. After receiving his M. This did not go well, and meanwhile he spent time teaching mathematics to first year engineering students. This hiatus was brief. Through a recommendation by E. Whittaker , his senior colleague at Trinity College, he secured a position at the Royal Observatory in Greenwich where he was to embark on his career in astronomy, a career whose seeds had been sown even as a young child when he would often "try to count the stars". He left Cambridge for Greenwich the following month. He was put to work on a detailed analysis of the parallax of Eros on photographic plates that had started in The prize won him a Fellowship of Trinity College, Cambridge. Later that year, Robert Ball , holder of the theoretical Lowndean chair also died, and Eddington was named the director of the entire Cambridge Observatory the next year. In May he was elected a Fellow of the Royal Society: He began this in with investigations of possible physical explanations for Cepheid variable stars. He developed his model despite knowingly lacking firm foundations for understanding opacity and energy generation in the stellar interior. However, his results allowed for calculation of temperature, density and pressure at all points inside a star, and Eddington argued that his theory was so useful for further astrophysical investigation that it should be retained despite not being based on completely accepted physics. James Jeans contributed the important suggestion that stellar matter would certainly be ionized , but that was the end of any collaboration between the pair, who became famous for their lively debates. Eddington defended his method by pointing to the utility of his results, particularly his important mass-luminosity relation. This had the unexpected result of showing that virtually all stars, including giants and dwarfs, behaved as ideal gases. In the process of developing his stellar models, he sought to overturn current thinking about the sources of stellar energy. Jeans and others defended the Kelvinâ€"Helmholtz mechanism , which was based on classical mechanics, while Eddington speculated broadly about the qualitative and quantitative consequences of possible proton-electron annihilation and nuclear fusion processes. Around , he anticipated the discovery and mechanism of nuclear fusion processes in stars, in his paper The Internal Constitution of the Stars. This was a particularly remarkable development since at that time fusion and thermonuclear energy, and even that stars are largely composed of hydrogen see metallicity , had not yet been discovered. But observations of Cepheid variable stars showed this was not happening. The only other known plausible source of energy was conversion of matter to energy; Einstein had shown some years earlier that a small amount of matter was equivalent to a large amount of energy. Francis Aston had also recently shown that the mass of a helium atom was about 0. All of these speculations were proven correct in the following decades. With these assumptions, he demonstrated that the interior temperature of stars must be millions of degrees. In , he discovered the mass-luminosity relation for stars see Lecchini in External links and references. An important topic was the extension of his models to take advantage of developments in quantum physics , including the use of degeneracy physics in describing dwarf stars. Dispute with Chandrasekhar on existence of black holes[edit] The topic of extension of his models precipitated his famous dispute with Subrahmanyan Chandrasekhar , who was then a student at Cambridge. History clearly proved Eddington wrong, but his motivation remains a matter of some controversy. Eddington was fortunate in being not only one of the few astronomers with the mathematical skills to understand general relativity, but owing to his internationalist and pacifist views inspired by his Quaker religious beliefs, [6] [9] one of the few at the time who was still interested in pursuing a theory developed by a German physicist. He quickly became the chief supporter and expositor of relativity in Britain. In , this was appealed against by the Ministry of National Service. Before the appeal tribunal in June, Eddington claimed conscientious objector status, which was not recognized and would have ended his exemption in August A further two hearings took place in June and July, respectively. During the eclipse, he took pictures of the stars several stars in the Hyades cluster include Kappa Tauri of the constellation Taurus in the region around the Sun. Eddington showed that Newtonian gravitation could be interpreted to predict half the shift predicted by Einstein. The news was reported in newspapers all over the world as a major story. Afterward, Eddington embarked on a campaign to popularize relativity and the expedition as landmarks both in scientific development and international scientific relations. The rejection of the results from the Brazil expedition was due to a defect in the telescopes used which, again, was completely accepted and well understood by contemporary astronomers. He collected many of these into the Mathematical Theory of Relativity in , which Albert Einstein suggested was "the finest presentation of the subject in any language. When Eddington refrained from replying, he insisted Arthur not be "so shy", whereupon Eddington replied, "Oh, no! I was wondering who the third one might be! In The Mathematical Theory of Relativity, Eddington interpreted the cosmological constant to mean that the universe is "self-gauging". Fundamental theory and the Eddington number[edit] During the s until his death, Eddington increasingly concentrated on what he called "fundamental theory" which was intended to be a unification of quantum theory , relativity , cosmology, and gravitation. At first he progressed along "traditional" lines, but turned increasingly to an almost numerological analysis of the dimensionless ratios of fundamental constants. His basic approach was to combine several fundamental constants in order to produce a dimensionless number. In many cases these would result in numbers close to , its square, or its square root. He was convinced that the mass of the proton and the charge of the electron were a natural and complete specification for constructing a Universe and that their values were not accidental. One of the discoverers of quantum mechanics, Paul Dirac , also pursued this line of investigation, which has become known as the Dirac large numbers hypothesis , and some scientists even today believe it has something to it. Wags at the time started calling him "Arthur Adding-one". These in effect incorporated spacetime into a higher-dimensional structure. While his theory has long been neglected by the general physics community, similar algebraic notions underlie many modern attempts at a grand unified theory. He did not complete this line of research before his death in ; his book Fundamental Theory was published posthumously in The Eddington number in the context of cycling is defined as the maximum number E such that the cyclist has cycled E miles on E days. Achieving a high Eddington number is difficult since moving from, say, 70 to 75 will probably require more than five new long distance rides since any rides shorter than 75 miles will no longer be included in the reckoning. The Eddington Number for cycling has units indeed applying it to any physical property will result in E having units. For example, an E of 62 miles means a cyclist has covered 62 or more miles on 62 or more days. Thus the order of bicyclists may change depending on units used. However, the latter may be a regular on a distance like this and get a km-Eddington of 80, while the former only had those 60 days riding, and thus stays at a km-Eddington of

2: Practical Mystic: Religion, Science, and A. S. Eddington, Stanley

The Philosophy of Science of Arthur Eddington Background: This page was written from the point of view of Wittgenstein's logic of language and may not be understood without first understanding that logic.

See Article History Alternative Title: Sir Arthur Stanley Eddington Arthur Eddington, in full Sir Arthur Stanley Eddington, born December 28, , Kendal , Westmorland , Englandâ€"died November 22, , Cambridge , Cambridgeshire , English astronomer, physicist, and mathematician who did his greatest work in astrophysics, investigating the motion, internal structure, and evolution of stars. He also was the first expositor of the theory of relativity in the English language. Early life Eddington was the son of the headmaster of Stramongate School, an old Quaker foundation in Kendal near Lake Windermere in the northwest of England. His father, a gifted and highly educated man, died of typhoid in The widow took her daughter and small son to Weston-super-Mare in Somerset, where young Eddington grew up and received his schooling. In he received the Plumian Professorship of Astronomy at Cambridge and in became also the director of its observatory. From to Eddington was chief assistant at the Royal Observatory at Greenwich, where he gained practical experience in the use of astronomical instruments. He made observations on the island of Malta to establish its longitude, led an eclipse expedition to Brazil , and investigated the distribution and motions of the stars. He broke new ground with a paper on the dynamics of a globular stellar system. In Stellar Movements and the Structure of the Universe he summarized his mathematically elegant investigations of the motions of stars in the Milky Way. During World War I he declared himself a pacifist. This arose out of his strongly held Quaker beliefs. His religious faith also found expression in his popular writings on the philosophy of science. He expressed this belief in other philosophical books: During these years he carried on important studies in astrophysics and relativity , in addition to teaching and lecturing. During the total eclipse of the sun, it was found that the positions of stars seen just beyond the eclipsed solar disk were, as the general theory of relativity had predicted, slightly displaced away from the centre of the solar disk. Eddington was the first expositor of relativity in the English language. His Report on the Relativity Theory of Gravitation , written for the Physical Society, followed by Space, Time and Gravitation and his great treatise The Mathematical Theory of Relativity â€"the latter considered by Einstein the finest presentation of the subject in any languageâ€"made Eddington a leader in the field of relativity physics. His own contribution was chiefly a brilliant modification of affine non-Euclidean geometry, leading to a geometry of the cosmos. Another book, Relativity Theory of Protons and Electrons , dealt with quantum theory. He gave many popular lectures on relativity, leading the English physicist Sir Joseph John Thomson to remark that Eddington had persuaded multitudes of people that they understood what relativity meant. Philosophy of science His philosophical ideas led him to believe that through a unification of quantum theory and general relativity it would be possible to calculate the values of universal constants, notably the fine-structure constant, the ratio of the mass of the proton to that of the electron , and the number of atoms in the universe. This was an attempt, never completed, at a vast synthesis of the known facts of the physical universe; it was published posthumously as Fundamental Theory , edited by Sir Edmund Taylor Whittaker , a book that is incomprehensible to most readers and perplexing in many places to all, but which represents a continuing challenge to some. Eddington received many honours, including honorary degrees from 13 universities. He was knighted in and received the Order of Merit in Meetings of the Royal Astronomical Society were often enlivened by dramatic clashes between Eddington and Sir James Hopwood Jeans or Edward Arthur Milne over the validity of scientific assumptions and mathematical procedures. Eddington was an enthusiastic participant in most forms of athletics, confining himself in later years to cycling , swimming, and golf. His work in astrophysics is represented by the classic Internal Constitution of the Stars and in the public lectures published as Stars and Atoms He believed that a great part of physics simply reflected the interpretation that the scientist imposes on his data. His theoretical work in physics had a stimulating effect on the thought and research of others, and many lines of scientific investigation were opened as a result of his work.

PHILOSOPHY OF SCIENCE OF A.S. EDDINGTON. pdf

3: F Gonseth (Editor of The Philosophy of Science of A. S. Eddington)

The Philosophy of Science of Arthur Eddington - Second Page Background: In philosophy we are trying to learn things in logic, ethics and metaphysics, but if our learning is to have a foundation in logic, then it must begin with logic's first principle, namely the distinction between sense and nonsense in language.

References Bergson , Henri. The Ascent of Man. The Common Sense of Science. The Origins of Modern Science The Philosophical Impact of Contemporary Physics. Van Nostrand Reinhold, The Nature of the Physical World. The Philosophy of Physical Science. Einstein, Albert, and Leopold Infeld. The Evolution of Physics: The Human Side of Mathematics. The Revolution in Modern Science. History and Philosophy of Science: Some Problems of Philosophy. Jeans , Sir James. The Growth of Physical Science. The New Background of Science. Letters of James Joyce. II and III, ed. Kuhn , Thomas S. Black-Body Theory and the Quantum Discontinuity Planetary Astronomy in the Development of Western Thought. The Structure of Scientific Revolutions. U of Chicago P, Time and Western Man. Newton , Sir Isaac. Mathematical Principles of Natural Philosophy. U of California P, Pagels , Heintz R. Quantum Physics as the Language of Nature. Three Lectures of the Metaphysical Implications of Science. Whitehead , Alfred North. The Concept of Nature. Science and the Modern World.

4: The Philosophy of Physical Science: Tarner Lectures by Arthur Stanley Eddington

The Philosophy of Science of A. S. Eddington - Kindle edition by John W. Yolton, F. Gonseth. Download it once and read it on your Kindle device, PC, phones or tablets. Use features like bookmarks, note taking and highlighting while reading The Philosophy of Science of A. S. Eddington.

But it would be out of the question nowadays to define "part" in such a way that electrons are parts of a physical system but positrons are not. And yet, we must admit that there is more to the world than what can be discovered in our sensory apparatus just as there can be other figures in the block of marble. Page , In his chapter "The Concept of Existence", Eddington asks us to consider whether an overdraft in a bank accounts exists or not. Are not overdrafts like a bunghole in a bank account? But what divides the two parties is no more than a question of words. It would be absurd to divide mankind into two sects, the one believing in the existence of overdrafts and the other denying their existence. The division is a question of classification, not of belief. For example, do chairs exist? Some philosophers claim that when we give a scientific description of a chair, we are not describing the object in everyday life we call a chair. This is the point when Eddington ask the question, "Are we really expected to take this sitting down? I cannot use "I" to refer to you, only to myself. The "I" is the concept of the "I Am" encountered by Moses in a time when the idea of an individual consciousness of self was so new that only a few courageous souls would even discuss it publicly and then only in the act of attributing it to God. Distinguishing it as I2, I2 is what is left if you imagine me without any of the feelings, thoughts, etc. These inventoried contents can be varied without modifying the essential "I" associated with them. But that is like arguing that the essential qualities of glue are best displayed when it does not contaminate itself by sticking to anything. To obtain the I2, of which we are aware in self-consciousness, thoughts and feelings must be abstracted, not eliminated. The unity of consciousness is manifest because there are parts for it to unite. In what Benjamin Lee Whorf called the Standard Average European language which epitomizes most languages of the Western civilization outside of various native languages the world is chopped up or analyzed grammatically into process and content, action and passivity, verbs and nouns. In this next passage Eddington talks of a paucity of verbs and demonstrates it with verbs for manipulating numbers. First have the child share with another child so each has the same amount. Then share with two other children. By starting with division concepts first, division will be easiest of the four processes of instead of the hardest when it is taught last in the usual pedagogical approach of teaching arithmetic in this order: Who among you had the least problem with division out of the four arithmetic operations? Who found long division fun? The paucity of verb forms is familiar to mathematicians as a difficulty of ordinary speech easily surmounted in their own symbolic language. Thus it is possible to speak of duplicating, triplicating, sesquiduplicating, etc. Then perhaps it will be said "It is clear that whenever anything is multiplied it must be multiplied by something, and this something, e. The argument would not have arisen if we had stuck to the terms duplicating, triplicating, etc.: Children are not ready to deal with the abstract concepts such as "independent entity" and no amount of repetition will help them to comprehend it, only the wisdom of years will manage the feat, and by then those taught too early using abstract entities will hate arithmetic, algebra, and all forms of mathematics. They will join in unison with Kathleen Turner in "Peggy Sue Got Married" when she goes back in time 30 years to high school and tells her math teacher, "I assure you that I will never use algebra as an adult! He says that physics has no laws which apply to the underlying reality, the objective content of the world. This thought should sober up any physicists or other scientists who are deeply intoxicated with the intricacies and beauty of their fields of endeavor. Every word has two types of meanings: It even happens v. See its explanation here:

5: Arthur Eddington | British scientist | www.enganchecubano.com

Get this from a library! The philosophy of science of A.S. Eddington.. [John W Yolton] -- Presents the National Severe Storms Laboratory (NSSL) in Norman, Oklahoma, an environmental research laboratory of the U.S. National Oceanic and Atmospheric Administration (NOAA).

Kendal, England, 28 December ; d. Cambridge, England, 22 November astronomy, relativity. Eddington was the son of a Somerset Quaker, Arthur Henry Eddington, headmaster of Stramongate School in Kendal from until his death in , and of Sarah Ann Shout, whose forebears for seven generations had been north-country Quakers. Following the death of her husband, Mrs. Eddington took Arthur Stanley, not yet two, and her daughter Winifred, age six, back to Somerset, where they made their home at Weston-super-Mare. In the atmosphere of this quiet Quaker home, the boy grew up. He remained a Quaker throughout his life. Brynmelyn School, to which he went as a day boy, had three exceptionally gifted teachers who imparted to him a keen interest in natural history, a love of good literature, and a splendid foundation in mathematics. Reserved and studious by nature, Eddington was also physically active, playing on the first eleven at both cricket and football and enjoying long bicycle rides through the Mendip Hills. In the autumn of , with an entrance scholarship, Eddington went into residence at Trinity College, Cambridge. After two years of intensive concentration on mathematics under the guidance of the distinguished coach R. Herman, who stressed both the logic and the elegance of mathematical reasoning, Eddington sat the fourteen papers of the tripos examinations in He won the coveted position of first wrangler, the first time that a second-year man had attained this distinction. In he gained his degree and proceeded to coach pupils in applied mathematics and to lecture in trigonometry during the following term. In February Eddington took an appointment as chief assistant at the Royal Observatory, Greenwich, where he remained until Here he obtained thorough training in practical astronomy and began the pioneer theoretical investigations that placed him in the forefront of astronomical research in a very few years. Besides his participation in the regular observing programs, Eddington had two special assignments: Two further tests of his ability as a practical astronomer came after his return to Cambridge as Plumian professor of astronomy and director of the observatory. During the war years Eddington completed single-handed the transit observations for the zodiacal catalog. In he organized the two eclipse expeditions that provided the first confirmation of the Einstein relativity formula for the deflection of light in a gravitational field. During these years Eddington was elected to fellowships in the Royal Astronomical Society and the Royal Society He was knighted in , and his greatest honor, the Order of Merit, was conferred on him eight years later. Eddington was president of the Royal Astronomical Society from to and of the Physical Society and the Mathematical Association from to In he became president of the International Astronomical Union. After his appointment in to the Plumian professorship in Cambridge, he moved into Observatory House as director of the observatory and brought his mother and sister to live with him. Here he remained until the autumn of , when he underwent a major operation from which he did not recover. Eddington will always be our incomparable pioneer. It is important to remember how rudimentary was much of our knowledge of astrophysics and of stellar movements at the beginning of this century. Proper motion or transverse motion had been known since the time of Halley and radial velocity since Doppler, but the assumption of William Herschel of random motion of the stars relative to the sun had been abandoned of necessity by Kapteyn in Schwarzschild attempted to show that the radial velocity vectors could be represented as forming an ellipsoid. He chose to work with proper motions and isolated two star streams or drifts. In he compared the two theories thus: The apparent antagonism between the two-drift and the ellipsoidal hypotheses disappears if we remember that the purpose of both is descriptive. Whilst the twodrift theory has often been preferred in the ordinary proper motion investigations on account of an additional constant in the formulae which gives it a somewhat greater flexibility, the ellipsoidal theory has been found more suitable for discussions of radial velocities and the dynamical theory of the stellar system [Monthly Notices of the Royal Astronomical Society, 77 ,]. He went on to other problems, such as the distribution of stars of different spectral classes, planetary nebulae, open clusters, gaseous nebulae, and the dynamics of globular clusters. In his first book, Stellar Movements and the Structure of the Universe , Eddington brought together all the material of some fifteen papers, most of which had been published in the Monthly Notices of the Royal Astronomical Society between and The cosmological knowledge of the period was summarized and the most challenging problems were delineated, and he clearly declared his preference for the speculation that the spiral nebulae were other galaxies beyond our Milky Way , which was itself a spiral galaxy. His first problem was radiation pressure, the importance of which had been pointed out a decade earlier by R. A theory of the radiative equilibrium of the outer atmosphere of a star was subsequently developed by Schwarzschild in Germany. Eddington delved deeper, in fact to the very center of a star, showing that the equation of equilibrium must take account of three forcesâ€" gravitation, gas pressure, and radiation pressure. Replacing the assumption of convective equilibrium of Lane, Ritter, and Emden with radiative equilibrium, he developed the equation that is still in general use. Not until did he realize that this assumption and, therefore, this model were also applicable to dwarf stars. That matter under stellar conditions would be highly ionized had been recognized by several astronomers, but it was Eddington who first incorporated this into the theory of stellar equilibrium by showing that high ionization of a gas reduced the average molecular weight almost to 2 for all elements except hydrogen. To obtain a theoretical relation between mass and luminosity of a star, some assumption was necessary about internal opacity. Since the observational data for dwarf stars, as well as for giant stars, closely fitted the theoretical curve, he announced that dwarfs also must be regarded as gaseous throughout, in spite of their densities exceeding unity. He realized that the effective volume of a highly or fully ionized atom is very small, and hence deviations from perfect gas behavior will occur only in stars of relatively high densities. The mass-luminosity relation has been widely used and is still of immense value, although its applicability has been somewhat limited in recent years by the more detailed classification of both giants and dwarfs and by the recognition of the distinctive characteristics, for example, of subdwarfs, which do not conform to the mass-luminosity relation. Eddington had calculated the diameters of several giant red stars as early as the summer of He therefore wrote W. Adams, asking him to measure the red shift in the Mount Wilson spectra of Sirius B, since, if a density of 50, or more did exist, then a measurable Einstein relativity shift to the red would result. Adams hastened to comply, and wrote Eddington that the measured shifts closely confirmed the calculated shift and, hence, confirmed both the third test of relativity theory and the immense densities that Eddington had calculated. This exchange of historic letters in and is recorded in Arthur Stanley Eddington, pp. A direct consequence of this work was the challenge it presented to physicists, a challenge taken up in by R. Except in the rare case of a nova or supernova that hurls out much of its matter, the loss of mass by a star is due to radiation. For a massive O or B class star to radiate itself down to a white dwarf , at least a trillion years would be required. This brought into the limelight the theory of conversion of matter into radiation by annihilation of electrons and protons, a hypothesis that appears to have been first suggested by Eddington in For seven years, in spite of severe criticism in Great Britain , he defended the general idea that the chief source of stellar energy must be subatomic. After many astronomers and physicists turned their attention to this. In , after the discovery of the positron, Eddington urged abandonment of the electron-proton annihilation theory, on the ground that electron-positron annihilation was not only a more logical supposition but also an observed fact. In came the famous carbon-nitrogen-oxygen- carbon cycle of Hans Bethe, elegantly solving some of the problems of stellar energy and invoking the electronpositron annihilation hypothesis. In Eddington published his great compendium, The Internal Constitution of the Stars reprinted in In and he had published papers on the mathematical theory of pulsating stars, explaining many observed features of Cepheid variables but not the phase relation. He returned to this problem in , when more was known about the convective layer and he could apply the physics of ionization equilibrium within this layer with encouraging results. Eddington developed a theory of the absorption lines in stellar atmospheres, extending earlier work of Schuster and Schwarzschild. This made possible the interpretation of many observed line intensities. Another line of adventurous thinking concerned the existence, composition, and absorptive and radiative properties of interstellar matter. He calculated the density and temperature and showed that calcium would be doubly ionized, with only about one atom in being singly ionized. He discussed the rough measurement of the distance of a star by the intensity of its interstellar absorption lines, a relation soon confirmed by O. Struve and by J. Plaskett In the field of astrophysics Eddington undoubtedly made his greatestâ€”but by no means his onlyâ€”contributions to knowledge. Here he fashioned powerful mathematical tools and applied them with imagination and consummate skill. But during these same years his mind was active along other lines; thus we have his profound studies on relativity and cosmology, his herculean but unsuccessful efforts to formulate his Fundamental Theory, and his brilliant, provocative attempts to portray the meaning and significance of the latest physical and metaphysical thinking in science. Immediately recognizing its importance and the revolutionary character of its implications, Eddington threw himself into a study of the new mathematics involved, the absolute differential calculus of Ricci and Levi-Civita. He was soon a master of the use of tensors and began developing his own contributions to relativity theory. At the request of the Physical Society of London, he prepared his Report on the Relativity Theory of Gravitation , the first complete account of general relativity in English. He called it a revolution of thought, profoundly affecting astronomy, physics, and philosophy, setting them on a new path from which there could be no turning back. This test was met when the measurements on Sirius B made by W. Eddington published a less technical account of relativity theory, Space, Time and Gravitation, in This book brought to many readers at least some idea of what relativity theory was and where it was leading in cosmological speculation. This fascination with the fundamental constants of natureâ€”the gravitation constant, the velocity of light, the Planck and Rydberg constants, the mass and charge of the electron, for exampleâ€”and the basic problem of atomicity had driven Eddington to seek this bridge between quantum theory and relativity. Having found it, he eventually established relationships between all these and many more constants, showing their values to be logically inevitable. From seven basic constants Eddington derived four pure numbers, including the famous forever associated with his name. This is the fine structure constant. In all, he evaluated some twenty-seven physical constants. As all this work proceeded, Eddington published a succession of books, both technical and nontechnical, dealing with the above problems and also with the new problems that were arising in cosmological theories. He sent a reprint to Eddington only in The Nature of the Physical World and The Expanding Universe deal with the above ideas and his, epistemological interpretation. All these books are rich in literary excellence and in the sparkle of his imagination and humor, as well as being gateways to new ideas and adventures in thinking. His technical book The Relativity Theory of Protons and Electrons , based almost wholly on the spin extension of relativity, spurred Eddington to evolve a statistical extension. The difficulties were immense and, as we now know, the greatest complexities of nuclear physics and subatomic particles were not yet discovered. But he took hurdle after hurdle as he saw them, with daring leaps, always landing, as he believed, surefootedly on the far side, even though he could not demonstrate his trajectories with mathematical rigor. He believed that truth in the spiritual realm must be directly apprehended, not deduced from scientific theories. Cambridge, , published posthumously. Yolton, The Philosophy of Science of A. Eddington The Hague, Vibert Douglas Pick a style below, and copy the text for your bibliography.

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7: The Joyce of Science - References

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