

NOMINATION OF PROF M. W. EVANS

The totality of his research work stretches back to 1971 in an unbroken chain of papers, reviews, books, edited books, essays, broadcasts and postings. There are over twenty five thousand items in all and his work has already received copious recognition by the British Government. The nominator feels that the work should receive recognition at the highest level by academic prizes such as the Nobel Prize. He was nominated for a Civil List Pension in 2004 by the Royal Society of Chemistry. This was awarded by Queen Elizabeth in 2005. He has also been nominated many times, notably for a Nobel Prize and Wolf Prize, and for the Copley, Davy, and Royal Medals of the Royal Society, the Priestley Medal of the American Chemical Society and Dirac Medal of the Institute of Physics. He was awarded arms and raised to the Gentry in 2008 for services to science and voluntary work. He has produced about two thousand scientific papers and books, and contemporary computer based scientometrics {1} show very clearly that the work is making an unprecedented impact. He has probably produced more work (1971 to date) than any single scholar in physics and chemistry, judged by individual scholarly output. In a sense, all his work culminated in ECE unified field theory, inferred in March 2003, and by now well known and greatly developed. It is therefore best, in my own opinion, to describe it in a historical context. The early work was in its time very successful, and ultimately led to the discovery of B(3) at Cornell in November 1991.

Chemical Physics

This early work from 1971 to 1986 is summarized in all detail in the second volume of his autobiography {2} in which every publication of that era is reviewed and put in historical context. Very briefly its main achievements include the first understanding of molecular dynamics in the far infra red, the co pioneering of molecular dynamics computer simulation {3} and its application to the far infra red and a wide range of spectroscopies {4}, the discovery by computer simulation and spectroscopy of many new fundamental types of correlation function, the founding and organization of the European Molecular Liquids Group, the co pioneering of the use of array processors with supercomputers at the IBM Kingston Clementi environment in New York State, the co pioneering of computer animation at IBM Kingston and Cornell Theory Center, the application of group theory to statistical mechanics, the development of molecular dynamics computer simulation of condensed matter in the presence of external fields, for example the first simulation of the Langevin functions, discovery by computer simulation of many non linear properties of liquids, the extension of the memory function theory to many areas of physics and chemistry {5}, the development of novel reflection spectroscopies of various kinds, the development of theories of non linear optics, notably the theory of optical NMR at Cornell Theory Center, the theory and computer simulation of non linear optics, notably the inverse Faraday effect, the editing with Kielich of a classic volume on nonlinear optics {6}, the first computer simulations at the University of Zurich and ETH Zurich of many non linear optical effects, discovering many new types of correlation functions associated with non linear optics, and culminating in the discovery of the B(3) field at Cornell Theory Center in November 1991, published in *Physica* in 1992 {7}.

This work received copious recognition, notably a “world record” of about fifteen prestigious post doctoral Fellowships, a D. Sc. Degree at the age of 27 in 1978, the youngest recipient under modern rules, and still a “world record” now, the Royal Society of Chemistry Harrison Memorial Prize (1978), and Meldola Medal (1979), and a nomination for the Marlow Medal (1979 / 1980). Later it was recognized as part of lifetime achievement by a Civil List Pension in 2005 (roughly equivalent to O. M. or C. H.), and a coat of arms and

armorial badge in 2008 upon being raised to the Gentry. The establishment of the European Molecular Liquids Group is marked by two drops of liquid in his armorial badge on www.aias.us. Reference volumes in which he appears include thirty four editions of the world's leading professional reference book: "Marquis Who's Who" in America, the World, Science and Engineering since 1999, and "Burke's Peerage and Gentry" (2012).

Theoretical Physics

The development of his work into theoretical physics followed a letter from the renowned Jean-Pierre Vigi er in January 1993 indicating that B(3) implies rigorously non zero photon mass, overturning many ideas of the standard model. The main achievements of that era (1993 to 2003) include the incorporation of B(3) and photon mass theory into electrodynamics in many different ways, summarized in the five volume "The Enigmatic Photon" co authored with Vigi er {8} in the acclaimed van der Merwe series of volumes in foundational physics, the incorporation of B(3) theory into non linear optics (second edition of ref. {6}), the incorporation of B(3) into classical and quantum electrodynamics {9}, the initial stages of the theory of energy from spacetime, of great practical importance and now realized industrially, and the first inroads into unified field theory.

The famous Einstein Cartan Evans (ECE) unified field theory was initiated in March 2003{10} and is based directly on a mathematically irrefutable geometry. ECE theory can only be criticised experimentally. After twelve years of intense international scrutiny it is known to be mathematically watertight simply because it is Cartan geometry within a few simple hypotheses that do not affect the Cartan geometry. The B(3) field was incorporated into general relativity in the first few papers of ECE theory. The detailed scientometrics {1} show that ECE made an immediate delta function impact among the best in the world, an impact that has been sustained among the best in the world at a very intense level to time of writing (June 2015). The most notable achievements of ECE include the derivation of all the equations of physics and engineering from a geometry that includes torsion inferred by Cartan in the early twenties, notably the field and potential equations of electromagnetism, gravitation, and the weak and strong nuclear forces, the interrelation of the four fundamental fields, derivation of all the fundamental wave equations of physics from Cartan's differential geometry, the unification of quantum mechanics and general relativity, the refutation of the second Bianchi identity in what has become a classic paper, UFT88 {11}, the refutation of the Einsteinian general relativity and its improvement with ECE theory, the refutation of the Heisenberg uncertainty principle and the elimination from physics of non Baconian ideas that are "not even wrong" in the famous words of Pauli. In other words the unworkable and unscientific obscurity of standard physics has been eliminated by the clear, geometrically based, experimentally testable, ideas of ECE theory. Discovery of the quantum Hamilton and quantum force equations, development of spin connection resonance theory culminating in UFT311 {12} by Eckardt et al., a paper that demonstrates experimentally the existence of the spin connection in electrodynamics and verifies ECE theory experimentally. The first clear understanding of how badly needed electric power can be obtained from spacetime using circuits such as the one given in UFT311, the first clear understanding of low energy nuclear reactors using the ECE spacetime. Geometrical explanation of many fundamental phenomena of physics, including phase effects such as the Berry phase, the Aharonov Bohm effects, precessional effects such as the Thomas and equinoctial precessions. Development of new field equations of gravitation to replace the incorrect Einstein field equation of gravitation and the incorporation of the gravitomagnetic field. Development with Eckardt and Lindstrom of the antisymmetry laws of ECE theory and refutation of many of the ideas of standard physics using these laws. Replacement of the Dirac equation with the ECE fermion equation, elimination of the non Baconian Dirac sea, and the non Baconian negative energy of the

Dirac equation, inference of many new types of fermion resonance spectroscopy from B(3) and ECE theory. Development of one fermion quantum field theory from the fermion equation. Development with Eckardt and Lindstrom of the vacuum ECE theory, and new explanations of vacuum effects such as the anomalous g factor of the electron, the Lamb shift and other radiative corrections. Development of new types of particle collision theory (the R theory of ECE), new types of orbit theory culminating in the x theory of ECE and three dimensional orbit theory. The x theory is able to describe all that the Einstein theory can to the same experimental precision, and also the velocity curve of a whirlpool galaxy. Both Einstein and Newton fail completely to describe the velocity curve. The x theory eliminates the need for unobservable dark matter and dark energy. Recently the ECE theory has been applied to the Evans Morris effects, which observe many novel frequency shifts that the standard model cannot describe. This hugely popular series of papers, written in 2014 and 2015, has resulted in several refutations of the standard model, and several key advances. In UFT313 the second Bianchi identity, the foundation stone of Einsteinian relativity overturned in UFT88, was developed into the Jacobi Cartan Evans (JCE) identity which led almost immediately to the inference of ECE2 theory, simpler and in many ways more powerful even than ECE theory.

The ECE theory to 2007 has been ably summarized by Laurence Felker {13} in the classic “The Evans Equations of Unified Field Theory” translated into Spanish by Alex Hill. The ECE theory after 2007 is reviewed in UFT100 on www.aias.us, UFT200 and “The Principles of ECE Theory” {14}.

Mathematics

Mathematics was his second tripos subject as an undergraduate at Aberystwyth, and he graduated top first in chemistry in 1971. Basic discoveries in mathematics are rare on the ground compared with physics and chemistry. In my own opinion his most important contribution to mathematics is the discovery of several fundamental identities of geometry. The first of these is the Cartan Evans identity in the early stages of ECE theory. This identity is the basis of the inhomogeneous field equations of ECE theory and is the Cartan identity written with Hodge duals of the relevant two forms (antisymmetric tensors). The Hodge dual of a two form in four dimensions is another two form. In UFT109 he discovered an exact identity of torsion named the Evans identity simply to distinguish it from other known identities. The Evans torsion identity is an exact identity of tensor and form analysis valid in any space of any dimension. The Cartan Evans identity on the other hand is valid in four dimensions only. In UFT313 he discovered the Jacobi Cartan Evans (JCE) identity, which is the famous 1902 second Bianchi identity corrected with torsion. The JCE identity is again an exact identity of geometry valid in any space of any dimension. In deriving it from the Jacobi identity the Evans identity of UFT112 emerged from the analysis self consistently. In basing his famous 1915 field equation of general relativity on the torsionless second Bianchi identity, Einstein unfortunately made a fundamental error which is corrected in the ECE theory. This is why ECE theory is named the Einstein Cartan Evans theory. He has also made many contributions to differential geometry such as numerous detailed proofs, and detailed intricate translations of notations for the non specialist, translations from differential form to tensor to vector notation, definitions of the meaning of tangent space indices, removal of tangent space indices and so on, in cooperation with Eckardt and Lindstrom.

Electrical Engineering

Many contributions to the basic theory of circuits that are able to take energy from spacetime. This work started in 2005 and was precisely verified experimentally in 2015 in UFT311. He is not an electrical engineer himself, but works on a day to day basis with

electrical engineers in international cooperation.

Scientometrics (or Impact Measurement)

He has devised a completely new and original method of measuring impact {1} which has been published in UFT307 and as a book. It is much more accurate and much more detailed than the traditional reliance on citation. The scientometrics in ref. (1) use many measuring parameters based on computer feedback software. The scientometrics indicate beyond reasonable doubt that ECE is making an unprecedented impact, and has been studied millions of times since inception. The quality of the readership can be seen from the scientometrics to be the highest possible. It is regularly studied for example at the best two hundred universities in the world. The scientometrics are carefully filtered to remove extraneous and irrelevant data.

New Methods of Publication and Education

Many open source methods of publication and education have been devised using the www.aias.us and www.upitec.org websites. The former is archived at the British Library from the National Library of Wales on www.webarchive.org.uk, the digital archives. The vast readership of these websites defies hyperbole, and they are bringing much needed education to people at all levels, from university staff to post doctorals, post graduates and undergraduates to teachers and pupils at leading schools, to industry and government around the world, and to literally millions of individuals. The publication method has been recognized by the colleagues through the fact that they read and accept the theory with enthusiasm. The ECE theory has therefore been exhaustively scrutinized or refereed, on countless occasions by the best in the world.

Recent Advances (2015 - present)

There have been rapid advances followed routinely in the best universities, institutes and similar in the world (known from detailed and precise scientometrics). All these advances have been checked carefully with computer algebra by co author Horst Eckardt. The main achievement is the unification of electrodynamics, gravitation and fluid dynamics with Cartan geometry in a mathematical space which has finite torsion and curvature. The new type of unification has been named ECE2 unified field theory. It has the great advantage of being Lorentz covariant in a space with finite torsion and curvature. This has been named ECE2 covariance. ECE2 has resulted in many inferences and discoveries which are all archived on www.aias.us, www.upitec.org, and www.archive.org. They include the inference of non Newtonian effects which could be of use in counter gravitation. ECE2 gives a precise explanation of light deflection due to gravitation, perihelion precession and the velocity curve of a whirlpool galaxy without the use of dark matter. It can explain planetary precession in several equivalent ways, without use of the Einstein theory, which it criticizes and improves. It has inferred new types of spectroscopy by criticizing the Dirac approximation and by replacing it with an exact theory, giving many new types of spectral patterns that challenge the foundations of relativistic quantum mechanics.. It has produced an exact theory of orbital precession by solving simultaneously the ECE2 lagrangian and hamiltonian. The fundamental vacuum particle has been inferred and used to explain the radiative corrections on the basis of the exact Dirac equation, without using the Dirac approximation. The latter removes the radiative corrections, and this is contrary to observation. So ECE2 improves the Dirac equation. The method removes the need for quantum electrodynamics. Similarly the Rayleigh Jeans and Planck laws have been criticized during the development of the Evans / Morris papers and new experimental tests proposed

ECE2 has given new explanations for geodetic and Lense Thirring precession

based on Cartan geometry, and in the work of 2016 has shown that fluid dynamics has a field equation structure that is identical with that of electrodynamics and gravitational theory. These inferences allow a vast array of new developments in the future. For example the latest work has shown that orbital precession can be explained as a vacuum effect using the principles of fluid dynamics. In general, ECE2 is simpler and more powerful than the standard model because it is rigorously Baconian and avoids the use of unobservables and adjustables. In consequence both ECE and ECE2 have a very large and sustained readership in the world's best universities.

Recent Advances in Electrical Engineering

Although he is not himself an electrical engineer, he has worked in close cooperation with electrical engineers who have shown that ECE theory gives a precise explanation of a reproducible and repeatable circuit capable of taking energy from spacetime. This circuit is of clear importance as a source of new energy and was developed by Osamu Ide and the Munich group of Horst Eckardt. UFT311 on www.aias.us shows that ECE is the only theory capable of describing it. UFT364 shows that it is reproducible and repeatable. UFT321 suggests more advanced circuit design.

Development of Distance Teaching Methods.

The scientometrics show that the AIAS Institute (www.aias.us) of which Prof. Evans is Founder and co President has developed distance teaching methods whereby its work is routinely studied and accepted in the world's top twenty universities and similar. This has been done in cooperation with UPITEC (www.upitec.org) So the ECE and ECE2 theories have been accepted by the best in the world, and the teaching of the two theories takes place routinely alongside with the standard model. This is a healthy development in physics and the nominator feels that this development is worthy of recognition in the same way as the standard model. ECE and ECE2 are now mature, accepted theories which have made several major advances, a small fraction of which are summarized here. The scientometrics show that the theories will be studied indefinitely into the future.

Advances Made from about June 2016 to July 2017

About thirty scientific papers and books were produced in this year (approximately UFT354 to UFT384 on www.aias.us on the following topics). UFT354 is an important geometrical paper authored by Douglas Lindstrom, Horst Eckardt and Prof. Evans. It shows that the correct consideration of torsion changes completely the relation between the metric and connection, and completely refutes Einsteinian general relativity (EGR). UFT355 - UFT358 are papers which result from the triple unification of gravitation, electrodynamics and fluid dynamics made possible by the geometrical structure of ECE2 theory. UFT359 is a transition paper between this kind of theory and new aspects of orbital theory discussed in UFT360 to UFT363 and UFT365, notably: spatial structure induced by Newtonian gravitation, a generally covariant inverse square law, the use of the Lagrange derivative and orbital theory and precession induced by ECE2 fluid dynamics. It is realized in these papers that orbital precession can be described in several different ways, and not just by EGR. UFT364 describes the replication of the Osamu Ide circuit mentioned already, and is an important advance in electronics made by co author Horst Eckardt and his group in Muenich. UFT366 is the preliminary draft of the second volume of "The Principles of ECE", which is the equivalent of a "best seller" albeit openly accessible from www.aias.us and www.upitec.org. UFT367 to UFT370 develop the dynamics of gyroscopes with the intention of explaining their relation to counter gravitation. This work is based on the ability

of the Maxima code to integrate simultaneous partial differential equations under the aegis of co author Horst Eckardt. All UFT papers are checked exhaustively by self criticism, co authorship and computer algebra, so are highly accurate scholarship. UFT371 to UFT376 deal with further aspects of precessional motion in orbits, using ECE2 covariance, a well defined general covariance. So ECE2 is a generally covariant unified field theory. UFT377 is an important advance which shows that the ECE2 lagrangian is capable of producing retrograde precession, claimed to have been observed recently in S2 star systems. The same lagrangian when applied appropriately produces forward precession. This is also new to mathematics. UFT378 is a summary of field, potential and force equations and UFT379 and UFT380 refer to counter gravitation. UFT381 gives complete solutions of the ECE field equations with conservation of antisymmetry, a concept unique to ECE and ECE2 theories, and a concept missed entirely by the standard model of physics. UFT382 and UFT383 introduce important new circuit designs from Dr. Horst Eckardt and the Muenich group affiliated with AIAS / UPITEC. Finally UFT384 proves conservation of antisymmetry in orbital theory.

Work of July 2017 to Present

Important advances made with Horst Eckardt in UFT384 to UFT400 are reviewed in UFT400, notably major advances in gyroscope dynamics; orbital precession theory; conservation of antisymmetry and vacuum fluctuation theory of the type used in radiative correction theory. UFT401 - UFT413 prove that precession originates in vacuum fluctuation theory; give an analytical orbital equation for ECE2 covariant precession; give an ECE2 covariant apsidal and Larmor theory of precession due to rotation (the Lense Thirring effect); give an ECE2 covariant theory of all precessions; give a complete refutation of Einsteinian general relativity (EGR) using vacuum fluctuation theory of precessions and light bending due to gravitation; apply Thomas precession theory to the Hulse Taylor binary pulsar; give a new and universal ECE2 law of all precessions; develop ECE2 dynamics in a rotating frame; give the relation between the spin connection and frame rotation ; and give a theory of orbital shrinkage and precession due to a rotating frame caused by Cartan torsion.

In recent papers (UFT414 - UFT423 on www.aias.us) an original theory of classical relativistic dynamics has been developed in the most general spherically symmetric spacetime, and given the appellation "m theory". The basic equations of motion of the theory are the Evans Eckardt equations of motion, based on the very fundamental fact that the hamiltonian H and angular momentum L are constants of motion. So the Evans Eckardt equations of motion are $dH / dt = 0$ and $dL / dt = 0$. A lagrangian formalism of the theory has also been developed. The theory is capable of advancing well beyond the standard model of physics and has already given a number of important results. For example m theory gives forward and retrograde precession, whereas Einsteinian general relativity can only give forward precession. The m theory produces shrinking orbits without the use of gravitational radiation from the obsolete Einstein field equation, refuted completely in the UFT series of papers on www.aias.us and www.upitec.com. The m theory can also give expanding orbits and in well defined circumstances gives superluminal motion and the possibility of infinite energy from m space, the most general spherically symmetric space. Therefore the origin of energy from spacetime or vacuum has been discovered in the geometry of m space. In UFT311 this type of theory was shown to give precise agreement with the Ide circuit, replicated in UFT364. The m theory can also be used to produce the spin connection of ECE2 theory and to explain the radiative corrections in terms of the geometry of m space. The m theory has been applied to the orbit of the S2 star in UFT419 and the major discovery made that the orbit is an ellipse within the experimental uncertainty, an ellipse that can be described with m theory with a static m, but not by Keplerian or Newtonian theory. Einsteinian general

relativity (EGR) is refuted completely in UFT419 because EGR gives a large precession of 0.219 degrees per orbit, a precession which is not observed. The m theory gives a precession of 0.033 degrees per orbit, and this is close to the experimental data which show no precession within the noise. In UFT420 the Evans Eckardt equations of motion are developed in detail, ready for computation in future work. In UFT421 EGR was refuted completely because EGR does not give a constant v at infinite r as observed in the velocity curve of a galaxy. The m theory is able to describe the velocity curve and also the observed forms of galaxies. The m theory shows that the Sagnac effect can be used as in UFT422 to measure $m(r)$ and produces a theory of the Sagnac effect in the most general spherical spacetime. This theory clearly refutes EGR as shown in UFT422. When the well known $m(r) = 1 - r_0/r$ of EGR is used in the Sagnac effect, effects are predicted by EGR which are not observed, so EGR is refuted completely in another way. Therefore recent UFT papers have produced three clear experimental refutations of EGR: the velocity curve of a whirlpool galaxy; the orbit of the S2 star and the Sagnac effect. Finally in UFT423 the concept of black hole is replaced by an effective mass derived from m theory with constant $m(r)$. These are all clear and significant advances which go well beyond the standard model.

All seven hundred or so UFT papers and books of the ECE unified field theory are checked rigorously in the internationally renowned Evans Eckardt dialogue, using computer algebra whenever possible.

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