

The True Meaning of Einstein's Relativity

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This paper examines the extent to which an interpretation of Einstein's relativity suggested in *The Special Theory of Reality* might provide clearer answers in areas such as gravity, quantum mechanics, string theory and particle physics generally. The extent to which the simple concepts of rings of tiny particles and rings of such particles becoming spirals suggest explanations and solutions in the area of particle physics specifically is explored and explanations suggested for all four fundamental forces. Most significantly, a description and unrealized properties of the Higgs boson are presented, and explanations are suggested for the very nature of quantum mechanics and string theory in the context of what is suggested as the true meaning of relativity. An explanation for the significance of specific frequencies in new energy and health technologies is also suggested.

Key words: relativity, mass, particle physics, quantum mechanics, string theory, Higgs boson

Introduction

The Special Theory of Reality stems from thought experiments that logically demonstrate that the most fundamental component of mass in the tiniest possible of elementary particles (and possibly larger objects) is dependent on their spin. Assuming then that a more logical interpretation of general relativity may be that mass (spin) results in curvature of motion rather than curvature of space, a theory of larger particle structure was developed on the implication that mass generated by spin results in curvature of motion in the plane of spin, whereas motion along the axis of spin is facilitated by a corresponding reduction of mass in that direction, with the tendency then towards Newton's straight line motion. Almost immediately, many answers seemed to be offered by this approach, which grew as I delved into the 20th century development of physics, particularly de Broglie's contribution. Very significantly, answers became apparent for the very nature of both quantum mechanics and string theory. Also, curvature of motion of the tiniest particle dependent on total energy present (spin and translation) is quantum general relativity. Thus this simple idea appears to have the potential to unify the three most prominent ideas of 20th century physics.

Relevant Information about the Author

Having no formal training or academic position other than two years of an engineering degree course up to 1965, with only private study of relativity up to that date, the author's position in physics is highly unusual. Only after 'revelations' starting on October 3rd 2003 did the new interpretation of relativity come.

The reader is requested to bear in mind that the author's access to papers and journals is limited, and that my work covers areas, the history of which is littered by attempts to stop the spread of knowledge. For instance the late Dr. Bruce E. DePalma wrote an open letter [1] saying that his life had been threatened and that he would be kidnapped if he tried to leave the US, and that some of his work had been confiscated. Despite these limitations and difficulties, the fact that my paper of 2011[2] cited the work of more than 40 others in providing some degree of verifying evidence for twenty predictions stemming from this theory, clearly indicates why the reader may be encouraged to consider the ideas and evidence here presented. It should also be noted that the 21st prediction might claim verifying evidence subsequent to my 2011 paper via the much publicised work suggesting that neutrinos may travel faster than c , as first made clear in my paper of 2007 [3] and further explained below.

Why rings and spirals?

If spinning particles naturally follow a curved path, the curvature of which is dependent on the rate of spin, then many particles with the same rate and direction of spin can combine to form rings. This is not just possibly indicated via the superficial interpretation of general relativity proposed in my introduction, but derives from a logical analysis of the implication from special relativity that the value of π is increased in rotating bodies.

The logical problem is this: in the case of a rocket ship, special relativity suggests that both the rocket and a measuring rod within it will experience the same proportionate change of dimension with speed.

In the case of a rotating disc, however, whilst it is possible to imagine distortion of a disc which would decrease the value of π , imagining any distortion that might increase the value of π is far more difficult, if not strained to the limits of credibility and even possibility. But when we go on to consider a rotating solid, spherical particle such as an elementary particle, thus without sub-structure, it seems clearly impossible to envisage distortion that could either increase or decrease the value of π .

This apparent inconsistency might be solved if dimensions do not actually change, but rather that considering them to change is a useful way of describing the true relativity of events. In this respect, we might say that the value of π has increased for a point on the edge of a rotating disc or sphere in the relative situations of the body in question having translational motion or not. In the case of straight line translation in the plane of spin, a point on the circumference of a rotating disc or sphere will have the longer cycloidal path in space-time compared to circular motion without relative motion. In the case of curved motion, the path will be the even longer hypercycloid. In the case of motion of a spinning particle in a helical spiral, it is the latter plus the increase over circular motion that any particular spiral represents depending on the frequency of circular motion and the speed of translation at right angle to it. The additional motion in this case can also be expressed via an increase in π according to the following formula:

$$\pi_1 = \sqrt{\pi^2 + \left(\frac{v}{fD}\right)^2}$$

This is very simply derived, as shown in my paper of 2006 [4] from the following formula for arc length of a helix (one complete turn) to be found in any good maths text book, e.g. Kreyzig p.462:

$$s = 2\pi \sqrt{r^2 + \left[\frac{l}{2\pi}\right]^2}$$

The new value of π derived has a real meaning as follows. If a ring of particles of diameter D is rotating with a frequency of rotation given by f , the distance travelled by each particle in one revolution is given by πD . If, however, the ring starts to move face on with velocity v , each particle will describe a helix. The distance then travelled by the particle in one revolution will then be given by $\pi_1 D$.

If we consider the hypothetical situation of an elementary particle in complete isolation of any external influence, conservation of energy demands that if we consider it to spin, it has to be at the expense of translational energy, or put another way, such a particle cannot increase its rate of translation without reducing its rate of spin. So how can point p on a spinning particle follow a longer path in space-time if spin commences or increases? The only possible solution is curvature of motion in which the translational speed of the particle decreases whilst still resulting in point p having longer motion in space-time compared to circular motion without translation.

Experimental evidence was provided in my paper of 2007 [3] of the implied exchangeability of angular and linear momentum, via the demonstrations of the late Professor Eric Laithwaite with orbiting gyros. This principle is crucial to the explanations of radiation and force carrying 'particles' that follow, and can be confirmed or denied via the simple addition of a stroboscope to Laithwaite's apparatus.

Of similar importance are the other experiments of Laithwaite and of the late Dr. Bruce E. DePalma and others as described in some detail in my paper of 2007 [3] that together verify my conclusion that mass increases in the plane of spin but decreases along the axis of spin.

Whether this new interpretation of Einstein's relativity might be correct is indicated by the number and significance of answers it appears to provide and the evidence appearing to support the many predictions that stem from it. Thus the 21 predictions with some degree of verifying evidence mentioned must be considered and the extent of solutions suggested below.

Based on the experimental evidence cited above, my first explanation for the motion of neutrinos, otherwise not understood, seems quite obvious.

Neutrinos

Neutrinos and anti-neutrinos are observed to have exclusively right or left handed helicity respectively, meaning that they always move at right angles to their plane of spin. My theory, and the experimental evidence mentioned, provide the very simple explanation that spin reduces mass along the axis of spin, whereas, increased mass in the plane of spin maintains straight line motion. This also suggests that the only difference between neutrinos and anti-

neutrinos is the direction of motion relative to the direction of spin. It is suggested that there may be a preferred direction of spin in our universe, perhaps because the universe as a whole is rotating. Various forms of evidence of an axis in the universe were presented in my paper of 2011 [2].

If I am right about the exchangeability of angular and linear momentum, the only thing limiting how fast neutrinos may travel could be the rate at which they can spin before emission. I have suggested that light travelling only at c may be an illusion present only in light as a multi-photon phenomenon. Evidence of individual photons travelling faster and slower than c is mentioned in my paper of 2011 [2].

Electrons/Photons

Electrons and photons require various explanations, which I think imply a sub-structure governed by the principles set out so far in this paper. Firstly, a mechanism is required to explain the means by which energy can be stored and released. If particles forming my suggested rings have a much greater tendency to move along their axis of spin, then so do the rings they form. A containing mechanism is thus suggested whereby rings of lower energy spin can prevent axial motion in rings of higher energy spin (and thus smaller diameter) within them, as long as their plane of spin remains at right angles to the contained ring or within certain limits close to a right angle.

If the outer, containing ring then revolves uniformly about an axis through the rim of the ring, i.e. at right angles to the preferred axis of translation, it would facilitate the emission at regular intervals of the contained ring in a progressive manner which would turn it into a helical spiral. Thus force-carrying 'particles' might be explained which can 'screw in' to other rings or spirals, exchanging momentum between the individual tiny particles. Considering de Broglie, however, and polarization, it would appear that light photons could be explained by the emission of groups of three rings. The outer ring thus becomes a helical spiral and is de Broglie's accompanying, guiding, pilot wave. The 'particle' guided by this 'wave' is represented by the two smaller, internal, transverse rings (that remain rings) at right angles. Both can give the same frequency (as a count of tiny particles in unit time registered by the eye) as the internal of

these two is smaller, containing fewer tiny particles, but rotates faster.

A structure of electrons is thus suggested, appearing very much like a gyroscope but with more internal rings at right angles. The change of electron energy via loss or gain of photons is then easy to visualise as the number or energy levels of internal rings.

Secondly, the wave-like motion and behaviour in double slit experiments of electrons (as with photons) needs clearer explanation than so far provided in physics. If the force-carrying 'particles' that hold electrons in place are emitted at regular intervals, as my theory suggests, a clear, mechanical explanation of the Born interpretation can be visualised in which the electron oscillates in a region distant from the proton or between protons if shared.

In the case of double slit experiments, it makes much more sense to think of electrons and photons as being capable of splitting and re-unifying than indivisible and capable of being in two or more places at the same time. A computer simulation suggests why my spinning and orbiting particles might well be the answer. In the computer simulation of a flock of birds [5] it was found that realism could be achieved by applying just two components: a tendency for 'birds' to maintain some degree of separation, and a tendency to return to the flock. If particles spin in the same direction, they bounce off each other, thus satisfying the first requirement. Because they orbit, the second requirement is met. And it was found that the simulated flock, on encountering an obstacle, would split into two flocks and recombine into one flock after the obstacle.

Perhaps more scientifically persuasive experimental confirmation of my view of photons relates to work done on twisted light. In *The Special Theory of Reality* [4], I referred to experiments by Alois Mair in 2001 [6], confirming that the orbital angular momentum shown by Les Allen in 1992 [7] to apply to twisted light, resided in individual photons [8], verifying my interpretation of the de Broglie component as orbiting particles moving at right angles to the plane of spin and orbit.

Also involved in this confirmation by Alois Mair was Anton Zeilinger's group at the University of Vienna, who created entangled pairs of twisted photons and showed that the twist resides in each photon. A twisted photon appears to travel along a helical path, subject to the fact that its position at any

point can only be inferred as a matter of probability in quantum mechanics, giving a spread out quantum wave function similar to that of non-twisted light. My theory explains both the questions of probability and the spread out wave in terms of random contacts of my particles spinning in the same direction, which then have random variations in orbit size giving the spread out wave. And this explains the many frequencies of vibration in string theory, because energies of spin are exchanged in every random contact. Clearly, my rings are the loops of string theory, and 'tiny curled up extra dimensions' are represented by the tight orbits of my spinning particles.

I have recently found that the work on twisted light has provided evidence in favour of photons both splitting and combining. Miles Padgett & L. Allen, in a paper of 2000 [9], state that, "In degenerate down conversion, a single input photon becomes two photons of half the frequency" (p.284), and referred to experiments in which the obstacle to motion, a crystal, caused two infrared photons to combine into a single green photon (p. 279).

Thirdly, after I apply the solution of rings to quarks and gluons as a means of explaining neutrons and protons, it will be shown that this approach also provides an easily visualised explanation for exclusion principle.

Quarks, Gluons, Neutrons, Protons & Bosons

Based on the probability that quarks have the same basic structure as electrons, though probably larger and clearly containing rings of higher spin energy to explain higher energy radiation, a structure of neutrons was proposed in which the outer rings of quarks are linked together by smaller rings (gluons). Figure 1 presents this in very simplified form in order to clearly show the suggested linking of outer rings.

As in the mechanics of structures in engineering, the triangular structure that results from the linking of rings may explain the stability of neutrons. Also, as the tiny particles in the gluon orbit at a distance determined by their rate of spin, they will provide resistance to the separation of the quarks that will increase with distance (much like an elastic band), providing an explanation for the strong nuclear force.

Note that this diagrammatic representation is not to scale and highly simplified.

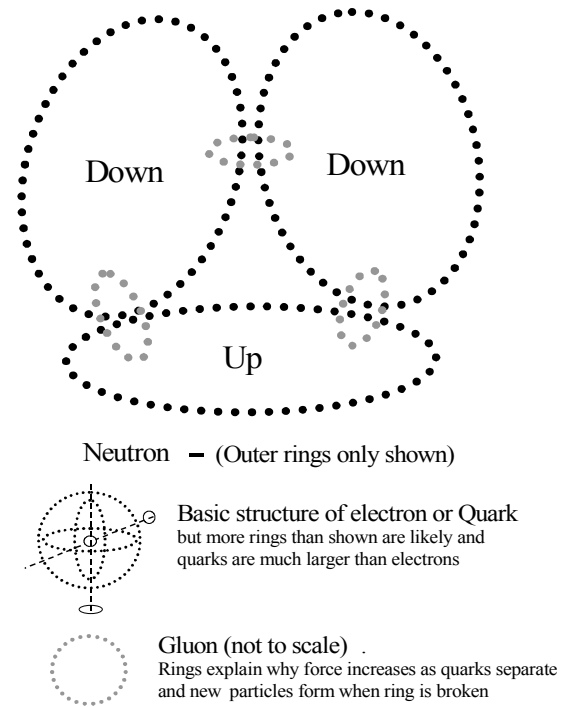


Figure 1
Diagrammatic representation of a neutron

The obvious possibility of the gluon ring breaking, however, provides an explanation for neutrons becoming protons, leaving the particles in the broken gluon ring to explain the resultant electron and anti-neutrino, implying perhaps that gluons and electrons are comprised of anti-neutrinos of one more in number in the gluon than required to form an electron. One of the down quarks in the neutron becomes an up quark because in moving round into alignment it changes its direction of spin relative to its configuration in the neutron. As explained below, this alignment allows the emission of linking spirals that hold the two up quarks together in the weak nuclear force that then extend to a greater length of turn to explain the weaker electromagnetic force that holds electrons in place.

Figure 2 is a diagrammatic explanation of exclusion principle, which also indicates the way in which the lost gluon has allowed the outer rings of two of the quarks to move round into alignment, facilitating the exchange of the force carrying spirals. As with Figure 1, it is highly diagrammatic and not to scale, the distance between proton and electrons being vastly greater in reality. Only one of the two

interlinking spirals is shown for simplicity in demonstrating the principle.

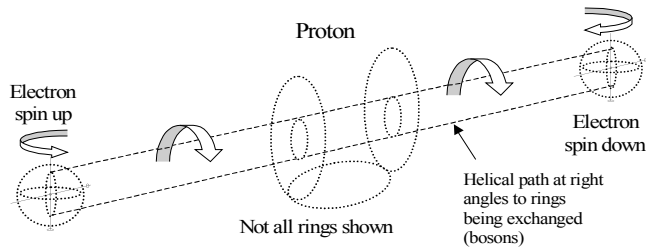


Figure 2
Explanation of exclusion principle

The rings that become spirals need to rotate with the same handedness (as viewed from behind the direction of motion) to explain a pulling force as opposed to repulsion. Thus the spins within the electrons need to be in opposite directions because the spiral path through the proton is clockwise to the left electron and anti-clockwise to the right.

Much of my maths is long forgotten, but it appears to me to be quite likely that the up quark charge of $2/3$ derives from the fact that in the proton only two of the three quarks can have their rings aligned. In isolation (if this were possible) each up quark would have a charge of $1/3$, as in the down quark, but by virtue of alignment in the proton the charge of each combines to give more energetic spirals.

Spirals linking the two aligned quarks in protons are thus W^\pm gauge bosons, and with Z^0 bosons (I guess rings that do not become spirals to explain no charge) explain the weak nuclear force. W^\pm bosons have high mass because their high rotational energy is conserved in spirals of short turn, which gives a stronger pulling force than the more extended spirals of the electromagnetic force.

Rings within rings, which can have variations in relative planes and alignment of spins, gives permutations that might explain the number and variety of quarks theoretically possible.

Gravitons

To complete the four basic forces of nature, gravity remains to be explained here. My second paper, 2007 [3] examined this in some depth and included various quotes of Einstein to demonstrate that he considered there to be more than one type of gravitational field. It suggested four basic components to the gravitational fields that determine the motions of planets and other bodies as follows:

1. The rotation of the universe (not including completely empty space for which the concept of motion is nonsense)
2. The rotation of the galaxy (that implies that the galaxy may follow a curved path in my theory)
3. Pure gravitational field resulting from the action of spirals of tiny particles (probably neutrinos)
4. Curvature of motion due to the spin of the planet (not specifically understood by Einstein perhaps, but implied in total mass and energy present)

For 1,2 & 4, curvature of motion can be linked to increased values of π as described above, as applied to spiralling motion that gave 3. In a system that is rotating, what would otherwise be straight line motion is curved relative to everything else that is rotating. As I have explained, such curvature of motion can be quantified by assuming the value of π to have increased, and this is equivalent to assuming measuring rods to have shrunk in the direction of rotation, even though in reality they do not, which is thus suggested as the true meaning of Einstein's relativity. Time, however does change, and is discussed later

Gödel, of course, showed that a rotating universe satisfied the field equations of general relativity [10]. Various forms of evidence of an axis in the universe were included in my paper of 2011[2].

The paper of 2007 [3] also contained various types of evidence indicating terrestrial gravitation to be a real force, capable of shielding, disruption or cancelling locally. Einstein's comment of 1920 that, "General relativity without ether is unthinkable" indicates that local gravitational field, or his 'pure gravitational field' is transmitted via something physical in nature. Though he warned that a simplistic view of the ether would not do, i.e. something uniform in nature that can carry waves to which calculations of relative motion might apply.

My theory does not depend on such a simplistic view of ether (or aether), as spirals can move in completely empty space, but the collective nature of all such motions and interactions of tiny particles can be considered as a non-uniform, particulate 'aether', but not one that it is possible to ascribe relative motion to as a whole, because its constituents are in constant, diverse relative motions.

Local gravitation field thus appears most likely to be explained by rings that become spirals, but in which the spiral has a very much longer length of turn than the other forces. This would be explained if

much more of the rotational energy of the ring were transformed into translational energy. These spirals would also need to always have the same direction of rotation (handedness) for gravity to be always attractive. All this leads me to suspect that gravitons originate as single rings of high rotational energy within quarks, and perhaps one type of quark in particular, though as yet I have not given much thought to which that might be.

As with other force-carrying 'particles', it appears likely that gravitons would be emitted at a particular frequency, suggesting that it may be possible to block or disrupt the action of gravitons using specific frequencies, as evidence in my paper of 2007 [3] suggests.

Clearly the rings emitted as gravitons have to be replaced. Incoming gravitons from the Sun and other bodies is obviously suggested, but with the Sun hugely dominant. As the Sun loses matter, mass and other energy in various forms, it seems likely that the number of, and rotational energy in, replacement gravitons will diminish very slowly, meaning that the Earth may spiral out from the Sun, the Earth may expand, and the Moon may spiral out from the Earth. Evidence of all these possibilities can be found in my first three papers [4,3 &2].

This view of gravity also enabled me to predict that black holes must be self limiting and that they periodically stop feeding, which is now well known, and that new stars should form from material ejected from black holes, which had only been observed quite recently at the time that observational evidence of this [11&12] was included in my paper of 2011 [2].

Doubt is thus thrown on the possibility of singularities and big bang theory. Instead it appears that the universe evolves over a longer time-scale than is suggested by big bang theory, with super-dense objects (not quite 'black' 'holes') at the centres of galaxies acting as great recyclers and most likely the source of background microwave radiation.

Mesons Isospin and mass

It has been suggested that my theory contains an internal contradiction because particles such as mesons can have mass but an isospin of 0. The answer to this is that an isospin of 0 does not necessarily mean that no spin is present. My theory suggests that in mesons, the quark and antiquark rotate together like gearwheels because their external spins are in opposite directions. Thus the net external

spin is 0, but there is spin to give mass, including internally within the quarks. It should be noted that the fundamental component of mass produced by simple spin is directional. The suggested gyroscopic arrangement of rings multiplies the mass and makes it three dimensional.

Plasma

In the opening remarks of my paper of 2011[2] I made the point that I was able to predict straight away on reading of the apparent ability of blobs of plasma gas to 'communicate, replicate and grow' (Xmas 2003 New Scientist [13]), that this would be via the exchange of encoded helices, whereas as indicated below, others did not come to exactly the same conclusion (even verifying my explanation of helical interaction to explain forces) until 2007. To demonstrate that four physicists from four academic institutions in three countries agree exactly with my prediction made three and a half years earlier, I include the following abstract and list of authors from a paper of August 2007: **“From plasma crystals and helical structures towards inorganic living matter”** [14] (note in particular my red highlighting):

“Complex plasmas may naturally self-organize themselves into stable **interacting helical structures that exhibit features normally attributed to organic living matter**. The self-organization is based on non-trivial physical mechanisms of plasma interactions involving over-screening of plasma polarization. As a result, **each helical string composed of solid microparticles** is topologically and dynamically controlled by plasma fluxes leading to particle charging and over-screening, the latter **providing attraction even among helical strings of the same charge sign**. These interacting complex structures exhibit thermodynamic and evolutionary features thought to be peculiar only to living matter such as bifurcations that serve as 'memory marks', self-duplication, metabolic rates in a thermodynamically open system, and non-Hamiltonian dynamics. We examine the salient features of this new complex 'state of soft matter' in light of the autonomy, evolution, progeny and autopoiesis principles used to define life. It is concluded that complex self-organized plasma structures exhibit all the necessary properties to qualify them as candidates for inorganic living matter that may exist in space provided certain conditions allow them to evolve naturally.”

“From plasma crystals and helical structures towards inorganic living matter”

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Higgs boson

I hope that it should now be obvious to the reader that the Higgs boson is the ring of tiny particles from which every other 'particle' (with the probable exception of neutrinos), radiation and force is constructed or manifests as. Thus, it appears not to always have the same size or mass and most significantly, that mass is directional. These are all reasons why identification of the Higgs has been so difficult. It seems most likely that the tiny particles forming the rings are either neutrinos or anti-neutrinos for any particular ring but that both are likely for different rings.

Time

As noted above, time does change with speed, but not in the sense that time is some 'thing' that can flow at different rates. If I am right about the exchangeability of angular and linear momentum, then it is clear that with no input of energy, a spinning particle can only have increased translation at the expense of energy of spin. This is what Einstein meant in saying that each reference system has its own time. For the spinning particle considered above, 'time' is running slower as translational speed increases.

My theory suggests that the translational speed of photons results from conversion of some of the spin energy (mass) of rings. Any change of speed as light travels implies that the spin of the photon (and thus frequency in my theory) must also change if there is no other energy exchange. So this is the true meaning of special relativity. Time for the photon changes. And because frequency changes depending on speed relative to different observers, light as a multi-photon

phenomenon appears to travel always at the same speed for each observer.

Implications

Clearly, if all forces can be explained by the same principle of rings and rings becoming spirals, explaining at the same time the very nature of quantum mechanics and string theory via an easily visualised mechanism that makes relativity more logical and applicable at the smallest level, the implications for physics are huge. Thus there has to be very strong justification of the urgent need to repeat Laithwaite's suspended, orbiting gyro experiment with the addition of a stroboscope to confirm or deny the principle of exchangeability of angular and linear momentum by which my theory must stand or fall.

On the question of string theory, string theorists should give very careful consideration to the interpretation that a more logical view of 'tiny curled up extra dimensions' is my alternative view of relativity, that the tiniest particles (and possibly larger objects) naturally follow a curved path in the plane of spin. Different planes of spin can in theory account for as many 'extra dimensions' as appears necessary, but in practice boils down to the degrees of freedom needed to explain all other 'particles' as my model suggests (if verified).

If physics can move on in this way, there may be many implications regarding technologies that may benefit humanity, some hard to predict now. This work may, however, already help to explain those new energy and health technologies that appear to depend on specific frequencies, that could be hugely significant in avoiding human suffering. The most certain of various threats that may imminently face humanity are water shortages and the conflicts likely to result. The low energy dissociation of sea water could be crucial in this respect. But many doubt the work of people such as the late Stanley Meyer [15], thinking that high voltage and low current can give no advantage over low voltage and high current. If, however, it can be understood that the force holding electrons in place is emitted at frequencies explainable by my rotating, containing rings, it can be seen why electrons are hugely more vulnerable to expulsion by high voltages pulsed at appropriate frequencies. And it thus appears very likely that Rife's [16] means of disintegrating viruses may work for the same reason.

References

- [1] Bruce E. DePalma, "Open Letter", *Space Energy Association Newsletter* **3** (3) (Oct-Nov 1992), <http://www.padrak.com/ine/INE19.html>.
- [2] Robert F. Beck, "Verifying Evidence for the Predictions of the Special Theory of Reality" *Proceedings of the NPA* **8** : 39 - 44 (2011). <http://www.einsteins-revolution.com/Papers/NPAthirdpaper2011.pdf>
http://www.worldsci.org/pdf/abstracts/abstracts_6156.pdf
- [3] Robert F. Beck, "A Heuristic Paper on the Nature of Mass", *Proceedings of the NPA* **4** (1): 2-15 (2007). (minus appendices) For full version see: <http://www.einsteins-revolution.com/Papers/NPA%20UConn-Storrs%20Paper%20-%20Mass.pdf>
- [4] Robert F. Beck, "The Special Theory of Reality" (2006) (too long for NPA written proceedings) See: <http://www.einsteins-revolution.com/Papers/The%20Special%20Theory%20of%20Reality%20NPA%20Tulsa%2006.pdf>
http://www.worldsci.org/pdf/abstracts/abstracts_106.pdf
- [5] "The Science of Special Effects", Discovery Science documentary first seen by me early in 2004
- [6] Alois Mair, Anton Zeilinger et al *Nature* **412**: 313 (2001).
- [7] Les Allen et al, *Phys. Rev. A* **45** 8185 (1992).
- [8] Stephen Battersby, "Twisting the Light Away", *New Scientist*, **182** (2451): 36-40 (12 Jun 2004). See esp. "The quantum angle" p.40
- [9] Miles Padgett & L. Allen, "Light with a twist in its tail", *Contemporary Physics*, 2000, volume 41, number 5, pages 275± 285
<http://people.physics.illinois.edu/Selvin/PRS/498IBR/Twist.pdf>
- [10] Kurt Gödel, "Rotating Universes in General Relativity Theory" *General Relativity and Gravitation*, Volume 32, Number 7, 1419-1427 (2000), doi: [10.1023/A:1001911308752](https://doi.org/10.1023/A:1001911308752)
<http://www.springerlink.com/content/np67m0m438431367/>
- [11] World Science staff, "Do black holes zap galaxies into existence?" http://www.world-science.net/othernews/091201_galaxy (2009).
- [12] World Science staff, "Explosion shutting down a galactic party: physicists", http://www.world-science.net/othernews/110223_blackhole (2011).
- [13] New Scientist staff "Best bits of 2003", *New Scientist*, p. 23 (Xmas 2003).
- [14] V. N. Tsytovich et al, *New Journal of Physics* **9**: 263 (Aug 2007) doi: [10.1088/1367-2630/9/8/263](https://doi.org/10.1088/1367-2630/9/8/263),
<http://science.howstuffworks.com/framed.htm?parent=weird-life.htm&url=http://www.iop.org/EJ/abstract/1367-2630/9/8/263>.
- [15] http://peswiki.com/index.php/Directory:Stanley_Meyer
- [16] <http://www.rense.com/health/rife.htm>