# Quanta and General Relativity

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## Overview

Einstein said in 1954, a year before his death, that if even one flaw were found in his cloud castle, then it all would fall.[1] He was indirectly referencing the rise of quantum field theory, for which his gravity-as-geometry, general relativity theory had no clear answer – even though Einstein had also been one of quantum theory's founders.

General Relativity (GR) gravity math is still being *correlated*[2] over increasing distances – with the *circular logic assumption* that this model is *causally* accurate, since the GR math apparently correlates.[3] The Achilles heel of GR "proofs" is that they only apparently work over some dimensions, not over all – whereas a true gravity/electromagnetic theory would apply within and among all logarithmic dimensions.

Even in 2018 there are continuing efforts to prove the validity of GR, but most quality data only reach out to a nearby portion of the Milky Way's diameter. Proof is sketchy among measurable galaxies beyond ours. There is no elegant, *exclusive* proof of dark energy, nor of related many-dimensional string theory.

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1 http://astronomy-links.net/AstrophysicsCloudCastles.pdf

2 http://astronomy-links.net/correlation.and.causation.pdf

3 http://science.sciencemag.org/content/360/6395/1342

It took about 1,400 years to disprove the accepted Ptolemaic cosmological math that supported Earth as the center of our solar system. Galileo telescopically saw the phases of Venus in 1610, for which the Ptolemaic model had no explanation. Still, Galileo spent the rest of his life under house arrest. If he hadn't been personal friends with the pope, Galileo might have suffered the fate of priest Giordano Bruno: In 1600 Bruno was burned at the stake for proclaiming the heliocentric model is correct, and that there are stars with civilizations beyond ours. Jealous Earth gods and their structured religious hierarchies were not pleased.[4]

Science is always looking for a gravity theory that is beyond Einstein, as GR was the next step beyond Newton at Relativistic speeds. Quantum theories in their mechanical and field variants seem to be more about refined measurements than grand theory. QT would like to apply everywhere, but seems testable only fairly locally. GR and QT seem to be incompatible.

This essay explores the idea of fundamental quanta, showing them as universal building blocks within an upgraded paradigm. Larger "quanta" such as atoms may exhibit quantum behavior, but they are composites of fundamental quanta. Any successful quantum theory thus must take into account truly fundamental yin/yang quanta and their combinations, at least up to where classical physical behavior measurably appears.

Modern push/shadow gravity, with yin/yang quanta, puts us closer to a unified theory. Add into the mix *primary* (+/-), and *secondary* (+ and -) *electromagnetism* to approach a coherent theory of everything (TOE).[5] A bonus from this emerging 21st century perspective is how science can now envision and resolve what constitutes both dark matter, and dark energy.

Experimental progress can often seem revolutionary, but may only be incremental at best. If a non-random subset of reality is

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[4] http://astronomy-links.net/Religion.and.Math.pdf

[5] https://en.wikipedia.org/wiki/Theory_of_everything

subjected to scrutiny, then general conclusions are harder to induce, however precise the measurements. This experimental limitation is another illusion of increasingly refined deductive data encountering persistent limits of cosmological induction. Only a better theory could move the knowledge needle.

Consider the recent GR experiment (reference #3 above), where a gravitational ring around a single lensing galaxy[6] about 450 million light years away matches up well with GR math. Even that distance is part of our universal neighborhood. As with QT, GR has not been measurably shown – to the exclusion of all other models – to be extensible to the edges of our visible universe, not to mention what local universes may lie beyond ours. This lack of truly distant verifiable data threatens any universal force claims. There remain serious questions for any force theory, such as dark energy, that claims to extend to the edges of our visible universe.

*Here are two actual DISproofs of cosmological GR without correlation* at distances greater than 500 million light years:[7,8] One of these disproofs involves a cubic volume with 1.74 billion light years on each edge, holding thousands of galaxies. The most recent "correlative proof" of GR with one lensing galaxy must also support the equally correlative causative alternative: push-shadow gravity. Einstein's fear of his teetering cloud castle collapsing has come true.

A better model of the true universe is *the 3-D multiverse*, within which our visible universe is like one random bubble in a multiversal bubble bath.[9] The latest and most distant GR confirmation is trivial, because that data equally supports the validity of push/shadow gravity.

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6 http://heritage.stsci.edu/2007/08/supplemental.html

7 http://astronomy-links.net/GGvsGR.html

8 http://astronomy-links.net/DipoleRepellerExplained.pdf

9 http://astronomy-links.net/Evidence.for.Multiverse.pdf

The same triviality applies to other recent, and fundamentally equivalent, GR verifications, such as the three-body data from a fairly close high-density, triple-star system.[10] This observational experiment does however shine some light on the equivalent relationship between gravitational mass and energy – which is also at the very core of fundamental yin/yang quanta, and EM.

# Where GR Got It Wrong

At the start of the 20th century physics was frustrated by gravity. It didn't play well with the other forces. No theory of gravity, other than Newton's 17th century ideas, was at all viable. Fatio's alternate 17th century model, push/shadow gravity (in its wrong billiard-balls form), had become generally doubted, and was finally discarded in the late 19th century.

It took until the 1920s for astronomy to discover that many "spiral nebulae" were not nebulae, but great galaxies outside our own. There was no standard-model concept of Dark Matter, and no pre-GR concept of Dark Energy.[11]

Einstein was happy to fill this void with his seductive gravity-as-geometry model; including the odd wavelength fudge factor, *lambda (λ),* which allowed theorists to shoehorn in dark energy.

Einstein did not get his 1921 Nobel for GR, but won for the particle/wave photoelectric effect. GR itself had to await "proof," which soon followed: The two phenomena of (1) Mercury's odd precession, and (2) light bending around the sun, as seen during total solar eclipses – culturally sealed the deal, making Einstein a world celebrity in the post-WWI era. Trouble is, neither proof proved much. Just because neither "proof" disproved Einstein, it does not equal real proof, only that his GR theory was disprovable:

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[10] https://gizmodo.com/einsteins-theory-of-gravity-holds-up-on-test-of-a-three-1827319579

[11] https://www.space.com/40958-einstein-general-relativity-test-distant-galaxy.html

[1] *Consider Mercury's precession.*[12] It was known in the 19th century, but Einstein's relativistic math made better sense of it. Einstein worked his formulas backwards several times to get something that matched the observations. This trick was similar to what quantum physicists do when their formulas turn up zeros and infinities: They tweak - renormalize - their input data to get the output result they want.

[2] *Consider the bending of light around the sun.*[13] Photon path bending does happen around massive bodies, be they stars or galaxies. In 1919 Einstein's GR was "proven right" – *assuming* his gravity-as-geometry funnels are the correct causative model. Measurements made during the 1919 solar eclipse, and in later eclipses all seemingly "work" with the funnel math, even if there are no spacetime funnels. They also equally correlate with the push/shadow model, the real astrophysical phenomenon.

*Light beam photons are composed of rotating yin/yang strings* expressing both energy (yang), and matter (yin). *The length of each spinning string determines the photon's frequency.*

*The vacuum speed of light itself is a result of snap-back separating elastic yin/yang particles and their bead-like strings. The vacuum speed of light "c" is thus not a constant of nature, but rather a product of snap-back detachment within elastic strings and rings of y/y particles.* This simple fact degrades the GR model. [Please read this light speed essay footnote. As a bonus, it has an *alternate explanation* (on pages 15-16) *for GPS*:[14]]

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12 http://milesmathis.com/merc.html

13 http://astronomy-links.net/Allais.html

14 http://astronomy-links.net/LightSpeed.pdf

# Partial and Full Shadowing

It is important to understand the difference between partial and full shadowing within this new paradigm. It is not at all like the 17th- and 18th-centuries' version of gravitational shadowing, which has been properly discredited since the 19th century. This is not about tiny, hyperluminal billiard balls, which are unreal. If 21st century push/shadow gravity had been understood before 1915, GR would have been unnecessary, even though correlative GR math has been somewhat useful over the last century.

A good way to look at partial and full shadowing, *and* to appreciate how push/shadow gravity works, is to consider Newton's famous *Third Law of Motion*:[15] *"For each and every action there is an equal and opposite reaction."*

Consider a person standing on the ground. Net-force gravity is pushing that person toward the Earth at 1 g. True, but Newton says there is an opposite and equal force: The effect of our partially shadowing bodies yields net force gravity pushing the Earth in our direction with equal force. Of course, it is easier to envision the first half, because there is such asymmetry in total mass. It would be easier to imagine two large space rocks of equal mass touching each other equally.

Newton did not model push/shadow gravity, even though his friend, Nicolas Fatio, first formulated the correct idea, if not the correct model. Newton, closet alchemist, talked about undefined *attractive* forces – but what is really going on are *NET multiversal pushing forces; not stringy, inter-brane, graviton tractor beams*.

Earth only *partially shields* us from pushing, omnidirectional, multiversal yin/yang flows. We are still subject to the full, unshadowed flows from all other directions, yielding an elegant *net force pushing us down to the surface. There is thus no*

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[15] http://newtonslaw.co/third-law-of-motion/

*voodoo traction force pulling us down*, as GR would have it, and certainly no sloping gravity brane funnels.

We are also equally "attracting" the whole Earth. The net force from our direction is very tiny, but of equal power. Only a tiny directional portion of Earth's mass partially shields us from below our feet. In contrast, all of our mass is used to shield the Earth, creating an unnoticeable effect, which is equal and opposite as a net force. Due to their *porous densities*, both the Earth and our bodies only *partially shield* each other from omnidirectional multiversal y/y flows.

The smallest particles currently detectable are EM-neutral neutrinos, at about 10e-24 meters. That's about ten orders of magnitude smaller than atoms. They zip straight through the porous rocky Earth and its atoms. Neutrinos are about fourteen logarithmic orders of magnitude larger than individual EM-neutral yin/yang particles, making y/y penetration of seemingly hard porous masses even easier.

By comparison, humans mostly live at around one meter, which is 14 orders of magnitude larger than atoms – and 24 orders larger than neutrinos, which are themselves 14 orders larger than single y/y particles. Humans are thus about 38 logarithmic orders larger than individual y/y, EM-neutral, particles. (From humans to the whole visible universe is only about 27 orders.)

A low mass/volume ratio gives our bodies *lots of empty space* for the hordes of multiversal y/y particles to simply zip through. Nevertheless, there are enough interactions (but not billiard-ball collisions) among approaching fundamental particles, or from EM interactions, to generate Third Law gravity in both directions.

Things get very interesting as the mass/volume ratio of a large object sharply increases. Consider the strong net gravity of dense white dwarfs, and the even greater net gravity of neutron stars and pulsars – all from *still-partial shadowing*.

Finally, consider the much greater effect from black-hole central masses, so great that the entire Schwarzschild "black hole" functions as if it were part of the central shadowing mass, *blocking/absorbing* the full inflow of y/y photons and other matter, yielding a *full shadow*.

A supermassive black hole's full-shadow region is a very local photon sink. Outside the *Schwarzschild radius*, its black background is just a partial gravity shadow. Stellar masses revolve around and near the partially shadowing black hole as if in a photosphere; and they stay outside due to their centrifugal inertia being stronger than internal centripetal forces.[16]

The supermassive black hole at the center of our MW does have a very small partial-shade "gravitational effect" on us at 26,000 l.y., but nothing like our moon nearby. It's all about how much multiversal flows are weakened by shrinking shadow mass relative to radial distance. Earth's nearby moon may have a greater shadowing effect on us than all the black holes combined.

Do not confuse imaginary tractor-beam, tornado-like vortices with real shadowing effects. Experiments have been underway from Galileo to the most recent "confirmation of GR" with three dense stars. Both the correct and incorrect theories seem to be "confirmed" by GR's correlating math on fairly local cosmic levels.

You can correlatively measure different gravities even with the wrong model, just as long as you understand that GR tractor beam, inter-brane gravity is an illusion; and that GR brane funnels are just plain funny. Here is why it is important to find and disprove the correlative limits of GR funnels beyond some cosmic limits. If you can't correlate/causally explain gravity in all logarithmic dimensions, it is irrelevant.

Push/shadow conceptually works at all distances, except down toward the smallest levels where dominates *Coulombic EM* (C). It

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[16] http://astronomy-links.net/SBH&MV.pdf

is like the math of Newtonian gravity, inversely proportional to the square of the distance. These dual forces allow for a logical continuum from the very smallest dimensions to the outer regions (if any) of the multiverse. Any candidate TOE, and any coherent theory of quantum gravity (QG), would require this dimensional continuum.

# Quantum Gravity

There are *three ways of looking at "quanta."* The first two are either/or, and the third perspective is a hybrid:

[1] The *first* perspective is to classically envision the very smallest elemental particles, likely below the Planck limit of 10e-35 m. Approaching that limit, and going below, one can hypothesize these "quanta" somehow follow classical laws of physics, decreasingly gravitational, and increasingly Coulombic. Planck would not agree with this model.

[2] The *second* perspective is that of quantum theories. Physics is just beginning the second century of QT. It emerged with Planck, Heisenberg, and Einstein, among others. Shortly thereafter, QT morphed from a study of fluctuating tiny particles, Quantum Mechanics (QM) – into Quantum Field Theory (QFT), where particles are virtually irrelevant, and quantum waves rule.

One of the foundations of QFT is the d*e Broglie-Bohm* model of pilot waves in quantum seas.[17] Recently, experimenters at the three global LIGO detectors have wrongly claimed detection of GR wobbly sheet waves. They did detect push/shadow pilot waves, but not GR brane waves. I have written a thesis discussing this fascinating discovery.[18] Here looks like another odd appropriation of QFT by advocates of GR.

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[17] https://en.wikipedia.org/wiki/De_Broglie–Bohm_theory

[18] http://astronomy-links.net/LIGO.and.GR.pdf

QFT experimenters agree that *on larger scales fluctuating quantum effects can smooth out to appear much like classical effects*, starting even among larger molecules. Actual gravity waves that LIGO detected are most likely classically Dopplerian pilot waves, but the idea of QFT helps for perspective. Whatever the final verdict, space may appear to be empty, but is very busy.

QT helps with modeling how a "quantum sea" of yin/yang particles and their combinations will spread out in space as if by Brownian motion to appear to defy competing brane vortices.

*If quantum waves dialectically emerge as classical waves, then which dimensional wave type is primary, and which is secondary?* This is an ontological dilemma requiring different perspectives.

[3] Within the *third* perspective, GR spacetime sheet waves lose out in the "elegance competition" at great distances to push/shadow pilot waves. Once again, "proof" of Einstein's GR is only supposed *a priori*, not proven *a posteriori*.

Without GR being demonstrated as causally consistent at truly great distances, what damage does this do to the idea of dark energy in our universe; and to our post-Big-Bang universe as all that is? Where also does real dark matter fit in, and what is it?

The correct third cosmic paradigm points to the *multiverse*. Think of the multiverse as being *like* an endless bubble bath of emerging and dispersing universes. This heuristic model gets rid of the causative need for either God or magic directing each local universe's big bang. The only gravity working within the full multiverse is modern push/shadow, the parsimonious model not bound to funnel architecture.

Ironically, the very theory that works on the smallest levels also relies on the very largest levels of the multiverse to supply us with the ingredients of a viable quantum gravity (QG) theory. Except for the smallest "quanta," everything else on a larger scale appears to emerge classically.

Furthermore, the best QG hypothesis would rely *BOTH* on the as-if quantum sea of locally dispersed particles in flux, appearing like Brownian motion,[19] *AND* on vast numbers of incredibly small yin/yang multiversal particles zipping around in all 3-D linear directions – without much interference from the sea's equally small, and relatively stationary "quanta" or local field waves.

It is thus not the seemingly static sea of yin/yang particles and particle strings that provides the push/shadow gravity force (which is NOT an inter-branes tractor beam). The massive, multiversal flow from all 3-D directions of interpenetrating, but hardly interacting, yin/yang elements provides omnidirectional and virtually equal gravity push. The granular pushing flows are only locally and directionally weakened by shadowing masses. Empty space is undetectably full, and full of motion.

Strong and equal omnidirectional y/y flows offset each other. That is why a space person floating in a deep "zero gravity" field away from shielding masses will feel like he or she is weightless. Here is why partially shielding masses are needed to offset the overall multiversal push-force symmetry, to give local direction for net flows. We on Earth are like previously "weightless" space men visiting Earth's shielding mass.

This push/shadow paradigm also easily allows for dense *dark matter*, *which mostly is composed of very short, yin/yang photonic strings with extremely high frequencies.* There is much dark matter clustered in the quantum sea, and it does participate in push/shadow net forces. If human technology ever develops the tools to directly detect these very high frequencies from short photonic strings, humans will then directly measure previously unseen "dark" matter.

The push/shadow paradigm also allows for elegant versions of gravity operating across truly immense spaces, without resorting

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[19] https://en.wikipedia.org/wiki/Brownian_motion

to local GR gravity funnels, or to M-theory's 10e500[20] math *universes*. (By comparison, there are "only" about 10e80 very abundant hydrogen *molecules* in our one visible universe.)

*Dark energy is simply accelerating energy/mass in our visible universe which is approaching shadowing distal mass in adjacent universal bubbles.* It is not a separate force. The inter-universal push/shadow net force visually measured by increasingly red-shifted (Doppler) photons is named *Hubble's law*.[21]

Multiple inter-universal shadowing masses surround our own escaping mass from all spherical directions, which is why the *Cosmic Microwave Background* (CMB) looks generally similar from all directions. Each juxtaposed universe within the multiverse experiences its own version of push/shadow expansion, and reception, with nearby universal masses.

It is logical to hypothesize that adjacent bubble universes are also at their most distal regions differentially attracted by net push/shadow effects toward our own and other local universal masses. These numerous two-way dances are how expanding bubbles interpenetrate over many billions of Earth years to seed each other with new energy/mass leading to new big bangs. There is no pure "universe void" in the multiversal bubble bath.

The *multiverse* itself appears *as if* it were the ideal Newtonian 3-D uber-framework, wherein all 4-D relativistic (small "r") universes dwell. Inter-universal elementary particles are small enough to easily penetrate clouds of visible and dark matter. They easily travel in a linear way among adjacent universes, following Newton's *First Law*, that of inertia. They are also the right sizes to interact with each other as dimensional equals. Along with their incredibly vast numbers, they generate perceived net push/shadow gravity at all larger dimensions.

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[20] http://astronomy-links.net/Hawking.legacy.pdf

[21] http://hyperphysics.phy-astr.gsu.edu/hbase/Astro/hubble.html

Activity at the smallest yin/yang dimension also manifests Coulombic electromagnetism (C). Similar to the inverse square formula for gravity, the formula for C shows how EM attraction *radically increases* as juxtaposed elements (10e-38 m diameter) deform in shape, which brings their tiny centers even closer.[22]

With primary EM attractions between juxtaposed yin/yang particles being so strong, extremely long strings of photon-like structures can form and persist. Because yin/yang particles fiercely attached to each other are somewhat elastic, and thus not perfectly spherical (as isolated yin/yang particles would be), they firmly cohere along partially flattened surfaces; not as rigid spheres only touching at a tiny point and thereby smoothly rotating. Deformation leads to spin changes at one string end immediately translating to the distal end. It's like what happens when both ends of a long pole equally spin when one end is turned. This looks spooky.

Emerging physics already has enough measured and theorized components to start building a unified theory. There's plenty of new math polishing work to be had for the physics community. This heuristic thesis is only a start, so there will also be new theory work for the community, outside current comfort zones.

Science must first supersede ideas a century old. Even though humans may never be able to directly detect individual yin/yang particles – we can examine their activity in large collections, such as with atoms and molecules, or even appearing as Bose-Einstein condensates.

To the degree that *composite quanta* are central to quantum physics, we should therefore factor in the much smaller yin/yang *fundamental quanta.*

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[22] http://www.endmemo.com/physics/coulomb.php

# Summary

At the end of the 19th century many people incorrectly thought that physics was nearly complete. After a brilliant 20th century, many comfortably think anew that physics is nearly complete.

General Relativity and quantum theories are operationally not totally incompatible, just incompletely crafted. This essay has shown that key dialectical elements are already at hand for a renewed astrophysics in the 21st century, some of which would be familiar to a modern Newton, Coulomb, and Fatio.

To approach a better unified theory, science can use correlative math as one bridge to causative math. At this point in local time it doesn't matter if experiments temporarily use a wrong theory's correlative geometry to measure causal forces. Society has long used magical formulas to plausibly portray the mundane.

Evolved physics will embrace the *multiversal quantum sea*, within which are inter-universal flows (both linear and in waves) of elementary yin/yang particles, alone and in combinations. This cosmic sea perspective opens the door for a radically improved multiversal version of formerly discredited push/shadow gravity.

Elements of old quantum theories are of modest interest on larger scales, even though they should be helpful in the design of quantum computers and critical security protocols. It is yet to be determined if future top security will be more hardware based, or software based.

Most important will be the emerging unified theory where even the very smallest dimensions are seamlessly joined with the very largest dimensions, and where all valid forces synchronize with each other.