

# *The Flying Spaghetti Monster Is a Mathematician*

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Abstract -

First, some background information from Wikipedia's article "Flying Spaghetti Monster" ([https://en.wikipedia.org/wiki/Flying\\_Spaghetti\\_Monster](https://en.wikipedia.org/wiki/Flying_Spaghetti_Monster)) -

The **Flying Spaghetti Monster (FSM)** is the deity of the **Church of the Flying Spaghetti Monster** or **Pastafarianism** (a [portmanteau](#) of [pasta](#) and [Rastafarian](#)), a [social movement](#) that promotes a light-hearted view of religion and opposes the teaching of [intelligent design](#) and [creationism](#) in public schools.<sup>[3]</sup> Pastafarianism is legally recognized as a religion in [Poland](#),<sup>[4]</sup> in [The Netherlands](#),<sup>[5]</sup> and in [New Zealand](#) - where Pastafarian representatives have been authorized to celebrate weddings and where the first legally recognized Pastafarian wedding was performed in April 2016.<sup>[6][7][8]</sup> In the same month in the [United States](#), a Federal Judge ruled that the "Church of the Flying Spaghetti Monster" is not a real religion.<sup>[9]</sup> The "Flying Spaghetti Monster" was first described in a satirical open letter written by Bobby Henderson in 2005 to protest the [Kansas State Board of Education decision](#) to permit teaching [intelligent design](#) as an [alternative to evolution in public school science classes](#).<sup>[10]</sup> In that letter, Henderson satirized [creationism](#) by professing his belief that whenever a scientist [carbon-dates](#) an object, a supernatural creator that closely resembles [spaghetti and meatballs](#) is there "changing the results with His Noodly Appendage". Henderson argued that his beliefs were just as valid as intelligent design, and called for equal time in science classrooms alongside intelligent design and evolution.<sup>[11]</sup> After Henderson published the letter on his website, the Flying Spaghetti Monster rapidly became an [Internet phenomenon](#) and a symbol of opposition to the teaching of intelligent design in public schools.<sup>[12]</sup>

Now for the science bits I wrote after switching on my computer and learning of the world's first Pastafarian wedding. I had to look up the P word – I was right about the Rastafarian part, but thought the first letters had something to do with Pakistan. A mere 10 years ago, the prophet Bobby Henderson revealed that an invisible and undetectable Flying Spaghetti Monster created the universe. Many people regard the Church of the Flying Spaghetti Monster as a light-hearted look at religion. But since the prophet has stated that "the only dogma allowed in the Church of the Flying Spaghetti Monster is the rejection of dogma", more serious speculation is also permitted. This includes the Mathematical Might of the Monster – an attribute bestowing Monster-ous SubGenius such that this world (especially its "enlightened" science journals) cannot imagine or acknowledge.

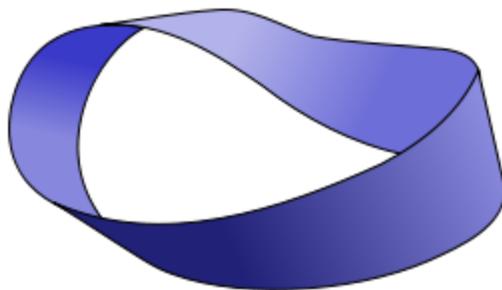
Content -

In order to create the universe, the Monster draws on mathematics' topology, or rubber-sheet geometry. The topology takes the form of electronics' binary digits (1's and 0's) composing 2 Möbius strips which are united into a figure-8 Klein bottle constituting a "sub"universe. The encoding of infinitely-long irrational and transcendental numbers like pi, e,  $\sqrt{2}$  by the digits produces an infinite series of sub-universes (an infinite universe).\* And other subs can naturally affect our own 13.8 billion-year-old subcosmos. ("Our Mathematical Universe" by cosmologist Max Tegmark – Random House/Knopf, January 2014 believes the universe has a mathematical foundation).

\* For what I see as potential support for this maths, I thank "The origins of space and time" by Zeeya Merali ("Nature" 500, 516–519: 28 August 2013) which supplied the info that Rafael Sorkin, a physicist at the Perimeter Institute in Waterloo, Canada postulates that the building blocks of space-time are simple mathematical points that are connected by links. He calls his theory Causal Sets.

Binary digits are proposed to be the Hidden Variables which "are an interpretation of quantum mechanics based on the belief that the theory is incomplete and that there is an underlying layer of reality that contains additional information about the quantum world. This extra information is in the form of the hidden variables, unseen but real quantities. The identification of these hidden variables would lead to exact predictions for the outcomes of measurements and not just probabilities of obtaining certain results." ("Quantum" by Manjit Kumar - Icon Books, 2008 - p. 379)

String theory – the best known hypothesis of modern physics searching for the universe's Theory of Everything - says everything's composed of tiny, one-dimensional strings that vibrate as clockwise, standing, and counterclockwise currents. We can visualize the so-called Virtual Particles that fill all space and are really pulses of energy. We can visualize them generating tiny, one dimensional binary digits of 1 and 0 (base 2 mathematics) that form currents in a two-dimensional program called a Mobius loop – or in 2 Mobius loops, clockwise currents in one loop combining with counterclockwise currents in the other to form a standing current. (The curving of what we call space-time sounds very strange, but I think it can actually be explained by modelling space-time's construction on the Mobius strip that can be represented by giving a strip of paper a half-twist of 180 degrees before joining its ends.)

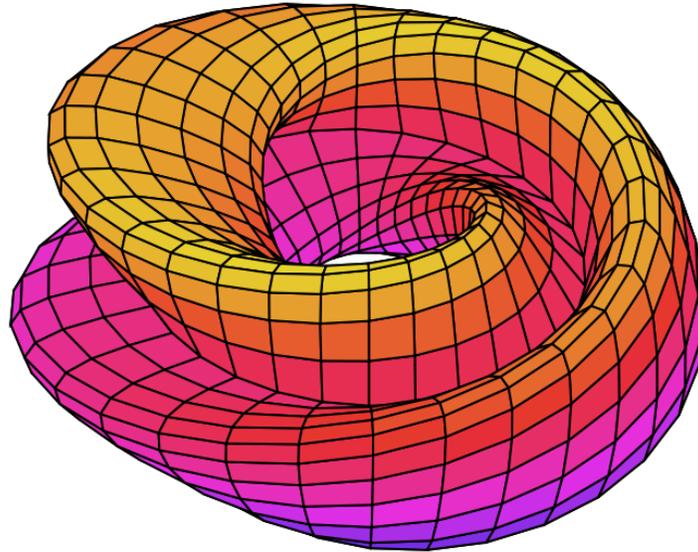


**Möbius Loop**

(source:

[http://www.polyvore.com/mobius\\_strip\\_public\\_domain\\_clip/thing?id=72360021](http://www.polyvore.com/mobius_strip_public_domain_clip/thing?id=72360021))

Joining two Mobius strips (or Mobius bands) forms a four-dimensional Klein bottle  
(<http://plus.maths.org/content/os/issue26/features/mathart/index>)



**Figure-8 Klein Bottle**

(source:

<http://commons.wikimedia.org/wiki/File:KleinBottle-Figure8-01.png>)

And each Klein bottle can become an observable (or "sub") universe (figure-8 Klein bottles resemble spiral galaxies, and appear to have the most suitable shape to form subuniverses). This connection of the 2 Mobius strips can be made with the infinitely-long irrational and transcendental numbers. Such an infinite connection translates into an infinite number of TANGIBLE figure-8 Klein bottles which are subuniverses. They're tangible because the numbers result from the presently theoretical virtual particles making up the universal gravitational field (gravitons). The gravitons also help compose matter in partnership with electromagnetism's photons – see reference below to Einstein's paper "Do gravitational fields play an essential role in the structure of elementary particles?" The infinite numbers make the cosmos as a whole\* physically infinite, the union of space and time makes it eternal, and it's in a static or steady state because it's already infinite.

\* That is: the cosmos beyond our 13.8-billion-year-old subuniverse, which is apparently expanding from the energy of virtual particles becoming spacetime or matter, and displacing parts of the universe beyond (in about the middle of last century; Fred Hoyle, Hermann Bondi and Thomas Gold calculated that maintaining a "steady state" where the universe is constantly roughly the same on the largest scales only requires the mass of one hydrogen atom to be added [from electronically-generated virtual particles, it turns out] in each quart of space every half-billion years ("The Universe" by Life Nature Library - Time Inc. 1964, p.175). In space, the energy of weak gravitational waves combines with the  $10^{36}$ -times-stronger energy of electromagnetic waves to make mass.<sup>^</sup> In reference to the remainder of this paragraph, please see ^^ - Translation into matter could be via photons of electromagnetic waves and gravitons of gravitational waves being disturbances in electromagnetic and gravitational fields. These disturbances are known as virtual particles and are equivalent to energy pulses that produce the

binary digits of 1 and 0 encoding pi, e,  $\sqrt{2}$  etc. Matter particles [and even bosons like the Higgs, W and Z particles] are given mass by the energy of photons and gravitons interacting in "wave packets" (interaction within this term from quantum mechanics results in wave-particle duality).

^ Albert Einstein's "Spielen Gravitationfelder in Aufbau der Elementarteilchen eine Wesentliche Rolle?" (Do gravitational fields play an essential role in the structure of elementary particles?), Sitzungsberichte der Preussischen Akademie der Wissenschaften, (Math. Phys.), 349-356 (1919) Berlin.

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^^ - The gravitational field can create electromagnetism, and their interaction produces matter (along with its short-range strong and weak nuclear forces). Step 1 can be described this way - gravitational waves may be called quadrupole because they vibrate in 4 directions: up-down, side-to-side, forwards-backwards, and in time (the progress of the first 3 motions). Then the wave is split into a dipole electromagnetic wave which, if viewed in a snapshot of space (as stationary), only vibrates in two directions: the up-down of one component, and the side-to-side of its other component (the components are electrical and magnetic). The smallest excitations of electromagnetic and gravitational waves - the photon and the theoretical graviton - could then interact in Erwin Schrödinger's "wave packets" to give matter Wave-particle Duality.

There are two problems with wave-packet theory, according to "Quantum" by Manjit Kumar (Icon Books, 2008, pp.215-217). The solution to both appears to reside in the unification of space-time and its contents by gravitation. That is - by the gravitational field creating electromagnetism, their interaction producing matter and the 2 nuclear forces, and the motions of particles being what we call time. First, waves would spread out to such a degree that they'd have to travel faster than light in order for experiments to connect them with detection of a particle-like electron. Possible solution - this is only a problem if things are actually separate. Modern understanding of quantum entanglement suggests that distance and travel faster than light are inconsequential in a universe where gravitation unites electromagnetism, matter and time into one thing. Second, applying Schrödinger's wave equation to helium and other atoms led to an abstract multidimensional space that was impossible to visualize. Possible solution - "Physics of the Impossible" by Michio Kaku (Penguin Books, 2009) states on p.276, "When we solve (19<sup>th</sup>-century Scottish physicist James Clerk) Maxwell's equations for light, we find not one but two solutions: a 'retarded' wave, which represents the standard motion of light from one point to another; but also an 'advanced' wave, where the light beam goes backward in time. Engineers have simply dismissed the advanced wave as a mathematical curiosity since the retarded waves so accurately predicted the behavior of radio, microwaves, TV, radar, and X-rays. But for physicists, the advanced wave has been a nagging problem for the past century." Albert Einstein's equations say gravitational fields carry enough information about electromagnetism to allow Maxwell's equations to be restated in terms of these gravitational fields. Therefore, gravitational waves also have a "retarded" wave and an "advanced" wave. They can travel forward or backward not only in space, but in time too. Believing matter results from gravitational-electromagnetic interaction means matter can also go back and forth

in time. In 3 dimensions; an object has length, width and height at right angles to each other. To enter the 4th dimension and go back or forward in time; we must travel perpendicular to length, width and height - all at once. Going forward in time has always been a reality - by simply living, we go forward one day every day. So reality and the universe are multidimensional, even though only 3 dimensions can be visualized.

Extra questions - 1) How could a wave packet possess electric charge? By quadrupole gravitational waves that vibrate in 4 directions being split into dipole electromagnetic waves that vibrate in 2 directions, and one component of the latter wave being electrical. 2) Could wave mechanics incorporate quantum spin? There are 2 forms of spin - classical (e.g. a rotating top) and quantum. The latter can't be explained classically but may possibly be explained by particles and space mutually affecting each other. According to General Relativity, matter causes a gravity field by its mass creating depressions in space that can be pictured as a flexible rubber sheet. Space could affect particles through its curvature (gravity) infiltrating particles, thus giving them quantum spin. 3) If the wave function doesn't represent real waves in 3-dimensional space, what does it represent? Not the probability of a particle being in a certain position, but complex waves in 5-dimensional space. Visualize space-time as a sphere defined by a horizontal diameter, a vertical diameter, and a third diameter that's perpendicular to both of these. These represent the cardinal directions gravitational waves can travel. One direction along the horizontal axis corresponds to going forwards in time but any direction in space, and is called "real". The reverse direction along the horizontal axis corresponds to going backwards in time but any direction in space, and is called "complex". The vertical axis represents the "imaginary time" described by the imaginary numbers of physics. The terms real, imaginary and complex come from the corresponding numbers in maths. And the 3rd diameter may allow sideways movement in time - to complement forward motion in time, backward motion, and up-down movement in imaginary time. Even if a computer operated continuously for billions of years in either imaginary or sideways time, its final calculations would be retrieved instantly after the problems were entered into the computer because no period at all could elapse in our "real" time - a computer working in complex time delivers results at any desired point in the past. Since space-time includes infinitely-long numbers like  $\Pi$  ( $\pi$ ), the sphere of space-time must be extended infinitely - meaning the universe would literally go on and on forever (not merely in terms of space but into the past and the future).

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For the note below on the figure-8 Klein bottle, I refer to – a) Bourbaki, Nicolas (2005). Lie Groups and Lie Algebras. Springer b) Conway, John (1986). Functions of One Complex Variable I. Springer c) Gamelin, Theodore (January 2001). Complex Analysis. Springer d) Joshi, Kapli (August 1983). Introduction to General Topology. New Age Publishers e) Spanier, Edwin (December 1994). Algebraic Topology. Springer

Informally - if an object in space consists of one piece and does not have any "holes" that pass all the way through it, it is called simply-connected. A doughnut (and the figure-8 Klein bottle it resembles) is "holey" and not simply connected (it's multiply connected). The universe appears to be infinite (more info in "Infinite Universe" by Bob Berman - "Astronomy", Nov. 2012), being flat on the largest scales and

curved on local scales (from far away, a scene on Earth can appear flat, yet the curves of hills become apparent up close). A flat universe that is also simply connected implies an infinite universe [Luminet, Jean-Pierre; Lachi`eze-Rey, Marc - "Cosmic Topology" - Physics Reports 254 (3): 135–214 (1995) [arXiv:gr-qc/9605010](https://arxiv.org/abs/gr-qc/9605010)]. So it seems the infinite universe cannot be composed of subunits called figure-8 Klein bottles (flat universes that are finite in extent include the torus and Klein bottle).

But gaps in, or irregularities between, subuniverses shaped like figure-8 Klein bottles are "filled in" by binary digits in the same way that computer drawings can extrapolate a small patch of blue sky to make a sky that's blue from horizon to horizon. This makes space-time relatively smooth and continuous - and gets rid of holes, making these types of Klein subunits feasible. The Klein bottle is a closed surface with no distinction between inside and outside. There cannot be other universes outside our infinite and eternal universe – there's only one cosmos.

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