

# The Dium TOE Model of LIGO Detected Gravity Waves

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September 6, 2021, Patrick Rael, -Director

In the [Dium TOE](#) space is a continuous natural dimension object. Space is generically named dium for the contraction of dimension-ium. Specifically, tridium is 3-space. One of the properties of tridium is that it can stretch. However, the stretch is not constrained by the properties of discrete atomized objects which connect to each other and have breaking points. A balloon is such a discrete atomized surface where stretching beyond a certain limit by filling it with air will cause a compound to break and trigger a chain reaction tear and the balloon pops. Continuous natural dimension has no breaking point limit to stretch. Tridium has a resistance to but no limit to stretch. Tridium can stretch to infinity due to its continuous property.

Lets explore the stretch property of the tridium further. In the Dium TOE mass is like a pinch compression of tridium at the center. That higher centralized compression borrows from the surrounding volume causing that surrounding to be at lesser density of dium. The farther away from the center pinch, the less is borrowed. Illustrating this as the ubiquitous ball on a 2-D rubber sheet is conceptually similar. A better analogy would be to exclude the ball and instead pinch the sheet to higher compression while leaving it flat, then freeze that pinched center with liquid nitrogen to cause it to remain compressed, leaving the surrounding area pulled tighter. A grid of lines will show the pinch stretches the lines inward to the pinched center. This is warped space. This is analogously closer to how 3-D tridium is, a higher compressed central volume surrounded by lesser density volume all around it.

If two objects of mass  $M$  and  $N$  aggregate, their combined mass is  $M+N$  under additive rules. But if the aggregation is going to release mass, such as in annihilation or if the black hole(s) and neutron star(s) will lose mass in their union, then the release of mass is a 3-D outward flow of tridium as the tightness of space is allowed to become less tight. This is like the rubber 2-D sheet with a frozen spot of higher compressed sheet, and the frozen spot is melting, releasing the compressed sheet of rubber. Upon final melting of that spot, the rubber sheet space has returned to normal smoothness with no gravity dimple compressions. Similarly if two rotating black holes are going to combine with mass less than their sum, the difference is the amount of tridium (space) that will be freed to allow space to become less stretched. This un-stretching travels outward from the center as a longitudinal wave of space re-normalizing to less stretch. This is not a transverse wave. After the wave has passed, space has normalized to less stretch than before. This difference before and after should be detectable.

This is not a peer-reviewed article. The Intractable Studies Institute solves intractable challenges and doesn't wait for others to catch up. Any objections that space is not an object should first consider that LIGO has confirmed gravitational longitudinal compression waves of space. That space which transmits the gravitational wave is the continuous natural dimension of the Dium TOE. The Dium TOE pre-dates the LIGO discovery. The Dium TOE is the product of 24 years of side-effort, 1990-2013.

The Institute is at the leading edge of Theoretical Physics using the Dium TOE to solve Gravity Waves and exactly what gravity and mass are. This is an intractable challenge which is perfectly suited for the Intractable Studies Institute to solve. See the Dium TOE and [On Applying the Dium TOE](#) Communications of the Intractable Studies Institute for more details.

# Appendix

When the word “natural” is used as an adjective to dimension that distinguishes it from the well known “abstract” dimensions of algebra and the Cartesian Plane. Whereas abstract dimensions spring into existence to plot 2 or more variables of data, the natural dimension 3-space volume that we exist in is not a dimension springing into existence to satisfy a plot of 3 or 4 variables. Natural means it exists in nature. In this case it is not merely a thing in nature like a rock, but a Dimension Type of object which is continuous and has extents and can contain other non-dimension type objects like particles, elements, compounds and rocks, etc.

The phrase “3-space” assigns the number of dimensions of the natural dimension, establishing volume. It is not merely 3 single 1-dimensional lines that intersect on graph paper as abstract dimensions do. It is a volumetric dimensional type object. The term “tridium” is the contraction of tridium or 3-dium, aka 3-space.

The word “continuous” means that while the dimension is extended, that extension is not a collection of discrete objects when zoomed into it infinitely. It means there is no lower limit of continuity. An example of a lower-limit is the Planck scale in Quantum Mechanics which by definition is discrete. But continuous natural dimension has no lower limit of continuity. The continuity is infinite “in the small”. This is outside the bounds of atomic principle theories which are discrete.

Comparing continuous to discrete is somewhat but not entirely analogous to the comparison of the abstract Mathematical real numbers and whole numbers. The real numbers are continuous. They have no lower bound where they stop being smaller. There are always smaller real numbers. Alternately, the whole numbers are discrete. Each chunk of whole number is the size of 1 unit larger than the previous and 1 chunk smaller than the next. The chunks do not get smaller. Fractions belong to the real numbers. Real numbers contain the whole numbers entirely, and so does the continuous tridium analogously contains discrete models like Quantum Mechanics.

The Dium TOE began from a blank slate without even dimension assumed. Then it declared what natural dimension is and its properties. In this sense the Dium TOE is very distinct from the Standard Model and Quantum Mechanics. Furthermore, the Dium TOE is a [Reality-Class](#) model because it addresses directly and initially what natural dimension is. The alternative Predictor-Class models don't address this but instead are extremely useful at predicting how much will happen, but not what is. Often in Predictor-Class models it is meaningless to ask what is something, but instead calculate the values to predict the measure of something. Only a Reality-Class model such as the Dium TOE can answer “What is natural dimension made of?”.

In the Dium TOE, mass of a particle is described as a kind of “pinch” or “dimple” but ultimately is a compression of natural dimension 3-space. If the inner compressed region holds the compression then it is a static dimple. If the inner compressed region oscillates from higher density than surrounding region to lower density and repeating, then it is a dynamic dimple. The non-neutrino fermions (quarks and leptons) of the Standard Model are static dimples with constant mass. Neutrinos oscillate in their dimple warp and thus have dynamic mass. They oscillate across all three generations of matter.

Whether static or dynamic, as long as the compression does not involve a twist of space, then there is no charge.

In the Dium TOE, charge of a particle is described as a “twist” of tridium. The exact shape of the twist is not provided here. The twist cannot have a compression of tridium, else charge would give rise to mass. A static twist of dium is where the twist is non-changing. If the twist oscillates from twisting one way and then rebounding back across neutral to the other way and repeating, that is an oscillation such as the electromagnetic wave. The EM wave twist doesn’t compress tridium anywhere and thus has no mass warp of space. The shape of the twist is such that it can have an opposite shape to account for positive and negative charge. Fractional charges may be the amount of twist and/or other properties of the shape of twist. Finding the exact shape(s) of twist charge would make good research projects at CERN, Fermilab and/or LIGO.

The mechanism that determines static versus dynamic oscillating dimple warps and twist charges of dium isn’t fully determined yet. The difference between the two is one is static and unchanging and the other is dynamic and oscillating. One can speculate that static is somewhat like frozen in time, the other isn’t. It’s possible to interpret that literally as the static form of the warp and charge as being anchored just beyond the leading edge of the time also known as the dynamic Now in the Dium TOE. History, aka Chronodium in the Dium TOE, is static so it’s a well known source of unchanging property. Alas, there is one change that static warps and charges can experience to transition and that is annihilation of matter and antimatter particles of same mass and opposite charge. The twists undo to neutral untwisted space and the warps unwarps to neutral smooth space. However, annihilation is exceptional and existential to the particles; it’s during the existence of the particle that is in question and whether during that time it is static or oscillating so annihilation shouldn’t necessarily except this line of speculation. This is TBD and would make good research projects at CERN, Fermilab and/or LIGO.

What is wrong with the rubber-sheet-ball model of gravity? First, 3-space is dimensionally reduced to 2-space rubber sheet but the ball is 3-D and it is pulled downward into the rubber with gravity in 3-space. That model as an analogy has many flaws. Instead, the Dium TOE models gravity and mass as a compression of 3-space, higher compression at center and surrounding space stretched to lesser compression. This can be modeled in the dimensionally reduced 2-space rubber sheet as a pinch compression of the space sheet but keep the sheet flat. Then conceptually freeze that compression to static state with liquid nitrogen. In this example liquid nitrogen is the means to freeze the rubber sheet, but in tridium it isn’t temperature that freezes the higher inner compressed space. This Dium TOE model is outside the bounds of Science, having avoided peer review to think freely without constraint.

The Dium TOE is very different from prior models of Physics, but only in that it defines a new lower Baseline of reality. That baseline is continuous natural dimension object of type Natural Dimension. The Dium TOE starts with a single 3-D Volume object with time progression as the entire universe, with several phases and properties including oscillations, stretch, compression, twist, flow, etc. As a lower baseline of reality, it allows higher level models like discrete Quantum Mechanics to layer on top of the baseline. Proving or refuting the Dium TOE and discovering evidence pro and con could involve thousands of physics researchers at CERN, Fermilab and LIGO for decades.