Foreword

1 BOOM!

Here it is,finally, at long last... a unified field theory, a Theory of Everything... a ToE...

Cassiopeia's Toe.

I started this quest more than a decade ago. Einstein has always been at the top of the list of people I would designate as my heroes.. I have studied his amazing successes, especially in General Relativity. But, more than that, I have admired his method. He would sit and think and VISUALIZE. And I think that is something that modern physics has lost. There is no longer an attempt to visualize the problem or the solution. If the math works, it doesn't matter that it makes no sense in the physical world. Outcomes are all that matter. Observables erase the importance of what lies beneath.

So...Modern Physics has two particularly brilliant and particularly unruly "children". And worse, they don't like each other. Throw in Cosmology, and make it three. They don't get along. There are infinities everywhere that make the math questionable as to how it represents the real world. I have solved it... ALL OF IT.... reconciled the "children" and made them behave. I have looked beneath the bad behavior and found the prickly thorn... and I removed it.

ALL of the equations, all of the successes, all of the amazing work is preserved in this new work. GR still holds, Maxwell's equations, Shroedinger's Equation, the Standard Model, Quantum Field Theory, Lambda-Cold-Dark-Matter... all still in play. As a matter of fact, I can DERIVE THEM ALL from the new model. Infinities are gone, the need for Renormalization, gone, Singularities, gone. Physics makes sense again.

John Archibald Wheeler was another of my heroes. A lifetime ago, I read his work "Geometrodynamics". And though it proved to be unsuccessful, it was the beginning of my lifelong search to make the geometry of space, the topology, perform the same magic in the world of the tiny that it does in the world of the huge. At the same time, I wanted the world of the huge to have a more fundamental basis than it does. It started with this idea...

If space can be bent, then it must have a structure.

Wheeler, was the first to use the term "quantum foam". He imagined that if we looked at tinier and tinier and tinier scales of "space", that it would

have structure... dynamic bubbles and wormholes, and perhaps would even be multiply connected. I have taken his raw idea and discovered how it can be used to describe EVERYTHING we see in the universe.

I imagined (as have many others) that space was composed of tiny segments and if there is a tiniest segment, then we can say that space is quantized. Max Planck did the calculations based on measured physical constants to quantify that size. There is a smallest time as well. I took Planck's smallest volume of space and designated it the quantum of space. Then I assumed that, like Wheeler, there were no permanent connections between these quanta of space. I took Wheeler's wormholes and said "what if"... what if wormholes, dynamic ever changing wormholes, are the only connections between these tiny space quanta?

After a few years of developing a qualitative model, I decided to try and treat these dynamic wormholes with Statistical Mechanics... the same stuff that Thermodynamics uses to take averages over trillions of molecules to get emergent physical laws. AND guess what... out popped General Relativity. Excited and scared I tried Coulomb's Law, then Ampere's and then Maxwell's Equations. That success was followed by QED (Quantum Electro-Dynamics). I got gauge fields and U(1) X SU(2) X SU(3). I got it ALL. And there is no need for String-Theory and extra (unseen) dimensions. There are no self-inflicted infinities that need to be "Renormalized". There are no Singularities that blow theories up.

But here's the rub, nobody with "important eyes" will take the time to look at the successes and ask, "Can this be right?" Throughout, there are tiny, subtle variations that could be tested — YES, it is testable. It makes predictions about EVERYTHING. o ... there is only this website — currently it is the only vehicle I can think of to share this IDEA... perhaps the last GREAT IDEA I will have in my lifetime.

The website is organized into the rigorously mathematical physics, the slightly less technical and more descriptive parts, and, where I can afford to make images and videos, those too.

Oh, and recently, I have asked additional hard questions of my model (Foam-Plexus / Cassiopeia's ToE). I have asked what is mass, what is charge, why is there CP violation, and more. And, guess what? The model has potential answers for those questions as well. It is all in the geometry that arises when we apply statistical mechanics to the quantum foam.