

**STRING EXTENSION IN APPLYING TO FIELD THEORY (LEGO-STRINGS-BRICKS)*****Lie Chun Pong**Received 18th October 2025; Accepted 27th November 2025; Published online 26th December 2025

Abstract

In this paper, we utilize string theory as an integral framework to bridge the conceptual gap between field theory and spacetime extension. Our hypothesis posits that the fundamental constituents of matter can be re-envisioned as tiny vibrational dimensional strings, which serve as the basic building blocks of the universe. By conceptualizing these entities as analogous to LEGO string bricks, we propose that the universe is constructed from vibrational modes of these strings, whose oscillations give rise to the elementary particles observed, such as electrons, quarks, and their associated fields. In addition, this research adopts string theory as a foundational hypothesis to derive a corresponding string-based mirror (magnetic) field, positing that such a field is intimately related to string-like particles functioning as dual entities within a wave-particle duality framework, thereby contributing to a deeper understanding of the unified nature of fundamental "Lego-field" interactions, causing Lego-Strings-Bricks, to build up with & fill up the universe.

Keywords: StringExtension, Field landscape, "Lego-field" interactions, "Lego-String-Bricks".

INTRODUCTION

In classical and quantum field theory, a field assigns a specific value either a classical scalar or a quantum probability amplitude to every point in spacetime, thus describing point-like excitations. In contrast, string theory departs from point particles, as its fundamental excitations are defined over extended dimensional objects, or strings, which can transform in multiple modes.

Physicists [1] [2] [3] employ compactifications on different Calabi-Yau four-folds to explore various classical solutions in the string theory landscape. Each vacant space within a Calabi-Yau corresponds to a set of low-energy modes of strings. Our hypothesis is that, if there are three such spaces, they will give rise to three groups of vibrational patterns and, consequently, three sets of layers of extra-space. String vibrations influenced the shape of these compact dimensions and, thus, the characteristics of the layer's pattern of space will be developed.

Also, the masses of elementary particles' frequency are dictated by how the internal cycles and singularities within a Calabi-Yau manifold intersect and interact, so the intersection pt may represent time. These intersection patterns significantly affect particle properties, including mass spectra and coupling constants. Additionally, the concept of Calabi-Yau Algebra extends the traditional geometric framework of Calabi-Yau manifolds into noncommutative algebraic geometry, offering a solid foundation to describe complex string compactifications and their moduli spaces. We assume that the hybrid string theory emerged from the first superstring evolution, involving the merging of two closed strings vibrating in different directions. The string undergoing clockwise vibration can be modeled as vibrating within a nine-dimensional target space, whereas the anti-clockwise vibrating string is conceptualized as oscillating within a twenty-five-dimensional manifold. Although the framework incorporates a unification of twenty-six-dimensional bosonic string theory in spacetime and ten-dimensional fermionic string theory in spacetime, with a composition limited to purely oriented, closed string

configurations, this theoretical construct provides a mechanism for explaining gauge symmetry manifestations resulting from compactification processes and the emergence of solitonic structures on toroidal compactifications. We assume that low-energy effective field theory corresponds to type I string theory, specifically $SO(32)$, also known as O-type heterostring, which exhibits 32-dimensional rotational symmetry and shows T-duality with E-type heterostrings and S-duality with I-type strings. This means that when the coupling constant of O-type heterostrings exceeds 1, the coupling constant of I-type strings is less than 1, and vice versa. In this research paper, we call this relationship "Mirror-String-field-interaction-duality."

A coupling constant below 1 suggests that the perturbation method is appropriate. Additionally, the compact space radius of O-type heterostrings is $1/R$, which can be equivalent to the theory of the compact space radius R of I-type strings. Our duality assumption can be applied to and integrated into spacetime dimension extension with different geometry and is known as "large/small radius duality." These dualities can be extended into the $E8 \times E8$ (E-type heterochord) spacetime manifold, which can be supported by Calabi-Yau models [3][4], and can cooperate with the $E8$ Lie group within the exceptional group, having a T-duality relationship with O-type heterostrings, as well as a U-duality relationship with M-theory, which can be seen as a correspondence between 9 and 11 dimensions. So, in our paper, we can call it a "Lego-String-Field" building block to represent the extension of the spacetime.

In further supporting our basic assumption, we quote Physicists [1][2][3][4] development to be a classical analytical representation of the Euler-Beta function and tree-level string scattering amplitudes grounded in quantum field theoretical frameworks. These formulations are meromorphic with singularities confined to discrete poles and incorporate contact interaction terms analogous to those encountered in quantum field theory.

So, our research produced new parametric integral representations of the Riemann Zeta function and the constant

pi, inspired by quantum field theory techniques, which demonstrate rapid convergence properties and enhanced analytical tractability. Which of these parameters of the constant can be well supported and applied to our new innovative “Lego-Strings-Brick.”

Our goal is to modify the hybrid string theory using "Lego-String-Bricks" that can connect and act as a bridge for expanding the field of universes through imaginative numbers that fit into the spacetime extension. These bricks truncate the expansion of string theory amplitudes up to a specific mass level to capture the essential features of the string amplitude. This represents a significant departure from the behavior of quantum field theory (QFT) amplitudes, as string theory amplitudes show Alpha behavior can be develop exponentially by soft high-energy behavior scattering.

DISCUSSION

Our new innovative systematic development and truncation of the string's mass spectrum while potentially preserving the full range of string-theoretic properties and symmetries. Our approach (Lego-Strings-Bricks) which we call it as a (Lego-Strings-Field) makes it easier to explore effective field theories that capture string dynamics at specific mass levels, providing a valuable computational framework. This allows our innovative assumption of the “Lego-strings-brick” to build up our universe's spacetime, focusing on the most important aspect of extension, where it interacts with the field and becomes the field. Additionally, a quantum field theory-like representation is its potential to clarify string phenomena within the modern S-matrix bootstrap program, emphasizing principles such as analyticity, unitarity, and crossing symmetry. We suggest that advanced numerical bootstrap methods can be used to approximate or directly incorporate contributions from higher mass excitations in the string spectrum, opening up promising opportunities for non-perturbative research and a deeper understanding of string physics. In our research paper, we propose the use of the methodology to establish a “Strings Space model”, specifically a superstrings connector model. Our new innovative model encompasses single, double, and triple integrals of strings, extending to contour, surface, and volume integrals on a 6+5 dimension manifold can be transform to 6*5 dimension by vibration folding extension (folding fan), representing the Kaluza-Yau model dimension and KK model dimension.

Our Innovative Model (Mirror String Field World)

So, in this research paper we suggested to utilise our innovative methodology concept as a means to derive an Strings Space model, that is, superstrings connector mode $\int \text{Strings} \int \text{Strings} \int \text{Strings} - \text{to} - \text{extent} \oint \text{Field} \oint \text{Field} \oint \text{Field}$. (like the basic music form of Do, Re Me, fi, So five basic music element) to manifold of 6*5 dimension, that is Kaluza-Yau model dimension+ KK model.

Our new innovative concept is well supported and can be compatible by the anti de Sitter model. According to the anti de Sitter model of assumption, no matter if it is triangular, rectangular, or circular in the curvature manifold, it is the same kind of membrane that is connected. So, we introduce a mirror magnet string effect assumption as an innovative mirror string field concept idea. Using our mirror assumption, we may apply the polishing concept to string theory to develop different

layers of fields in which the strings can be united as a mirror field connected to the space net. This can be explained as a complement by the relativity and gravitational assumption approach, which is, the mirror strings field wall of connectors.

In this research paper, we employ the determinant of a matrix as a singular numerical value for explanation. This value is instrumental in the computation of the matrix's inverse and in the resolution of systems of equations. The determinant of an inverse mirror matrix, denoted as |j| or alternatively as det(j), will be a focal point of state.

Our Innovative Uniform mirror-string approach, with the affine parameter's connection with the field

Let,
 $N(\varphi) = \det(\bar{g}_j + \varphi \bar{j}) \cdot \det(\bar{g}_j)$
 If,
 $dx \, dy (\ln \det(\bar{g}_j + \varphi \bar{j}) + \varphi \bar{j}) - \ln \det(\bar{g}_j) - \eta) = 0$
 then when,
 $\det(\bar{g}_j + \varphi \bar{j}) = e$
 $(\omega + dy \, dx \, d\varphi) = e \, \omega$

Since $(\omega + dy \, dx \, d\varphi)^n - \omega^n$ is exact, from Stokes' theorem we infer that the constant c is uniquely determined. Therefore, solving the Calabi conjecture is equivalent to solving the following Dirichlet problem for the complex Monge-Ampère operator on M. In order to find a Kähler-Einstein metric on M, we need to find a suitable solution (i.e., $\omega + d\bar{d}\varphi \geq 0$) for the equation (for some constant c). If $c_1(M) = 0$, then $\lambda = 0$, and the solvability is guaranteed by a theorem. If $c_1(M) < 0$, we can solve the equation in a similar manner. In fact, the uniform estimate for $\omega + d\bar{d}\varphi$ with $\lambda < 0$ is very important: $(\omega + d\bar{d}\varphi) = V, Mc + \eta \det(\bar{g}_j)$. Consequently, we will modify this approach by introducing our new assumption when applying the integrated strings mirror.

We will make use of the theorem of chain rule. We know that in the context of mirror strings field assumption, if $XY=YX$, then $dx \, dy + dy \, dx = 0$.

$\oint dx \, y, dy \, x \, \oint dV = \oint y \, x \, ddx \, y \, \oint dV$, in our innovative Mirror Manifold

When equivalent to mirror strings, we have equality strings mirror reflection as,

$\text{String}^* \text{String}^c + \text{String}^c * \text{String}^* = 0$
 $S^* S^c + S^c * S^* = 0$

Which is similar the concept of Calabi conjecture in $M \, R \, \omega$ manifold assumption,

As a compact manifold of dimension $n \geq 2$ and ω a Kähler form with local potential gravativity pt of estimate.

When, strings evolve to the field,
 $\int \text{Strings} \int \text{Strings} \int \text{Strings}$

Then, when the strings integrate it become field,
 $\text{to} - \text{extent} \oint \text{Field} \oint \text{Field} \oint \text{Field}$

When field extent the scope of magnitude, it will become a manifold R. (R mirror dimension-space) $R \oint R \oint R \oint$

In the 3D projection of Calabi-Yau manifolds, a Calabi-Yau n -manifold is defined as having an $SU(n)$ holonomy or a globally non-zero holomorphic $(n,0)$ -form. In the one-dimensional case, the only example is the torus family. The metric of Ricci flatness on the ring is a flat metric, making the holonomy a trivial group ($SU(1)$). In the two-dimensional case, the T4 and K3 surfaces are the only instances. The T4 is sometimes not classified as a Calabi-Yau manifold because its harmonic group, a trivial group, is a subgroup of $SU(2)$ rather than isomorphic to $SU(2)$. On the other hand, the K3 surface has the entire $SU(2)$ as its harmonic group, making it a true 2-dimensional Calabi-Yau manifold.

In the state of string theory applications, the classification of potential Calabi-Yau manifolds in the complex three-dimensional case remains an unsolved problem. One example of a 3D Calabi-Yau manifold is a non-singular quintic hypersurface in complex projective space CP^4 . These manifolds are important in the context of superstring theory and compactifications of Calabi-Yau n -manifolds preserve some of the original supersymmetry from being broken. Specifically, the compactification of the Calabi-Yau 3-manifold (real dimension 6) preserves a quarter of the original supersymmetry.

This research paper suggested that 5+6 dimensions can be further expanded to the 5*6 dimensions, with our new Lie-Yau model + Calabi-Yau KK model being familiar. When the theory is compactified on Calabi-Yau n -folds, some of the original supersymmetry is preserved in models called flux compactifications, implying that it may derive an extra dimension potential if under the symmetry assumption. By our innovative Mirror-Strings-Field assumption, in M-theory, physicists use compactifications on various Calabi-Yau to find different classical solutions in the string theory landscape. The shape of the compact dimensions affects the vibrations of strings and the properties of particles can be observed. Therefore, it can support our innovative mirror strings concept that can apply to the different field, and can show that the matter of particles are influenced by the way in the different curvature in a Calabi-Yau that may derive an extra intersect, like the loops which may affect all particle properties including the dimension itself. So, in this research paper, we propose to extend the geometry of a Calabi-Yau manifold with the effect of the loop to create an extra dimension that can bridge the gap with the commutative society as well as the noncommutative algebraic geometry society. This innovative concept of idea, we call "Lie-Yau Stings-Field Model."

Furthermore, by utilizing the properties of wedge powers, we can illustrate the triviality of a concept. When constructed from algebraic surfaces, the total space of the canonical sheaf for an algebraic surface forms a Calabi-Yau threefold. An illustrative example of this is projective space. In superstring theory, Calabi-Yau manifolds represent shapes that satisfy the spatial requirement for the six "unseen" dimensions of string theory, so, this research paper emphasizes that these six dimensions of the Calabi-Yau can derive an extra KK dimension if when substitute the KK effect into each of the Calabi-Yau dimension, in that case it may derive a 30-dimensional potential, when the fold is looping over, that is $6*5=30$ dimension. Moreover, the concept of large extra dimensions appears in braneworld models, where the Calabi-Yau manifold is sufficiently good fit into an extra spatial dimension that is confined within a region

state, intersecting with a D-brane. This framework could potentially explain certain physical phenomena, a link that may link up higher dimensions with implications for gravitational general relativity.

Conclusion:

In conclusion, in our research paper, we propose using our new methodology to establish a (Lego-Strings-Bricks) that can build up to our purposes "Strings Space model," specifically a superstrings conductor (connector) model. Our innovative model encompasses single, double, and triple integrals of strings, extending to contour, surface, and volume integrals on a 6+5-dimensional manifold, like the music of extension by different vibrations. We also suggest that the Lie-Yau dimension can further extend to 5*6-dimensional potentials when the loops fold over, our new innovative concept can be applicable to adapting both the Calabi-Yau model dimension with the KK model dimension. In addition, we innovatively develop the "Lego-Strings-bricks" as a bridge to fill the gap between string and field theory. Most importantly, our new model assumption is extendable and can be applied to different spacetime dimensions, making it applicable across all fields, including M theory.

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