Physics Colloquium

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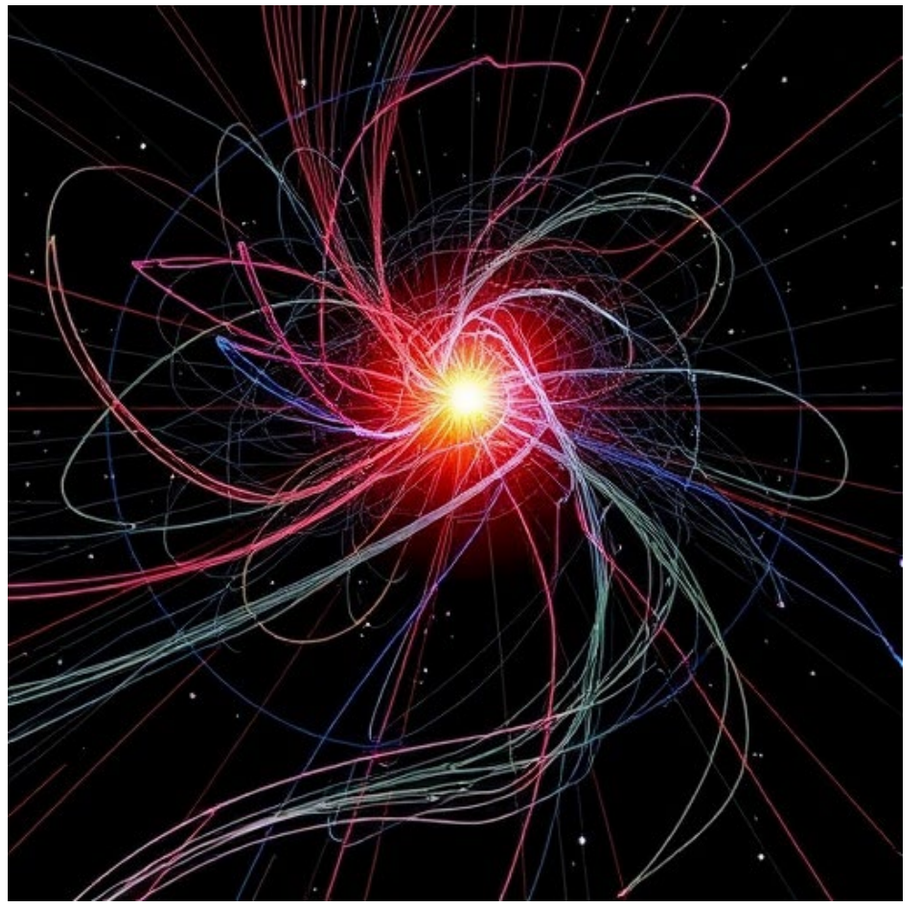
Dynamical String Tension Theories with Space Scale Invariance Spontaneous Symmetry Breaking (SSB) and Restoration

ABSTRACT

The string and brane tensions do not have to be put in by hand, they can be dynamically generated, as in the case when we formulate string and brane theories in the modified measure formalism. Here, we take the measure as a metric independent density defined in terms of measure fields, independent of the metric. Then string and brane tensions appears, but as an additional dynamical degree of freedom. It can be seen, however, that these string or brane tensions are not universal, but rather each string and each brane generates its own tension. To make the string tension totally dynamical, a bulk field is introduced. As we have seen in previous publications, world sheet conformal invariance in the case of two different species of strings with different tension can produce brane worlds, Swampland constraints may be avoided. We also introduce brane world scenarios without singularities of the string tensions, although they still can grow to very large values. This is done by demanding a certain periodicity in one light-like coordinate. Finally, we add two crucial observations:

1. Demanding the effective low energy theory inherit the target space scale invariance implies four-dimensional space time for the low energy theory.
2. Dark matter to us may consist of matter made of strings with different tensions because of decoupling of standard string interactions for strings with different tensions. Furthermore, the dark strings are expected to produce dark copies of the Standard Model.



3:00-4:00 p.m., Friday, November 14th, 2025

In-person in McLane Hall 162