

Abstract Submitted
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Biconformal Gauge Theory: A New Perspective on the Coleman-Mandula Theorem¹ BENJAMIN LOVELADY, JAMES WHEELER, Utah State Univ — The four fundamental interactions can be understood as gauge theories of Lie groups. According to the Coleman-Mandula Theorem, the only way to combine spacetime and internal symmetry groups, i.e. gravity and one or more of the other interactions, is by a direct product. Most theories circumvent this by extending the Lie Groups to Lie Supergroups. We take a different approach, showing that it is possible to construct a gauge theory of a simple Lie group that dynamically requires subgroups of Lorentz and Euclidean signature, i.e. spacetime and internal symmetries. These subgroups are combined by a direct product, as the Coleman-Mandula Theorem requires. We consider both the flat case, and cases perturbative in the curvature.

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