

Eliminating the impossible to find the truth

In the last decade, the numerical Bootstrap has emerged as a universal and complementary tool for studying a wide range of physical systems, from condensed matter to particles and gravity. In this talk, I will discuss its application to scattering amplitudes, the so-called S-matrix Bootstrap, in honor of the program that flourished in the 1960s. By combining relativistic causality and quantum-mechanical unitarity with modern optimization techniques, we can translate fundamental principles into a precise numerical framework. Our journey will begin with questions such as "How strong can interactions among particles be?" and will conclude with the striking prediction of a doubly-charged light tetraquark: a state once thought improbable, but for which experimental hints are now emerging.

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