



Sommerfeld Theory Colloquium

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Pulling Yourself by your Bootstraps in Quantum Field Theory

Quantum field theory (QFT) is the universal language of theoretical physics, underlying the Standard Model of elementary particles, the physics of the early Universe and a host of condensed matter phenomena such as phase transitions and superconductivity. A great achievement of 20th-century physics was the understanding of weakly coupled quantum field theories where interactions can be treated as small perturbations of otherwise freely moving particles. Critical challenges for the 21st century include solving the problem of strong coupling and mapping the whole space of consistent QFTs.

In this lecture, I will overview the bootstrap approach, the idea that theory space can be determined from the general principles of symmetry and quantum mechanics. This strategy provides a new unifying language for QFT and has allowed researchers to make predictions for physical observables even in strongly coupled theories. I will illustrate the general framework in a few examples, ranging from the concrete (boiling water) to the abstract (supersymmetric theories in various spacetime dimensions).

[Wednesday, 30 January 2019, 16:15h, Room A348, Theresienstr. 37/III](#)