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Particle Physics in Paris

Mardi 4 Fevrier 2020, 11 :00
LPTHE, Library, tour 13-14, 4th floor
Domaines : hep-ph—hep-th

Titre : *Microscopic Bounds on Macroscopic Theories*

Orateur : **Francesco Riva (Geneva University)**

Résumé : *Effective Field Theories (EFTs) appear everywhere there is a mass scale. They serve to simplify complex multiscale problems (e.g. the theory of fermions below the electroweak scale), and they serve as general tools to parametrise the unknown or incalculable (e.g. the pion chiral Lagrangian, gravity, or physics beyond the standard model). In this sense, they are perhaps even too general (everything which is not forbidden is compulsory). In this talk I will present a tool to distinguish EFTs that can originate from microscopic unitary theories and I will show that this strongly limits the (classic and quantum) running of EFTs scattering amplitudes. In particular, Massive gravity, theories with isolated massive higher-spin particles, and theories with very irrelevant interactions, cannot originate from unitary theories.*