SEMPARIS – Séminaires en région parisienne

http ://string.lpthe.jussieu.fr/semparis/

Particle Physics at LPTHE

Vendredi 31 Janvier 2025, 14 :00
LPTHE, Library
Domaines : hep-ph

Titre : *Compositeness from eV to TeV*

Orateur : **Benoit Assi (U. Cincinnati)**

Résumé : *In this talk, I discuss two separate efforts that address compositeness across energy scales. First, I introduce a new computationally efficient approach for calculating matrix elements for all-heavy hadrons and multi-hadron systems in QCD. This includes extending the potential non-relativistic QCD (pNRQCD) framework combined with advanced quantum Monte Carlo techniques. I will present results on binding energies and matrix elements for all-heavy hadrons and multi-hadron systems in QCD and composite dark matter in SU(N) gauge theories. This approach accurately predicts quarkonium, baryon masses, and the conditions for bound tetraquark formation, while offering practical fits for NR composite dark matter models. In the second part, I will discuss a model in which the SM quarks themselves are made composite in a chiral SU(15) gauge theory where quarks and leptons emerge as bound states of massless prions, naturally yielding three generations of SM particles, vector-like fermions, and deuteron-like scalar singlets and Higgs doublets.*