Physics Seminar: Alexandre Homrich
Wednesday, March 11 · 2:00 – 3:00pm
313
Title: Imprints of asymptotic freedom on confining strings

Abstract: I will discuss 2602.15097. There, we consider the Polyakov loop correlator in the confining phase of large N Yang-Mills theory in three and four dimensions. It can be computed by summing over the exchange of closed flux tubes winding around the thermal cycle. At short separations, the leading divergence is controlled by perturbation theory. Combining these two facts allows us to determine the asymptotic spectral density of string states contributing to the correlator. This sharply relates the weakly-coupled UV of the gauge theory to the dynamics of highly energetic flux tubes. Then, in a toy integrable setting, we explore how this can bound the scattering data of the Goldstone modes on top of a long string. We derive a bound on the asymptotic behavior of the reflection amplitude of Goldstones against the flux tube boundary sourced by the Polyakov line, and rule out an asymptotically linear phase shift for the S-matrix. Along the way, we discuss how causality can impose bounds on thermodynamic quantities, and show how the positivity of time delays follows from unitarity and analyticity of 2d massless elastic S-matrices.