TEP Seminar

Tuesday, March 3rd @ 2pm
Schwinger Lounge

"Antipodal Self-Duality in Planar N=4 and Fishnets"

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Abstract: Multi-loop scattering amplitudes in QCD are needed for high precision at the LHC. They are complex functions of the kinematics, but they can often be organized using the symbol, part of a Hopf algebra that acts on multiple polylogarithms. In a close cousin of QCD called planar N=4 SYM, scattering amplitudes can be computed to much higher loop orders, making it possible to discover new properties. One of the more remarkable, yet mysterious, such properties is antipodal (self-)duality (ASD), which relates two amplitudes (or one amplitude to itself) under reversing the letters of the symbol. This strange operation also exchanges the role of branch cuts and derivatives. However, ASD has been seen in only a few processes, and its physical origin is unknown. In searching for the physics underlying ASD, we examine observables in an even simpler cousin, strongly-deformed planar N=4 SYM (fishnet theory), where many ASD examples have now been found, and are starting to be understood using integrability-based representations and the theory of symmetric functions.