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String-like amplitudes for surfaces beyond the disk

Abstract

In 1969, Koba and Nielsen found some equations (now known as u-equations or non-crossing equations) whose solutions can be described as cross-ratios of n points on a line. The tree string amplitude, or generalized Veneziano amplitude, can be defined as an integral over the non-negative solutions to the u-equations. This is a function of the Mandelstam variables and has interesting properties: it does not diverge as the Mandelstam variables get large, and it exhibits factorization when one of the variables approaches zero. One should think of these functions as being associated to the disk with marked points on the boundary. I will report on ongoing work with Nima Arkani-Hamed, Hadleigh Frost, Pierre-Guy Plamondon, and Giulio Salvatori, in which we replace the disk by other oriented surfaces. (The first paper in what will be a series is available online at [arXiv:2309.15913](https://arxiv.org/abs/2309.15913).) I will emphasize the part of our approach which is based on representations of gentle algebras, which arise from a triangulation of the surface.