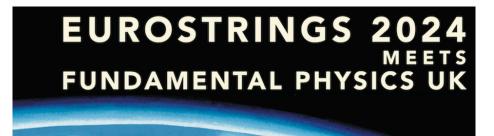Contribution ID: **190**   Type: **Talk in parallel session**

Integration on higher-genus Riemann surfaces from and for string amplitudes

Wednesday 4 September 2024 11:00 (30 minutes)

In this talk, multiloop string amplitudes are discussed as a rewarding laboratory to develop integration techniques on higher-genus Riemann surfaces. I will review a string-amplitude inspired generalization of the Brown-Levin elliptic polylogarithms and their Kronecker-Eisenstein integration kernels to arbitrary genus. The key ingredients are convolutions of Arakelov Green functions on genus-g surfaces which transform as tensors under the modular group $Sp(2g, Z)$. Our higher-genus integration kernels simplify the spin-structure summations in the RNS formulation of multiloop string amplitudes and the low-energy expansion of moduli-space integrals. The recent Fay identities among the higher-genus kernels play a key role in the development of more general integration algorithms relevant to precision calculations for particle colliders or gravitational-wave experiments and to mathematical classifications of period integrals on higher-genus surfaces.

Link to publication (if applicable)

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Session Classification: Parallel sessions