



Contribution ID: 425

Type: **Plenary presentation**

Recent work on tessellations of hyperbolic geometries

Tuesday, 27 July 2021 10:40 (20 minutes)

I discuss progress in simulating field theories on discrete hyperbolic spaces, with the goal of studying their physics in the bulk, and on the boundary. At tree-level, a free scalar field propagating in the bulk lattice is found to possess power-law two-point correlation functions on the boundary. The power-law behavior excellently matches the expected Klebanov-Witten formula despite being far away from the continuum, as well as matching the expected form due to the explicit breaking of conformal symmetry from the finite-volume boundary. When the field is dynamical—in the case of Ising spins—on a fixed hyperbolic lattice, the boundary physics is separated into two regimes depending on the bulk nearest-neighbor coupling. The conformal behavior of the free field—as well as the strong-coupling limit of the dynamical field—on the boundary can be seen explicitly to be a consequence of the hyperbolic geometry.

Primary author: UNMUTH-YOCKEY, Judah (Fermi National Laboratory)

Co-authors: HUBISZ, Jay (Syracuse University); ASADUZZAMAN, Muhammad (Syracuse University); NELSON, Roice; Prof. CATTERALL, Simon (Syracuse University)

Presenter: UNMUTH-YOCKEY, Judah (Fermi National Laboratory)

Session Classification: Plenary

Track Classification: Invited plenary