



Contribution ID: 3

Type: **not specified**

Hyperbolic Band Theory, Higgs Bundles, and Supersymmetric Field Theory

Monday, 7 April 2025 12:05 (35 minutes)

The advent of topological materials has brought with it new connections between physics and pure mathematics. In particular, algebraic topology has played a decisive role in the classification of these materials. In this talk, I will offer a brief look at an emerging chapter in this story in which complex algebraic geometry — in particular, of moduli spaces of unitary and nonunitary data associated with complex curves — is used to anticipate new forms of synthetic quantum matter, supported for example on 2-dimensional hyperbolic lattices. In the process, I will explain my recent joint works with J. Maciejko, E. Kienzle, and Á. Nagy respectively that lay the groundwork for, and subsequently probe, an electronic band theory for such matter. I will connect this discussion to Higgs bundles, supersymmetric Yang-Mills theory, and Nakajima quiver varieties.

Presenter: RAYAN, Steven