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MODELING PERIODIC RIEMANN FUNCTIONS

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The notion of a “Riemann function” generalizes the Baker-Norine rank function of a graph. The “Riemann-Roch formula” associated to any Riemann function can be viewed as an Euler characteristic formula.

For a certain class of Riemann functions $\mathbb{Z}^2 \rightarrow \mathbb{Z}$, this involves a family of sheaves on a fixed five-point topological space; these sheaves fit together via skyscraper sheaves and have a simple duality theory. All other Riemann functions can be modeled by a formal difference of such sheaves.

When a Riemann function is “periodic” (as are all Baker-Norine rank functions), these sheaves have much more structure, including a stronger duality theory.

We do not assume any familiarity with sheaf theory or Baker-Norine functions.

This is joint work with Nicolas Folinsbee.