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Singular Hodge Theory of Matroids

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To any matroid, I will associate a certain ring that, when the matroid is realizable, is the cohomology ring of a certain variety called the semi-wonderful model. I will show how the Hodge theory of this ring can conjecturally be used to establish the “top-heavy conjecture” of Dowling and Wilson from 1974 as well as the non-negativity of the matroid Kazhdan–Lusztig polynomials of Elias, Proudfoot, and Wakefield.

This is joint work with Tom Braden, June Huh, Nick Proudfoot, and Botong Wang.

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