Workshop on Representation Theory, Geometry & Combinatorics

Organizer: Mark Haiman

Monday June 2–Friday June 6, 9:30–5:00pm, Bechtel 120ABC

Reimundo Heluani, UC Berkeley

Supersymmetry of the chiral de Rham complex: Calabi-Yau case

The "chiral de Rham complex" (CDR) of Malikov-Shechtman-Vaintrob is a sheaf of vertex superalgebras associated to any manifold X. We will show how, in the smooth context, extra geometric data on X (e.g. having special holonomy) translates into extra symmetries of the corresponding vertex superalgebras of global sections. For example, we show that when X is Kahler, the Kahler form is responsible $N = 2$ supersymmetry of CDR. If X is Calabi-Yau, its complex structure is responsible for another $N = 2$ supersymmetry of CDR. These two sets of supersymmetries are interrelated in an interesting way.