"Computing sheaf cohomology on Calabi-Yau hypersurfaces in toric varieties and D-brane instantons", Benjamin Sung, Northeastern University

Sheaf cohomology on Calabi-Yau varieties serves as a key bridge between geometry and string theory. In particular, the sheaf cohomology of divisors on a Calabi-Yau threefold yields information about the zero mode spectrum of wrapped ED3 branes and hence the non-perturbative superpotential, which has direct applications for moduli stabilization and axion inflation. Although there are methods to perform such computations (Eisenbud-Mustata-Stillman), these fail for many large examples. I will present a new technique and explicit formulas for these computations using combinatorial properties of the ambient toric variety based on joint work with Andreas Braun, Cody Long, Liam McAllister, and Mike Stillman.