Abstract:

In the celebrated work of Bershadsky–Cecotti–Ooguri–Vafa the genus one string partition function in the B-model is identified with certain analytic torsion of the Hodge Laplacian on a Kähler manifold. In a joint work with Shu Shen (IMJ-PRG) and Jianqing Yu (USTC) we study the analogous torsion in Landau–Ginzburg models. I will explain the corresponding index theorem based on the asymptotic expansion of the heat kernel of the Schrödinger operator. I will also explain the rigorous definition of the BCOV torsion for homogeneous polynomials on $\mathbb{C}^N$. Lastly I will explain the conjecture stating that in the Calabi–Yau case the BCOV torsion solves the holomorphic anomaly equation for marginal deformations.