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Geometric Variations of Local Systems

Geometric variations of local systems are families of variations of Hodge structure; they typically correspond to fibrations of Kähler manifolds for which each fibre itself is fibred by codimension-one Kähler manifolds. In this talk, I introduce the formalism of geometric variations of local systems and then specialize the theory to study families of elliptic surfaces. I will explain some of the computational challenges that go into computing geometric variations of Hodge and highlight examples coming from elliptically fibred K3-surfaces and K3-surface fibred Calabi-Yau threefolds.