Title: Asymptotic analytic torsions for compact locally symmetric orbifolds

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Abstract: In this talk, I would like to present a result on the full asymptotic expansions of Ray-Singer real analytic torsions associated with a sequence of flat vector bundles on a compact locally symmetric space, especially an orbifold. By applying Selberg's trace formula to compute the heat trace, we transform the problem into evaluating semi-simple orbital integrals. Then a key step is to evaluate the orbital integrals associated with nontrivial elliptic elements, that ultimately lead to exponential polynomials in the expansions of analytic torsions. To achieve this, we established a geometric localization formula which allows us to rewrite an elliptic orbital integral as a sum of several identity orbital integrals associated with the centralizer of the elliptic element. The explicit geometric formula of Bismut for semi-simple orbital integrals is crucial to these computations.