

BOSTON UNIVERSITY GEOMETRY AND PHYSICS SEMINAR

**A COMMON FRAMEWORK FOR  
AUTOMORPHIC FORMS AND TOPOLOGICAL  
STRING PARTITION FUNCTIONS**

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Feb 26, 2014, 4:00 – 5:00pm  
Math/Computer Science, Room 148  
111 Cummington Street, Boston

Tea: 3:45pm in Room 144

**Abstract:** :A common framework for automorphic forms and topological string partition functions. Abstract: Classical modular forms and in general automorphic forms enjoy  $q$ -expansions with fruitful applications in different branches of mathematics. From another side we have  $q$ -expansions coming from the B-model computations of mirror symmetry which, in general, are believed to be new functions. In this talk I will present a common algebro-geometric framework for all these  $q$ -expansions. This is based on the moduli of varieties with a fixed topological data and enhanced with a basis of the algebraic de Rham cohomology, compatible with the Hodge filtration and with a constant intersection matrix. In our way, we will also enlarge the algebra of automorphic forms to a bigger algebra which is closed under canonical derivations. I will mainly discuss three examples:

1. Elliptic curves and classical modular forms,
2. Principally polarized abelian varieties, lattice polarized K3 surfaces and Siegel modular forms
3. Mirror quintic Calabi-Yau varieties, Yukawa coupling and topological string partition functions.

See <http://math.bu.edu/research/geom/seminar.html> or contact Si Li [sili@math.bu.edu](mailto:sili@math.bu.edu) for more information.