

## Event in commemoration of Boris Dubrovin, Sept. 27, 2019

**Title:**

From integrable Lagrangians to automorphic forms

**Speaker:**

Don Zagier

**Abstract:**

I will discuss a surprising connection between a complicated problem in the theory of integrable systems—an area that is indissolubly associated with the name of Boris Dubrovin—and a multivariate automorphic form (Picard modular form). The problem from the theory of integrable Lagrangians is a non-linear system of 15 partial differential equations in three variables that was studied by Ferapontov, Khusnutdinova and Tsarev and shown by them to have a huge group of symmetries and to be related in a special case to classical modular forms. The automorphic form has beautiful number-theoretic aspects coming from work on special values of  $L$ -functions done by Fernando Rodriguez-Villegas and myself some 25 years ago. The fact that these two very different problems lead to the same functions is a wonderful instance of the interplay between integrable systems and automorphic forms and promises many further developments in the future.