Beyond q: special functions on elliptic curves

Eric Rains

Caltech, USA

   An important thread in modern representation theory (and combinatorics) is that many important objects have so- called q-analogues, generalizations depending on a parameter q which reduce to more familiar objects when $q = 1$. For instance, the Schur functions (irreducible characters of the unitary group) have q,t-analogues, namely the famous Macdonald polynomials, and similarly the Koornwinder polynomials are six-parameter q-analogues of the characters of other classical groups. It turns out that many q-analogues extend further to elliptic analogues, in which q is replaced by a point on an elliptic curve. The Macdonald/Koornwinder polynomials are no exception; I will describe a relatively elementary approach to those polynomials and how to modify the approach to obtain an elliptic analogue.