Symmetries, Invariants and rational curves on the Dwork pencil

Anca Mustata
UCC

Abstract

The Dwork pencil of quintics is remarkable due to its large group of symmetries: it is acted upon by a direct product of the group of fifth roots of unity as well as the group of symmetries of 5 elements, and the quotient of the pencil by the former group is the mirror family for quintics, the first extensively studied example of mirror symmetry. In this talk I will review works of D. Zagier and Candelas, de la Ossa, Van Geemen & Van Straten exploiting this rich symmetry to give a very concrete description of the spaces of lines on the Dwork pencil. I will relate these to some of my earlier results and then discuss how these techniques apply to the study of higher degree curves on the pencil.