THE SPACES OF RATIONAL CURVES ON DEL PEZZO SURFACES VIA CONIC BUNDLES

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There have been extensive activities on counting functions of rational points of bounded height on del Pezzo surfaces, and one of prominent approaches to this problem is by the usage of conic bundle structures on del Pezzo surfaces. This leads to upper and lower bounds of correct magnitude for quartic del Pezzo surfaces. In this talk, I will explain how conic bundle structures on del Pezzo surfaces induce fibration structures on the spaces of rational curves on such surfaces. Then I will explain applications of this structure which include:

(1) Upper bounds of correct magnitude for the counting function of rational curves on quartic del Pezzo surfaces over finite fields,

(2) Rationality of the space of rational curves on a quartic del Pezzo surface.

If time permits, I will explain our ongoing proof of homological stability for the spaces of rational curves on quartic del Pezzo surfaces. The last work on homological stability is joint work in progress with Ronno Das, Brian Lehmann, and Philip Tosteson.