ODTU-Bilkent Algebraic Geometry

Towards 800 conics on a smooth quartic surfaces

By

Alexander Degtyarev
(Bilkent)

Abstract: This will be a technical talk where I will discuss a few computational aspects of my work in progress towards the following conjecture.

Conjecture: A smooth quartic surface in P3 may contain at most 800 conics.

I will suggest and compare several arithmetical reductions of the problem. Then, for the chosen one, I will discuss a few preliminary combinatorial bounds and some techniques used to handle the few cases where those bounds are not sufficient.

At the moment, I am quite confident that the conjecture holds. However, I am trying to find all smooth quartics containing 720 or more conics, in the hope to find the real quartic maximizing the number of real lines and to settle yet another conjecture (recall that we count all conics, both irreducible and reducible).

Conjecture: If a smooth quartic X⊂P3 contains more than 720 conics, then X has no lines; in particular, all conics are irreducible.

Currently, similar bounds are known only for sextic K3-surfaces in P4.

As a by-product, I have found a few examples of large configurations of conics that are not Barth--Bauer, i.e., do not containa 16-tuple of pairwise disjoint conics or, equivalently, are not Kummer surfaces with all 16 Kummer divisors conics.

Date: 11 March 2022, Friday
Time: 15:40 (GMT+3)
Place: Zoom

To request the event link, please send a message to sertoz@bilkent.edu.tr