ODTU-Bilkent Algebraic Geometry

A decade of line counting: an overview

By

Alexander Degtyarev
(Bilkent)

Abstract: I will give a brief overview of a long project that started a decade ago (in collaboration with Ilia Itenberg and Sinan Sertöz and in parallel with Slawomir Rams and Matthias Schutt) and originally intended to bridge a minor gap in the proof of Segre's celebrated theorem on 64 lines on a smooth quartic surface. Confining ourselves to polarized K3-surfaces, now we manage to answer questions that no one even dared to ask, mostly because of lack of tools. For example, we

- obtained sharp upper bounds on the possible number of lines on a smooth polarized $K3$-surface of any degree,
- obtained similar bounds for quartics, sextics, and octics with singularities,
- advanced in the understanding of conics on $K3$-surfaces,
- started the study of twisted cubics.

I will try to discuss both classical (more than 5 years old) results and recent advances; if time permits, I will also try to outline the
techniques used.

Date: 17 April 2026, Friday
Time: 15:40 (GMT+3)
Place: Zoom

This is an online seminar. To request the Zoom link, please send a message to sertoz@bilkent.edu.tr