

14. John von Neumann Lecture

Approximate groups, incidence geometry and model theory

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The celebrated sum-product theorem of Erdős and Szemerédi asserts that for every finite set of numbers A either the sum-set $A+A$ or the product-set AA must be significantly larger than A , that is at least $|A|^{1+\varepsilon}$ for some $\varepsilon > 0$. One possible proof consists in a simple application of the Szemerédi-Trotter theorem in incidence geometry. Both results have had considerable impact in many areas from additive combinatorics to analytic number theory and asymptotic group theory. A far-reaching generalization of the sum-product phenomenon was formulated some years ago by Elekes and Szabó in terms of counting triples of numbers satisfying a given algebraic constraint (e.g. the (x,y,z) with $z=f(x,y)$ for a given rational map f). In this talk I will give an introduction to the above topics and present a recent work with Martin Bays (Münster) in which we completely classify the algebraic constraints appearing in the the Elekes-Szabó problem in all dimensions and arity. Our method uses insights from Model Theory and is based on Hrushovski's notion of pseudo-finite dimensions as well as classical results from abstract projective geometry.

Donnerstag,
21.06.2018
16.30 Uhr
Hörsaal M5

Einsteinstr. 64, 48149 Münster

Tee wird ab 16.00 Uhr im Sitzungszimmer des Fachbereichs Mathematik und Informatik gereicht. Nach dem Vortrag sind Sie herzlich zum Empfang im Foyer, Orléansring 12, eingeladen!

Organisatoren:
Prof. Dr. Dr. h.c. Joachim Cuntz, Prof. Dr. Angela Stevens, Prof. Dr. Dr. Katrin Tent