SIMC welcomes postdocs-2020

April 22 – 23, 2021

Organizers

Steklov Mathematical Institute of Russian Academy of Sciences, Moscow

Steklov International Mathematical Center, Moscow

Weichung Chen. ACC for generalized e-lct for generalized Fano pairs

We show that ACC for generalized e-log canonical threshold holds for surfaces of Fano type for any positive real number e. This then implies the existence of bounded e-lc complements for e-lc generalized Fano pairs with generalized boundaries in a DCC set.

Konstantin Loginov. Log Fano varieties and their applications

Fano varieties play an important role in algebraic geometry. In modern birational geometry, it is more convenient to work with pairs variety + boundary divisor on it. Using this language, various generalisations of Fano varieties were defined: log Fano varieties, varieties of Fano type, etc. These notions appeared to be useful for many problems in birational geometry, and also they are interesting in themselves. We present some results that show how the geometrical properties (e.g. toricity or rationality) of a log Fano variety are connected with the geometry of its boundary. We also discuss applications to the study of the Cremona group.

Maria Matushko. Calogero–Sutherland systems and Dunkl operators at infinity

The Calogero–Sutherland system along with its generalizations is one of the most valuable example of quantum integrable systems. For its description the Cherednik–Dunkl operators are used. In the talk there will be given different constructions of the (spin and spinless) Calogero–Sutherlad systems in the limit where the number of particles tends to infinity.

Artyom Radomskii. Consecutive primes in short intervals and sums related to Euler's totient function

We will discuss some results related to the distribution of prime numbers. We prove that there are infinitely many collections of consecutive primes with restrictions on their differences. One of the ingredients of the proof is a technique suggested by James Maynard.

Alexander Shaposhnikov. Sobolev–Kantorovich inequalities

We discuss a semigroup–theoretic approach to some interpolation inequalities which can be viewed as multidimensional analogs of the classic Hardy–Landau–Littlewood and the celebrated Otto–Villani HWI inequalities.

Stanislav Speranski. A Computational Perspective on Reasoning about Probability Spaces

The aim of this talk is to give a survey of the computational aspects of quantified probability logics. More precisely, we shall be concerned with what might be called the *elementary theories* of natural classes of probability spaces, and for each such theory its complexity will be measured by its degrees of algorithmic undecidability. For example:

— the theory of atomless spaces turns out to be decidable;

— the theory of finite spaces is computably isomorphic to the complement of the halting problem for Turing machines;

— the theory of discrete spaces — as well as the theory of infinite spaces — is computably isomorphic to complete second-order arithmetic, which can be identified with *elementary analysis*.

We shall discuss these and other results, and also take a brief look at the underlying mathematical machinery.

Bin Wang. Generic Fibers of Parabolic Hitchin Maps: GL_n-Case

In this talk, we will discuss parabolic Hitchin maps over algebraic curves and their generic fibers. The main result is a parabolic analogue of the Beauville–Narasimhan–Ramanan's correspondence which is proved via a detailed study of both geometric and algebraic structures of generic singular spectral curves. In particular, it shows that generic fibers are Picard varieties of normalized spectral curves. If time permits, we will also discuss the parabolic global nilpotent cones. This is a joint work with Xiaoyu Su and Xueqing Wen.