

On Singularities and Related Fields

A workshop in the Memory of Mihai Tibăr

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ABSTRACTS

Logarithmic convex hulls and the arithmetic of Dirichlet polynomials

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We use logarithmic versions of the classical Newton polygons to devise methods for studying the factorization of Dirichlet polynomials $f(s) = \frac{a_m}{m^s} + \dots + \frac{a_n}{n^s}$ over unique factorization domains R , and obtain irreducibility criteria analogous to the classical results of Schönemann, Eisenstein, and Dumas, as well as to more recent results of Cavachi for polynomials. We then describe criteria that simultaneously use two or more p -adic valuations, and irreducibility conditions for Dirichlet polynomials taking a prime or a prime power value, analogous to the classical results of Stäckel, Ore, and Weisner. We also find upper bounds for the multiplicities of the irreducible factors, in particular a square-freeness criterion that requires no derivatives and which, in case R has positive characteristic, reduces to asking certain matrices associated to f to have full rank. Finally, criteria for absolute irreducibility, analogous to results of Ostrowski, Gao, and Stepanov-Schmidt are provided in the multivariate case using logarithmic Newton polytopes and logarithmic upper Newton polygons.

Diophantine sets in commutative rings

Mihai CIPU

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One of the oldest notion in number theory originates in the books on Arithmetics by Diophantus. Today terminology is *Diophantine sets*. Initially studied for the ring of integers, this notion has been extended to more general commutative rings.

The aim of the talk is to describe the context in which the first traces have been located, introduce the main problems, give a rough idea of the most successful strategies employed for their solutions. Time permitting, several open questions will be also discussed.

Spectrally bounded and locally spectrally bounded operators

Constantin COSTARA

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In this talk, we shall present some properties and characterizations of spectrally bounded and locally spectrally bounded linear operators defined on $\mathcal{L}(X)$ spaces, with X a finite or an infinite dimensional normed space.

From line arrangements to conic-line arrangements

Anca MĂCINIC

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We discuss results on certain classes of curves that extend known results in the theory of hyperplane arrangements.

On Teissier’s example of an equisingularity class that cannot be defined over the rationals (joint with Adam Parusiński)

Laurențiu PĂUNESCU

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Bernard Teissier proposed an example of a surface singularity in $\mathbb{C}^3$ that is not equisingular, in the sense of Whitney, to a surface singularity in $\mathbb{C}^3$ defined by an analytic function with rational coefficients. Whether it is possible to deform it to a singularity defined over $\mathbb{Q}$, by a topologically equisingular deformation, is still an open problem. Teissier’s example, taken from the book of Grünbaum, is one of the classical examples in convex geometry. As B. Teissier let us know, that particular example admits a polynomial equation with rational coefficients and it has to be corrected and we will explain it in this paper. There is another problem in the Teissier’s argument. The above mentioned property of the example is proven with the use of a theorem on the deformation of a surface to its tangent cone and the theorem is incorrect. We give an alternative proof of Teissier’s result.