

Angelica Cueto (Columbia)Non-Archimedean Combinatorics

Abstract for the Colloquium 2014 December 1

Non-Archimedean analytic geometry, as developed by Berkovich, is a variation of classical complex analytic geometry for non-Archimedean fields such as p -adic numbers. Solutions to a system of polynomial equations over these fields form a totally disconnected space in their natural topology. The process of analytification adds just enough points to make them locally connected and Hausdorff. The resulting spaces are technically difficult to study but, notably, their heart is combinatorial: they can be examined through the lens of tropical and polyhedral geometry.

I will illustrate this powerful philosophy through complete examples, including elliptic curves, the tropical Grassmannian of planes of Speyer-Sturmfels, and a compactification of the well-known space of phylogenetic trees of Billera-Holmes-Vogtmann.

This talk is based on joint works with M. Haebich, H. Markwig and A. Werner.

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