MSRI–Evans Talk

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           Topology of Complex Line Arrangements

Much of the fascination with arrangements of hyperplanes comes from the rich interplay between their combinatorics and their topology. The intersection lattice (which encodes the combinatorics) determines the cohomology ring of the complement. Other topological invariants of the complement, such as the homotopy groups, may depend on further information.

In this talk, I will focus on arrangements of affine lines in the complex plane. Key to understanding the fundamental group of the complement is the stratification of the character variety by the jumping loci for cohomology with coefficients in rank 1 local systems. Counting torsion points on these varieties yields information about the homology of finite covers of the complement. The closely related resonance varieties yield information about the lower central series quotients of the group.