The Worldwide Center of Mathematics

Milnor fibres of hyperplane arrangements

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Friday, September 25, 2015
Coffee, tea, cookies: 3:30pm
Talk: 4-5pm
929 Massachusetts Ave., Cambridge, Suite #102

Abstract: The Milnor fibration of a complex, projective hypersurface produces a smooth manifold as a regular, cyclic cover of the hypersurface complement. When the hypersurface is a union of complex hyperplanes, the Milnor fibre is part of the study of hyperplane arrangements. In this case, the hypersurface complement is well-known and studied. In particular, it is a Stein manifold, a rationally formal space, and it admits a perfect Morse function.

The cohomology and the monodromy of the Milnor fibre can be understood in terms of the cohomology jump loci of the hypersurface complement. For generic hyperplane arrangements, these cohomology and monodromy representations are known and fairly straightforward, although current techniques still fall short of being able to describe even the betti numbers in the case of reflection arrangements. Some combinatorial techniques can be used to construct arrangements with Milnor fibres with interesting properties that contrast with the well-behaved nature of the arrangement complements. These include integer homology torsion, non-formality, and non-trivial monodromy representations in all cohomological degrees.

This talk is based on joint work with Alex Suciu.

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