



Berlin  
Mathematical  
School

## BMS Friday Colloquium

Friday 7 June 2019 at 14:15

*Tea & Cookies starting at 13:00*

BMS Loft, Urania, An der Urania 17, 10787 Berlin

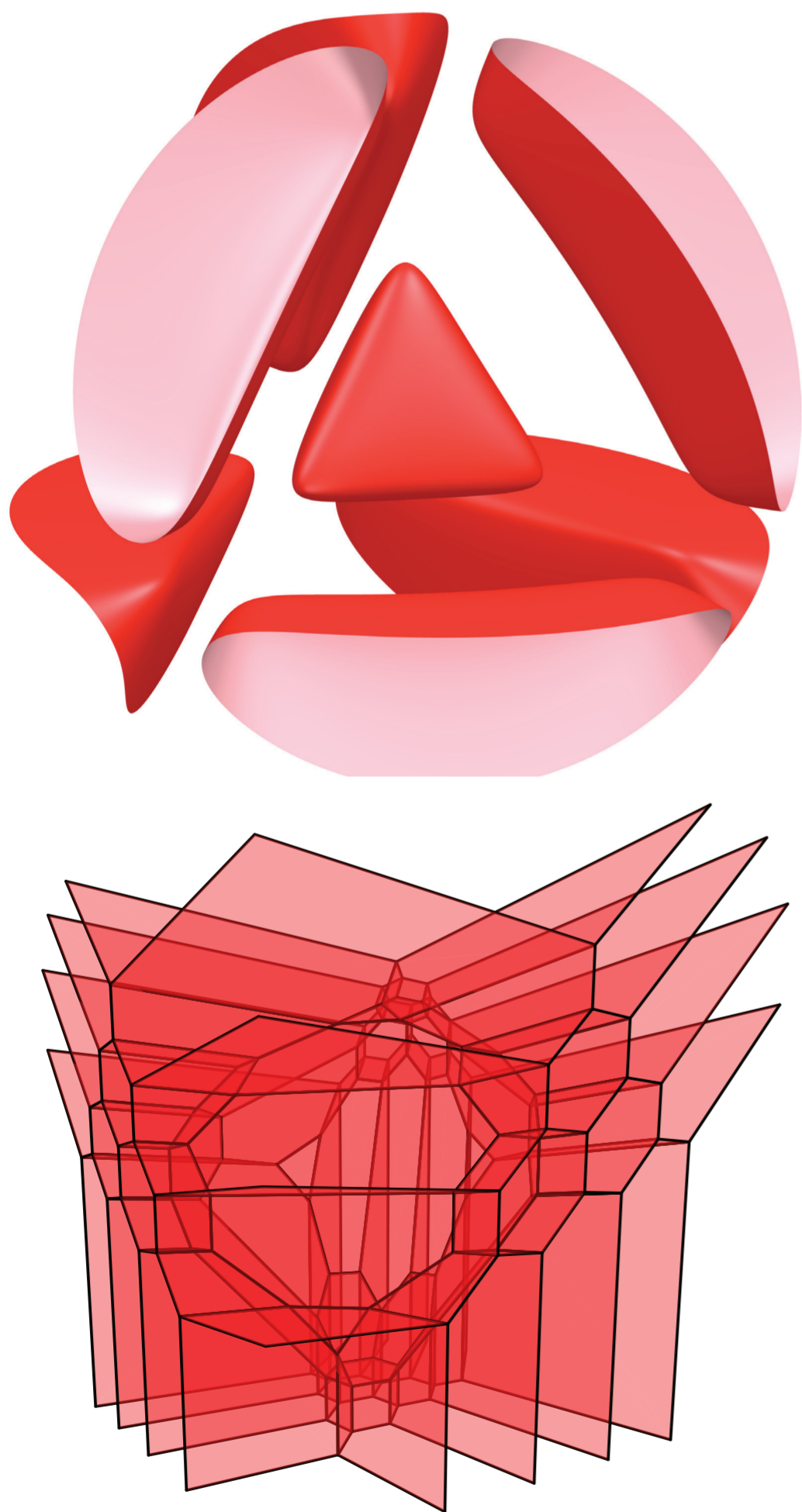
### Kristin Shaw

*(U Oslo)*

#### The topology of real algebraic hypersurfaces

Almost 150 years ago, Harnack gave a tight upper bound on the number of connected components of non-singular real algebraic curves of a fixed degree in the plane. In higher dimensions, there are still no known tight upper bounds on the number of connected components of real algebraic hypersurfaces of a fixed degree, nor are there any tight bounds on their higher Betti numbers. In 1980, Viro conjectured a bound on the first Betti number of a real surface in terms of its complexification. This bound was derived from a fascinating conjecture by Ragsdale in 1906 in relation to real algebraic plane curves and Hilbert's 16th problem. Counterexamples to both conjectures have since been constructed by Itenberg using a powerful technique by Viro that is now understood in terms of tropical geometry. In her talk, Shaw will show that despite these counterexamples, Viro's conjecture and a generalization by Itenberg hold for all real algebraic hypersurfaces near a non-singular tropical limit. This talk includes joint work with Arthur Renaudineau.

Kristin Shaw is a Canadian mathematician who specializes in connections between combinatorics and algebraic geometry over tropical, real, and complex numbers. She is currently a tenure track Associate Professor at the University of Oslo and leader of the research group Algebraic and Topological Cycles in Tropical and Complex Geometries, which is supported by the Bergen Research Foundation. Shaw got her PhD from U Geneva in 2011 and then held postdoc positions at U Toronto, TU Berlin (supported by the Humboldt Foundation) and MPI Leipzig before joining U Oslo in 2018. She was also a visiting student at the BMS from 2007 to 2008.



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