Berlin Mathematical School

BMS Kovalevskaya Colloquium

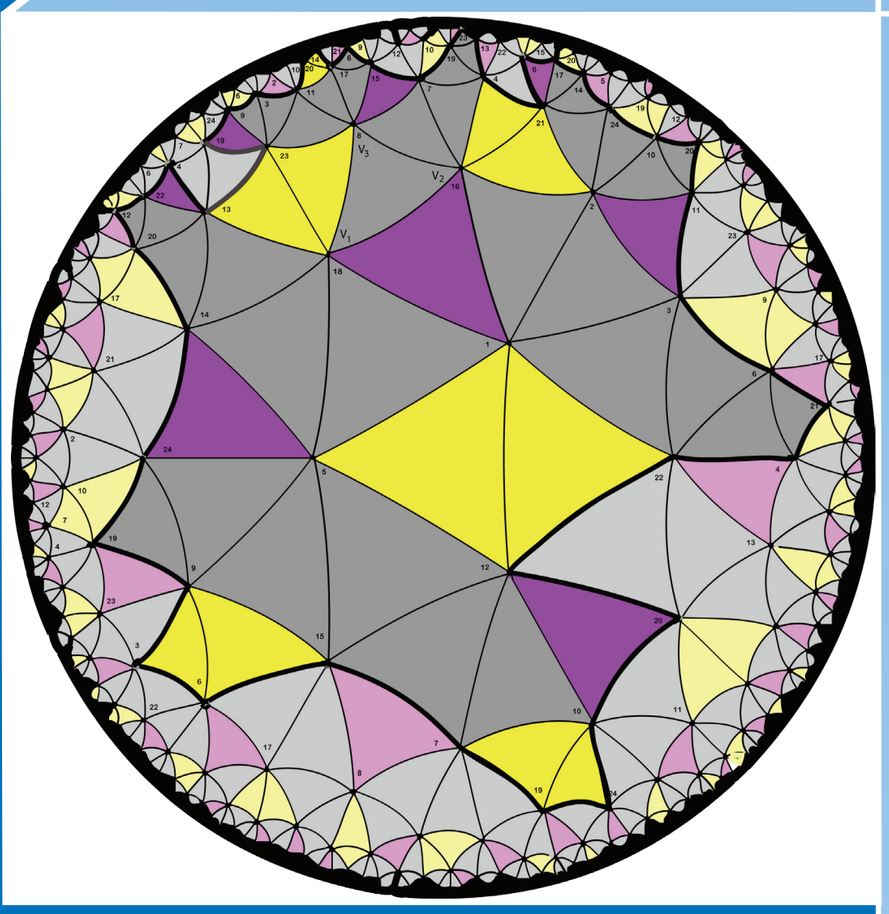
Friday 21 June 2019 at 14:15

Tea & Cookies starting at 13:00

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

Katrin Wendland

(U Freiburg)



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Representations of Moonshine

Moonshine refers to phenomena where some finite group unexpectedly governs a special holomorphic function on the complex upper half plane. Specifically, each instance of moonshine is based on a so-called modular form whose Fourier series has integral coefficients that encode a characteristic fingerprint of some finite group.
The first known such phenomenon is *Monstrous Moonshine*, where the coefficients of the modular j-function are dimensions of representations of the Monster group. This was first observed by John McKay in 1987; Richard Borcherds received a Fields Medal for his proof of the resulting Moonshine Conjectures in 1998. In the more recent *Mathieu Moonshine* of 2010, Tohru Eguchi, Hiroshi Ooguri and Yuji Tachikawa link the largest Mathieu group to topological invariants of K3 surfaces, yielding the Fourier coefficients of a certain elliptic modular form. Conformal field theory turns out to be key to every known instance of moonshine.

In her talk, Wendland will provide an introduction to solved and unsolved mysteries of these two types of moonshine and their representations in geometry.

Katrin Wendland is a mathematical physicist at the University of Freiburg. Her main research interests are conformal field theories and geometry. Wendland got her PhD in theoretical physics at U Bonn in 2000, and then held various positions in the USA and in the UK before taking up a full professorship in mathematics at U Augsburg in 2006. She received an ERC Starting Grant in mathematics in 2009 and was an invited sectional speaker in mathematical physics at the 2010 ICM in Hyderabad, India. Wendland moved to U Freiburg in 2011, where she holds a professorship in geometry.

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