

Women at the Intersection of Mathematics and High Energy Physics

February 18-20, 2019 - Villa Battelle (UNIGE)

Gong Show Talks

Olga CHEKERES

Title:

Quantum Wilson surfaces and topological interactions

Abstract:

We introduce the description of a Wilson surface as a 2-dimensional topological quantum field theory with a 1-dimensional Hilbert space. On a closed surface, the Wilson surface theory defines a topological invariant of the principal G -bundle. Interestingly, it can interact topologically with 2-dimensional Yang-Mills and BF theories modifying their partition functions. We compute explicitly the partition function of the 2-dimensional Yang-Mills theory interacting with a Wilson surface for some gauge groups and obtain a general formula for any compact connected Lie group.

Pierre CLAVIER

Title :

Locality and multivariate renormalisation

Abstract :

Locality plays an essential role in quantum field theory, and is implemented in renormalisation theory through a Birkhoff-Hopf factorisation. Multivariate renormalisation aims to keep track of the locality properties of the objects to be renormalised by introducing more than one regulator. In this short non-technical talk, I will try to present some ideas and results of multivariate renormalisation, and its links to the physical concept of locality.

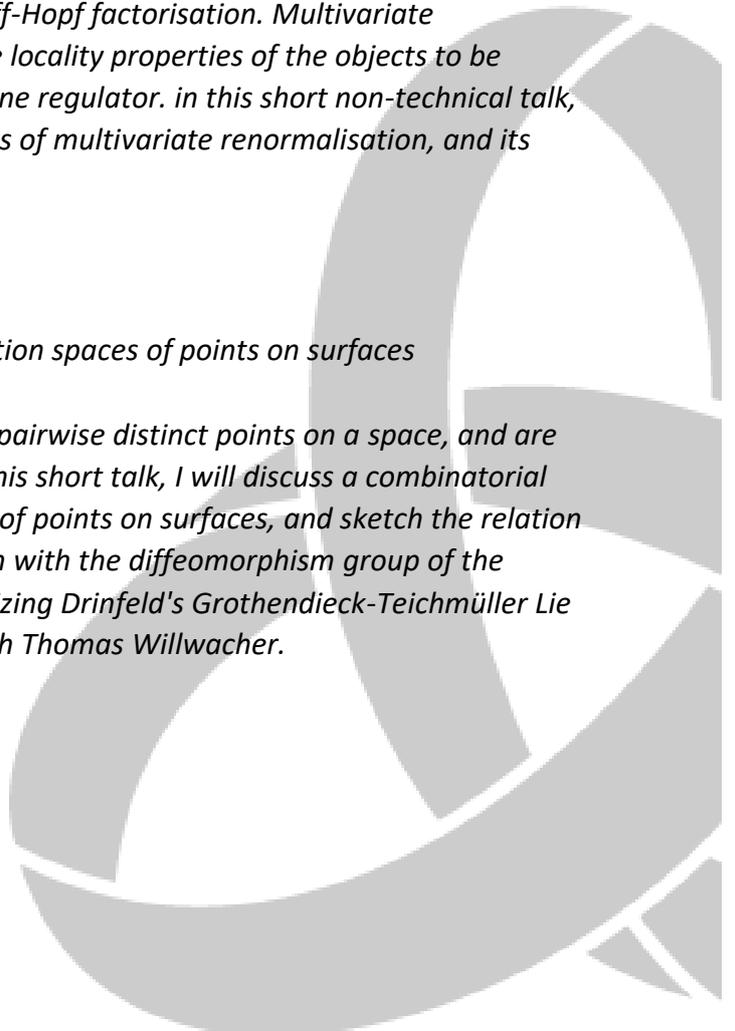
Matteo FELDER

Title:

Automorphisms of a model for configuration spaces of points on surfaces

Abstract :

Configuration spaces consist of tuples of pairwise distinct points on a space, and are widely studied in algebraic topology. In this short talk, I will discuss a combinatorial real model for such configuration spaces of points on surfaces, and sketch the relation of its group of (homotopy) automorphism with the diffeomorphism group of the surface, and certain Lie algebras generalizing Drinfeld's Grothendieck-Teichmüller Lie algebra. This is joint work in progress with Thomas Willwacher.



Andrea NÜTZI

Title:

Scattering amplitudes of YM and GR as minimal model brackets and their recursive characterization.

Abstract :

Attached to Yang-Mills and General Relativity about Minkowski spacetime are their gauge independent tree scattering amplitudes. We reinterpret and construct them as L -infinity minimal model brackets of suitable dgLa. The amplitudes are then given by a sum of trivalent Feynman tree graphs. Using Hartogs extension for complete intersection varieties we prove a recursive characterization of the amplitudes via their residues, independent of the original Feynman graph definition, and without invoking BCFW shifts.

Elise RAPHAEL

Title :

Kashiwara Vergne in depth 2 and q -divergence

Abstract :

I will start with a brief overview of the Grothendieck-Teichmüller, Double Shuffle and Kashiwara-Vergne Lie algebras. We will then focus on a classic filtration of the Kashiwara Vergne Lie algebra and our principal object : the q -divergence cocycle.

This will lead us to solving some nice polynomial equations, allowing us to state a result in depth 2 and see links with similar results in multiple zeta values theory.

This is joint work with Anton Alekseev and Anna Lachowska.

