SPEAKER: Gunther Cornelissen (University of Utrecht)

TITLE: Deforming weak ramification

ABSTRACT: How can a curve be deformed while preserving a finite group of its automorphisms? If the order of the group is coprime to the characteristic of the ground field, the answer was in some sense already known to Riemann. We will concentrate on the case where the order of the group is divisible by the characteristic of the ground field. It is then important to focus on the action of ramification groups on local rings of points of the curve (interesting only in case of wild ramification). As such, the theory has some similarities with the deformation theory of Galois representations. One proves the existence of a "versal" deformation ring in the sense of Schlessinger, and relates invariants of this ring to some kind of group cohomology.

The easiest kind of wild ramification is so called "weak ramification": when the second ramification group (in the natural filtration on the ramification group) vanishes. In this case, our main results are (i) the explicit computation of versal deformation rings. It turns out they may contain nilpotents and are definitely not always complete intersections; (ii) deciding which of these versal rings are in fact universal. This turns out to depend on the group in a subtle way.

Joint work with Jakub Byszewski, Ariane Mezard and Fumiharu Kato (arXiv: 0708.3279, math/0412189, math/0103207)

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RTG-seminar

Title: Matrices versus Power Series

Abstract: *This will be more of an exercise session: the audience is expected to play around with some examples for the upcoming JointNTS talk. I will define some explicit actions of finite groups on rings of matrices and power series over fields of positive characteristic and let you do some computations with power series, matrices, deformations and group cohomology. This will hopefully make the general theory of the "big" talk more tangible.*