

MINI-WORKSHOP ON INVARIANT THEORY

WITH SPECIAL INTEREST IN THE COHEN-MACAULAY
PROPERTY AND SEPARATING INVARIANTS

Organiser: Dr. Emilie Dufresne, MATCH

Guests:

- Dr. Jonathan Elmer, RWTH Aachen
visit: 16-22 February, 2009
- Dr. Martin Kohls, TU München
visit: 16-27 February, 2009

TALKS

Tuesday, February 17th, 2009 in INF 288, Hörsaal 3

- 11:00 to 12:00
Dr. Jonathan Elmer, RWTH Aachen
Title: Depth and Cohomological Detection in Modular Invariant Theory
- 16:00 to 17:00
Dr. Martin Kohls, TU München
Title: The depth of invariants of (infinite) algebraic groups
Abstract: The depth of invariant rings of finite groups has been a topic in invariant theory for almost 30 years now. We give a short overview over the most important results, and present first results on the depth of invariants of (infinite) algebraic groups.

Wednesday, February 18th, 2009 in INF 288, Hörsaal 3

- 11:00 to 12:00
Dr. Emilie Dufresne, MATCH
Title: On the good behaviour of separating algebras
Abstract: The study of separating invariants, initiated by Derksen and Kemper, has become quite popular in recent years.

This popularity stems from separating algebras being often much better behaved than the ring of invariants, while detecting the same orbits. For reductive groups, and in particular for finite groups, graded separating algebras, are closely related to the ring of invariants, thus limiting their good behaviour. In this talk, we illustrate this phenomenon for finite groups, by giving necessary conditions for the existence of polynomial, complete intersection, and Cohen-macaulay graded separating algebras.

- 14:00 to 15:00

Dr. Andreas Maurischat, IWR, Heidelberg

Title: Functorial Invariants in Differential Galois theory

Abstract: In classical Galois theory, for a given finite Galois extension E/F , one obtains a Galois correspondence between the subgroups of the Galois group and the intermediate fields of E/F by taking invariants with respect to the subgroup. In differential Galois theory, there is an analogous correspondence for so called Picard-Vessiot extensions. If the characteristic of the fields is positive, however, there exist intermediate (differential) fields over which the extension field is inseparable and these intermediate fields cannot be obtained as fields of invariants.

In this talk, we introduce the notion of group functors (and group schemes) as well as functorial invariants and show some properties related to them. Moreover, we show how this leads to a Galois correspondence which also takes into account the intermediate fields over which the extension field is inseparable.

Thursday, February 19th, 2009 in INF 288, Hörsaal 3

- 14:00 to 15:00

Arno Fehm, Tel Aviv University, GTEM guest

Title: An introduction to ample fields

Abstract: Pop introduced ample fields in 1996 in the context of Galois theory, where they proved to be of tremendous importance. Recently, they also turned out to be useful in other branches of mathematics: the study of abelian varieties, rationally connected varieties, and definability in fields. I will give an introduction to ample fields and survey some of the recent developments in this area.

You are cordially invited to attend the talks.