

MATHEMATISCHES FORSCHUNGSINSTITUT OBERWOLFACH

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Algebraic Groups

Organised by
Michel Brion, Grenoble
Jens Carsten Jantzen, Aarhus

April 18th – April 24th, 2010

ABSTRACT. The workshop dealt with a broad range of topics from the structure theory and the representation theory of algebraic groups (in the widest sense). There was emphasis on the following areas:

- classical and quantum cohomology of homogeneous varieties,
- representation theory and its connections to orbits and flag varieties.

Mathematics Subject Classification (2000): 14Lxx, 14Mxx, 14Nxx, 17Bxx, 20Gxx.

Introduction by the Organisers

The workshop continued a series of Oberwolfach meetings on algebraic groups, started in 1971 by Tonny Springer and Jacques Tits. This time, the organizers were Michel Brion and Jens Carsten Jantzen.

During the last years, the subject of algebraic groups (in a broad sense) has seen important developments in several directions, also related to representation theory and algebraic geometry. The workshop aimed at presenting some of these developments in order to make them accessible to a "general audience" of algebraic group-theoretists, and to stimulate contacts between participants.

Several series of talks were dedicated to areas of research that have recently seen decisive progress :

- classical and quantum cohomology of homogeneous varieties (Chaput, Perrin, Tamvakis)
- representation theory and its connections to orbits and flag varieties (Goodwin, Riche, Rumynin, Vasserot)
- intersection cohomology in positive characteristics (Fiebig, Juteau)
- geometry and classification of spherical varieties (Avdeev, Gandini).

Other talks introduced to several recent advances in different areas: classical questions on the subgroup structure and the representations of reductive groups (Hille, Littelmann, Ressayre, Roehle), Schubert and Deligne-Lusztig varieties (Goertz, Kuttler), generalizations of Newton polytopes (Kiritchenko), versal actions of algebraic groups (Reichstein), geometry of symmetric Lie algebras (Bulois), quantum homogeneous spaces (Lehrer).

In order to leave enough time for fruitful discussions, the number of talks (generally of one hour) was limited to five per day, and to 21 altogether.

Besides the scientific program, the participants enjoyed a piano recital on Thursday evening, by Pierre-Emmanuel Chaput, Peter Fiebig and Harry Tamvakis.

The workshop was held under special circumstances: due to lasting disruptions of the airplane traffic, 15 registered participants could not make the trip to MFO, and had to cancel their participation. This includes several mathematicians who very likely would have given a talk. As partial replacements, 6 participants (from universities in Germany or France) could join the workshop at the last minute.

There were 40 participants, coming mainly from Europe and North America. This includes 6 young researchers who participated as Oberwolfach Leibniz Graduate Students. The organizers are grateful to the Leibniz-Gemeinschaft for this support, and to the MFO for providing excellent working conditions.