

Provisional Synopses of Invited Talks

1. C. M. RINGEL Classification problems for representation-infinite algebras
 The Auslander-Reiten quiver. Finite components (the first Brauer-Thrall conjecture). Proprojective components.
 Separating tubular series. Tame algebras of finite and infinite growth. Tubular algebras. Strings and bands.
 The Gelfand problem.
 (3 lectures)
2. P. GABRIEL The combinatorics of representation-finite algebras.
 Dimension vectors and Tits form, covering techniques, faithful and minimal representation-infinite algebras, lists of Bongartz and Happel-Vossieck, construction of indecomposable modules, finiteness criterions, combinatorial description of representation-finite algebras. Brauer-Thrall-Nazarova-Roiter.
 (3 lectures)
3. A. V. ROITER Algorithms for Matrix Problems
 Matrix problems and representations of partially ordered sets. Methods for reduction of matrix problems. Some results of the Kiev school of representation theory.
 (3 lectures)
4. H. KRAFT On the Geometry of Quivers
 The aim of these lectures is to understand representations of quivers as geometric objects. For this we will use some tools from algebraic geometry and from the theory of algebraic transformation groups. We plan to describe deformations and degenerations of representations, the relations with invariant theory and with general root systems.
 (3 lectures)
5. J. L. ALPERIN Structure of Group Algebras and Equivalences of Algebras
 Structure and associated quivers of projective modules. Projective weights. Morita equivalences, in particular, nilpotent blocks Z*-theorem. Stable equivalences, in particular, trivial intersection of Sylow subgroups, cyclic blocks, abelian blocks. Bimodules.
 (2 lectures)

6. D. A. BENSON Representation rings of finite groups
 Structure in representation rings with particular emphasis on connections with group cohomology and almost split sequences.
 (2 lectures)
7. M. AUSLANDER Existence theorems for almost split sequences
 Existence of almost split sequences for various types of rings and modules including finite dimensional modules over finite dimensional algebras, lattices over one and higher dimensional orders, including Cohen-Macaulay modules over isolated singularities, and finitely generated modules over arbitrary rings.
 (1 lecture)
8. M. AUSLANDER and H. KNÖRRER Isolated Singularities of finite Cohen-Macaulay type
 A survey of results concerning complete isolated singularities which have only a finite number of non-isomorphic indecomposable Cohen-Macaulay modules, including simple plane singularities, rational surface singularities and higher dimensional singularities. In particular, H. Knörrer will speak on Cohen-Macaulay-Modules over simple hypersurface singularities. An important class of hypersurface singularities are the so-called simple singularities. They are characterised by the property that there are only finitely many isomorphism classes of singularities occurring in a small deformation of such a simple singularity. We want to explain their relevance in the theory of hypersurface singularities, and - after this motivation - show that there are only finitely many isomorphism classes of indecomposable maximal Cohen-Macaulay modules over their local rings and describe their Auslander-Reiten quivers. The methods involved are based on the fact that the two-dimensional simple hypersurface singularities are just the quotient singularities \mathbb{C}^2/G where G is a finite subgroup of $SL_2(\mathbb{C})$, and a "Thom-Sebastiani-type" operation for Cohen-Macaulay modules over hypersurface singularities.
 (4 lectures)