

BIREP CLUSTER SUMMER 2010

For large parts of the plan the Preprint [BK] Bernhard Keller *Cluster Algebras, Quiver Representations and Triangulated Categories* serves as a good survey.

1. Talk: *Cluster algebras I*. [10] [BK: 2., 3., 4.]
Definition of Cluster Algebras without and with coefficients; clusters, cluster variables; discussing Laurent Phenomenon, Exchange Graph; Examples.
2. Talk: *Cluster algebras II*. [11] [BK: 2., 3.]
Finite Type Classification, Theorems 1.4–1.13, 8.6. Sketch of proof.
3. Talk: *Cluster categories*. [3], [6] [BK: 5.7–5.12]
[3]: Definition of cluster categories, 2-CY property, example A_3 ; cluster tilting objects, tilting (exchange) graph; connections with cluster algebras Thm. 4.5; description of complements via approximations Thm. 6.8; exchange pairs Thm. 7.5. [6]: Thm. 4.4.
4. Talk: *Cluster tilted algebras*. [4], [5]
[4]: Theorems A and B. Sketch of Proofs. Example 3.2. [5]: Prop. 3.2, Thm. 5.1 and 6.1. Sketch of proofs.
5. Talk: *Cluster-tilting in a general framework*. [14], [16]
[14]: 2.1 Proposition, 2.2 Proposition / [16]: Thm. 3.3, Thm. 4.3 and Corollaries. [14]: CY-property Theorem 3.3 (optional).
6. Talk: *From triangulated categories to cluster algebras*. [7], [9], [8] [BK: 5.3, 5.6, 5.7, 6.1, 6.2]
[8]: Multiplication formula Thm. 2, denominator property Thm. 3, 4.3, categorification of cluster algebras Thm. 4 and Corollaries.
7. Talk: *Mutation in triangulated categories*. [2], [12] [BK: 7.]
[2]: Chapter II. Definition and main properties of cluster structures in 2-CY categories. Examples. [12]: Mutation pairs 2.5; Theorem 5.1 and 5.3.
8. Talk: *Triangulated orbit categories*. [13] [BK: 5.7, 6.1, 7.7]
Thm. 1; sketch of proof. Thm. 6.
9. Talk: *Acyclic Calabi-Yau categories*. [15] [BK: (3.3.3), 6.3]
Main Result Thm. 2.1. Sketch of proof.
10. Talk: *Cluster categories of canonical algebras*. [1]
Prop. 2.1. Cluster structure Thm. 3.1. Examples of cluster-tilted algebras. Connectedness of the tilting graph Thm. 8.8.

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