Interactions between Algebraic Geometry and Noncommutative Algebra

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Abstract. The workshop presented current developments exploring the boundaries and intersections between the fields of noncommutative algebra and representation theory on the one hand, and algebraic geometry on the other hand, with particular emphasis on topics where such interactions have led to substantial recent progress.

Mathematics Subject Classification (2010): 14A22

Introduction by the Organisers

The workshop brought together 49 participants from ten countries (Australia, Belgium, Canada, France, Germany, Japan, Netherlands, Russia, UK, US). 24 talks were presented in the five-day period, a considerable part of them given by younger participants. To advance interaction between the participants working at the different strands of the topic during the workshop, three introductory/overview talks were given on the first two days by B. Davison, K. McGerty and M. Wemyss.

The workshop explored the application of ideas and techniques from algebraic geometry to noncommutative algebra and vice versa. There has been a considerable amount of activities at the interface between these different areas, with several very recent exciting developments.

A broad range of these interfaces was reflected in the participants’ research activities and the talks, including
• **Hall algebras** in relation to quantum groups and Donaldson-Thomas theory
• **Symplectic and Poisson geometry** in relation to quantization, quiver varieties, and Cherednik algebras
• **Categorification** and (triangulated) categories in relation to homological algebra and Lie-theoretic representation theory
• **Noncommutative resolutions of singularities** in relation to decompositions of derived categories of sheaves and to representation theory
• **Noncommutative algebraic geometry** in relation to classical projective geometry and ring theory

The broad perspective of the workshop, the interactions between many different areas, and the range of substantial advances is illustrated by the abstracts.

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