

Preface

The title of the 8th Abel symposium was “Algebras, Quivers and Representations”. Representation theory of algebras is a classical and central topic within mathematics with strong links to Lie theory and mathematical physics. Non-commutative, and especially finite dimensional algebras, can often be described in terms of quivers. Moreover, the representation theory of such algebras can also be understood in terms of representations of quivers. Mainly due to its concrete and combinatorial nature, the theory has recently had an increasing impact in mathematics, with new connections to many other areas, like commutative algebra, algebraic geometry, algebraic groups, and combinatorics. The symposium focused on several of these connections, like cluster algebras, homological and representation theoretic aspects in commutative algebra and quiver varieties.

The recent increase in interaction with various other fields of mathematics has also had a positive impact for the study of internal representation theoretic questions. On one hand, it has given new techniques, both of combinatorial, geometrical and categorical nature. On the other hand, it has motivated the study of new classes of algebras. In the conference, several classical representation theoretic questions were also addressed.

This Abel symposium proceedings contains a selection of papers dealing with the above mentioned subjects. It was held in Balestrand at the Sognefjord from the 20th to 23rd of June 2011 in the Kviknes Hotel. There were 43 participants, and participation was by invitation only. The scientific committee for the symposium consisted of:

Aslak Bakke Buan (Trondheim)

Bernhard Keller (Paris)

Idun Reiten (Trondheim)

Claus M. Ringel (Bielefeld)

Sverre O. Smalø (Trondheim)

Øyvind Solberg (Trondheim).

The editors of this proceedings volume gratefully acknowledge the help, the assistance and the support of the other members in the scientific committee in organiz-

ing the symposium with special thanks to the foreign members and the local PhD-students and post doctoral fellows at the Department of Mathematical Sciences, NTNU.

The symposium had 18 talks:

<i>Luchezar Avramov</i>	Reverse homological algebra over local rings
<i>Ragnar-Olaf Buchweitz</i>	The fundamental class of an algebra
<i>Karin Erdmann</i>	Cohomology for Hecke algebras and related algebras
<i>Sergey Fomin</i>	Cluster structures in classical rings of invariants
<i>Dieter Happel</i>	Algebras of finite global dimension
<i>Bernhard Keller</i>	On generic bases in cluster algebras (after Plamondon)
<i>Maxim Kontsevich</i>	Cluster algebras from the mirror symmetry perspective
<i>Henning Krause</i>	An encounter between Gabriel-Roiter and Ziegler
<i>Bernard Leclerc</i>	Cluster structures on quantum coordinate rings
<i>Helmut Lenzing</i>	Triangle singularities, weighted projective lines, and nilpotent operators
<i>Robert Marsh</i>	From triangulated categories to module categories via localisation
<i>Hiraku Nakajima</i>	Handsaw quiver varieties and finite W-algebras
<i>Steffen Oppermann</i>	n -representation infinite algebras
<i>Claus M. Ringel</i>	Tensor products of path algebras
<i>Jan Schröer</i>	Cluster variables are irreducible
<i>Andrzej Skowroński</i>	Module categories with heart
<i>Lauren Williams</i>	Positive bases for cluster algebras from surfaces
<i>Andrei Zelevinsky</i>	Tropical dualities in cluster algebras.

In addition to the talks, the participants had the chance to attend a concert in St. Olaf's church on Monday night with traditional Norwegian folk music and a conference dinner celebrating Sverre O. Smalø's 60th birthday on Tuesday. In addition, they had the option to take part in an excursion on Wednesday, departing from Balestrand by the boat *M/S Sognefjell* and enjoying lunch on the way to the Norwegian Glacier Museum. After visiting the museum, the boat stopped at Hopperstad stave church and then Finden Gard, where participants had dinner, before returning to Balestrand.

The 43 participants at the symposium were:

Claire Amiot (Bonn)	Sergey Fomin (Michigan)
Javad Asadollahi (IPM & Isfahan)	Tore Forbregd (Trondheim)
Luchezar Avramov (Lincoln)	Christof Geiss (Mexico City)
Fedra Babaei (Trondheim)	Edward L. Green (Blacksburg)
Petter Andreas Bergh (Trondheim)	Benedikte Grimeland (Trondheim)
Aslak Bakke Buan (Trondheim)	Dieter Happel (Chemnitz)
Ragnar-Olaf Buchweitz (Toronto)	Martin Herschend (Trondheim)
Karin Erdmann (Oxford)	Dave Jorgensen (Arlington)

Katharina Kahrs (Trondheim)	Jan Schröer (Bonn)
Bernhard Keller (Paris)	Andrzej Skowroński (Torun)
Maxim Kontsevich (Bures-sur-Yvette)	Sverre O. Smalø (Trondheim)
Henning Krause (Bielefeld)	Øyvind Solberg (Trondheim)
Bernard Leclerc (Caen)	Johan Steen (Trondheim)
Helmut Lenzing (Paderborn)	Hugh Thomas (New Brunswick)
Dag Oskar Madsen (Fredrikstad)	Hermund A. Torkildsen (Trondheim)
Robert Marsh (Leeds)	Gordana Todorov (Boston)
Hiraku Nakajima (Kyoto)	Lauren K. Williams (Berkeley)
Nils Normes (Trondheim)	Dan Zacharia (Syracuse)
Steffen Oppermann (Trondheim)	Andrei Zelevinsky (Boston)
Idun Reiten (Trondheim)	Grzegorz Zwara (Torun)
Claus M. Ringel (Bielefeld)	Anette Wrålsen (Trondheim)
Shumbana Mohamed Said (Trondheim)	

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Finally, we thank Springer and Ruth Allewelt, for great patience and service during the preparation of this volume.

Trondheim,
May 2013

Aslak Bakke Buan
Idun Reiten
Øyvind Solberg

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