MSRI
Mathematical Sciences Research Institute

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Annual Report

on the

Mathematical Sciences Research Institute

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Mathematical Sciences Research Institute

NSA Annual Report

I. INTRODUCTION

The main scientific activities of MSRI are its Programs and Workshops. Typically, MSRI will host one year-long program with two semester-long programs or four semester-long programs each year. MSRI usually runs two programs simultaneously, each with about forty mathematicians in residence at any given time, with an additional eight to ten graduate students per program. Each year, MSRI also runs a one-year Complementary Program, with five to ten researchers. The purpose of the Complementary Program is to host mathematicians whose research expertise, while not directly in the area of the main programs held at MSRI that year, remains sufficiently close to it so as to promote interdisciplinary interactions among researchers.

The NSA grant H98230-08-1-0066 supported two semester-long programs in Spring 2008: *Combinatorial Representation Theory* and *Representation of Finite Group and Related Topics.*

II. OVERVIEW OF ACTIVITIES

Major Programs and their Associated Workshops

Program 1: *Combinatorial Representation Theory*

January 14, 2008 to May 23, 2008

Organized By: P. Diaconis, A. Kleshchev, B. Leclerc, P. Littelmann, A. Ram, A. Schilling, R. Stanley

In representation theory, abstract algebraic structures are represented using matrices or geometry. These representations provide a bridge between the abstract symbolic mathematics and its explicit applications in nearly every branch of mathematics as well as in related fields such as physics, chemistry, engineering, and statistics.

In Combinatorial Representation Theory, combinatorial objects are used to model these representations. These are refined enough to help describe, count (how many there are), enumerate (how to generate them all), and understand the representation theory. Furthermore, the interplay between the algebra and the combinatorics goes both ways: the combinatorics helps answer algebraic questions, and the algebra helps answer combinatorial questions.

Particularly in the last couple of decades, the field of Combinatorial Representation Theory has become a thriving discipline. Some recent catalysts stimulating the growth of this field have been the "crystals" discovered by Kashiwara and Lusztig and the development of the combinatorics of affine Lie groups with their connection to mathematical physics. In the 21st century, Combinatorial Representation Theory lies at the intersection of several fields: combinatorics, representation theory, analysis, algebraic geometry, Lie theory, and mathematical physics. These fields often operate under separate umbrellas, and the primary goal of this program was to bring together the experts of the various flavors of Combinatorial Representation Theory together in one interdisciplinary setting.

The very recent connections between path models for crystals, the geometry of the loop Grassmanian, and complex reflection groups and p-compact groups are indicators that the future holds even more gems for this field. The program made an effort to focus on main problems of the field such as:

- positive combinatorial formulas: q-weight multiplicities, Kazhdan-Lusztig polynomials, generalized Littlewood-Richardson coefficients;
- combinatorial indexings and constructions of irreducible representations: Springer correspondences, Langlands classifications, path models, tableaux;
- the Virasoro conjecture: counting branched covers of Riemann surfaces, Hurwitz numbers, cycle types, symmetric functions, determinant formulas;
- representation theoretic interpretations of Macdonald polynomials: Hilbert scheme, diagonal invariants, affine and graded Hecke algebra modules:
- distributions and convergence of random processes: random matrices, subsequences of permutations, statistical mechanics models;
- decomposition numbers for representations: affine Lie algebras, modular representations, highest-weight categories, homology representations, finite goups of Lie type;
- product structure in cohomology and K-theory: Schubert varieties, quiver varieties, toric varieties, loop Grassmanians.
- cluster algebras: generalized associahedra associated with root systems, coordinate rings of flag varieties and their double Bruhat cells.

Workshops Associated with the Combinatorial Representation Theory program:

Connections for Women: Introduction to the Spring 2008 programs

January 16, 2008 to January 18, 2008

Organized By: Bhama Srinivasan and Monica Vazirani

This intensive three-day workshop for women introduced advanced graduate students and recent PhDs to current areas of research in Representation Theory.

It consisted of introductory mini-courses and talks, as well as a poster session where all participants were encouraged to present their work. An important purpose of the workshop was to establish a professional network for participants by introducing them to each other and each others' work. To this end there was a dinner, social activities, and a panel discussion on issues related to women in mathematics.

The workshop was part of the Combinatorial Representation Theory Program and the Representation Theory of Finite Groups and Related Topics Program and participants were encouraged to attend associated Introductory Workshops on Combinatorial Representation Theory from January 21 to January 25, and Representation Theory of Finite Groups from January 28 to February 1. The Connections for Women workshop was a good introduction to these two workshops.

Introductory Workshop on Combinatorial Representation Theory

January 22, 2008 to January 25, 2008

Organized By: Persi Diaconis, Arun Ram, Anne Schilling (Chair)

The soul of Combinatorial Representation Theory (CRT) lies in the interplay between combinatorics and various branches of mathematics. Combinatorial methods are applied to solve problems in representation theory, Lie theory, geometry, and mathematical physics. In symbiosis, deep combinatorial problems also arise from these areas.

The goal of the Introductory Workshop was to survey current and recent developments in the field. The talks focused on tableaux, reflection groups, finite groups, geometry, and mathematical physics in the realm of Combinatorial Representation Theory.

Lie Theory

March 10, 2008 to March 14, 2008

Organized By: Alexander Kleshchev, Arun Ram, Richard Stanley (chair), Bhama Srinivasan

The emphasis was on the interplay of combinatorics, Lie theory, and finite group theory. Connections between these areas go back at least to Schur and Weyl: representations of the symmetric group, polynomial representations of general linear group, and Weyl's character formula. In the last 20 years, the field has seen great development as the combinatorics of Young tableaux has been generalized to any Lie type via the theory of crystals. Littlemann's path model approach to crystals makes a strong connection between this theory and the geometry of the flag variety. Recent activity is exploring the connection between representation theory, the geometry of the loop Grassmannian, and affine Hecke algebras. In the modular representation theory of finite groups of Lie type, connections with complex geometry have arisen in the defining characteristic case and with affine Kac-Moody algebras in the non-defining characteristic case.

Topics covered by the workshop included finite groups of Lie type, algebraic groups, quantum groups, affine Lie algebras, Hecke algebras, cluster algebras, W-algebras, and modular Lie algebras.

Topics in Combinatorial Representation Theory

March 17, 2008 to March 21, 2008

Organized By: Sergey Fomin, Bernard Leclerc, Vic Reiner (Chair), Monica Vazirani

Representation theory has often been a key to unlocking problems of enumeration and structure for our favorite combinatorial objects. In the reverse direction, answering many of the central questions of representation theory required development of sophisticated combinatorial techniques and constructions. This interplay, which has only intensified in recent years, was the focus of the workshop.

Topics discussed include (the combinatorial aspects of): quiver representations; cluster algebras; Macdonald and LLT polynomials; representation-theoretic techniques in quantum/statistical mechanics; generalized Littlewood-Richardson rules, Schur-positivity, and connections with Schubert calculus; crystal bases and graphs; affine Grassmannians, Mirkovic-Vilonen cycles; dual canonical and semi-canonical bases; Horn and Deligne-Simpson problems; tropical calculus in representation theory.

A relatively small number of talks left ample time for informal discussions and presentations.

Program Highlights:

Five of the organizers, Bernard Leclerc, Persi Diaconis , Alexander Kleshchev, Arun Ram, and Anne Schilling, were present for most of the duration of the program. Richard Stanley and Peter Littleman visited for periods of one to two months. Combinatorial Representation Theory is the interaction of combinatorics and representation theory. It lies at the intersection of several fields: combinatorics, representation theory, harmonic analysis, algebraic geometry, and mathematical physics. Many experts in these various fields came together under the interdisciplinary heading of Combinatorial Representation Theory. The facilities at MSRI were ideal for bringing this group together for a focused semester. The interaction with the concurrent program Representation Theory of Finite Groups and Related Topics was so intense that it was never clear which members were officially members of which program. The natural overlap between these fields was beneficial to both. The program saw great interplay between combinatorics, geometry, finite groups, Lie theory, and probability in their applications to representation theory. There was a focused excitement in the air throughout the program and an environment in which there was intense work on problems such as:

- Interaction of geometry, representation theory, and combinatorics,
- Macdonald polynomials,
- Applications of combinatorial representation theory,

- Computational advances and development of Sage-Combinat (a computer package), and
- Cluster algebras, quivers, and quantum affine algebras.

One of the exciting moments came when Arun Ram and Martha Yip discovered a new combinatorial formula for Macdonald polynomials. This new formula is valid for all root systems. One of the most exciting aspects of the Ram-Yip formula is the fact that it is in terms of the path model, which also has an algebro-geometric interpretation in terms of galleries in a building. The form of the new formula is the same as that of the formula of Haglund-Haiman-Loehr for type GL(n), but there is a fascinating and not very well understood collapsing of terms that relates the two formulas. Recent preprints of Cristian Lenart study this collapsing of terms. The connection between the path model combinatorics and the algebro-geometric interpretation was the centerpiece of discussions at MSRI between Peter Littelmann and Cristian Lenart. The compression of terms seems to have an algebro-geometric background related to the interpretation of galleries (or alcove walks) in the framework of affine buildings and the affine Grassmannian.

Several significant projects provided beautiful applications of combinatorial representation theory. One of the striking results was the discovery by Lauren Williams, J.C. Novelli, and J.Y. Thibon of a connection between the asymmetric exclusion process and combinatorial Hopf algebras. Several important features of the stationary distribution of the process can be read directly from the combinatorial Hopf algebra perspective, and there is further data available on the Hopf algebra side that, so far, is not yet understood in terms of the asymmetric exclusion process. Lauren Williams was a Viterbi postdoctoral fellow at MSRI for the entire semester and J.C. Novelli visited MSRI for a short period.

Sami Assaf, Persi Diaconis and Kannan Soundararajan are completing a beautiful project on the study of random walks on cosets. A particular case of interest, where the group is the symmetric group and the subgroup is a Young subgroup, corresponds to the analysis of shuffles of a bicolored deck of cards. They show that log n shuffles are sufficient to mix up a deck with n cards that are half red and half black. The proof of these results uses representation theory (character formulas for the symmetric group evaluated at transpositions), combinatorics (to get formulas for which decks are mostly likely to appear), and probabilistic and analytic methods (to get asymptotics for distance to uniformity).

The Focused Research group on ”Affine Schubert calculus” had a significant presence at MSRI with many members (Jason Bandlow, Francois Descouens, Anne Schilling, Mark Shimozono, Nicolas Thiéry, Mike Zabrocki) being in residence for varying amounts of time during the semester. On of the goals of this research group is to share computational software development efforts between the participants, and, at the end, to make it freely available. Under the leadership of Florent Hivert and Nicolas Thiéry, the open source algebraic combinatorics package MuPAD-Combinat (http:://mupad-combinat.sf.net/) has been developed since 2001. The rapid growth of

Sage (www.sagemath.org) makes it a much more viable alternative for a combinatorics package. Sage was started in 2005 by William Stein (now at the University of Washington), and it already consists of over two million lines of code. It incorporates several of the best free, open-source mathematics software packages available (GAP, Singular, Macaulay, GMP, and MPFR, just to name a few), as well as a huge original library, including several new algorithms not yet found elsewhere. (Incidentally, MSRI is holding a 4-day workshop in April 2009 on the SAGE software.)

Program 2: *Representation Theory of Finite Groups and Related Topics*

January 14, 2008 to May 23, 2008

Organized By: J. L. Alperin, M. Broue, J. F. Carlson, A. Kleshchev, J. Rickard, B. Srinivasan

Founded by Frobenius and Schur more than a century ago, the representation theory of finite groups is today a thriving field with many recent successes. Current research centers on the many open questions, particularly regarding representations over the integers or rings of positive characteristic. Brauer developed block theory to better understand such representations, and it proved important in solving some problems in the classification of finite simple groups. In the last few years the area has been driven by a panoply of exciting new conjectures concerning correspondence of characters and derived equivalences of blocks. A key feature is the interplay between the research on general finite groups and important special classes of groups. Some major advances have been made in the representation theories of symmetric groups and groups of Lie type.

Around the same time as Brauer, Eilenberg, and MacLane gave an algebraic definition of group cohomology, analogous to similar constructions in topology. It has been an important tool for those studying group representations. There are many fruitful interactions among mathematicians from diverse backgrounds who use group cohomology, including those who work in representation theory and algebraic topology. More recently, we have seen very active interactions between homotopy theory, commutative algebra, group actions and modular representation theory. Topics such as p-local groups, group actions on finite complexes and homotopy representations blend algebra and topology in novel and productive ways.

The goals of the semester focused the research on some of the conjectures and fostered emerging interdisciplinary connections between several related areas in algebra and topology.

The introductory workshop concentrated on some of the many fundamental open problems in group representations. Topical workshops emphasized the connections with the theory of Lie algebras and algebraic groups and with algebraic topology.

Workshops Associated with the Representation Theory of Finite Groups and Related Topics program:

Connections for Women: Introduction to the Spring, 2008 programs

(Co-sponsored by the program in Combinatorial Representation Theory. See workshop description above).

Introductory Workshop on the Representation Theory of Finite Groups

February 04, 2008 to February 08, 2008

Organized By: Jonathan Alperin (chair), Robert Boltje, Markus Linckelmann

The workshop focused on surveying main active areas of representation theory of finite groups, especially highlighting major unsolved problems. It was meant to be accessible for graduate students and non-specialists with some background in representation theory. The bulk of the week's program consisted of four short series of lectures (each was supplemented by a number of single lectures on a variety of topics):

Block theory and counting conjectures

The course introduced the basic ideas of modular representations, including block theory, the main theorems of Brauer and the Green correspondence. Special theories for cyclic and nilpotent blocks were covered. Subsequently, several counting conjectures were discussed. These included the Alperin-McKay conjecture, Alperin's weight conjecture, the Knorr-Robinson synthesis via alternating sums, Dade's conjecture, and recent subtle refinements.

Representation theory of groups of Lie type

While emphasizing the general linear group, this course covered topics including representations in characteristic zero, p and "el" and related structures such as Hecke algebras.

Representation theory and topology

The purpose of this course was to describe some of the important tie-ins between representation theory and algebraic topology through topics from cohomology of groups applied to representation theory, homological algebra (e.g. derived categories), fusion systems, and p-local finite groups.

Broue's abelian defect group conjecture

This course focused on equivalences between derived categories of blocks and on Broue's isotypies between blocks. In the case of finite groups of Lie type, related geometric structures enter the picture. These include Deligne-Lusztig varieties and complex reflection groups. The case of the symmetric groups was also discussed.

Lie Theory

(Co-sponsored by the program in Combinatorial Representation Theory. See workshop description above).

Homological Methods in Representation Theory

March 31, 2008 to April 04, 2008

Organized By: David Benson, Daniel Nakano (chair), Raphael Rouquier

Over the last century, algebraic invariants like cohomology have been a fundamental tool in studying properties of topological spaces. In the last 40 years, this trend has been reversed, cohomology and other homological methods have been used to study algebraic objects by introducing geometry (i.e., algebraic varieties, derived categories) that captures information about the algebras and their representations. The theme of this workshop involved exploring the deep connections between representations and their underlying geometry. The main topics included:

- Cohomology Theory: Varieties for Modules (for finite group schemes, quantum groups and other types of algebras), Endopermutation and Endotrivial Modules, p-local Finite Groups;

- Derived Categories: Broue's Conjecture, Structure of Triangulated Categories, Representation Dimension;

- Representations and Cohomology of Specific Groups and Algebras: Symmetric Groups, Finite Chevalley Groups, Reductive Algebraic Groups and associated Frobenius kernels.

The lectures at this meeting were aimed at presenting new developments in the area in a manner accessible for young researchers in the field.

Program Highlight

Three of the organizers, Michel Broue, John Carlson, and Alexander Kleshchev, were in residence for the entire program. The three other organizers, Jonathan Alperin, Jeremy Rickard, and Bhama Srinivasan were present for periods of 2 to 3 months. Their presence greatly contributed to the sense of cohesiveness that the researchers expressed in their comments to us. There were four workshops associated to the program. Two of these, Connections for Women, and Lie Theory, were shared with the program on Combinatorial Representation theory.

The heart of the research part of the program was revealed in the several (five, all told) seminars that were held weekly during the program.

The seminar on Representations of Groups of Lie Type, organized by Zongzhu Lin and his postdoc mentee, Daniel Juteau, produced a few exciting results. A notable one was Juteau’s counter-example to a conjecture by Mirkovic and Vilonen. His main idea, a geometric approach to modular representations involving modular character sheaves that was expounded in his dissertation, attracted a lot of attention.

The seminar on Representations of Symmetric Groups and Closely Related Topics was organized by David Hemmer and his postdoctoral mentee, Sinead Lyle. It included lectures by some members of the program on Combinatorial Representation Theory, namely Anatoly Vershik, Hyohe Miyachi, Francesco Brenti, and Olly Ru. It was a perfect opportunity for interactions between programs that yielded several important results in both areas of research. One of the surprising results was Dave Hemmer's stability theorem for symmetric group Specht module cohomology. Kleshchev and Brundan found new presentations of blocks of symmetric groups and cyclotomic Hecke algebras. These presentations establish an isomorphism between the blocks and the cyclotomic Khovanov-Lauda algebras introduced three months ago.

The seminar on Biset Functors was organized by Serge Bouc, with all of the lectures presented by Bouc, Boltje, Ragnarsson, and Webb. One of the postdocs in the program, Kari Ragnarsson, made some progress defining Mackey functors and Burnside rings for fusion systems. Bouc succeeded in proving one his own conjectures. He showed that for a group G, the cohomological Mackey functor for G over the base field k have projective resolutions with polynomial growth if and only if the Sylow p-subgroups of G are cyclic, in the case $p > 2$, or have sectional rank at most 2, if $p = 2$.

The seminar on Homological Methods in Representation Theory was organized by David Benson and Nadia Mazza. The seminar featured lectures by Vera Serganova, from the University of California, Berkeley, as well as lectures by members Ragnarsson, Webb, Nakano, Grodal, Lin, Webb, Symonds, Rickard, and Carlson. There were a couple of notable advances to come from this area of the program. Dave Benson and Julia Pevtsova discovered methods for constructing vector bundles over projective space in infinite characteristics, using the modules of constant Jordan type. The properties of these modules were developed by Carlson, Friedlander, Pevtsova, and Suslin. Peter Symonds proved several theorems related to Castelnuovo-Mumford regularity. In particular, he settled some conjectures of Kemper and others on the regularity of rings of polynomial invariants and proved Benson's conjecture on the regularity of cohomology rings. This last result has significant implications for the computation of cohomology.

There was an informal working group on character theory led Martin Isaacs, Gabriel Navarro, Pham Huu Tiep, and others. This is an area that has focused on important conjectures by Alperin, Dade, Isaacs, Navarro, and others. One of the most striking results to come from the semester at MSRI is a proof of Brauer's height zero conjecture in the case of blocks of maximal defect in characteristic 2. This conjecture states that all complex irreducible characters in a p-block B of a finite group G have height zero if and only if the defect group of B is abelian. It was first proposed by Richard Brauer more than 50 years ago and has been confirmed for many specific groups. However, up until now, there had been few results of any generality on the subject.

While it may in general be difficult to predict the overall impact of a program on the future of a research area, the signs were very positive. The program featured a large diverse group of young researchers. The research in the area has expanded into some new and unexpected directions of study. At the same time, some significant progress was made on a few of the old questions that have been driving research in the area.

III. PARTICIPATION SUMMARY

Name of Activity	# of Program Participants	# of Citizens & Per Res	%*	Decline/ No Reply	# of Female	%	# of Minorities	%*	Decline/ No Reply
Combinatorial Representation Theory	69	31	*46%*	1	12	*17%*	2	*6%*	34
Complementary Program (07-08)	15	8	*62%*	2	3	*20%*	1	*11%*	6
Geometric Group Theory	67	33	*50%*	1	13	*19%*	1	*3%*	35
Representation Theory of Finite Groups and Related Topics	67	26	*40%*	2	8	*12%*	-	*0%*	39
Teichmuller Theory and Kleinian Groups	59	37	*66%*	3	10	*17%*	3	*8%*	20
Total	277	135	*50%*	9	46	*17%*	7	*5%*	134
Total No. of Distinct Program Participants	266	132	*51%*	9	45	*17%*	7	*5%*	129

*Percentage for Citizens & Minorities are computed out of participants that provided info on their citizenship status & Ethnicity. (# of Minorites / (# of Participants – # of Decine or No Reply))

MSRI allocated NSF, NSA, and private funding to financially support 30 postdoctoral fellows during the 2007-08 academic year. Of those 30 postdoctoral fellows, one was financially supported by the NSA Practical & Intellectual H98230-08-1-0066 Grant.

The NSA Practical & Intellectual H98230-08-1-0066 Grant supported postdoctoral Lauren Williams from the Combinatorial Representation Theory Program. Below is the information regarding her work during her stay at MSRI**:**

Lauren Williams

Lauren received her Ph.D from Massachusetts Institute of Technology in 2005 under the supervision of Richard Peter Stanley. Her dissertation was titled “Combinatorial Aspects of Total Positivity.” Lauren has made seven significant contributions to algebraic combinatorics: Four of them are related to the idea of the "positive part" of an algebraic structure, motivated by Lusztig's definition of the totally postive part of a real flag variety. This work involves the positive Bergman complex of an oriented matroid, tropical algebraic geometry and cluster algebras (with D. Speyer), and the shellability of certain posets. Her other three contributions concern the structure of generalized permutohedra, permutation enumeration, and the partially asymmetric exclusion process. Lauren will continue her postdoctoral fellowship at MSRI in the Tropical Geometry Program which will take place next Fall 2009 semester.

IV. PUBLICATION SUMMARY

Last Name	First Name	Publication Title	Co-Authors
Barcelo	Helene	The Discrete fundamental group of te Associahedron of type A.	Chris Severs, JAcob White
Barcelo	Helene	Subspace arrangements and discrete homotopy groups.	Chris Severs, Jacob White
Barcelo	Helene	Basis graphs of shifted complexes	Abdul Jarrah, Susanna Fishel
Barcelo	Helene	Coloring Complexes	Einar Steingrimson
Boltje	Robert	Fibred biset functors	Olcay Coskun
Boltje	Robert	r-fold complexes	Dave Benson
Brundan	Jonathan	The degenerate analogue of Ariki's categorification theorem	A. Kleshchev
Brundan	Jonathan	Young's semi-normal form for higher levels	A. Kleshchev
Carlson	Jon	Blocks and support varieties	J. Rickard
Carlson	Jon	A polynomial-time reduction algorithm for groups of semilinear or subfield class	Max Neunhoeffer and Colva Roney-Dougal
Carlson	Jon	Finite generation of Tate cohomology	S. Chebolu and J. Minac
Carlson	Jon	Freyd's generating hypothesis for the stable module category of a finite group	S. Chebolu and J. Minac
Carlson	Jon	Varieties and cohomology for infinitely generated modules	D. J. Benson
Carlson	Jon	The group of endotrivial modules for the symmetric and alternating groups	D. J. Hemmer and Nadia Mazza
Carlson	Jon	Canonical constructions for modules over groups of order p^2	E. Friedlander and A. Suslin
Carlson	Jon	Generic kernels and other module constructions	E. Friedlander and J. Pevtsova
Doty	Stephen	Schur-Weyl duality for finite fields	Dave Benson
Doty	Stephen	Annihilators of permutation modules	Kathryn Nyman
Doty	Stephen	Polynomial representations of Chevalley groups	
Doty	Stephen	Quantized mixed tensor space and Schur-Weyl duality	Richard Dipper and Friedericke Stoll
Doty	Stephen	On the defining relations for generalized q-Schur algebras	Anthony Giaquinto and John B. Sullivan
Fomin	Sergey	Cluster algebras and triangulated surfaces. Part II: Lambda lengths	Dylan Thurston
Friedlander	Eric	Constructions for infinitesimal group schemes	Julia Pevtsova
Friedlander	Eric	Weil restriction and cohomological varieties	

Friedlander	Eric	Special properties of certain modules for elementary abelian p-groups	J. Carlson and A. Suslin
Friedlander	Eric	Higher order rank varieties	J. Carlson and J. Pevtsova
Friedlander	Susan	An inviscid dyadic model of turbulence: the global attractor	Alexey Cheskidov and Natasa Pavlovic
Friedlander	Susan	Kolmogorov's law for a dyadic model of turbulence	Alexey Cheskidov
Friedlander	Susan	Nonlinear instability for the surface quasi geostrophic equations	Natasa Pavlovic and Vlad Vicol
Glesser	Adam	Control of transfer and weak closure in fusion systems	Antonio Diaz, Nadia Mazza, Sejong Parkk
Glesser	Adam	Trivial Fusion Systems	
Glesser	Adam	The commuting category of a fusion system	Markus Linckelmann
Goodman	Frederick	Cyclotomic Birman--Wenzl--Murakami Algebras II: Admissibility Relations and Freeness	Holly Hauschild
Goodman	Frederick	Cellularity of Cyclotomic Birman--Wenzl--Murakami Algebras	
Goodman	Frederick	Cellularity and the Jones basic construction	John Graber
Guralnick	Robert	Cohomology of alternating and symmetric groups	P. Tiep
Guralnick	Robert	Primitive Monodromy Groups of Genus at most Two	Dan Frohardt and Kay Magaard
Halverson	Thomas	Crystals and Casimirs of Classical Lie Algebras	Arun Ram
Halverson	Thomas	A q-Partition Algebra	Arun Ram and Nat Theiem
Halverson	Thomas	Combinatorics of the q-Partition Algebra	Nat Thiem
Halverson	Tom	Combinatorics of the q-Partition Algebra	Nat Thiem
Halverson	Tom	Partition algebras and their q analogs	Arun Ram and Nat Theiem
Halverson	Tom	Motzkin Algebras	Georgia Benkart
Halverson	Tom	Model Characters in the Symmetric Group	Michael Decker (not at MSRI)
Halverson	Tom	Combinatorics of the q-Partition Algebra	Nat Thiem
Halverson	Tom	Partition algebras and their q analogs	Arun Ram and Nat Theiem
Halverson	Tom	Motzkin Algebras	Georgia Benkart
Halverson	Tom	Model Characters in the Symmetric Group	Michael Decker (not at MSRI)
Hemmer	David	On the cohomology of Young modules	Nakano and Cohen

Hemmer	David	A classification of the group of endotrivial modules for the symmetric and alternating groups	Carlson and Mazza
Hemmer	David	Cohomology and generic cohomology for Specht modules of the symmetric group.	
Isaacs	I. Martin	Character sums and double cosets	Gabriel Navarro
Isaacs	I. Martin	Rational elements in finite groups	Gabriel Navarro
Kedem	Rinat	Positivity for the cluster algebras associated with Q-systems	Philippe Di Francesco
Kedem	Rinat	Q-systems as cluster algebras II: Polynomiality and non-simply laced case	Philippe Di Francesco
Kedem	Rinat	Q-systems as cluster algebras	
Magaard	Kay	Primitive Groups of Genus 2	Frohardt,D. and Guralnick, R.
Magaard	Kay	Constructive Recognition of Tensor Products	O'Brien
Magaard	Kay	Irreducible Characters of Sylow p-subgroups of Groups of Exceptional Lie	Himstedt, F. and Le, T.
Orellana	Rosa	Kronecker Polynomials	Emmanuel Briand and Mercedes Rosas
Orellana	Rosa	Reduced Kronecker polynomials and Polyhedra	Emmanuel Briand and Mercedes Rosas
Schilling	Anne	Hecke group algebras as degenerate affine Hecke algebras	Florent Hivert, Anne Schilling, Nicolas Thiery
Schilling	Anne	Characterization of promotion operators on tensor products	Jason Bandlow, Anne Schilling. Nicolas Thiery
Schilling	Anne	Kirillov-Reshetikhin crystals of type C_n^{(1)}, D_{n+1}^{(2)} and A_{2n}^{(2)}	Ghislain Fourier, Masato Okado, Anne Schilling
Stancu	Radu	Transfer theorems on fusion systems	Adam Glesser, Nadia Mazza
Stembridge	John	Admissible W-graphs	
Vazirani	Monica	A bijection on core partitions and a parabolic quotient of the affine symmetric group	Chris Berg, Brant Jones
Vazirani	Monica	$(\ell,0)$-Carter partitions, a generating function, and their crystal theoretic interpretation	Chris Berg
Williams	Lauren	The totally non-negative part of G/P is a CW complex	K. Rietsch
Williams	Lauren	Combinatorial Hopf algebras, Hall-Littlewood polynomials, permutation tableaux.	J.C. Novelli and J.Y Thibon
Williams	Lauren	Discrete Morse theory and totally non-negative flag varieties	

Williams	Lauren	Parameterizations of Cominuscule flag varieties	P. Pylyavksy and T. Lam
Williams	Lauren	Bergman complexes of Coxeter arrangements and the tropical Grassmannian	F. Ardila
Williams	Lauren	Type B alternating sign matrices	A. Lascoux