

**Jonathan Brundan****Curriculum Vitae**

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**Date of birth** 12/12/1970.  
**Nationality** British. US permanent resident.  
**Status** Married (with 8 year old Joseph and 5 year old Aisha!).

**CAREER HISTORY**

**Current Position** Professor, University of Oregon, from Fall 2008.  
 Associate Professor, University of Oregon, 2002–2008.  
 Assistant Professor, University of Oregon, 1997–2002.

**Sabbatical** September 2003–February 2004, University of Bristol, UK.  
 March 2004–May 2004, University of Lyon I, France.

**Research fellowship** Trevelyan Research Fellow, Selwyn College,  
 Cambridge University, 1996–1997.

**Ph.D. in mathematics** Imperial College of Science, Technology and Medicine,  
 University of London, 1993–1996 (advisor: Martin Liebeck).

**P.G.C.E.** British teaching qualification, 11–18 year olds.  
 Dept. of Education, Cambridge, 1992–1993.

**BA (Hons) First Class** Mathematics. Queens' College, Cambridge, 1989–1992.

**Systems programmer** One year of C programming, 1988–1989.  
 Intelligent Micro Software Ltd., UK.

**RESEARCH INTERESTS**

1. Representation theory of Lie algebras, algebraic groups and quantum groups.
2. Algebraic combinatorics, Kazhdan-Lusztig polynomials and crystal bases.
3. Modular representation theory of finite groups, invariant theory.

## GRANTS AND AWARDS

1. NSF five year award 2007–2012, \$490,734 (PI, co-PI Kleshchev).
2. Selected as first alternate for 2007-2008 American Mathematical Society Centennial Fellowship (not awarded).
3. University of Oregon Ersted award, university-wide prize for outstanding teaching, June 2003.
4. University of Oregon Williams award, university-wide prize for excellence in teaching, May 2003.
5. NSF five year award 2002–2007, \$357,000 (co-PI, PI Kleshchev).
6. University of Oregon Bray award, university-wide prize for outstanding junior faculty, June 2000.
7. NSF standard award 1998–2001, \$67,000 (PI).

## PHD STUDENTS

1. James Urick, from Fall 2008.
2. Jonathan Brown, from Fall 2004. Thesis: “Finite  $W$ -algebras in classical Lie algebras”. Expected to finish in Fall 2008.
3. Aaron Tresham, Winter 2001–Fall 2002. Did not finish.
4. Jon Kujawa, Winter 1999–Summer 2003. Thesis: “The representation theory of the general linear supergroup”. Currently has a tenure-track position at University of Oklahoma, Norman.

## MANUSCRIPTS IN PREPARATION

1. *Highest weight categories arising from Khovanov’s diagram algebra I: cellularity* (with C. Stroppel).
2. *Highest weight categories arising from Khovanov’s diagram algebra II: Koszulity* (with C. Stroppel).
3. *Highest weight categories arising from Khovanov’s diagram algebra III: category  $\mathcal{O}$*  (with C. Stroppel).
4. *Highest weight categories arising from Khovanov’s diagram algebra IV: the general linear supergroup* (with C. Stroppel).

5. *Lectures on combinatorial representation theory and categorification* (notes from lectures given at Tsinghua University, May 2007).
6. *Cohomology of Spaltenstein varieties* (with V. Ostrik).

## MANUSCRIPTS SUBMITTED FOR PUBLICATION

7. *Centers of degenerate cyclotomic Hecke algebras and parabolic category  $\mathcal{O}$* , submitted to Represent. Theory, 26 pages; [math.RT/0607717](#).
8. *Schur-Weyl duality for higher levels*, submitted to Selecta Math., 51 pages (with A. Kleshchev); [math.RT/0605217](#).

## PUBLICATIONS

9. *Highest weight theory for finite  $W$ -algebras* (with S. Goodwin and A. Kleshchev), to appear in Int. Math. Res. Notices, 39 pages.
10. *Symmetric functions, parabolic category  $\mathcal{O}$  and the Springer fiber*, to appear in Duke Math. J., 33 pages.
11. *Elementary invariants for centralizers of nilpotent matrices*, to appear in J. Austral. Math. Soc., 12 pages (with J. Brown).
12. *Representations of shifted Yangians and finite  $W$ -algebras*, to appear in Mem. Amer. Math. Soc., 115 pages (with A. Kleshchev).
13. *Good grading polytopes*, Proc. London Math. Soc. **94** (2007), 155–180 (with S. Goodwin).
14. *James' regularization theorem for projective representations of symmetric groups*, J. Algebra **306** (2006), 128–137 (with A. Kleshchev).
15. *Dual canonical bases and Kazhdan-Lusztig polynomials*, J. Algebra **306** (2006), 17–46.
16. *Modular representations of the supergroup  $Q(n)$ , II*, Pacific J. Math. **224** (2006), 65–90.
17. *Shifted Yangians and finite  $W$ -algebras*, Advances Math. **200** (2006), 136–195 (with A. Kleshchev).
18. *Parabolic presentations of the Yangian  $Y(\mathfrak{gl}_n)$* , Commun. Math. Phys. **254** (2005), 191–220 (with A. Kleshchev).
19. *Tilting modules for Lie superalgebras*, Commun. Algebra **32** (2004), 2251–2268.

20. *Kazhdan-Lusztig polynomials and character formulae for the Lie superalgebra  $\mathfrak{q}(n)$* , *Advances Math.* **182** (2004), 28–77.
21. *Kazhdan-Lusztig polynomials and character formulae for the Lie superalgebra  $\mathfrak{gl}(m|n)$* , *J. Amer. Math. Soc.* **16** (2003), 185–231. This article has received a **featured review** in *Mathematical Reviews*.
22. *A new proof of the Mullineux conjecture*, *J. Algebraic Combin.* **18** (2003), 13–39 (with J. Kujawa).
23. *Representations of symmetric groups and their double covers*, in: ‘Groups, combinatorics and geometry (Durham, 2001)’, pp. 31–53, World Sci. Publishing, 2003 (with A. Kleshchev).
24. *Modular representations of the supergroup  $Q(n)$ , I*, *J. Algebra* **260** (2003), 64–98 (with A. Kleshchev).
25. *Cartan determinants and Shapovalov forms*, *Math. Ann.* **324** (2002), 431–449 (with A. Kleshchev).
26. *Projective representations of symmetric groups via Sergeev duality*, *Math. Z.* **239** (2002), 27–68 (with A. Kleshchev).
27. *Hecke-Clifford superalgebras, crystals of type  $A_{2\ell}^{(2)}$  and modular branching rules for  $\widehat{S}_n$* , *Represent. Theory* **5** (2001), 317–403 (with A. Kleshchev).
28. *Unipotent Brauer character values of  $GL_n(q)$  and the forgotten basis of the Hall algebra*, *J. Algebraic Combin.* **13** (2001), 137–149.
29. *Representations of the symmetric group which are irreducible over subgroups*, *J. reine angew. Math.* **530** (2001), 145–190 (with A. Kleshchev).
30. *Quantum linear groups and representations of  $GL_n(q)$* , *Mem. Amer. Math. Soc.* **149** (2001), no. 706, 112 pp. (with R. Dipper and A. Kleshchev).
31. *Tensor products and restrictions in type A*, in: ‘Modular representation theory of finite groups’, eds. M. Collins, B. Parshall and L. Scott, de Gruyter, 2001, pp. 67–99 (with A. Kleshchev).
32. *Lower bounds for degrees of irreducible Brauer characters of finite general linear groups*, *J. Algebra* **223** (2000), 615–629 (with A. Kleshchev).
33. *On translation functors for general linear and symmetric groups*, *Proc. London Math. Soc.* **80** (2000), 75–106 (with A. Kleshchev).
34. *Double coset density in classical algebraic groups*, *Trans. Amer. Math. Soc.* **352** (2000), 1405–1436.

35. *Some remarks on branching rules and tensor products for algebraic groups*, J. Algebra **217** (1999), 335–351 (with A. Kleshchev).
36. *Modular Littlewood-Richardson coefficients*, Math. Z. **232** (1999), 287–320 (with A. Kleshchev).
37. *Dense orbits and double cosets*, NATO Adv. Sci. Inst. Ser. C Math. Phys. Sci. **517** (1998), 259–274.
38. *Semisimple restrictions from  $GL(n)$  to  $GL(n - 1)$* , J. reine angew. Math. **500** (1998), 83–112 (with A. Kleshchev and I. Suprunenko).
39. *Modular branching rules and the Mullineux map for Hecke algebras of type  $\mathbf{A}$* , Proc. London Math. Soc. **77** (1998), 551–581.
40. *Lowering operators for  $GL(n)$  and quantum  $GL(n)$* , Proc. Symposia in Pure Math. **63** (1998), 95–114.
41. *Double coset density in exceptional algebraic groups*, J. London Math. Soc. **58** (1998), 63–83.
42. *Multiplicity-free subgroups of reductive algebraic groups*, J. Algebra **188** (1997), 310–330.
43. *Double coset density in reductive algebraic groups*, J. Algebra **177** (1995), 755–767.

## INVITED LECTURES, CONFERENCES AND WORKSHOPS

1. Invited participant at “Algebraic Lie theory” program at Isaac Newton Institute, Cambridge, UK (Spring 2009).
2. Participant in “Enveloping algebras and geometric representation theory”, Oberwolfach, Germany (March 8–March 14 2009).
3. Invited speaker at FPSAC (Formal Power Series and Algebraic Combinatorics), Valparaiso, Chile (June 23–27 2008).
4. Invited participant at “Combinatorial representation theory” and “Representations of finite groups” programs at MSRI, Berkeley (Spring 2008).
5. Series of two introductory lectures at “Representations of finite groups workshop”, MSRI, Berkeley, (February 4–8 2008).
6. Invited speaker “Algebraic aspects of Lie theory”, Academia Sinica, Taipei, Taiwan (December 20–23 2007).
7. Speaker at ICRT-IV, Lhasa, China (July 16–20 2007).

8. Speaker at “Algebraic and geometric Lie theory”, Aarhus, Denmark (June 25-30 2007).
9. Speaker at “Algebraic Lie theory”, BIRS, Canada (May 27–June 1 2007).
10. Series of eight lectures at Tsinghua University, Beijing, China (May 2007).
11. Colloquium talk on “Spaltenstein varieties and category  $\mathcal{O}$ ” at University of Washington, WA (April 10 2007).
12. Speaker at “Categorification in algebra and topology”, Uppsala, Sweden (September 7-11 2006).
13. Speaker at workshop on “Representation theory and geometry”, UC Berkeley, CA (May 2–5 2006).
14. Colloquium talk on “Schur-Weyl duality for higher levels” at UC Santa Barbara, CA (May 1 2006).
15. Speaker at AMS special session on “Lie algebras and applications”, San Francisco State University, San Francisco, CA (April 29-30 2006).
16. Speaker at “Algebraic groups and finite reductive groups”, Bernoulli center, EPFL, Lausanne, Switzerland (June 13-18 2005).
17. Speaker at “Representations of Kac-Moody algebras and combinatorics”, BIRS, Canada (March 27–31 2005).
18. Participant in “Enveloping algebras”, Oberwolfach, Germany (March 13–March 18 2005).
19. Representation theory seminar, EPFL, Lausanne, Switzerland (April 17 2004).
20. Seminaire Chevalley, University of Paris VII, France (April 8 2004).
21. Seminaire d’algèbre, University of Lyon I, France (March 16, April 21 2004).
22. Algebra seminar, University of Cambridge, UK (February 16 2004).
23. Colloquium and algebra seminar, University of Virginia, Charlottesville, VA (January 21-22 2004).
24. Algebra colloquium, University of Birmingham, UK (January 27 2004).
25. Speaker at Bristol-Leicester-Oxford representation theory meeting, University of Oxford, UK (January 9 2004).
26. London Algebra Colloquium, UK (November 27 2003).

27. Colloquium talk at University of Leicester, UK (November 20 2003).
28. Speaker at “Current trends in representation theory of finite groups”, BIRS, Canada (October 25–30 2003).
29. Series of six lectures on “Combinatorial representation theory”, Bristol University, UK (Fall 2003).
30. Speaker at California Lie theory seminar at Riverside, CA (November 9–10 2002).
31. Speaker at AMS special session on “Lie algebras and related topics” at University of Wisconsin (Madison) (October 12–13 2002).
32. Speaker at AMS summer meeting on “Cohomology of finite groups” at Mt. Holyoke College, MA (June 2002).
33. Colloquium talk and Lie theory seminar at University of Wisconsin (Madison) (September 18,21 2001).
34. Speaker at “Groups, geometry and combinatorics”, Durham, UK (July 16–July 26 2001).
35. Undergraduate talk on “Knots and physics” given at Linfield College, OR (May 2001).
36. Speaker at “Representation theory of finite groups”, Oberwolfach, Germany (March 26–March 30 2001).
37. Joint OU-OSU colloquium talk given at OSU, Corvallis, OR (February 20 2001).
38. Undergraduate talk on “Kazhdan-Lusztig polynomials” given at Reed College, OR (February 15 2001).
39. Speaker at AMS special session on “Representations of finite groups”, New Orleans, LA (January 5–January 7 2001).
40. Speaker at “Groups, geometries and combinatorics”, Milan, Italy (May 15–May 19 2000).
41. Speaker at “Représentations des groupes algébriques”, CIRM, Luminy, France (November 15–November 19 1999).
42. Speaker at “Representations of finite groups”, Oberwolfach, Germany (June 20–June 25 1999).
43. Speaker at mini-conference on “Finite group representations”, Stuttgart, Germany (June 17 1999).

44. Speaker at “Representations of algebraic groups” conference, Aarhus, Denmark (July 19–August 8 1998).
45. Speaker at CBMS conference, University of North Texas, Denton, TX (May 25–29 1998).
46. Colloquium talk given at Department of Mathematics, OSU, Corvallis, OR (October 18, 1997).
47. Resident at Isaac Newton Institute, Cambridge, UK (Jan–June 1997); speaker at NATO ASI, Cambridge, UK (June 1997).
48. Contributed talk to AMS Summer Research Institute, Seattle, WA (August 1996).

## SERVICE WITHIN THE MATHEMATICAL COMMUNITY

1. Organizer of LMS Symposium in “Representation Theory”, Durham, UK, July 2009.
2. Editor-in-chief for *J. Algebraic Combinatorics* (from January 2007).
3. Special session organizer for regional AMS meeting on “Representations of groups and algebras”, University of Oregon, November 12-13, 2005.
4. Local organizer for NSF funded workshop on “Lie groups and Lie algebras”, University of Oregon, October 8–9, 2005. January 2004, 2008.
5. Referee for numerous mathematical journals (averaging around 10 reports per year).
6. Reviewer for NSF, NSA and EPSRC (UK) grant proposals (around 6 reviews per year).
7. Reviewer for promotions to Associate and Full Professor of colleagues at other universities (around 2 letters per year).
8. Reviewer for *Mathematical reviews* (around 8 reviews per year).

## SERVICE WITHIN THE UNIVERSITY

1. Member of internal Assistant Department Head Search Committee, Spring 2008.
2. Elected member of university-wide Faculty Personnel Committee, 2005/07.
3. Chair of internal Department Head Search Committee, Winter 2007.
4. Member of Graduate Affairs Committee, 2005/06, 2006/07, 2007/08.
5. Member of Graduate Appointments Committee, 2007/08.
6. Chair of Graduate Appointments Committee, 2005/06.

7. Departmental Webmaster 2005/06, 2006/07, 2007/08.
8. Chair of Graduate Advising Committee, 2005/06.
9. Chair of Website Design Committee, 2004/05;
10. Member of Faculty Open Search Committee, 2004/05.
11. Head of Graduate Studies, 2001/02, 2002/03, 2004/05.
12. Chair of Mathematics Education Search Committee, 2002/03.
13. Member of School of Education Search Committee, 2001/02.
14. Member of Departmental Executive Committee, 1998/99, 1999/00 (chair), 2000/01, 2001/02, 2002/03, 2004/05, 2005/06, 2006/07 (chair), 2007/08.
15. Talks at Freshmen Science Honors Colloquia (2002, 2007).
16. Member of PhD committees within Mathematics Department (around 20 committees since 1999).
17. Undergraduate Honors Thesis advisor (Jeremiah Heller, 1998/1999).