

# Anthony Henderson

## Curriculum Vitae

School of Mathematics and Statistics F07  
University of Sydney, NSW 2006  
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**Citizenship:** Australian **Date of Birth:** July 21, 1976

### Employment History

- January 2007 – present: Lecturer, University of Sydney.
- July 2001 – December 2006: Postdoctoral Research Fellow, University of Sydney.

### Degrees Attained

- PhD in Mathematics, Massachusetts Institute of Technology, June 2001, supervised by G. Lusztig. Thesis: ‘Character sheaves on symmetric spaces’.
- BSc with First Class Honours and University Medal in Pure Mathematics, University of Sydney, 1996, supervised by G. I. Lehrer.

### Selected Awards, Grants and Scholarships

- Australian Postdoctoral Fellowship, Australian Research Council Discovery–Projects Scheme, 2003–06.
- Research Assistantship, Massachusetts Institute of Technology, 2000–01.
- Barker Graduate Travelling Scholarship, 1997–98.
- E. S. Wood Postgraduate Research Travelling Scholarship, 1997–98.
- University of Sydney Convocation Medal, 1997 (shared – for outstanding graduate of previous year across all faculties).
- University of Sydney Science Centenary Fund Scholarship and J. M. Coutts Scholarship, 1997 (for outstanding Science graduate of previous year).
- Barker Prize for Mathematics Honours, 1996.
- George Allen Scholarship in Pure Mathematics, 1995 (for outstanding student entering Pure Mathematics Honours).

## Publications and Preprints (linked from web page)

- Henderson, A., and Lehrer, G. I., ‘The equivariant Euler characteristic of real Coxeter toric varieties’, arXiv:0806.0680 [math.RT].
- Achar, P., and Henderson, A., ‘Orbit closures in the enhanced nilpotent cone’, *Advances in Mathematics* **219** (2008), no. 1, pp. 27–62.
- Henderson, A., and Rains, E., ‘The cohomology of real De Concini–Procesi models of Coxeter type’, *International Mathematics Research Notices* **2008** (2008), rnn001.
- Henderson, A., ‘Plethysm for wreath products and homology of sub-posets of Dowling lattices’, *Electronic Journal of Combinatorics* **13** (2006), # R87.
- Henderson, A., ‘Induced characters of the projective general linear group over a finite field’, *Journal of Algebra* **307** (2007), no. 1, pp. 116–135.
- Henderson, A., ‘Bases for certain cohomology representations of the symmetric group’, *Journal of Algebraic Combinatorics* **24** (2006), no. 4, pp. 361–390.
- Henderson, A., ‘Nilpotent orbits of linear and cyclic quivers and Kazhdan–Lusztig polynomials of type A’, *Representation Theory* **11** (2007), pp. 95–121.
- Henderson, A., ‘The symmetric group representation on cohomology of the regular elements of a maximal torus of the special linear group’, *Journal of the Australian Mathematical Society* **84** (2008), pp. 85–98.
- Henderson, A., ‘Species over a finite field’, *Journal of Algebraic Combinatorics* **21** (2005), no. 2, pp. 147–161.
- Henderson, A., ‘Representations of wreath products on cohomology of De Concini–Procesi compactifications’, *International Mathematics Research Notices* **2004:20** (2004), pp. 983–1021.
- Henderson, A., ‘Symmetric subgroup invariants in irreducible representations of  $G^F$ , when  $G = GL_n$ ’, *Journal of Algebra* **261** (2003), no. 1, pp. 102–144.
- Henderson, A., ‘Two-row nilpotent orbits of cyclic quivers’, *Mathematische Zeitschrift* **243** (2003), pp. 127–143.
- Henderson, A., ‘Spherical functions of the symmetric space  $G(F_{q^2})/G(F_q)$ ’, *Representation Theory* **5** (2001), pp. 581–614.
- Henderson, A., ‘Fourier transform, parabolic induction, and nilpotent orbits’, *Transformation Groups* **6** (2001), pp. 353–370.

## Conference Presentations

- ‘Orbit closures in the enhanced nilpotent cone’, Conference on Shuffles, Descents, and Representations, Nice, September 2007.
- ‘The cohomology of real De Concini–Procesi models of Coxeter type’, BIRS Workshop on Algebraic Lie Theory, Banff, May 2007.
- ‘The cohomology of real De Concini–Procesi models of Coxeter type’, Conference on Braids and their Ramifications, Cortona, May 2007.
- ‘The cohomology of the real De Concini–Procesi model of type  $B_n$ ’, Annual Meeting of the Australian Mathematical Society, Macquarie U, September 2006.
- ‘Quiver varieties and zero weight spaces’, AMSI Workshop on Lie Theory, Newcastle, November 2005.
- ‘Bases for certain cohomologies with local coefficients of a hyperplane complement’, Annual Meeting of the Australian Mathematical Society, UWA, September 2005.
- ‘Nilpotent orbits of linear and cyclic quivers and Kazhdan-Lusztig polynomials of type A’, Mathematical Physics and Lie Theory Conference, Coolangatta, December 2004.
- ‘The symmetric group representation on cohomology of the regular elements of a maximal torus of the special linear group’, Annual Meeting of the Australian Mathematical Society, RMIT, September 2004.
- ‘Representations of wreath products on cohomology of De Concini–Procesi compactifications’, Lie Minisymposium, USyd, November 2003.
- ‘Species over a finite field’, Australia/New Zealand Mathematics Convention, Sydney, July 2003.
- ‘Representations of wreath products on cohomology of De Concini–Procesi compactifications’, Workshop on Representation Theory, ANU, July 2003.
- ‘Two-row nilpotent orbits of cyclic quivers’, Australasian Research Symposium on Lie Groups, Algebraic Groups, Quantum Groups, and their Representations, Auckland, December 2001.
- ‘ $K(F_q)$ -invariants in irreducible representations of  $G(F_q)$ , when  $G = GL_n$ ’, Annual Meeting of the AustMS, ANU, September 2001.

## Seminars and Colloquia

- ‘Orbit closures in the enhanced nilpotent cone’, ANU Algebra Seminar, November 2007.
- ‘Poset homology and the cohomology of real De Concini-Procesi models’, UNSW Pure Mathematics Seminar, August 2006.
- ‘Quiver varieties and zero weight spaces’, ANU Algebra Seminar, November 2005.
- ‘Analytic functors and representations of wreath products’, ANU Mathematics Colloquium, October 2005.
- ‘Polynomial functors and representations of wreath products’, UNSW Pure Mathematics Seminar, August 2005.
- ‘A personal introduction to perverse sheaves’, UNSW Algebra Seminar, May 2003.
- ‘Green functions for symmetric spaces over a finite field’, ANU Algebra Seminar, September 2002.
- ‘Spherical functions of the symmetric space  $GL_n(F_{q^2})/GL_n(F_q)$ ’, MIT Lie Groups Seminar, November 2000.
- Many talks at the University of Sydney, including ten in the USyd Algebra Seminar.

## Teaching

- Lecturer, MATH1901 ‘Differential Calculus (Advanced)’, USyd, Semester 1, 2007–08.
- Lecturer, MATH2069/2969 ‘Discrete Mathematics and Graph Theory’, USyd, Semester 1, 2007–08.
- Lecturer, MATH3966 ‘Modules and Representation Theory’, USyd, Semester 2, 2006–08.
- Lecturer, ‘Introduction to Lie Algebras’, USyd, Semester 2, 2005.
- Lecturer, ‘Lie Algebras’, Australian Mathematical Sciences Institute Summer School, January/February 2004 (UNSW) and 2007 (USyd).
- Lecturer, MATH3002 ‘Rings and Fields’, USyd, Semester 1, 2003–04.
- Tutor, various undergraduate classes, USyd, 2003 – present.
- Lecturer, ‘Introduction to Lie Theory’, USyd, Semester 1, 2002.
- Recitation Instructor, two calculus classes, MIT, 1999.

## Postgraduate Supervision

- Jonathan Sun, PhD, associate supervisor, March 2008 – present.
- Justin Koonin, PhD, associate supervisor, July 2007 – present.
- Neil Saunders, PhD, associate supervisor, April 2007 – present.

## Honours Supervision

- Fan Wu, 2008.
- Michael Sun, 2008.
- Alex Fun, 2007.

## Mathematical Service

- Referee, *Journal of Algebra*.
- Referee, *Journal of the Australian Mathematical Society*.
- Referee, *Representation Theory*.
- Reviewer, *Mathematical Reviews*.
- Convenor, USyd Algebra Seminar, July 2003 – present.
- Organizer, SUMS Problem Competition, 2006 – present.
- Organizer of conference ‘GL07: Geometry and Lie Theory’, ANU and USyd, July 2007.
- Supervisor of vacation scholars, USyd, 2001 – present.
- Member of local committee for conference ‘Geometric Aspects of Representation Theory’, USyd, July 2002.
- Mentor of Australian IMO team members, 2002 and 2004.
- Lecturer, Australian IMO training schools, 1995–97.

## Community Service

- Volunteer programmer and presenter, 2MBS-FM, March 2004 – present.