

Pramod N. Achar

Curriculum Vitae

Department of Mathematics
Louisiana State University
Baton Rouge, LA 70803-4918
USA

☎ +1.225.578.7990

✉ pramod@math.lsu.edu

🌐 <http://www.math.lsu.edu/~pramod/>

Academic Positions

- 2001–2004 **L.E. Dickson Instructor in Mathematics**, *University of Chicago*.
2004–2010 **Assistant Professor of Mathematics**, *Louisiana State University*.
2010–2016 **Associate Professor of Mathematics**, *Louisiana State University*.
2016– **Professor of Mathematics**, *Louisiana State University*.

Education

- 1993–1997 **S.B. in Mathematics with Computer Science**, *Massachusetts Institute of Technology*.
1997–2001 **Ph.D. in Mathematics**, *Massachusetts Institute of Technology*.
Advisor: David A. Vogan, Jr.
Thesis: Equivariant coherent sheaves on the nilpotent cone for complex reductive groups

Papers

Refereed publications

1. P. Achar and E. Sommers, *Local systems on nilpotent orbits and weighted Dynkin diagrams*, Represent. Theory **6** (2002), 190–201.
2. P. Achar, *An order-reversing duality map for conjugacy classes in Lusztig's canonical quotient*, Transform. Groups **8** (2003), 107–145.
3. P. Achar, *On the equivariant K -theory of the nilpotent cone in the general linear group*, Represent. Theory **8** (2004), 180–211.
4. P. Achar and A.-M. Aubert, *Supports unipotents de faisceaux caractères*, J. Inst. Math. Jussieu **6** (2007), 173–207.
5. P. Achar and A.-M. Aubert, *Représentations de Springer pour les groupes de réflexions complexes imprimitifs*, J. Algebra **319** (2008), 4102–4139.
6. P. Achar and A.-M. Aubert, *On rank 2 complex reflection groups*, Comm. Algebra **36** (2008), 2092–2132.
7. P. Achar and A.-M. Aubert, *Springer correspondences for dihedral groups*, Transform. Groups **13** (2008), 1–24.
8. P. Achar and A. Henderson, *Orbit closures in the enhanced nilpotent cone*, Adv. Math **219** (2008), 27–62. *Corrigendum*, Adv. Math. **228** (2011), 2984–2988.

9. P. Achar and D. Sage, *On special pieces, the Springer correspondence, and unipotent characters*, Amer. J. Math. **130** (2008), 1399–1425.
10. P. Achar and D. Sage, *Perverse coherent sheaves and the geometry of special pieces in the unipotent variety*, Adv. Math. **220** (2009), 1265–1296.
11. P. Achar and D. Sage, *Staggered sheaves on partial flag varieties*, C. R. Acad. Sci. Paris Sér. I Math. **347** (2009), 139–142.
12. P. Achar, *Staggered t -structures on derived categories of equivariant coherent sheaves*, Int. Math. Res. Not. (2009), no. 20, 3843–3900.
13. P. Achar, *On the quasi-hereditary property for staggered sheaves*, Trans. Amer. Math. Soc. **362** (2010), 4735–4753.
14. P. Achar and A.-M. Aubert, *Localisation de faisceaux caractères*, Adv. Math. **224** (2010), 2435–2471.
15. P. Achar and C. Cunningham, *Toward a Mackey formula for compact restriction of character sheaves*, Harmonic analysis on reductive, p -adic groups, Contemp. Math., vol. 543, Amer. Math. Soc., Providence, RI, 2011, pp. 1–18.
16. P. Achar, A. Henderson, and E. Sommers, *Pieces of nilpotent cones for classical groups*, Represent. Theory **15** (2011), 584–616.
17. P. Achar and D. Treumann, *Baric structures on triangulated categories and coherent sheaves*, Int. Math. Res. Not. (2011), 3688–3743.
18. P. Achar, A. Henderson, and B. Jones, *Normality of orbit closures in the enhanced nilpotent cone*, Nagoya Math. J. **203** (2011), 1–45.
19. P. Achar, *Green functions via hyperbolic localization*, Doc. Math. **16** (2011), 869–884.
20. P. Achar and D. Treumann, *Purity and decomposition theorems for staggered sheaves*, J. Inst. Math. Jussieu **11** (2012), 695–745.
21. P. Achar, *Perverse coherent sheaves on the nilpotent cone in good characteristic*, Recent developments in Lie algebras, groups and representation theory, Proc. Sympos. Pure Math., vol. 86, Amer. Math. Soc., 2012, pp. 1–23.
22. P. Achar and C. Stroppel, *Completions of Grothendieck groups*, Bull. Lond. Math. Soc. **45** (2013), 200–212.
23. P. Achar and A. Henderson, *Geometric Satake, Springer correspondence, and small representations*, Selecta Math. (N.S.) **19** (2013), 949–986.
24. P. Achar and S. Riche, *Koszul duality and semisimplicity of Frobenius*, Ann. Inst. Fourier **63** (2013), 1511–1612.
25. P. Achar, *Kostka systems and exotic t -structures for reflection groups*, Recent developments in algebraic and combinatorial aspects of representation theory, Contemp. Math., vol. 602, Amer. Math. Soc., 2013, pp. 1–21.

26. P. Achar, A. Henderson, D. Juteau, and S. Riche, *Weyl group actions on the Springer sheaf*, Proc. Lond. Math. Soc. **108** (2014), 1501–1528.
 27. P. Achar and S. Kitchen, *Koszul duality and mixed Hodge modules*, Int. Math. Res. Notices **2014** (2014), 5874–5911.
 28. P. Achar and S. Riche, *Constructible sheaves on affine Grassmannians and geometry of the dual nilpotent cone*, Israel J. Math. **205** (2015), 247–315.
 29. P. Achar, A. Henderson, and S. Riche, *Geometric Satake, Springer correspondence, and small representations. II*, Represent. Theory **19** (2015), 94–166.
 30. P. Achar, *On exotic and perverse-coherent sheaves*, Representations of reductive groups: in honor of the 60th birthday of David A. Vogan, Jr. (M. Nevins and P. E. Trapa, eds.), Progr. Math., vol. 312, Birkhäuser/Springer, 2015, pp. 11–49.
 31. P. Achar and C. Mautner, *Sheaves on nilpotent cones, Fourier transform, and a geometric Ringel duality*, Mosc. Math. J. **15** (2015), 407–423.
 32. P. Achar and L. Rider, *Parity sheaves on the affine Grassmannian and the Mirković–Vilonen conjecture*, Acta Math. **215** (2015), 183–216.
 33. P. Achar and S. Riche, *Modular perverse sheaves on flag varieties II: Koszul duality and formality*, Duke Math. J. **165** (2016), 161–215.
 34. P. Achar and S. Riche, *Modular perverse sheaves on flag varieties I: tilting and parity sheaves*, Ann. Sci. Éc. Norm. Supér. **49** (2016), 325–370, with a joint appendix with G. Williamson.
 35. P. Achar, A. Henderson, D. Juteau, and S. Riche, *Modular generalized Springer correspondence I: the general linear group*, J. Eur. Math. Soc. (JEMS), to appear, arXiv:1307.2702.
 36. P. Achar, A. Henderson, D. Juteau, and S. Riche, *Modular generalized Springer correspondence II: classical groups*, J. Eur. Math. Soc. (JEMS), to appear, arXiv:1404.1096.
 37. P. Achar, A. Henderson, D. Juteau, and S. Riche, *Constructible sheaves on nilpotent cones in rather good characteristic*, arXiv:1507.06581.
 38. P. Achar and L. Rider, *The affine Grassmannian and the Springer resolution in positive characteristic*, Compos. Math., to appear, arXiv:1408.7050. With an appendix joint with S. Riche.
 39. P. Achar and S. Riche, *Modular perverse sheaves on flag varieties III: positivity conditions*, Trans. Amer. Math. Soc., to appear.
- [Submitted preprints](#)
40. P. Achar, A. Henderson, D. Juteau, and S. Riche, *Modular generalized Springer correspondence III: exceptional groups*, arXiv:1507.00401.
 41. P. Achar, A. Henderson, D. Juteau, and S. Riche, *Modular generalized Springer correspondence: an overview*, arXiv:1510:08962.
 42. P. Achar and S. Riche, *Reductive groups, the loop Grassmannian, and the Springer resolution*, arXiv:1602.04412.

Unrefereed manuscripts

43. P. Achar, *Springer theory for complex reflection groups*, Expansion of combinatorial representation theory, RIMS Kôkyûroku, no. 1647, 2009, pp. 97–112.
44. P. Achar, *Introduction to staggered sheaves*, arXiv:0902.0147, preprint, 2009.
45. P. Achar, *Equivariant mixed Hodge modules*, preprint, 2013.

Mathematical software

46. P. Achar, *The Lusztig–Vogan bijection for GL_n* , software available for download from <http://www.math.lsu.edu/~pramod/>, 2004.
47. P. Achar, *An implementation of the generalized Lusztig–Shoji algorithm*, software available for download from <http://www.math.lsu.edu/~pramod/>, 2008.

Conference Proceedings Volume

P. Achar, D. Jakelić, K. Misra, and M. Yakimov, eds. *Recent Advances in Representation Theory, Quantum Groups, Algebraic Geometry, and Related Topics*. Contemp. Math. no. 623, Amer. Math. Soc., Providence, RI, 2014, 280pp.

Research Grants

2001–2004	NSF Postdoctoral Research Fellowship DMS-0102030	\$90,000
2005–2009	National Science Foundation Grant DMS-0500873	\$98,874
2009	Louisiana Board of Regents LINK Grant NSF(2008)-LINK-35	\$18,000
2008–2010	National Security Agency Young Investigators Grant H98230-09-1-0024	\$30,000
2010–2014	National Science Foundation Grant DMS-1001594	\$129,000
2011	Louisiana Board of Regents LINK Grant NSF(2011)-LINK-57	\$1,000
2014	National Security Agency Standard Grant H98230-14-1-0117	\$32,208
2014	Louisiana Board of Regents LINK Grant NSF(2014)-LINK-91	\$7,000
2015	National Security Agency Standard Grant H98230-15-1-0175	\$33,987
2015–2018	National Science Foundation Grant DMS-1500890	\$191,790

Awards

- 2009 LSU Rainmaker Award
- 2016 LSU Alumni Association Faculty Excellence Award
- 2016 Carruth McGehee Award for Excellent Research in Mathematics by a Junior Faculty Member

Invited Conference Talks

- 2002 Midwest Workshop in Lie Theory, Representation Theory, and Automorphic Forms, *University of Notre Dame*.
- 2004 Colloque International « Journées Solstice d'été 2004 : Groupes », *Institut de Mathématiques de Jussieu*.
- 2005 Conference on Geometric Representation Theory, *University of Arizona*.
- 2007 Workshop on Algebraic Lie Theory, *Banff International Research Station*.

- Workshop on B -Stable Ideals and Nilpotent Orbits, *Istituto Nazionale di Alta Matematica*, Rome.
- 2008 Workshop on Expansion of Combinatorial Representation Theory, *RIMS*, Kyoto.
Workshop on Triangulated Categories, *University of Swansea*.
- 2009 Workshop on Representation Theory and Lie Theory, *Isaac Newton Institute*, Cambridge.
- 2010 Southeastern Lie Theory Conference on Homological Methods in Representation Theory, *University of Georgia*.
ICM Satellite Conference on Algebraic and Combinatorial Approaches to Representation Theory, *Indian Institute of Science*, Bangalore.
International Conference on Noncommutative Rings and Representation Theory, *Pondicherry University*.
- 2011 Conference on Chevalley Groups, Reflection Groups, Braid Groups in Honour of F. Digne and J. Michel, *École de Physique*, Les Houches, France.
Annual meeting of the ANR Project "REPRED", *Université de Tours*.
- 2013 Géométrie des orbites nilpotentes et W -algèbres finies, *Université de Poitiers*.
Second Congress of the Pacific Rim International Mathematical Association, *Shanghai Jiao Tong University*.
Representations of Reductive Groups, *University of Utah*.
Workshop on mixed Hodge modules, *Clay Mathematics Institute*, Oxford.
- 2014 Representations of reductive groups: A conference dedicated to David Vogan on his 60th birthday, *Massachusetts Institute of Technology*.
Representations of Algebraic Groups, *Université Lyon 1*.
Workshop on Geometric Representation Theory, *RIMS*, Kyoto.
Workshop on Moduli Spaces, Derived Geometry, and Geometric Representation Theory, *University of North Carolina at Chapel Hill*.
- 2015 Workshop on Lie Groups, Lie Algebras, and their Representations, *University of California, Riverside*.
Derived Categories, Algebra and Representation Theory, *University of Warwick*.
Enveloping Algebras and Geometric Representation Theory, *Mathematisches Forschungsinstitut Oberwolfach*.
Summer school/Workshop on Representation Theory, *East China Normal University*, Shanghai.
Algebra and Number Theory Day, *Johns Hopkins University* and *University of Maryland*.
Geometric and Categorical Representation Theory, Mooloolaba, Queensland, Australia.
- 2016 Taipei Conference in Representation Theory V, *Academia Sinica*, Taipei.
Advances in Geometric Representation Theory, *University of Michigan*, Ann Arbor.
XXVII Rencontres Arithmétiques de Caen, *Université de Caen*.
Nilpotent Orbits and Representation Theory, *Centro de Ricerca Matematica Ennio di Giorgi*, Pisa.

Invited Lecture Series and Mini-Courses

- 2008 **Introduction to staggered sheaves**, 3 lectures, *RIMS*, Kyoto.
- 2009 **Derived categories and perverse sheaves**, 5 lectures, Introductory Workshop on Algebraic Lie Theory, *Isaac Newton Institute*, Cambridge.
- 2011 **Introduction au lemme fondamental**, 5 lectures, Groupe de travail en théorie de représentations, *Université de Caen*.
- 2013 **Generalized Springer correspondence and Green functions**, 3 lectures, Summer School on Character Sheaves with Applications to Representation Theory, *TU Kaiserslautern*.
- 2014 **The Springer correspondence**, 3 lectures, Introductory Workshop on Geometric Representation Theory, *MSRI*.
- 2015 **Perverse sheaves in representation theory**, 8 lectures, Summer school/Workshop on Representation Theory, *East China Normal University*, Shanghai.
- 2015 **Modular perverse sheaves on flag varieties and representations of algebraic groups**, 16 lectures, *East China Normal University*, Shanghai.
- 2016 **I. Flag varieties in representation theory / II. Geometric local Langlands duality**, 2 lectures, Workshop on Algebraic Groups, Quantum Groups and Geometry, *University of Virginia*.

Other Invited Talks

Seminar and colloquium talks

2001–2016	Australian National Univ.	Univ. Bonn	Univ. of Maryland
	Cornell Univ.	Univ. de Caen	Univ. of Melbourne
	Idaho State Univ.	Univ. de Clermont-Ferrand	Univ. of Minnesota
	Inst. de Math. de Jussieu	Univ. de Paris - Sud	Univ. of Massachusetts
	Johns Hopkins Univ.	Univ. Calif. Berkeley	Univ. of North Texas
	Kansas State Univ.	Univ. Calif. Riverside	Univ. of Notre Dame
	Kyoto Univ.	Univ. of Chicago	Univ. of Oklahoma
	Louisiana State Univ.	Univ. of Connecticut	Univ. of Sheffield
	Northwestern Univ.	Univ. of Edinburgh	Univ. of Sydney
	Princeton Univ.	Univ. of Georgia	Univ. of Utah
	Rice Univ.	Univ. of Glasgow	Univ. of Virginia
	Tata Inst. of Fund. Research	Univ. of Illinois–Urbana	Univ. of Wisconsin–Madison
	Tulane Univ.	Univ. of Leeds	Univ. of South Alabama
	Zhejiang Univ.	Univ. of Leicester	

Special session (20-minute) talks

Fall 2002	Northeastern Univ.	Fall 2002	Univ. of Utah
Spring 2005	Western Kentucky Univ.	Fall 2005	Univ. of Oregon
Fall 2006	Univ. of New Hampshire	Fall 2007	Middle Tennessee State Univ.
Fall 2009	Baylor Univ.	Spring 2010	Macalester College
Spring 2010	Univ. of British Columbia	Spring 2012	Univ. of South Florida
Spring 2012	Univ. of Kansas	Spring 2013	Univ. of Colorado–Boulder
Spring 2016	Univ. of Georgia		

Visiting Research Invitations

- 2004 **Visiting maître de conférences**, 1 month, *Université Paris 7*.
2005 **Visiting maître de conférences**, 1 month, *Université Paris 7*.
2007 **Member**, 1 month, *Institut des Hautes Études Scientifiques*, Bures-sur-Yvette, France.
2009 **Member**, 6 months, *Isaac Newton Institute*, Cambridge.
2011 **Research in Pairs**, 2 weeks, *Mathematisches Forschungsinstitut Oberwolfach*.
2011 **Visiting researcher**, 2 months, *Université de Caen*.
2012 **Focused Research Group**, 1 week, *Banff International Research Station*.
2014 **Research Professor**, 3 months, *Mathematical Sciences Research Institute*.
2016 **Visiting researcher**, 1 month, *Université de Caen*.

Teaching Experience

Massachusetts Institute of Technology

Spring 1996	Differential Equations (<i>recitation</i>)	Fall 1996	Honors Calculus I (<i>recitation</i>)
Fall 1999	Differential Equations [†]	Fall 1999	Honors Calculus I [†]
Spring 2000	Honors Calculus II [†]	Fall 2000	Honors Calculus I (<i>recitation</i>)

[†]These courses were taught in the framework of MIT's *Experimental Study Group* (ESG) program.

University of Chicago

Fall 2002	Analysis in \mathbf{R}^n I	Winter 2003	Analysis in \mathbf{R}^n II
Spring 2004	Analysis in \mathbf{R}^n II	Spring 2004	Analysis in \mathbf{R}^n III

Louisiana State University: undergraduate courses

(Scores indicate assessment of the statement: "Overall, the instructor is an effective teacher.")

Fall 2004	Calculus I (4.21/5.00)	Spring 2005	Diff. Eqn. & Lin. Alg. (4.49/5.00)
Fall 2005	Calculus I (4.22/5.00)	Fall 2006	Technical Calculus (3.86/5.00)
Fall 2007	Complex Variables (4.50/5.00)	Fall 2008	Honors Calculus III (4.93/5.00)
Fall 2009	Calculus III (4.27/5.00)	Spring 2011	Solving Discrete Prob. (3.15/4.00)
Spring 2012	Advanced Calculus II (3.81/4.00)	Spring 2013	Advanced Calculus II (3.56/4.00)
Spring 2014	Advanced Calculus II (3.85/4.00)	Spring 2015	Graph Theory (3.92/4.00)
Spring 2016	Fin.-Dim'l Vector Spaces		

Louisiana State University: graduate courses

Fall 2005	Reflection Groups (4.62/5.00)	Spring 2007	Perverse Sheaves (5.00/5.00)
Fall 2007	Lie Algebras (4.56/5.00)	Spring 2008	Algebra II (4.50/5.00)
Fall 2008	Algebraic Groups (5.00/5.00)	Fall 2009	Fin.-Dim'l Algebras (4.83/5.00)
Fall 2010	Lie Theory (4.00/4.00)	Spring 2012	Algebra II (4.00/4.00)
Fall 2012	Sheaf Theory (4.00/4.00)	Spring 2014	Homological Algebra (4.00/4.00)
Spring 2015	Quiver Varieties (4.00/4.00)	Fall 2015	Homological Algebra (4.00/4.00)

Ph.D. Students

- 2010 **Jared Culbertson**, *Air Force Research Laboratory*, Dayton, Ohio.
2012 **Amber Russell**, Assistant Professor, *Butler University*.
2013 **Myron Minn-Thu-Aye**, Assistant Professor in Residence, *University of Connecticut*.
Laura Rider, Assistant Professor, *University of Georgia*.
2016 **Jacob Matherne**, postdoctoral researcher, *University of Massachusetts–Amherst*.
Current **Sean Taylor**.

Postdoctoral Researchers

- 2016–2019 **William Hardesty**.

Service & Organizational Activities

Committee service at Louisiana State University

- | | | | |
|-----------|----------------------------------|-----------|---------------------------|
| 2005–2008 | Undergraduate Advising Committee | 2008– | Algebra Seminar Organizer |
| 2008–2010 | Executive Committee | 2009–2010 | Internal Review Committee |
| 2011– | Colloquium Committee | 2013–2016 | Executive Committee |
| 2015– | Hiring Committee | | |

National committee service

- 2017–2020 AMS-Simons Travel Grants committee

Anonymous refereeing

Advances in Mathematics	FONDECYT (Chile)	Mathematical Research Letters
Agence Nationale de la Recherche	Geometriae Dedicata	National Science Foundation
Algebra & Representation Theory	Internat. Math. Research Notices	National Security Agency
American Journal of Mathematics	J. Algebra	Pacific Journal of Mathematics
Annals of Combinatorics	J. American Math. Society	Proc. American Math. Society
Annals of Mathematics	J. Combinatorial Theory Series A	Proc. London Math. Society
Bulletin de la SMF	J. Institut de Math. de Jussieu	Representation Theory
Compositio Mathematica	J. London Math. Society	Selecta Mathematica
Contemporary Mathematics	Lecture Notes in Mathematics	Transformation Groups

Conferences organized

- 2008 **Geometric and Combinatorial Representation Theory**, AMS Spring Southeastern Section Meeting, *Louisiana State University*.
- 2012 **Geometric and Algebraic Aspects of Representation Theory**, AMS Fall Southeastern Section Meeting, *Tulane University*.
- 2013 **Noncommutative Algebraic Geometry and Representation Theory**, 6th meeting of the Southeastern Lie Theory Workshop Series, *Louisiana State University*.
- 2015 **Workshop on Springer Theory and Related Topics**, *University of Massachusetts, Amherst*.
- 2015 **Lie Theory Workshop**, *Louisiana State University*.
- 2015 **Geometric and Categorical Representation Theory**, *Mooloolaba*, Queensland, Australia.
- 2016 **Sheaves and modular representations of reductive groups**, *American Institute of Mathematics*, San Jose, California.