Pramod N. **Achar**

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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
2019– **Shirley Blue Barton 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

Grants

As Principal Investigator:

2001–2004	**Postdoctoral Fellowship**, National Science Foundation	*$90,000*
2005–2009	**Research Grant**, National Science Foundation	*$98,874*
2008–2010	**Research Grant**, National Security Agency	*$30,000*
2010–2014	**Research Grant**, National Science Foundation	*$129,000*
2014–2015	**Research Grant**, National Security Agency	*$32,208*
2015–2016	**Research Grant**, National Security Agency	*$33,987*
2015–2018	**Research Grant**, National Science Foundation	*$191,790*
2017–2018	**Conference Grant**, National Science Foundation	*$20,000*
2018–2022	**Research Grant**, National Science Foundation	*$254,341*
2022–2025	**Research Grant**, National Science Foundation	*$240,000*
2023–2028	**Research-Training Grant**, National Science Foundation with Co-PIs: Pallavi Dani, Gestur Ólafsson, David Shea Vela-Vick, Anton Zeitlin	*$2,496,082*

As Co-PI:

2017–2020	**Research Grant**, Australian Research Council	PI: Anthony Henderson, Univeristy of Sydney	*AU$345,000*
2018–2020	**Conference Grant**, National Science Foundation	PI: Kailash Misra, North Carolina State University	*$49,970*
2023–2025	**Conference Grant**, National Science Foundation	PI: Kailash Misra, North Carolina State University	*$42,500*

Awards

2009 **Rainmaker Award**, LSU
2016 **Faculty Excellence Award**, LSU Alumni Association
2016 **Carruth McGehee Award for Excellent Research**, LSU Department of Mathematics
2017 **Invited Address**, American Mathematical Society
2017 **Graduate Teaching Award**, LSU College of Science
2020 **Fellow**, American Mathematical Society
2020 **Undergraduate Teaching Award**, LSU College of Science
2020 **Undergraduate Teaching Award**, Tiger Athletic Foundation

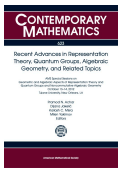
Books

Research monographs

P. Achar, *Perverse Sheaves and Applications in Representation Theory*, Mathematical Surveys and Monographs, no. 258, Amer. Math. Soc., Providence, RI, 2021. 562 pp.

P. Achar and S. Riche, *Central Sheaves on Affine Flag Varieties*, under review for publication in Panoramas et Synthèses, Société Mathématique de France, Paris. 376 pp., draft available at `https://lmbp.uca.fr/~riche/`.

Edited volume



P. Achar, D. Jakelić, K. Misra, and M. Yakimov, eds., *Recent Advances in Representation Theory, Quantum Groups, Algebraic Geometry, and Related Topics. Proceedings of the AMS Special Sessions on Geometric and Algebraic Aspects of Representation Theory and Quantum Groups and Noncommutative Algebraic Geometry, October 13–14, 2012, Tulane University, New Orleans, LA.*, Contemp. Math., vol. 623, Amer. Math. Soc., Providence, RI, 2014.

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. *Corrections*, Represent. Theory **20** (2016), 414–418.

[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) **18** (2016), 1405–1436.

[36] P. Achar and L. Rider, *The affine Grassmannian and the Springer resolution in positive characteristic*, Compos. Math. **152** (2016), 2627–2677, With an appendix joint with S. Riche.

[37] P. Achar, A. Henderson, D. Juteau, and S. Riche, *Constructible sheaves on nilpotent cones in rather good characteristic*, Selecta Math. (N.S.) **23** (2017), 203–243.

[38] P. Achar, A. Henderson, D. Juteau, and S. Riche, *Modular generalized Springer correspondence II: classical groups*, J. Eur. Math. Soc. (JEMS) **19** (2017), 1013–1070.

[39] P. Achar, A. Henderson, D. Juteau, and S. Riche, *Modular generalized Springer correspondence III: exceptional groups*, Math. Ann. **369** (2017), 247–300.

[40] P. Achar and S. Riche, *Modular perverse sheaves on flag varieties III: positivity conditions*, Trans. Amer. Math. Soc. **370** (2018), 447–485.

[41] P. Achar and S. Riche, *Reductive groups, the loop Grassmannian, and the Springer resolution*, Invent. Math. **214** (2018), 289–436.

[42] P. Achar, N. Cooney, and S. Riche, *The parabolic exotic t-structure*, Épijournal Géom. Algébrique **2** (2018), Art. 8, 31pp.

[43] P. Achar, S. Makisumi, S. Riche, and G. Williamson, *Koszul duality for Kac–Moody groups and characters of tilting modules*, J. Amer. Math. Soc. **32** (2019), 261–310.

[44] P. Achar, A. Henderson, D. Juteau, and S. Riche, *Modular generalized Springer correspondence: an overview*, Tsinghua Lectures in Mathematics (L. Ji, Y.-S. Poon, and S.-T. Yau, eds.), Adv. Lect. Math. (ALM), no. 45, Intl. Press, 2019, pp. 77–99.

[45] P. Achar, W. Hardesty, and S. Riche, *On the Humphreys conjecture on support varieties of tilting modules*, Transform. Groups **24** (2019), 597–657.

[46] P. Achar and W. Hardesty, *Calculations with graded perverse-coherent sheaves*, Q. J. Math. **70** (2019), 1327–1352.

[47] P. Achar and S. Riche, *Dualité de Koszul formelle et théorie des représentations des groupes algébriques réductifs en caractéristique positive*, SMF 2018: Congrès de la Société Mathématique de France, Sémin. Congr., vol. 33, Soc. Math. France, Paris, 2019, pp. 83–150.

[48] P. Achar, S. Riche, and C. Vay, *Mixed perverse sheaves on flag varieties of Coxeter groups*, Canad. J. Math. **72** (2020), 1–55.

[49] P. Achar, *How to glue parity sheaves*, J. Singul. **20** (2020), 128–164.

[50] P. Achar and L. Rider, *Nearby cycles for parity sheaves on a divisor with simple normal crossings*, J. Singul. **20** (2020), 311–341.

[51] P. Achar, W. Hardesty, and S. Riche, *Representation theory of disconnected reductive groups*, Doc. Math. **25** (2020), 2149–2177.

[52] P. Achar and S. Riche, *A geometric Steinberg formula*, Transform. Groups **28** (2023), 1001–1032.

[53] P. Achar, W. Hardesty, and S. Riche, *Integral exotic sheaves and the modular Lusztig–Vogan bijection*, J. Lond. Math. Soc. (2) **106** (2022), 2403–2458.

[54] P. Achar, W. Hardesty, and S. Riche, *Conjectures on tilting modules and antispherical p-cells*, arXiv:1812.09960.

[55] P. Achar and W. Hardesty, *Co-t-structures on derived categories of coherent sheaves and the cohomology of tilting modules*, Represent. Theory, to appear, arXiv:2012.06098.

[56] P. Achar and W. Hardesty, *Silting complexes of coherent sheaves and the Humphreys conjecture*, Duke Math. J., to appear, arXiv:2106.04268.

[57] P. Achar and W. Hardesty, *Nilpotent centralizers and good filtrations*, Transform. Groups, to appear, arXiv:2106.04374.

Preprints under review

[58] P. Achar, S. Makisumi, S. Riche, and G. Williamson, *Free-monodromic mixed tilting sheaves on flag varieties*, arXiv:1703.05843.

[59] P. Achar, M. Kulkarni, and J. Matherne, *Combinatorics of Fourier transforms for type A quiver representations*, arXiv:1807.10217.

[60] P. Achar and S. Riche, *A geometric model for blocks of Frobenius kernels*, arXiv:2203.03530.

[61] P. Achar, J. Lourenço, T. Richarz, and S. Riche, *Fixed points under pinning-preserving automorphisms of reductive group schemes*, arXiv:2212.10182.

[62] P. Achar and S. Riche, *Higher nearby cycles and central sheaves on affine flag varieties*, arXiv:2305.11696.

Invited Lectures (past 5 years)

2018 **Conference on Vertex Algebras and Related Topics**, RIMS Kyoto (Japan)
Southeastern Lie Theory Workshop X, University of Georgia
International Conference on Rings and Algebras, Czech Technical University
Conférence Théorie géométrique des représentations, Université Blaise Pascal (France)
Algebraic Groups: Geometric, Actions and Structures, Université Claude Bernard, Lyon
Enveloping Algebras and Geometric Representation Theory, Oberwolfach Research Institute (Germany)

2019 **Hilbert Schemes, Categorification and Combinatorics**, University of California, Davis
Modular Representation Theory, Clay Mathematics Institute (UK)

2020 **Geometry and Representation Theory**, Institut Henri Poincaré (France)
Geometric Representation Theory, University of Waterloo (Canada)
Algebraic Groups and their Representations, Shanghai Center for Mathematical Sciences (China)

2021 **Algebraic Groups**, Oberwolfach Research Institute (Germany)
Enveloping Algebras and Geometric Representation Theory, Oberwolfach Research Institute (Germany)

2022 **Representations and Automorphic Forms XI**, Oklahoma State University
Farewell Conference for Anthony Henderson, University of Sydney
Lie Group Days, Massachusetts Institute of Technology

2023 **Geometric and Categorical Representation Theory**, University of Bath (UK)
Geometric Representation Theory and Moduli Spaces, University of North Carolina, Chapel Hill

Ph.D. Students

Ph.D. Year	*Name*	*Current position*	
2010	**Jared Culbertson**	Air Force Research Laboratory	
2012	**Amber Russell**	Butler University	*Associate Professor*
2013	**Myron Minn-Thu-Aye**	University of Connecticut	*Associate Professor-in-Residence*
2013	**Laura Rider**	University of Georgia	*Associate Professor*
2016	**Jacob Matherne**	North Carolina State University	*Assistant Professor*
2018	**Sean Taylor**	St. Tammany Parish Public Schools	
2021	**Tamanna Chatterjee**	University of Notre Dame	*postdoctoral researcher*
2021	**Valentin Gouttard** (co-advised with Simon Riche)	Université Paris Saclay	*instructor*
Current	5 Ph.D. students and 1 M.S. student		

Postdoctoral Supervision

2016–2019	**William Hardesty**	
2021–2023	**Linyuan Liu**	Squarepoint Capital

Service to the Profession

Editorial boards

2018–2026 ***Representation Theory***, associate editor
2018– ***Algebras and Representation Theory***, associate editor
2022– ***Advances in Mathematics***, associate editor

National committee service

2017–2020 **AMS-Simons Travel Grant committee**
2022–2022 **MSRI Offsite Postdoctoral Fellow Selection Committee**, Chair

Conferences organized

2008 **Special Session**, AMS Sectional Meeting, Louisiana State University
2012 **Special Session**, AMS Sectional Meeting, Tulane University
2013 **Southeastern Lie Theory Workshop VI**, Louisiana State University
2015 **Workshop on Springer Theory and Related Topics**, University of Massachusetts, Amherst
2015 **Geometric and Categorical Representation Theory**, University of Queensland (Australia)
2016 **Sheaves and Modular Representations of Reductive Groups**, American Institute of Mathematics
2017 **Special Session**, AMS Sectional Meeting, College of Charleston
2017 **Future Directions in Representation Theory**, University of Sydney (Australia)
2018 **Character Formulas for Reductive Groups**, Mathematisches Forschungsinstitut Oberwolfach (Germany)
2019 **Southeastern Lie Theory Workshop XI**, Louisiana State University
2020 **New Connections in Representation Theory**, Univeristy of Queensland (Australia)
2022 **Special Session**, AMS-SMF-EMS Joint International Meeting, Université de Grenoble-Alpes (France)
2023 **Special Session**, AMS Sectional Meeting, University of South Alabama