

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

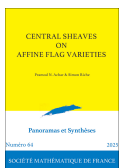
Awards

- 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
2026 **Invited Address**, International Congress of Mathematicians
2026 **Frontiers of Science Award**, Beijing Institute of Mathematical Sciences and Applications

Books



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



P. Achar and S. Riche, *Central Sheaves on Affine Flag Varieties*, Panoramas et Synthèses, vol. 64, Société Mathématique de France, Paris, 2025. xii + 347 pp.

Papers

- [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, W. Hardesty, and S. Riche, *Integral exotic sheaves and the modular Lusztig–Vogan bijection*, J. Lond. Math. Soc. (2) **106** (2022), 2403–2458.
- [53] P. Achar and S. Riche, *A geometric Steinberg formula*, Transform. Groups **28** (2023), 1001–1032.
- [54] P. Achar and W. Hardesty, *Co- t -structures on derived categories of coherent sheaves and the cohomology of tilting modules*, Represent. Theory **28** (2024), 49–89.
- [55] P. Achar and S. Riche, *Higher nearby cycles and central sheaves on affine flag varieties*, J. Singul. **27** (2024), 1–30.
- [56] P. Achar and W. Hardesty, *Nilpotent centralizers and good filtrations*, Transform. Groups **29** (2024), 893–908.
- [57] P. Achar and W. Hardesty, *Silting complexes of coherent sheaves and the Humphreys conjecture*, Duke Math. J. **173** (2024), 2397–2445.
- [58] P. Achar and S. Riche, *A geometric model for blocks of Frobenius kernels*, Ark. Mat. **62** (2024), 217–329.
- [59] P. Achar, S. Makisumi, S. Riche, and G. Williamson, *Free-monodromic mixed tilting sheaves on flag varieties*, Mem. Amer. Math. Soc. (2026), to appear.
- [60] P. Achar, J. Lourenço, T. Richarz, and S. Riche, *Fixed points under pinning-preserving automorphisms of reductive group schemes*, Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) (2026), to appear.
- [61] P. Achar and T. Chatterjee, *Equivariant sheaves for classical groups acting on Grassmannians*, Canad. J. Math. (2026), to appear.

PREPRINTS UNDER REVIEW

- [62] P. Achar, M. Kulkarni, and J. Matherne, *Combinatorics of Fourier transforms for type A quiver representations*, arXiv:1807.10217, 2018.
- [63] P. Achar, W. Hardesty, and S. Riche, *Conjectures on tilting modules and antispherical p -cells*, arXiv:1812.09960, 2018.
- [64] P. Achar, J. Lourenço, T. Richarz, and S. Riche, *A modular ramified geometric Satake equivalence*, arXiv:2403.10651, 2024.
- [65] P. Achar and A. Bourque, *On global Schubert varieties for the general linear group*, arXiv:2412.01962, 2024.
- [66] P. Achar, G. Dhillon, and S. Riche, *Semiinfinite sheaves on affine flag varieties*, arXiv:2503.18412, 2025.
- [67] P. Achar, G. Dhillon, and S. Riche, *Modular intersection cohomology of Drinfeld's compactifications*, arXiv:2505.17953, 2025.
- [68] P. Achar and P. Sobaje, *Steinberg quotients and Smith–Treumann localization*, arXiv:2606.21697, 2026.
- [69] P. Achar and S. Riche, *Tilting modules for reductive algebraic groups: characters and support varieties*, arXiv:2511.05063, 2025.

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
2022–2026	Research Grant , National Science Foundation	\$240,000
2023–2028	Research-Training Grant , National Science Foundation with Co-PIs: Ana Bălibanu, Pallavi Dani, Gestur Ólafsson, David Shea Vela-Vick	\$2,496,082
2026–2029	Research Grant , National Science Foundation	\$300,000

As Co-PI:

2017–2020	Research Grant , Australian Research Council	PI: Anthony Henderson, University of Sydney	AUS\$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
2026–2027	Conference Grant , National Science Foundation	PI: Kailash Misra, North Carolina State University	\$40,000

Invited Lectures (past 5 years)

- 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
- 2024 **Representation Theory and Related Geometry: Progress and Prospects**, University of Georgia
- 2025 **Enveloping Algebras and Geometric Representation Theory**, Oberwolfach Research Institute (Germany)
Workshop on Hessenberg varieties, Lusztig varieties, and Affine Grassmannians, IBS Korea
Category Theory, Combinatorics, and Machine Learning, ICERM, Providence
Representations, Motives, and Langlands Duality, Universität Essen
- 2026 **Hot Topics: Geometric Langlands Conjecture**, Simons–Laufer Mathematical Sciences Institute
International Congress of Mathematicians, Philadelphia, PA
International Congress of Basic Sciences, Beijing Institute for Mathematical Sciences and Applications

Ph.D. Students

<i>Ph.D. Year</i>	<i>Name</i>	<i>Current position</i>	
2010	Jared Culbertson	Air Force Research Laboratory	
2012	Amber Russell	Butler University	<i>Associate Professor</i>
2013	Myron Minn-Thu-Aye	University of Connecticut	<i>Associate Professor-in-Residence</i>
2013	Laura Rider	University of Georgia	<i>Associate Professor</i>
2016	Jacob Matherne	North Carolina State University	<i>Assistant Professor</i>
2018	Sean Taylor	St. Tammany Parish Public Schools	
2021	Tamanna Chatterjee	University of Notre Dame	<i>postdoctoral researcher</i>
2021	Valentin Gouttard (co-advised with Simon Riche)	Université Paris Saclay	<i>instructor</i>
2024	Andrea Bourque (M.S. student)	University of Chicago	<i>Ph.D. student</i>
2024	Vishnu Sivaprasad		
2024	Joseph Dorta	United States Military Academy	<i>Assistant Professor</i>
2026	Colton Sandvik	Johns Hopkins University	<i>postdoctoral researcher</i>
Current	3 Ph.D. students		

Postdoctoral Supervision

2016–2019	William Hardesty	
2021–2023	Linyuan Liu	Squarepoint Capital
2025–2028	John O'Brien	

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
2020–2022	MSRI Offsite Postdoctoral Fellow Selection Committee , Chair

CONFERENCES ORGANIZED (PAST 10 YEARS)

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 , University 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
2025	Southeastern Lie Theory Workshop XV , College of Charleston
2026	Focused Research Community: Representation Theory , Louisiana State University
2026	Southeastern Lie Theory Workshop XVI , University of Virginia