CURRICULUM VITAE

David A. Vogan, Jr.

A.B., University of Chicago (1974)
S.M., University of Chicago (1974)
Ph.D., Massachusetts Institute of Technology (1976)
Instructor, MIT, 1976–1977
Member, Institute for Advanced Study, Princeton, 1977–1979
Assistant Professor, MIT, 1979–1981
Associate Professor, MIT, 1981–1984
Professor, MIT, 1984–present
Head, Department of Mathematics, 1999–2004

PUBLICATIONS

"Lie algebra cohomology and the representations of semisimple Lie groups," Ph.D. dissertation, MIT, 1976.

"Lie algebra cohomology and a multiplicity formula of Kostant," J.Algebra **51** (1978), 69–75.

"Gelfand-Kirillov dimension for Harish-Chandra modules," Inventiones math. **48** (1978), 75–98.

"The algebraic structure of the representations of semisimple Lie groups I," Ann. of Math. **109** (1979), 1–60.

"Irreducible characters of semisimple Lie groups I, Duke Math. J. **46** (1979), 61–108.

"Irreducible characters of semisimple Lie groups II. The Kazhdan-Lusztig conjectures," Duke Math. J. **46** (1979), 805–859.

"A generalized τ-invariant for the primitive spectrum of a semisimple Lie algebra," Math. Ann. **242** (1979), 209–224.

"Reducibility of generalized principal series representations," Acta Math. **145** (1980), 227–299. (With Birgit Speh.)

"Ordering of the primitive spectrum of a semisimple Lie algebra," Math. Ann. **248** (1980), 195–203.

"The local structure of characters," J. Func. Anal. **36** (1980), 27–55. (With Dan Barbasch.)

"Singular unitary representations," 506–535 in *Non-commutative Harmonic Analysis and Lie Groups*, J. Carmona and M. Vergne, editors. Lecture Notes in Mathematics **880**. Springer-Verlag, Berlin- Heidelberg-New York, 1981.

Representations of Real Reductive Lie Groups. Birkhäuser, Boston-Basel-Stuttgart, 1981.

"Complex geometry and representations of reductive groups," lecture notes for conference "Representations and Harmonic Analysis of Lie Groups," Trento, Italy, February 16–21, 1981.

"Primitive ideals and orbital integrals in complex classical groups," Math. Ann. **259** (1982), 153–199. (With Dan Barbasch.)

"Irreducible characters of semisimple Lie groups IV. Character- multiplicity duality," Duke Math. J. **49** (1982), 943–1073.

"Singularities of closures of K-orbits on flag manifolds," Inventiones math. **71** (1983), 365–379. (With G. Lusztig.)

"Irreducible characters of semisimple Lie groups III. Proof of the Kazhdan-Lusztig conjectures in the integral case," Inventiones math. **71** (1983), 381–417.

"Primitive ideals and orbital integrals in complex exceptional groups," J. Algebra **80** (1983), 350–382. (With Dan Barbasch.)

"The Kazhdan-Lusztig conjecture for real groups," 223–264 in *Representation Theory of Reductive Groups*, P. Trombi, editor. Birkhäuser, Boston-Basel-Stuttgart, 1983.

"Weyl group representations and nilpotent orbits," 21–33 in *Representation Theory of Reductive Groups*, P. Trombi, editor. Birkhäuser, Boston-Basel-Stuttgart, 1983. (With Dan Barbasch.)

"Understanding the unitary dual," 264–286 in *Lie Group Representations I*, R. Herb, R. Lipsman, and J. Rosenberg, editors. Lecture Notes in Mathematics **1024**. Springer-Verlag, Berlin-Heidelberg-New York, 1983.

"Classifying irreducible representations by lowest K-types," 269–288 in Lectures in Applied Mathematics **21**. American Mathematical Society, Providence, Rhode Island, 1985.

"Problems in primitive ideal theory," lecture notes for Durham Symposium on Universal Enveloping Algebras.

"Unitary representations with non-zero cohomology," Compositio Math. **53** (1984), 51–90. (With Gregg Zuckerman.)

"Unitarizability of certain series of representations," Ann. of Math. **120** (1984), 141–187.

"Unipotent representations of complex semisimple Lie groups," Ann. of Math. **121** (1985), 41–110. (With Dan Barbasch.)

"The unitary dual of $GL(n)$ over an archimedean field," Invent. math. **83** (1986), 449–505.

"The orbit method and primitive ideals for semisimple Lie algebras," 281–316 in *Lie Algebras and Related Topics*, CMS Conference Proceedings, volume 5, D.J. Britten, F.W. Lemire, and R.V. Moody, editors. American Mathematical Society for CMS, Providence, Rhode Island, 1986.

Unitary Representations of Reductive Lie Groups. Annals of Mathematics Studies, Princeton University Press, Princeton, New Jersey, 1987.

"Representations of reductive Lie groups," 245–266 in *Proceedings of the International Congress of Mathematicians 1986*, volume I. American Mathematical Society, Providence, Rhode Island, 1987.

"Irreducibility of discrete series representations for semisimple symmetric spaces," 191–221 in *Representations of Lie groups, Kyoto, Hiroshima, 1986*, K. Okamoto and T. Oshima, editors. Advanced Studies in Pure Mathematics, volume 14. Kinokuniya Company, Ltd., Tokyo, 1988.

"Noncommutative algebras and unitary representations," 35–60 in *Proceedings of Symposia in Pure Mathematics*, volume 48. American Mathematical Society, Providence, Rhode Island, 1988.

"On the structure of Kazhdan-Lusztig cells for branched Dynkin diagrams," J. Alg. **153** (1992), 91–120. (With Devra Garfinkle.)

"Harish-Chandra's method of descent," Amer. J. Math. **114** (1992) 1243–1255. (With Jeffrey Adams.)

"Dixmier algebras, sheets, and representation theory," 333– 395 in *Operator Algebras, Unitary Representations, Enveloping Algebras, and Invariant Theory*, A. Connes, M. Duflo, A. Joseph, and R. Rentschler, eds. Birkhäuser Boston, 1990.

"Intertwining operators for real reductive groups," Adv. in Math. **82** (1990), 203–243. (With Nolan Wallach.)

"Associated varieties and unipotent representations," 315–388 in *Harmonic Analysis on Reductive Groups*, W. Barker and P. Sally, eds. Birkhäuser, Boston-Basel-Berlin, 1991.

"L-groups, projective representations, and the Langlands classification," Amer. J. Math. **114** (1992), 45–138. (With Jeffrey Adams.)

The Langlands Classification and Irreducible Characters for Real Reductive Groups. Birkhäuser, Boston-Basel-Berlin, 1992. (With Jeffrey Adams and Dan Barbasch.)

"Unitary representations of reductive Lie groups and the orbit method," 87–114 in *New Developments in Lie Theory and Their Applications*, J. Tirao and N. Wallach, eds. Birkhäuser, Boston-Basel-Berlin, 1992.

"The local Langlands conjecture," 305–379 in *Representation theory of groups and algebras*, J. Adams *et al.*, eds. Contemporary Mathematics **145**. American Mathematical Society, Providence, Rhode Island, 1993.

"Unipotent representations and cohomological induction," 47–70 in *The Penrose transform and analytic cohomology in representation theory*, M. Eastwood, J. Wolf, and R. Zierau, eds. Contemporary Mathematics **154**. American Mathematical Society, Providence, Rhode Island, 1993.

"The unitary dual of G_2," Invent. math. **116** (1994), 677–791.

Cohomological Induction and Unitary Representations. Princeton Math. Ser. **45**, Princeton University Press, Princeton, 1995. (With Anthony Knapp.)

"The orbit method and unitary representations for reductive Lie groups," 243–339 in *Algebraic and Analytic Methods in Representation Theory (Sønderborg, 1994)*. Perspectives in Mathematics **17**. Academic Press, San Diego 1997.

"Geometric quantization for nilpotent coadjoint orbits," 69–137 in *Geometry and representation theory of real and p-adic groups*, J. Tirao, D. Vogan, and J. Wolf, editors. Birkhäuser, Boston-Basel-Berlin, 1998. (With William Graham.)

"On the classification of unitary representations of reductive Lie groups," Ann. of Math. **148** (1998), 1067–1133. (With Susana A. Salamanca-Riba.)

"Cohomology and group representations," 219–243 in *Representation Theory and Automorphic Forms (Instructional Conference, International Centre for Mathematical Sciences, Edinburgh, March, 1996)*, T. Bailey and A. Knapp, editors. Proceedings of Symposia in Pure Mathematics **61**. American Mathematical Society, Providence, RI, 1997.

"Functions on the model orbit in E_8," Represent. Theory **2** (1998), 224–263. (With Jeffrey Adams and Jing-Song Huang.)

"The method of coadjoint orbits for real reductive groups," 179–238 in *Representation Theory of Lie Groups*, IAS/Park City Mathematics Series **8**. American Mathematical Society, Providence, RI, 1999.

"A Langlands classification for unitary representations," 299–324 in *Analysis on homogeneous spaces and representation theory of Lie groups, Okayama–Kyoto (1997)*. Adv. Stud. Pure Math. **26**. Math. Soc. Japan, Tokyo, 2000

"Unitary representations of reductive Lie groups," 147–167 in *Mathematics towards the Third Millenium*. Rend. Mat. Acc. Lincei s. 9, fasc. spec. Rome, 2000.

"Strictly small representations and a reduction theorem for the unitary dual," Represent. Theory **5** (2001), 93–110. (With Susana A. Salamanca-Riba.)

"Unitary representations and complex analysis" in *Representation Theory and Complex Analysis (CIME 2004)*, Andrea D'Agnolo, editor. Springer, 2008.

"Unitary Shimura correspondence for split real groups," J. Amer. Math. Soc. **20** (2007), no. 3, 701–751. (With Jeffrey Adams, Dan Barbasch, Annegret Paul, and Peter Trapa.)

"Isolated unitary representations," 379–398 in *Automorphic Forms and their Applications (2002)*, IAS Park City Mathematics Series **12**, 379-398. American Mathematical Society, Providence, RI (2007).

"Branching to a maximal compact subgroup," 321–401 in *Harmonic analysis, group representations, automorphic forms and invariant theory*, Lect. Notes Ser. Inst. Math. Sci. Natl. Univ. Singap. **12**. World Sci. Publ., Hackensack, NJ, 2007.

"The character table for E_8," Notices Amer. Math. Soc. **54** (2007), no. 9, 1122–1134.

INVITED LECTURES

23rd Arbeitstagung, Bonn, June, 1982: "Representations with cohomology"

Special Year in Harmonic Analysis, University of Maryland, 1982: "Understanding the unitary dual" (two lectures)

Durham Symposium on Universal Enveloping Algebras of Lie Algebras, July, 1983: "Problems in primitive ideal theory" (four lectures)

Conference on Algebraic Groups in Honor of A. Borel, October, 1983: "Unitary representations and continuous cohomology"

Harish-Chandra Memorial Conf., April, 1984: "The method of descent and unipotent representations"

AMS Summer Meeting Hour Address, August, 1984: "Unitary representations of simple Lie groups"

Hermann Weyl Memorial Lectures, Institute for Advanced Study, January, 1986: "Unitary representations of reductive Lie groups"

International Congress of Mathematicians Hour Address, August, 1986: "Representations of reductive Lie groups"

Hermann Weyl Symp., Duke, May, 1987: "Noncommutative algebras and unitary representations"

Special Period on Hecke Algebras and Unipotent Representations, Paris, June-July, 1987: "Unitary dual for real reductive groups" (five lectures)

University of Iowa, October, 1987: "Group representations and algebraic geometry" (four lectures)

University of California at Santa Barbara, Distinguished Professor Lecture Series, March, 1988: "Unitary representations of reductive groups" (five lectures)

Bowdoin Conference on Harmonic Analysis on Reductive Groups, August, 1989: "Unitary representations attached to nilpotent orbits" (four lectures)

Third Seminar-Workshop on Representations of Lie Groups and Applications, Córdoba, Argentina, August, 1989: "Unitary representations of real reductive groups" (four lectures)

Soviet-American Symposium on Algebraic Groups and Related Number Theory, Minsk, May, 1991: "L-groups, stable characters, and perverse sheaves"

University of Paris VII, January 1992: "The orbit method for real reductive groups" (four lectures)

Nankai Institute of Mathematics, Tianjin, China, May–June 1994: "Noncommutative algebras and unitary representations for reductive Lie groups" (eleven lectures)

Instituto de Matematicas, Universidad Nacional Autonoma de Mexico, July, 1994: "Representations of reductive groups" (fourteen lectures)

European School of Group Theory, Sønderborg, Denmark, August, 1994: "The orbit method and unitary representations for reductive Lie groups" (eight lectures)

Fifth Seminar-Workshop on Representation Theory of Lie Groups and its Applications, Córdoba, Argentina, August, 1995: "Geometric quantization and nilpotent coadjoint orbits" (four lectures)

Instructional Conference on Representation Theory and Automorphic Forms, International Centre for the Mathematical Sciences, Edinburgh, March, 1996: "Cohomological induction" (three lectures)

Graduate Summer School of the Park City Mathematics Institute, July, 1998: "The method of coadjoint orbits for real reductive groups" (eight lectures)

British Math. Coll., March, 1999: "Three-dimensional subgroups and unitary representations"

Mathematics Towards the Third Millenium, Accademia Nazionale dei Lincei, Rome, May, 1999: "Unitary representations of reductive Lie groups"

Mathematics and Theoretical Physics, Singapore, March, 2000: "Three-dimensional subgroups and unitary representations"

Representation Theory and Complex Analysis, CIME Summer School, Venice, June, 2004: "Unitary representations and complex analysis" (four lectures).

Algebraic groups, arithmetic groups, automorphic forms and representation theories: an international conference in memory of Armand Borel, Hangzhou, China, July, 2004: "Unitary representations and Weyl group representations"

Representation Theory and Harmonic Analysis, Urumqi, China, August 2004: "Introduction to unitary representations of reductive Lie groups" (four lectures)

Ordway Lectures, University of Minnesota, October, 2005: "The Local Langlands Conjecture"

Ritt Lectures, Columbia University, December 2007: "Geometry and representations of reductive groups."

OTHER POSITIONS

Member, Council of the American Mathematical Society, 1985–1987

Corresponding Editor, Princeton University Press, 1983–1988

Associate Editor for Research-Expository Articles, Bulletin of the AMS, 1987–1992

Member, Science Policy Committee of the American Mathematical Society, 1989–1991

Member, Editorial Board, International Mathematics Research Notices, 1990–2005

Associate Editor for Research Reports, Bulletin of the American Mathematical Society, 1995–2001.

Managing Editor, Journal of Representation Theory (American Mathematical Society), 1996–2003.

Member, American Academy of Arts and Sciences, 1996–present.

Member, Editorial Board, Journal of Representation Theory, 2003–present.

PH.D. STUDENTS

Luis Casian, 1983
Joseph Johnson, 1983
Susana Salamanca-Riba, 1986
Jesper Bang-Jensen, 1987
William McGovern, 1987
James Schwartz, 1987
Hisayosi Matumoto, 1988
Jing-song Huang, 1989
Iwan Pranata, 1989
Eugenio Garnica, 1992
William Graham, 1992
Kian-Boon Tay, 1994
Diko Mihov, 1996
Hongyu He, 1998
Monica Nevins, 1998
Peter Trapa, 1998
Adam Lucas, 1999
Wentang Kuo, 2000
Dana Pascovici, 2000
Pramod Achar, 2001
Thomas Pietraho, 2001
Alessandra Pantano, 2004
Wai-Ling Yee, 2004
Christopher Malon, 2005
Chuying Fang, 2007
Jerin Gu, 2008
Markéta Havlíčková, 2008

FELLOWSHIPS

National Science Foundation Graduate Fellowship, 1974-1976
Sloan Foundation Fellowship, 1983-1987