

Curriculum Vitae  
Jeb Faulkner Willenbring

I. EDUCATION

- Ph. D. in Mathematics (June 2000) – University of California, San Diego  
Advisor: Professor Nolan R. Wallach
- Bachelor of Science (May 1995) – North Dakota State University  
Major: Mathematics

II. POSITIONS

- Professor (2013-present) Department of Mathematical Sciences,  
University of Wisconsin-Milwaukee
- Associate Professor (2008-2013) Department of Mathematical Sciences,  
University of Wisconsin-Milwaukee
- Assistant Professor (2003-2008) Department of Mathematical Sciences,  
University of Wisconsin-Milwaukee
- J. W. Gibbs Instructorship with NSF VIGRE funding (2000-2003)  
Mathematics Department, Yale University

III. PUBLICATIONS

- *Symmetry: Representation Theory and its Applications* Progress in Mathematics.  
Joint with Roger Howe and Markus Hunziker. To appear for publication.
- *The cubic, the quartic, and the exceptional group  $G_2$*   
With Anthony van Groningen. To appear for publication.
- *Sums of Squares of Littlewood-Richardson coefficients*  
With Pamela E. Harris. Accepted for publication.
- *The measurement of quantum entanglement and enumeration of graph coverings*  
With Michael W. Hero and Lauren Kelly Williams;  
AMS Contemporary Mathematics, Volume 557, 2011.
- *Stable Hilbert series as related to the measurement of quantum entanglement.*  
With: Michael W. Hero;  
Discrete Math. 309 (2009), no. 23-24, 6508–6514.
- *Toric degeneration of branching algebras.*  
With: Roger Howe, Steven Jackson, Soo Teck Lee and Eng-Chye Tan;  
Adv. Math. 220 (2009), no. 6, 1809–1841.
- *Invariance of generalized wordlength patterns.*  
With Jay Beder;  
J. Statist. Plann. Inference 139 (2009), no. 8, 2706–2714.
- *The Stability Of Graded Multiplicity In The Setting Of The Kostant-Rallis Theorem.*  
With: Roger Howe and Eng Chye Tan.  
Transform. Groups 13 (2008), no. 3-4, 617–636.
- *Invariant Differential Operators and FCR factors of Enveloping algebras.*  
With Ian Musson;  
Comm. Algebra 36 (2008), no. 10, 3759–3777.
- *A generating function for Blattner's formula.*  
With Gregg Zuckerman;  
Proc. Amer. Math. Soc. 136 (2008), no. 6, 2261–2270.
- *Reciprocity Algebras and Branching for Classical Symmetric Pairs.*  
With Roger Howe and Eng-Chye Tan;  
Groups and analysis, 191–231, London Math. Soc. Lecture Note Ser., 354, Cambridge Univ.  
Press, Cambridge, 2008.
- *Small semisimple subalgebras of semisimple Lie algebras.*  
With Gregg Zuckerman;  
Harmonic analysis, group representations, automorphic forms and invariant theory, 403–429, Lect.  
Notes Ser. Inst. Math. Sci. Natl. Univ. Singap., 12, World Sci. Publ., Hackensack, NJ, 2007.
- *Stable Hilbert series of  $\mathcal{S}(\mathfrak{g})^K$  for classical groups.*  
Journal of Algebra. Vol 314/2 (2007) pp 844-871.
- *A basis for the  $GL_n$  tensor product algebra.*  
With Roger Howe and Eng-Chye Tan;  
Advances in Mathematics 196 (2005), no. 2, 531–564.

- *Stable branching rules for classical symmetric pairs.*  
With Roger Howe and Eng-Chye Tan;  
Transactions of the American Mathematical Society. Vol. 357 (2005), 1601-1626.
- *Hilbert series, Howe duality and branching for classical groups.*  
With Thomas J. Enright;  
Annals of Mathematics. 159 (2004), no. 1, 337–375.
- *Hilbert series, Howe duality, and branching rules.*  
With Thomas J. Enright;  
Proceedings of the National Academy of Sciences. 100 (2003), no.2, 434–437.
- *An Application of the Littlewood Restriction Formula to the Kostant–Rallis Theorem.*  
Transactions of the American Mathematical Society. Vol. 354(11), 2002, 4393-4419.
- *A stable range for dimensions of homogeneous  $O(n)$ -invariant polynomials on the  $n \times n$  matrices.*  
Journal of Algebra. Vol. 242(2) (2001) pp.691-708.
- *Stability properties for  $q$ -multiplicities and branching formulas for representations of the classical groups.*  
Ph.D. Thesis – University of California, San Diego, 2000.
- *On Some  $q$ -Analogues of a Theorem of Kostant-Rallis.*  
With Nolan R. Wallach;  
Canadian Journal of Mathematics. Vol. 52(2), 2000 pp.438-448.

#### IV. GRANTS AND RECOGNITION

- Distinguished Undergraduate Teaching Award (2013)  
University of Wisconsin - Milwaukee
- Fellow of the American Mathematical Society
- Joint PI with Markus Hunziker, Conference Grant (July 2010 – July 2011).  
National Security Agency, Grant # H98230-10-1-0239.  
Title: *Lie Theory and its applications, conference in honor of Nolan Wallach*
- PI, Young Investigator’s Grant (January 2009 – July 2011).  
National Security Agency, Grant # H98230-09-0054.  
Title: *Combinatorial Problems related to Harish-Chandra modules*
- PI, Young Investigator’s Grant (December 2004 – August 2007).  
National Security Agency, Grant # H98230-05-1-0078.  
Title: *The Combinatorics of Branching Rules.*
- Research Growth Initiative Grant (July 2007-July 2008), UW–Milwaukee
- Graduate School Research Committee Award (June 2006-July 2007), UW–Milwaukee
- Supported by the YALE VIGRE Program (2000-2003) National Science Foundation
- CMI Liftoff Program (Summer 2000) Clay Mathematics Institute

#### V. INVITED TALKS

- United States Military Academy, West Point. Colloquium (November 2013).
- Marquette University, Milwaukee, WI. Colloquium (April 2012).
- University of Illinois, Urbana-Champaign.  
Algebra-Geometry-Combinatorics Seminar (April 2011).
- Macalester College. Spring Central Section Meeting 2010, St. Paul, MN. Special Session on Cohomology and Representation Theory of Algebraic Groups and Related Structures, I (Talk prepared jointly with Michael W. Hero and Lauren Kelly Williams.)
- Notre Dame. Algebra Seminar (November 2009)  
(Talk prepared jointly with Michael W. Hero and Lauren Kelly Williams.)
- Notre Dame. Lie theory Seminar (November 2009)
- Yale University. Representation Theory and Mathematical Physics Conference in honor of Gregg Zuckerman’s 60th birthday (October 2009)
- Baylor University. Fall Central Section Meeting, Waco, Texas. Special Session on Lie Groups, Lie Algebras, and Representations (October 2009)
- Joint Mathematics Meeting in San Diego, CA; Special Session on Structure, Geometry, and Symbolic Computation of Algebraic Groups and Symmetric Spaces (January 2008)
- University of Minnesota Mathematics Colloquium (October 2007)
- University of Minnesota Lie Groups Seminar (October 2007)
- Bremen, Germany (March 2007). Seminar on Transformation Groups and Mathematical Physics
- Yale University (August 2006); Algebra and Lie Groups Seminar  
(Talk prepared jointly with Anthony van Groningen)

- University of Washington (May 2006); Mathematics Colloquium
- Virginia Polytechnic Institute (March 2006); Mathematics Colloquium
- Western Kentucky University (March 2005) Southeastern Sectional Meeting of the AMS. Special Session on Representation Theory
- Western Kentucky University (March 2005) Special Session on Recent Advances in Non-Commutative Algebra. Southeastern Sectional Meeting of the AMS
- Ohio State University (March 2005); Combinatorics Seminar
- National University of Singapore (January 2005); Representation Theory Seminar
- Northwestern University (October 2004)  
Conference of the American Mathematical Society  
Special Session on Algebraic Representations and Deformations
- University of California - Riverside (October 2004)  
NSF Sponsored Workshop: Lie Groups, Lie Algebras and their Representations
- Binghamton University (October 2003); *Invited Hour Address*  
Eastern Section Meeting of the AMS
- University of Wisconsin-Madison (October 2003); Lie Theory Seminar
- University of Wisconsin-Milwaukee (April 2003); Mathematics Colloquium
- Yale University Mathematics Department (April 2003)  
Geometry, Physics and Symmetry Seminar
- Fall Western Section AMS Meeting in Salt Lake City, Utah (October 2002)  
Special session on the Representation Theory of Semisimple Lie Groups
- Yale University Mathematics Department (October 2002)  
Algebra/Lie Groups Seminar
- Massachusetts Institute of Technology (March 2002)  
Combinatorics Seminar
- University of California - San Diego (January 2002)  
NSF Workshop on Lie groups, Lie algebras, and their Representations
- Yale University Mathematics Department (May and June 2001)  
Invariant Theory Seminar
- Northeastern University Mathematics Department (March 2001)  
Geometry-Algebra-Singularities-Combinatorics Seminar
- North Dakota State University Mathematics Department (December 2000)  
Mathematics Colloquium
- Rutgers University Mathematics Department (December 2000)  
Representation Theory Seminar
- Ohio State University Mathematics Department (November 2000)  
Harmonic Analysis, Automorphic Forms And Representation theory (HAAR) Seminar
- Yale University Mathematics Department (September 2000)  
Lie Groups Seminar
- University of California, San Diego Mathematics Department (February 2000)  
Combinatorics Seminar
- National Security Agency (January 2000)  
Mathematics Seminar

## VI. TEACHING

- University of Wisconsin-Milwaukee (Current Position)
  - Intermediate Algebra (Winter 2011, 2012)
  - College Algebra (Summer 2012, Winter 2013)
  - Calculus with Analytic Geometry (Spring, Fall 2006)
  - Introduction to the Language and Practice of Mathematics (Fall 04, 05, 07, 13; Spring 05, 07, 10)
  - Advanced Calculus (Fall 2013)
  - Number Theory (Fall 04, 10, 12)
  - Differential Geometry (Fall 2011)
  - Introduction to Modern Algebra (Spring 2005)
  - Modern algebra (2005-06, 2006-07, 2008-09)
  - Graduate Algebra (2007-08, 2010-11, 2012-13)
  - Algebra seminar (Spring 05, 07, 08, 11, and Fall 06, 08)
  - Advanced Topics in Algebra (Fall 03, 11 and Spring 04, 10, 12)
- Yale University (Gibbs Instructor)

- Abstract Algebra (Fall 02)
- VIGRE Program Instructor (Summer 02)
- Topics in the representation theory of the classical groups (Spring 02)
- Linear Algebra and Applications (Fall 01)
- Topics in Analysis (Spring 01)
- Discrete Mathematics (Fall 00, 01, 02)
- University of California at San Diego (1995-2000)
  - Graduate Student Lecturer (Fall 98, and Spring 99)  
Calculus for Social and Life sciences
- North Dakota State University (1991-1995)
  - Undergraduate Student Teaching (1994-95)
  - Teaching Assistant (1991-92)

## VII. SELECTED EDUCATIONAL AND SERVICE ACTIVITIES

- Ph. D. Students:
  - Lauren Kelly Williams  
Graduated Summer 2013
  - Pamela E. Harris  
Graduated Spring 2012
  - Anthony van Groningen (Joint Advisor with Allen Bell)  
Graduated Summer 2007
- Masters Students
  - Lindsey Mathewson: Graduated Winter 2012
  - Anthony Varey: Graduated Fall 2011
  - Drew Shulman; Graduated Summer 2006
- Organizer for UW-Milwaukee Putnam Mathematics Competition Team (2008, 2010, 2011).  
Joint with Michael W. Hero
- Supervision of UW-Milwaukee Mathematics major capstone projects
- Judge for the Wisconsin State Science Fair at Marquette University  
March 2006, 2007, 2014.
- Clay Mathematics Institute Research Academy (Boston, MA) (March 2003)  
(This is a program for talented high school students for which I assisted in the instruction.)
- Organizer for the UW-Milwaukee Marden Lecture (2013).
- Organizer for the UW-Milwaukee Marden Lecture (2010). Joint with Michael W. Hero
- Assistant Chairperson (2008-2009), UW-Milwaukee Department of Mathematical Sciences
- Qualifying Exam Writer in Algebra (December 2002), Yale University
- Master's Proficiency Exam Writer in Algebra (2006 – 2010, 2013, 2014), UW-Milwaukee
- UWM Department of Mathematical Sciences Recruitment Planning Committee Chair (2011-12)
- UWM Department of Mathematical Sciences Colloquium Committee Chair (2013-15)
- Editor for invited volume *Symmetry: Representation Theory and Its Applications* published by Springer. Joint with Roger Howe and Markus Hunziker.
- Conference Organizer: *Lie theory and its applications, conference in honor of Nolan Wallach*.  
Joint with Danny Goldstein, Roger Howe, Markus Hunziker, David Meyer, and Lance Small.
- Reviewer of the AMS Math Reviews
- Referee for: *American Journal of Mathematics, Communications in Algebra, Discrete Mathematics, Journal of Algebra, Journal of Algebraic Combinatorics, Proceedings of the AMS, Transactions of the AMS*

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