Curriculum Vitae
Jeb Faulkner Willenbring

I. EDUCATION
- **PhD 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
- *Lowest $\mathfrak{sl}_2$-types in $\mathfrak{sl}_n$-representations*
  Joint with Hassan Lhou. Represent. Theory 21 (2017), 20–34.
- *The cubic, the quartic, and the exceptional group G_2*
  With Anthony van Groningen. Developments and Retrospectives in Lie Theory: Algebraic Methods. Edited by Geoffrey Mason, Ivan Penkov, Joseph A. Wolf. *Developments in Mathematics.* Springer-Verlag. 2014.
- *Symmetry: Representation Theory and its Applications; In Honor of Nolan R. Wallach.*
  Joint with Roger Howe and Markus Hunziker. Progress in Mathematics 257. Birkäuser Basel. 2014.
- *Sums of Squares of Littlewood-Richardson coefficients*
  With Pamela E. Harris. In *Symmetry: Representation Theory and Its Applications.* Progress in Mathematics 257. Birkäuser Basel. 2014.
- *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;
  Ann/als 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.*
  PhD Thesis – University of California, San Diego, 2000.
- *On Some q-Analogs 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

- PI, Industries for the Blind (IB). 2016-17. $19,200. *Support for tutoring of students in the Mathematical Sciences, who are blind or visually impaired.*
  IB has agreed to re-fund for a second year at approximately $20,000.
- UW-System *Support for Undergraduate Research Fellows (SURF).* Approx. $15,000 supporting nine students. Topic: experiments with cellular. automata. Students: Harry Boris, Wes Falk, Dan Hahn, Eric Johnson, Ariel Kraemer, Dan Swanson, Alex van Abel, Alex Washburn, John Williams
- Accessibility Resource Center Excellence Award (2016)
- 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
- Clay CMI Liftoff Program (Summer 2000) Clay Mathematics Institute

V. INVITED TALKS

- Americans with Disabilities Act (ADA) Accessibility and Advisory Committee, Chapman Hall UW-Milwaukee, 2016
- Rutgers University, New Brunswick, NJ. Fall Eastern Sectional Meeting of the American Mathematical Society (November 2015) Special Session on Representations of Reductive Groups.

- University of Wisconsin - Eau Claire. Fall Central Section Meeting of the American Mathematical Society (October 2014). Eau Claire, WI. Special Session on Analysis and Geometry on Lie Groups. Talk prepared jointly with Hassan Lhou.
- 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)**
  - **Mathematics and Society (Winter 2016)**
  - **Intermediate Algebra (Winter 2011, 2012, 2014, 2015)**
  - **College Algebra (Summer 2012, Winter 2013)**
  - **Survey of Calculus (Summer 2015)**
  - **Elementary Statistical Analysis (Summer 2017)**
  - **Calculus with Analytic Geometry (Spring, Fall 2006; Fall 2014)**
  - **Introduction to the Language and Practice of Mathematics (Fall 04, 05, 07, 13, 15, 17; Spring 05, 07, 10)**
  - **Advanced Calculus (2013-14)**
  - **Number Theory (Fall 04, 10, 12)**
  - **Differential Geometry (Fall 2011)**
  - **Introduction to Modern Algebra (Spring 2005)**
  - **Modern algebra (2005-06, 2006-07, 2008-09)**
  - **High School Mathematics from an Advanced Perspective (Spring 2015, 2016)**
  - **Graduate Algebra (2007-08, 2010-11, 2012-13, 2014-15)**
  - **Homological Algebra (Spring 2016)**
  - **Advanced Topics in Algebra (Fall 03, 11 and Spring 04, 10, 12)**
  - **Algebra seminar (Spring 05, 07, 08, 11, 13, 15, and Fall 06, 08, 17)**
- **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

- **Associate Chair for the Graduate Program. UWM Dept. of Math. Sciences**
- **PhD Students:**
  - **Hassan Lhou, PhD. Graduated Summer 2016**
    Dissertation has been published (jointly) in *Representation theory*.
    Currently employed at Arizona State University
  - **Wayne A. Johnson, PhD. Graduated Summer 2015** Dissertation published in the Journal of Lie Theory.
    Currently employed at UW-Platteville (tenure-track)
  - **Lauren Kelly Williams, PhD. Graduated Summer 2013**
    Dissertation published in the Transactions of the American Mathematical Society
    Currenlty employed at Mercyhurst University (tenure-track)
  - **Pamela E. Harris, PhD. Graduated Spring 2012** Dissertation published in Comptes Rendus Mathématique. Académie des Sciences. Paris
    Currently employed at Williams College (tenure-track).
  - **Anthony van, Groningen, PhD. (Joint Advisor with Allen Bell)**
    Graduated Summer 2007

    Dissertation published jointly in *Developments and Retrospectives in Lie Theor*

    Currently employed at the Milwaukee School Of Engineering

- Masters Students
  - Lindsey Mathewson: Graduated Winter 2012
  - Anthony Varey: Graduated Fall 2011
  - Drew Shulman; Graduated Summer 2006
- Undergraduate Students
  - Supervision of UW-Milwaukee Mathematics major capstone projects (12 students as of 2017).
- Faculty advisor for UW-Milwaukee *Support for Undergraduate Research Fellows* (2014-15)
- UWM Department of Mathematical Sciences Colloquium Committee Chair (2013-15)
- Organizer for UW-Milwaukee Putnam Mathematics Competition Team (2008, 2010–15). Joint with Michael W. Hero (Organizer 2009).
- Judge for Wisconsin Science Fairs 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
- Master's Proficiency Exam Writer in Algebra and Analysis, UW-Milwaukee
- Qualifying Exam Writer in Algebra (December 2002), Yale University
- UWM Department of Mathematical Sciences Recruitment Planning Committee Chair (2011-12)
- GAANN Advisory Committee (2010 − 2015)
- 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*, *Electronic Journal of Representation Theory*, *Journal of Algebra*, *Journal of Algebraic Combinatorics*, *Journal of Linear and Multi-linear algebra*, *Journal of Mathematical Physics*, *Proceedings of the AMS*, *Symmetry Integrability Geom. Methods Appl.(SIGMA)*, *Transactions of the AMS*

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