

Gene Freudenburg

Curriculum Vitae, August 2014

Chair, Department of Mathematics
Professor of Mathematics
Western Michigan University

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EDUCATION

1992	Ph.D. Mathematics	Washington University in Saint Louis
1986	M.S. Mathematics	Saint Louis University
1982	B.A. Interdisciplinary Studies	Valparaiso University

APPOINTMENTS

Western Michigan University

2006 - present	Chair, Department of Mathematics
2010 - 2012	Interim Dean, The Graduate College
2006 - present	Professor of Mathematics

University of Southern Indiana

2005 - 2006	Associate Dean, Pott College of Science & Engineering
2005 - 2006	Professor of Mathematics
1999 - 2005	Associate Professor of Mathematics
1995 - 1999	Assistant Professor of Mathematics

Ball State University

1992 - 1995	Assistant Professor of Mathematics
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RESEARCH AREAS

Commutative algebra, derivations of rings, affine algebraic geometry, automorphisms of affine spaces, group actions on affine varieties, invariant theory (MSC numbers 13,14)

BOOKS

G. Freudenburg, *Algebraic Theory of Locally Nilpotent Derivations*
Encyclopaedia of Mathematical Sciences
Invariant Theory and Algebraic Transformation Groups, Volume VII
R. V. Gamkrelidze, V. L. Popov, Series Editors
Springer Verlag (Berlin, Heidelberg, New York) 2006, 261 pages

RESEARCH GRANTS

Agency: US National Science Foundation, Division of Mathematical Sciences

Project Title: *Algebraic Automorphisms of Affine Space*

Principal Investigator: G. Freudenburg

Award Amount: \$61,275

Award Number: DMS 0101836

Dates: September 2001 to August 2005

RESEARCH ARTICLES

- [25] G. Freudenburg, *An affine version of a theorem of Nagata*, Kyoto J. Math. (to appear)
- [24] G. Freudenburg, *Laurent cancellation for rings of transcendence degree one over a field*, In: Automorphisms in Birational and Affine Geometry, Levico Terme, Italy, Oct. 2012, I. Cheltsov (et al), eds., Springer Proc. Math. Stat. **79** (2014), 313-326
- [23] G. Freudenburg, *Foundations of invariant theory for the down operator*, J. Symbolic Comput. **57** (2013) 19-47
- [22] G. Freudenburg, L. Moser-Jauslin, *Locally nilpotent derivations of rings with roots adjoined*, Michigan Math. J. **62** (2013) 227-258
- [21] G. Freudenburg, *Bivariate analogues of Chebyshev polynomials with application to embeddings of affines spaces*, CRM Proc. Lecture Notes **54** (2011), 39-56
- [20] D. Daigle, G. Freudenburg, *Families of affine fibrations*, in: Symmetry and Spaces, In Honor of Gerry Schwarz, 35-44, Progress in Mathematics **278**, Birkhäuser, Boston, 2010
- [19] G. Freudenburg, *Derivations of $R[X, Y, Z]$ with a slice*, J. Algebra **322** (2009) 3078-3087
- [18] G. Freudenburg, *A linear counterexample to Hilbert's Fourteenth Problem in dimension eleven*, Proc. Amer. Math. Soc. **135** (2007) 51-57
- [17] G. Freudenburg, *Vénéreau polynomials relative to \mathbb{C}^* -vector bundles and stable coordinates*, in: Affine Algebraic Geometry, 203-215, Osaka University Press, Osaka, 2007
- [16] G. Freudenburg, L. Moser-Jauslin, *Real and rational forms of certain $O_2(\mathbb{C})$ -actions, and a solution to the Weak Complexification Problem*, Transform. Groups **9** (2004) 257-272
- [15] G. Freudenburg, L. Moser-Jauslin, *Embeddings of Danielewski surfaces*, Math. Z. **245** (2003) 823-834
- [14] G. Freudenburg, L. Moser-Jauslin, *A non-linearizable S_3 -action on \mathbb{C}^4* , Annals Fourier Inst. **52** (2002) 133-143
- [13] G. Freudenburg, *A survey of counterexamples to Hilbert's Fourteenth Problem*, Serdica **27** (2001) 171-192
- [12] D. Daigle, G. Freudenburg, *Triangular derivations of $k[X_1, X_2, X_3, X_4]$* , J. Algebra **241** (2001) 328-339
- [11] G. Freudenburg, *Recent progress on Hilbert's Fourteenth Problem via triangular derivations*, Ann. Polon. Math. **76** (2001) 95-99
- [10] D. Daigle, G. Freudenburg, *A note on triangular derivations of $k[X_1, X_2, X_3, X_4]$* , Proc. Amer. Math. Soc. **129** (2000) 657-662
- [9] G. Freudenburg, *A counterexample to Hilbert's Fourteenth Problem in dimension six*, Transform. Groups **5** (2000) 61-71
- [8] D. Daigle, G. Freudenburg, *A counterexample to Hilbert's Fourteenth Problem in dimension five*, J. Algebra **221** (1999) 528-535
- [7] D. Daigle, G. Freudenburg, *Locally nilpotent derivations over a UFD and an application to rank two locally nilpotent derivations of $k[X_1, \dots, X_n]$* , J. Algebra **204** (1998) 353-371

- [6] G. Freudenburg, *Actions of \mathbb{G}_a on \mathbb{A}^3 defined by homogeneous derivations*, J. Pure Appl. Algebra **126** (1998) 169-181
- [5] G. Freudenburg, *Local slice constructions in $k[X, Y, Z]$* , Osaka J. Math. **34** (1997) 757-767
- [4] G. Freudenburg, *A note on the kernel of a locally nilpotent derivation*, Proc. Amer. Math. Soc. **124** (1996) 27-29
- [3] G. Freudenburg, *Triangulability criteria for additive group actions on affine space*, J. Pure Appl. Algebra **105** (1995) 267-275
- [2] G. Freudenburg, *One-parameter subgroups and the triangular subgroup of the affine Cremona group*, Automorphisms of Affine Spaces (Curacao, 1994), 201-213, Kluwer Acad. Publ., Dordrecht, 1995
- [1] G. Freudenburg, *Three-dimensional analogues of the Nagata surfaces*, Comm. Algebra **23** (1995) 139-164

DOCTORAL DISSERTATION

On the Automorphism Group of the Polynomial Ring in Three Variables, Washington University in Saint Louis, 1992. David L. Wright, Advisor

SELECTED TALKS (2000-2014)

Two Cancellation Theorems for Rings of Transcendence Degree One
Affine Algebraic Geometry and the Jacobian Conjecture, Chern Institute of Mathematics
Tianjin, China (July 2014)

Invariants of Linear \mathbb{C}^+ Actions
Michigan Computational Algebraic Geometry 2012, Oakland University
Rochester, Michigan, USA (May 2012)

Locally Nilpotent Derivations of Rings with Roots Adjoined
Affine Algebraic Geometry 7, Kansai Gakuin University
Osaka, Japan (March 2011)

Locally Nilpotent R -Derivations of $R[X, Y, Z]$ with a Slice
Group de Travail Inter-universitaire en Algèbre, Université Blaise Pascal
Clermont-Ferrand, France (June 2009)

Embeddings of Affine Spaces using Chebyshev Polynomials and their Successors
Affine Algebraic Geometry, McGill University
Montreal, QC, Canada (June 2009)

Families of Affine Fibrations
Fall Western Section Meeting of the AMS, University of New Mexico
Albuquerque, New Mexico (October 2007)

The Vénéreau polynomials relative to \mathbb{C}^ -fibrations and stable coordinates*
Symmetry and Spaces, Fields Institute, University of Toronto
Toronto, Canada (July 2006)

Sounding the Depths of Hilbert's 14th Problem
Joint AMS-Taiwanese Mathematical Society Meeting
Taichung, Taiwan (December 2005)

Embeddings of Danielewski surfaces

Joint AMS-RSME Meeting
Seville, Spain (June 2003)

Algebraic Automorphisms of \mathbb{C}^n

Algebra Seminar, Université de Bourgogne
Dijon, France (June 2003)

Polynomial Automorphisms

Algebra Seminar, Catholic University Nijmegen
Nijmegen, The Netherlands (March 2002)

Asanuma's Non-Linearizable Torus Actions and the Cancellation Problem

Group Actions on Rational Varieties, Centre de Recherche Math., Université de Montreal
Montreal, QC, Canada (February 2002)

Counterexamples to Hilbert's 14th Problem

Visiting Lecturer, Universität Basel
Basel, Switzerland (June 2001)

A Non-Linearizable Action of S_3 on \mathbb{C}^4

Algebra Seminar, Universität Freiburg
Freiburg, Germany (June 2001)

Triangular Actions of \mathbb{G}_a on \mathbb{C}^n with Non-finitely Generated Invariant Rings

Affine Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach
Oberwolfach-Walke, Germany (May 2000)

VISITING APPOINTMENTS

Université de Bourgogne, Department of Mathematics
Dijon, France, June 2003 and June 2009
Host: L. Moser-Jauslin

Universität Basel, Department of Mathematics
Basel, Switzerland, June 2001
Host: H. Kraft

WORKSHOPS

EAGER 26th Autumn School in Algebraic Geometry
 \mathbb{C}^+ Actions on Affine Spaces and Locally Nilpotent Derivations
Łukęcin, Poland, Sept. 14-20, 2003
Lecturers: D. Daigle and G. Freudenburg
Organized by M. Koras and J. Buczynski,
Institute of Mathematics, Warsaw University

PROFESSIONAL SERVICE

Referee Work

Journal of Algebra, Journal of Algebraic Geometry, Journal of Pure and Applied Algebra, Transformation Groups, Communications in Algebra, Linear Algebra and Its Applications, Applied Mathematical Letters, American Mathematical Monthly, Forum Mathematicum, Journal of Symbolic Computation, Kyoto Journal of Mathematics, Progress in Mathematics

Review Work

Articles. Reviewer for *Mathematical Reviews* and *Zentralblatt Mathematik*

Grant Proposals. Reviewer for National Science Foundation (USA), National Security Agency (USA), National Organization for Scientific Research (The Netherlands), National Science Centre (Poland)

Books. Book review, *American Mathematical Monthly* 103 (1996)

Conference Organization

Michigan Computational Algebraic Geometry 2013

Western Michigan University, May 2013

Organizer: G. Freudenburg

Special Session: *Algebraic Group Actions on Affine Varieties*

Fall Central Section Meeting of the American Mathematical Society

University of Notre Dame, November 2010

Session Organizers: H. Derksen and G. Freudenburg

Fall Central Section Meeting of the American Mathematical Society

Western Michigan University, October 2008

Local Organizer: G. Freudenburg

Special Session: *Geometry of Affine Space*

Spring Central Section Meeting of the American Mathematical Society

University of Louisville, March 1998

Session Organizers: G. Freudenburg and D.L. Wright

Dissertation Defense Committee

M. DeBondt, Radboud University Nijmegen

The Netherlands, 2009

External Reviewer

Department of Mathematics, Northern Illinois University, 2012

AWARDS

2004 Distinguished Professor, University of Southern Indiana

The Distinguished Professor Award recognizes a university faculty member for excellence in teaching, scholarship, and service as well as those intangible personal qualities which inspire others. This award is the highest recognition bestowed upon a faculty member at the University of Southern Indiana. (From the Award Description)

UNIVERSITY SERVICE

Western Michigan University

- 2012 - present Chair's Council (College of Arts & Sciences)
- 2012 - present WMU-STEP Advisory Board (Vice President, Academic Affairs)
- 2013 MLK 50th Anniversary Committee (Vice President, Diversity and Inclusion)
- 2010 - 2012 Provost's Council (Vice President, Academic Affairs)
- 2010 - 2012 Graduate Studies Council (Faculty Senate)
- 2010 - 2012 Research Policies Council (Faculty Senate)
- 2010 - 2012 Graduate Student Advisory Committee (Faculty Senate)
- 2010 - 2012 Research Advisory Team (Vice President for Research)
- 2010 - 2012 SEM Committee (Vice Provost, Strategic Enrollment Mgt.)
- 2010 - 2012 Enrollment Forecast Committee (Vice Provost, Strategic Enrollment Mgt.)
- 2010 - 2012 MI-AGEP Steering Committee (Michigan AGEPE Alliance)
- 2010 Search Committee, Lee Honors College Dean (Vice President, Academic Affairs)
- 2009 - 2010 4.1 Subcommittee, HLC Comprehensive Visit (Vice Provost, Inst. Effectiveness)
- 2006 - 2010 Chair's Council (College of Arts & Sciences)
- 2007 - 2009 Dissertation Completion Fellowship Committee (The Graduate College)
- 2006 - 2007 Graduate Studies Council (Faculty Senate)

University of Southern Indiana

- 2005 - 2006 Chair, College Promotions Committee (College of Science & Engineering)

GRANT ADMINISTRATION

Co-PI/PD 2011-2012

A Planning Grant to Enrich and Enlarge the Michigan AGEPE Alliance

National Science Foundation, HRD-1110556

Project Dates: 2011-2012

Co-PI/PD 2010-2012

The Michigan AGEPE Alliance

National Science Foundation, HRD-0450063

Project Dates: 2004-2012