

# Curriculum Vita

## Darrin Frey

### Office Address

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### Education

#### **Ph.D. in Mathematics, University of Michigan, April, 1995**

Thesis Title: *Conjugacy of Alternating Groups of Degree 5 and  $SL(2, 5)$  Subgroups of the Complex Lie Group of Type  $E_8$ .*

Thesis advisor: Robert L. Griess, Jr.

Research interests: Finite perfect groups, exceptional complex Lie groups. AMS codes 20, 22

#### **B.S. in Mathematics with High Distinction, University of Nebraska, 1989**

Undergraduate Thesis Title: *Conjugation in Inverse Semigroups*

### Professional Experience

#### **August 2009 - Present**

Cedarville University, Cedarville, OH - Professor of Mathematics

#### **August 2003 - August 2009**

Cedarville University, Cedarville, OH - Associate Professor of Mathematics

#### **August 1997 - August 2003**

Cedarville University, Cedarville, OH - Assistant Professor of Mathematics

Courses Taught: Calculus I, II, III, Business Calculus

Differential Equations

Precalculus

Abstract Algebra I, II,

Topology

Combinatorics

Graph Theory

Algebraic Structures for Secondary Ed Majors

Euclidean and Non-Euclidean Geometries

Logic and Methods of Proof

Introduction to Math

Capstone Experience: Error-Correcting Codes

Capstone Experience: Sporadic Groups

Beautiful Math

Topics in Math: Character Theory of Finite Groups

Independent Study: Lie Groups, Lie Algebras and Representation Theory  
Independent Study: Measure Theory  
Independent Study: Knot Theory  
Independent Study: Regular and Inverse Semigroups  
Independent Study: Projective Geometries

**September 1995 - May 1997**

**Winona State University, Winona, MN - Assistant Professor of Mathematics**

Courses Taught: Calculus I, II  
Precalculus I  
Abstract Algebra  
Multivariable Calculus  
Discrete Math  
Contemporary Math  
Math with Applications to Business

## Publications

“Conjugacy of  $Alt_5$  and  $SL(2, 5)$  subgroups of  $E_8(\mathbb{C})$ ,”  
*Memoirs of the American Mathematical Society*, Vol. 133, No. 634, (1998), 1-162.

“Conjugacy of  $Alt_5$  and  $SL(2, 5)$  subgroups of  $E_6(\mathbb{C})$ ,  $F_4(\mathbb{C})$  and a subgroup of  $E_8(\mathbb{C})$  of type  $A_2E_6$ ,” *Journal of Algebra*, Vol. 202, (1998), 414-454.

“Conjugacy classes of elements in the Borovik group,” (with Robert L. Griess, Jr.)  
*Journal of Algebra*, Vol. 203, (1998), 226-243.

“Generalizing Bailey’s Generalization of the Catalan Numbers,” (with James A. Sellers),  
*Fibonacci Quarterly*, Vol. 39, no. 2 (May 2001), 142-148

“Jacobsthal Numbers and Alternating Sign Matrices,” (with James A. Sellers)  
*Journal of Integer Sequences*, Vol. 3, no. 2 (2000), Article 00.2.3.

“Conjugacy of  $Alt_5$  and  $SL(2, 5)$  subgroups of  $E_7(\mathbb{C})$ ”  
*Journal of Group Theory*, Vol. 4, (2001), 277-323.

“On Powers of 2 Dividing the Values of Certain Plane Partition Functions,” (with James A. Sellers) *Journal of Integer Sequences*, Vol. 4, no. 1 (2001), Article 01.1.8.

“Prime Power Divisors of the Number of  $n \times n$  Alternating Sign Matrices,”  
(with James A. Sellers) *Ars Combinatoria*, Vol. 71 (2004), 139-147.

“Arithmetic Properties for a Certain Family of Knot Diagrams,” (with James A. Sellers)  
*Ars Combinatoria*, Vol. 77 (2005), 65-73.

“Conjugacy of Embeddings of  $Alt_n$  and its Nonsplit Central Extensions into Exceptional Complex Lie Groups for  $n \geq 6$  with Appendix by A.J.E. Ryba,” (submitted to *Journal of Algebra* in September, 2008)

## Awards

**1999**

Cedarville Summer Scholar Award

**1996**

Runner-up for Sumner-Myers award for best math dissertation  
at the University of Michigan

**1/95 - 4/95**

Rackham Dissertation Fellow

**9/90 - 12/92**

Department of Education Fellow

**8/89**

Best Student Speaker award at Pi-Mu-Epsilon national meeting, Boulder, CO

**5/89**

Phi Beta Kappa, University of Nebraska

## Professional Speaking

Invited general interest math Lecture at Sinclair Community College, February 10, 2006  
“Iteration and Chaos: Beauty from the Mundane.”

Invited speaker at the Oberwolfach Seminar “Sphere Packings: Exceptional Geometric Structures and Connections to other Fields,” November 20-26, 2005, at the Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany.  
“Alternating subgroups in exceptional complex Lie Groups.”

Algebra Seminar at Wayne State University, November 11, 2005  
“Conjugacy of alternating subgroups and their nonsplit central extensions in exceptional complex Lie groups.”

Invited 1 hour speaker at the conference on “Algebraic Groups and Finite Reductive Groups,” June 13-17, 2005, at the Centre Interfacultaire Bernoulli at Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland.  
“Alternating subgroups in exceptional complex Lie groups.”

Group Theory/Lie Theory Seminar at the University of Michigan, March 26, 2001  
“Conjugacy of Embeddings of  $Alt_5$  and  $SL(2, 5)$  subgroups into  $E_7(\mathbb{C})$ ”

Group Theory Seminar at Ohio State University, April 27, 1998  
“Conjugacy Classes of Elements in the Borovik Subgroup of  $E_8(\mathbb{C})$ ”

Algebra Seminar at Wayne State University, February 27, 1998  
“Conjugacy Classes of Elements in the Borovik Group”

Invited speaker at AMS meeting #922, Special Session on Groups and Geometries and Related Topics, May 3-4, 1997, Detroit, Michigan.  
“Recent progress in classifying  $Alt_5$  and  $SL(2, 5)$  subgroups of exceptional complex Lie groups up to conjugacy”

Invited speaker at AMS meeting #904, Special Session on Groups and Geometries and Related Topics, November 3-4, 1995, Kent, Ohio.  
“Conjugacy of  $Alt_5$  and  $SL(2, 5)$  subgroups of  $E_6(\mathbb{C})$ ”

Invited speaker at AMS meeting #899, Special Session on Finite Groups and Related Topics, March 17-18, 1995, Orlando, Florida.  
“Conjugacy of  $Alt_5$  and  $SL(2, 5)$  subgroups of  $E_8(\mathbb{C})$ ”

Invited speaker at Joint AMS, MAA, Pi-Mu-Epsilon meeting, August 1 - 6, 1989, Boulder, Colorado.  
“Conjugation in inverse semigroups”

## Conferences Co-Organized

### June 2000

MAA Ohio Section Summer Short Course: “Proofs and Confirmations: The Story of the Alternating Sign Matrix Conjecture” (with James A. Sellers)  
Speaker: David Bressoud, Macalester College

### June 1997

MAA North Central Section Summer Short Course: “An Introduction to Artificial Neural Networks” (with Steven D. Leonhardi and Barry A. Peratt)  
Speakers: Richard De Veaux, Williams College  
Lyle Unger, University of Pennsylvania

## Other Conferences

### June 2011

Southeastern Lie Theory Workshop: Finite and Algebraic Groups, University of Virginia

### October/November 2003

Conference on Groups, Representations and Galois Theory in Honor of Walter Feit, Yale University

### March 2003

Conference on Groups and Computation, Ohio State University

### September 2001

AMS Regional Meeting, Ohio State University

### April 2000

MAA Ohio Section meeting, Marshall University

### April 1999

Midwest Group Theory Conference, Bowling Green State University

### March 1999

MAA Ohio Section meeting, University of Dayton

### April 1998

MAA Ohio Section meeting, John Carroll University

### April 1997

Conference on Finite Simple Groups in memory of Daniel Gorenstein, Queen's College

### May 1996

The Second Monster Conference, Ohio State University

## January 1995

AMS-MAA Joint Meeting, San Francisco, CA

## Fall 1992

AMS Regional Meeting, Wright State University

## 1991, 1992, 1993

Midwest Group Theory Conference, University of Chicago

## July 1989

Berkeley Conference on Monoids, University of California at Berkeley

## Seminars

Group Theory Seminar - Ohio State University

Group Theory Seminar - University of Wisconsin - Madison

Faculty seminar - Winona State University

Group theory/Lie theory seminar - University of Michigan

Student Group theory - University of Michigan

Student Lie algebras - University of Michigan

Student algebra (organizer) - University of Michigan

Semigroup theory seminar - University of Nebraska

## Research Reviewing and Refereeing

### Reviewed for *Mathematical Reviews*

Barchini, L., and Sepanski, Mark R., "Finite-reductive dual pairs in  $G_2$ ,"  
*Linear Algebra and its Applications*, Vol. 340 (2002), pp. 123-136.

Steinbach, Anja, "Subgroups of the Chevalley Groups of Type  $F_4$  Arising  
From a Polar Space," *Advances in Geometry*, Vol. 3 (2003), 73-100.

Lusztig, George, "Homomorphisms of the alternating group  $A_5$  into reductive  
groups," *Journal of Algebra*, Vol. 260 (2003), 298-322.

### Refereed

Cusick, Larry, "The Hyperoctahedral Group & Free Symmetries of the Hypercube"  
for the *American Mathematical Monthly*.

Alikhani, Saeid, and Peng, Yee-hock, "Product Formula for Jacobsthal Polynomial"  
for the *Journal of Applicable Analysis and Discrete Mathematics*. (June 2008).

Akbulak, Mehmet and Oteles, Ahmet, "On the sum of Pell and Jacobsthal numbers,"  
for the *Rocky Mountain Journal of Mathematics*. (May 2012)

## Department/College Service

Assistant Chair - Math 2002 -

Department Tenure Committee 2004-2007

Education Internal Advisory Council

Developed the course: Beautiful Math Structures and Thinking

Developed the course: Algebraic Structures for Secondary Education

Co-hosted (with Dr. James Sellers) the MAA-Ohio Section Short Course entitled

“Proofs and Confirmations: The Story of the Alternating Sign Matrix Conjecture.”

## **Service to the Mathematical Community**

Served as the inquirer for a nearby university looking into alleged academic misconduct on the part of a faculty member applying for NSF support (Summer 2011)

## **Community/Church involvement**

AWANA worker - 1997-2008

Deacon (Secretary and member of the Executive Committee, also in charge of socials and hospitality) 2005-2008

Junior High leader - 2007-present

Occasional Sunday School teacher (both adult and children)

Soccer Coach - 8-9 year old boys - 2005

Vice President, Cedarville Soccer Association - 2004-2005

President, Cedarville Soccer Association - 2006-2010