David J. Hemmer

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Education:

2001	Ph.D	Mathematics	University of Chicago, Chicago, IL
1997	M.S.	Mathematics	University of Chicago, Chicago, IL
1996	B.A.	Mathematics	Dartmouth College, Hanover, NH

Thesis advisor: Jonathan L. Alperin
Thesis title: Extensions of hook and completely splittable modules for the symmetric group.

Employment history:

8/2007- present	**University at Buffalo, SUNY,** Buffalo, NY Associate Professor
1/2008-5/2008	**Mathematical Sciences Research Institute,** Berkeley, CA Member
8/2003-8/2007	**University of Toledo,** Toledo, OH Assistant/ Associate Professor
2001-2003	**University of Georgia,** Athens, GA National Science Foundation Postdoctoral Fellow
1996-2001	**University of Chicago,** Chicago, IL National Science Foundation Graduate Fellow
1997	**Institute for Defense Analysis,** Princeton, NJ Participated in summer research program of permanent IDA staff and invited visiting faculty doing research on classified problems.

External Funding:

2010-2012	National Security Agency Title: Cohomology and representation theory for symmetric and algebraic groups. Sole PI: David Hemmer
2006-2010	National Science Foundation Grant # DMS 0556260, Title: Cohomology and representation theory,

Sole PI: David Hemmer

2008 Mathematical Sciences Research Institute
Member: Special semester on representation theory of finite groups and related topics.

2004-2006 National Security Agency Grant # H98230-05-1-0023
Title: Modular representation theory and cohomology of the symmetric group and related objects.
Sole PI: David Hemmer

2001-2004 National Science Foundation Grant # DMS0102019
Title: Modular representation theory of the symmetric group.
Sole PI: David Hemmer

1997-2001 National Science Foundation graduate fellowship
University of Chicago

Publications:

[18] David J. Hemmer, Jonathan Kujawa, "Signed Specht modules for symmetric groups," *in preparation*

[17] David J. Hemmer, "Realizing large gaps in cohomology for symmetric group modules," *submitted 2011.*

[16] David J. Hemmer, "A combinatorial approach to Specht module cohomology," to appear, *Algebra Colloq. 2011.*

[15] David J. Hemmer, "Stable decompositions for some symmetric group characters arising in braid group cohomology." *Journal of Combinatorial Theory Series A,* **(118)** (2011) 1136-1139.

[14] Frederick R. Cohen, David J. Hemmer, Daniel K. Nakano, "On the cohomology of Young modules for the symmetric group," *Advances in Mathematics* **(224)** (2010), *1419-1461.*

[13] Jon Carlson, David J. Hemmer, Nadia Mazza, "The group of endotrivial modules for the symmetric and alternating groups," *Proc. Edin. Math. Soc.* **53** (2010) , 83–95.

[12] David J. Hemmer, "Cohomology and generic cohomology for Specht modules of the symmetric group," *J. Algebra* , **(322)** (2009), *1498-1515.*

[11] David J. Hemmer, "The complexity of certain Specht modules for the symmetric group," *Journal of Algebraic Combinatorics*, ***(30)*** (2009), *421-427.*

[10] David J. Hemmer, "Symmetric group modules with Specht and dual Specht filtrations," *Communications in Algebra*, **35:11**, (2007) p. 3292 - 3306.

[9] David J. Hemmer, "Tilting modules for symmetric groups?" Mathematisches Forschungsinstitut Oberwolfach Reports, **(15)** (2006) p.937-40.

[8] David J. Hemmer, Daniel K. Nakano, "Cohomology of Specht modules," *J. Algebra* **(306)** (2006), p. 191-200.

[7] David J. Hemmer, "Irreducible Specht modules are signed Young modules," *J. Algebra* (**305**) (2006) p. 433-441.

[6] David J. Hemmer, Jonathan Kujawa, Daniel K. Nakano, "Representation Type of Schur Superalgebras," *J. Group Theory*, **(9)** (2006) #3, p. 283-306.

[5] David J. Hemmer, "A row removal theorem for the Ext^1 quiver of symmetric groups and Schur Algebras," *Proceedings of the American Mathematical Society*, (**133**) (2005), p.403-414.

[4] David J. Hemmer, "Fixed-point functors for symmetric groups and Schur algebras," *J. Algebra*, **(280)** (2004), 295-312.

[3] David J. Hemmer, Daniel K. Nakano, "Specht filtrations for Hecke Algebras of Type A," *Journal of the London Mathematical Society* (2), (**69)** (2004), 623-638**.**

[2] David J. Hemmer, Daniel K. Nakano, "Support varieties for modules over symmetric groups," *Journal of Algebra*, (**252)** (2002), 422-440.

[1] David J. Hemmer, "The Ext^1 quiver for completely splittable representations of the symmetric group," *Journal of Group Theory*, **(4)** (2001) #4, 401-416.

Teaching:

University at Buffalo, SUNY:

Fall 2010	Math 461/561 Introduction to Lie Algebras and Representation Theory
Fall 2009:	Math 819- Representation Theory of Finite Groups
Spring 2009:	Math 620 Abstract Algebra II Math 142 Calculus II
Fall 2008	Mathematics of Voting- Undergraduate Honors Seminar Math 619 Abstract Algebra I Math 241 Calculus III

Fall 2007 Math 141 Calculus I
Math 419 Introduction to Abstract Algebra

University of Toledo:

Honors Calculus I, II
Business Calculus
Honors Differential Equations
Introduction to Combinatorics (designed and taught)
Graduate Algebra Sequence
Graduate topics course in representation theory
Advanced linear algebra
Introduction to Abstract Algebra

University of Georgia:
Calculus I, II

University of Chicago:
Calculus I, II, III

Advising:

Undergraduate Honors Theses:
Joe Ricci 2011.
Graham Clenaghan 2009-2010
Andrew Hughes 2008-2009
Fangya Tan 2008-2009
Ben Connell 2006-2007

Master's Theses
Leya Tesmenitsky- 2010

Doctoral Students:
Craig Dodge (current)
Christy Callear (current)

Professional Activities:

- **Math Reviews:** Major database for published mathematics papers. I have had published 22 reviews since 2001.

- **NSF Panel:** I have reviewed grants for the NSF.

- **Referee:** In recent years I have refereed journal submissions or book proposals for:

  Advances in Mathematics
  Algebras and Representation Theory
  Algebra Colloq.

Cambridge University Press
Communications in Algebra
Journal of Algebra
Journal of Algebraic Combinatorics
Journal of Combinatorial Theory
Journal of Pure and Applied Algebra
Proceedings of the London Mathematical Society
Proceedings of the American Mathematical Society
Quarterly Journal of Mathematics, Oxford.

- **Memberships:** American Mathematical Society, Mathematical Association of America.

- **VIGRE group leader:** I directed a research seminar for undergraduates, graduate students and faculty on the Alperin weight conjecture for symmetric groups as part of the University of Georgia's VIGRE program. This program was funded by an NSF grant of more than $3 million.

- **Conference Organizer:** E. Wiesner and I organized a special session at the AMS meeting in Syracuse, October 2010. C. Pillen and I organized a special session at the annual AMS meeting in Atlanta in January 2005. These sessions are competitively chosen.

- **Conference Organizer:** S. Danz and I organized an Oberwolfach workshop in April of 2011.

Invited Talks:

- **Oberwolfach, Germany,** "A variety of approaches to Specht module cohomology," Conference on Representation Theory of Symmetric Groups, April 2011.
- **University of South Alabama:** "Frobenius twists for symmetric group module?", Colloquium, March 2011.
- **University of South Alabama:** "Generic cohomology for Specht and Young modules of the symmetric group", Algebra Seminar, March 2011.
- **Southwest Group Theory Day:** "Young modules for the symmetric group with large vanishing ranges in cohomology", November, 2010.
- **Oberwolfach, Germany,** "Young modules for the symmetric group with large vanishing ranges," Conference on Cohomology of Finite Groups, July 2010.
- **Southeast Lie Theory Conference- Invited speaker: "**Vanishing ranges and Young module cohomology for symmetric groups," May 2010.
- **VIGRE Summer School: Homological Methods in Representation Theory:** Group leader.
- **University of Oklahoma:** "A tour of symmetric group representation theory," colloquium, April 2010.
- **University of Oklahoma:** "Signed Specht modules for symmetric groups?", representation theory seminar, April 2010.
- **AMS/MAA National Meeting**, "A combinatorial approach to Specht module cohomology," San Francisco, January 2010.

- **Oberwolfach, Germany,** "The complexity and support varieties for some Specht modules of the symmetric group," Conference on Support Varieties, February 2009.
- **University of Virginia:** "A tour of symmetric group representation theory via Specht module filtrations." Colloquium, November 2008.
- **University of Virginia:** "An application of algebraic topology to computing cohomology for Young modules of the symmetric group." Algebra seminar, November 2008.
- **AMS meeting,** "Generic cohomology for Young modules of the symmetric group," Kalamazoo, MI. Special session on computation in modular representation theory and cohomology.
- **Mathematical Sciences Research Institute, "**An application of topology to computing the cohomology of Young modules for the symmetric group," Conference on homological methods in representation theory, April 1, 2008.
- **American Institute of Mathematics,** "An introduction to the cohomology and modular representation theory of the symmetric groups," Workshop on cohomology and representation theory for finite groups of Lie type: computational methods, June 2007.
- **AMS/MAA National Meeting**, "Cohomology of Specht modules," New Orleans, January 2007.
- **Oberwolfach, Germany,** "Tilting modules for symmetric groups?" Conference on representation theory of finite groups, March 2006.
- **Bowling Green University,** "Specht module filtrations for representations of the symmetric groups," Colloquium, October 2004**.**
- **AMS-IMS-Siam Summer Research Conference**, "Fixed point functors for symmetric groups and Schur algebras," Conference on Representations of Algebraic groups, quantum groups and Lie algebras," Snowbird, Utah, July 2004.
- **AMS meeting,** "A row removal theorem for the Ext^1 quiver of symmetric groups and Schur algebras," Chapel Hill, NC. Special session on group cohomology and algebra and geometry. October 2003.
- **AMS meeting**, "Cohomology for symmetric groups," Madison, WI. Special session on Lie theory, October 2002
- **Dartmouth College,** "The Ext^1 quiver for completely splittable representations for symmetric groups," Colloquium**,** May 2001
- **AMS/MAA National Meeting**, "The Ext^1 quiver for completely splittable representations for symmetric groups," New Orleans, Special session on representation theory of finite and algebraic groups, January 2001

Other Talks:

- **Canisius College,** math club, February 2010.
- **University at Buffalo,** math club, January 2010.
- **University of Toledo,** colloquium March 2009
- **University at Buffalo, SUNY** algebra seminar. Multiple talks fall 2009.
- **University of Chicago,** Group Theory Seminar, May 2008.
- **Harvey Mudd College,** Applied representation theory seminar, May 2007.
- **University at Buffalo, SUNY,** Colloquium February 2007.
- **University of Denver,** Colloquium February 2007.
- **University of Chicago,** Group theory seminar May 2006
- **Ohio State University,** Group Theory Seminar, November 2005
- **University of Georgia,** Algebra Seminar, November 2005
- **University of Georgia,** Algebra Seminar, March 2005

- **University of Georgia**, Algebra Seminar, August 2004.
- **University of Chicago,** Group theory seminar April 2004
- **University of Oregon,** "Groups and Representation" conference in honor of Gary Seitz, March 2004.
- **University of Northern Illinois,** Colloquium, April 2004
- **Ohio State University,** Algebra seminar, February 2004
- **University of Georgia,** Algebra seminar, January 2004
- **University of Bristol,** Colloquium, May 2003
- **University of Leicester,** Pure maths seminar, May 2003
- **Oxford University,** Representation theory seminar, May 2003.
- **Oxford University,** Algebra Seminar, May 2003.
- **University of Georgia,** Undergraduate math club, April 2003.
- **University of Florida,** Conference in honor of John G. Thompson, March 2003.
- **University of Toledo,** Colloquium, February 2003.
- **Wayne State University,** Colloquium, February 2003.
- **North Carolina State,** Algebra Seminar, February 2003.
- **University of South Alabama**, Colloquium, January 2003.
- **AMS-IMS-Siam Summer Research Conference**, Groups, Representations and Cohomology, June 2002.
- **University of Chicago** Group Theory Seminar, April 2002
- **University of Georgia**, Group cohomology and representation theory seminar, 2002
- **Depaul University,** Midwest algebra and representation theory conference, December 2001
- **University of Chicago,** Group theory seminar, February 2001