

DANIEL J. HERNÁNDEZ  
CURRICULUM VITAE

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Department of Mathematics  
University of Utah  
155 S 1400 E, Room 233  
Salt Lake City, Utah 84112

Office: JWB 118  
Phone: (801) 585-7658  
Email: [dhernan@math.utah.edu](mailto:dhernan@math.utah.edu)

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#### PROFESSIONAL PREPARATION

- 2013-present    **University of Utah:** NSF Postdoctoral Fellow
- Spring 2013    **MSRI:** Postdoctoral Fellow
- 2011 - 2013    **University of Minnesota:** Dunham Jackson Assistant Professor
- 2011            **University of Michigan:** Ph.D., Mathematics  
Dissertation:  $F$ -purity of hypersurfaces  
Advisor: [Professor Karen E. Smith](#)
- 2005            **Boston University:** B.S., Mathematics  
Summa Cum Laude/College Prize in Mathematics

#### FELLOWSHIPS & HONORS

- (1) NSF MSPRF, 2013-2016
- (2) Ford Foundation Postdoctoral Fellow, 2012-2013 academic year.
- (3) [Outstanding Graduate Student Instructor Award 2010](#) (University-wide competition)
- (4) NSF RTG Fellowships: Fall 2008, Winter/Summer 2009, Winter/Summer/Fall 2010.
- (5) Rackham Merit Fellow: Fall 2005 - Winter 2007

#### RESEARCH INTERESTS

Singularities and invariants in positive characteristic commutative algebra defined using the Frobenius morphism (i.e.,  $F$ -pure thresholds and test ideals) and their connection with singularities and invariants arising in birational geometry (i.e., log canonical thresholds and multiplier ideals).

#### RESEARCH ARTICLES

- (1) Log canonical thresholds,  $F$ -pure thresholds, and non-standard extensions (with [B. Bhatt](#), [L. Miller](#), and [M. Mustațǎ](#)); *Algebra & Number Theory*, Vol. 6 (2012), No. 7, 14591482.
- (2)  $F$ -pure thresholds of binomial hypersurfaces; to appear in *Proceedings of the AMS*.
- (3)  $F$ -purity of hypersurfaces; *Mathematical Research Letters*, 19(02):1-13, 2012.
- (4)  $F$ -purity versus log canonicity for polynomials.
- (5)  $F$ -invariants of diagonal hypersurfaces; to appear in *Proceedings of the AMS*.
- (6)  $F$ -pure thresholds of quasi-homogeneous polynomials (joint with Luis Núñez Betancourt, Emily E. Witt, and Wenliang Zhang).

#### PROFESSIONAL ACTIVITIES

Recent Talks:

- 11/2012:** Algebra and Number Theory Seminar, Penn State University  
**11/2012:** [Fifth Annual Mathematical Field of Dreams Conference](#), Arizona State University  
**5/2012:** [Computational Workshop on Frobenius singularities and invariants](#)  
(short lecture series), Ann Arbor, MI  
**3/2012:** AMS Special Session, Lawrence, KS  
**10/2011:** AMS Special Session, Salt Lake City, Utah  
**8/2011:** [AIM Workshop: Relating test ideals / multiplier ideals](#)

- 1/2011:** Joint Math Meetings, MRC (Commutative Algebra) Special Session
- 11/2010:** Algebraic Geometry Seminar, University of British Columbia
- 10/2010:** Commutative Algebra Seminar, University of Michigan
- 10/2010:** Route 81 Conference / AMS Special Session, Syracuse University
- 6/2010:** AMS Math. Research Communities (Commutative Algebra), Snowbird
- 6/2010:** AMS-SMM 8th International Meeting/AMS Session, Berkeley, CA

Organizer:

- (1) Organizer for upcoming AMS special session in Commutative Algebra, Albuquerque, New Mexico.
- (2) Local Organizer: Frobenius Splittings in Commutative Algebra and Algebraic Geometry, University of Michigan, May 2010
- (3) Local Organizer: Conference in Honor of Mel Hochster, University of Michigan, July 2008

Selected Conferences and Workshops:

- (1) Workshop on computing  $F$ -invariants, Ann Arbor, MI, May 2012
- (2) AIM Workshop: Relating test ideals / multiplier ideals, August 2011
- (3) D-modules and applications to Singularity Theory, Sevilla / Madrid, Spain, June 2001
- (4) AMS Math. Research Communities (Commutative Algebra), Snowbird, June 2010.
- (5) Classical Algebraic Geometry Today, MSRI, January 2009.
- (6) Poster, PASI Conference in honor of Wolmer Vasconcelos, Olinda, PE, Brazil, August 2009.

TEACHING

<b>Instructor</b> University of Utah	<a href="#">Math 2250, Diff. Equations &amp; Linear Algebra, Fall 2013</a>
<b>Coordinator/Instructor</b> University of Minnesota	<a href="#">Math 4281, Introduction to Modern Algebra, Spring 2012</a> <a href="#">Math 2243, Diff. Equations &amp; Linear Algebra, Fall 2011</a>
<b>Graduate Student Instructor</b> University of Michigan	<a href="#">Math 115, Calculus I, Fall 2006</a> <a href="#">Math 115, Calculus I, Fall 2007</a> <a href="#">Math 115, Calculus I, Spring 2011</a>
<b>Course Co-coordinator</b> University of Michigan	<a href="#">Math 105, Pre-calculus, Fall 2009</a>
<b>Course Assistant/Grader</b> University of Michigan	<a href="#">Math 632, Algebraic Geometry II</a>

OUTREACH PROGRAMS

The Professionals in Training (PTP) and M-STEM programs are summer programs at Michigan aimed at increasing the participation of underrepresented groups in the areas of science and engineering. The Michigan Math and Science Scholars (MMSS) program is a two-week summer program for high-school students interested in science and mathematics.

- (1) PTP Instructor: Differential Calculus, Summer 2007.
- (2) M-STEM Instructor: Differential Calculus, Summer 2008, 2009, 2010.
- (3) MMSS Instructor (with Mel Hochster and Emily Witt): Summer 2008, 2009, 2010.

WORK WITH UNDERGRADUATES

- (1) Bhargav Bhatt, Emily Witt and I supervised an REU project on  $F$ -pure thresholds during Summer 2011 for Joe Billian and Sifat Rahman, two undergraduates at Michigan.
- (2) Supervised reading course on Modern Algebra for Mikael Nelson, an undergraduate at the University of Minnesota during Summer 2012.
- (3) Supervising senior projects for Taka Inukai and Duksang Yoon, undergraduates at the University of Minnesota during Fall 2012.