

WAYNE STATE UNIVERSITY

Professional Record

Faculty

NAME: Daniel C. Isaksen

DATE PREPARED: October 2007

OFFICE ADDRESS:

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Department of Mathematics
Wayne State University
Detroit, MI 48202

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DEPARTMENT: Mathematics, College of Liberal Arts and Sciences

PRESENT RANK: Associate Professor, August 2007

WSU APPOINTMENT HISTORY:

Year Appointed/Rank: 2003/Assistant Professor
Year Awarded Tenure: 2007
Year Promoted to Associate Professor: 2007

CITIZEN OF: U.S.A.

EDUCATION:

BACCALAUREATE: University of California, Berkeley, B.A. in Mathematics, 1994, *with highest honors*

GRADUATE: University of Chicago, S.M. in Mathematics, 1995, Ph.D. in Mathematics, 1999

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FACULTY APPOINTMENTS AT OTHER INSTITUTIONS:

University of Notre Dame, McKenna Visiting Assistant Professor, 2000–2003

Universität Bielefeld, Wissenschaftlicher Mitarbeiter, 1999–2000

PROFESSIONAL SOCIETY MEMBERSHIPS:

American Mathematical Society
Mathematical Association of America
American Association of University Professors

HONORS/AWARDS:

Graves Memorial Teaching Award, University of Chicago, 1999
National Science Foundation Graduate Research Fellowship, 1994–1998
Phi Beta Kappa, University of California, Berkeley, 1994

I. Teaching

A. YEARS AT WAYNE STATE: 2003–current

B. YEARS AT OTHER COLLEGES/UNIVERSITIES:

University of Notre Dame, 2000–2003
Universität Bielefeld, 1999–2000
University of Chicago, 1995–1999

C. COURSES TAUGHT AT WAYNE STATE IN LAST FIVE YEARS:

1. UNDERGRADUATE:

MAT 2010, Calculus I, Fall 2007
MAT 2010, Calculus I, Fall 2007
MAT 5430, Algebra 2, Winter 2007
MAT 1000, Mathematics in Today's World, Winter 2006
MAT 2020, Calculus II, Winter 2006
MAT 2020 ESP, Calculus II, Fall 2005
MAT 2030, Calculus III, Fall 2005
MAT 5520, Introduction to Topology, Winter 2005

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MAT 2020, Calculus II, Fall 2004
MAT 2030, Calculus III, Fall 2004
MAT 2020, Calculus II, Winter 2004
MAT 2010, Calculus I, Fall 2003
MAT 2010, Calculus I, Fall 2003

2. GRADUATE

MAT 7470, Topics in Algebra, Winter 2007
MAT 7500, Topology II, Winter 2005

D. ESSAYS/THESES/DISSERTATIONS DIRECTED:

Sarah Bratek, undergraduate honors essay, Gray codes and *The Brain* puzzle, 2007–2008

Sarah Yeakel, undergraduate research project, Computing eigenvalues of certain elements in Cayley-Dickson algebras, 2006

Christopher Zin, undergraduate research project, Computing annihilators of certain elements in Cayley-Dickson algebras, 2005–2006

Armira Shkembi, graduate reading courses, Homotopy theory, category theory, and homological algebra, 2005–2007

Armira Shkembi and Matthew Buckman, undergraduate research project, Comparing values of the Hopf-Stiefel function and the Atiyah function, 2004

Arjun Sondhi, undergraduate research project, Computing values for the Hopf-Stiefel function, 2004

David Brown and Andrew Rupinski, undergraduate research project, Counting a certain type of multigraph with given Euler characteristic, 2003

Brian Ginsberg and Keith Harwood, undergraduate research project, Hamiltonian cycles in vertex-deleted Cayley digraphs, 2003

Vickie Barone, Matt Mauntel, and Micah Miller, *Hamiltonicity of the Cartesian product of two directed cycles minus a subgroup*, AKCE Int. J. Graphs Comb. **3** (2006) 39–43 (undergraduate research project, 2002)

Micah Miller, *Hyperhamiltonicity of the Cartesian product of two directed cycles*, Ars Combin. **79** (2006) 269–275 (undergraduate research project, 2002)

Daniel C. Isaksen, Christopher Jankowski, and Stephanie Proctor, *On K_* -homogeneous graphs*, Ars Combin. **82** (2007) 83–96 (undergraduate research project, 2002)

Greg Boughton, Katie Hylden, and Glenn Stryker, undergraduate research project, Hamiltonian cycles in Cayley digraphs, 2001

E. COURSE OR CURRICULUM DEVELOPMENT

Taught one of two pilot sections of MAT 1000 in Winter 2006 and participated in development of course concept and syllabus

F. COURSE MATERIALS (UNPUBLISHED):

Library of calculus problems for online quizzes using WebCT technology, University of Notre Dame, 2002–2003

II. Research

A. RESEARCH IN PROGRESS:

Computational stable motivic homotopy theory

B. FUNDED RESEARCH IN LAST FIVE YEARS:

Sums-of-squares formulas in characteristic p

Cellular motivic homotopy theory

Zero-divisors in Cayley-Dickson algebras

Pro-homotopy theory

C. FELLOWSHIPS/GRANTS/SPECIAL AWARDS IN LAST FIVE YEARS:

National Security Agency Conference Grant, Communicating Mathematics, 2006–2007, \$23,500 (with S. Adams)

National Science Foundation Research Grant, Applications of pro-homotopy theory to algebra, 2005–2008, \$95,214

National Security Agency Young Investigators Grant, Homotopical methods for quadratic forms, 2005–2007, \$30,000 (approved, but my acceptance of an NSF grant required me to decline this grant)

University Research Grant, 2004–2005, \$7,000

National Science Foundation Postdoctoral Research Fellowship, 2000–2003, \$90,000

National Science Foundation Research Experience for Undergraduates, 2002–2003, \$100,786 (with F. Connolly)

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III. Publications

C. EDITORSHIPS OF BOOKS/PROCEEDINGS:

Communicating Mathematics, Contemporary Mathematics series, American Mathematical Society, to appear (with T. Y. Chow)

D. JOURNAL ARTICLES PUBLISHED:

1. REFEREED JOURNALS:

- [1] *The Hopf condition for bilinear forms over arbitrary fields*, *Annals of Mathematics* **165** (2007), 943–964 (with D. Dugger)
- [2] *Model structures on pro-categories*, *Homology, Homotopy, and Applications* **9** (2007), 367–398 (with H. Fausk)
- [3] *t-model structures*, *Homology, Homotopy, and Applications* **9** (2007), 399–438 (with H. Fausk)
- [4] *On K_* -ultrahomogeneous graphs*, *Ars Combinatoria* **82** (2007), 83–96 (with C. Jankowski and S. Proctor)
- [5] *Flasque model structures for simplicial presheaves*, *K-Theory* **36** (2005), 371–395
- [6] *Motivic cell structures*, *Algebraic and Geometric Topology* **5** (2005), 615–652 (with D. Dugger)
- [7] *Algebraic K-theory and sums-of-squares formulas*, *Documenta Mathematica* **10** (2005), 357–366 (with D. Dugger)
- [8] *Completions of pro-spaces*, *Mathematische Zeitschrift* **250** (2005), 113–143
- [9] *Duality and pro-spectra*, *Algebraic and Geometric Topology* **4** (2004), 781–812 (with J. D. Christensen)
- [10] *Etale realization on the \mathbb{A}^1 -homotopy theory of schemes*, *Advances in Mathematics* **184** (2004), no. 1, 37–63
- [11] *Topological hypercovers and \mathbb{A}^1 -realizations*, *Mathematische Zeitschrift* **246** (2004), no. 4, 667–689 (with D. Dugger)
- [12] *Hypercovers and simplicial presheaves*, *Mathematical Proceedings of the Cambridge Philosophical Society* **136** (2004), no. 1, 9–51 (with D. Dugger and S. Hollander)
- [13] *Obstruction theory in model categories*, *Advances in Mathematics* **181** (2004), 396–416 (with J. D. Christensen and W. G. Dwyer)

- [14] *Calculating limits and colimits in pro-categories*, *Fundamenta Mathematicae* **175** (2002), 175–194
- [15] *A model structure on the category of pro-simplicial sets*, *Transactions of the American Mathematical Society* **353** (2001), 2805–2841
- [16] *Triangle-free polyconvex graphs*, *Ars Combinatoria* **64** (2002), 259–263 (with B. Robinson)
- [17] *Randomly planar graphs*, *Discrete Mathematics* **175** (1997), 265–269 (with D. P. Moulton)
- [18] *A cohomological viewpoint on elementary school arithmetic*, *American Mathematical Monthly* **109** (2002), 796–805
- [19] *Shortest shoelaces*, *Mathematics Magazine* **73**, no. 1, February 2000, 60–61
- [20] *How to kick a field goal*, *College Mathematics Journal* **27** (1996), 267–271
- [21] *Linear algebra on the gridiron*, *College Mathematics Journal* **26** (1995), 358–360

3. NONREFEREED JOURNALS:

- [22] *Student mentors in the Duluth mathematics REU*, *Council on Undergraduate Research Quarterly* **19**, no. 4, 163–167, June 2000 (with D. K. Biss)
- [23] *The Tanglewood of mathematics*, *Math Horizons*, September 1997

E. PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS:

1. REFEREED PAPERS:

- [24] *Strict model structures for pro-categories*, in *Algebraic Topology: Categorical Decomposition Techniques* (Skye, 2001), *Progress in Mathematics*, Vol. 215, Birkhauser, 2003, 179–198
- [25] *Weak equivalences of simplicial presheaves*, in *Homotopy Theory: Relations with Algebraic Geometry, Group Cohomology, and Algebraic K-Theory*, 97–113, *Contemporary Mathematics* **346**, American Mathematical Society, 2004 (with D. Dugger)
- [26] *Mobius knitting*, *Bridges: Mathematical Connections in Art, Music, and Science*, ed. R. Sarhangi, 1999, 67–76 (with A. P. Petrofsky)

2. NONREFEREED PAPERS

- [27] *Graduate students as mentors in mathematics REUs*, in Proceedings of the Conference on Promoting Undergraduate Research in Mathematics (Rosemont, Illinois, 2006), ed. J. A. Gallian, American Mathematical Society, 2007, 285–287 (with S. G. Hartke and P. M. Wood)
- [28] *Assessment methods for undergraduate research programs*, in Proceedings of the Conference on Promoting Undergraduate Research in Mathematics (Rosemont, Illinois, 2006), ed. J. A. Gallian, American Mathematical Society, 2007, 307–310

L. PAPERS PRESENTED:

1. INVITED AND/OR REFEREED INTERNATIONALLY OR NATIONALLY:

Promoting Undergraduate Research in Mathematics, Rosemont, IL, 2006

Algebraic K -Theory Workshop, University at Buffalo, 2005

Special Session on Algebraic K -Theory, American Mathematical Society Sectional Meeting, Lincoln, NE, 2005

Special Session on Algebraic Topology, American Mathematical Society Sectional Meeting, Eugene, OR, 2005

Special Session on Research in Graph Theory by Undergraduates, Mathematical Association of America Mathfest, Albuquerque, 2005

Special Session on Mathematics in Fiber Arts, Joint Meetings of the American Mathematical Society and the Mathematical Association of America, Atlanta, 2005

Special Session on Homotopy Theory, American Mathematical Society Sectional Meeting, Boulder, CO, 2003

Special Session on Homotopy Theory, Joint Meetings of the American Mathematical Society and the Mathematical Association of America, Baltimore, 2003

International Conference on Algebraic Topology, Northwestern University, 2002

SFB Farewell Conference, Universität Bielefeld, Germany, 2000

Transpennine Topology Triangle, University of Leicester, UK, 2000

2. INVITED AND/OR REFEREED LOCALLY/REGIONALLY:

Michigan Mathematics REU Conference, Grand Valley State University, 2007

Annual Meeting, Michigan Section of the Mathematical Association of America, University of Michigan–Dearborn, 2007

Special Session on Homotopy Theory, American Mathematical Society Sectional Meeting, Evanston, IL, 2004

Special Session on Homotopy Theory, American Mathematical Society Sectional Meeting, Bloomington, IN, 2003

Midwest Topology Seminar, Western Michigan University, 2002

3. INVITED SEMINARS OR LECTURES PRESENTED IN LAST FIVE YEARS:

Topology Seminar, Stanford University, 2007

Topology Seminar, University of Michigan, 2007

Topology Seminar, Wayne State University, 2007

Topology Seminar, Massachusetts Institute of Technology, 2006

Geometry-Algebra-Singularities-Combinatorics Seminar, Northeastern Univ., 2006

Topology Seminar, Wayne State University, 2006

Department of Mathematics Colloquium, Wayne State University, 2005

Homotopy Theory Seminar, Universität Bielefeld, Germany, 2005

Topology Seminar, University of Chicago, 2005

Undergraduate Colloquium, Calvin College, 2005

Undergraduate Colloquium, Albion College, 2005

Topology Seminar, University of Oslo, Norway, 2004

Department of Mathematics Colloquium, University of Western Ontario, 2004

Topology Seminar, Wayne State University, 2004

Motivic Cohomology Seminar, University of Western Ontario, 2004

Topology Seminar, Stanford University, 2004

Department of Mathematics Colloquium, University of Oregon, 2003

Topology Seminar, Wayne State University, 2003

Department of Mathematics Colloquium, San Francisco State University, 2003

Topology Seminar, Wayne State University, 2003

Department of Mathematics Colloquium, Northeastern Illinois University, 2003

Department of Mathematics Colloquium, Queens College (New York), 2003

Department of Mathematics Colloquium, Wayne State University, 2003

4. OTHER SCHOLARLY WORK:

CONFERENCE ORGANIZATION

Communicating Mathematics, Duluth, Minnesota, 2007

Midwest Topology Seminar, Detroit, Michigan, 2007

MEETINGS ATTENDED IN THE LAST FIVE YEARS:

Communicating Mathematics, University of Minnesota–Duluth, 2007

Michigan Mathematics REU Conference, Grand Valley State University, 2007

Michigan Section of the Math. Assoc. of America, Univ. of Michigan–Dearborn, 2007

Midwest Topology Seminar, Wayne State University, 2007

Complex cobordism in homotopy theory, Johns Hopkins University, 2007

Midwest Topology Seminar, University of Illinois at Chicago, 2007

Joint Meetings of the American Math. Soc. and the Math. Assoc. of America, New Orleans, 2007

Promoting Undergraduate Research in Mathematics, Rosemont, IL, 2006

Masterclass on Derived Algebraic Geometry, Oslo, Norway, 2006

Category Theory and Its Applications, University of Chicago, 2006

American Mathematical Society Sectional Meeting, Lincoln, NE, 2005

Algebraic K -Theory Workshop, University at Buffalo, 2005

American Mathematical Society Sectional Meeting, Eugene, OR, 2005

Mathematical Association of America Mathfest, Albuquerque, NM, 2005

Midwest Topology Seminar, Calvin College, 2005

Joint Meetings of the American Math. Soc. and the Math. Assoc. of America, Atlanta, 2005

American Mathematical Society Sectional Meeting, Evanston, IL, 2004

Midwest Topology Seminar, Purdue University, 2004

Great Lakes K -Theory Conference, University of Illinois, 2004

Theory of motives, homotopy theory of varieties, and dessins d'enfants, American Institute of Mathematics Workshop, Palo Alto, CA, 2004

Joint Meetings of the American Math. Soc. and the Math. Assoc. of America, Phoenix, 2004

American Mathematical Society Sectional Meeting, Boulder, CO, 2003

Joint Meetings of the American Math. Soc. and the Math. Assoc. of America, Baltimore, 2003

American Mathematical Society Sectional Meeting, Bloomington, IN, 2003

REFEREEING

Advances in Mathematics
Documenta Mathematica
Forum Mathematicum
Fundamenta Mathematicae
Journal of Pure and Applied Algebra
Mathematische Zeitschrift
Topology and Its Applications

IV. Service

C. COMMITTEE ASSIGNMENTS IN LAST FIVE YEARS

4. COLLEGE/DEPARTMENT COMMITTEE MEMBERSHIP

Undergraduate Committee, Department of Mathematics, 2004–2007
Salary Committee, Department of Mathematics, 2005–2007
Topology Seminar Coordinator, Department of Mathematics, 2004–2005, 2007

E. MEMBERSHIPS/OFFICES HELD IN PUBLIC OR PRIVATE AGENCIES RELATED TO DISCIPLINE IN LAST FIVE YEARS

Member, American Mathematical Society
Member, Mathematical Association of America

H. OTHER PROFESSIONALLY RELATED SERVICE

Lecturer, High School Mathematics Day, Wayne State University, 2006
Grader, Michigan Mathematics Prize Competition, 2004, 2006–2007

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