

# WILLIAM J. TURNER

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## EDUCATION

Ph.D., North Carolina State University, Computational Mathematics, 2002

Advisor: Erich Kaltofen

Dissertation: *Black Box Linear Algebra with the LinBox Library*

M.S., Iowa State University, Applied Mathematics, 1996

Advisor: Ralph Smith

Project: *Time Discretization of Structural Problems*

B.S., Iowa State University, Mathematics and Physics, 1994

Awarded with honors and distinction

Honors Project: *Detection of Heavy Ion Recoils Following Pair Production*

## PROFESSIONAL POSITIONS

### Permanent Positions

Associate Professor of Mathematics & Computer Science, Wabash College, 2008 –

Assistant Professor of Mathematics & Computer Science, Wabash College, 2004 – 2008

Byron K. Trippet Assistant Professor of Mathematics & Computer Science, Wabash College, 2002 – 2004

Teaching & Research Assistant, Department of Mathematics, North Carolina State University, 1996 – 2002

Teaching Assistant, Department of Mathematics Iowa State University, 1994 – 1996

Undergraduate Research Assistant, Department of Physics & Astronomy Iowa State University, 1991 – 1994

### Temporary Positions

Programmer on the Maple e-Grading Project, North Carolina State University, Summer 2001

Graduate Student Intern, Boeing, Seattle, Washington, Summer 1998

Graduate Student Summer Intern, Wright-Patterson AFB, Ohio, Summer 1995

## HONORS AND AWARDS

Tenure, Wabash College (Dec 2007)

Exxon-Mobil Project NExT Fellow (2003 – 2004)

Project NExT-IN Fellow (2002 – 2003)

Lowell S. Winton and Nicholas J. Rose Research Scholarship (2002)

Outstanding Teaching Assistant (2000)

Aggie Ho Outstanding Teaching Award (1996)

Bachelor of Science with honors and distinction (1994)

Mortar Board National Honor Society (1993)

Phi Kappa Phi National Honor Society (1992)  
 Golden Key National Honor Society (1992)  
 Pi Mu Epsilon National Mathematics Honorary (1992)  
 Iowa State University Academic Recognition Scholarship (1992)  
 National Merit Scholarship (1992)  
 David Collins Freshman Physics Scholarship (1991)

## PUBLICATIONS

- [10] William J. Turner (2007). Determinantal Divisors and Matrix Preconditioners. Submitted to *Journal of Symbolic Computation*.
- [9] Mike Axtell, J.D. Phillips, and William Turner (2007). Wabash Summer Institute in Algebra (WSIA). In Joseph A. Gallian, editor, *Proceedings of the Conference on Promoting Undergraduate Research in Mathematics*, pages 183–188. American Mathematical Society, Providence, Rhode Island. ISBN 978-0-8218-4321-5.  
 URL <http://www.ams.org/employment/REUproceedings.html>
- [8] M. Axtell and W. Turner (2007). Examining the Effectiveness of Reading Questions in Introductory College Mathematics Courses. In Joelle Fanghanel and Digby Warren, editors, *International Conference on the Scholarship of Teaching and Learning (2005 and 2006)*, pages 205–210. CEAP, City University, London. ISBN 978-0-9543742-3-5.
- [7] William J. Turner (2006). A Block Wiedemann Rank Algorithm. In Jean-Guillaume Dumas, editor, *ISSAC 2006: Proceedings of the 2006 International Symposium on Symbolic and Algebraic Computation*, pages 332–339. ACM Press, New York, New York.  
 URL <http://doi.acm.org/10.1145/1145768.1145822>
- [6] William J. Turner (2005). Preconditioners for Singular Black Box Matrices. In Manuel Kauers, editor, *ISSAC 2005: Proceedings of the 2005 International Symposium on Symbolic and Algebraic Computation*, pages 332–339. ACM Press, New York, New York.  
 URL <http://doi.acm.org/10.1145/1073884.1073930>
- [5] J.-G. Dumas, T. Gautier, M. Giesbrecht, P. Giorgi, B. Hovinen, E. Kaltofen, B. D. Saunders, W. J. Turner, and G. Villard (2002). LinBox: A Generic Library for Exact Linear Algebra. In Arjeh M. Cohen, Xiao-Shan Gao, and Nobuki Takayama, editors, *Proceedings of the International Congress of Mathematical Software (ICMS), Beijing*. World Scientific, Singapore.  
 URL <http://persweb.wabash.edu/facstaff/turnerw/Publications/linbox-2002.pdf>
- [4] William J. Turner (2002). *Black Box Linear Algebra with the LinBox Library*. Ph.D. thesis, North Carolina State University, Raleigh, North Carolina.  
 URL <http://www.lib.ncsu.edu/theses/available/etd-06122002-095342/unrestricted/etd.pdf>
- [3] Li Chen, Wayne Eberly, Erich Kaltofen, B. David Saunders, William J. Turner, and Gilles Villard (2002). Efficient Matrix Preconditioners for Black Box Linear Algebra. *Linear Algebra and its Applications*, 343-344:119–146. Special issue on *Infinite Systems of Linear Equations Finitely Specified*.  
 URL <http://persweb.wabash.edu/facstaff/turnerw/Publications/cekstv-laa-2002.pdf>
- [2] Shangzou Gao, M. A. Jeffris, Min Liang, D. F. Pilkey, W. J. Turner, Yun Wang, and B. G. Fitzpatrick (1997). Wavelet Analysis of Vibration in Nondestructive Evaluation. In F. Reitich, J. S. Scroggs, and H. T. Tran, editors, *1996 Industrial Mathematics Modeling Workshop for Graduate Students*, pages 78–85. Tech. Rep. CRSC-TR97-8, Center for Research in Scientific Computation.  
 URL <http://www.ncsu.edu/crsc/reports/ftp/crsc-tr97-8.ps.gz>
- [1] William J Turner (1996). Time Discretization of Structural Problems. Master’s project, Iowa State University, Ames, Iowa.  
 URL <http://persweb.wabash.edu/facstaff/turnerw/Publications/ms-1996.pdf>

**PRESENTATIONS**

- [15] William J. Turner (6 February 2007). Linear Algebra on a Computer: An Introduction to Black Box Methods. Department Colloquium, Department of Mathematics & Computer Science, Wabash College. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/colloquium-2007-handout.pdf>
- [14] William Turner (18 August 2006). WSIA : Wabash Summer Institute in Algebra. Contributed Talk, 2006 Ides of August, Wabash College. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/ides-2006.pdf>
- [13] William J. Turner (11 July 2006). A Block Wiedemann Rank Algorithm. Contributed Talk, 2006 International Symposium on Symbolic and Algebraic Computation. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/issac-2006.pdf>
- [12] Mike Axtell and William Turner (18 May 2006). Examining the Effectiveness of Reading Questions in Introductory University Mathematics Courses. Contributed Talk, London SoTL 6th Annual International Conference. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/sotl-2006.pdf>
- [11] William J. Turner (27 July 2005). Preconditioners for Singular Black Box Matrices. Contributed Talk, 2005 International Symposium on Symbolic and Algebraic Computation. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/issac-2005.pdf>
- [10] William J. Turner (19 October 2004). Can You Hear Me Know? An Introduction to Coding Theory. Department Colloquium, Department of Mathematics & Computer Science, Wabash College. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/colloquium-2004-handout.pdf>
- [9] William J. Turner (12 March 2004). Black Box Linear Algebra: An Introduction to Wiedemann's Approach. Department Seminar, Center For Computing Sciences, Bowie, Maryland. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/ccs-2004.pdf>
- [8] William J. Turner (12 November 2003). Black Box Linear Algebra: An Introduction to Wiedemann's Approach. Department Seminar, Department of Mathematics, Rose-Hulman Institute of Technolog. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/rhit-2003.pdf>
- [7] Jean-Guillaume-Dumas, William J. Turner, and Zhendong Wan (18 May 2002). Exact Solution to Large Sparse Integer Linear System. Poster Presentation, East Coast Computer Algebra Day (ECCAD), LaGuardia Community College of The City University of New York.
- [6] William J. Turner (6 March 2002). Black Box Linear Algebra. Graduate Algebra Seminar, Department of Mathematics, North Carolina State University. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/gras-2002.pdf>
- [5] William J. Turner (21 Septebmer 2001). Black Box Linear Algebra with the LinBox Library. Graduate Algebra Seminar, Department of Mathematics, North Carolina State University. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/gras-2001.pdf>
- [4] William J. Turner (23 – 25 July 2001). Efficient Matrix Preconditioners for Black Box Linear Algebra. Poster Presentation, International Symposium on Symbolic and Algebraic Computation (ISSAC), London, Ontario, Canada. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/issac-2001.pdf>
- [3] William J. Turner (5 May 2001). A Randomized Baby Steps/Giant Steps Implementation of Wiedemann's Determinant Algorithm. Poster Presentation, East Coast Computer Algebra Day (ECCAD), Florida State University. URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/eccad-2001.pdf>

- [2] William J. Turner (23 June 2000). The Generic Field and Black Box Matrix Models in the LinBox Library. Presentation at LinBox Meeting, Institut d'Informatique et de Mathématiques Appliquées de Grenoble (IMAG), France.  
URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/grenoble-2000.pdf>
- [1] William J. Turner (13 May 2000). The Generic Field and Black Box Matrix Models in the LinBox Library. Poster Presentation, East Coast Computer Algebra Day (ECCAD), University of Western Ontario.  
URL <http://persweb.wabash.edu/facstaff/turnerw/Presentations/eccad-2000.pdf>

## GRANTS

NSF DMS-0453387 : REU Site: Wabash Summer Institute of Algebra

## SERVICE

### Service to Profession

#### *Professional Societies*

ACM SIGCSE Information co-Director (2007 – )  
ACM SIGSAM Advisory Board (2005 – )  
Project NExT-Indiana Co-Organizer (2004 – 2005)  
ACM SIGSAM Information Director (2003 – )

#### *External Reviewer/Referee*

2008 SIGCSE Symposium  
2007 International Symposium on Symbolic and Algebraic Computation  
*Journal of Online Mathematics and its Applications*  
ITiCSE 2007  
*Journal of Symbolic Computation*  
*Transactions on Mathematical Software*  
2007 SIGCSE Symposium  
ITiCSE 2006  
*American Journal of Undergraduate Research*  
2006 SIGCSE Symposium  
ITiCSE 2005  
2005 SIGCSE Symposium  
2004 Midstates Conference for Undergraduate Research in Computer Science and Mathematics  
2004 Consortium for Computing Sciences in Colleges: Eastern Conference  
2004 International Symposium on Symbolic and Algebraic Computation  
2004 SIGCSE Symposium  
John Wiley & Sons, Inc., Publishers  
2003 Consortium for Computing Sciences in Colleges: Midwest Conference  
*College Mathematics Journal* “Classroom Capsule”  
*American Journal of Undergraduate Research*  
2002 Consortium for Computing Sciences in Colleges: Midwest Conference  
*Journal of Symbolic Computation*  
2001 International Symposium on Symbolic and Algebraic Computation  
2000 International Symposium on Symbolic and Algebraic Computation

***Conference Organizing Committee***

Poster Committee Member, 2005 International Symposium on Symbolic and Algebraic Computation  
 Web Chair, 2003 International Symposium on Symbolic and Algebraic Computation  
 Web Co-chair, 2001 International Symposium on Symbolic and Algebraic Computation  
 Automated poster submission system, 1999 East Coast Computer Algebra Day

***Other***

Session Chair, 2006 International Symposium on Symbolic and Algebraic Computation  
 National Study of Liberal Arts Education, Institutional Context Study  
     Center of Inquiry in the Liberal Arts, Wabash College  
 Judge, 2004 Joint Mathematics Meetings Undergraduate Student Poster Session

**Service to Institution**

Graduate Fellowships Committee (2007 – )  
 Outside Faculty Member, Visiting Philosophy Search (2007)  
 Teaching and Learning Committee (2006 – ) : Chair (2007 – )  
 Outside Faculty Member, Visiting Religion Search (2006)  
 Norman E. Treves Science Award Committee (2005 – )  
 Academic Policy Committee (2005 – 2006)  
 Curriculum Appeals Committee (2005)  
 Faculty Admissions Committee (2004 – 2006)  
 Technology Advisory Committee (2004 – 2007) : Chair (2005 – 2007)  
 Cultures & Traditions, European Revolution Module Subcommittee (2004)  
 Cultures & Traditions, Greek Module Revision Subcommittee (2004)  
 Outside Faculty Member, Tenure-Track German Search (2004)  
 Division I Speakers Committee (2003 – 2004)  
 Freshman Advisor (2003, 2005)  
 International Merit Scholarship Committee (2003 – 2004)  
 Faculty Advisor, Delta Omicron Chapter, Alpha Phi Omega (2002 – ) : Advisory Board Chair (2004, 2007)  
 Science and Math Facilities Committee (2002 – 2004)

**Service to Department**

J. Crawford Polley Prize Coordinator (2006 – )  
 Written Comprehensive Examinations (2006 – )  
 George E. Carscallen Prize Coordinator (2005 – )  
 Technical Report Series (2004 – )  
 Assessment (2003 – )  
 Calculus Course Coordinator (2003 – 2005)  
 Listserv Administrator (2003 – )  
 Web Pages (2003 – )  
 Mathematics Competitions (2002 – 2004)

**PROFESSIONAL SOCIETIES**

American Mathematical Society (AMS)  
 Association for Computing Machinery (ACM)  
 ACM Special Interest Group on Computer Science Education (ACM SIGCSE)

ACM Special Interest Group on Symbolic and Algebraic Manipulation (ACM SIGSAM)  
Mathematical Association of America (MAA)

## UNDERGRADUATE RESEARCH STUDENTS

Devin Chalmers, Wabash College '07 (Summer 2004)  
Damie Green, University of Texas of the Permian Basin '08 (WSIA 2007)  
Feng Mai, Wabash College '08 (WSIA 2006)  
Alan Patton, Wabash College '04 (Summer 2003)  
Matthew A. Reyna, Case Western Reserve University '07 (WSIA 2006)  
Zachary J. Roth, Hastings College '07 (WSIA 2006)  
Amanda J Watkins, University of Evansville '08 (WSIA 2006)  
Austin Somers, Wabash College '07 (Summer 2004)

## COURSES TAUGHT

### Wabash College

C&T 201: *Cultures & Traditions I* — Fall 2003, Fall 2006

CSC 101: *Introduction to Computer Science* — Fall 2005, Fall 2006, Fall 2007

CSC 111: *Introduction to Computer Science* — Fall 2002 (co-taught)

CSC 112: *Advanced Programming* — Fall 2003, Fall 2004

CSC 211: *Introduction to Data Structures* — Spring 2003, Spring 2004

CSC 341: *Theory of Computing* — Spring 2007

FRT: *Freshman Tutorial* — Fall 2005 (*Man and Machine*)

MAT 106: *Topics in Contemporary Mathematics* — Spring 2005, Spring 2006, Spring 2007

MAT 111: *Calculus I* — Fall 2002, Spring 2003, Fall 2003, Fall 2004

MAT 112: *Calculus II* — Spring 2004

MAT 219: *Combinatorics* — Spring 2006

MAT 222: *Theory of Numbers* — Fall 2005, Fall 2006, Fall 2007

MAT 223: *Elementary Linear Algebra* — Fall 2002, Spring 2006, Fall 2007

MAT 226: *Operations Research* — Spring 2003, Spring 2005, Spring 2007

MAT 314: *Modeling with Differential Equations* — Fall 2004

MAT 319: *Combinatorics* — Spring 2004

MAT 331: *Abstract Algebra I* — Spring 2005

### North Carolina State University

MA 111: *Precalculus Algebra and Trigonometry* — Fall 1996 (Teaching assistant)

MA 141: *Analytic Geometry and Calculus I* — Fall 1997, Fall 1998, Spring 1999, and Fall 1999

MA 305: *Elementary Linear Algebra* — Spring 2000 (Internet course; teaching assistant)

### Iowa State University

Math 141/2: *Trigonometry and Analytic Geometry* — Fall 1994

Math 160: *Calculus for Economics and Biology Majors* — Spring 1995, Fall 1995, and Spring 1996

## CONFERENCES ATTENDED

2007 International Symposium on Symbolic and Algebraic Computation (ISSAC)  
2006 International Symposium on Symbolic and Algebraic Computation (ISSAC)  
London SoTL 6th Annual International Conference  
2005 International Symposium on Symbolic and Algebraic Computation (ISSAC)  
2005 SIGCSE Technical Symposium  
2004 MAA MathFest  
2004 Project NExT Workshop  
2004 SIGCSE Technical Symposium  
2004 Joint Mathematical Meetings  
2003 International Symposium on Symbolic and Algebraic Computation (ISSAC)  
2003 MAA MathFest  
2003 Project NExT Workshop  
2003 MAA Indiana Section Spring Meeting  
2003 SIGCSE Technical Symposium  
2002 MAA Indiana Section Fall Meeting  
2002 Project NExT Indiana Section Workshop  
2002 Joint Mathematical Meetings  
2001 International Symposium on Symbolic and Algebraic Computation (ISSAC)  
2001 Internet Accessible Mathematical Computation Workshop (IAMC)  
2001 ISSAC Tutorial: Symbolic Linear Algebra: Design, Analysis and Implementation  
2001 East Coast Computer Algebra Day (ECCAD)  
2000 East Coast Computer Algebra Day (ECCAD)  
2000 Southern Ontario Numerical Analysis Day (SONAD)  
1999 International Symposium on Symbolic and Algebraic Computation (ISSAC)  
1999 East Coast Computer Algebra Day (ECCAD)