

CURRICULUM VITAE

TYLER J. JARVIS

Education.

Ph.D: 1994. Princeton University, mathematics.

M.A: 1992. Princeton University, mathematics.

M.S: 1990. Brigham Young University, mathematics.

B.S: 1989. Brigham Young University, mathematics, summa cum laude.

Academic Experience.

2006–present: Professor, Brigham Young University.

2010: Visiting Researcher, Max Planck Institut für Mathematik, Bonn, Germany.

2007: Visiting Researcher, Mittag-Leffler Institute, Djursholm, Sweden.

2001–2006: Associate Professor, Brigham Young University.

2001–2002: Visiting Faculty, Boston University.

1996–2001: Assistant Professor, Brigham Young University.

1994–1996: Assistant Professor, Mississippi State University.

Administrative Experience.

2006–present: Chair, Brigham Young University, Department of Mathematics.

Led a transformation of the department into one of the leading undergraduate mathematics programs in the US:

- We increased the number of undergraduate students involved in mentored research by 160% and mentor more students than any mathematics department in the country (78 students in 2009). The number of student research presentations at venues outside of the department has increased four-fold.
- We improved teaching quality in our courses (including about 8,500 service enrollments per year), as evidenced by improved student ratings.
- Faculty received three national-level teaching awards from the Mathematical Association of America (the largest professional organization in the US for college mathematics teaching, with roughly 25,000 members).
- We increased the number of mathematics majors by 26%.
- We are now ranked #7 in the US for number of undergraduates who successfully complete a doctorate in mathematical sciences.
- We significantly increased faculty scholarly productivity (the number of peer-reviewed published pages per faculty member increased from 17 to 29 per year).
- We increased external funding by more than four times.
- We improved supervision and coordination of Continuing Education offerings in mathematics (Independent Study, Salt Lake Center, and Evening School) in order to ensure uniformly high standards and quality in all classes.
- We implemented several cost-saving measures and developed new sources of funding to balance a budget that was previously in deficit, while at the same time increasing services and offerings. Despite recent budget cuts, we have been able to maintain and even increase these services and offerings.
- We established permanent funding for the Math Lab (tutoring center), which handles about 18,000 student visits per month.
- We generated \$500,000 in funding for scholarships.

1996–2007: Member, Board of Directors, Meyer and Liechty Corp.

Provided guidance on business strategy, financial matters, and personnel issues.

2005–2006: Chair, Rock Canyon School Community Council (elected office).

Led the council in identifying the school's most critical needs and writing an academic plan to use school trustland funds to address those needs. Advised and made recommendations to school and district administrators and the local school board regarding the school and its programs and other issues relating to the community environment for students.

1999–2001, 2002–2006: Director of Graduate Studies, Brigham Young University, Department of Mathematics.

Established TA training programs, raised standards in graduate programs, improved advising and recruiting.

Service Contributions.

2010–present: Brigham Young University, Department Chair Coordinating Committee.

2009–present: Producer of the film *We Use Math* and the website *WhenWillIUseMath.com*.

The film and website are the first part of our national campaign (partly supported by the Mathematical Association of America) to inform high school and college students, their parents, and career counselors about the importance of learning mathematics and the many career opportunities available in mathematics.

2009–present: Brigham Young University, Student Ratings Task Force.

We are developing a new instrument for evaluating teaching at BYU.

2008–present: Mathematical Association of America, Committee on the Profession.

Develop guidelines for undergraduate programs and departments in the mathematical sciences, including guidelines about faculty, staffing, curriculum, teaching, resources, and students.

2008–2009: Utah State Office of Education, Mathematics Steering Committee.

Provided recommendations to the Utah State Board of Education and State Office of Education about how to help K–12 students receive the mathematical training they need to be successful in an increasingly technological world.

2006: Co-founder of the BYU Center for Undergraduate Research in Mathematics (CURM).

CURM is funded by a \$1.2M-grant from the National Science Foundation to teach mathematics faculty across the country how to mentor undergraduates successfully.

2004–2006: Rock Canyon School, Community Council member (elected office).

Reviewed test scores and other indicators and consulted with the Principal and teachers to identify and address the school's most pressing needs.

2000: Co-founder and Director of the BYU Math Camp.

The BYU Math Camp was the precursor of the current, National-Science-Foundation-sponsored Mathematics Research Experience for Undergraduates (REU) at BYU.

1985–1987: LDS Mission to Frankfurt, Germany.

Lifelong: Active member of the LDS church. Served in many callings including Stake Executive Secretary, Stake Clerk, Ward Mission Leader, Elders Quorum President, Ward Executive Secretary, Ward Clerk, Scoutmaster, Sunday School President, Primary Teacher, Priests Quorum Advisor, and Gospel Doctrine Teacher.

Awards and Recognitions.

2006: Award for Distinguished Teaching of Mathematics. Mathematical Association of America, Intermountain Section.

2006: College Recognition Award for Outstanding Teaching. College of Physical and Mathematical Sciences, Brigham Young University.

1995–1998: National Science Foundation, CAREER Award.

The CAREER award is the National Science Foundation's most prestigious award in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research.

1990–1993: National Defense Science and Engineering Graduate Fellow.

1989: Orson Pratt Prize in Mathematics, Brigham Young University.

1984–1989: Spencer W. Kimball Scholar, Brigham Young University.

Grants Received.

2010–2011: Principal Investigator, National Security Agency Grant H98230-10-1-0181: "Group actions, orbicurves, and topological field theory."

2006–2009: Principal Investigator, National Science Foundation Grant DMS-0605155: "Stringy invariants, orbicurves, and topological field theory."

2006–2010: Co-Principal Investigator, National Science Foundation Grant DMS-0636648: "Center for Undergraduate Research in Mathematics."

2001–2005: Principal Investigator, National Science Foundation Grant DMS-0105788: "Higher Spin Curves and Cohomological Field Theories."

1998–2000: Principal Investigator, National Security Agency grant MDA904-99-1-0039: "Moduli of Higher Spin Curves."

1995–1998: Principal Investigator, National Science Foundation, Faculty Early Career Development (CAREER) Award DMS-9501617: "Moduli of Generalized Spin Curves; Class Size and Calculus Learning."

Articles and Publications.

Peer-Reviewed Mathematical Publications.

- (1) Edidin, D., Jarvis, T. J., & Kimura, T. (2010) Logarithmic trace and orbifold products. *Duke Mathematical Journal*. **153**(3), 427–473.
- (2) Fan, H. J., Jarvis, T. J., & Ruan, Y. (2008). Geometry and Analysis of Spin Equations. *Communications on Pure and Applied Mathematics*. **61**(6), 745–788.
- (3) Jarvis, T. J., Kaufmann, R., & Kimura, T. (2007). Stringy K-theory and the Chern Character. *Inventiones Mathematicae*. **168**(1), 23–81.
- (4) Jarvis, T. J., Lang, W. E., Petrosyan, N., Rimmasch, G., Rogers, J., & Summers, E. D. (2005). Classification of Singular Fibres on Rational Elliptic Surfaces in Characteristic Three. *Communications in Algebra*, **33**, 4533–4566.
- (5) Jarvis, T. J., Kimura, T. & Vaintrob, A. (2005). The Moduli Space of Stable r -Spin Maps and Quantum Cohomology. *Communications in Mathematical Physics*. **259**(3), 511–543.
- (6) Jarvis, T. J., Kaufmann, R., & Kimura, T. (2005). Pointed admissible G -covers and G -equivariant cohomological field theories. *Compositio Mathematica*, **141**, 926–978.
- (7) Jarvis, T. J. & Tanton, J. (2004). The hairy ball theorem via Sperner's lemma. *American Mathematical Monthly*, **111**(7), 599–603.
- (8) Abramovich, D. & Jarvis, T. J. (2003). Moduli of Twisted Spin Curves. *Proceedings of the American Mathematical Society*, **131**(3), 685–699.
- (9) Jarvis, T. J. & Kimura, T. (2002). Orbifold quantum cohomology of the classifying space of a finite group. In A. Adem, J. Morava, & Y. Ruan (Eds.). *Orbifolds in mathematics and physics (Madison, WI, 2001)*, Contemporary Mathematics, **310**, 123–134. Providence, R.I: American Mathematical Society.
- (10) Jarvis, T. J., Kimura, T. & Vaintrob, A. (2001). Gravitational Descendants and the Moduli Space of Higher Spin Curves. In E. Previato (Ed.), *Advances in Algebraic Geometry Motivated by Physics*. Contemporary Mathematics **276**, 167–177. Providence, R.I: American Mathematical Society.

- (11) Jarvis, T. J. (2001). Picard Group of the Moduli of Higher Spin Curves. *New York Journal of Mathematics*, **7**, 23–47.
- (12) Jarvis, T. J., Kimura, T. & Vaintrob, A. (2001). Moduli spaces of higher spin curves and integrable hierarchies. *Compositio Mathematica*, **126**(2), 157–212.
- (13) Jarvis, T. J., Kimura, T. & Vaintrob, A. (2000). Tensor products of Frobenius manifolds and moduli spaces of higher spin curves. In G. Dito & D. Sternheimer (Eds.), *Conférence de Moshé Flato 1999*, vol. 2, (145–166). Dordrecht, Netherlands: Kluwer Academic Publishers.
- (14) Jarvis, T. J. (2000). Geometry of the moduli of higher spin curves. *International Journal of Mathematics*, **11**(5), 637–663.
- (15) Jarvis, T. J. (2000). Compactification of the universal Picard over the moduli of stable curves. *Mathematische Zeitschrift*, **235**, 123–149.
- (16) Jarvis, T. J. (1998). Torsion-free sheaves and moduli of generalized spin curves. *Compositio Mathematica*, **110**(3), 291–333.
- (17) Barrett, W. W. & Jarvis, T. J. (1992). Spectral properties of a matrix of Redheffer. *Linear Algebra and Its Applications*, **162–164**, 673–683.
- (18) Cox, P. A., Cromar, S. & Jarvis, T. J. (1992). Underwater pollination, three-dimensional search, and pollen morphology: predictions from a supercomputer analysis. In S. Blackmore & S. H. Barnes (Eds.), *Pollen and Spores: Patterns of Diversification*, 363–375. Oxford University Press.
- (19) Cox, P. A., Cromar, S. & Jarvis, T. J. (1991). Underwater pollination and three-dimensional search: A super computer approach. In K.R. Billingsly, H.U. Brown III, & E.S. Derohanes (Eds.), *Computer Assisted Analysis and Modeling on the IBM 3090*, Vol. 2. 569–582. MIT Press.
- (20) Jarvis, T. J. (1990). A dominant negative eigenvalue of a matrix of Redheffer. *Linear Algebra and Its Applications*, **142**, 141–152.

Other Mathematical Publications.

- (21) Jarvis, T. J., Kimura, T. & Vaintrob, A. (Eds.). (2006). *Proceedings of the Conference on Gromov-Witten Theory of Spin Curves and Orbifolds*, Contemporary Mathematics, **403**. American Mathematical Society, Providence, RI.
- (22) Jarvis, T. J. (1994). *Compactification of the moduli space of generalized spin curves*. Doctoral Dissertation. Princeton University.

Popular Publications.

- (23) Jarvis, T. J. & Jarvis, H. B. (2001). Gambling: What are the odds? *BYU Magazine*, Spring 2001, 48–52.
- (24) Jarvis, T. J. & Jarvis, H. B. (1999). Gambling: A Lie and a Snare. In D. Paul & G. Hatch (Eds.), *Enter to Learn* (pp. 288–299). Provo, UT: Brigham Young University.

Posted Preprints and Submitted Manuscripts.

- (25) Fan, H. J., Jarvis, T. J., Merrell, E. & Ruan, Y. D_4 Integrable Hierarchies. arXiv:1008.0927
- (26) Jarvis, T. J., Lang, W. E., and Ricks, J. R. Integral Models of Extremal Rational Elliptic Surfaces. arXiv:0908.1831
- (27) Fan, H. J., Jarvis, T. J., & Ruan, Y. The Witten equation, mirror symmetry and quantum singularity theory. arXiv:0712.4021
- (28) Jarvis, T. & Kimura, T. A relative Riemann-Hurwitz theorem, the Hurwitz-Hodge bundle, and orbifold Gromov-Witten theory. arXiv:0810.2488
- (29) Fan, H. J., Jarvis, T. J., & Ruan, Y. The Witten equation and its virtual fundamental cycle. arXiv:0712.4025

Selected Presentations.

- 2011, July (scheduled):** Invited address, Workshop “Recent developments on Orbifolds,” Chern Institute of Mathematics, Tianjin, China.
- 2010, November:** *Moduli of curves with W-structure, mirror symmetry, and the Landau-Ginzburg/Calabi-Yau correspondence.* Invited address, Boston University.
- 2010, June:** *Mirror symmetry and integrable hierarchies for the D_4 singularity.* Invited address, Workshop “Geometry and Physics of the Landau-Ginzburg Model.” Institut Fourier, Université de Grenoble.
- 2009, November:** *Landau-Ginzburg mirror symmetry and integrable hierarchies.* Invited address, Department of Mathematics, University of Pennsylvania.
- 2009, August:** *Surviving as Teacher and Scholar.* Invited address, Mathematical Association of America MathFest special session on “Issues for Early Career Mathematicians in Academia.”
- 2009, May:** *Mirror symmetry and quantum singularity theory.* Invited address, Conference on Symplectic Geometry and Physics. Beijing International Center for Mathematical Research.
- 2009, January:** *The Witten equation, mirror symmetry and quantum singularity theory.* Clay Math Institute workshop “Geometry and Physics of the Landau-Ginzburg Model.” Cambridge, MA.
- 2008, October:** *The Witten equation, mirror symmetry and quantum singularity theory.* Invited address, Great Lakes Geometry Conference, Ann Arbor, Michigan.
- 2007, February:** *Higher spin curves and quasi-homogeneous singularities.* Invited address, Mittag-Leffler Institute, Djursholm, Sweden.
- 2006, May:** *Mirror Symmetry and Quantum Cohomology of Quasi-Homogeneous Singularities.* Invited address, Mathematical Sciences Research Institute Workshop “New developments in the geometry and physics of Gromov-Witten theory,” Berkeley, CA.
- 2005, July:** *The virtual class in orbifold cohomology and K-theory.* Invited address, American Mathematical Society Decennial Institute in Algebraic Geometry. Seattle, WA.