David Futer

Curriculum Vitae

Mathematics Department
Michigan State University
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Research Interests: Knot theory, three–dimensional topology, hyperbolic geometry.

Employment

RTG Postdoctoral Instructor, Michigan State University, 2005–2008.

Assistant Professor, Temple University, 2008–

Visiting Positions

Osaka University, Osaka, Japan. January–February 2006.

Center for Mathematical Sciences, Hangzhou, China. June–July 2007.

Mathematical Sciences Research Institute, Berkeley, CA. August–December 2007.

Education

Stanford University, Stanford, CA.
Ph.D. in Mathematics, 2005. Advisor: Steven P. Kerckhoff.
Thesis: *Angled Triangulations of Link Complements.*

University of Pennsylvania, Philadelphia, PA.
B.A. in Mathematics and Philosophy, *magna cum laude*, 1999.
M.A. in Mathematics, 1999.

Selected Awards and Honors

Centennial Teaching Award, Stanford University School of Humanities and Sciences, 2005.

Outstanding TA Award, Stanford University Mathematics Department, 2004.

Undergraduate Research Prize, University of Pennsylvania Mathematics Department, 1998 and 1999.

Publications

D. Futer, A. Gnepp, D. McMath, B. Munson, T. Ng, S-H Pahk, C. Yoder. "*Cost–minimizing networks among immiscible fluids in* $\mathbb{R}^2$." Pacific Journal of Mathematics **196** (2000), no. 2, 395–414.

D. Futer, "*Geometric triangulations of two–bridge link complements.*" Appendix to an article by F. Guéritaud. Geometry & Topology **10** (2006), 1267–1282, arXiv:math/0406242.

D. Futer, "*Involutions of knots that fix unknotting tunnels.*" Journal of Knot Theory and its Ramifications **16** (2007), No. 6, 741–748. arXiv:math/0401421.

Publications (continued)

D. Futer and J. Purcell, "*Links with no exceptional surgeries.*" Commentarii Mathematici Helvetici **82** (2007), No. 3, 629–664. arXiv:math/0412307.

D. Futer, E. Kalfagianni, and J. Purcell, "*Dehn filling, volume, and the Jones polynomial.*" Journal of Differential Geometry **78** (2008), 429–464. arXiv:math/0612138.

D. Futer and F. Guéritaud, "*Angled decompositions of arborescent link complements.*" To appear in Proceedings of the London Mathematical Society (2008). arXiv:math/0610775.

O. Dasbach, D. Futer, E. Kalfagianni, X-S Lin, N. Stoltzfus, "*The Jones polynomial and graphs on surfaces.*" Journal of Combinatorial Theory, Series B **98** (2008), Issue 2, 384–399. arXiv:math/0605571.

O. Dasbach, D. Futer, E. Kalfagianni, X-S Lin, N. Stoltzfus, "*Alternating sum formulae for the determinant and other link invariants.*" Submitted. arXiv:math/0611025.

D. Futer, E. Kalfagianni, and J. Purcell, "*Symmetric links and Conway sums: volume and Jones polynomial.*" Submitted. arXiv:math/0804.1542.

D. Futer, E. Kalfagianni, and J. Purcell, "*Cusp areas of Farey manifolds and applications to knot theory.*" In preparation.

D. Futer, F. Guéritaud, and G. Indurskis, "*Classification of Dehn fillings of once–punctured torus bundles.*" In preparation.

Teaching Experience

Instructor, Stanford University and Michigan State University. *Lectured three times weekly, designed syllabus and exams. Coordinated special learning accommodations for a blind student and a deaf student.*

Lower-level undergraduate courses:
- First–semester calculus, 2002 and 2005.
- Second–semester calculus, 2008.
- Multivariable calculus and linear algebra, 2005.

Upper-level undergraduate courses:
- Real analysis, 2006.
- Metric spaces and topological spaces, 2006.

Graduate courses:
- Algebraic topology, 2007.

Independent Study Supervisor. *Guided reading projects for a group of two undergraduates and a group of two graduate students.*

- Point–set topology, Michigan State University, 2007.
- Hyperbolic 3–manifolds, Michigan State University, 2008.

Seminar Leader. *Presented conceptual review and moderated biweekly problem sessions for graduate students studying for their qualifying exams in complex analysis.*

- Complex analysis, Stanford University, 2001–2003.

Invited Academic Talks

Departmental Colloquia:

– 2007: Oberlin College.
– 2008: Gettysburg College, Florida State U, Temple U, UC Santa Cruz, U Connecticut.

Geometry/Topology Seminars:

– 2005: Stanford, Michigan, Michigan State, UC Davis.
– 2006: Osaka, Michigan State, UIC, Louisiana State, Michigan, USC, British Columbia.
– 2007: UT Austin, MSRI, UC Davis, Columbia.
– 2008: Michigan State, Pomona College.

Conference Talks:

– 2005: AMS Western Section Meeting, Santa Barbara.
– 2005: Arkansas–Oklahoma Workshop in Topology and Geometry.
– 2006: Hiroshima Topology Conference.
– 2006: Around the Volume Conjecture, Columbia U.
– 2006: Hyperbolic Geometry Workshop, Fields Institute, Toronto.
– 2006: Park City Math Institute, summer program.
– 2007: AMS National Meetings, New Orleans.
– 2007: A Second Time Around the Volume Conjecture, Louisiana State.
– 2007: Geometric Topology Conference, Beijing.
– 2007: International Conference on Geometric Topology and Geometric Analysis, Hangzhou.
– 2007: AIM Workshop on Triangulations, Heegaard Splittings, and Hyperbolic Geometry.
– 2008: AMS Western Section Meeting, Claremont, CA.

Mini-courses:

– 2006: *"Angle structures and hyperbolic structures."* Series of 8 lectures (joint with François Guéritaud) at Osaka U.
– 2007: *"Angled triangulations and hyperbolic geometry."* Series of 4 lectures, Center for Mathematical Sciences, Hangzhou.

Service Activities

Teaching Liaison and Consultant: Stanford University, 2002 – 2005.

– Trained teaching assistants, facilitated in-class evaluations for new instructors, organized lunch seminars.

Seminar Organizer:

– Hyperbolic geometry seminar, Park City Math Institute, 2006.
– Joint postdoctoral seminar, Mathematical Sciences Research Institute, 2007.

Referee:

– Communications in Contemporary Mathematics.
– Annals of Combinatorics.