

CURRICULUM VITAE

Name: Efstratia (Effie) Kalfagianni

Address:

Department of Mathematics
Michigan State University
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Education:

PhD, Mathematics, Columbia University, New York, 1995
MA, Mathematics, Columbia University, New York, 1991
MS, Mathematics, Fordham University, New York, 1990
BS, Aristotelian University of Thessaloniki, Greece, 1988

Graduate Advisor: Joan S. Birman

Thesis title: Finite type invariants for knots in 3-manifolds

Research Interests: Low dimensional topology; knot theory, 3-manifolds, quantum topology, hyperbolic geometry, braid groups, combinatorics.

Faculty Appointments:

2008- / /, Professor, Michigan State University
2003-2008, Associate Professor, Michigan State University
1998-2003, Assistant Professor, Michigan State University
1995-1998, Hill Assistant Professor, Rutgers University

Visiting Appointments:

July 2014, Visiting Member, ESI, Vienna, Austria
June-July 2007, Visiting Member, MPI, Bonn, Germany
2004-2005, Member, Institute for Advanced Study, Princeton
1994-1995, Member, Institute for Advanced Study, Princeton
July-August 1999, Visiting Member, MPI, Bonn, Germany

Fellowships/Honors:

Plenary Invited Address, AMS Central Section, October 2013
2004-2005, Research Scholarship, Institute for Advanced Study
1996-1997, MSRI Postdoctoral Fellowship (declined)
1995, Sigma Chi Research Society, Columbia Chapter
1994-1995, Postdoctoral Fellow, Institute for Advanced Study
1990-1994, Columbia University Fellowship
1989-1990, Graduate Fellowship, Fordham University
1983-1988, Greek National Science Foundation undergraduate fellowship

Research Grants:

2014-2017, sole PI for NSF Grant, DMS-1404754
Total grant amount \$224,415
2011-2015, sole PI for NSF Grant, DMS-1105843
Total grant amount \$209,004
2008-2011, sole PI for NSF Grant, DMS-0805942
Total grant amount \$153,242
2005-2009, PI for NSF Focused Research Grant, DMS-0456155,
(collaborative with A. Champanerkar, O. Dasbach, I Kofman,
X.-S. Lin, W. Neumann and N. Stoltzfus)
Total grant amount \$915,137
2004-2005, Research Scholarship, IAS
Total grant amount \$25,000
2003-2006, sole PI for NSF grant DMS-0306995
Total grant amount \$95,879
2001-2007, sole PI for NSF grant DMS-010400
Total grant amount \$58,000
1999-2001, sole PI for NSF grant DMS-9996227
Total grant amount \$24,000
1996-1999, sole PI for NSF grant DMS-9626140
Total grant amount \$71,000

June-July 2007, visit grant, MPI-Bonn, Germany

Total grant amount \$4,500

July-August 1999, visit grant, MPI-Bonn, Germany

Total grant amount \$2,500

Training Grants:

2004-2009, Co-PI for NSF/RTG Grant, DMS-0353717,

(joint with Fintushel, Parker and Wolfson)

Total grant amount \$640,000

2008-2012, Co-PI for NSF/RTG Grant, DMS-0739208,

(joint with R. Fintushel, T. Parker and J. Wolfson)

Total grant amount \$583,870

Books :

Guts of surfaces and the colored Jones polynomial, co-authored D. Futer and J. Purcell, **Research Monograph, Lecture Notes in Mathematics**, Vol. 2069, xii+ 175p., Berlin, Springer (2013)

Interactions between Hyperbolic Geometry, Quantum Topology and Number Theory, co-edited with A. Champanerkar, O. Dasbach, I. Kofman, W. Neumann and N. Stoltzfus, **Contemporary Mathematics** (AMS), 2011; 257 pp; Volume: 541.

Papers:

1. *On the G_2 Link invariant*,
J. of Knot Theory and Ramif., Vol. 2 no. 4 (1993), 431-451.
2. *Addendum to: On the G_2 link invariant*,
J. of Knot Theory Ramif., Vol 3 No. 3 (1994), 431-432.
3. *Finite type invariants for knots in 3-manifolds*,
Ph.D Thesis (1995), Columbia University, NY.
4. *Homology spheres with the same finite type invariants of bounded orders*,
Mathematical Research Letters 4 (1997), 341-347.

5. *Finite type invariants for knots in 3-manifolds*,
Topology 37 (1998) no. 3, 673-707.
6. *Milnor and finite type invariants of plat-closures*,
with X.-S. Lin, **Mathematical Research Letters**, 5 (1998), 293-304.
7. *Vassiliev invariants and orientation of pretzel knots*,
J. of Knot Theory and Ramif., Vol. 7 no. 2 (1998), 173-185.
8. *The HOMFLY polynomial for links in rational homology 3-spheres*,
with X.-S. Lin, **Topology** 38 (1999) no. 1, 95-115.
9. *Power series link invariants and the Thurston norm*,
Topology and Its Applications, Vol. 101 (2000), no. 2, 107-119.
10. *On knot adjacency*, with N. Askitas,
Topology and Its Applications, Vol. 126 (2002), no. 1-2, 63-81.
11. *Surgery n -triviality and companion tori*,
J. of Knot Theory and Ramif., Vol. 13 (2004), 441-456.
12. *Knot adjacency and satellites*, with X.-S. Lin,
Topology and its Applications, Vol. 138 (2004), 207-217.
13. *Alexander polynomial, finite type invariants and volume of hyperbolic knots*, **Algebraic and Geometric Topol.**, Vol. 4 (2004), 1111-1123.
14. *Knot adjacency, genus and essential tori*, with X.-S. Lin,
Pacific J. of Mathematics, Vol. 228, No. 2 (2006), 251-276.
15. *Seifert surfaces, Commutators and Vassiliev knot invariants*,
with X.-S. Lin, **J. of Knot Theory and Ramif.**, Vol. 16 No 10 (2007), 1295-1329. Volume in honor of L. Kauffman's 60th birthday.
16. *Knot adjacency and fibering*, with X.-S. Lin,
Trans. of the American Math. Soc., Vol. 360(2008), 3249-3261.
17. *The Jones polynomial and graphs on surfaces*,
with D. Futer, O. Dasbach, X.-S. Lin and N. Stoltzfus,
J. of Combinatorial Theory, Series B 98, Issue 2 (2008), 384-399 .
Featured by JCTB as one of the 5 Most cited articles published since 2007.
18. *Dehn Filling, volume and the Jones polynomial*,
with D. Futer and J. Purcell, **J. of Differential Geometry**, Vol 78,
no 3 (2008), 429-464.

19. *Quantum 3-manifold invariants and hyperbolic volume*,
J. of Knot Theory and Ramif., Vol. 18, No 1 (2009), 1-7.
20. *Symmetric Links and Conway sums: Volume and Jones polynomial*,
with D. Futer and J. Purcell, **Mathematical Research Letters**,
16(2009), no 2, 233-253.
21. *Alternating sum formulae for the determinant and other link invariants*,
with D. Futer, O. Dasbach, X.-S. Lin and N. Stoltzfus, **J. of Knot
Theory and Ramif.**, Vol. 19, No. 6 (2010), 765-782.
22. *Xiao-Song Lin: 1957-2007* O. Dasbach, **J. of Knot Theory and
Ramif.**, Vol. 19, No. 6 (2010), 763-784.
23. *On diagrammatic bounds of knot volumes and spectral invariants*,
with D. Futer and J. Purcell, **Geometricae Dedicata**, Vol 147, No.
1 (2010), 115-130.
24. *Cusp areas of Farey manifolds and applications to knot theory*,
with D. Futer and J. Purcell, **Int.Math. Res. Notices**, Vol. 2010,
Issue 23(2010), 4434-4497.
25. *Slopes and colored Jones polynomials of adequate links*,
with D. Futer and J. Purcell, **Proc. of the American Math. Soc.**,
Vol. 139(5)(2011), 1879-1887.
26. *An intrinsic approach to invariants of framed links in 3-manifolds*,
Quantum Topology, Vol 2, Issue 1(2011), 71-96.
27. *Cosmetic crossing changes of fibered knots*, **J. Reine Angew.
Math.(Crelle)**, Vol 2012, Issue 669, 151-164.
28. *Cosmetic crossings of genus one knots*,
with C. Balm, S. Friedl and M. Powell, **Comm. in Anal. and Geom.**
, Vol 20, No 2 (2012), 235-254.
29. *Guts of surfaces and the colored Jones polynomial*,
with D. Futer and J. Purcell, (Research Monograph), **Lecture Notes
in Mathematics**, Vol. 2069, xii+ 175p., Berlin, Springer (2013)
30. *Jones polynomials, volume, and essential knot surfaces: A survey*,
with D. Futer and J. Purcell, *Proceedings of Knots in Poland III*, **Ba-
nach Center Pub.**, Vol. 100 (2013).
31. *Quasi-Fuchsian state surfaces*, with D. Futer and J. Purcell, **Trans. of
the American Math. Soc.**, Vol 366, Issue 8, 4323-4343 (2014).

32. *On The degree of the colored Jones polynomials*,
with C. Lee, **Acta Math Vietnamica**, 39, no. 4, 549-560(2014).
*Special Issue: Proceedings of Hyperbolic Geometry and Quantum
Topology in Nha Trang*
33. *Semi-adequate hyperbolic links*, with D. Futer and J. Purcell,
Comm. in Anal. and Geom., accepted.
34. *Knots without cosmetic crossings*,
with C. Balm, ArXiv:1406.1755.
35. *Crosscap numbers and the Jones polynomial*,
with C. Lee, arXiv:1408.4493.
36. *Knot Cabling and the Degree of the Colored Jones Polynomial*,
with A. Tran, arXiv:1501.01574.
37. *Knot Cabling and the Degree of the Colored Jones Polynomial II*,
with A. Tran, arXiv:1501.04614.

Selected Talks/Invitations:

- 2015, Invariants in Low Dimensional Geometry, Gazi University in Ankara, Turkey, 10-14 August
- 2015, Redbud Topology Conference, Oklahoma State University, Stillwater, April 2-5 (2 talks)
- 2015, 3rd Annual Midwest Symposium of Women in the Mathematical Sciences, March 7
- 2014, Workshop on Random Tensors, Erwin Schrodinger International Institute for Mathematical Physics, Vienna, July 14-18 (Opening talk)
- 2014, Topology seminar, Ohio State University
- 2013, Topology seminar, University of Iowa
- 2013, Plenary Invited Address, AMS Central Section, Washington University, St. Louis, MO, October 18-20
- 2013, Geometric Topology in Cortona (in honor of Riccardo Benedetti for his 60th birthday), Cortona, Italy, June 3-7 (Plenary talk)
- 2013, Quantum Topology and Hyperbolic Geometry in Nha Trang, Vietnam May 13-17 (Plenary talk)
- 2012, Knots in Washington, December 7-9.

2012, Geometry seminar, Indiana University
 2012, Special Session, AMS National meeting, Boston
 2011, Topology seminar (LSU, Rice U., U. of Iowa)
 2011, Mathematics Department colloquium, LSU
 2011, Mathematics Department colloquium, Dartmouth College
 2010, “Knots in Poland III”, Banach Center (Warsaw and Beldewo) Poland, July 18-August 4 (Plenary talk)
 2010, MSRI Workshop Connections for Women: Homology Theories of Knots and Links January 21-22 (Plenary talk)
 2009, Moab topology conference, Utah, May 13-15 (Plenary talk)
 2009, Conference on the Geometry and Topology of Knots, Oklahoma State University, March 20-21 (Plenary talk)
 2008, Special Session AMS Sectional meeting, Baton Rouge, LA
 2007, Geometric Topology seminar, Columbia University
 2007, “International Conference on Topology and Physics”, Nankai University, Tianjin, China
 2007, Mathematics colloquium, University of South Alabama
 2007, Topology seminar, University of South Alabama
 2007, Special Session, AMS National meeting, New Orleans
 2005, AIM Workshop on “Moduli spaces of Knots”
 2005, Bryn-Mawr-Haverford bi-college Mathematics colloquium
 2005, Topology Seminar, Princeton University
 2005, Quantum Topology Conference, Snowbird Resort, Utah
 2004, Cascade Topology Conference, Boise State University
 2004, Geometric Topology seminar, Columbia University
 2003, Topology seminar, University of Michigan
 2003, Workshop on Quantum Topology, Oberwolfach, Germany
 2002, ICM Satellite “Geometric Topology”, Xian, China
 2002, Special Session in Topology, AMS meeting, Ann-Arbor
 2001, Special Session, AMS meeting, Las Vegas
 2000, “Knots 2000”, KAIST, Korea

1999, Poincare Seminar, Rutgers at Newark
 1999, Oberseminar, Max-Planck-Institut für Mathematik
 1998, Math Department Colloquium, University of Crete, Greece
 1998, “Knots in Hellas ’98”, Delphi-Greece
 1998, Special Session at AMS meeting, Philadelphia
 1998, Mathematics colloquium, Oklahoma State University
 1997, Special session at AMS Meeting, Baltimore
 1997, Geometry/Topology seminar, Rutgers University
 1996, Topology seminar, Rutgers University
 1996 and 1997, Topology Seminar, Columbia University
 1996, Special session at AMS Meeting, Lawrenceville NJ
 1995, Workshop in Knot Theory, Oberwolfach, Germany
 1995, Gauge theory seminar, Harvard University
 1995, Mathematics colloquium, Indiana University
 1994, Geometry Festival, Bethlehem, PA
 1994, Topology seminar, Princeton University
 1994, Conference in low dimensional topology, Luminy, France
 1994, Topology-Geometry seminar, University of Pennsylvania
 1994, Special session at AMS Meeting, Brooklyn, NY

Postdoctoral associates:

- 1999-2001, Hessam Hamidi-Tehrani (PhD Columbia University)
 Assistant Professor (tenure-track) at BCC of CUNY – Currently in Finance.
- 2005-2008, David Futer (PhD Stanford University)
 Currently: Associate Professor (tenured), Temple University
- 2006-2009, Lawrence Roberts (PhD UCB)– Co-mentor with Fintushel
 Currently: Assistant Professor (tenure-track), University of Alabama
- 2007-2008, Teaching Mentor for Manish Kumar (Algebra postdoc)
- 2009–2010, Eric Shoenfield (PhD Stanford University)

Currently: Google, San Francisco

– 2010-2011, Matt Rathbun (PhD UC-Davis)

Currently: Assistant Professor (tenure-track), California State, Fullerton

-2015– / , Renaud Detcherry (PhD Paris XI)

Long term visitors hosted: –December 2009- February 2010, Sang Young Lee (Professor at Pusan National University, Korea)

–September 2015– / / Yewong Jung (PhD from Pusan National University, Korea)

Graduate students:

PhD students:

- Thomas Jaeger (PhD, 2011); Philip T Church Fellow, Syracuse Univ.

Thesis: “Topics in Link Homology”

- Chris Cornwell (PhD, 2011); 3-year postdoc at Duke University

Thesis: “Invariants of Topological and Legendrian Links in Lens Spaces with a Universally Tight Contact Structure”

- Cheryl Balm (PhD, 2013); 3-year postdoc at Kansas State University.

Thesis: “Topics in Knot Theory: On generalized crossing changes and the additivity of the Turaev Genus”

- Adam Giambrone (PhD, 2014); Visiting Assistant Professor, University of Connecticut.

Thesis: “A Combinatorial Approach to Knot Theory: Volume Bounds for Hyperbolic, Semi-Adequate Link Complements”

- Christine Lee (PhD, 2015); NSF Research Postdoctoral Fellow and Instructor at University of Texas, Austin.

Thesis: “Jones type link invariants and applications to 3-manifold topology”

- Stephen Burton (Spring 2013–//)

- Wenzhao Chen (Fall 2014–//) (with M. Hedden)

Masters students: Martin Kell (Fall 2009), Indra Shottland (Spring 2012)

Dissertation Defense Committees: Inanc Baykur (2007), Elmas Irmak (2002), Adam Knapp (2008), Nathan Sunukjian (2010), B.K. Park (2014), Faramarz, Vafae (2014), David, Krcatovich (2014), Wei Fan (2015).

Guidance and Comprehensive Exam Committees: Adam Knapp (2005-2008), Nathan Sunukjian (2007-2010), David, Krcatovich (2010-2014), Faramarz, Vafae (2010-2014), B.K. Park (2011-2014) Kaveh Kasebian (2013- /).

Graduate reading courses: Stephen Burton (Fall 2014, Fall 2013, Spring and summer 2014), Christine Lee and Indra Shottland (Spring 2012), Adam Giabrone and Christine Lee (Fall 2011), Adam Giabrone (Summer 2011), Dan Barkley, Adam Giabrone and Kenny Barrese (Summer 2010), Cheryl Balm and Dan Smith (Fall 2009), Cheryl Balm (Summer 2009), Thomas Jaeger (2007-2008), Chris Cornwell (2006-2007).

Courses I have taught:

Michigan State University:

Fall 2015: Math 996: Topics in Knot Theory

Spring 2015: Math 961 Algebraic Topology II

Fall 2014: Math 960 Algebraic Topology I; Math 132, Calculus I

Spring 2014: Math 869, Geometry/Topology

Fall 2013: Math 496, An elementary Introduction to Knot Theory

Spring 2013: Math 132, Calculus I (2 sections)

Fall 2012: Math 996, Introduction to 3-manifold Topology and Geometry;
Math 496, An elementary Introduction to Knot Theory

Spring 2011: Math 996, Topics in Knot Theory

Fall 2010: Math 132, Calculus I (2 sections)

Spring 2010: Math 961: Algebraic Topology II

Fall 2009: Math 960 Algebraic Topology I; Math132, Calculus I

Spring 2009: Math 869, Geometry/Topology

Fall 2008: Math 132, Calculus I (2 sections)

Spring 2008: Math 996, Topics in 3-dimensional Topology

Fall 2007: Math 132, Calculus I (2 sections)

Spring 2007: Math 961, Algebraic Topology, II

Fall 2006: Math 960 Algebraic Topology I; Math 133-AP, Advanced Placement Calculus II

Spring 2006: Math 869, Geometry/Topology

Fall 2005: Math 496, An elementary Introduction to Knot Theory ; Math 133-AP, Advanced Placement Calculus II

Spring 2004: Math 496, An elementary Introduction to Knot Theory

Fall 2003: Math 153H, Honors Calculus II; Math 235

Spring 2003: Math 153H, Honors Calculus II

Fall 2002: Math 235, Differential Equations; Math 132

Spring 2002: Math 235, Differential Equations

Fall 2001: Math 132, Calculus I (2 sections)

Spring 2001: Math 996, Topics in Knot theory

Fall 2000: Math 461, Geometric Topology; Math 132

Spring 2000: Math 132, Calculus I

Fall 1999: Math 314, Linear Algebra; Math 132

Spring 1999: Math 132, Calculus I

Fall 1998: Math 132, Calculus I

Rutgers University, New Brunswick, NJ: I taught Calculus I for non-science majors (Fall 95, 96, Spring 1997), Calculus I for science majors (Fall 96, Spring 97), Calculus II for Biology majors (Spring 96) and Linear Algebra (Fall 95, Spring 96, Spring 1997).

Columbia University, New York, NY: I taught the undergraduate seminar for Mathematics majors (1991-1992, 1992-1993) with topics: Linear representations of finite groups, Differential topology, Probability theory. I have also taught Calculus I (Summer 1992, Summer 1993).

Professional Service:

2015, Member of an NSF proposal evaluation panel

2015, Leader of Topology Session at the 3rd annual Midwest Women in Mathematics Symposium (WIMS) March 7, Dominican University

2015, co-organizer of Special Session “Invariants and Geometry of 3-manifolds 3-Manifold ”, AMS Central Section, East Lansing, March 14-15
 2014, Member of an NSF proposal evaluation panel
 2013, co-organizer of Special Session “Geometric Aspects 3-Manifold Invariants”, AMS Central Section, St Louis, October 18-20
 2012, Member of an NSF proposal evaluation panel
 2010, Reviewer of CUNY research grant proposals
 2010, Scientific committee of “Knots in Poland III”, Banach Center (Warsaw and Beldewo) Poland, July 18-August 4
 2010, co-organizer of Special Session “Geometric Aspects of Link and 3-Manifold Invariants”, Joint AMS Meeting, San Francisco, January 11-16
 2010, Member of an NSF proposal evaluation panel
 2009- / / , Member of the AWM Mentor Network
 2009, co-organizer of a workshop and conference on “Interactions between Hyperbolic Geometry, Quantum Topology and Number Theory”, June 3-19, Columbia University, New York
 2008, Member of an NSF proposal evaluation panel
 2008, Chair of NSF site visit committee at MSRI (April 16-18)
 2007, Member of an NSF proposal evaluation panel
 2007, co-organizer of the conference “A second time around the Volume Conjecture”, May 28-June 3, LSU, Baton Rouge
 2006, co-organizer of the conference “Around the Volume Conjecture”, March 13-19, Columbia University, New York
 2005, Member of an NSF proposal evaluation panel
 2005-present, co-organizing the RTG lectures
 2006-present, co-organizing the “Low dimensional topology seminar”.

Departmental/University Service:

2015- / / , Graduate Hearing Board
 2015-2017, CNS Promotion & Tenure Committee
 2014-2015, Personnel Committee
 2013-2014, Hiring Committee

Spring 2013, Calculus I coordinating committee
 2011-2012, Hiring Committee
 2011-2012, Graduate Studies Committee
 2010-2011, Hiring Committee
 2010-2011, Graduate Studies Committee
 2010-2011, Personnel Committee
 2009-2010, Hiring Committee
 2009, RTG Graduate Student Recruitment Committee
 2009, RTG Postdoctoral Fellow Recruitment Committee
 2/2009, LBC Interview Exit Committee (for T. Gerhardt)
 2008-2009, Graduate Studies Committee
 2007-2008, Advisory Committee
 2006-2007, Hiring Committee
 Fall 2006, Calculus I final exam writing committee
 2005-present, RTG program co-coordinator
 2006-present, Incoming graduate student advisor
 2006–2008 , Mathematics department member for Lyman Briggs College
 “2-PC” Committee for Assistant Professor R. Bell.
 2005-2006, Graduate Studies Committee
 2004-present, Undergraduate student department advisor
 2003-2004, Undergraduate studies committee
 2003-2004, Calculus I coordinating committee
 2003- 2004, Calculus I final exam writing committee
 2007–present, Honors College advisor

Professional Memberships:

American Mathematical Society (AMS)
 Association for Women in Mathematics (AWM)
 1995–/ /, Sigma Xi, Columbia University Chapter