

James Conant

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AREA: Low dimensional topology: knots (of dimension 1 or 2), n -manifolds ($n \leq 4$), and their invariants; Geometric group theory: group homology; Combinatorial topology

EMPLOYMENT: **University of Tennessee**, Associate Professor, 2008—Present
Assistant Professor, 2003 — 2008
Undergraduate Thesis: Jeffrey Hankins (2007)
Masters students: Jim Borkowski (2004), Oliver Thistlethwaite (2007), Eric Kim (2007), Matt Dawson (2009)
Doctoral students: Jon Gray (current)

Cornell University, VIGRE Assistant Professor, 2000 — 2003
Undergraduate thesis: Ben Cooper (2003)

UC San Diego, Graduate Teaching Assistant, 1995-2000

EDUCATION UC San Diego, Ph.D 2000, Advisor: Peter Teichner
Thesis: *A knot bounding a grope of class n is $\lceil \frac{n}{2} \rceil$ -trivial*

UC San Diego, MA 1997

Rutgers University, B.A. 1995, Highest Honors, Advisor: Norm Levitt
Senior Thesis: *Whitehead torsion and simple homotopy type*

HONORS AND SUPPORT July 2010- December 2010 visiting researcher, Max Planck Institut für Mathematik, Bonn, Germany

2009 Chancellor's Research and Creative Achievement/Professional Promise Award

2006–2007 College of Arts and Sciences Research and Creative Achievement Award

NSF Grant DMS 0604351, \$108,961 (2006-2009)

NSF Grant DMS 0305012, \$64,532 (2003-2006)

Max Planck Institut Gesellschaft — Supported joint research with Rob Schneiderman and Peter Teichner (Summer 2001)

ARCS Scholar- a stipended award by the San Diego ARCS chapter to support promising graduate research. (1998-2000)

John Bogart Prize- awarded by Rutgers University to top undergraduate mathematics major (1995)

Henry Rutgers Scholar — Rutgers College senior thesis program

$\Phi\eta\Sigma$, Golden Key and ΦBK honor societies

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JOURNAL
PUBLICATIONS

J. Conant and O. Thistlethwaite “Boolean formulae, hypergraphs and combinatorial topology,” *Topology and its Applications*, to appear.

J. Conant, J. Mostovoy and T. Stanford, “Finite type invariants based on the band-pass and the doubled-delta move,” *Journal of Knot Theory and its Ramifications*, 19 (2010), no. 3, 355–384.

J. Conant, “Homotopy approximations to the space of knots, Feynman diagrams, and a conjecture of Scannell and Sinha,” *American Journal of Mathematics* 130 (2008), no. 2, 341–357

J. Conant, “Ornate necklaces and the homology of the genus one mapping class group,” *Bulletin of the London Mathematical Society* 39 (2007), no. 6, 881–891

J. Conant and K. Vogtmann, “Morita classes in the homology of $\text{Aut}(F_n)$ vanish after one stabilization,” *Groups, Geometry and Dynamics* 2 (2008), no. 1, 121–138

J. Conant, R. Schneiderman and P. Teichner, “Jacobi identities in low dimensional topology,” *Compositio Mathematica* 143 Part 3 (2007) pp.780-810

J. Conant “Chirality and the Conway Polynomial,” *Topology Proceedings*, Volume 30, No. 1, 2006, p.153-162

R. Budney, J. Conant, K. Scannell, D. Sinha, “New perspectives on self-linking,” *Advances in Mathematics* Vol. 191, Issue 1 (2005), Pages 78-113

J. Conant, F. Gerlits and K. Vogtmann, “Cut vertices in commutative graphs,” *Oxford Quarterly Journal*, Vol. 56, No. 3 (2005)

J. Conant and K. Vogtmann, “Morita classes in the homology of automorphism groups of free groups,” *Geom. Topol.*, Vol. 8 (2004) Paper no. 40, pages 1471–1499

J. Conant, “Gropes and the rational lift of the Kontsevich integral,” *Fundamenta Mathematicae*, Vol. 184 (2004), 73–77

J. Conant and P. Teichner, “Grove cobordism and Feynman diagrams,” *Math. Annalen* Vol. 328 (2004), Nos. 1-2, 135-171

J. Conant and P. Teichner, “Grove cobordism of classical knots,” *Topology* Vol. 43, Issue 1 (2004); 119-156

J. Conant and K. Vogtmann, “On a theorem of Kontsevich” *Algebraic and Geometric Topology*, 3 (2003), paper no. 42, pages 1167-1224

J. Conant and K. Vogtmann, “Infinitesimal operations on chain complexes of graphs,” *Math. Annalen*, Vol. 327, No. 3 (2003); 545-573

J. Conant, “Fusion and fission in graph complexes,” *Pac J. Math*, Vol. 209, No.2 (2003), 219–230

J. Conant, “On a theorem of Goussarov,” *J. Knot Theory Ramifications*, Vol. 12 (No. 1) (2003) 47–52

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CURRENT PROJECTS

J. Conant, M. Kassabov and K. Vogtmann, “On the abelianization of the Lie algebra of symplectic derivations of F_{2n} ,” in preparation

J. Conant, R. Schneiderman and P. Teichner, “Geometric filtrations of classical link concordance,” in preparation

J. Conant, R. Schneiderman and P. Teichner, “Milnor invariants and twisted Whitney towers,” in preparation

J. Conant, R. Schneiderman and P. Teichner, “On a conjecture of Levine,” in preparation

J. Conant, R. Schneiderman and P. Teichner, “Universal quadratic refinement and Whitney towers,” in preparation

COLLOQUIA AND SEMINAR TALKS

Departmental Colloquia (2009): Kansas State University

Departmental Colloquia (2000-2005): Rice, University of Oregon, University of Münster, New Mexico State University, SUNY Geneseo, Virginia Tech, University of Tennessee, UC Davis

Seminar Talks (2010): Cornell University

Seminar Talks (2009): Cornell University

Seminar Talks (2008): University of California, Berkeley

Seminar talks (2006): Cornell, University of Oregon, Vanderbilt, Tennessee State University

Seminar talks (2000-2005): Columbia, Cornell, UC Berkeley, UC San Diego, UC Riverside, Monmouth, NYU Courant, Ohio State, Rutgers, SUNY Binghamton, SUNY Buffalo, University of Texas, University of Virginia, Yale.

CONFERENCE TALKS “The cohomology of $Out(F_n)$ and the Eichler-Shimura isomorphism,” *Théorie géométrique des groupes*, Centre International des Rencontres Mathématiques; June 2010

“The Topology of Sets of Boolean Formulae,” *Wasatch Topology Conference*, University of Utah; August 2007

“Chirality and the Conway Polynomial,” *Quantum Topology — Contemporary issues and perspectives*, Snowbird, Utah; June 2005

“Chirality and the Conway Polynomial,” *Conference on Low Dimensional Topology*, University of Virginia; December 2004

“A variation on finite type knot invariants,” *Twenty-first Annual Workshop on Geometric Topology*, Milwaukee, WI; June 2004

“On the rational homology of the group of automorphisms of the free group,” Semi-plenary talk, *Spring Topology and Dynamics Conference*, Birmingham, AL; March 2004

“Do Vassiliev invariants distinguish knots?” *Knots in Poland*, Warsaw, Poland; June 2003

“Some remarks on grope cobordism,” *Workshop in quantum topology*, Warwick, England; March 2002

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“A Lie bialgebra structure on graphs and graph homology,” *Junge Topologen und Neue Topologie*, Münster, Germany; September 2001

“Gropes cobordism of classical knots,” *Knots in Montreal*, Montreal, Canada; April 2001

“Gropes, clasps and Vassiliev invariants,” *Albany Geometric Group Theory Conference*, Albany, NY; October 2000

AMS Special Sessions where I gave talks:

Geometric Group Theory, New Orleans, LA; January 2007

Braids and knots, Albuquerque, NM; October 2004

Categories and operads in topology, geometry, physics, Albuquerque, NM; October 2004

Low dimensional topology, Phoenix, AZ; January 2004

Quantum topology, Portland, OR; May 2002

Low dimensional topology, San Diego, CA; January 2002

Topology of links, Las Vegas, NV; April 2001

SERVICE

University service (2009-2010): Arts and Sciences Advising, Faculty Senate, Teaching Council, Committee for the Campus Environment

Department Service (2009-2010): Honors Day Committee, Tennessee Math Contest Math Bowl Committee

University service (2008-2009): Arts and Sciences Advising, Faculty Senate, Teaching Council, Committee for the Campus Environment

Department Service (2008-2009): Honors Day Committee, Tennessee Math Bowl Committee

University Service (2007-2008): Arts and Sciences Advising, Faculty Senate, Teaching Council, Research Council, Committee for the Campus Environment

Department Service (2007-2008): Advisory Committee, Graduate Assistantship Committee, Tennessee Math Bowl Committee

Department Service (2006-2007): Advisory Committee, Graduate Assistantship Committee, Bylaws Committee, Fermat I Committee

Department Service (2005-2006): Graduate Committee, Graduate Assistantship Committee, Fermat I Committee

Department Service (2004-2005): Allen Medal Committee, Undergraduate Committee, Barrett Lectures Committee

Department Service (2003-2004): Allen Medal Committee, Undergraduate Committee

Refereed roughly 3 or 4 papers a year for *GT*, *AGT*, *Topology*, *Math. Annalen*, *Compositio Math*, *IMRN*, *Pac. J. Math*, *J. Knot Theory and its Ramifications*, *Top. Proceedings*.

Reviewed papers (6 per year) for *Math Reviews* and evaluated NSF proposals (around 3).

Cornell Topology seminar organizer (2002-2003)

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CONFERENCES Barrett Lectures (Spring 2006), Cornell Topology Festival (May 2001, 2002, 2003), Special
CO-ORGANIZED Session in Low dimensional topology (NYU Spring 2003)

OUTREACH Outreach activities (2009): Participated in UT REU program in summer 2009. Gave public talk
on “A history of pi” to Knoxville senior center.

Outreach activities (2007-2008): Participated in University of Tennessee REU, summers 2007
and 2008, gave public talks on “The History of Pi” and “Art and Mathematics” through the
Faculty Speakers Bureau

Outreach activities (2006): Gave talk under auspices of Speaker’s Bureau on “Mathematics and
Art,” to the Oak Ridge Philosophical Society (Spring 2006)

Outreach Activities (2000-2005): Directed REU project (Summer 2005), Junior Colloquia at
Cornell and Tennessee (2001, 2003, 2005), Six week short course for Cornell’s Math Explorer’s
club for advanced high school students (April-May 2002)