Nathan Broaddus

Associate Professor of Mathematics

Address:
Department of Mathematics
Ohio State University
231 W. 18th Ave.
Columbus, OH 43210-1174, USA

Email: broaddus.9@osu.edu
Web: people.math.osu.edu/broaddus.9
Tel: +1 614 292 0605
Fax: +1 614 292 1479
Skype name: nate.broaddus

Education and Employment

Associate Professor - Ohio State University, 2015-Present
Assistant Professor - Ohio State University, 2009-2015
NSF Postdoc/L.E. Dickson Instructor - University of Chicago, 2005-2009
NSF Postdoc/VIGRE Postdoc/H.C. Wang Asst. Professor - Cornell University, 2003-2005
Ph.D. Math - Columbia University, 1997-2003
B.S. Math - University of Chicago, 1993-1997

Thesis Advisor

Joan S. Birman, Columbia University

Grants

Awarded 2010 NSF Program Description PD 04-1267 - Topology
   Title: The mapping class group and its finitely generated subgroups
   Dates: 7/15/2010-7/14/2014
   Grant Number: DMS-1007059
   Amount: $118,739.00
Awarded NSF Mathematical Sciences Postdoctoral Research Fellowship
   Dates: 9/25/2003-8/31/2006
   Grant Number: DMS-0303436
   Amount: $108,000.00

Papers

[1] T. E. Brendle, N. Broaddus and A. Putman, The mapping class group of connect sums of $S^2 \times S^1$. *Submitted.*

[2] T. E. Brendle, N. Broaddus and A. Putman, The high-dimensional cohomology of the moduli space of curves with level structures II: punctures and boundary. *Submitted.*

[3] J. Birman, N. Broaddus and W. Menasco, Finite rigid sets and homologically nontrivial spheres in the curve complex of a surface, J. Topol. Anal. **7** (2015), no. 1, 47–71. MR3284389

[4] N. Broaddus, Homology of the curve complex and the Steinberg module of the mapping class group, Duke Math. J. **161** (2012), no. 10, 1943–1969. MR2954621

[5] N. Broaddus, B. Farb and A. Putman, Irreducible Sp-representations and subgroup distortion in the mapping class group, Comment. Math. Helv. **86** (2011), no. 3, 537–556. MR2803852

[6] N. Broaddus, B. Farb and A. Putman, The Casson invariant and the word metric on the Torelli group, C. R. Math. Acad. Sci. Paris **345** (2007), no. 8, 449–452. MR2367364

[7] J. S. Birman, T. E. Brendle and N. Broaddus, Calculating the image of the second Johnson-Morita representation, in *Groups of diffeomorphisms*, 119–134, Adv. Stud. Pure Math., 52, Math. Soc. Japan, Tokyo. (2008) MR2509709

[8] N. Broaddus, Noncyclic covers of knot complements, Geom. Dedicata **111** (2005), 211–239. MR2155182

Talks

- Tech Topology Conference, Georgia Institute of Technology, December 5, 2020

- UC San Diego Colloquium, January 9, 2020

- 49th Spring Topology and Dynamics Conference 2015 at Bowling Green State University, May 15, 2015

- Knots, braids, and mapping classes: A conference in honor of Bill Menasco's 60th birthday University at Buffalo, May 11, 2015

- 1109th AMS Meeting at the University of Alabama in Huntsville, AL, March 29, 2015

- Ohio State University Invitation to Mathematics Seminar, February 5 & 12, 2014

- University at Buffalo Geometry and Topology Seminar, December 5, 2014

- Ohio State University Geometric Group Theory Seminar, September 30, 2014

- University of Illinois at Urbana-Champaign Differential Geometry/Group Theory Seminar, December 10, 2013

- Buffalo Geometry and Topology Seminar, March 8, 2013

- Columbia Geometric Topology Seminar, March 1, 2013

- UC San Diego Topology Seminar, June 11, 2012

- Moduli Spaces of Riemann Surfaces at the Park City Mathematics Institute, Park City Utah, July 7, 2011

- Arithmetic Groups vs. Mapping Class Groups: Similarities, Analogies and Differences, Oberwolfach, June 9, 2011

- Princeton University Topology Seminar, October 7, 2010

- Ohio State University Geometric Group Theory Seminar, October 15, 2009

- Spring AMS Special Session on Hyperbolic Geometry and Teichmuller Theory, March 27, 2009

- University of Illinois at Chicago Geometry/Topology/Dynamics Seminar, March 9, 2009

- Loyola University New Orleans Colloquium, February, 2009

- Temple University Colloquium, February 11, 2009

- Ohio State University Colloquium, February 5, 2009

- Ohio State University Invitation to Mathematics Seminar, February 1 & 8, 2009

- University of Dayton Colloquium, January 29, 2009

- Oklahoma State University Colloquium, January 22, 2009

- Midwest Topology Seminar at Northwestern University, May 3, 2008

- Spring AMS Southeastern Meeting Special Session on Geometric Group Theory, March 30, 2008

- University of Chicago Geometry/Topology Seminar, January 10, 2008

- Michigan State University Geometry/Topology Seminar, December 5, 2007

- Summer Wasatch Topology Conference at the University of Utah, August 13, 2007

- University of Chicago Geometry/Topology Seminar, August 3, 2007

- Joint AMS-MAA Meeting in New Orleans Special Session, January 8, 2007
- Columbia University Topology Seminar, March 10, 2006
- Ohio State University Topology Seminar, January 31, 2006
- University of Chicago Geometry/Topology Seminar, November 22, 2005
- Louisiana State University Topology Seminar, September 6, 2005
- 1001st AMS Meeting at Northwestern University, October 24, 2004
- 1000th AMS Meeting at the University of New Mexico, October 16, 2004
- University of Illinois at Chicago Topology Seminar, March 12, 2004
- University of Chicago Geometry/Topology Seminar, March 10, 2004
- Buffalo University Topology Seminar, February 13, 2004
- McMaster University Geometry & Topology Seminar, October 27, 2003
- Binghamton University Geometry Topology Seminar, October 2, 2003
- Cornell University Topology/Geometric Group Theory Seminar, September 9, 2003
- Columbia University Geometric Topology Seminar, May 9, 2003
- 986th AMS Meeting at the Courant Institute, Special Session, April 13th, 2003

Teaching

- The Ohio State University
  - Differential Equations and Their Applications (Math 2255)—*Spring 2021, Summer 2019, Summer 2018*
  - Calculus I (Math 1151)–*Fall 2020, Fall 2014*
  - Accelerated Calculus I (Math 1161.01)—*Fall 2018, Fall 2017*
  - Ordinary and Partial Differential Equations (Math 2415)—*Summer 2018, Summer 2017*
  - Linguistics of the word problem (Math 8110 **graduate topics course**)–*Fall 2017*
  - Calculus III (Math 2153)–*Fall 2015*
  - Algebraic Topology II (Math 6802 **graduate course**)–*Spring 2015*
  - Complex Analysis (Math 4552)–*Spring 2015*
  - Foundations of Higher Mathematics (Math 3345)–*Spring 2014*
  - General Topology and Knot Theory (Math 5801 **graduate course**)–*Fall 2012*
  - Transition Calculus II (Math 1534)–*Summer 2012*
  - Introduction to Low Dimensional Topology (Math 641 **graduate course**)–*Winter 2012*
  - Foundations of Higher Mathematics (Math 345)–*Fall 2011*
  - Algebraic Topology II (Math 757 **graduate course**)–*Winter 2011*
  - Calculus and Analytic Geometry II (Math 152.02)–*Winter 2011, Winter 2010*
  - Algebraic Topology I (Math 756 **graduate course**)–*Fall 2010*
  - Honors Calculus (Math 161.01)–*Fall 2010*
  - Calculus and Analytic Geometry I (Math 151.02)–*Fall 2009*

- University of Chicago

- – Honors calculus I–*Fall 2006, Fall 2007, Fall 2008*
    - – Honors calculus II–*Winter 2008*
    - – Honors calculus III–*Spring 2008, Spring 2009*
    - – Homology of the mapping class group **(graduate course)**–*Spring 2007*
    - – Introduction to algebraic topology–*Spring 2007*
    - – Directed reading program–*Winter 2007*
    - – Intro to analysis and linear algebra–*Fall 2006, Fall 2007*

- Cornell University

    - – Foliations **(graduate course)**–*Fall 2004*
    - – Calculus for engineers–*Fall 2003*

- Columbia University

    - – Undergraduate seminar on Coxeter groups–*Spring 2003*
    - – Undergraduate seminar on combinatorics–*Fall 2002*
    - – Ordinary differential equations–*Summer 2002*
    - – Undergraduate seminar on logic–*Fall 2001*
    - – Calculus IIA–*Spring 2000, Summer 2000, Summer 2001*
    - – Calculus IA–*Fall 1999*
    - – Calculus for the social sciences II–*Summer 1999*

Professional Service

- Co-organizer for Topological Methods in Group Theory at Ohio State University. June 16-20, 2014

- Co-organizer for the 32nd Ohio State-Denison Mathematics Conference at Ohio State University. May 9-11, 2014

- Organizer for the OSU workshop on the Torelli group, mapping class group, and Out(Fn), May 2-6, 2011

- Co-organizer for the Ohio State Univeristy Geometric Group Theory Seminar 2010-Present

- Co-organizer for 2010-2011 the Ohio State Univeristy Special Year in Topology and Geometric Group Theory

- Co-organizer for the Ohio State Univeristy Topology Seminar 2009-2010

- Co-organizer for the University of Chicago Geometry/Topology Seminar 2005-2009

- Referee for Algebraic and Geometric Topology 2011

- Referee for Proceedings of Groups of Diffeomorphisms 2006

Conference Participation

- Tech Topology Conference, Georgia Institute of Technology, December 4 to 6, 2020.

- No Boundaries: Groups in Algebra, Geometry, and Topology–A Celebration of the Mathematical Contributions of Benson Farb, University of Chicago, October 27-29, 2017.

- MSRI Research Member, Geometric Group Theory Program August 15 - December 16, 2016.

- What's next: the mathematical legacy of Bill Thurston at Cornell University, June 23-27, 2014

- Moduli Spaces of Riemann Surfaces at the Park City Mathematics Institute, Park City Utah, July 3-23, 2011

- Arithmetic Groups vs. Mapping Class Groups: Similarities, Analogies and Differences at the Mathematisches Forschungsinstitut Oberwolfach, June 5-11, 2011

- Conference in Geometric Group Theory and related topics at Ohio State University, May 30 - June 3, 2011

- Examples of Geometries, Summer School for women Graduate Students at Ohio State University, May 23-28, 2011

- Geometrical methods in high-dimensional topology at Ohio State University, May 16-20, 2011

- Systolic groups and CAT(0) cubical complexes at Ohio State University, May 9-13, 2011

- Workshop on the Torelli group, mapping class group, and Out(Fn) at Ohio State University, (**Organizer**), May 2-6, 2011

- Coxeter groups, Artin groups, buildings and their automorphism groups at Ohio State University, April 25-29, 2011

- Classifying spaces for families of subgroups at Ohio State University, December 4-5th, 2010

- Vogtmannfest, in Luminy, France, June 21-25, 2010

- "Examples of Group Actions." at Ohio State University, (**Co-organizer**), May 28-June 3rd, 2010

- 2009 Spring Central Sectional Meeting "Hyperbolic Geometry and Teichmüller Theory", in Urbana, IL, March 27-29, 2009

- American Institute of Mathematics workshop, "The Isoperimetric Inequality for $SL(n, \mathbb{Z})$", (**Co-organizer**) September 8-12, 2008

- 2008 Spring AMS Southeastern Meeting Special Session "Geometric Group Theory", in Baton Rouge, LA, March 28-30, 2008

- Topics in Geometric Group Theory at MSRI, November 5-9, 2007

- Joint AMS-MAA Meeting in New Orleans Special Session "Mapping class groups and handlebodies", January 8, 2007

- International Congress of Mathematicians 2006, Madrid, August 22-30, 2006

- Winter 2005 Wasatch Topology Conference (Park City, Utah), December 14-16, 2005

- Cornell Topology Festival (**Co-organizer**), May 6-9, 2005

- Conference on Braids, Links, and Mapping Class Groups in Honor of Joan Birman (Columbia U.) March 17-20, 2005

- Cornell Topology Festival (**Co-organizer**), May 7-10, 2004

- Albany Group Theory Conference, October 17-19, 2003

- Cornell Topology Festival, May 1-4, 2003

- Workshop on Groups and 3-manifolds at CRM, June 25-29, 2001

- AMS Mathematical Challenges of the 21st Century at UCLA, August 7-12, 2000

- Knots 2000 at the Korea Advanced Institute of Science and Technology, July 31-August 5, 2000