

# Curriculum Vitae

## ADAM CLAY

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Date of Birth: 1981, Halifax, Canada (Canadian citizenship)  
Date of CV: May 3, 2018

### Education/Employment

- 2018 – Associate Professor, University of Manitoba
- 2013 – 2018 Assistant Professor, University of Manitoba
- 2012 – 2013 CIRGET postdoctoral fellow, Université du Québec à Montréal (advisor: Steve Boyer)
- 2010 – 2012 NSERC postdoctoral fellow, Université du Québec à Montréal (advisor: Steve Boyer)
- 2010 Ph.D. University of British Columbia, Mathematics (advisor: Dale Rolfsen)
- 2005 M.Sc. University of British Columbia, Mathematics (advisor: Dale Rolfsen)
- 2003 B.Sc. University of King's College, Halifax, Canada, Mathematics (with Honours).

### Research interests

Group theory, actions of groups on  $S^1$  and  $\mathbb{R}$ , 3-manifolds, knot theory, left orderability of fundamental groups of 3-manifolds, Dehn surgery and foliations, algebraic properties of left- and circularly orderable groups.

### Publications

#### Books

1. (with Dale Rolfsen) *Ordered groups and Topology*. Graduate Studies in Mathematics 176 (2016), American Mathematical Society, Providence RI, USA.

#### Articles in progress

2. (with Ty Ghaswala) *Free products of circularly ordered groups with amalgamated subgroup*, in preparation.
3. (with Tali Pinsky) *Anosov flows on torus knot complements*, in preparation.

#### Peer-reviewed journal articles

4. (with Kathryn Mann and Cristobal Rivas) *On the number of circular orders on a group*, J. Algebra 504 (2018), 336-363.
5. (with Sina Zabanfahm) *Automorphisms acting on the left-orderings of a bi-orderable group*, New York Journal of Mathematics 23 (2017), 67-83.
6. (with Steve Boyer) *Foliations, orders, representations, L-spaces and graph manifolds*, Adv. Math. 310 (2017), 159-234.
7. (with Colin Desmarais and Patrick Naylor) *Testing bi-orderability of knot groups*, Canadian Mathematical Bulletin, 59 (2016), 472-482.
8. (with Tye Lidman and Liam Watson) *Graph manifolds, left-orderability and amalgamation*, Algebr. Geom. Topol. 13 (2013), no. 4, 2347-2368.

9. (with Masakazu Teragaito) *Left-orderability and exceptional Dehn surgery on two-bridge knots*, Geometry and topology down under, 225–233, Contemp. Math., 597, Amer. Math. Soc., Providence, RI, 2013.
10. *Left-orderings and quotients of the braid groups*, J. Knot Theory Ramifications 21 (2012), no. 14, 125–130, 9 pp.
11. (with Dale Rolfsen) *Ordered groups, eigenvalues, knots, surgery and L-spaces*, Math. Proc. Cambridge Philos. Soc. 152 (2012), no. 1, 115–129.
12. (with Liam Watson) *Left-orderable fundamental groups and Dehn surgery*, Int. Math. Res. Not. IMRN 2013, no. 12, 2862–2890.
13. *Free lattice-ordered groups and the space of left-orderings*, Monatsh. Math. 167 (2012), no. 3–4, 417–430.
14. (with Liam Watson) *On cabled knots, Dehn surgery, and left-orderable fundamental groups*, Math. Res. Lett. 18 (2011), no. 6, 1085–1095.
15. *Exotic left orderings of the free groups from the Dehornoy ordering*, Bull. Aust. Math. Soc. 84 (2011), no. 1, 103–110.
16. *Isolated points in the space of left orderings of a group*, Groups Geom. Dyn. 4 (2010), no. 3, 517–532.
17. (with Andrés Navas and Cristóbal Rivas, my contribution is the appendix) *A new characterization of Conrad’s property for group orderings, with applications*, Algebr. Geom. Topol. 9 (2009) 2079–2100.
18. (with Lawrence H. Smith) *Corrigendum to “On ordering free groups” [J. Symbolic Comput. 40 (2005) 1285–1290]*, J. Symbolic Comput. 44 (2009), no. 10, 1529–1532.
19. (with Dale Rolfsen) *Densely ordered braid subgroups*, J. Knot Theory Ramifications 16 (2007), no. 7, 869–877.

#### Non-peer-reviewed work

20. *Left-orderability Of 3-manifold fundamental groups*, CMS Notes 48 (2016) no. 2, 14–15. (invited expository piece for the CMS Notes).
21. (with Mathieu Anel) *Orderable groups and bundles*, (2012) 13 pages. arXiv:1208.5844
22. *Orderable groups and topology minicourse notes*, (2014) 22 pages.  
server.math.umanitoba.ca/~claya/Santiago\_notes.pdf
23. (with Steve Boyer) *Slope detection, foliations in graph manifolds, and L-spaces*, (2015), 30 pages. arXiv:1510.02378.

#### Lectures and presentations

##### Conferences

- 2017 Aug. Quito, Ecuador (XXII Coloquio Latinoamericano de Álgebra): Automorphisms acting on the space of orderings.
- July Montreal, Canada (Mathematical Congress of the Americas): The number of circular orderings of a group.
- 2016 Apr. Fargo, USA (AMS sectional meeting): Orderability and Dehn fillings of knot complements.
- 2015 July Vancouver, Canada (PIMS Symposium on the Geometry and Topology of Manifolds): Foliations of graph manifolds
- April Victoria, Canada (The 54<sup>th</sup> Cascade Topology Seminar): Foliations, left-orderability and L-spaces

- 2014 Sept. Santiago, Chile (Orderable Groups): Ordered groups and topology (minicourse, three lectures)
- Aug. Dublin, Ireland (The 10<sup>th</sup> William Rowan Hamilton Geometry and Topology Workshop): Graph manifolds, left-orderability and L-spaces
- June Winnipeg, Canada (CMS special session on low-dimensional topology and geometric group theory): Bi-orderability of fundamental groups of 3-manifolds
- 2013 Dec. Ottawa, Canada (CMS special session on geometric group theory and low-dimensional topology): The Burns-Hale theorem and its generalizations
- 2012 Dec. Montreal, Canada (CMS special session on geometrical group theory): Graph manifolds, orderability, L-spaces and foliations
- June Regina, Canada (CMS special session on geometry and topology): Foliations of graph manifolds and left-orderability
- Feb. Banff, Canada (BIRS workshop): Left-orderability and foliations
- 2010 Apr. Banff, Canada (Cascade topology seminar): Group orderings and knots
- 2009 Jan. Washington DC, USA (AMS special session on orderings and logic): Limit points in the space of left orderings of a group
- 2008 May Montreal, Canada (Colloque Panquébécois des Étudiants): Cofinal elements in orderable groups
- 2007 June Vancouver, Canada (Pure Math Graduate Student Conference): Densely ordered braid subgroups
- May Banff, Canada (BIRS workshop): Normal subgroups of the braid groups and the Dehornoy order

### Seminars

- 2017 Nov. University of Manitoba (Learning seminar in geometry and topology): Free subgroups of groups of homeomorphisms
- Sept. University of Manitoba (Learning seminar in geometry and topology): The Ping-Pong Lemma
- Aug. Dalhousie University (Colloquium): An introduction to circular orderings and left orderings of groups.
- March The University of British Columbia (Topology seminar): The spaces of left and circular orderings of a group.
- 2016 July Dalhousie University (Colloquium): Smooth Foliations of 3-Manifolds
- 2015 Nov. University of Manitoba (Learning seminar in geometry and topology): Introduction to the space of left-orderings (2 talks)
- Sept. University of Manitoba (Learning seminar in geometry and topology): Introduction to group growth
- Mar. University of British Columbia (invited lecturer for a graduate class on orderable groups): Foliations and left-orderings of Seifert fibred manifolds (2 talks)
- 2014 Oct. University of Manitoba (Learning seminar in geometry and topology): Dehn surgery and fundamental groups of manifolds (2 talks)
- Mar. University of Manitoba (Colloquium): Knot groups and orderability
- Feb. University of Manitoba (Learning seminar in geometry and topology): Introduction to braids and knot theory (3 talks)
- 2013 May Dalhousie University (Colloquium): Ordered groups and 3-manifolds
- Mar. Université du Québec à Montréal (CIRGET Geometry & Topology): Orderability and knots
- Feb. University of Manitoba: Ordered groups and 3-manifolds
- 2012 Oct. McMaster University (Geometry & Topology seminar): Left-orderability, foliations, L-spaces and graph manifolds

- 2011 July University of British Columbia (Algebra & Topology seminar): Left-orderability and Dehn surgery
- 2010 Nov. Université du Québec à Montréal (CIRGET geometry & topology): Orderability and knots
- 2009 Nov. University of Tokyo (Topology seminar): An introduction to orderable groups
- Jan. Dalhousie University (Graduate Student seminar): An introduction to orderable groups
- 2008 Nov. Universidad de Santiago de Chile (Dynamical Systems seminar): Isolated points in the space of left orderings of a group
- Feb. University of British Columbia (Algebra & Topology): The space of left orders of the braid groups
- 2007 Nov. Laboratoire de Mathématiques Nicolas Oresme (invited speaker): The space of orderings and the braids
- Nov. University of British Columbia (Algebra & Topology): Normal subgroups of the braid groups and the Dehornoy order

### Organizing conferences, meetings and activities

- 2019 Co-organizer: Ordered Groups and Rigidity in Dynamics and Topology (BIRS/CMO event 19w5044), June 16–21 Oaxaca, Mexico.
- 2017 Co-organizer: CMS session in low dimensional topology and geometric group theory, December 8–11 Waterloo, Canada.
- 2016 Co-organizer: CMS session in low dimensional topology and geometric group theory, December 3–5 Niagara Falls, Canada.
- 2015 Co-organizer: CMS session in low dimensional topology and geometric group theory, December 6–9 Montreal, Canada.
- 2014 Co-organizer: CMS session in low dimensional topology and geometric group theory, June 6–9 Winnipeg, Canada.
- 2013 Co-organizer: CMS session in geometric group theory and low dimensional topology, December 6–9 Ottawa, Canada.
- Co-organizer: Low dimensional topology, knots and orderable groups, July 1–5 at Centre International de Rencontres Mathématiques, Luminy, Marseille.

### Referee and review activities

#### Journals refereed

Compositio Mathematica  
 Journal of Knot theory and its Ramifications  
 Communications in Analysis and Geometry  
 Journal of Algebra  
 Algebraic & Geometric Topology  
 Communications in Algebra  
 Proceedings of the American Mathematical Society  
 Canadian Mathematical Bulletin  
 Topology and its Applications

#### Granting agencies refereed

Fonds de recherche du Québec - Nature et technologies (FRQNT)  
 Natural Sciences and Engineering Research Council (NSERC)

**Scientific/Academic honours and grants**

- 2014 – 2015 University of Manitoba URGP (\$6000)
- 2014 – 2019 NSERC Discovery grant (\$95000 over 5 years)
- 2013 – 2016 University of Manitoba startup grant (\$45000)
- 2013 Co-PI for NSF conference grant 1305741 (\$32000 USD)
- PI for PIMS conference grant (\$4000)
- 2010 – 2012 NSERC postdoctoral fellowship, Université du Québec à Montréal
- 2008 University graduate fellowship, University of British Columbia
- 2005 – 2007 NSERC PGS-D, University of British Columbia
- 2003 – 2005 NSERC PGS-M, University of British Columbia
- 2003 King's Medal

**Teaching awards**

- 2017 Faculty of Science Award for Innovation in Teaching (\$1000)
- 2008 University of British Columbia graduate teaching award (departmental)

**Teaching activities**

- 2018 Winter Algebra 3 (MATH 3322 at the University of Manitoba)
- 2017 Fall Introduction to Analysis (MATH 2080 at the University of Manitoba)
- Differential Calculus (Math 1500 at the University of Manitoba)
- 2017 Winter Analysis 3 (MATH 3472 at the University of Manitoba)
- Differential Calculus course coordinator (Math 1500 at the University of Manitoba)
- 2016 Fall Topics in Geometric group theory
- Honours Differential Calculus (Math 1230 at the University of Manitoba)
- 2016 Winter Algebra 1 (MATH 2020 at the University of Manitoba)
- Differential Calculus (Math 1500 at the University of Manitoba)
- 2015 Fall Introduction to Topology (Math 3390 at the University of Manitoba)
- 2015 Winter Engineering Analysis 1 (Math 2132 at the University of Manitoba)
- Advanced Calculus (Math 3760 at the University of Manitoba)
- 2014 Fall Advanced Calculus (Math 3760 at the University of Manitoba)
- 2014 Winter Topology I (Math 3240 at the University of Manitoba)
- Differential Calculus (Math 1500 at the University of Manitoba)
- 2012 Fall Enriched Linear Algebra and Geometry (Math 134 at McGill)
- 2011 Fall Linear Algebra and Geometry (Math 133 at McGill)
- 2010 Fall Linear Algebra and Geometry (Math 133 at McGill)
- 2009–2010 Organizer of nine calculus workshops (Math 110 at UBC)
- 2005–2008 Ordinary differential equations (Math 265 at UBC)
- 2005 Winter Integral calculus (Math 103 at UBC)

**PhD students advised**

- current Adriana Ciupeanu (2016–present)

**MSc students advised**

- current Irshad Ayoob (2017–present)
- completed Serhii Dovhyi (2014–2017)
- Thesis: Non-left-orderable surgeries of twisted torus knots.
- Ali Khardani (2013–2014, joint supervision with Steve Boyer at UQAM)
- Thesis: Groupes ordonnés et les variétés de dimension 3.

## Undergraduate students mentored

- 2018 USRA Jeremy Friesen *Groups and topological dynamics*
- 2018 USRA Robert Harris *Density of representations of the free group*
- 2018 USRA Tessa Reimer *Isolated points in spaces of orderings*
- 2018 Hons. Jeremy Friesen (honours project) *Topological groups in physics*
- 2017 USRA Tessa Reimer *Algebraic properties of ordered groups*
- 2016 USRA Sina Zabanfahm *Spaces of left-orderings of braid groups*
- 2015 USRA Patrick Naylor *Diffuse groups and locally invariant orderings*
- 2015 USRA Colin Desmarais *A brute force approach to knot group bi-orderability*
- 2014 USRA Patrick Naylor *Bi-orderability of two bridge knot groups*
- 2014 USRA Colin Desmarais *Testing bi-orderability of knot groups*

## Postdocs mentored

- 2017–present Ty Ghaswala
- 2015–2016 Juliana Theodoro de Lima (co-supervisor with Steve Boyer)

## Seminars organized or co-organized

- 2017–2018 Learning seminar in geometry and topology (at University of Manitoba, co-organizer)
- 2014–2016 Learning seminar in geometry and topology (at University of Manitoba, co-organizer)
- 2013 Co-organizer, CIRGET-LaCIM seminar (at UQAM)
- 2011 Working group in low dimensional topology (at UQAM)

**Committee work**

## Administrative committees

- Hiring (U of M departmental committee) (2017)
- Promotion (U of M departmental committee) (2016)
- Member of the CMS finance committee (2016–present)
- Executive (U of M departmental committee) (2016–present)
- Scholarships and awards (U of M departmental committee) (2016–present)
- Hiring (U of M departmental committee) (2015)
- Research advisory team science (U of M faculty committee) (2014–present)
- Hiring (U of M departmental committee) (2014)
- Strategic planning (U of M departmental committee) (2013–2016)

## Examination committees

- Jeffrey Lanyon (Chair, 2018)
- Monsur Chowdhury (Chair, 2016)
- Ji Zhou (Chair, 2016)
- Juliana Theodoro de Lima (External examiner, 2014)
- Armin Hatefi (Chair, 2014)

**References**

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