Andrew Sale   Curriculum Vitae

PERSONAL	*Address:* Department of Mathematics	*Email:*	andrew.w.sale@gmail.com

Address: Department of Mathematics
Univeristy of Hawaii at Manoa
2565 McCarthy Mall (Keller Hall 401A)
Honolulu, Hawaii 96822

Email: andrew.w.sale@gmail.com
andrew.sale@hawaii.edu

Website: http://math.hawaii.edu/~andrew/

CURRENT EMPLOYMENT

University of Hawai'i at Mānoa, USA   **Aug 2018 – present**
Assistant Professor of Mathematics (tenure-track).

PREVIOUS EMPLOYMENT

Cornell University, USA   **Aug 2017 – May 2018**
Visiting Assistant Professor.

Vanderbilt University, USA   **Aug 2014 – Aug 2017**
Assistant Professor (non-tenure track).

Université de Rennes 1, France   **Sep 2013 – Aug 2014**
Post-doc on the ANR project: DiscGroup, Facettes des groupes discrets.
Mentor: Vincent Guirardel.

Cornell University, USA   **Jan 2013 – May 2013**
Visiting Assistant Professor.

EDUCATION

University of Oxford, Balliol College, UK   **Oct 2009 – Dec 2012**
DPhil completed under the supervision of Prof. Cornelia Druţu.
Thesis title: *The length of conjugators in solvable groups and lattices of semisimple Lie groups.*

University of Bristol, UK   **Sep 2008 – Sep 2009**
Post-graduate study begun in Bristol, supervised by Dr Tim Riley.

University of Oxford, Somerville College, UK   **Sep 2004 – Sep 2008**
MMath Mathematics (Hons) First Class

AWARDS AND GRANTS

2020–25: Simons Foundation Collaboration Grant for Mathematicians

2016: PI for NSF grant DMS–1608473: "Conference: Geometric methods in group theory"

2008–2012: EPSRC PhD Studentship (stipend and travel support for 3 1/2 years)

2008: Mary Somerville Prize

2005: Cobbe Scholarship

RESEARCH INTERESTS

Geometric Group Theory, including the study of:

- Automorphism groups of RAAGs, RACGs, and other graph products;
- The conjugacy problem from a geometric perspective;
- Relatively hyperbolic groups, mapping class groups, and lattices in semisimple Lie groups.
- Finitely generated infinite solvable groups, wreath products and various group extensions.

PREPRINTS

○ On virtual indicability and property (T) for outer automorphism groups of RAAGs,
    arXiv:2011.03576

REFEREED PUBLICATIONS

○ Outer automorphism groups of graph products: subgroups and quotients,
    with Tim Susse. To appear in *Pacific Journal of Mathematics*.

○ Calculating the virtual cohomological dimension of the automorphism group of a RAAG,
    with Matt Day and Richard Wade. *Bulletin of the London Mathematical Society* (2021).

- Outer automorphism groups of right-angled Coxeter groups are either large or virtually abelian,
    with Tim Susse. *Transaction of the AMS* (2019).
- Metric approximations of wreath products,
    with Ben Hayes. *Annales de l'Institut Fourier* (2018).
- Vastness properties of automorphism groups of RAAGs,
    with Vincent Guirardel. *Journal of Topology* (2018).
- Permute and conjugate: the conjugacy problem in relatively hyperbolic groups,
    with Yago Antolín. *Bulletin of the London Mathematical Society* (2016).
- Conjugacy length in group extensions,
    Communications in Algebra (2016).
- Geometry of the conjugacy problem in lamplighter groups,
    in Algebra and Computer Science, *AMS Contemporary Mathematics* (2016).
- The geometry of the conjugacy problem in wreath products and free solvable groups,
    Journal of Group Theory (2015).
- Metric behaviour of the Magnus embedding,
    Geometriae Dedicata (2015).
- Palindromic width of wreath products, metabelian groups and max-n solvable groups,
    with Tim Riley. *Groups Complexity Cryptology* (2014).
- Bounded conjugators for real hyperbolic and unipotent elements in semisimple Lie groups,
    Journal of Lie Theory (2014).

INVITED RESEARCH TALKS

April 2018 *The Geometry of outer spaces and outer automorphism groups*, University of Warwick.

September 2017 *Cornell University*, Topology and Geometric Group Theory Seminar.

June 2017 *32nd Summer Conference on Topology and its Applications*, University of Dayton, Ohio.

April 2017 *Redbud Geometry/Topology Conference*, University of Arkansas.

March 2017 *University of Oklahoma*, Geometry and Topology Seminar.

January 2017 *Non-Positive Curvature in Action*, Isaac Newton Institute, Cambridge, UK.

August 2016 *Vanderbilt University*, Topology and Group Theory Seminar.

June 2016 *ICMAT, Madrid*, Seminario de Teoría de Grupos.

June 2016 *University of Bristol*, Algebra and Geometry Seminar.

April 2016 *CUNY Graduate Center*, Algebra and Cryptography Seminar.

March 2016 *Cornell University,* Topology and Geometric Group Theory Seminar.

January 2016 *Vanderbilt University,* Topology and Group Theory Seminar.

May 2015 *Spring Topology and Dynamics Conference,* Bowling Green State University, Ohio.

March 2015 *University of Utah, Salt Lake City,* Max Dehn Seminar.

March 2015 *University of Wisconsin, Madison,* Geometry and Topology Seminar.

January 2015 *Joint Mathematics Meeting, San Antonio TX,* AMS Special Session in Groups, Algorithms, Cryptography.

October 2014 *Vanderbilt University,* Topology and Group Theory Seminar.

January 2014 *Institut Fourier, Grenoble,* Séminaire de Topologie.

September 2013 *Université de Rennes 1,* Séminaire de Théorie Ergodique.

April 2013 *Cornell University,* Lie Groups Seminar.

April 2013 *Binghamton University,* Geometry and Topology Seminar.

February 2013 *Cornell University,* Topology Seminar.

November 2012 *University of Oxford,* Topology Seminar.

May 2012: *Université Paris-Sud 11,* Séminaire de Théorie Géométrique des Groupes.

May 2012: *Ecole Normale Supérieure de Lyon,* Séminaire de Géométrie et Dynamique.

March 2012: *North British Geometric Group Theory Seminar,* ICMS, Edinburgh, Scotland.

Teaching at UH Mānoa		
Fall 2019:	Math 253A	— Accelerated Calculus III
	Math 623	— Geometric group theory
Spring 2019:	Math 253A	— Accelerated Calculus III
Fall 2018:	Math 241	— Calculus I
	Math 421	— Topology

Previous Teaching

Vanderbilt University:
Methods of Linear Algebra
Methods of Ordinary Differential Equations
Differential Equations with Linear Algebra
Accelerated Single-Variable Calculus I
Accelerated Single-Variable Calculus II
Multivariable Calculus

Cornell University:
Multivariable Calculus for Engineers
Mathematics & Politics
Abstract Algebra
Calculus 3

University of Oxford:
Linear Algebra I (TA)
Linear Algebra II (TA)
Introduction to Groups, Rings and Fields (TA)
Integration (TA)
Pure Math revision classes (TA)
Abelian, Nilpotent and Solvable Groups (TA)

Université de Rennes:
Mapping Class Groups (graduate reading course).

Further Activities

2021: I served on the PhD Committee for Daniel Flores.

2020-21: I was Faculty Advisor for the UH Manoa AMS Student Chapter.

2019-21: I established and co-organized the Geometric Group Theory Seminar at UH Manoa.

2018-21: I have been active on various committees at UH Manoa, notably the Curriculum Committee (2018-21) and two hiring committees.

2018: I was involved in the organization of the 54th Cornell Topology Festival.

2017: I was a co-organizer of the Topology and Group Theory Seminar at Vanderbilt University.

2016: I was an organizer for the weekend workshop "Geometric methods in group theory," held at Vanderbilt University, and PI for an NSF grant awarded to support the workshop.
Website: `https://my.vanderbilt.edu/shanksgroups16/`

2013-14: I organized a groupe de travail (reading group) on mapping class groups for graduate students at the Unvieristé de Rennes 1.

2011: I organized the Taught Course Centre Graduate Event Day: Algebra, held at University of Oxford. This was a one-day conference for graduate students in the UK who study various areas of algebra. All the talks were given by graduate students or young post-docs.