

Emily Cliff

Département de mathématiques
Faculté des sciences, Local D3-1031
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EMPLOYMENT *Professeure adjointe (assistant professor)* November 2021–present
Département de mathématiques, Université de Sherbrooke, Canada

Lecturer in Pure Mathematics July 2019–July 2021
School of Mathematics and Statistics, University of Sydney, Australia

J.L. Doob Research Assistant Professor August 2016–August 2019
Department of Mathematics, University of Illinois at Urbana–Champaign, USA

Research Fellow in Geometry and Representation Theory August 2015–August 2016
Mathematical Institute, University of Oxford, United Kingdom

DEGREES *Doctor of Philosophy, Mathematics* October 2011–September 2015
University of Oxford, Oxford, United Kingdom

- *Universal D -modules, and factorisation structures on Hilbert schemes of points*
- Supervised by Kobi Kremnitzer.

Master of Science, Mathematics September 2010–August 2011
University of Toronto, Toronto, Ontario, Canada

- GPA 4.0
- Master's project: *Lie bialgebras following Belavin-Drinfeld*
Supervised by Dror Bar-Natan and Joel Kamnitzer.

PUBLICATIONS Cliff, E.: Chiral algebras, factorization algebras, and Borchers's singular commutative rings approach to vertex algebras, *Communications in Mathematical Physics* (2022). doi:10.1007/s00220-021-04307-4

Cliff, E., T. Nevins, and S. Shen: On the Kirwan map for moduli of Higgs bundles, *Algebraic Geometry* (2021). doi:10.14231/AG-2021-011

Cliff, E.: Universal factorization spaces and algebras, *Mathematical Research Letters* (2019). doi:10.4310/MRL.2019.v26.n4.a5

D. Berwick-Evans, E. Cliff, N. Ganter, A. Tripathy, and J. Wen: Representation theory and the elliptic frontier, *Notices of the American Mathematical Society* (2019). doi: 10.1090/noti1805

Cliff, E.: Universal \mathcal{D} -modules and stacks of étale germs of n -dimensional varieties, *European Journal of Mathematics* (2017). doi:10.1007/s40879-017-0135-7

Cliff, E.: Factorisation structures on Hilbert schemes of points, *Oberwolfach Reports*, Report No. 25 (2016).

PREPRINTS	String structures, 2-groups bundles, and a categorification of the Freed–Quinn line bundle (joint with Daniel Berwick-Evans, Laura Murray, Apurva Nakade, and Emma Phillips). arXiv:2110.07571	
THESIS	<i>Universal D-modules, and factorisation structures on Hilbert schemes of points.</i> University of Oxford, 2015.	
GRANTS	<i>NSERC Discovery Grant, Discovery Launch Supplement.</i>	April 2022–March 2027 (\$107,500)
	<i>NSF conference grant (for Elliptic Cohomology Days).</i> Joint with Daniel Berwick-Evans and Arnav Tripathy.	June 2019.
	<i>AMS–Simons Travel Grant (\$4000).</i>	July 2017–July 2019.
TEACHING EXPERIENCE	<i>MAT193: Algèbre linéaire (physique)</i> • Université de Sherbrooke	Automne 2022
	<i>MAT729: Algèbre commutative et géométrie algébrique</i> • Université de Sherbrooke	Hiver 2022
	<i>MAT253: Algèbre linéaire</i> • Université de Sherbrooke	Hiver 2022, 2023
	<i>MATH1012: Linear algebra</i> • Unit coordinator and sole lecturer, University of Sydney • Cohort of 2850 students • Lectures delivered online, tutorials delivered in person and online	Semester 1 2021
	<i>MATH1004/1904: Discrete mathematics</i> • Lecturer and tutor, University of Sydney • In 2020, lectures and tutorials were delivered online	Semester 2 2019, 2020
	<i>MATH1014: Introduction to linear algebra</i> • Lecturer and tutor, University of Sydney	Intensive January 2020
	<i>MATH 241: Vector calculus</i> • Lecturer, UIUC	Spring 2019
	<i>MATH 595: Factorization algebras</i> • Lecturer, UIUC	Fall 2018
	<i>MATH 595: Modern algebraic geometry II—sheaf cohomology</i> • Lecturer, UIUC	Spring 2018
	<i>MATH 595: Modern algebraic geometry III—curves and surfaces</i> Spring 2018 • Lecturer, UIUC	Spring 2017, Spring 2018

	<i>MATH 402: Non-Euclidean geometry</i>	Fall 2016, Fall 2017, Fall 2018
	• Lecturer, UIUC	
	<i>Retaining-fee lecturer in pure mathematics</i>	October 2014–June 2016
	• Somerville College, University of Oxford	
	<i>Third/fourth year algebra courses</i>	October 2011–June 2014
	• Representation theory; groups and character theory; Galois theory	
	• Teaching assistant, class tutor, University of Oxford	
	<i>MAT135: Calculus I</i>	September 2010–April 2011
	• Teaching assistant, University of Toronto	
STUDENTS SUPERVISED	Cameron Eggins, Honours student	September 2020–present
	Yves Lolelo, MSc student	September 2022–present
	Cloé Allard, undergraduate research project	Winter 2023
TEACHING AWARDS	<i>UIUC list of teachers ranked as excellent.</i>	Fall 2016, Spring 2017, Fall 2018
	<i>Shortlist for the Oxford University Students' Union "Outstanding Tutor" award in the mathematical, physical, and life sciences division.</i>	May 2016
WORKSHOPS/ SEMINARS ORGANIZED	Co-organizer for workshop on topological moonshine, UIUC	July 2023
	Co-organizer for SAG summer school on fibrations and connections, Sherbrooke	June 2023
	Co-organizer for SMRI Algebra and Geometry Online	May 2020–March 2021
	Co-organizer for Elliptic Cohomology Days, UIUC	June 2019
	Co-organizer for AMS mathematics research community on equivariant elliptic cohomology and geometric representation theory	June 2019
	Organizer for UIUC algebraic geometry seminar	2017–2018
	Co-organizer for special session of the AMS sectional meeting: quantum field theories and geometric representation theory	October 2016
	Co-organizer for Deformation Week (workshop for graduate students), University of Oxford	April 2013
INTERNAL SEMINARS ORGANIZED	Co-organizer for learning seminar on quantum computing and category theory	August 2022–present

Co-organizer for learning seminar on Hilbert schemes August–December 2020

Organizer for graduate summer school on D -modules July 2017

Co-organizer for learning seminar on the WZW model and CFT May 2017

Co-organizer for reading group on twisted K -theory and moduli spaces of principal G -bundles Fall 2016

Co-organizer for reading group on quantum groups and affine Lie algebras Hilary and Trinity 2016

Co-organizer for reading group on “Tensor structures arising from affine Lie algebras I–IV” (Kazhdan–Lusztig) Hilary and Trinity 2016

Organizer for reading group on derived categories Trinity 2012

SCHOOL SERVICE

Faculty organizer: Université de Sherbrooke club math (weekly math seminars aimed at undergraduates) August 2022–present

Department–library liaison officer
Département de mathématiques, Université de Sherbrooke November 2021–present

Volunteer: Université de Sherbrooke cercle mathématique (problem solving for children) November 2021–present

Member: CRM-ISM postdoctoral hiring committee December 2021, 2022

Member: Equity, Diversity, and Inclusion Committee
School of Mathematics and Statistics, University of Sydney September 2020–July 2021

Member: Equity, Diversity, and Inclusion Working Party
School of Mathematics and Statistics, University of Sydney February–March 2020

INVITED TALKS

Upcoming: Isaac Newton Institute, Cambridge (UK), *Workshop on applied and computational algebraic geometry*, January 2024.

Upcoming: ICMS, Edinburgh (UK), *Workshop on geometric representation theory and W -algebras*, August 2023.

Upcoming: Montreal (Canada), *Fifth Canada–Mexico–USA conference in representation theory, noncommutative algebra, and categorification*, August 2023.

Upcoming: BIRS/UBC Okanagan (Canada), *Workshop on the geometry, algebra, and physics of Higgs bundles*, May/June 2023.

Upcoming: Université de Québec à Montréal (Canada), *CIRGET seminar*, April 2023.

Upcoming: Dalhousie University (Canada), *Mathematics Colloquium*, March 2023.

Upcoming: University of Toronto (Canada), *Algebraic geometry seminar*, February 2023.

University of Hertfordshire (UK), *Mathematical physics seminar*, November 2022. *Online.*

CRM (Canada), *Workshop on quantum symmetries: tensor categories, topological quantum field theories, vertex algebras*, October 2022.

University of Ottawa/Carleton University (Canada), *Algebra Day*, October 2022.

ICMS, Edinburgh (UK), *Workshop on bundles and conformal blocks with a twist*, June 2022. *Online.*

Université de Sherbrooke/Northeastern, *TRAC seminar (théorie des représentations et ses applications et connexions aux autres domaines)*, May 2022. *Online.*

University of Leeds (UK), *Algebra seminar*, April 2022. *Online.*

Queen's University (Canada), *Algebra and geometry seminar*, April 2022.

CRM (Canada), *Mathematical physics seminar*, April 2022. *Online.*

IMPA (Brazil), *Workshop on representation theory, vertex and chiral algebras*, March 2022. *Online.*

Université de Sherbrooke (Canada), *Séminaire SAG (structures algébriques et géométriques)*, March 2022.

Western Hemisphere colloquium on geometry and physics, February 2022. *Online.*

Instituto Superior Técnico (Portugal), *Topological Quantum Field Theory Club*, February 2022. *Online.*

Boston University (USA), *Geometry and physics seminar*, December 2021. *Online.*

ICTS, Tata Institute of Fundamental Research (India), *Workshop: quantum fields, geometry, and representation theory*, July 2021. *Online.*

Australian National University (Australia), *Workshop: the mathematics of conformal field theory II*, July 2021. *Online.*

IMPA (Brazil), *Conference: String-Math*, June 2021. *Online.*

MIT (USA), *Conference: Viva Talbot*, June 2021. *Online.*

Berkeley (USA), *Learning seminar: Conformal field theory and chiral algebras*, June 2021. *Online.*

University of Saskatchewan (Canada), *Departmental seminar*, February 2021. *Online.*

University of Winnipeg (Canada), *Departmental seminar*, February 2021. *Online.*

Northeastern (USA), *Geometry, physics, and representation theory seminar*, February 2021. *Online*.

Université de Sherbrooke (Canada), *Departmental seminar*, February 2021. *Online*.

Ruhr-Universität Bochum (Germany), *Topology seminar*, December 2020. *Online*.

MSRI Berkeley (USA), *Workshop: tensor categories and topological quantum field theories*, March 2020. *Online*.

Mooloolaba (Australia), *Conference: New connections in representation theory*, February 2020.

Australian National University (Australia), *Algebra and topology seminar*, November 2019.

University of New South Wales (Australia), *Pure maths seminar*, November 2019.

University of Melbourne (Australia), *Pure maths seminar*, September 2019.

Simons Center for Geometry and Physics (USA), *Workshop on current trends on spectral data for Higgs bundles*, May 2019.

Louisiana State University (USA), *Southeastern Lie theory Workshop XI*, May 2019.

IHES (France), *Conference on non-local aspects of holomorphic and topological field theory*, January 2019.

University of Toronto/Fields Institute (Canada), *Geometric representation theory seminar*, November 2018.

University of Ottawa (Canada), *Algebra seminar*, November 2018.

Indiana University (USA), *Algebra seminar*, October 2018.

University of Saskatchewan (Canada), *Workshop on geometry and physics of gauge theories at infinity*, August 2018.

RIMS Kyoto (Japan), *Conference on vertex operator algebras and symmetries*, July 2018.

IPMU Tokyo (Japan), *Conference on vertex algebras and factorization algebras*, July 2018.

University of Notre Dame (USA), *Conference on geometric representation theory*, June 2018.

University of Washington (USA), *Conference on non-commutative algebra and related fields*, March 2018.

Rutgers University, New Brunswick (USA), *Lie group/quantum mathematics seminar*, February 2018.

Perimeter Institute for Theoretical Physics (Canada), *Mathematical physics seminar*, January 2018.

University of Sydney (Australia), *Conference on future directions in representation theory*, December 2017.

Northern Illinois University (USA), *Colloquium*, November 2017.

University of Oxford (UK), *Mini-course at graduate summer school on modern moduli theory*, September 2017.

University of Chicago (USA), *Introductory talk at conference on interactions between representation theory and algebraic geometry*, August 2017.

University of Lancaster (UK), *Colloquium*, June 2017.

University of Illinois at Chicago (USA), *Geometry, topology, and dynamics seminar*, April 2017.

University of Illinois at Urbana–Champaign (USA), *Doob colloquium*, April 2017.

University of Saskatchewan (Canada), *Algebra, geometry, and number theory seminar*, March 2017.

University of Saskatchewan (Canada), *Colloquium*, March 2017.

Plymouth University (UK), *Pure maths seminar*, February 2017.

University of Illinois at Urbana–Champaign (USA), *Algebraic geometry seminar*, August 2016.

Max Planck Institute for Mathematics (Germany), *Higher differential geometry seminar*, July 2016.

Oberwolfach (Germany), *Workshop on factorization algebras and functorial field theories*, May 2016.

Bristol (UK), *Bristol Leicester Oxford Colloquium (BLOC) meeting at the British Mathematical Colloquium*, March 2016.

Edinburgh (UK), *MAXIMALS algebra seminar*, February 2016.

University of Illinois at Urbana–Champaign (USA), *Algebraic geometry seminar*, February 2016.

Mooloolaba (Australia), *Conference on geometric and categorical representation theory*, December 2015.

Kioloa (Australia), *Workshop on topology and representation theory*, November 2015.

University of East Anglia (UK), *Pure maths seminar*, October 2015.

University of Oxford (UK), *Workshop on derived structures in geometry and representation theory*, September 2015.

EPFL (Switzerland), *Geometry seminar*, April 2015.

University of Copenhagen (Denmark), *Geometry and topology seminar*, February 2015.

University of Alberta (Canada), *Algebra seminar*, January 2015.

University of Alberta (Canada), *Special talk*, January 2015.

Perimeter Institute for Theoretical Physics (Canada), *Mathematical physics seminar*, January 2015.

Imperial College (UK), *MAGIC (algebraic geometry) seminar*, October 2014.

Rice University (USA), *Algebraic geometry and number theory seminar*, September 2014.

University of Oxford (UK), *Deformation Week (graduate summer school)*, April 2013.