

# Emily Cliff

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Department of Mathematics, University of Illinois at Urbana–Champaign  
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**EMPLOYMENT** *Lecturer in Pure Mathematics* July 2019–June 2022  
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 factorization 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.

*Bachelor of Arts,* September 2006–April 2010

*Combined Honours in Mathematics and Linguistics*

University of Alberta, Edmonton, Alberta, Canada

- First class honours (GPA 4.0)
- Honours thesis: *Type frequency in exemplar-based phonology*  
Supervised by Robert Kirchner, 2009–2010.
- Summer project: *Two-parameter affine Hecke algebras*  
Supervised by Nicolas Guay, 2010.
- Summer project: *Maximal singularities in affine Schubert varieties*  
Supervised by Jochen Kuttler, 2009.

**PUBLICATIONS** Universal factorization spaces and algebras  
(to appear in *Mathematical Research Letters*).  
arXiv:1608.08122.

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).

<b>PREPRINTS</b>	On the Kirwan map for moduli of Higgs bundles (joint with Thomas Nevins and Shiyu Shen). arXiv:1808.10311	
	Hilbert schemes and factorization spaces (in preparation).	
	Factorization algebras, chiral algebras, and Borchers' singular commutative rings approach to vertex algebras (in preparation).	
<b>GRANTS</b>	<i>AMS–Simons Travel Grant (\$4000).</i>	July 2017–July 2019.
<b>TEACHING EXPERIENCE</b>	<i>MATH 241: Vector calculus</i>	Spring 2019
	• Lecturer, UIUC	
	<i>MATH 595: Factorization algebras</i>	Fall 2018
	• Lecturer, UIUC	
	<i>MATH 595: Modern algebraic geometry II—sheaf cohomology</i>	Spring 2018
	• Lecturer, UIUC	
	<i>MATH 595: Modern algebraic geometry III—curves and surfaces</i>	Spring 2017, Spring 2018
	• Lecturer, UIUC	
<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		
<b>TEACHING AWARDS</b>	<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
<b>WORKSHOPS/ SEMINARS ORGANIZED</b>	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: October 2016  
quantum field theories and geometric representation theory

Co-organizer for Deformation Week (workshop for graduate students), April 2013  
University of Oxford

**INTERNAL  
SEMINARS  
ORGANIZED**

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

**INVITED  
TALKS**

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

Louisiana State University, *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.

*I have also given over 30 talks at internal reading groups and learning seminars.*