

Maxence Mayrand

Curriculum Vitae | December 2020

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Employment

University of Toronto | Postdoctoral Fellow 2019–present

Geometric Structures Laboratory, Department of Mathematics

Supervisor: Prof. Marco Gualtieri

Jesus College, University of Oxford | Lecturer in Pure Mathematics 2018–2019

Part-time teaching position during my last year of PhD.

Education

University of Oxford | DPhil in Mathematics 2015–2019

Supervisor: Prof. Andrew Dancer

McGill University | BSc Honours Mathematics 2012–2015

Mentor: Prof. Niky Kamran

Research interests

I am a geometer whose research is influenced in large part by questions arising from theoretical physics, especially quantum field theory.

Keywords: Complex geometry; hyperkähler geometry; geometric quantization; holomorphic Poisson geometry; Lie groupoids; Lie algebras; integrable systems; moment maps; symplectic reduction; geometric invariant theory; singular spaces; moduli spaces; gauge theory; Yang–Mills equations.

Papers

- [1] Mayrand, M., *Hyperkähler metrics near Lagrangian submanifolds and symplectic groupoids*. [arXiv:2011.09282](#)
- [2] Mayrand, M., *Stratified hyperkähler spaces and Nahm's equations (PhD thesis)*. [Oxford University Research Archive](#) (2019)
- [3] Mayrand, M., *Kempf–Ness type theorems and Nahm equations*. [Journal of Geometry and Physics](#), **136** (2019), 138–155. [arXiv:1809.04518](#)
- [4] Mayrand, M., *Stratification of singular hyperkähler quotients*. [arXiv:1807.05992](#)

- [5] Mayrand, M., *Stratified hyperkähler spaces from semisimple Lie algebras*. [Transformation Groups](#) (2018). [arXiv:1709.09126](#)
- [6] Mayrand, M., *Particle motion in monopoles and geodesics on cones*. [Symmetry, Integrability and Geometry: Methods and Applications \(SIGMA\)](#), **10** (2014), 102, 17 pages. [arXiv:1407.7919](#)

Teaching

University of Toronto

- Introduction to Combinatorics (MAT344) Fall 2020
- Concepts in Abstract Mathematics (MAT246) Winter 2020

Jesus College, University of Oxford

- Linear Algebra I (1st year) Fall 2018
- Introduction to University Mathematics (1st year) Fall 2018
- Introduction to Complex Numbers (1st year) Fall 2018
- Linear Algebra II (1st year) Winter 2019
- Groups and Group Actions (1st year) Winter–Spring 2019
- Topology (2nd year) Winter 2019
- Group Theory (2nd year) Spring 2019

Mathematical Institute, University of Oxford

- Commutative Algebra (3rd year); TA. Winter 2018
- Lie Algebras (4th year); Tutor. Fall 2017
- Lie Algebras (4th year); Tutor. Spring 2017
- Representation Theory of Semisimple Lie Algebras (4th year); TA. Winter 2017
- Lie Algebras (4th year); TA. Fall 2016

Talks

1. *Hyperkähler realizations of holomorphic Poisson surfaces* 11 Dec 2020
 Friday Fish Seminar
 Utrecht University
2. *Mini-course on Symplectic Reduction and Geometric Invariant Theory* 3 Dec 2020
 2020 Canadian Mathematical Society Winter Meeting
3. *Symplectic reduction along a submanifold and the Moore–Tachikawa TQFT* 3 Sep 2020
 Northeastern University
 Geometry, Physics, and Representation Theory Seminar
4. *Hyperkähler structures on holomorphic symplectic groupoids* 7 Jun 2020
 Workshop on Lie theory and integrable systems in symplectic and
 Poisson geometry
5. *Hyperkähler structures on symplectic realizations of holomorphic Poisson surfaces* 28 May 2020
 School on Geometry and Dynamics of Foliations
 CIRM

6. *Kempf-Ness type theorems and Nahm's equations* 7 Dec 2019
 2019 Canadian Mathematical Society Winter Meeting
 Algebraic Geometry and Representation Theory
 Toronto, Canada
7. *Stratified hyperkähler spaces, GIT, and Nahm's equations* 5 Dec 2019
 Boston College
 Geometry and Topology Seminar
8. *Symplectic reduction, GIT quotients, and Nahm's equations* 21 Nov 2019
 McMaster University
 Geometry and Topology Seminar
9. *Singular hyperkähler reduction and geometric invariant theory* 11 Nov 2019
 University of Toronto
 Symplectic Geometry Seminar
10. *Two lectures on Nahm's equations* 30–31 Oct 2019
 The Fields Institute
 Geometric Structures Laboratory Seminar
11. *Symplectic reduction, GIT quotients, and Nahm's equations* 11 Oct 2019
 CIRGET (Centre interuniversitaire de recherches en géométrie et topologie)
 Geometry and Topology Seminar
12. *Singular hyperkähler quotients* 16 May 2019
 University of Duisburg-Essen, Germany
 The Essen Seminar for Algebraic Geometry and Arithmetic
13. *TQFTs with values in holomorphic symplectic varieties* 14 Feb 2019
 University of Oxford
 Junior Geometry and Topology Seminar
14. *Stratified hyperkähler spaces* 6 Feb 2019
 Centre for Quantum Geometry of Moduli Spaces, Aarhus, Denmark
 QGM seminars
15. *Hyperkähler quotients and geometric invariant theory* 5 Feb 2019
 Centre for Quantum Geometry of Moduli Spaces, Aarhus, Denmark
 Introductory seminars
16. *Nahm's equations, groupoids, and Higgs bundles* 25 Jul 2018
Part II of a mini-course on my thesis work
 The Fields Institute
 Geometric Structures Laboratory Seminar
17. *Stratified hyperkähler spaces and Nahm's equations* 24 Jul 2018
Part I of a mini-course on my thesis work
 The Fields Institute
 Geometric Structures Laboratory Seminar
18. *Stratified hyperkähler spaces* 15 Jun 2018
 University of Edinburgh
 GLEN Algebraic Geometry Seminar
19. *Stratified hyperkähler spaces* 5 Mar 2018
 University of Oxford
 Geometry and Analysis Seminar

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| 20. | <i>Symplectic reduction and geometric invariant theory</i>
University of Oxford
Junior Geometry and Topology Seminar | 8 Feb 2018 |
| 21. | <i>Stratified Spaces and Nahm Equations</i>
University of Oxford
Junior Geometry and Topology Seminar | 11 Apr 2017 |
| 22. | <i>Nahm equations, stratified hyperkähler spaces and the Moore–Tachikawa category.</i>
ICTS, Tata Institute of Fundamental Research, Bangalore, India
ICTS Special Seminar | 30 Mar 2017 |
| 23. | <i>Nahm equations and stratified hyperkähler spaces</i>
Indian Institute of Science, Bangalore, India
School and Workshop on Geometry and Physics of Moduli Spaces | 28 Mar 2017 |
| 24. | <i>A hyperkähler metric on the cotangent bundle of a complex reductive group</i>
University of Oxford
Junior Geometry and Topology Seminar | 2 Jun 2016 |

Scholarships and awards

University of Toronto

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|---|-----------|
| • NSERC Postdoctoral Fellowship (2 years) | 2019–2021 |
| • FRQNT Postdoctoral research scholarship (2 years) | 2019–2021 |

Pacific Institute for the Mathematical Sciences

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| • PIMS Postdoctoral Fellowship (2 years) (declined) | 2019–2021 |
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University of Oxford

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| • Moussouris Scholarship, University of Oxford (3.5 years)
Full scholarship (tuition fees, college fees, and living expenses) | 2015–2019 |
| • NSERC CGS D (2 years) (declined)
Alexander Graham Bell Canada Graduate Scholarships–Doctoral Program | 2017–2019 |
| • NSERC PGS D (2 years)
Postgraduate Scholarships–Doctoral Program | 2017–2019 |
| • FRQNT doctoral scholarship (2 years) (declined) | 2017–2019 |
| • FRQNT master scholarship (2 years) | 2015–2017 |

McGill University

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| • Dean’s Honour List | May 2015 |
| • First Class Honours in Mathematics | May 2015 |
| • Gowrisankaran Prize in Mathematics and Statistics | May 2015 |
| • NSERC Undergraduate Student Research Award | Summer 2014 |
| • Kamran Undergraduate Award | Summer 2013 |