Marco Gualtieri

Professor of mathematics
University of Toronto

mgualt@math.toronto.edu
www.math.toronto.edu/mgualt
(647) 983-0908
Date of birth: March 10, 1979
Citizenship: Canadian

1 Degrees

2004 D. Phil., University of Oxford
Thesis title: *Generalized complex geometry*
Thesis supervisor: Prof. N. J. Hitchin

1999 B.Sc. Mathematics and Physics, McGill University

2 Appointments

2016– Full Professor, University of Toronto

2013–2016 Associate Professor, University of Toronto

2008–2013 Assistant Professor, University of Toronto

2005–2008 C.L.E. Moore Instructor, MIT

2004-2005 NSERC Postdoctoral Fellow, Fields Institute

2002-2003 Stipendiary Lecturer, New College, Oxford

3 Honours

2020 Cathleen Synge-Morawetz Prize of the CMS

2015 Simons Fellowship in Mathematics

2015 Distinguished Professor Award, University of Toronto

2014 Coxeter-James Prize of the CMS

2012 André-Aisenstadt prize, Centre de Recherches Mathématiques

2010 Lichnerowicz prize in Poisson geometry

2010 Most Cited Articles 2006-2010 award, from the journal *Advances in Mathematics*

2010 Early Researcher Award, Government of Ontario

2000–2002 Julie Payette NSERC postgraduate award

1999-2003 Rhodes Scholarship

4 Visiting Positions

2022 Visiting Scholar (Spring), ICMAT

2022 Visiting Scholar (Summer), Geneva

2016 Visiting Scholar (Spring), Imperial College

2015 Fondation Jacques Hadamard Fellowship (Summer), IHP Paris

2015 Visiting Scholar (Spring), UC Berkeley

2006 Visiting member (Spring), IHES

2003 General member (Fall), MSRI

5 Research Grants

2018-2023 NSERC Discovery grant ($228000)

2013–2017 NSERC Discovery Grant ($190000)

2013–2015 NSERC Accelerator supplement ($120000)

2015 GEAR Network Exchange Grant ($13000)

2013 NSERC Engage grant in architectural geometry (Undergraduate training, $25000)

2010–2014 Early Researcher Award, Government of Ontario, ($150000)

2008–2012 NSERC Discovery Grant, ($85000)

2010 Connaught grant, University of Toronto, ($40000)

6 Publications

1. (2023) M. Bailey and M. Gualtieri, *Integration of generalized complex structures*, to appear in **Journal of Mathematical Physics**, 35pp.
2. (2022) F. Bischoff and M. Gualtieri, *Brane quantization of toric Poisson varieties*, **Commun. Math. Phys.** 391, 357–400 (2022). https://doi.org/10.1007/s00220-022-04315-y
3. (2022) F. Bischoff, M. Gualtieri, and M. Zabzine, *Morita equivalence and the generalized Kähler potential*, **J. Differential Geom.** 121(2): 187-226. DOI: 10.4310/jdg/1659987891
4. (2021) M. Gualtieri and K. Luk *Log Picard algebroids and Meromorphic line bundles*, **International Mathematics Research Notices**, Volume 2021, Issue 21, November 2021, Pages 16592–16635, https://doi.org/10.1093/imrn/rnz272
5. (2020) M. Gualtieri, M. Matviichuk, and G. Scott *Deformation of Dirac structures via L_∞ algebras*, **International Mathematics Research Notices**, Volume 2020, Issue 14, July 2020, Pages 4295–4323, https://doi.org/10.1093/imrn/rny134

6. (2018) M. Gualtieri, *Generalized Kähler metrics from Hamiltonian deformations*, in Andrew Dancer, Jørgen Ellegaard Andersen, and Oscar García-Prada (eds), Geometry and Physics: **Volume II: A Festschrift in honour of Nigel Hitchin** (Oxford, 2018; online edn, Oxford Academic, 20 Dec. 2018), https://doi.org/10.1093/oso/9780198802020.003.0023

7. (2018) M. Bailey, G. Cavalcanti, and M. Gualtieri, *Type one generalized Calabi-Yaus*, **J. Geom and Phys.** Vol 120, 2018, 89–95, doi:10.1016/j.geomphys.2017.03.012.

8. (2017) G. Cavalcanti and M. Gualtieri, *Stable generalized complex structures*. **Proc. London Math. Soc.** doi:10.1112/plms.12093

9. (2017) M. Bailey, M. and Gualtieri, M., *Local analytic geometry of generalized complex structures.* **Bull. London Math. Soc.**, 49: 307–319. doi:10.1112/blms.12029

10. (2017) A. Cabrera, M. Gualtieri, and E. Meinrenken, *Dirac geometry of the holonomy fibration*, **Comm. Math. Physics.** (2017) 355: 865. doi:10.1007/s00220-017-2936-4.

11. (2017) M. Gualtieri, S. Li, A. Pelayo, T. Ratiu, *The tropical momentum map: a classification of toric log symplectic manifolds*. **Math. Ann.**, 367 (2017), No. 3, 1217–1258.

12. (2015) M. Gualtieri, S. Li and B. Pym, *The Stokes groupoids*, **J. Reine Angew. Math.**, 0.0 (40pp.), 2015.

13. (2014) H. Bursztyn, G. Cavalcanti and M. Gualtieri, *Generalized Kähler geometry of instanton moduli spaces*, **Comm. Math. Phys.**, 1–30, 2014.

14. (2014) M. Gualtieri, *Generalized Kähler geometry*, **Comm. Math. Phys.**, 0010-3616 (2014), 1–35.

15. (2013) M. Gualtieri, S. Li, *Symplectic groupoids of log symplectic manifolds*, **Inter. Math. Res. Not.**, rnt024 (2013), 53 pp.

16. (2013) M. Gualtieri, B. Pym, *Poisson modules and degeneracy loci*, **Proc. London Math. Soc.**, pds090 (2013), 28 pp.

17. (2012) P. Best, M. Gualtieri, P. Hayden *Orbits of the centralizer of a linear operator*, **J. Lie theory**, 22 (2012), No. 4, 1039–1048, `arXiv:1110.4899 [math.DS]`.

18. (2011) M. Gualtieri, *Generalized complex geometry*, **Ann. of Math. 174** (2011), 75–123, doi:`10.4007/annals.2011.174.1.3`.

19. (2011) G. Cavalcanti and M. Gualtieri, *Blowing up generalized Kähler 4-manifolds*, **Bull. Braz. Math. Soc. (N.S.)** 42 (2011), no. 4, 507–536. `arXiv:1106.1481v1 [math.DG]`.

20. (2010) G. Cavalcanti and M. Gualtieri, *Generalized complex geometry and T–duality*, *A celebration of the mathematical legacy of Raoul Bott*, 341–365, **CRM Proc. Lecture Notes 50**, Amer. Math. Soc., Providence, RI, 2010.

21. (2010) M. Gualtieri, *Branes on Poisson varieties*, **The many facets of geometry**, 368–394, edited by Jean-Pierre Bourguignon, Simon Salamon, and Oscar Garcia Prada, Oxford Univ. Press, Oxford (2010), `arXiv:0710.2719v1 [math.DG]`.

22. (2009) G. Cavalcanti and M. Gualtieri, *Blow-up of generalized complex 4-manifolds*, **J. Topol.** 2, 840–864, 2009. `arXiv:0806.0872v1 [math.SG]`.

23. (2008) H. Bursztyn, G. Cavalcanti, and M. Gualtieri, *Generalized Kähler and Hyper-Kähler quotients*, in "Poisson Geometry in Mathematics and Physics", **Contemporary Mathematics** 450, 61-77, 2008.
arXiv:math/0702104v1 [math.DG].

24. (2007) V. Apostolov and M. Gualtieri, *Generalized Kähler manifolds with split tangent bundle*, **Comm. Math. Phys.** 271 (2007), 561-575. arXiv:math/0605342v2 [math.DG].

25. (2007) G. Cavalcanti and M. Gualtieri, *A surgery for generalized complex structures on 4-manifolds.* **J. Differential Geom.**, 76, 35–43, 2007. arXiv:math/0602333v1 [math.DG].

26. (2007) H. Bursztyn, G. Cavalcanti, M. Gualtieri, *Reduction of Courant algebroids and generalized complex structures*, **Advances in Math.** 211 (2). 726–765, 2007. arXiv:math/0509640v3 [math.DG].

27. (2006) M. Gualtieri, T. Tokieda, L. Advis-Gaete, E. Reffet and C. Guthmann, *Golfer's dilemma*, **Am. J. Physics** 74 (6), 2006.

28. (2004) G. Cavalcanti and M. Gualtieri, *Generalized complex structures on nilmanifolds*, **J. Symp. Geom**, 2, 393–410, 2004., arXiv:math/0404451v1 [math.DG].

7 Special invited lectures

1.	Mar 2022	Homotopical Methods in Geom. and Phys. (Getzler 60th)	Northwestern
2.	Jun 2021	Plenary Speaker at the ICMP	Geneva
3.	Oct 2021	Noncommutative shapes (Michel van den Bergh 60th)	Antwerp
4.	Aug 2020	West. Hem. Colloq. in Geometry and Physics	Online
5.	Jul 2019	Plenary speaker, String–Math 2019	Uppsala
6.	Jan 2019	Dan Freed 60th conference	Austin
7.	Aug 2017	Integrable Systems: Hurtubise 60th	CRM Montreal
8.	Sep 2016	Hitchin 70th conference	ICMAT
9.	Jun 2015	Geometric Analysis in honor of Tudor Ratiu	Lausanne
10.	Jul 2013	Plenary speaker, String–Math 2013	Simons Center
11.	Jul 2013	Weinstein 70th conference	Lausanne
12.	Jun 2011	Plenary speaker, Chern Centennial Conference	MSRI
13.	Jul 2011	Plenary speaker, inaugural String–Math conference	UPenn
14.	Jun 2008	A Celebration of Raoul Bott's Legacy in Mathematics	CRM
15.	May 2008	Conference in Honour of Guillemin–Sternberg	Fields Institute
16.	Jul 2006	Hitchin 60th conference	CSIS

8 Selected recent conference presentations

Jul 2022	Poisson 2022	CSIS
Mar 2022	Geometry and Physics seminar	ETH
Feb 2022	Geometry seminar	Geneva
Jan 2022	SwissMAP minicourse at Les Diablerets	Switzerland
Oct 2021	Complex geometry conference	CRM
Sep 2021	International Fall Workshop in Geometry and Physics Portugal	Zoom
Aug 2021	First geometry meeting IM-UFRJ	Zoom
Mar 2020	Hamburg Geometry Conference	Hamburg
Dec 2019	Poisson geometry conference	IMPA
Jun 2019	Geometry and Analysis Seminar	Oxford University
May 2019	Geometry and Physics seminar	Simons Center
Mar 2019	Geometry seminar	Osaka
Mar 2019	String theory and Mirror Symmetry seminar	IPMU Tokyo
Feb 2019	Geometry seminar	Barcelona
Feb 2019	Differential geometry seminar	ICMAT Madrid
Jun 2018	Geometry and Analysis seminar	Oxford
Dec 2017	Algebraic geometry seminar	Harvard
Nov 2017	Geometry and Physics seminar	UT Austin
Oct 2017	Colloquium	UIUC
Jul 2017	Mathematical physics workshop	MIT
Feb 2017	Hitchin systems in mathematics and physics	Perimeter
Jan 2017	String and M-theory geometries	BIRS Banff
Dec 2016	Noncommutative geometry and generalized geometry	Oxford
Aug 2016	Topology, Stratified spaces and Physics	Fields Institute
May 2016	Programme in geometry and physics	IHP
Mar 2016	Lie groups and geometry conference	Nara, JP
Feb 2016	Geometry seminar	Imperial
Jan 2016	Southern California Geometric Analysis Winter School	UC Irvine
Jun 2015	PIMS Symposium Plenary	UBC
May 2015	Colloquium	UNB
Mar 2015	Symplectic geometry seminar	UC Berkeley
Feb 2015	Colloquium	EPFL
Feb 2015	Geometry seminar	Geneva
Nov 2014	Generalized geometry and physics	ICMAT Madrid
Sep 2014	Geometric Structures	Hamburg
Jul 2014	Poisson 2014	UIUC
Jul 2014	Resurgence and Trans-series	CERN
Jun 2014	CMS Coxeter-James lecture	UManitoba
Apr 2014	Geometry and Fluids	Oxford
Jan 2014	Minicourse on Stokes phenomenon	Diablerets
Nov 2013	String geometry and Beyond	Soltis Center
Oct 2013	Colloquium	Perimeter
Oct 2013	Calabi-Yau conference	Perimeter
Oct 2013	Symplectic Algebraic Geometry	Kyoto
June 2013	Moduli spaces and invariants	CRM
Oct 2012	Departmental Colloquium	Columbia U
Oct 2012	Gone Fishing conference	UCLA
Sep 2012	Noncommutative Geometry	Fields
Jul 2012	Poisson 2012	Utrecht

9 Professional Service

Main professional service activities outside of usual university committee duties and besides usual refereeing duties.

2009– 1. Founder and Principal Investigator of the Geometric Structures Laboratory, a research lab within the Fields Institute and the University of Toronto. We run a programme of weekly 2-hour research talks in a working group style, with periodic minicourses taught by invited speakers. This is partially funded by the Fields Institute and the math department at Toronto. In 2019 we moved into a new lab space housing four postdocs and 10 PhD students.

2022-24 2. Chair of the Scientific Committee of the Poisson Biennial Conference (2024)

2022 3. Organizer for SwissMAP conference "Differentiable Stacks, Poisson geometry and related geometric structures", Feb 6-11, 2022.

2018-20 4. Chair of the Scientific Committee of the Poisson Biennial Conference (2020)

2020– 5. Member of scientific committee for Global Poisson webinar series.

2020– 6. Associate Editor for the AMS Graduate Studies in Mathematics Series

2019 7. Co-organizer of the conference in honour of Ragnar Buchweitz (RRAGE)

2022-23 8. Co-organizer, with J. Streets, M. Garcia-Fernandez, K. Becker, V. Cortes of a Simons Center Programme on generalized geometry in 2023-24.

2022-3 9. Co-organizer, with A. Alekseev and X. Xu, of a Simons Center programme in Spring 2023 on Stokes Phenomena.

2018 10. Co-organizer, with E. Meinrenken, of Poisson 2018, biennial conference in Poisson geometry, to be held at the Fields Institute in July 2018.

2018 11. Co-organizer, with E. Meinrenken and L. Jeffrey, of the Fields Institute 2-month programme on Poisson geometry and physics, June 1–July 31, 2018.

2017 12. Co-organizer, together with Steven Rayan, Ruxandra Moraru, and McKenzie Wang of "Connections in Geometry and Physics", December 1-3, 2017 held at the Fields Institute.

2017 13. Co-organizer, with H. Bursztyn and R. Moraru, of "Poisson Geometry and Stacks", a conference at the Fields Institute, July 31-Aug 3, 2017.

2016 14. Co-organizer, together with Steven Rayan, Ruxandra Moraru, and McKenzie Wang of "Connections in Geometry and Physics", May 17-20, 2016 held at the Fields Institute.

2015 15. Co-organizer, together with Alberto Garcia-Raboso, Ruxandra Moraru, McKenzie Wang and Freddy Cachazo of "Connections in Geometry and Physics", May 25-30, 2015, held at Perimeter Institute.

2014 16. Co-organizer, together with Spiro Karigiannis, Ruxandra Moraru, McKenzie Wang and Tristan Hubsch of "Connections in Geometry and Physics", 29-31 May, 2014, held at UBC.

2013 17. Co-organizer, together with Spiro Karigiannis, Ruxandra Moraru, and McKenzie Wang of "Connections in Geometry and Physics", 29-31 May, 2013, held at University of Montreal.

2012 18. Organizer, together with Ruxandra Moraru, Justin Sawon, Jacques Hurtubise, Daniel Huybrechts, and Eyal Markman, of a Banf BIRS 5-day workshop "Advances in Hyperkäher and holomorphic symplectic geometry", March 11-16, 2012.

2012 19. Co-organizer, together with Spiro Karigiannis, Ruxandra Moraru, McKenzie Wang and Rob Myers of "Connections in Geometry and Physics", a regional meeting May 5-7, 2012, held at the University of Waterloo and the Perimeter Institute.

2011 20. Co-organizer, together with Spiro Karigiannis, Ruxandra Moraru, McKenzie Wang and Rob Myers of "Connections in Geometry and Physics", a regional meeting May 13-15, 2011, held at the Fields Institute and funded by a partnership between the Perimeter Institute and the Fields Institute.

2010 21. Co-organizer, together with Spiro Karigiannis, Ruxandra Moraru, McKenzie Wang, Jaume Gomis, and Rob Myers of "Connections in Geometry and Physics", a regional meeting May 7-9, 2010, held at the Perimeter Institute and funded by a partnership between the Perimeter Institute and the Fields Institute.

2010 22. Principal organizer, together with Gil Cavalcanti, Nigel Hitchin, and Ruxandra Moraru, of a Banff BIRS 5-day workshop in April 2010 entitled "Generalized complex geometry and integrable systems".

2009 23. Co-organizer, together with Spiro Karigiannis, Ruxandra Moraru, and McKenzie Wang, of "Connections in Geometry and Physics", a regional meeting May 8-10, 2009, held at the Perimeter Institute and funded by a partnership between the Perimeter Institute and the Fields Institute. The conference has 60 registered participants and 18 invited speakers.

10 Teaching and Training

10.1 PhD Students

1. Waleed Qaisar, PhD student, 2022–. Jointly supervised with Prof K. Murty. Project: Irregular Riemann-Hilbert correspondence and Galois Theory.
2. Maziar Fahrazad, PhD student, 2021–. Project: Geometry of Lattice Quantum Field Theory
3. Adriano Pacifico, PhD student, 2021–. Project: Discrete Riemann Surfaces
4. Keirn Munro, PhD student, 2021–. Project: Homological Perturbation Theory and the Finite Element Method
5. Gavin Hurd, PhD student 2021–. Project: Exceptional Generalized Geometry
6. Thomas Stanley, PhD student, 2019–. Project: Noncommutative algebraic geometry and Quantum Groups

7. Caleb Jonker, PhD student, 2019–. Project: Connections in Generalized Kähler geometry
8. Yucong Jiang, PhD student, 2019–2023. Project: Double Lie Groupoids and Generalized. Kähler geometry. Postdoc at UIUC.
9. Lennart Doppenschmitt, 2017-2022, PhD. program. Project: Moduli space of Generalized Kähler metrics. Postdoc at Zurich.
10. Josh Lackman, 2016-2022, PhD. program. Project: Van Est and the Geometry of Stacks. Moved to private sector.
11. Francis Bischoff, 2014-2019, PhD. program. Project: groupoids in the Riemann-Hilbert problem and in generalized Kahler geometry. Postdoc at Oxford, and assistant professorship at Regina.
12. Mykola Matviichuk, 2014-2020, PhD. program. Project: Projective geometry of quantum algebras and homotopy Lie structures. Now Postdoc at Imperial College London.
13. Kevin Luk, 2012-2017, Ph.D. program. Project: Logarithmic Atiyah and Courant algebroids. Now a research scientist at Facebook.
14. Nikita Nikolaev, 2011-2017, Ph.D. program. Project: Spectral Networks on Riemann Surfaces. Moved to Postdoc at Sheffield, now Marie Curie Fellow at Birmingham.
15. Brent Pym, 2008-2013, Ph.D. program. Project: Holomorphic Poisson and generalized complex geometry. Postdoc at Oxford, now Assistant professor at McGill University.
16. Travis Li, 2008-2013, Ph.D. program. Jointly supervised with Prof. Lisa Jeffrey. Project: groupoids and quantization in symplectic and generalized complex geometry. Moved on to a postdoc at St. Louis and now works in R□D at Google.
17. Michael Bailey, 2008-2011, Ph.D. program. Jointly supervised with Prof. Yael Karshon. Thesis title: "On the local and global classification of generalized complex structures". Moved to Postdoc at Utrecht and now works in private sector.

10.2 MSc Students

1. Panagiotis Angelinos 2018, MSc. Project on variation of Hodge structures.
2. Lennart Doppenschmitt, 2016-17, MSc. Project: Exceptional generalized geometry.
3. Christopher Mahadeo, 2016-17, MSc. Project: Normal forms in Poisson and generalized complex geometry.
4. Gavin Hurd, MSc student, project on Weinstein manifolds 2020-21.
5. Mark Penney. 2012 summer MSc student. Project on Wonderful Compactifications.
6. Kirill Levin, 2010 summer, M. Sc. program. Project: deformation theory of A-branes.
7. Brad Hannigan-Daley, 2009 summer, M. Sc. program. Project: Gerbes and twisted sheaves.

10.3 Postdoctoral Researchers

1. Daniel Alvarez, 2021–.
2. Alessandro Malusa, 2021–.
3. Maxence Mayrand 2019-2022, now Assistant Prof. at Sherbrooke.
4. Xiudi Tang 2019–2022, now Assistant Prof. at Beijing.
5. Aaron Fenyes 2016-2019, went on to do a postdoc at IHES and now instructor in Mathematics at Phillips Exeter Academy.
6. Shinji Sasaki 2016-2019, now Assistant Prof at Shibaura Institute of Technology, Japan.
7. Joey Van der Leer Duran 2015-2017, now working as Lead Data Scientist in the Oil and Gas sector.
8. Anton Izosimov 2015-2017, now Associate Professor at Arizona.
9. Geoffrey Scott 2014–2017, moved to R□D at Google.
10. Victor Mouquin 2014–2017, became Assistant Prof. at Shanghai Jiao Tong University.
11. Alberto Garcia-Raboso 2013–2016, working in private sector.
12. Steven Rayan, 2011–2015, now Assistant Prof. at University of Saskatchewan.
13. Alejandro Cabrera, 2009–2011, now Full. Prof. at UFRJ, Rio.

Undergraduate Summer Research Mentorships

1. 2022 Andy Kim and James Bona-Landry, undergraduate research assistants. Project title: Spin chains and representation theory of groups.
2. 2021 Work-Study student supervision: James Hogan. (Logarithmic connections)
3. 2020 Work-Study student supervision: Adrian Carpenter. (Borel resummation)
4. 2020 Work-Study student supervision: Waleed Qaisar. (Logarithmic connections)
5. 2019 NSERC USRA student supervision: Aleksandr Karapetyan. (L-infinity algebras)
6. 2018 NSERC USRA student supervision: Adriano Pacifico (Generalized complex structures)
7. 2018 NSERC USRA student supervision: William Kingsford (Classical mechanics)
8. 2017 NSERC USRA student supervision: Adam Artymowicz (Morse theory)
9. 2016 NSERC USRA student supervision: Theo Van Den Hurk (Symplectic Geometry)
10. 2015 NSERC USRA student supervision: Gideon Providence (Symplectic geometry)
11. 2014 NSERC USRA student supervision: Dylan Butson (Quantum field theory)
12. 2013-4 reading course: Joshua Seaton (Embedded surfaces and Riemannian geometry)

13. 2013 NSERC USRA student supervision: Dylan Butson (Morse theory and classical mechanics)
14. 2013 NSERC USRA student supervision: Changho Han (Morse theory and classical mechanics)
15. 2011 University of Toronto Excellence Awards summer supervision for Sergei Sagatov, undergraduate student. (logarithmic complex surfaces)
16. NSERC USRA Project entitled "Categorified Lie algebras and quantum mechanics", involving two students: Michael Wan and Qiao Zhou, taking place during summer 2009.

11 Courses

Brief summary of main courses developed and taught at the University of Toronto.

1. (Undergraduate) Honours Linear Algebra (MAT240), a large (250 students) course for first-year undergraduate students.
2. (Undergraduate) Mathematical Discovery, a first-year seminar designed for students in the humanities.
3. (Undergraduate) Advanced Quantum Mechanics. A course on quantum mechanics taught in the mathematics department.
4. (Undergraduate) Differential Geometry
5. (Undergraduate) Seminar in enumerative geometry and string theory for final-year specialists
6. (Undergraduate) Morse Theory, an advanced course for later-year undergraduates
7. (Graduate) Geometry and Topology (large required graduate core course for the qualifying exam)
8. (Graduate) Topics course: Shifted Symplectic Geometry
9. (Graduate) Topics course: The Exact WKB Method
10. (Graduate) Topics Course: Generalized complex geometry
11. (Graduate) Topics Course: Generalized Kähler geometry
12. (Graduate) Topics Course: Calabi-Yau Manifolds
13. (Graduate) Topics Course: The Moduli Space of Higgs Bundles
14. (Graduate) Riemann Surfaces
15. (Graduate) Geometric Invariant Theory
16. (Graduate) Connections on Riemann Surfaces and the Stokes Phenomenon