

Benjamin McKay

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Experience

| | | |
|--------------|---------------------------|---|
| 2007–present | Lecturer Above the Bar | University College Cork |
| 2005–2007 | Lecturer | University College Cork |
| 2004–2005 | Fellow | USF Center for the Study, Protection and Amelioration of Coastal Environments |
| 2003–2005 | Assistant Professor | University of South Florida (cross-appointed) Department of Mathematics and Department of Environmental Science, Policy & Geography |
| 2001–2003 | Scott Assistant Professor | University of Utah |
| 2000–2001 | Postdoctoral Fellow | University of Utah, Salt Lake City, USA |
| 1999–2000 | Postdoctoral Fellow | Max-Planck-Institut für Mathematik, Bonn, Germany |
| 1989 | Researcher | Department of Electrical Engineering, Dalhousie University, Halifax, Canada |
| 1986 | Computer programmer | Covello, Bryan and Associates, Arctic Geological Exploration, Yellowknife, Canada |

Visiting Positions

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|------|--|---|
| 2012 | Université Nice Sophia Antipolis | University of Rome Tor Vergata |
| 2011 | Université Nice Sophia Antipolis University of Waterloo University of Rome Tor Vergata Tata Institute of Fundamental Research | 2009 Universität Munster 2008 Université Paris-Sud 11 2007 Université de Toulouse |
| 2010 | Université Paris-Sud 11 | 1996 Institute for Advanced Study, Princeton |

Grants & Awards

| | | |
|---------------------------|----------------------------|-----------|
| 1. Sloan Fellow | Sloan Foundation | 1998 |
| 2. Travel Award | ESP&G Department | 2003–2004 |
| 3. Travel Award | College of Arts & Sciences | 2003–2004 |
| 4. Research Grant | ESP&G Department | 2003–2004 |
| 5. New Investigator Grant | USFSP | 2004 |
| 6. Research Grant | ESP&G Department | 2003–2004 |
| 7. Teaching Reduction | College of Arts & Sciences | 2005 |
| 8. Book Allowance | UCC Maths | 2005–2006 |
| 9. Travel Grant | UCC Maths | 2005–2006 |
| 10. Seminar Grant | UCC Maths | 2005–2006 |
| 11. Book Award | UCC Science Faculty | 2005 |
| 12. Research Grant | Science Foundation Ireland | 2007–2010 |
| 13. Research Grant | Science Foundation Ireland | 2007–2010 |

Education

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|------------|--------------------------|-----------------------|----------------------------|
| 1993 B.Sc. | Mathematics & Philosophy | University of Toronto | |
| 1994 M.Sc. | Mathematics | University of Toronto | Advisor: Richard W. Sharpe |
| 1999 Ph.D. | Mathematics | Duke University | Advisor: Robert L. Bryant |

Teaching Experience

Average teaching evaluation: 4.3/5.0

Duke University

- Reform Precalculus
- Traditional Calculus
- Reform Calculus

University of Utah

- PDE for Engineers (2×)
- Applied Complex Variables (2×)
- Complex Analysis (2×)
- Business Calculus (2×)
- Business Precalculus

University of South Florida

- Precalculus Algebra
- Calculus I
- Business Calculus (2×)
- Linear Algebra
- Introductory Statistics (2×)
- Calculus II (2×)
- Finite Mathematics

University College Cork

- Calculus
- Curves and Surfaces (3×)
- Game Theory and Linear Programming
- Graph Theory and Combinatorics
- Linear Algebra (12×)
- ODE (2×)
- Rings & Fields
- Topics in Modern Maths (2×)
- Topics in Maths and Applied Maths (3×)

Publications

Doctoral Thesis

Duality and integrable systems of pseudoholomorphic curves, Duke University, 1999.

Books

1. (with K. Becker, M. Becker, A. Bertram and P. Green), **Lectures on the Geometry of Strings**, American Mathematical Society, 2006.

Papers in Pure Mathematics

1. *Dual curves and pseudoholomorphic curves*, **Selecta Mathematica N.S.**, 9 (2003), pp. 251–311, math.DG/0101017.
2. *The Blaschke conjecture and great circle fibrations of spheres*, **American Journal of Mathematics**, vol. 126, no. 5, October 2004, 1155–1191, math.DG/0112027.
3. *Smooth projective planes*, **Geometriae Dedicata**, 116, # 1 December 2005, 157–202, math.DG/0412500.
4. *Lagrangian manifolds in affine symplectic geometry*, **Differential Geometry and Its Applications**, vol. 24, no. 6, December 2006, 670–689, math.DG/0508118.
5. *Complete complex parabolic geometries*, **International Mathematics Research Notices**, vol. 2006, Article ID 86937, 2006, math.DG/0409559.
6. *Complex nonlinear ordinary differential equations and geometry*, **International Workshop on Multi-Rate Processes & Hysteresis**, Journal of Physics Conference Series, vol. 55, Institute of Physics, 2006, pp. 165–170.
7. *Analogues of complex geometry*, **Journal of the London Mathematical Society**, vol. 76, no. 2, 2007, 16–40. math.DG/0107073.
8. *Almost complex rigidity of the complex projective plane*, **Proceedings of the American Mathematical Society**, 135 (2007) 597–603, math.SG/0403155.
9. *Sussmann’s orbit theorem and maps*, **Differential Geometry and its Applications**, June 2007, vol. 25, no. 3, 277–280, math.DG/0508121.
10. *Extension phenomena for holomorphic geometric structures*, **Symmetry, Integrability, Geometric Structures and Applications**, special issue “Élie Cartan and Differential Geometry”, 2009, 5, 1, 1–45, arXiv:0812.2353.
11. (with Indranil Biswas), *Holomorphic Cartan geometries and Calabi-Yau manifolds*, **Journal of Geometry and Physics**, 60, 2010, 610–613, arXiv:0812.3978.
12. (with Indranil Biswas), *Holomorphic Cartan geometries, Calabi-Yau manifolds and rational curves*, **Diff. Geom. Appl.** 28 (2010), no. 1, 102–106.
13. (with Alexey Pokrovskiy), *Locally homogeneous geometric structures on Hopf surfaces*, **Indiana U. Math. J.**, 59 (2010), 1491–1540, arXiv:0910.0369.
14. *Characteristic forms of complex Cartan geometries*, **Advances in Geometry**, 2011, vol. 11, no. 1, 138–168, arXiv:0704.2555.
15. *Holomorphic Cartan geometries on uniruled surfaces*, **C. R. Math. Acad. Sci. Paris, Ser. I**, 2011, arxiv:1105.4732.
16. *Holomorphic parabolic geometries and Calabi-Yau manifolds*, **Symmetry, Integrability, Geometric Structures and Applications**, 7 (2011), 090, 11 pages, arXiv:0812.1749.
17. *Rigid geometry on projective varieties*, **Mathematische Zeitschrift**, 2011, to appear, arXiv:math/0603276.

Papers in Mathematics Applied to Medicine

1. (with Devashish Shrivastava and Robert Roemer), *An analytical study of heat transfer in finite tissue with two blood vessels and uniform Dirichlet boundary conditions*, **Journal of Heat Transfer**, February 2005, vol. 127, #2, p. 179-188.
2. (with William P.S. McKay and Peter H. Gregson), *Transfer-function analysis in anesthesia research*, **Canadian Journal of Anaesthesia** September 1999, vol. 46, #9, pp. 813-819.
3. (with William P.S. McKay, Peter H. Gregson, and Julio Militzer), *Sternal acceleration ballistocardiography and arterial pressure wave analysis to determine stroke volume*, **Clinical and Investigative Medicine** vol. 22 #1, February, 1999, 4-14.
4. (with William P.S. McKay, Peter H. Gregson, and Terence Blanchet), *Resting muscle sounds in anaesthetised patients*, **Canadian Journal of Anaesthesia** vol. 45 (1998), no. 5, part II:A26.
5. (with William P.S. McKay, Peter H. Gregson, and Terence Blanchet), *Resting muscle sounds in anesthetized patients*, **The Canadian Journal of Physiology and Pharmacology** 1998 April 76(4): 401-6.
6. (with William P.S. McKay, Miklavs Erjavec, Peter H. Gregson, Terence Blanchet and Guy Kember), *Muscle sounds in anaesthetized patients*, (abstract) **Canadian Journal of Anaesthesia** 43 (1996), no. 5, part II:A10-A.
7. (with William P.S. McKay and Peter H. Gregson), *Sternal accelerometer ballistocardiography and arterial pressure wave analysis to determine stroke volume*, (abstract) **Canadian Journal of Anaesthesia** 41 (1994), no. 5, part II:A45A.
8. (with William P.S. McKay and Peter H. Gregson), *Direct accelerometer ballistocardiography for the detection of coronary artery disease*, (abstract) **Clinical and Investigative Medicine** 15 (1992), no. 4:A9.

Invited Talks

2000

- Utah State University, Mathematics and Physics Departments, *Seminar in Formal Geometry & Mathematical Physics*

2002

- Northeastern University, *AMS Conference: Developments and Applications in Differential Geometry*
- Utah State University, Mathematics Department, *Colloquium*

2003

- University of Florida, Mathematics Department, *Colloquium*
- University of Florida, Mathematics Department, *Geometry & Mathematical Physics Seminar*
- University of Texas Austin, Mathematics Department, *Geometry Seminar*
- University of South Florida Saint Petersburg, *College of Arts & Sciences Colloquium*
- Fordham University, Mathematics Department, *Colloquium*
- University of South Florida Tampa, Mathematics Department, *Colloquium*

2004

- University of Arizona, Mathematics Department, *Colloquium*
- University of Arizona, Mathematics Department, *Geometry Seminar*
- University of Manitoba, Mathematics Department, *Colloquium*
- Brock University, Mathematics Department, *Colloquium*
- Vrije Universiteit Amsterdam, Mathematics Department, *Colloquium*
- Dalhousie University, *Canadian Mathematical Society Summer Meeting*
- University College Cork, Mathematics Department, *Colloquium*

2005

- Texas A&M University, Mathematics Department, *Geometry Seminar*
- National University of Ireland Maynooth, Mathematics Department, *Departmental Seminar*
- University College Cork, Mathematics Society, *Colloquium*

2006

- Erwin Schrödinger Institute, Vienna, *Colloquium*
- University College Cork, *International Workshop on Multi-Rate Processes & Hysteresis*
- Trinity College Dublin, School of Mathematics, *Colloquium*
- University of Münster, *Topological Problems in Geometry*
- Keio University, Japan, *Workshop on Geometry and Dynamical Systems*

2007

- University of Utrecht, Netherlands, *Colloquium*
- Banff International Research Station, *Focused Research Group: the Ξ -transform*
- Laboratoire de Mathématiques Emile Picard, Toulouse, *Colloquium*
- CIRM, Luminy, *Rigidity in Geometry and in Dynamics*
- Dublin City University, *Colloquium*
- Korean Institute for Advanced Study, *Colloquium*

2008

- Université Paris-Sud, *Colloquium*
- Utah State University, Mathematics and Physics Departments, *Colloquium*
- Oxford, *Colloquium*
- Institute of Technology Tralee, *Irish Geometry Meeting*
- Kyungpook National University, Taegue, Korea, *12th International Workshop on Differential Geometry*

2009

- Wilfred Laurier University, *Colloquium*

- University of Rome Tor Vergata, *Colloquium*
- National University of Ireland Maynooth, *Colloquium*
- St. Francis Xavier University, *Colloquium*
- CIRM Levico Terme, Italy, *Complex Analysis and Geometry*
- University of Oslo, *25th Nordic Congress of Mathematicians*
- University of Münster, *Oberseminar*

2010

- University of Toronto, *Seminar*
- University of Waterloo, *Geometry and Topology Seminar*
- St. Jerome's University, *Colloquium*
- McGill University/UQAM, *Joint Geometry Seminar*
- Queen's University, *Colloquium*
- University of Lille-1, *Conference on Almost Complex Geometry and Foliations*
- University of Rome Tor Vergata, *Colloquium*
- Dublin Institute of Technology, *Irish Mathematical Society Meeting*
- St. Patrick's College Drumcondra, *Irish Algebraic Geometry Conference*

Conference Organizing

- Co-organizer, Joint AMS–IMS–SIAM *Conference on String Geometry*, Snowbird Resort, Utah, June 5–11, 2004.
- Organizer, Irish Geometry Conference, Cork, Ireland, May 8–9, 2009.
- Co-organizer, Nonlinear Dynamics Conference in Memory of Alexei Pokrovskii, Cork, Ireland, September 5–9, 2011.
- Co-organizer, Irish Geometry Conference, Cork, Ireland, June 15–16, 2012.

Student Comments on Teaching

- Very thorough and enthusiastic.
- Very thorough coverage of course content
- Patient and considerate with students. Portrays a love for what he teaches.
- Treats everyone with respect.
- McKay is an excellent instructor who is always willing to assist his students in any way.
- Very thorough with ideas and concepts!
- He makes it easy to understand the work and materials for this class. I would definitely recommend for students to take the course with Professor McKay.
- Prof. McKay has a genuine interest in imparting this course's information in an enthusiastic and approachable way.
- Great way of teaching math.
- I found Mr. McKay to be well prepared for each class and extremely flexible with regards to availability for review and quizzes. Mr. McKay was very respectful to all students—only wish I could say the same for some of my classmates! The web page was an excellent idea!
- Was very good. No need to improve.
- Best maths lecturer so far!
- Brilliant lecturer.
- Very interesting course. Excellent lecturer (best maths lecturer I've had so far).
- Best of all my maths teachers!
- Very interesting lectures, made easily understandable with terms such as “kill everything beneath pivot.” Thanks for your time and effort.
- He was very approachable.
- It's grand the way it is. I like the tests every couple of weeks to make sure we're keeping up with the material.
- In what way could the structure or content of this course be improved? It couldn't. It is laid out very well.
- Great material on web site.
- He chose a book that was easy to access and free. He took into account people's requests and tried to adhere to them.
- He is a really great professor.
- Dr. McKay presents course material in a very clear and concise manner. Applications to science and engineering are presented and this makes the course all the more interesting and valuable. He is the best math professor I have ever had a class with.
- Excellent teaching!!

Service

- UCC Mathematics Circle Summer Academy (for gifted high school students), Organizer, 2006, 2007
- Supervisor
 - Postdoctoral Fellowships
 - 2008–2009: Edward Lee, Jesse Ratzkin
 - Master's Theses
 - 2006–2007: Rory Conboye
 - Undergraduate Senior Theses
- 2005–2006: Ricky O'Riordan, Rory Conboye
- 2006–2007: Danny Gleeson
- 2007–2008: Jane Cahill
- 2008–2009: Cormac Egan, Peter Fennell
- 2010–2011: Kaya Luken
- 2011–2012: Eoin Healy
- Undergraduate Summer Research Projects

- 2007: Aidan Floyd, Tara Hennessy, Mary Clare Murphy, Gerard O'Hara-Lyons
- 2008: Alexey Pokrovskiy Jr.
- Reviewer
 - Acta Universitatis Matthiae Belii
 - Annales Polonici Mathematici
 - Central European Journal of Mathematics
 - Czech Science Foundation
 - Differential Geometry and its Applications
 - Duke Mathematics Journal
 - Geometriae Dedicata
 - Mathematical Reviews
 - Monatshefte für Mathematik
 - Proceedings of the American Mathematical Society
 - Royal Society
 - SIGMA
 - USF Tampa Internal Grants Program
 - Zentralblatt MATH
- Colloquium director, UCC School of Mathematics, 2005–present
- School of Maths representative, 2008–present, Research and Graduate Studies Committee, College of Science, Engineering and Food Science, UCC
- Member, UCC Science Education, Outreach, Promotion and Public Engagement Committee, 2008–present
- Open Day Director, School of Maths, 2005–present
- Head, School of Maths Postgraduate and Research Funding Working Group, 2009–present
- Founder and organizer
 - Differential Geometry Seminar, Univ. of Utah, 2001–2003
 - QFT/String Geometry Seminar (joint with Katrin Becker), Univ. of Utah, 2002–2003
 - Geometry Seminar, UCC, 2005–2007
 - Riemann Surfaces Seminar, UCC, 2011–present
- Department of Environmental Science, Policy and Geography, University of South Florida, 2004–2005
 - Chair, Budget Committee
 - Member, Colloquium Committee
 - Member, Statistics Search Committee
- Copyeditor, Marcel Berger's *A Panoramic View of Riemannian Geometry*
- Webmaster, UCC School of Maths, 2006–present
- Ph. D. examiner
 - UCC, 2006
 - Utrecht, 2007
- Mathematical Contest in Modelling, Team Advisor: 2006 (Honorable Mention), 2007, 2008 (Meritorious Winner)
- Interdisciplinary Contest in Modelling, Team Advisor, 2006 (Meritorious Winner)
- Superbrain Mathematics Competition, Organizing committee member, 2007–present
- Chair, UCC Linear Algebra Committee
- Irish Intervarsity Mathematics Competition, Organizing committee member, 2009
- Member, Student Recruitment and Outreach Committee, College SEFS, 2011–present
- Member, Quality Review Steering Committee, College of Science, Engineering and Food Science, 2011–present
- Mentor, CK407 Science Engineering and Food Science, 2011–present
- Member, School of Maths SWOT team, 2011
- Member, College SWOT team, 2011
- Member, SEFS College Council, 2011–present
- Acting Head, Department of Mathematics, July–September, November, December 2011
- Co-ordinator for the courses: MS1001, MS2001, MS2002, MS2003, MS2005, MS2012, MS2013, MS3001, MS3003, MS3005, MS3006, MS3011, MS5005, MA1003, MA1008, MA1058, MA1100, MA1905, MA2006, MA2007, MA2013, MA2051, MA2054, MA2055, MA2059, MA2071, MA2200, MA3051, MA3052, MA3053, MA3054, MA3056, MA3060, MA3301, MA3901, MA4051, MA4052, MA4053, MA4058, MA4061, MA4402, MA4403.
- Developed new courses: MA1004 Calculus for Science, MA4062 Topics in Modern Algebra, MA4063 Topics in Differential Geometry, MA4069 Topics in Maths.
- Maths Circle volunteer, 2010
- School of Maths representative, Faculty of Food Science and Technology
- Listed in **Who's Who in the World**, 25th ed.

Last updated January 11, 2012.