

# Martin Kerin

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## PERSONAL INFORMATION

**Born:** March, 1981

**Citizenship:** Irish

Department of Mathematical Sciences  
Durham University  
Durham  
UK

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*EMail:* martin.p.kerin@durham.ac.uk  
*Website:* maths.dur.ac.uk/users/martin.p.kerin

**Languages:** English, German, Portuguese, Spanish, Irish (in order of decreasing fluency)

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## RESEARCH INTERESTS

Riemannian Geometry: non-negative and positive sectional curvature; Lie group actions; torus actions; topology and geometry of smooth quotients; geometry of orbifolds; rationally elliptic manifolds.

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## POSITIONS

Associate Professor, Department of Mathematical Sciences, Durham University, UK	2024 -
Assistant Professor, Department of Mathematical Sciences, Durham University, UK	2022 - 2024
Lecturer, School of Mathematical & Statistical Sciences, NUI Galway, Ireland	2019 - 2022
Vertretungsprofessor (Professor), Math. Institut, Universität Bonn, Germany	April-Sept 2017
Akademischer Oberrat (Senior Lecturer), Math. Institut, WWU Münster, Germany	2017 - 2019
Research Member, Program in Differential Geometry, MSRI, Berkeley, USA	Mar-May 2016
Akademischer Rat (Lecturer), Math. Institut, WWU Münster, Germany	2011 - 2017
Wissenschaftlicher Mitarbeiter (Post-doc), Math. Institut, WWU Münster, Germany	2008 - 2011

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## EDUCATION

<b>Habilitation</b> in Mathematics, WWU Münster, Germany Sponsor: Burkhard Wilking	2017
<b>Ph.D.</b> in Mathematics, University of Pennsylvania, Philadelphia, PA, USA Advisor: Wolfgang Ziller	2008
<b>M.Sc.</b> in Mathematics, National University of Ireland, Maynooth, Ireland Advisor: David Wraith	2003
<b>B.Sc.</b> in Mathematics and Mathematical Physics, NUI Maynooth, Ireland Double Honours (First Class)	2001

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## GRANT AWARDS

LMS Research Grant Number XXXXX (co-PI's in Cardiff, Durham, Oxford, QMUL, Stirling, Warwick) Total Grant Award: £1,500.	2024 - 2025
Isaac Newton Institute Network Support for Mathematical Sciences (co-PI's in Cardiff, Durham, Oxford, QMUL, Stirling, Warwick) Total Grant Award: £6,000.	2024 - 2025
LMS Undergraduate Research Bursary URB-2024-73 Total Grant Award (incl. match funding from Durham): £1,590.	2024
LMS Research Grant Number 32327 (co-PI's in Cardiff, Durham, Oxford, Warwick) Total Grant Award: £1,200.	2023 - 2024
IRC Laureate Consolidator Award (declined) Total Grant Award: €600,000.	2022
NUI Galway EDI Project Fund Total Grant Award: €1,000.	2021
IMS Conference Grant: <i>Groups in Galway meets the Irish Geometry Conference</i> Total Grant Award: €800	2020
DFG Research Grant (Priority Program: Geometry at Infinity): KE 2248/1-1 // GA 2050/2-1 (co-PI: F. Galaz-García (Karlsruhe IT)) Total Project Award: €191,300	2017 - 2020

	DFG Conference Grant: <i>Curvature and Global Shape</i>	2019
	Under Priority Program: Geometry at Infinity (co-PI's: M. Wiemeler, B. Wilking)	
	Total Grant Award: €10,000	
	DFG Conference Grant: <i>Curvature and Global Shape</i>	2017
	Under Priority Program: Geometry at Infinity (co-PI's: R. Lafuente, B. Wilking)	
	Total Grant Award: €5,000	
	NSF Conference Grant: <i>Representations of Riemannian Geometry</i>	2017
	DMS-1720590 (PI: C. Escher; co-PI's: L. Kennard, M. Kerr, K. Tapp)	
	Total Grant Award: \$36,200	
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HONOURS AND AWARDS	Nominated for President's Early Stage Researcher Award, NUI Galway	2020
	Benjamin Franklin Fellowship, Department of Mathematics, University of Pennsylvania	2006
	Clay Mathematics Institute Summer School, MSRI	2005
	Karcher Fellowship, Department of Mathematics, University of Pennsylvania	2003
	London Mathematical Society Bursary	2002
	Irish Research Council for Science, Engineering and Technology Scholarship	2002
	National University of Ireland, Maynooth, Bursary	2001 - 2003
	National University of Ireland, Maynooth, Studentship	2001
	De Brún Prize, Department of Mathematics, National University of Ireland, Maynooth	2001
	Delort Prize, Department of Mathematics, National University of Ireland, Maynooth	1999
	Darré Exhibition, Department of Mathematics, National University of Ireland, Maynooth	1998
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SELECTED ARTICLES	S. Goette, M. Kerin and K. Shankar, <i>Highly connected 7-manifolds and non-negative sectional curvature</i> , Ann. of Math. <b>191</b> (2020), 829–892	
	F. Galaz-García, M. Kerin and M. Radeschi, <i>Torus actions on rationally elliptic manifolds</i> , Math. Z. <b>297</b> (2021), 197–221	
	J. Harvey, M. Kerin and K. Shankar, <i>Semi-free actions with manifold orbit spaces</i> , Documenta Math. <b>25</b> (2020), 2085–2114	
	F. Galaz-García, M. Kerin, M. Radeschi and M. Wiemeler, <i>Torus orbifolds, slice-maximal torus actions and rational ellipticity</i> , Int. Math. Res. Not. IMRN 2018 no. 18, 5786–5822	
	M. Kerin, <i>On the curvature of biquotients</i> , Math. Ann. <b>352</b> (2012), 155–178	
	M. Kerin, <i>Some new examples with almost positive curvature</i> , Geom. Top. <b>15</b> (2011), 217–260	
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CONFERENCES AND SEMINARS ORGANISED	Spectral Geometry Day	June 2024
	Durham University, UK	
	UK Metric Geometry and Analysis Network meetings	2024 -
	Cardiff University, Durham University, UK	
	Analysis and Geometry Day	Mar 2024
	Durham University, UK	
	Yorkshire-Durham Geometry Days	2023 -
	Durham University, University of Leeds, University of York, UK	
	Geometry & Topology Seminar	2023 -
	Durham University, UK	
	Groups in Galway meets the Irish Geometry Conference	May 2022
	NUI Galway, Ireland	
	Irish Geometry Seminar	2021 - 2022
	NUI Galway and Maynooth University, Ireland	
	Workshop on Curvature and Global Shape	2011, 2013, 2015, 2017, 2019
	WWU Münster, Germany	

Representations of Riemannian Geometry St. Joseph's University, Philadelphia, USA	Aug 2017
Seminar on Symmetry in Geometry MSRI, Berkeley, USA	Mar-May 2016
Geometry Reading Seminar: <i>The Atiyah-Singer Index Theorem</i> WWU Münster, Germany	Winter 2009/10

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PLENARY TALKS  
(LAST 5 YEARS)

<i>Double disk bundles</i> Prospects in Geometry and Global Analysis, Universität Marburg.	Aug 2023
<i>Double disk bundles</i> British Mathematics Colloquium, University of Bath.	Apr 2023
<i>Double disk-bundle decompositions</i> Yorkshire-Durham Geometry Day, Durham University.	Dec 2022
<i>A pot-pourri of non-negatively curved 7-manifolds</i> Yorkshire-Durham Geometry Day, Durham University.	Dec 2020
<i>A pot-pourri of non-negatively curved 7-manifolds</i> Virtual Seminar on Geometry with Symmetries.	July 2020
<i>Highly connected 7-manifolds with non-negative sectional curvature</i> Annual Meeting of the Irish Mathematical Society, National University of Ireland, Galway.	Sept 2019
<i>Highly connected 7-manifolds and non-negative sectional curvature</i> New trends and open problems in Geometry and Global Analysis, Universität Marburg.	Aug 2018
<i>Non-negative curvature and the linking form</i> Geometrie, Mathematisches Forschungsinstitut, Oberwolfach.	June 2018
<i>Non-negative curvature on exotic 7-spheres</i> Irish Geometry Conference, National University of Ireland, Maynooth.	May 2017
<i>Non-negative curvature on exotic 7-spheres</i> Reflections on Global Riemannian Geometry, University of Tennessee.	Aug 2016
<i>Non-negative curvature on exotic 7-spheres</i> Geometrie, Mathematisches Forschungsinstitut, Oberwolfach.	June 2016

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OTHER TALKS  
(LAST 5 YEARS)

<i>Isometric rigidity of Wasserstein spaces</i> Geometry and Mathematical Physics Seminar, University of York.	Nov 2024
<i>Double disk bundles</i> Algebra and Geometry Seminar, Newcastle University.	Oct 2024
<i>A pot-pourri of non-negatively curved 7-manifolds</i> Algebra, Geometry and Number Theory Seminar, University of Bath.	Oct 2020
<i>A pot-pourri of non-negatively curved 7-manifolds</i> Online Geometric Analysis Seminar, Peking University, Beijing.	Sept 2020
<i>A pot-pourri of non-negatively curved 7-manifolds</i> Geometric Analysis Seminar, City University of New York.	July 2020
<i>A pot-pourri of non-negatively curved 7-manifolds</i> Virtual Seminar on Geometry with Symmetries.	July 2020
<i>Highly connected 7-manifolds with non-negative sectional curvature</i> Mathematics Seminar, National University of Ireland, Maynooth.	Dec 2019
<i>Double disk-bundles in geometry and topology</i> Mathematics Seminar, National University of Ireland, Galway.	Oct 2019
<i>Non-negative curvature and the linking form</i> Geometry-Topology Seminar, University of Pennsylvania.	May 2019
<i>Double disk-bundle decompositions and rational ellipticity</i> Felix Klein Seminar, University of Notre Dame.	May 2019

<i>Non-negative curvature on exotic 7-spheres</i> Pure Mathematics Seminar, University of Queensland.	Feb 2019
<i>Non-negative curvature and the linking form</i> Australian-German Workshop on Differential Geometry in the Large, MATRIX Institute.	Feb 2019
<i>Non-negative curvature and the linking form</i> Felix Klein Seminar, University of Notre Dame.	April 2018
<i>Double disk-bundle decompositions and rational ellipticity</i> Geometry and Topology Seminar, University of Oklahoma.	March 2018
<i>Non-negative curvature on exotic 7-spheres</i> Oberseminar Differentialgeometrie, Universität zu Köln.	Jan 2018
<i>Non-negative curvature on exotic 7-spheres</i> Oberseminar Differentialgeometrie, Karlsruhe IT.	Jan 2018
<i>Non-negative curvature on exotic 7-spheres</i> Oberseminar Differentialgeometrie, TU Dortmund.	June 2017
<i>Curvature and exotic spheres</i> Department of Mathematics Colloquium, Université de Fribourg.	Mar 2017
<i>Non-negative curvature on exotic 7-spheres</i> Oberseminar Topologie, Université de Fribourg.	Mar 2017
<i>Non-negative curvature on exotic 7-spheres</i> Oberseminar Differentialgeometrie, MPI Bonn.	Jan 2017
<i>Non-negative curvature on exotic 7-spheres</i> Differential Geometry Seminar, Università di Firenze.	Nov 2016
<i>Slice-maximal torus actions, curvature and ellipticity</i> Seminar on Symmetry in Geometry, MSRI.	April 2016
<i>Slice-maximal torus actions, curvature and ellipticity</i> Differential Geometry Seminar, UC Riverside.	April 2016
<i>On semi-free actions whose orbit spaces are manifolds</i> Differential Geometry Seminar, Cal State, Fullerton.	April 2016
<i>Slice-maximal torus actions, curvature and ellipticity</i> Geometry-Topology Seminar, University of Pennsylvania.	Feb 2016

SCHOLARLY AND  
PROFESSIONAL  
SERVICE

**Editor:** Glasgow Mathematical Journal.

**Referee:** Annals of Mathematics; Geometry and Topology; Mathematische Annalen; IMRN; Journal of Topology; Transformation Groups; Proceedings of the AMS; Annals of Global Analysis and Geometry; Pacific Journal of Mathematics; Geometria Dedicata; Proceedings of the Edinburgh Mathematical Society; Involve; Frontiers of Mathematics in China; Bulletin of the Irish Mathematical Society; Bulletin of the Malaysian Mathematical Sciences Society.

**Reviewer:** AMS Math Reviews.

**Membership:** Irish Mathematical Society.

**Committees:** Irish Mathematical Society: Education Subcommittee (Secretary). 2021 - 2023  
 UK Metric Geometry & Analysis Network: Steering Committee. 2023 -  
 Durham University: MSc (Mathematics) Committee. 2024  
 NUI Galway: *College of Science & Engineering*  
 - Student Recruitment and Public Engagement.  
*School of Mathematical & Statistical Sciences*  
 - School Executive;  
 - Communications and Outreach (Director);  
 - School Advisory (re Head of School);  
 - Research and Graduate Studies;  
 - Financial Mathematics & Economics Programme.  
 WWU Münster: Hiring Committee for W2-Professor (Diff. Geom./Geom. Analysis);  
 Masters Admissions Committee.

MINI-COURSES  
TAUGHT

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*Construction of manifolds with non-negative curvature: Biquotients*  
Técnicas modernas en Geometría Riemanniana, UNAM, Mexico.

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July-Aug 2014

TEACHING  
EXPERIENCE

**Modules completed for Professional Development**

- Learning Technologies – Centre for Excellence in Learning and Teaching, NUI Galway

**Supervision**

- PhD students: 1 – Durham University (ongoing)
- Masters students: 5 – Durham University
- Bachelor/final-year projects: 6 – NUI Galway; 3 – Durham University

**Lecturer/Dozent**

- Topology, Single Mathematics B – Durham University
- Measure Theory; Linear Algebra; Actuarial Mathematics; Engineering Calculus – NUI Galway
- Geometrie I – Universität Bonn
- Seminar on the Classification of Surfaces – Universität Bonn, WWU Münster
- Analysis I, II – WWU Münster
- Calculus I – University of Pennsylvania

**Assistant/Ansprechpartner**

- Analysis I, III; Introduction to Analysis, Topology and Geometry; Complex Analysis;  
Curves and Surfaces; Differential Geometry I, II; Ricci Flow; Lie groups and homogeneous spaces;  
Morse Theory Seminar; Differential Geometry Seminar; Classification of Surfaces Seminar.  
(all WWU Münster)

**Teaching Assistant/Tutor/Grader**

- Geometric Topology; Analysis I; Complex Analysis; Linear Algebra (all Durham University)
- Calculus I, III; Advanced Linear Algebra; Topology and Geometric Analysis;  
Differential Geometry I, II (all University of Pennsylvania)
- Pre-Calculus; Finite Mathematics; Data Analysis; Calculus I, III; Linear Algebra;  
Operations Research; Statistics I (all NUI Maynooth)

INVITED  
CONFERENCE  
PARTICIPANT  
(LAST 5 YEARS)

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Workshop on Curvature and Global Shape WWU Münster, Germany.	Aug 2025
Prospects in Geometry and Global Analysis Universität Marburg, Germany.	Aug 2023
Workshop on Curvature and Global Shape WWU Münster, Germany.	Aug 2023
Workshop on Curvature and Global Shape WWU Münster, Germany.	Aug 2021
Geometrie (postponed) Mathematisches Forschungsinstitut, Oberwolfach, Germany.	June 2020
Annual Meeting of the Irish Mathematical Society National University of Ireland, Galway, Ireland.	Sept 2019
Geometry of, and via, Symmetries University of Notre Dame, USA	April 2019
Australian-German Workshop on Differential Geometry in the Large MATRIX Institute, Creswick, Australia.	Feb 2019
New trends and open problems in Geometry and Global Analysis Universität Marburg, Germany.	Aug 2018
Geometrie Mathematisches Forschungsinstitut, Oberwolfach, Germany.	June 2018

Differentialgeometrie im Großen Mathematisches Forschungsinstitut, Oberwolfach, Germany.	July 2017
Irish Geometry Conference National University of Ireland, Maynooth, Ireland.	May 2017
Reflections on Global Riemannian Geometry University of Tennessee, Knoxville, TN, USA	Aug 2016
Geometrie Mathematisches Forschungsinstitut, Oberwolfach, Germany.	June 2016
Program on Differential Geometry MSRI, Berkeley, USA	Mar-May 2016

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FURTHER  
CONFERENCES  
ATTENDED  
(LAST 5 YEARS)

Meetings of the UK Metric Geometry & Analysis Network Cardiff University, Durham University, UK.	2024 ( $\times 2$ )
Yorkshire-Durham Geometry Days Durham University, University of Leeds, University of York, UK.	2022 ( $\times 1$ ), 2023 ( $\times 3$ ), 2024 ( $\times 3$ )
Groups in Galway meets the Irish Geometry Conference NUI Galway, Ireland	May 2022
Annual Meeting of the Irish Mathematical Society University College Cork, Ireland.	Sept 2021
Workshop on Curvature and Global Shape WWU Münster, Germany.	July 2019
Representations of Riemannian Geometry St. Joseph's University, Philadelphia, USA	Aug 2017
Workshop on Curvature and Global Shape WWU Münster, Germany.	July 2017
Differential Geometry in the Large Università di Firenze, Florence, Italy.	July 2016
Kähler Geometry, Einstein Metrics, and Generalizations MSRI, Berkeley, USA	Mar 2016

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REFERENCES

Karsten Grove University of Notre Dame, Notre Dame, IN, USA	<i>kgrove2@nd.edu</i>
Krishnan Shankar James Madison University, Harrisonburg, VA, USA	<i>shankakx@jmu.edu</i>
Burkhard Wilking Mathematisches Institut, WWU Münster, Germany	<i>wilking@math.uni-muenster.de</i>
David Wraith Maynooth University, Maynooth, Ireland	<i>david.wraith@mu.ie</i>
Wolfgang Ziller University of Pennsylvania, Philadelphia, PA, USA	<i>wziller@math.upenn.edu</i>