# Philipp REISER

Curriculum Vitae

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| EMAIL | philipp.reiser.math@mailbox.org |
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| WEBSITE | philipp-reiser.github.io |

RESEARCH INTERESTS | Riemannian geometry and geometric topology. In particular: Riemannian manifolds of positive Ricci curvature, various other lower curvature bounds (scalar, sectional intermediate Ricci curvature), generalised notions of Ricci curvature, spaces and moduli spaces of Riemannian metrics, surgery, torus actions and Lie group actions with low-dimensional orbit space

LANGUAGES | German (native), English (fluent), French (intermediate), Chinese (intermediate)

## 1. EDUCATION

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|---|---|
| Feb 2019 - Aug 2022 | **Karlsruhe Institute of Technology** |
| | Degree: PhD in Mathematics (Dr. rer. nat.) |
| | Thesis: *Generalized Surgery on Riemannian Manifolds of Positive Ricci Curvature*, doi:10.5445/IR/1000150280 |
| | Supervisors: Prof. Wilderich Tuschmann, Prof. Fernando Galaz-García |

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| Oct 2016 - Feb 2019 | **Karlsruhe Institute of Technology** |
| | Degree: Master of Science in Mathematics (M.Sc.) |
| | Thesis: *Spaces and Moduli Spaces of Riemannian Metrics with Positive Scalar Curvature* |
| | Supervisor: Prof. Fernando Galaz-García |

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|---|---|
| Oct 2013 - Sep 2016 | **Karlsruhe Institute of Technology** |
| | Degree: Bachelor of Science in Mathematics (B.Sc.) |
| | Thesis: *The Plateau Problem and Conformal Parameters* |
| | Supervisor: Prof. Tobias Lamm |

## 2. EMPLOYMENT

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| Sep 2023 - Aug 2025 | **Department of Mathematics, University of Fribourg** |
| | Position: Postdoc |
| | Supervisor: Prof. Anand Dessai |

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| Sep 2022 - Aug 2023 | **Department of Mathematics, University of Fribourg** |
| | Position: Postdoc within the SNSF-Project 200020E_193062 and the DFG-Priority programme SPP 2026 |
| | Supervisor: Prof. Anand Dessai |

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| Oct 2019 - Aug 2022 | **Department of Mathematics, Karlsruhe Institute of Technology** |
| | Position: Research associate within the RTG 2229 "Asymptotic Invariants and Limits of Groups and Spaces" |
| | Supervisor: Prof. Wilderich Tuschmann |

## 3. PUBLICATIONS

12. D. Maximo, P. Reiser and D. Semola, *Ricci curvature and minimal hypersurfaces with large Betti numbers.* Calc. Var. (to appear). arXiv:2507.17305.

11. P. Reiser and F. Tripaldi, *Surgery and positive Bakry-Émery Ricci curvature.* Calc. Var. 65, 38 (2026). doi:10.1007/s00526-025-03211-2.

10. P. Reiser and D.J. Wraith, *Positive intermediate Ricci curvature on connected sums.* Algebr. Geom. Topol. 25 (2025). doi:10.2140/agt.2025.25.4209.

9. P. Reiser and D.J. Wraith, *Positive intermediate Ricci curvature on fibre bundles.* SIGMA Symmetry Integrability Geom. Methods Appl. 21 (2025). doi:10.3842/SIGMA.2025.006.

8. P. Reiser and F. Galaz-García, *Free torus actions and twisted suspensions.* Forum Math. Sigma 13:e3 (2025). doi:10.1017/fms.2024.141.

7. P. Reiser, *Examples of tangent cones of non-collapsed Ricci limit spaces.* Nonlinear Anal. 252 (2025), Paper No. 113699. doi:10.1016/j.na.2024.113699.

6. P. Reiser, *Metrics of Positive Ricci Curvature on Simply-Connected Manifolds of Dimension $6k$.* J. Topol. 17(4) (2024), Paper No. e70007, 50. doi:10.1112/topo.70007.

5. P. Reiser, *Positive Ricci Curvature on Twisted Suspensions.* Int. Math. Res. Not. IMRN 22 (2024), 14115–14137, doi:10.1093/imrn/rnae231.

4. P. Reiser and D.J. Wraith, *Intermediate Ricci curvatures and Gromov's Betti number bound.* J. Geom. Anal. 33 (2023), 364, doi:10.1007/s12220-023-01423-6.

3. P. Reiser, *Generalized Surgery on Riemannian Manifolds of Positive Ricci Curvature.* Trans. Amer. Math. Soc. 376 (2023), 3397–3418, doi:10.1090/tran/8789.

2. G. Frenck, F. Galaz-García, and P. Reiser, *Cohomogeneity One Manifolds and Homogeneous Spaces of Positive Scalar Curvature.* Bull. Lond. Math. Soc. 54 (2022), no.1, 71-82, doi:10.1112/blms.12557.

1. P. Reiser, *Moduli Spaces of Metrics of Positive Scalar Curvature on Topological Spherical Space Forms.* Canad. Math. Bull. 63 (2020), no. 4, 901–908, doi:10.4153/s0008439520000132.

## 4. Preprints

2. P. Reiser, *Positive Ricci curvature on connected sums of fibre bundles.* arXiv:2406.02274 (2024).

1. P. Reiser and D.J. Wraith, *A generalization of the Perelman gluing theorem and applications.* arXiv:2308.06996 (2023).

## 5. Awards and Honors

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| Nov 2019 | Faculty award for outstanding achievements in the Master's programme in mathematics<br>Karlsruhe Institute of Technology |

## 6. Grants and Fellowships

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| Jul 2024 | Mathematics Münster programme *Young Research Fellow* to visit Dr. Masoumeh Zarei at the University of Münster |
| Mar 2022 - Jun 2022 | Karlsruhe House of Young Scientists (KHYS) *Research Travel Grant* to visit Prof. David Wraith at Maynooth University |
| Dec 2019 - Oct 2020 | Research Assistantship with Prof. Fernando Galaz-García at Durham University, funded by DFG grant GA 2050 2-1 within the SPP 2026 "Geometry at Infinity" |
| Feb 2019 - Aug 2019 | DAAD Scholarship to visit Prof. Yihu Yang at Shanghai Jiao Tong University |

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| Oct 2016 - Sep 2018 | Scholarship *Deutschlandstipendium* |

## 7. Invited Talks

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| May 2025 | *Manifolds of positive Bakry-Émery Ricci curvature*<br>Peking-Westlake Geometric Analysis Seminar, held online |
| Apr 2025 | *Tangent cones of non-collapsed Ricci limit spaces*<br>Geometric Analysis Seminar, University of Vienna |
| Nov 2024 | *Positive Ricci curvature and connected sums*<br>Geometry and Topology Seminar, Durham University |
| Nov 2024 | *Positive Ricci curvature and connected sums*<br>Geometry Seminar, University of Leeds |
| Sep 2024 | *Twisted suspensions, torus actions, and positive Ricci curvature*<br>Virtual seminar on geometry with symmetries, held online |
| Jul 2024 | *Manifolds of positive Bakry-Émery Ricci curvature*<br>Differential Geometry Research Seminar, University of Münster |
| Jun 2024 | *Manifolds of positive Bakry-Émery Ricci curvature*<br>Differential Geometry Research Seminar, Karlsruhe Institue of Technology |
| Feb 2024 | *Connected sums and lower curvature bounds*<br>Colloquium of the Department of Mathematics and Statistics, Maynooth University |
| Feb 2024 | *Surgery on weighted Riemannian manifolds of positive Bakry-Émery Ricci curvature*<br>Geometry and Topology Seminar, Durham University |
| Nov 2023 | *Positive intermediate Ricci curvature, surgery and Gromov's Betti number bound*<br>Geometry Research Seminar, University of Freiburg i.Br. |
| Jul 2023 | *Positive intermediate Ricci curvature, surgery and Gromov's Betti number bound*<br>Workshop: Modern Techniques in Riemannian Geometry 2023, Universidad Nacional Autónoma de México (UNAM), held online |
| May 2023 | *Surgery and positive intermediate Ricci curvature*<br>Differential Geometry Research Seminar, University of Münster |
| May 2023 | *Positive intermediate Ricci curvature, surgery and Gromov's Betti number bound*<br>Differential Geometry Research Seminar, Karlsruhe Institue of Technology |
| May 2023 | *Positive intermediate Ricci curvature: an introduction and new examples*<br>Riemannian Topology Seminar, University of Stuttgart |
| Apr 2023 | *Surgery and positive intermediate Ricci curvature*<br>Geometry and Topology Seminar, Syracuse University |
| Feb 2023 | *Positive intermediate Ricci curvature on fibre bundles*<br>Oregon Topology/Geometry Zoom Seminar, held online |
| Dec 2022 | *Surgery on Riemannian Manifolds of Positive Ricci Curvature*<br>Conference: Young Mathematicians in Geometry and Analysis, Université de Haute-Alsace (UHA), Mulhouse |

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| Nov 2022 | *Generalized Surgery on Riemannian Manifolds of Positive Ricci Curvature*<br>Geometry and Topology Seminar, Durham University |
| Feb 2022 | *Generalized Surgery on Riemannian Manifolds of Positive Ricci Curvature and Applications in Dimension 6*<br>Irish Geometry Seminar, held online |
| Mar 2021 | *Generalized Surgery on Riemannian Manifolds of Positive Ricci Curvature*<br>Oregon Topology/Geometry Zoom Seminar, held online |
| Jan 2021 | *Positive Ricci Curvature and Surgery*<br>Augsburg-Fribourg-Karlsruhe (A-Fri-Ka) Riemannian Topology Research Seminar, held online |
| Jan 2020 | *Moduli Spaces of Riemannian Metrics with Positive Scalar Curvature on Topological Spherical Space Forms*<br>Geometry and Topology Seminar, Durham University |
| Oct 2019 | *Moduli Spaces of Riemannian Metrics with Positive Scalar Curvature on Topological Spherical Space Forms*<br>Topology Seminar, University of Fribourg |

## 8. Contributed Talks

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| Aug 2023 | *Positive intermediate Ricci curvature, surgery and Gromov's Betti number bound*<br>Workshop: Curvature and Global Shape, University of Münster |
| Jun 2021 | *Positive Ricci Curvature and Generalized Surgery*<br>Workshop: Analysis, Geometry and Topology of Positive Scalar Curvature Metrics, Oberwolfach |

## 9. Teaching Experience

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| Feb 2025 - May 2025 | Lecture: *Linear Algebra II*, Lecturer<br>University of Fribourg |
| Feb 2024 - May 2024 | Lecture: *Algebra and Geometry II*, Teaching Assistant<br>University of Fribourg |
| Sep 2023 - Dec 2023 | Proseminar: *Knot Theory*, Lecturer<br>University of Fribourg |
| Feb 2023 - May 2023 | Lecture: *Linear Algebra II*, Teaching Assistant<br>University of Fribourg |
| Sep 2022 - Dec 2022 | Lecture: *Linear Algebra I*, Teaching Assistant<br>University of Fribourg |
| Apr 2022 - Jun 2022 | Seminar: *Lie Groups*, Lecturer<br>Maynooth University |
| Mar 2019 - Apr 2019 | Mini Lecture Series (4 sessions): *Spaces and Moduli Spaces of Riemannian Metrics with Positive Scalar Curvature*, Lecturer<br>Shanghai Jiao Tong University |
| Oct 2018 - Feb 2019 | Lecture: *Linear Algebra I*, Tutor<br>Karlsruhe Institute of Technology |

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| Apr 2018 -<br>Sep 2018 | Lecture: *Introduction to Algebra and Number Theory*, Tutor<br>Karlsruhe Institute of Technology |
| Oct 2017 -<br>Mar 2018 | Lecture: *Analysis I*, Tutor<br>Karlsruhe Institute of Technology |
| Oct 2016 -<br>Mar 2017 | Lecture: *Analysis III*, Tutor<br>Karlsruhe Institute of Technology |
| Apr 2016 -<br>Sep 2016 | Lecture: *Analysis II*, Tutor<br>Karlsruhe Institute of Technology |
| Oct 2015 -<br>Mar 2016 | Lecture: *Analysis I*, Tutor<br>Karlsruhe Institute of Technology |

## 10. Extended Visits

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| Jul 2024 | University of Münster<br>Visiting Dr. Masoumeh Zarei |
| Mar 2022 -<br>Jun 2022 | Maynooth University<br>Visiting Prof. David Wraith |
| Dec 2019 -<br>Oct 2020 | Durham University<br>Visiting Prof. Fernando Galaz-García |
| Feb 2019 -<br>Aug 2019 | Shanghai Jiao Tong University<br>Visiting Prof. Yihu Yang |

## 11. Service

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| | Reviewer for *Mathematische Zeitschrift*, *Pacific Journal of Mathematics* and *Topology and its Applications* |
| 2025 | Student co-supervision (with Prof. Anand Dessai): Axel Dafflon (M.Sc.), Thesis title: "Riemannian submersions and positive Ricci curvature" |
| Sep 2022 -<br>Aug 2025 | Co-organiser of the topology research seminar<br>University of Fribourg |
| Jan 2024 | Member of the departmental advisory group for the hiring of a professor in mathematics<br>University of Fribourg |
| Nov 2023 | Co-organiser of the workshop *Riemannian Topology Meeting*<br>University of Fribourg |
| Oct 2020 -<br>Sep 2021 | Speaker of the Ph.D. Students of the RTG 2229 "Asymptotic Invariants and Limits of Groups and Spaces"<br>Karlsruhe Institute of Technology |

## 12. Conferences Attended

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| Nov 2024 | *Young Mathematicians in Geometry and Analysis*<br>Université de Haute Alsace (UHA), Mulhouse |
| Nov 2023 | *Riemannian Topology Meeting*<br>University of Fribourg |

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| Aug 2023 | *Curvature and Global Shape*<br>University of Münster |
| Jul 2023 | *Modern Techniques in Riemannian Geometry 2023*<br>Universidad Nacional Autónoma de México (UNAM), participated online |
| Jun 2023 | *Geometry and analysis of groups and manifolds*<br>De Giorgi Center, SNS Pisa |
| Dec 2022 | *Young Mathematicians in Geometry and Analysis*<br>Université de Haute Alsace (UHA), Mulhouse |
| Aug 2022 | *Metric Measure Spaces with Symmetry and Lower Ricci Curvature Bounds*<br>Casa Matemática Oaxaca, participated online |
| May 2022 | *Groups in Galway meets the Irish Geometry Conference*<br>National University of Ireland, Galway |
| Aug 2021 | *Curvature and Global Shape*<br>University of Münster |
| Jun 2021 | *Analysis, Geometry and Topology of Positive Scalar Curvature Metrics*<br>Oberwolfach |
| Aug 2020 | *Virtual Workshop on Ricci and Scalar Curvature in Honor of Misha Gromov's 75th Birthday*<br>held online |
| Sep 2019 | *Student Conference of the DMV Annual Meeting*<br>Karlsruhe |
| Nov 2018 | *Riemannian Topology Meeting*<br>University of Fribourg |