CV

Academic Positions

since 2006	Full professor at Freiburg
2003–2006	Professor at Regensburg
1999–2003	Assistant at Tübingen
1993–1998	Research assistant at Freiburg

Education

2002	Habilitation in Mathematics at Tübingen
1997	Ph.D. in Mathematics at Freiburg (summa cum laude)

Grants

2023–2026	FNRS–DFG Weave Project “Topological Methods in G_2-Geometry”, with A. Haydys
2016–2023	Simons Collaboration “Special Holonomy in Geometry, Analysis, and Physics”, PI
2012–2022	DFG Research Training Group “Cohomological Methods in Geometry”, PI
2017–2020	DFG SPP 2026, project “Secondary invariants for foliations”, with S. Azzali and I. Roy
2009–2012	DFG SFG TR 71 “Geometric Partial Differential Equations”, PI
2001	Research Grant at MSRI
1998–1999	DFG Scolarship at Paris-Sud

Prizes

1997	Ferdinand-von-Lindemann-Preis of the University at Freiburg

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Preprints

with J. Nordström, **ν-invariants of extra-twisted connected sums,** with an appendix by D. Zagier, Preprint (2020); arXiv:2010.16367

with M. Kerin and K. Shankar, **Highly connected 7-manifolds, the linking form and non-negative curvature,** preprint (2020); arXiv:2003.04907

with D. Crowley, and J. Nordström, **An analytic invariant of G_2 manifolds,** preprint (2015); arXiv:1505.02734

Refereed Publications

with M. Kerin, K. Shankar, **Highly connected 7-manifolds and non-negative sectional curvature,** Ann. of Math. (2) 191 (2020), no. 3, 829–892

with S. Azzali, T. Schick, **Large time limit and local L2-index theorems for families,** J. Noncommut. Geom. 9 (2015), no. 2, 621–664

Adiabatic limits of Seifert fibrations, Dedekind sums, and the diffeomorphism type of certain 7-manifolds, J. Eur. Math. Soc. 16 (2014), no. 12, 2499–2555

with K. Igusa, **Exotic smooth structures on topological fibre bundles II,** Trans. Amer. Math. Soc. 366 (2014), 791–832

with K. Igusa, B. Williams, **Exotic smooth structures on topological fibre bundles I,** Trans. Amer. Math. Soc. 366 (2014), 749–790

with D. Crowley, **Kreck-Stolz invariants for quaternionic line bundles,** Trans. Amer. Math. Soc. 365 (2013), 3193–3225

Scalar Curvature Estimates by Parallel Alternating Torsion, Trans. of the Amer. Math. Soc. 363 (2011), 165–183

Eta invariants of homogeneous spaces, Pure Appl. Math. Q. 5 (2009), 915–946

with C. Zickert, **The extended Bloch group and the Cheeger-Chern-Simons class,** Geom. Topol. 11 (2007), 1623–1635

Vafa-Witten estimates for Compact Symmetric Spaces, Comm. Math. Phys. 271 (2007), 839-851

with N. Kitchloo and K. Shankar, **Diffeomorphism type of the Berger space** SO(5)/SO(3), Am. J. Math. 126 (2004), 395–416

with J.-M. Bismut, **Equivariant de Rham torsions,** Ann. of Math. 159 (2004), 53–216

with U. Semmelmann, **Scalar Curvature Estimates for Compact Symmetric Spaces,** Diff. Geom. Appl. 16 (2002), 65–78

with U. Semmelmann, **The Point Spectrum of the Dirac Operator on Non-compact Symmetric Spaces,** Proc. Amer. Math. Soc. 130 (2002), 915–923

with J.-M. Bismut, **Families torsion and Morse functions,** Astérisque 275 (2001), x + 293 pages

with U. Semmelmann, **Spin^c Structures and Scalar Curvature Estimates,** Ann. Global Anal. Geom. 20 (2001), 301–324

with J.-M. Bismut, **Holomorphic Equivariant Analytic Torsions,** Geom. funct. anal. 10 (2001), 1289–1422

Equivariant eta-Invariants and eta-Forms, J. reine angew. Math. 526 (2000), 181–236

Equivariant eta-Invariants on Homogeneous Spaces, Math. Z. 232 (1999) 1, 1–42

with V. Schroeder, **Totally geodesic hypersurfaces in manifolds of nonpositive curvature,** manuscripta math. 86 (1995), 169–184

Survey Articles

with D. Crowley, J. Nordström, **Distinguishing G_2-manifolds,** Lectures and surveys on G_2-manifolds and related topics, 143–172, Fields Inst. Commun., 84, Springer, New York, 2020

Computations and Applications of eta Invariants, in C. Bär, J. Lohkamp, M. Schwarz (eds), Global Differential Geometry, Springer Proc. Math. 17, Springer, Heidelberg (2012), 401-431

Torsion invariants for families, in X. Dai (ed.) et al., From probability to geometry II, Volume in honor of the 60th birthday of Jean-Michel Bismut, Astérisque 328 (2009), 161–206