

Personal Details

Date of Birth 04.12.1984
Place of Birth Vaihingen an der Enz, Germany
Work address Universität Hamburg
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Research Interests

Differential geometry, in particular hyperkähler and hypersymplectic structures and their relation to gauge theory and Lie theory.
Moduli spaces of Nahm's equations, Higgs bundles, harmonic maps from Riemann surfaces into homogeneous spaces, Nahm-Schmid equations.

Academic Employment

- 09/2022 – Teaching/Research Fellow (permanent, on parental leave 02/2023 – 09/2023), Universität Hamburg
- 10/2018 – 09/2022 Postdoctoral Research Fellow (on parental leave 09/2021 – 09/2022), Universität Hamburg, Germany
- 04/2014 – 09/2018 Postdoctoral Research Fellow, Leibniz Universität Hannover, Germany
Associated member DFG Research Training Group 1463 “Analysis, Geometry, and String Theory” (2015 – 2017)
- 10/2012 – 03/2014 Postdoctoral Research Fellow, SFB 878 “Groups, Geometry and Actions”, Universität Münster, Germany
- 10/2010 – 06/2012 Retained Lecturer in Pure Mathematics, Jesus College, Oxford.

Education

- 10/2009 – 09/2012 DPhil in Mathematics, New College, University of Oxford
Thesis: “The ASD Equations in Split Signature and Hypersymplectic Geometry”, Supervisor: Andrew Dancer
- 10/2008 – 07/2009 Master of Advanced Study in Mathematics, with Distinction, Girton College, University of Cambridge
- 10/2006 – 09/2008 Mathematics, Eberhard-Karls-Universität Tübingen, Vordiplom
- 10/2005 – 09/2008 Physics, Eberhard-Karls-Universität Tübingen, Vordiplom

Prizes and Awards

- 2009 EPSRC 3-year “fees-only” DPhil-Studentship, University of Oxford
- 2009 M.T. Meyer Scholarship for mathematics, Girton College, Cambridge
- 2009 Getrude Mather Jackson prize for mathematics, Girton College, Cambridge
- 2008 European Student Bursary, Cambridge European Trust
- 2008 Scholarship from the DAAD (German Academic Exchange Service) to support my studies at Cambridge

Written Work

Preprints

- [15] “Quaternionic Kähler manifolds fibered by solvsolitons”
(with Alejandro Gil Garcia and Vicente Cortés), preprint arxiv:2501.12225
- [14] “Geometry of the space of sections of twistor spaces with circle action”
(with Florian Beck, Indranil Biswas and Sebastian Heller), preprint arXiv:2102.10853
- [13] “Slodowy slices and the complete integrability of Mishchenko-Fomenko subalgebras on regular adjoint orbits”
(with Peter Crooks and Stefan Rosemann), preprint arxiv:1803.04942

Publications

- [12] “Complete quaternionic Kähler manifolds with finite volume ends”
(with Vicente Cortés and Daniel Thung), accepted for publication in Annales de l’institut Fourier preprint arXiv:2105.00727
- [11] “Hessenberg varieties and Poisson slices”
(with Peter Crooks), accepted for publication in Contemporary Mathematics of the AMSpreprint arXiv:2005.00874
- [10] “On the singularities of Mishchenko–Fomenko systems”
(with Peter Crooks), Transformation Groups (2022)
- [9] “The log symplectic geometry of Poisson slices”
(with Peter Crooks), accepted for publication in The Journal of Symplectic Geometry, preprint arxiv:2008.06172
- [8] “On the fibres of Mishchenko-Fomenko systems”
(with Peter Crooks), Documenta Mathematica 25, 1195-1239 (2020)
- [7] “Energy of sections of the Deligne-Hitchin twistor space”
(with Florian Beck and Sebastian Heller), Mathematische Annalen 380 , no. 3-4, 1169–1214, (2021)
- [6] “Real holomorphic sections of the Deligne-Hitchin Twistor space”
(with Indranil Biswas and Sebastian Heller), Communications in Mathematical Physics, 366(3), 1099–1133, (2019)
- [5] “Irreducibility of the Laplacian Eigenspaces of some Homogeneous Spaces”
(with David Petrecca), Mathematische Zeitschrift 291, 395–419, (2019)
- [4] “The Nahm-Schmid Equations and Hypersymplectic Geometry”
(with Roger Bielawski and Nuno Romao), The Quarterly Journal of Mathematics, Volume 69, Issue 4, 1253–1286, (2018)
- [3] “Hyperkähler Implosion and Nahm’s Equations”
(with Andrew Dancer and Frances Kirwan), Communications in Mathematical Physics, 342(1), 251–301, (2016)
- [2] “Harmonic Maps and Hypersymplectic Geometry”
Journal of Geometry and Physics 78 (2014), 111–126.

Thesis

- [1] “The ASD Equations in Split Signature and Hypersymplectic Geometry”
DPhil Thesis, Oxford (2012)

Research Visits

- 06/2019 Northeastern University, Boston (Peter Crooks), 4 days
- 06/2019 “Geometry and Physics of Hitchin Systems”, Simons Center for Geometry and Physics, Stony Brook, 10 days.
- 10/2016 Waseda University, Tokyo (Martin Guest), two weeks
- 09/2015 Universität Stuttgart (Frederik Witt), four days
- 06/2014 University of Oxford (Andrew Dancer, Frances Kirwan), four days

Invited Talks

Mini-Courses

- 10/2018 – 11/2018 “Hyperkähler geometry of Nahm moduli spaces” (6 talks), Gauge Theory Seminar, University of Göttingen
- 10/2017 “The Classical Simpson Correspondence” (4 talks on non-abelian Hodge Theory), Research Seminar Arithmetic Geometry, FU Berlin

Colloquium Talks

- 02/2022 “Harmonic Maps and the Deligne–Hitchin Twistor Space”, Institutskolloquium, Mathematisches Institut, Universität Potsdam
- 01/2019 “Higgs Bundles, Harmonic Maps and Twistor Lines”, Mathematische Gesellschaft, Universität Göttingen

Research Talks

- 04/2021 “Geometry of the Space of Sections of the Deligne–Hitchin Twistor Space”, Differential Geometry Seminar, University of California, Riverside
- 11/2020 “Hitchin’s equations, harmonic maps and twistor lines”, Edinburgh Mathematical Physics Group Seminar, Maxwell Institute for Mathematical Sciences, Edinburgh
- 06/2020 “Hessenberg varieties and Poisson slices”, Lie Theory and integrable systems in symplectic and Poisson geometry, Fields Institute
- 05/2020 “Holomorphic sections of the Deligne–Hitchin Twistor space”, Higgs bundles and related topics, University of Toronto
- 01/2019 “Real holomorphic sections of the Deligne–Hitchin Twistor space”, Gauge Theory Seminar, Universität Göttingen
- 10/2018 “Real holomorphic sections of the Deligne–Hitchin Twistor space”, Research Seminar Differential Geometry, Universität Hamburg
- 07/2018 “Real holomorphic sections of the Deligne–Hitchin Twistor space”, BIRS-CMO Workshop “Higgs bundles and Harmonic Maps from Riemann Surfaces”, Oaxaca, Mexico
- 06/2018 “Real holomorphic sections of the Deligne–Hitchin Twistor space”, Oberseminar Geometrie, LMU München
- 06/2018 “Irreducibility of the Laplacian Eigenspaces of some Homogeneous Spaces”, Oberseminar Global Analysis, Universität Regensburg
- 08/2017 “The Nahm–Schmid Equations and Hypersymplectic Geometry”, Conference “Higgs Bundles, Harmonic Maps and Integrable Systems” in honour of Franz Pedit’s 60th birthday, Leibniz Universität Hannover
- 10/2016 “Schmid’s Equations and Hypersymplectic Geometry”, Waseda University, Tokyo
- 03/2016 “Hyperkähler Implosion and Nahm’s Equations”, Workshop “Lie Theory and Geometry”, Schloss Rauischholzhausen
- 11/2015 “Symplectic and Hyperkähler Implosion”, Workshop “Hyperkähler and Related Structures in Differential and Algebraic Geometry”, Levico Terme, Italy
- 06/2015 “Hyperkähler Implosion”, 6th Northern German Differential Geometry Day, Christian-Albrechts-Universität zu Kiel
- 12/2014 “Hyperkähler Implosion and Nahm’s Equations”, Gauge Theory Seminar, Georg-August-Universität Göttingen
- 11/2014 “Hyperkähler Implosion and Nahm’s Equations”, Geometry and Analysis Seminar, University of Oxford
- 10/2014 “Hyperkähler Implosion and Nahm’s Equations”, Oberseminar Differentialgeometrie, Leibniz Universität Hannover
- 09/2014 “Hyperkähler Implosion”, Mini-Symposium “Quaternion-Kähler manifolds and related structures in Riemannian and Algebraic Geometry”, DMV-PTM meeting, Poznan
- 05/2014 “Hypersymplectic Manifolds”, Oberseminar Differentialgeometrie, Leibniz Universität Hannover
- 07/2012 “Harmonic Maps and Hypersymplectic Geometry” Forschungsseminar Mathematische Physik, Philipps Universität Marburg

- 01/2012 “Hypersymplectic Geometry and Gauge Theory” Oberseminar Differentialgeometrie, Westfälische Wilhelms-Universität Münster
- 01/2012 “Hypersymplektische Geometrie” Oberseminar Geometrie, Universität Stuttgart
- 10/2010 “Mirror Symmetry for K3 Surfaces” String Theory Lunchtime Seminar, Mathematical Institute, University of Oxford

Events and Seminars organised

- 04/2021 – 07/2021 Seminar “Stability Conditions” (with Tobias Dyckerhoff) Center for Mathematical Physics, Universität Hamburg
- 12/2017 “GRK Final Colloquium” 15.12.2017 (with Klaus Hulek und Elmar Schrohe), DFG Research Training Group 1463, Leibniz Universität Hannover
- 01/2017 – 07/2017 PhD student seminar “The Geometry of the Nilpotent Variety”, DFG Research Training Group 1463, Leibniz Universität Hannover
- 05/2016 Workshop on “Geometric Structures related to Hermitian and Almost Hermitian Manifolds”, Leibniz Universität Hannover (with Roger Bielawski, David Petrecca, Lars Schäfer)
- 04/2015 – 04/2017 Reading Seminar, Institute of Differential Geometry, Leibniz Universität Hannover
- 10/2011 – 06/2012 Junior Geometry and Topology Seminar, Mathematical Institute, University of Oxford

Other Activities

- 10/2017 – Member of several appointment committees (W2 positions) and two habilitation committees, Leibniz Universität Hannover and Universität Hamburg
- 04/2017 – 09/2018 Postdoctoral representative on the faculty committee (Fakultätsrat), Faculty of Mathematics and Physics, Leibniz Universität Hannover
- 09/2014 – 06/2015 Participant in the higher education programme “Pro Lehre”, Leibniz Universität Hannover, Germany.
- 2013 – I have been invited to review articles for “Advances in Mathematics”, “Annals of Global Analysis and Geometry”, “Differential Geometry and its Applications”, “Journal of the London Mathematical Society”, “Journal of Physics A”, “Mathematical Reviews”, “Mathematische Annalen”, “Mathematische Zeitschrift”.

Teaching Experience

Lecture Courses taught at Universität Hamburg

- SS 2024/25 B.Ed. lecture course “Mathematics of Voting Systems”
- WS 2024/25 Graduate lecture course “Elliptic Operators on Compact Manifolds”
- WS 2024/25 B.Ed. lecture course “Geometry of curves and surfaces”
- WS 2023/24 B.Ed. lecture course “Geometry of curves and surfaces”
- SS 2021 Graduate lecture course “Elliptic Operators with Applications in Gauge Theory”

Seminars taught at Universität Hamburg

- SS 2025 M.Ed. Seminar “Discrete Symmetry groups”
- WS 2024/25 M.Ed. Seminar “Symmetries”
- WS 2023/24 M.Ed. Seminar “Symmetries”

Tutorials given at Universität Hamburg

- SS 2025 “Mathematics 2 LA Sek”
“Software course (B.Ed.)”
- WS 2024/25 “Mathematics 1 LASEk”
- WS 2023/24 “Mathematics 1 LASEk”
“Mathematics 3 LASEk”
- SS 2023 “Mathematics 2 LA Sek”
“Mathematics 4 LA Sek”
- WS 2022/23 “Mathematics 1 LASEk”
“Mathematics 3 LASEk”
- SS 2021 “Mathematics for Physicists IV”
- WS 2020/21 “Mathematics for Physicists I”
“Mathematics for Physicists III”
- SS 2020 “Mathematics for Physicists IV”
- WS 2019/20 “Mathematics for Physicists III”
- SS 2019 “Differential Geometry I”
“Mathematics for Physicists II”
- WS 2018/19 “Mathematics for Physicists I”

Lecture Courses taught at Leibniz Universität Hannover

- SS 2018 Graduate lecture course (with exercises) “Yang-Mills theory and stable bundles over Kähler manifolds”
- SS 2016 Undergraduate lecture course “Manifolds”

Tutorials given at Leibniz Universität Hannover

- WS 2017/18 “Riemannian Geometry”
“Mathematics for Physicists I”
- SS 2017 “Manifolds”
“Analysis II”
- WS 2016/17 “Riemannian Geometry”
“Analysis I”
- WS 2015/16 “Analysis I”
- SS 2015 “Schulgeometrie vom höheren Standpunkt” (Axiomatic Euclidean Geometry for highschool teachers)
“Classical Differential Geometry”
- WS 2014/15 “Riemannian Geometry”,
“Complex Differential Geometry”
- SS 2014 “Schulgeometrie vom höheren Standpunkt” (Axiomatic Euclidean Geometry for highschool teachers)
“Mathematics II for Engineers”

Tutorials given at the University of Oxford

- 10/2010 – 06/2012 Retained Lecturer in Pure Mathematics, Jesus College, Oxford.
Tutorials for first and second year undergraduates in pure mathematics (Analysis, Geometry, Linear Algebra, Algebra, Topology, Measure Theory)
- 01/2010 – 03/2010 Assistant for the course “C 3.2b: Differentiable Manifolds”
[Tutorials given at Eberhard-Karls-Universität Tübingen](#)
- SS 2008 “Linear Algebra II”
- WS 2007/08 “Physics I, Classical Mechanics”

Theses

[Universität Hamburg](#)

- 06/2020 – I have acted as second examiners for 1 BA thesis (first examiner: Prof. Dr. Janko Latschev) and 1 MA thesis (first examiner: Prof. Dr. Vicente Cortés) on topics in differential geometry

[Leibniz Universität Hannover](#)

- 06/2015 – 09/2018 I have acted as second examiner for 15 BA theses by prospective highschool teachers on topics related to elementary/axiomatic geometry (first examiner: PD Dr. Lutz Habermann)

Conferences Attended

- 06/2020 “Lie Theory and integrable systems in symplectic and Poisson geometry”, Fields Institute
- 05/2020 “Higgs bundles and related topics”, University of Toronto
- 07/2019 “Metric and Analytic Aspects of Moduli Spaces”, Leibniz Universität Hannover
- 07/2018 BIRS-CMO Workshop “Higgs bundles and Harmonic Maps from Riemann Surfaces”, Oaxaca, Mexico
- 10/2017 “Lie Theory, Geometry and Differential Equations”, Schloss Rauischholzhausen
- 08/2017 “Higgs Bundles, Harmonic Maps and Integrable Systems”, Leibniz Universität Hannover
- 05/2016 “Geometric Structures related to Hermitian and Almost Hermitian Manifolds”, Leibniz Universität Hannover
- 03/2016 “Lie Theory and Geometry”, Schloss Rauischholzhausen
- 11/2015 “Hyperkähler and Related Structures in Differential and Algebraic Geometry”, Levico Terme, Italy
- 09/2015 “New Methods in Geometric Invariant Theory”, Freie Universität Berlin
- 09/2014 “DMV-PTM”, joint meeting of the Polish and German mathematical societies, Poznan, Poland
- 09/2014 “Special Geometric Structures in Mathematics and Physics”, Universität Hamburg
- 08/2014 “Gauge Theory in higher dimensions”, Leibniz Universität Hannover
- 07/2013 “Curvature and Global Shape”, Westfälische Wilhelms-Universität Münster
- 12/2012 “Geometry of the Vortex Equations”, Hausdorff Institute, Bonn
- 07/2012 “Poisson 2012”, University of Utrecht, Netherlands
- 07/2012 “Geometric Structures on Manifolds and their Applications”, Castle Rauischholzhausen, Germany
- 03/2012 “International school on Geometry and Physics, Geometry and Quantization of Moduli Spaces”, Centre de Recerca Matemàtica, Barcelona, Spain
- 08/2011 “Gauge Theory Workshop” Centre for Quantum Geometry of Moduli Spaces, Aarhus University, Denmark
- 07/2011 “Gauge Theory and Complex Geometry” University of Leeds, UK
- 03/2011 “Higgs Bundles and Representations of Surface Groups” University of Oxford, UK
- 01/2011 “Winter School on Moduli Spaces” Isaac Newton Institute Cambridge, UK
- 03/2010 “Young Researchers in Mathematics” University of Cambridge, UK