

MANUEL KRANNICH

PERSONAL DATA

ADDRESS: Karlsruhe Institute of Technology
Department of Mathematics
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RESEARCH INTERESTS: Algebraic and Geometric Topology

POSITIONS

since Apr 2022	KARLSRUHE INSTITUTE OF TECHNOLOGY Junior Professor (Tenure-Track, W1 to W3) Head of research group <i>Algebraic and Geometric Topology</i> Institute for Algebra and Geometry Department of Mathematics
Oct 2021 – Mar 2022	UNIVERSITY OF MÜNSTER Postdoctoral researcher Mathematics Münster: Dynamics–Geometry–Structure
Oct 2018 – Sept 2021	UNIVERSITY OF CAMBRIDGE Research Associate Department of Pure Mathematics and Mathematical Statistics

EDUCATION

2015 – 2018	UNIVERSITY OF COPENHAGEN PhD in Mathematics Member of the Centre for Symmetry and Deformation Thesis: <i>On characteristic classes of manifold bundles</i> Advisor: Nathalie Wahl
2013 – 2015	KARLSRUHE INSTITUTE OF TECHNOLOGY Master of Science (M.Sc.) in Mathematics
2010 – 2013	KARLSRUHE INSTITUTE OF TECHNOLOGY Bachelor of Science (B.Sc.) in Mathematics

AWARDS

2025	GÖTTINGEN ACADEMY OF SCIENCES AND HUMANITIES <i>Academy Prize in the Mathematical and Natural Sciences.</i>
2023	INTERNATIONAL CONFERENCE FOR BASIC SCIENCE (ICBS) <i>Frontiers of Science Award 2023</i> for the publication “A homological approach to pseudoisotopy theory I”.
2019	UNIVERSITY OF COPENHAGEN <i>SCIENCE PhD Award 2019</i> for one of the three best PhD theses in natural sciences.
2015	KARLSRUHE INSTITUTE OF TECHNOLOGY <i>Faculty Award 2015</i> for the best master’s degree of the year.

2013 KARLSRUHE INSTITUTE OF TECHNOLOGY
Faculty Award 2013 for the best bachelor's degree of the year.

SCHOLARSHIPS, STIPENDS, AND GRANTS

2026 – 2031	European Research Council <i>ERC Starting Grant</i> “Manifolds and Functor Calculus”
2023	Karlsruhe House of Young Scientists <i>Aspiring Grant</i> to fund a research visit of Robin Stoll
2022 – 2025	Deutsche Forschungsgesellschaft Principal Investigator of the <i>Research Training Group 2229</i> “Asymptotic Invariants and Limits of Groups and Spaces” funded by the DFG (acquired funding for a PhD student through a supplementary proposal).
2015 – 2018	University of Copenhagen, Centre of Symmetry and Deformation, Department of Mathematical Sciences <i>PhD stipend.</i>
2013 – 2015	German National Academic Foundation <i>Scholarship.</i>
2012 – 2013	German Federal Ministry of Education and Research <i>Scholarship Deutschlandstipendium.</i>
2011 – 2012	German Federal Ministry of Education and Research <i>Scholarship Deutschlandstipendium.</i>

EXTENDED VISITS

JAN 2022 – MAR 2022	INSTITUT MITTAG-LEFFLER Research programme <i>Higher algebraic structures in algebra, topology and geometry.</i>
APR 2018, MAR 2019, MAR 2020	HARVARD UNIVERSITY Visiting Alexander Kupers.
FEB 2018 – APR 2018	STANFORD UNIVERSITY Visiting Søren Galatius.
JAN 2017 – APR 2017	UNIVERSITY OF CAMBRIDGE Visiting Oscar Randal-Williams.

PUBLICATIONS

- Manuel Krannich, Alexander Lytchak, and Marco Radeschi, *Isoparametric foliations and bounded geometry*.
Journal of the European Mathematical Society, to appear.
Preprint available at [arXiv:2502.20191](https://arxiv.org/abs/2502.20191).
- Manuel Krannich and Oscar Randal-Williams, *Diffeomorphisms of discs and the second Weiss derivative of $\mathrm{BTop}(-)$* .
Inventiones Mathematicae **246** (2026) 197–316.
- Manuel Krannich, Alexander Kupers, and Fadi Mezher, *Framed configuration spaces and exotic spheres*.
Forum of Mathematics, Sigma, **14** (2026) E91 1–30.
- Manuel Krannich and Alexander Kupers, *Infinity-operadic foundations for embedding calculus*.
Journal of Topology, **19** (2026), no. 2, e70071.
- Geoffroy Horel, Manuel Krannich, and Alexander Kupers, *Two remarks on spaces of maps between operads of little cubes*.
Higher Structures, **9** (1) (2025) 329–339.

- Manuel Krannich and Alexander Kupers, *On Torelli groups and Dehn twists of smooth 4-manifolds*. Bulletin of the London Mathematical Society, **57** (3) (2025), 956–963.
- Manuel Krannich and Alexander Kupers, *The Disc-structure space*. Forum of Mathematics, Pi, **12** (2024) E26 1–98.
- Mauricio Bustamante, Manuel Krannich, Alexander Kupers, and Bena Tshishiku *Mapping class groups of exotic tori and actions by $SL_d(\mathbb{Z})$* . Transactions of the American Mathematical Society, **11** (2024), pp. 1316–1349.
- Manuel Krannich and Alexander Kupers, *A note on homotopy and pseudoisotopy of diffeomorphisms of 4-manifolds*. Comptes Rendus Mathématique, **362** (2024), pp. 1515–1520.
- Mauricio Bustamante, Manuel Krannich, and Alexander Kupers, *Finiteness properties of automorphism spaces of manifolds with finite fundamental group*. Mathematische Annalen, **388** (2024), 3321–3371.
- Thomas Goodwillie, Manuel Krannich, and Alexander Kupers, *Stability of concordance embeddings*. Proceedings of the Royal Society of Edinburgh: Section A Mathematics **154** (6) (2024) 1713–1748.
- Manuel Krannich and Alexander Kupers, *Embedding calculus for surfaces*. Algebraic & Geometric Topology **24**-2 (2024), 981–1018.
- Manuel Krannich, *A homological approach to pseudoisotopy theory. I*. Inventiones Mathematicae, **227** (2022) no. 3 1093–1167.
- Manuel Krannich, Alexander Kupers, and Oscar Randal-Williams, *An HP^2 -bundle over S^4 with nontrivial $\hat{A}$ -genus*. Comptes Rendus. Mathématique, Tome **359** (2021) no. 2, pp. 149–154.
- Bena Tshishiku, with an appendix by Manuel Krannich, *Geometric cycles and characteristic classes of manifold bundles*. Commentarii Mathematici Helvetici, **96** (1) (2021), 1–45.
- Manuel Krannich, *Mapping class groups of highly connected $(4k+2)$ -manifolds*. Selecta Mathematica, **26**, 81 (2020).
- Manuel Krannich and Oscar Randal-Williams, *Mapping class groups of simply connected high-dimensional manifolds need not be arithmetic*. Comptes Rendus. Mathématique, Tome **358** (2020) no. 4, pp. 469–473.
- Manuel Krannich, *A note on rational homological stability of automorphisms of manifolds*. The Quarterly Journal of Mathematics **71** (3) (2020), 1069–1079.
- Manuel Krannich and Alexander Kupers, *Some Hermitian K -groups via geometric topology*. Proceedings of the American Mathematical Society **149** (2021), 2745–2752.
- Manuel Krannich and Jens Reinhold, *Characteristic numbers of manifold bundles over surfaces with highly connected fibers*. Journal of the London Mathematical Society **102** (2) (2020), 879–904.
- Manuel Krannich, *On characteristic classes of exotic manifold bundles*. Mathematische Annalen **379** (2021), 1–21.
- Manuel Krannich, *Homological stability of topological moduli spaces*. Geometry & Topology **23** (5) (2019), 2397–2474.

PREPRINTS

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- Manuel Krannich and Alexander Kupers, *Pontryagin–Weiss classes and a rational decomposition of spaces of homeomorphisms*. Preprint (2025), arXiv:[2504.20265](https://arxiv.org/abs/2504.20265).

CONTRIBUTIONS TO CONFERENCE PROCEEDINGS

- Manuel Krannich, *Pontryagin–Weiss classes*.
Oberwolfach Reports, **21** (2024), no. 3, 1959–1961.
- Manuel Krannich, *Stability of concordance embeddings*.
Oberwolfach Reports, **19** (2022), no. 3, 1979–1982.
- Manuel Krannich, *Moduli spaces of h -cobordisms of discs*.
Oberwolfach Reports **17** (2020), no. 21, 1089–1090.
- Manuel Krannich, *Pseudoisotopies of even discs, revisited*.
Oberwolfach Reports **17** (2020), no. 1, 431–432.

INVITED LECTURE SERIES

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| MAR 2027 | <i>Mini-course: Mapping class groups of high-dimensional manifolds</i> , Research School: Algebraic and Geometric Topology, CIRM (scheduled). |
| SEP 2026 | <i>Mini-course: Embedding calculus from a higher-categorical perspective</i> , European Autumn School in Topology, Utrecht. |
| MAY 2026 | <i>Mini-course: Introduction to embedding calculus</i> , Conference: Interactions between higher algebra, manifolds and functor calculus, Bonn. |
| JUN 2025 | <i>Mini-course: Embedding calculus and applications to diffeomorphism groups</i> , Young Topologists Meeting, Stockholm. |
| APR 2024 | <i>Mini-course: Pontryagin–Weiss classes and diffeomorphisms of discs</i> , Masterclass: Homotopical methods in manifold theory, Copenhagen. |
| JULY 2023 | <i>Mini-course: Diffeomorphism groups of discs</i> , Workshop: Algebraic K-Theory of Spaces, Regensburg. |
| JUNE 2022 | <i>Lecture series: The Disc-structure space</i> , Topology Seminar, Kansas State University. |

INVITED TALKS

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| JAN 2027 | <i>TBD</i> , Topology Seminar, Bonn (scheduled). |
| APR 2026 | <i>Framed configuration spaces and exotic spheres</i> , Workshop: Manifolds and moduli, Lisbon. |
| NOV 2025 | <i>Diffeomorphism groups of discs</i> , Kolloquium, Göttingen. |
| OCT 2025 | <i>Pontryagin–Weiss classes</i> , Higher Invariants: interactions between arithmetic geometry and global analysis, Regensburg. |
| JUL 2025 | <i>Configuration spaces and exotic spheres</i> , Bavarian Topology Meeting, Augsburg. |
| MAY 2025 | <i>Configuration spaces and exotic spheres</i> , NRW Topology Meeting, Osnabrück. |
| APR 2025 | <i>Configuration spaces and exotic spheres</i> , Algebraic Topology Seminar, Columbia. |
| APR 2025 | <i>Configuration spaces and exotic spheres</i> , Topology Seminar, Notre Dame. |
| APR 2025 | <i>Diffeomorphism groups of discs</i> , Colloquium, Notre Dame. |
| MAR 2025 | <i>Configuration spaces and exotic spheres</i> , Geometry and Topology Seminar, Toronto. |
| NOV 2024 | <i>The Disc-structure space</i> , Algebraic Topology Seminar, Princeton. |
| AUG 2024 | <i>Decomposing high-dimensional manifold theory</i> , Conference: Topology of moduli spaces (on the occasion of Ulrike Tillmann’s 60th birthday), Copenhagen. |
| JULY 2024 | <i>Pontryagin–Weiss classes</i> , Topologie, Oberwolfach. |
| MAY 2024 | <i>Pontryagin–Weiss classes</i> , Topology Intercity Seminar, Utrecht. |
| FEB 2024 | <i>Surreal Pontryagin classes</i> , Colloquium (on the occasion of Michael Weiss’ retirement), Münster. |
| OCT 2023 | <i>Exotic tori, actions by $SL_d(\mathbb{Z})$, and mapping class groups</i> , Geometria em Lisboa Seminar, Lisbon. |

- AUG 2023 *Automorphisms of the E_d -operad*, Workshop: String topology and connections to BV-quantization, symplectic topology, and manifold topology, Dublin.
- JUL 2023 *A homological approach to pseudoisotopy theory*, ICBS, Beijing.
- JUN 2023 *Exotic tori, actions by $SL_d(\mathbb{Z})$, and mapping class groups*, Oberseminar Differentialgeometrie, Augsburg.
- JUN 2023 *A rational pullback decomposition of spaces of homeomorphisms of manifolds*, Oberseminar Topologie, Münster.
- MAY 2023 *Automorphisms of the little d -discs operad*, Workshop on Homology of Configuration Spaces and related topics, Paris.
- MAR 2023 *Pontryagin classes of Euclidean fibre bundles over spheres*, Dublin Mathematics Colloquium, Dublin.
- FEB 2023 *Diffeomorphisms of discs*, Colloquium, LMU Munich.
- JAN 2023 *Manifolds and calculus*, Chromatic Homotopy, K-Theory and Functors, CIRM, Luminy.
- OCT 2022 *Manifolds and calculus*, Ib Fest: On the occasion of Ib Madsen's 80'th birthday, Copenhagen.
- SEP 2022 *Multirelative connectivity results in geometric topology*, 4-Manifolds: from Above and Below, CIRM, Luminy.
- SEP 2022 *The Disc-structure space*, Classifying spaces in homotopy theory: in honour of Ran Levi's 60th Birthday, ICMS, Edinburgh.
- JULY 2022 *Stability of concordance embeddings*, Topologie, Oberwolfach.
- JUNE 2022 *The Disc-structure space*, Topology Seminar, Bonn.
- MAY 2022 *Top(d) and orthogonal calculus*, Topology Seminar, Stockholm.
- FEB 2022 *The Disc-structure space*, Higher algebraic structures in algebra, topology and geometry, Institut Mittag-Leffler, Stockholm.
- FEB 2022 *Pseudoisotopies of discs and $K(\mathbb{Z})$* , Oberseminar Geometrie und Topologie, Göttingen.
- DEC 2021 *Smoothing fibre bundles and diffeomorphism groups of discs*, IMUNAM Algebraic Topology Seminar, Mexico City.
- OCT 2021 *Top(d) and orthogonal calculus*, Topology Seminar, Münster.
- JULY 2021 *(In)finiteness properties of automorphism spaces of manifolds*, AG-Seminar, Regensburg.
- APR 2021 *Embedding calculus, factorisation homology, and surfaces*, Séminaire de l'équipe Topologie Algébrique, Université Sorbonne Paris Nord (Paris 13).
- APR 2021 *Embedding calculus in codimension zero*, Building Bridges Seminar: Invariants of Embedding spaces, virtual.
- FEB 2021 *Smoothing fibre bundles and diffeomorphism groups of discs*, Geometry & Topology Seminar, Toronto.
- JULY 2020 *Moduli spaces of h -cobordisms of discs*, Topologie, Oberwolfach.
- MAY 2020 *Pseudoisotopies of discs and algebraic K -theory of the integers*, Topology Seminar, Purdue.
- MAY 2020 *The pseudoisotopy stable range*, Topology Seminar, Bonn.
- MAR 2020 *Pseudoisotopies of even discs and algebraic K -theory of the integers*, Topology Seminar, Wayne State.
- MAR 2020 *Pseudoisotopies of even discs and algebraic K -theory of the integers*, Geometry & Topology Seminar, Brown.
- MAR 2020 *Pseudoisotopies of even discs and algebraic K -theory of the integers*, Topology Seminar, Brandeis.
- FEB 2020 *Pseudoisotopies of even discs, revisited*, Manifolds and Groups, Oberwolfach.
- JAN 2020 *A homological approach to pseudoisotopy theory*, Topology Seminar, Warwick.
- DEC 2019 *A homological approach to pseudoisotopy theory*, Topology Seminar, Münster.

- NOV 2019 *Diffeomorphism groups of discs*, Topology Seminar, Aberdeen.
- OCT 2019 *Mapping class groups, signatures, and arithmeticity*, MPI Topology Seminar, Bonn.
- JULY 2019 *Diffeomorphism groups of discs*, Four Manifolds: Confluence of High and Low Dimensions, Fields Institute, Toronto.
- JUNE 2019 *Rational homotopy groups of diffeomorphism group of discs, revisited* (short talk), Conference: SYM 10 Years Old, Copenhagen.
- APR 2019 *Mapping class groups of highly connected manifolds*, Utrecht Geometry Centre Seminar, Utrecht.
- APR 2019 *Mapping class groups of highly connected manifolds*, Seminar in Algebra & Geometry, Stockholm.
- MAR 2019 *Mapping class groups of highly connected manifolds*, Topology Seminar, MIT.
- JAN 2019 *Mapping class groups of highly connected manifolds*, Geometry and Topology Seminar, Durham.
- DEC 2018 *On the signature of bundles over surfaces*, Oberseminar Differentialgeometrie, Augsburg.
- DEC 2018 *Mapping class groups of highly connected manifolds*, Bavarian Geometry and Topology Seminar, Augsburg.
- NOV 2018 *Detecting exotic smooth structures in diffeomorphism groups*, Differential Geometry and Topology Seminar, Cambridge.
- SEPT 2018 *Topological moduli spaces, E_2 -algebras, and homological stability*, Workshop: Cohomological study of mapping class groups and related topics, Strasbourg.
- APR 2018 *Characteristic numbers of manifold bundles over surfaces with highly connected fibres*, Oxford–Aberdeen–Cambridge Meeting on Manifolds, Cambridge.
- APR 2018 *Homological stability of topological moduli spaces*, Topology Seminar, Purdue.
- APR 2018 *Detecting exotic smooth structures in diffeomorphism groups*, Topology Seminar, Northwestern.
- APR 2018 *Topological moduli spaces, E_2 -algebras, and homological stability*, Geometry/Topology Seminar and Topology Seminar (joint), University of Chicago.
- JAN 2018 *On characteristic classes of exotic manifold bundles*, Topology Seminar, Bonn.
- JAN 2018 *On characteristic classes of exotic manifold bundles*, Topology Seminar, Karlsruhe.
- JAN 2018 *On characteristic classes of exotic manifold bundles*, Topology Seminar, Münster.
- OCT 2017 *On characteristic classes of exotic manifold bundles*, Topology Seminar, Copenhagen.
- MAR 2017 *Homological stability of E_1 -modules over E_2 -algebras and twisted stability of topological moduli spaces*, Topology Seminar, Aberdeen.
- MAR 2017 *Moduli spaces of manifolds*, Geometry Tea, Cambridge.
- JUNE 2015 *Through scanning to the theorem of Galatius-Madsen-Tillmann-Weiss*, Topology Seminar, Karlsruhe.

CONTRIBUTED TALKS

- JUNE 2021 *The Disc-structure space*, Conference *Manifolds and K-theory: the legacy of Andrew Ranicki*, Edinburgh.
- DEC 2018 *Mapping class groups of highly connected manifolds*, Workshop "Manifolds", part the programme "Homotopy harnessing higher structures", Newton Institute, Cambridge.
- JUN 2018 *On the signature of smooth bundles over surfaces*, International Conference on Manifolds, Groups and Homotopy, Skye.
- SEPT 2017 *On characteristic classes of bundles of manifolds connect summed with an exotic sphere* (short talk), Research School: Algebraic Topology of Manifolds, Oxford.
- JULY 2017 *On the cohomology of moduli spaces of manifolds connect summed with an exotic sphere*, Young Topologists Meeting, Stockholm.

SEPT 2016	<i>Homological stability of E_2-modules and twisted stability of moduli spaces of manifolds</i> , European Autumn School in Topology 2016, Utrecht.
MAY 2016	<i>Scanning & stability – Scrutinizing topological moduli spaces</i> , ALG/NCG/TOP PhD students’ seminar, Copenhagen.

SERVICE

since 2018	Referee reports and opinions for various journals in mathematics including Acta Mathematica, Advances in Mathematics, Algebraic & Geometric Topology, American Journal of Mathematics, Crelle, Communications in Mathematical Physics, Forum of Mathematics Sigma, Geometry & Topology, Journal of the European Mathematical Society, Journal of Topology, Mathematische Annalen, Mathematische Zeitschrift, Philosophical Transactions of the Royal Society A, Selecta Mathematica.
AUG 2027	Organiser of the workshop <i>Manifolds, homotopy theory, and related topics</i> , Clay Mathematics Institute, Oxford.
OCT 2026	Examiner for PhD thesis at University of Melbourne.
JUNE 2026	Examiner for PhD thesis at Max Planck Institute for Mathematics in Bonn.
OCT 2024	Examiner for PhD thesis at University of Münster.
NOV 2023	Organiser of the workshop <i>Spaces of manifolds: algebraic and geometric approaches</i> , Banff International Research Station.
MAY 2023	Examiner for PhD thesis at Stockholm University.
SINCE MAY 2022	Organiser of the <i>Online Seminar on Manifolds, homotopy theory, and related topics</i> , jointly with Alexander Kupers and Oscar Randal-Williams.
MAY 2022	Examiner for licentiate thesis at Stockholm University.
SPRING 2021	Organiser of the <i>Seminar on Factorisation Homology</i> , Cambridge.
FALL 2019	Organiser of the <i>Seminar on work of Weiss and Williams</i> , Cambridge.
JAN 2016 – SEPT 2018	Organiser of pre-talks to the <i>Topology Seminar</i> , Copenhagen.
AUG 2016 – SEPT 2018	Organiser of the <i>ALG/NCG/TOP PhD students’ seminar</i> , Copenhagen.
JULY 2016	Organiser of the conference <i>Young Topologists Meeting 2016</i> , Copenhagen.

SUPERVISION AND MENTORING EXPERIENCE

since Oct 2026	Postdoctoral mentor of Thomas Blom.
since Nov 2025	Postdoctoral mentor of Fadi Mezher.
Apr 2023 – Sept 2026	PhD advisor of João Lobo Fernandes.
SUMMER 2026	Supervision of a Master’s theses.
Oct 2022 – Sept 2025	Postdoctoral mentor of Florian Kranhold.
SUMMER 2025	Supervision of five Bachelor’s theses.
WINTER 2024/2025	Supervision of two Master’s theses.
WINTER 2023/2024	Supervision of a Master’s thesis and a Bachelor’s thesis.
SUMMER 2023	Supervision of a Master’s thesis.

TEACHING EXPERIENCE

WINTER 2026/2027	Lecture: <i>Algebraic Topology</i> , Karlsruhe, Lecturer.
SUMMER 2026	Seminar: <i>Stable Homotopy Theory</i> , Karlsruhe, Lecturer.
SUMMER 2026	Seminar: <i>Knotentheorie</i> , Karlsruhe, Lecturer.
WINTER 2025/2026	Lecture: <i>Topics in Homotopy Theory</i> , Karlsruhe, Lecturer.
WINTER 2024/2025	Lecture: <i>Algebraic Topology</i> , Karlsruhe, Lecturer.

SUMMER 2024	Lecture: <i>Lectures on Exotic Spheres</i> , Karlsruhe, Lecturer.
SUMMER 2024	Seminar: <i>Fundamental groups and covering spaces</i> , Karlsruhe, Lecturer.
WINTER 2023/2024	Lecture: <i>Elementary Geometry</i> , Karlsruhe, Lecturer.
SUMMER 2023	Seminar: <i>Cohomology and Characteristic Classes</i> , Karlsruhe, Lecturer.
WINTER 2022/2023	Lecture: <i>Algebraic Topology</i> , Karlsruhe, Lecturer.
SUMMER 2022	Seminar: <i>Vector bundles and topological K-theory</i> , Karlsruhe, Lecturer.
FALL 2020	Lecture series: <i>Lectures on Manifold Toplogy: Exotic Spheres</i> , Lecturer (as part of the Online Graduate Lecture Series of the London Mathematical Society).
FALL 2017	Lecture: <i>Algebraic Topology</i> , Copenhagen, Teaching Assistant.
FALL 2016	Lecture: <i>Algebraic Topology</i> , Copenhagen, Teaching Assistant.
SUMMER 2015	Lecture: <i>Algebraic Topology</i> , Karlsruhe, Tutor.
WINTER 2014/2015	Lecture: <i>Introduction into Geometry and Topology</i> , Karlsruhe, Tutor.
WINTER 2013/2014	Lecture: <i>Differential Geometry</i> , Karlsruhe, Teaching Assistant.
SUMMER 2013	Lecture: <i>Introduction into Algebra and Number Theory</i> , Karlsruhe, Tutor.
WINTER 2012/2013	Lecture: <i>Introduction into Geometry and Topology</i> , Karlsruhe, Tutor
SUMMER 2012	Lecture: <i>Linear Algebra II</i> , Karlsruhe, Tutor.
WINTER 2012/2013	Lecture: <i>Linear Algebra I</i> , Karlsruhe, Tutor