

Filip Misev

professional address	Universität Regensburg Fakultät für Mathematik 93040 Regensburg, Germany
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nationality	Swiss
languages	German (native), English (fluent), French (fluent).

Research interests

Low dimensional topology and geometry (knots, surfaces, knot concordance), singularity theory.

Education

2012 – 2016	PhD in Mathematics advised by Prof. Sebastian Baader at the University of Bern. Thesis: <i>On the plumbing structure of fibre surfaces</i> .
2008 – 2012	MSc in Mathematics at the University of Basel, Master thesis advised by Prof. Norbert A'Campo on <i>periodic points and symplectic monodromy of singularities</i> .
2005 – 2008	BSc in Mathematics with minor in Physics at the University of Basel.

Professional experience

04.2020 – 09.2024	Wissenschaftlicher Mitarbeiter, Fakultät für Mathematik der Universität Regensburg.
03.2018 – 03.2020	Postdoc at the Max Planck Institute for Mathematics, Bonn.
09.2016 – 02.2018	Postdoc at Aix-Marseille University, research group of Prof. Michel Boileau, Ana Lecuona, Benjamin Audoux. Funding: Swiss National Science Foundation, early postdoc.mobility.
2012 – 2016	Teaching assistant at the Mathematical Institute of the University of Bern.
2008 – 2012	Teaching assistant at the Mathematical Institute of the University of Basel.
2006	Short term training at the cancer research laboratory at the Manitoba Institute of Cell Biology (MICB) in Winnipeg, Canada.
2005	Job at Medika AG pharmaceuticals, Aesch, Switzerland (later Teva Pharma AG, Basel); administration of pharmaceutical registration documents.

Teaching experience

Advised Theses	Bachelor's thesis <i>On the Alexander polynomial of satellite knots</i> Zulassungsarbeit <i>Evolution, Sicherheit und Effizienz moderner Verschlüsselungsverfahren</i>
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Lectures

2023	Seminar Singularitäten komplexer Hyperflächen (together with Jonathan Bowden) Examenskurs Analysis (Lehramt Gymnasium)
2022	Knot theory (together with Stefan Friedl) Elementare Zahlentheorie (Lehramt Grund- Mittel- und Realschule) Proseminar Elementargeometrie (Lehramt Grund- Mittel- und Realschule)
2021	Examenskurs Analysis (Lehramt Gymnasium) - hybrid format Elementare Zahlentheorie (Lehramt Grund- Mittel- und Realschule) - online on „zoom“
2020	Examenskurs Analysis (Lehramt Gymnasium) - online on „zoom“ Elementare Zahlentheorie (Lehramt Grund- Mittel- und Realschule) - online on „zoom“
2019	Algebraic curves, topics course for master students at the University of Bonn (2h per week, 14 weeks)
before 2019	Occasional lecture substitution in first year courses. 90 minutes lecture on fibred knots during master course on Invariants of knots and 3-manifolds and knot invariants at the University of Bonn, by W. Lück and P. Teichner.

Service lectures	Exercise classes in mathematics for natural sciences
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Exercise classes	Linear Algebra, Analysis, Complex analysis, Geometry, Differential geometry, Riemannian geometry, Topology
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Seminars	Algebraic curves, Proseminar Elementargeometrie, Seminar on singular points of complex hypersurfaces, following Milnor's book.
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Publications and preprints

- [11] (with M. Kegel, L. Lewark, N. Manikandan, L. Mousseau and M. Silvero): *On unknotting fibered positive knots and braids*, **preprint** (2023), arXiv:2312.07339.
- [10] (with S. Baader, L. Lewark and P. Truöl): *3-braids with maximal 4-genus* **Transactions of the AMS**, Series B, 11 (2024), p. 600-621, arXiv:2303.11918.
- [9] (with S. Friedl and R. Zentner): *Rational homology ribbon cobordism is a partial order* (2022), **accepted** for publication in **Algebraic & Geometric Topology**, arXiv:2204.10730.
- [8] (with S. Baader, R. Blair and A. Kjuchukova): *The bridge number of arborescent links with many twigs* **Algebraic & Geometric Topology** 23 (2023), no. 1, p.75-85, arXiv:2008.00763.
- [7] (with G. Spano): *Tight fibred knots without L-space surgeries* **Glasgow Mathematical Journal** (2020), 1-9, arXiv:1906.11760.
- [6] (with S. Baader, A. Kjuchukova, L. Lewark and A. Ray): *Average four-genus of two-bridge knots* (2019), **accepted** for publication in **Proceedings of the AMS**, arXiv:1902.05721.
- [5] (with A. Pichon): *Lipschitz normal embedding among superisolated singularities* **International Mathematics Research Notices**, (2019), rmz221, arXiv:1810.10179.
- [4] *On families of fibred knots with equal Seifert forms* **Communications in Analysis and Geometry** 29 (2021), no. 2, p.465-482, arXiv:1703.07632.
- [3] (with S. Baader): *On the stabilisation height of fibre surfaces in S^3* **Journal of Knot Theory and Its Ramifications**, 27 (2018), no. 3, p.1840001, arXiv:1607.00857.
- [2] *Hopf bands in arborescent Hopf plumbings* **Osaka Journal of Mathematics**, 56 (2019), no. 2, pp. 375-389, arXiv:1601.01933.
- [1] *Cutting arcs for torus links and trees* **Bulletin de la Société Mathématique de France**, 145 (2017), no. 3, pp. 575-602, arXiv:1409.0644.

Talks upon invitation and talks at conferences

04 / 2024	Regensburg – 12 th Bavarian Geometry & Topology Meeting – upcoming –
02 / 2024	Fribourg – <i>Braids on three strings with maximal four-genus</i> , Oberseminar Geometrie.
11 / 2023	Dijon – <i>Les tresses à trois brins de 4-genre maximal</i> , uB, Séminaire GADT.
05	Montpellier – <i>Audition maître de conférences</i> , IMAG, job interview .
02	Notre Dame IN, (USA) – <i>Ribbon cobordism between knots and 3-manifolds</i> , Topology seminar.
09 / 2022	Berlin – <i>Ribbon cobordism between knots and 3-manifolds</i> , FU, DMV-Jahrestagung 2022 .
09	Montpellier – <i>Cobordismes ribbon entre noeuds et entre variétés de dimension trois</i> , IMAG.
09	Marseille – <i>Cobordismes ribbon entre noeuds et entre variétés de dimension trois</i> , I2M.
07	Grenoble – <i>Meridional rank of arborescent links with many twigs</i> , AMS-EMS-SMF Meeting .
01	<i>Families of fibred knots with the same Seifert form</i> , [K-OS] Knot Online Seminar, virtual .
2020	<i>Meridional rank of arborescent links with many twigs</i> , Boston College GTD virtual seminar . <i>Fibred knots, positivity and L-spaces</i> , virtual, NCNGT (two pre-recorded 30 minute talks).
2019	Bern – <i>Positive fibred knots and the unknotting number</i> , Mini Swiss Knots workshop. Neuchâtel – <i>Positive fibred knots and the unknotting number</i> , InterCity Seminar. Regensburg – <i>An introduction to knot concordance</i> , Low-dimensional topology workshop. Bonn – <i>Unknot positive knots!</i> , MPIM, 5 min talk at 4-manifolds workshop . Bonn – <i>Fibre surfaces, knots, and elastic strings</i> , MPIM, Oberseminar-Kolloquium. Regensburg – <i>Fibred knots, positivity and concordance</i> , Oberseminar Globale Analysis. Zürich – <i>Algebraic knots, L-spaces and concordance</i> , ETH, Swiss Knots 2019 . Reims – <i>Lipschitz normal embedding among superisolated singularities</i> , WinterBraids IX . Bern – <i>Metric distortion of algebraic varieties</i> , Mathematisches Kolloquium.
2018	Marseille – <i>Noeuds fibrés, positivité et concordance</i> , I2M, Séminaire GDT. Oaxaca – <i>Lipschitz normal embeddings among superisolated singularities</i> , CMO-BIRS , workshop on Lipschitz geometry of singularities. Bonn – <i>Fibred knots and concordance</i> , MPIM, MPI-Oberseminar. Caen – <i>Sur la concordance des noeuds fibrés</i> , LMNO, Séminaire Algèbre et Géométrie. Marseille – <i>Sur les points périodiques d'une monodromie</i> , I2M, Séminaire Singularités.
2017	Grenoble – <i>Sur la concordance des noeuds fibrés</i> , Institut Fourier, Séminaire de Topologie. Köln – <i>The stabilisation height of fibre surfaces</i> , Mathematisches Institut, Oberseminar GTA. Köln – <i>Introduction to fibred knots</i> , Mathematisches Institut, graduate lecture . Montpellier – <i>Sur la concordance des noeuds fibrés</i> , IMAG, Séminaire Topologies.
2016	Marseille – <i>La structure de plombage des noeuds fibrés</i> , I2M, Séminaire GDT. Strasbourg – <i>Hopf bands and quadratic forms</i> , IRMA, Séminaire GT3.
2015	Grenoble – <i>Hopf bands and quadratic forms</i> , Institut Fourier, Séminaire de Topologie. <i>Knots and surfaces</i> , uB Dijon, Séminaire étudiants. Paris – <i>Bandes non-nouées, surfaces fibrées et groupes de Coxeter</i> , IMJ-PRG, Sém. Top. Pau – <i>Cutting and glueing fibre surfaces</i> , Winterbraids V .
2014	Rennes – <i>Noeuds fibrés</i> , Séminaire "Pampers" des jeunes chercheurs en géométrie.
2013	Zürich – <i>What is...Monodromy?</i> ETH, Graduate colloquium.

Seminar talks

2011 – now	Seminar and graduate colloquium contributions on various topics, among others:		
Lefschetz fixed point theorem	quasimorphisms and laws after D.Calegari	monodromy of singularities	
plane algebraic curves	vector bundles and K-theory	fibred knots	
h-principle	twisted bands in embedded surfaces	Mostow's rigidity theorem	
trisections of 4-manifolds	hyperbolic volume of alternating knots	Basel problem	
Murasugi sums and fibrations	ribbon concordance is a partial order after I.Agol		
Conical structure theorem	Theorem of Whitney on (non-)singular varieties		

Selected conferences attended

04 / 2024	– upcoming – Regensburg: 12 th Bavarian Geometry & Topology Meeting (plenary talk)
09 / 2023	Regensburg: SwissKnots 2023
07 / 2023	Regensburg: Gauge theory and its applications to geometry and low-dimensional topology
2022	Berlin - FU: Jahrestagung der DMV 2022 (plenary talk in the geometry/topology section) Grenoble: AMS-EMS-SMF meeting (plenary 20 min talk in the low-dim. topology section)
	Regensburg/Creswick: Dynamics, Foliations, and Geometry II (MATRIX workshop, hybrid)
2021	Dijon: WinterBraids XI Regensburg: Perspectives on quantum link homology theories Fribourg: Swiss Knots 2021 [virtual] Regensburg: Seminar on foundations in 3-manifold topology IV (shared talk with L. Lewark)
2020	[virtual] NCNGT: Nearly Carbon Neutral Geometric Topology Conference (two pre-recorded 30 min talks) Pisa: WinterBraids X
2019	Bern: Mini Swiss Knots, one-day workshop (plenary talk) Regensburg: Arbeitstagung on foliations Regensburg: Low-dimensional topology workshop (plenary talk) Bonn - MPIM: Workshop on 4-manifolds (plenary 5 min talk) Zürich - Swiss Knots 2019 (plenary talk) Le Croisic (Nantes) - Knot concordance and low-dimensional manifolds Reims - LMR-FRE: WinterBraids IX (plenary talk)
2018	Oaxaca - CMO-BIRS: Workshop on Lipschitz geometry of singularities (plenary talk) Marseille - CIRM: Knotted embeddings in dimensions 3 and 4 Marseille - CIRM: Winterbraids VIII Marseille - CIRM: Representation spaces, Teichmüller theory, and their relationship with 3-manifolds from the classical and quantum viewpoints
2017	Marseille: Lipschitz geometry of singularities Bern: Swiss Knots 2017 Marseille: Workshop on profinite groups and topology Cambridge - INI: 3-manifold workshop
2016	Bonn - MPIM: Conference on 4-manifolds and knot concordance Dubrovnik - IUC: Perspectives in topology and geometry of 4-manifolds
2015	Edinburgh - ICMS: Topological methods in singularity theory Genève - Swiss Knots 2015 Pau: Winterbraids V (plenary talk)
2014	Providence - ICERM: Combinat. Link Homology Theories, Braids, and Contact Geometry La Llagonne: Winter school on Jones polynomial and hyperbolic volume
2013	Toulouse - Low-dimensional Topology and Geometry in Toulouse Cortona - INdAM Meeting: Geometric topology in Cortona
2012	Bern - Workshop: Algebra and Geometry Les Diablerets - The h-principle Seminar and autumn school Strasbourg: 89 ^e rencontre entre physiciens théoriciens et mathématiciens: Invariants quantiques des 3-variétés en mathématiques et en physique
2011	Mainz - Autumn School: Topology of Singularities Aberdeen - LMS-EPSRC: Short Course on Symplectic Geometry
2010	Higashi-Hiroshima - Graduate School of Advanced Sciences of Matter, Hiroshima University - Workshop: Branched Coverings, Degenerations and Related Topics 2010
2009	Edmonton - University of Alberta: PIMS Algebra Summer School
2008	Strasbourg: Sémaine spéciale Géométrie et Théorie des Groupes