Curriculum Vitae

Stephan Martin Wehrli

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Research Interests: Low-dimensional Topology, Knot Theory, Knot Homology Theories

Professional Experience:

- 2016-present, Associate Professor, Syracuse University
- 2010-2016, Assistant Professor, Syracuse University
- Spring 2010, Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley
- 2008-2010, Postdoctoral Fellow, Université Paris VII, France
- 2007-2008, Postdoctoral Fellow, Columbia University
- 2004-2007, Teaching Assistant, University of Zurich, Switzerland
- 2003-2004, Teaching Assistant, University of Basel, Switzerland

Education:

- 2007, Ph.D., Mathematics, with distinction, University of Zurich, Switzerland
  Thesis Title: Contributions to Khovanov Homology
  Advisors: A. Beliakova, N. A'Campo
- 2002, Diploma, Mathematics, University of Basel, Switzerland
  (The Swiss Diploma degree is equivalent to a Master's degree)

Grants and Fellowships:

- Fall 2022-present, NSF conference grant, Award Number 2232266 (co-PI: C. Miller)
- Fall 2019-present, Simons Collaboration Grant, Award Number 632059
- Fall 2011-Fall 2017, NSF Grant DMS-1111680
- Spring 2010, Fellow of the Mathematical Sciences Research Institute, Berkeley
- 2008-2010, Fellow of the Fondation Sciences Mathématiques de Paris
- 2007-2008, Fellow of the Swiss NSF

Collaborators:

- D. Auroux, University of California, Berkeley
- A. Beliakova, University of Zurich, Switzerland
- M. Doig, Creighton University

- J. E. Grigsby, Boston College
- M. Hogancamp, University of Southern California
- A. Licata, Australian National University in Canberra, Australia
- C. Necheles, Syracuse University
- K. Putyra, Univeristy of Zurich, Switzerland
- W. Rushworth, University of Hull, UK

Invited Conference Talks:

2023   AMS Sectional Meeting, Atlanta:
"Categorical traces and colored link homology"

2021   Joint Mathematics Meeting:
"On categorifications of the colored Jones polynomial"

2020   Workshop on Link Homology and Concordance, Fields Institute:
"Unification of colored $sl(2)$ knot homology"

2019   AMS Sectional Meeting, Binghamton:
"Odd annular Bar-Natan category and $gl(1|1)$"

Knots in Washington XLVII, George Washington University:
"Colored Quantum Annular Khovanov homology"

2016   Advances in Quantum and Low-Dimensional Topology, University of Iowa:
"On categorical traces and invariants of annular links"

2015   Knots in Washington XLI, George Washington University:
"A (mostly) combinatorial proof of the homology cobordism classification of lens spaces"

Categorification in Algebra, Geometry and Physics, Cargèse, France:
"Annular Khovanov homology and knotted Schur-Weyl representations"

2014   AMS Sectional Meeting, Greensboro, NC:
"Quantum sutured annular Khovanov homology"

Knots in Washington XXXVIII:
"Commuting actions of $sl(2)$ and S_n on sutured annular Khovanov homology"

2012   Knots in Washington XXXV, George Washington University:
"A symmetric group action on the Khovanov homology of cables"

AMS Sectional Meeting, Washington DC: "Diagram algebras in Khovanov- and
Heegaard Floer-type homology theories"

2011   Knots in Washington XXXIII, George Washington University:
"Khovanov's diagram algebras and bordered Floer homology"

Homological Invariants in Low-dimensional Topology, Stony Brook University: "Khovanov-Seidel quiver algebras and bordered Floer homology"

Swiss Knots 2011, Lake Thun, Switzerland: "Khovanov-Seidel quiver algebras and bordered Floer homology"

2010   XIX Oporto Meeting on Geometry, Topology and Physics, Faro: "Oriented Khovanov homology and a new categorification of the colored Jones polynomial"

AMS Sectional Meeting, Newark: "On the relationship between sutured Khovanov homology and sutured Floer homology"

2009   Swiss Knots 2009, Université de Fribourg: "Sutured Floer homology and the colored Jones polynomial"

2008   Heegaard Floer Panel of the Kirbyfest 2008, MSRI, Berkeley: "Colored Khovanov homology and Sutured Floer homology"

Knots in Washington XXVI, George Washington University: "A new categorifcation of the colored Jones polynomial"

2007   Link homology and categorification, Kyoto University: "Mutation invariance of Khovanov homology over $\mathbb{F}_2$"

Knots in Washington XXIV, George Washington University: "Mutation invariance of Khovanov homology over $\mathbb{F}_2$"

Summer Schools:

2012   Lectures on Khovanov homology at the École de recherche CIMPA-ICTP Géométrie symplectique et topologie géométrique, Meknès, Morocco (Research summer school aimed at giving young researchers from the Greater Middle East the opportunity to learn about recent developments in symplectic geometry and low-dimensional topology)

Invited Seminars and Colloquia:

2022   Dartmouth College, Topology Seminar

2019   Creighton University, Mathematics Department Colloquium

2017   Boston College, Geometry/Topology Seminar

Australian National University, Quantum Mathematics Seminar

Columbia University, Symplectic Geometry, Gauge Theory, and Categorification Seminar

2014   Boston College, Informal Seminar

2013   Institut de Mathématiques de Jussieu, Séminaire de Topologie

Columbia University, Symplectic Geometry, Gauge Theory, and Categorification Seminar

University of Geneva, Séminaire Groupes de Lie et espaces de modules

2012   Columbia University, Symplectic Geometry, Gauge Theory, and Categorification Seminar

2011   University of Pennsylvania, Geometry-Topology Seminar

Boston College, Geometry-Topology Seminar

2009   ETH Zurich, Algebra-Topology Seminar

Université de Strasbourg, Séminaire Quantique

University of Cambridge, Differential Geometry Seminar

University of Warwick, Geometry and Topology Seminar

Columbia University, Informal Heegaard Floer Homology Seminar

Université Joseph Fourier, Séminaire de Topologie

2008   CTQM, University of Aarhus, Topology Seminar

Bryn Mawr College, Bryn Mawr-Haverford Colloquium

University of Massachusetts Amherst, Geometry and Topology Seminar

2007   Université Paris VII, Séminaire de Topologie

Teaching Experience:

- Courses taught at Syracuse University:
  - Algebraic Topology (MAT 762), Fall 2011, 2013, 2014, 2016, 2019
  - Introduction to Algebraic Topology (MAT 761), Spring 2011, 2018, 2019, 2021, 2022
  - Introduction to Point Set Topology (MAT 661), Fall 2012

- Elementary Topology (MAT 562), Spring 2013, 2015, 2019, 2021
- Second Course in Linear Algebra (MAT 531), every semester since Spring 2013, except in Fall 2017, Fall 2018, Spring 2019, Spring 2021, and Fall 2021
- Independent Study (MAT 490), Fall 2016
- Calculus III (MAT 397), Spring 2012, 2016
- First Course in Linear Algebra (MAT 331), Spring 2014
- Calculus II (MAT 296), Spring 2017
- Calculus I (MAT 295), Fall 2015 (large lecture), Fall 2020, Fall 2021 (large lecture), Fall 2022, course supervisor for Calculus I in Fall 2021
- Calculus for the Life Sciences I (MAT 285), Fall 2010, Spring 2011, Fall 2018
- Reading Course for a graduate student, Fall 2015
- Independent Study (MAT 690), Fall 2021

- University of Zurich:
  - Teaching Assistant for "Mathematics for Teachers"
  - Teaching Assistant for "Geometry and Topology" (held recitiations, gave substitute lectures, prepared and graded homework, served as a co-examiner for diploma (masters) exams in Mathematics)
  - Coorganizer of a seminar on Heegaard Floer homology at ETH Zurich

- University of Basel:
  - Teaching Assistant for "Mathematics for Natural Scientists"
  - Teaching Assistant for "Complex Analysis" (held recitations, prepared and graded homework)

Service and Advising:

- Helped initiate a new series of regional topology conferences in Upstate New York. This series was started at SUNY Buffalo in Fall 2017 on the eve of an AMS Sectional Meeting, for which I also co-organized a special session. The series now runs under the name Upstate New York Topology Seminar (UNYTS).
- Co-organized the third UNYTS conference at Syracuse University in Fall 2022. This conference was supported by an NSF conference grant, for which I was the PI.
- Advisor for freshman and sophomore students at Syracuse University from Fall 2012 to Spring 2015
- Advisor for math majors since Spring 2017
- Ph.D. advisor for Casey Necheles since Spring 2016, Casey defended her dissertation in 2021
- Ph.D. advisor for Jacob Migdail-Smith since 2021
- Honors capstone advisor for Jordan Barrett from Fall 2016 to Spring 2017

- Mentored three postdoctoral students: Thomas Jäger, Margaret Doig (Margaret was a postoc of Peter Horn, but she and I worked on a joint research project), Will Rushworth

- Co-organizer and co-initiator of the new Geometry & Topology Seminar at Syracuse University

- Member of the Undergraduate Committee of the SU Mathematics Department, Fall 2012 to Spring 2015, Fall 2016 to Spring 2017, and Fall 2018 to Spring 2019

- Member of the Graduate Committee of the SU Mathematics Department 2021-2022

- Chair of the Graduate Committee of the SU Mathematics Department starting Fall 2023

- Member of the Chair Search Committee of the SU Mathematics Department, Fall 2016

- Member of several search subcommittees of the SU Mathematics Department

- Library Liaison for the SU Mathematics Department, 2021

- Member of an ad hoc P&T subcommittee

- Regular referee for Algebraic & Geometric Topology, Duke Mathematical Journal, Journal of Knot Theory and Its Ramifications, Pacific Journal of Mathematics, Quantum Topology, Mathematical Research Letters, Topology and Its Applications

- Reviewer of a grant proposal for the NSA

Publications and Preprints:

- *On unification of colored annular $\mathfrak{sl}_2$ knot homology* (with A. Beliakova, M. Hogancamp, and K. Putyra), submitted, available at arXiv:2305.02977, 47 pages

- *On the functoriality of sl(2) tangle homology* (with A. Beliakova, M. Hogancamp, and K. Putyra), Algebraic & Geometric Topology, **23** (2023) 1303–1361

- *Odd annular Bar-Natan category and $\mathfrak{gl}(1|1)$* (with C. Necheles), submitted, available at arXiv:2206.01892, 83 pages

- *An action of $\mathfrak{gl}(1|1)$ on odd annular Khovanov homology* (with J. E. Grigsby), Mathematical Research Letters, **27**(3) (2020) 711–742

- *Quantum Link Homology via Trace Functor I* (with A. Beliakova and K. Putyra), Inventiones Mathematicae, **215**(2) (2019) 383–492

- *Annular Khovanov-Lee homology, braids, and cobordisms* (with J. E. Grigsby and A. M. Licata), Pure and Applied Mathematics Quarterly, Special Issue in Honor of Simon Donaldson, **13**(3) (2017) 389–436 (published online on November 12, 2018)

- *Annular Khovanov homology and knotted Schur-Weyl representations* (with J. E. Grigsby and A. M. Licata), Compositio Mathematica, **154**(3) (2018) 459–502

- *An elementary fact about unlinked braid closures* (with J. E. Grigsby), AWM Springer Series, Advances in the Mathematical Sciences, (2016) 93–101

- *A note on the combinatorics of lens space d-invariants* (with M. I. Doig), submitted, available at arXiv:1505.06970, updated in 2022, 10 pages

- *Sutured Khovanov homology, Hochschild homology, and the Ozsváth-Szabó spectral sequence*

(with D. Auroux and J. E. Grigsby), Transactions of the American Mathematical Society, **367**(10) (2015) 7103–7131

- *Khovanov-Seidel quiver algebras and bordered Floer homology* (with D. Auroux and J. E. Grigsby), Selecta Mathematica, **20**(1) (2014) 1–55

- *On Gradings in Khovanov homology and sutured Floer homology* (with J. E. Grigsby), Contemporary Mathematics **560** (2011) 111–128

- *On the naturality of the spectral sequence from Khovanov to Heegaard Floer homology* (with J. E. Grigsby),
International Mathematics Research Notices, **2010**(21) (2010) 4159–4210

- *Khovanov homology, sutured Floer homology, and annular links* (with J. E. Grigsby), Algebraic & Geometric Topology, **10** (2010) 2009–2039

- *Mutation invariance of Khovanov homology over $\mathbb{F}_2$,*
Quantum Topology, **1**(2) (2010) 111–128

- *On the Colored Jones Polynomial, Sutured Floer homology, and Knot Floer homology,* (with J. E. Grigsby), Advances in Mathematics, **223**(6) (2010) 2114–2165

- *A remark on the topology of (n,n) Springer varieties,* arXiv:0908.2185

- *Categorification of the colored Jones polynomial and Rasmussen invariant of links,* (with A. Beliakova), The Canadian Journal of Mathematics, **60** (2008) 1240–1266

- *A spanning tree model for Khovanov homology,*
Journal of Knot Theory and Its Ramifications, **17**(12) (2008) 1561–1574

- *Contributions to Khovanov homology,* Ph.D. Thesis, University of Zurich (2007)

- *Khovanov Homology and Conway Mutation,* arXiv:math/0301312