

Sabine J. Lang

Ph.D. Candidate in Mathematics

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Citizenship: Switzerland

Education

- 2015–current **Ph.D. in Mathematics**, *University of Utah, USA*.
Advisor: Prof. Gordan Savin. Expected graduation: June 2020.
- 2013–2015 **M.Sc. in Mathematics**, *Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland*.
Advisor: Prof. Donna Testerman. Thesis title: Restricting irreducible representations of simple Lie algebras to semisimple subalgebras.
Specialization in fundamental mathematics.
- 2010–2014 **B.Sc. in Mathematics**, *EPFL, Switzerland*.
- 2007–2010 **High school diploma**, *Gymnase de Nyon, Switzerland*.
Major: biology and chemistry. With courses taught both in German and French.

Research

- Area *Representation Theory*.
- Topics of interest Real reductive groups, Theta correspondence for real and complex groups, oscillator representation, dual pairs, branching rules.

Publications

Projective cases for the restriction of the oscillator representation to dual pairs, *Preprint: arXiv:1711.10562 [math.RT]*, Submitted to The Pacific Journal of Mathematics.

Teaching

- 2016–current **Instructor**, *University of Utah, USA*.
Teaching undergraduate courses with full responsibility for lectures and grades.
- Spring 2020: Linear Algebra (MATH 2270)
 - Fall 2018: Discrete Mathematics (MATH 2200)
 - Spring 2018: Trigonometry, Online section (MATH 1060)
 - Spring 2017: Precalculus (MATH 1080)
 - Fall 2016: Business Calculus (MATH 1100)
 - Summer 2016: Business Algebra (MATH 1090)
 - Spring 2016: Introduction to Quantitative Reasoning (MATH 1030)
- In 2018, my duties also included typing and correcting notes for Precalculus.
- Summer 2019 **Instructor Training Facilitator**, *University of Utah, USA*.
Facilitator for the two-week-long instructor training for incoming graduate students and postdocs in the Department of Mathematics. Organizing, planning and leading workshops, observing new teachers and providing feedback.

- Summer 2019 **Mathematics Graduate Teaching Peer Mentor**, *University of Utah, USA*.
Mentor for graduate students teaching as instructors for the first time. In-class observations, feedback, meetings with first-time teachers, and meetings with course coordinators.
- Summer 2019 **Assistant to Course Coordinators**, *University of Utah, USA*.
Rewriting online homework for Trigonometry (MATH 1060) associated with an Open Educational Resources (OER) textbook. Adapting textbook problems as online exercises and coding with MyOpenMath. In collaboration with faculty members from Salt Lake Community College.
- Spring 2019 **Assistant to Course Coordinators**, *University of Utah, USA*.
Mentoring of a Teaching Assistant for Differential Equations and Linear Algebra (MATH 2250). Rewriting online homework for College Algebra (MATH 1050), choosing problems, and coding with MyOpenMath.
- 2017–2019 **Examiner for mathematics exams**, *Nyon and Morges High Schools, Switzerland*.
Final exams for the high school diploma. Reviewing the grading for written exams, examiner for oral exams. Co-responsible for final grades.
- Fall 2015 **Teaching Assistant**, *University of Utah, USA*.
Trigonometry (MATH 1060). Assisting the instructor during lectures, grading.
- Spring 2015 **Graduate Teaching Assistant**, *EPFL, Switzerland*.
Creation of problem sheets with detailed solutions and quizzes for a Massive Open Online Course (MOOC) of Linear Algebra taught by Prof. Donna Testerman, available on edX.
- 2012–2014 **Student Teaching Assistant**, *EPFL, Switzerland*.
Answering questions during problem sessions, leading discussions, and grading weekly problem sheets.
- Fall 2014: Algebra I and Advanced linear algebra I.
 - Spring 2014: Algebra II and Advanced linear algebra II.
 - Fall 2013: Algebra I, Advanced linear algebra I, and Linear algebra for chemistry.
 - Spring 2013: Algebra II, Advanced linear algebra II, and Analysis II for crime scene investigation students.
 - Fall 2012: Analysis I for crime scene investigation students.
 - Spring 2012: Physics II for computer science.
- 2009–2014 **Tutoring**, *Switzerland*.
Private courses for students from 10 years old to the end of high school.

Professional/Teaching development

- 2019–current **Online course**, *edX, Inc. (MOOC platform)*.
Inclusive Teaching: Supporting All Students in the College Classroom – Columbia University. Certificate expected: January 2020

Outreach and Service

- 2019–2020 **BRIDGES conference: Co-organizer, University of Utah, USA.**
Conference for early graduate students and advanced undergraduate students interested in representation theory, number theory, and commutative algebra.
- 2018–2020 **Student Chapter of the Association for Women in Mathematics, University of Utah, USA.**
President (2019–2020). Creation of new committees. Organization of meetings, team management. Official contact person for the organization. Making budget decisions. Organizing events including:
- Speaker Series (mathematician from an underrepresented group in mathematics visiting the University of Utah, including a research talk and a career talk).
 - Creation of another Speaker Series supported by Research Training Grant (RTG) funding, aimed at a larger audience including faculty members.
 - LaTeX workshops
 - Workshop leader for “Defining Your Path”, with 7th to 9th graders
- Vice-president (2018–2019).** Helping the president oversee events. Making budget decisions. Organizing events including:
- Professor Panel to help graduate students find an advisor
 - Meetings with job candidates
 - Speaker Series
 - LaTeX workshops
 - Departmental climate survey for graduate students
- 2019–2020 **Graduate Student Advisory Committee: Peer mentoring program for incoming graduate students, co-chair, University of Utah, USA.**
Organizing a program pairing incoming graduate students with an experienced graduate student to support them during their first year of graduate school.
- Spring 2019 **Directed Reading Program: Co-organizer and mentor, University of Utah, USA.**
Organizing a program pairing undergraduate students interested in mathematics with a graduate student, for independent reading during the semester.
Mentee: James Higgins (undergraduate student). **Project:** Logic and Structure.
- 2018–2019 **Representation Theory Reading Group: Organizer, University of Utah, USA.**
Organizing a reading group among graduate students with weekly meetings
- 2018–2019 **Graduate Student Advisory Committee: Retention Promotion and Tenure committee, University of Utah, USA.**
Making recommendations concerning promotion, tenure, and retention of faculty members. Includes teaching observations and an official report.
- 2011–2014 **CQFD, Association of Students in Mathematics, EPFL, Switzerland.**
Liaison between the students and the Department of Mathematics. Organization of events, including a week-long seminar to prepare students for their second year exams, and social gatherings.
- 2013–2014: President and student representative for 1st year of Master’s.
 - 2012–2013: Vice-president and student representative for 3rd year of Bachelor’s.
 - 2011–2012: Committee member, student representative for 2nd year of Bachelor’s.
- 2010–2014 **Swiss Olympiads in Mathematics.**
Teaching in preparation of national selections. Deputy leader for the Swiss team during the European Olympiads in 2012.

Conferences

- 2020 **Joint Mathematical Meeting**, *Denver, Colorado, USA*.
Poster for AWM Graduate Student Poster Session, funded participant.
- 2019 **National Council of Teachers of Mathematics, Regional Conference & Exposition**, *Salt Lake City, Utah, USA*.
Participant.
- 2018 **Workshop on Algebra and Representation Theory, Held on Oregonian Grounds: Deligne-Lusztig theory**, *University of Oregon, Eugene, Oregon, USA*.
Funded participant.
- 2018 **Automorphic Forms on Reductive Groups and Their Covers: In Honour of S. Friedberg**, *Eidgenössische Technische Hochschule Zürich, Switzerland*.
Funded participant.
- 2018 **Summer School on Lie Theory**, *University of Georgia, Athens, Georgia, USA*.
Partially funded participant.
- 2018 **Representation Theory, Geometry, and Quantization: The Mathematical Legacy of B. Kostant**, *Massachusetts Institute of Technology, Cambridge, Massachusetts, USA*.
Funded participant.
- 2018 **Introductory Workshop: Group Representation Theory and Applications**, *Mathematical Sciences Research Institute, Berkeley, California, USA*.
Funded participant.
- 2018 **Connections for Women: Group Representation Theory and Applications**, *Mathematical Sciences Research Institute, Berkeley, California, USA*.
Funded participant.
- 2017 **The Atlas of Lie Groups and Representations**, *University of Utah, Salt Lake City, Utah, USA*.
Participant.
- 2017 **Current Topics in the Theory of Algebraic Groups**, *University of Burgundy, France*.
Funded participant.
- 2017 **Young Algebraists' Conference**, *EPFL, Switzerland*.
Participant and speaker.

Talks and Presentations

- 2020 **Teaching seminar**, *University of Utah, USA*.
"Students' ownership of their learning and their mathematics"
- 2020 **Joint Mathematical Meeting, AWM Graduate Student Poster Session**, *Denver, Colorado, USA*.
Poster: "Projective cases for the restriction of the oscillator representation to dual pairs"

- 2019 **Teaching seminar**, *University of Utah, USA*.
Lightning talk: "Tips for productive groups work"
- 2019 **Talk for prospective graduate students**, *University of Utah, USA*.
"What is representation theory?"
- 2018 **Representation theory seminar**, *University of Utah, USA*.
"Restriction of the oscillator representation using dual pairs"
- 2018 **Reading group in Representation theory**, *University of Utah, USA*.
"Double centralizer theorem"
- 2018 **Graduate Colloquium**, *University of Utah, USA*.
"Specht Modules For The Symmetric Group"
- 2017 **Graduate Colloquium**, *University of Utah, USA*.
"Finite and Infinite Hat Problems"
- 2017 **Young Algebraists' Conference**, *EPFL, Switzerland*.
"Restrictions of representations: dual pairs"
- 2015 **Representation theory student seminar**, *University of Utah, USA*.
"Restricting irreducible representations of simple Lie algebras to semisimple subalgebras"
- 2014 **Undergraduate Colloquium**, *EPFL, Switzerland*.
"What is representation theory? Examples for finite groups"

Awards

- 2020 **Graduate Student Travel Funding**, *Department of Mathematics, University of Utah, USA*, \$250.
- 2018 **Summer Research Fellowship**, *Department of Mathematics, University of Utah, USA*, \$4500.
- 2017 **Graduate Student Travel Assistance Award**, *Graduate School, University of Utah, USA*, \$400.
- 2017 **Graduate Student Travel Funding**, *Department of Mathematics, University of Utah, USA*, \$500.

Computer skills

\LaTeX , PHP (creating questions for MyOpenMath)

Languages

French Native language.

English Fluent.

German High school level.

Bilingual high school: French/German.