

Johannes Cuno

Curriculum Vitae

PERSONAL DETAILS

Institution Ludwigsburg University of Education, Institute of Mathematics II
Address Reuteallee 46, 71634 Ludwigsburg, Germany
E-Mail johannes.cuno@ph-ludwigsburg.de

RESEARCH INTERESTS

My research interests range from combinatorial and geometric group theory to formal languages. Moreover, I wrote papers on graph theory and random walks on infinite graphs and groups. Inspired by my new environment in Ludwigsburg also educational aspects of mathematics are coming into focus.

EDUCATION AND PROFESSIONAL EXPERIENCE

Lecturer (“Akademischer Rat”) **2018 – now**
PH Ludwigsburg, Germany

Employment as Postdoc with ... **2015 – 2018**
01/09/2017 – 31/08/2018 Anna Erschler, *École normale supérieure, Paris, France*
01/06/2016 – 31/07/2017 Vadim Kaimanovich, *University of Ottawa, Canada*
15/10/2015 – 14/05/2016 Wolfgang Woess, *TU Graz, Austria*

PhD Programme in Mathematics (“Promotionsstudium”) **2011 – 2015**
TU Graz, Austria

Degree Dr. techn.
Advisor Wolfgang Woess
Thesis Combinatorial and probabilistic aspects of discrete groups
04/01/2014 – 01/03/2014 Participant in the Geowalks Trimester, *IHP, Paris, France*
14/01/2013 – 12/07/2013 Visiting Graduate Student with Tim Riley, *Cornell University, Ithaca, NY, USA*

Master’s Programme in Mathematics (“Diplomstudium”) **2005 – 2011**
Goethe University, Frankfurt am Main, Germany

Degree Dipl.-Math.
Advisor Robert Bieri
Thesis Non-spherical triangles of groups

Teacher Education Programme (“Lehramtsstudium”) **since 2001**
Goethe University, Frankfurt am Main, Germany

When I came to university, I wanted to become a school teacher for Mathematics and Latin. Teaching was, and still is, a passion of mine. But, after a while, I found myself surrounded by mathematical structures, by challenging problems and elegant proofs. In light of this beauty, I decided to postpone my career as a teacher and to delve deeper into mathematics.

TEACHING EXPERIENCE

Lectures, ...

PH Ludwigsburg, Germany

- Summer 23 MAT 462 School Maths from a Higher Point of View, MAT 511 Modelling & Simulation, MAT 704 Markov Chains, MAT 780 Group Theory (+ 2 hrs Recitation)
- Winter 22/23 MAT 431 Arithmetic & Algebra, MAT 511 Modelling & Simulation, MAT 708 Mathematics of the Infinite (+ 2 hrs Recitation)
- Summer 22 MAT 462 School Maths from a Higher Point of View, MAT 511 Modelling & Simulation, MAT 704 Markov Chains, MAT 780 Group Theory (+ 5 hrs Recitation)
- Winter 21/22 MAT 431 Arithmetic & Algebra, MAT 454 Undergraduate Seminar “Charming Proofs”, MAT 511 Modelling & Simulation, MAT 706 Combinatorics (+ 6 hrs Recitation)

- Summer 21 MAT 411 Introduction, MAT 704 Markov Chains (+ 10 hrs Recitation)
- Winter 20/21 MAT 411 Introduction, MAT 706 Combinatorics, MAT 709 Algebra (+ 8 hrs Recitation)
- Summer 20 MAT 411 Introduction, MAT 705 Number Theory, MAT 707 Markov Chains (+ 8 hrs Recitation)
- Winter 19/20 MAT 411 Introduction, MAT 706 Combinatorics (+ 10 hrs Recitation)
- Summer 19 MAT 703 Topology, MAT 709 Algebra (+ 12 hrs Recitation)
- Winter 18/19 MAT 705 Number Theory (+ 14 hrs Recitation)

Theses. I am serving as a supervisor for both Bachelor’s and Master’s theses in Mathematics. Until now I have supervised 18 Bachelor’s theses as examiner as well as 7 Master’s theses as second examiner.

Practical School Training. According to BW LVVO §2 (7), a state regulation in Baden–Wuerttemberg, I regularly supervise students during their practical school training. At the moment, I am doing so at Gemeinschaftsschule Ludwigsburg. For this activity the legislator estimates a workload of 4 hours per week during the lecture period.

Lectures

University of Ottawa, Canada

- Winter 17 MAT 1341 Introduction to Linear Algebra
- Autumn 16 MAT 1341 Introduction to Linear Algebra

Recitation Classes (“Übungsgruppen”)

TU Graz, Austria

- Winter 14/15 Discrete Mathematics Lecture: Franz Lehner
- Summer 14 Linear Algebra II Lecture: Franz Lehner
- Winter 13/14 Linear Algebra I Lecture: Wolfgang Woess
- Winter 12/13 Mathematics A for Electrical Engineers Lecture: Wolfgang Woess
- Summer 12 Linear Algebra II Lecture: Wolfgang Woess
- Winter 11/12 Linear Algebra I Lecture: Wolfgang Woess

Recitation Classes (“Übungsgruppen”)

Goethe University, Frankfurt am Main, Germany

- Summer 09 Formal Languages and Computability Lecture: Detlef Wotschke
- Summer 08 Introduction to Topology Lecture: Wolfgang Metzler
- Winter 06/07 Introduction to Algebra and Number Theory Lecture: Robert Bieri
- Summer 06 Linear Algebra II Lecture: Robert Bieri
- Winter 05/06 Linear Algebra I Lecture: Robert Bieri
- Summer 05 Analysis for Computer Scientists Lecture: Anton Wakolbinger
- Winter 04/05 Mathematics I for Teacher Students: Number Systems Lecture: Robert Bieri
- Winter 03/04 Probability Theory for Computer Scientists Lecture: Anton Wakolbinger

PUBLICATIONS

5. Johannes Cuno and Gerald Williams: A class of digraph groups defined by balanced presentations. *J. Pure Appl. Algebra* **224** (8), 2020, № 106342.
4. Johannes Cuno and Ecaterina Sava-Huss: Random walks on Baumslag–Solitar groups. *Israel J. Math.* **228** (2), 2018, 627 – 663.
3. Johannes Cuno and Jörg Lehnert: The Tits alternative for non-spherical triangles of groups. *Trans. Lond. Math. Soc.* **2** (1), 2015, 93 – 124.
2. Tetiana Boiko, Johannes Cuno, Wilfried Imrich, Florian Lehner, and Christiaan E. van de Woestijne: The Cartesian product of graphs with loops. *Ars Math. Contemp.* **11** (1), 2016, 1 – 9.
1. Johannes Cuno, Wilfried Imrich, and Florian Lehner: Distinguishing graphs with infinite motion and nonlinear growth. *Ars Math. Contemp.* **7** (1), 2014, 201 – 213.

SELECTED TALKS

Audiofeedback – From the idea to a prototype and first test runs

This talk has been given at the following occasion:

11/01/2023 Colloquium of the Institute of Mathematics II, *PH Ludwigsburg, Germany*

Three reasons to look forward to mathematics

Different versions of this talk have been given at the following occasions:

13/10/2022 Welcome Week, *PH Ludwigsburg, Germany*

10/10/2019 Welcome Week, *PH Ludwigsburg, Germany*

The golden ratio and the so called Fibonacci sequence

This talk has been given at the following occasion:

18/01/2019 Workshop on Fibonacci, *PH Ludwigsburg, Germany*
Video recording available on <https://www.youtube.com/watch?v=KMtNXyl9GwU>

How not to hang a picture on a wall

This talk has been given at the following occasion:

26/07/2017 Guest Talk at the Undergraduate Student Seminar, *University of Ottawa, Canada*

Baumslag–Solitar groups and around

Different versions of this talk have been given at the following occasions:

25/09/2017 Réunion de rentrée de l'équipe «Algèbre et géométrie», *ENS, Paris, France*

02/11/2016 Analysis Seminar, *University of Ottawa, Canada*

SQ-universality for polygonal products of one-relator groups

This talk has been given at the following occasion:

30/01/2015 Advanced Topics in Discrete Mathematics, *TU Graz, Austria*

Free groups and the Hanna Neumann conjecture – A picture book

Different versions of this talk have been given at the following occasions:

31/03/2017 Analysis Seminar, *University of Ottawa, Canada*

23/09/2014 Mathematics Seminar, *University of Essex, Colchester, UK*

12/05/2014 Structure Theory Seminar, *TU Graz, Austria*

04/02/2014 Student Seminar (Geowalks), *IHP, Paris, France*

30/04/2013 The Olivetti Club, *Cornell University, Ithaca, NY, USA*

Random walks on Baumslag–Solitar groups

Different versions of this talk have been given at the following occasions:

- 09/04/2018 Séminaire GAN, *University of Paris-Sud, Orsay, France*
- 20/02/2018 Group Theory Seminar, *ENS, Paris, France*
- 10/12/2015 Random Walks and Harmonic Functions on Groups, *CIB, Lausanne, Switzerland*
- 12/12/2014 Doctoral School Seminar, *TU Graz, Austria*
- 05/06/2014 Groups, Graphs, and Random Walks, *Palazzone di Cortona, Italy*
- 23/09/2013 18th ÖMG–DMV Congress, *University of Innsbruck, Austria*
- 14/12/2012 Doctoral School Seminar, *TU Graz, Austria*
- 15/06/2012 Advanced Topics in Discrete Mathematics, *TU Graz, Austria*

About free products of groups with one additional defining relation

This talk has been given at the following occasion:

- 26/01/2012 Structure Theory Seminar, *TU Graz, Austria*

The Tits alternative for non-spherical triangles of groups

Different versions of this talk have been given at the following occasions:

- 24/11/2015 Geometry and Analysis on Groups, Research Seminar, *University of Vienna, Austria*
- 17/10/2013 Mathematics Seminar, *University of Essex, Colchester, UK*
- 17/09/2013 27th Leoben–Ljubljana Seminar, *Graz, Austria*
- 08/03/2013 Mathematics Colloquium, *Syracuse University, NY, USA*
- 12/02/2013 Topology and Geometric Group Theory Seminar, *Cornell University, Ithaca, NY, USA*
- 03/08/2012 GAGTA 6, *Heinrich-Heine-University, Düsseldorf, Germany*
- 01/06/2012 Discrete Mathematics Day 2012, *TU Graz, Austria*
- 27/10/2011 Structure Theory Seminar, *TU Graz, Austria*
- 30/08/2011 Algebra and Geometry Seminar, *Goethe University, Frankfurt am Main, Germany*

CONFERENCES AND WORKSHOPS

- 29/08/2022 – 02/09/2022 56th GDM Congress, *Goethe University, Frankfurt am Main, Deutschland*
- 28/09/2020 – 01/10/2020 54th GDM Congress, Online Meeting, *University of Würzburg, Germany*
- 15/11/2019 – 16/11/2019 Workshop on Tertiary Mathematics Education, *PH Ludwigsburg, Germany*
- 04/03/2019 – 08/03/2019 53rd GDM Congress, *University of Regensburg, Germany*
- 11/02/2019 – 12/02/2019 Groups, Automata, and Graphs, *TU Graz, Austria*
- 17/01/2019 – 18/01/2019 Workshop on Fibonacci und Frederick II, *PH Ludwigsburg, Germany*
- 09/11/2018 – 10/11/2018 Workshop on Computer Science at School, *PH Ludwigsburg, Germany*
- 30/11/2017 – 01/12/2017 Christmas Tree Meeting of the GNC Network, *Orsay, France*
- 05/06/2017 – 09/06/2017 Geometric and Probabilistic Properties of Infinite Groups, *Lille, France*
- 07/12/2015 – 11/12/2015 Random Walks and Harmonic Functions on Groups, *CIB, Lausanne, Switzerland*
- 02/06/2014 – 06/06/2014 Groups, Graphs, and Random Walks, *Palazzone di Cortona, Italy*
- 24/02/2014 – 28/02/2014 Groups Acting on Rooted Trees and around (Geowalks), *IHP, Paris, France*
- 27/01/2014 – 31/01/2014 Random Walks on Groups (Geowalks), *IHP, Paris, France*
- 06/01/2014 – 17/01/2014 Introductory School to the Geowalks Trimester, *CIRM, Luminy, France*
- 22/09/2013 – 28/09/2013 18th ÖMG–DMV Congress, *University of Innsbruck, Austria*
- 16/09/2013 – 17/09/2013 27th Leoben–Ljubljana Seminar, *Graz, Austria*
- 28/05/2013 – 31/05/2013 GAGTA 7, *City College of New York, NY, USA*
- 20/09/2012 – 22/09/2012 26th Leoben–Ljubljana Seminar, *Bovec, Slovenia*
- 25/07/2012 – 03/08/2012 GAGTA 6, *Heinrich-Heine-University, Düsseldorf, Germany*
- 12/03/2012 – 16/03/2012 Groups 2012, *Bielefeld University, Germany*
- 06/03/2012 – 09/03/2012 10th German Probability and Statistics Days, *University of Mainz, Germany*
- 23/09/2011 – 24/09/2011 25th Leoben–Ljubljana Seminar, *University of Leoben, Austria*

03/07/2011 – 16/07/2011 GAGTA 5, *Polytechnic University of Catalonia, Manresa, Spain*
 04/04/2011 – 15/04/2011 Discrete Probability, Ergodic Theory, and Combinatorics, *TU Graz, Austria*
 25/08/2008 – 27/08/2008 Groups and Infinite Graphs, *Erwin Schrödinger Institute, Vienna, Austria*
 12/12/2007 – 15/12/2007 Geometric Group Theory, *Georg-August-University, Göttingen, Germany*
 27/08/2007 – 31/07/2007 GAGTA 2, *University of Dortmund, Germany*

AWARDS

Winner of the Doctoral School Award

2014

Doctoral School of Mathematics and Scientific Computing, Graz, Austria

Each academic year, the Doctoral School of Mathematics and Scientific Computing, which is jointly run by TU Graz and the University of Graz, awards this prize for the two best papers.

Winner of the Olivetti Egg

2013

Cornell University, Ithaca, NY, USA

This wooden egg is the prize for the best talk given at the Olivetti Club, a seminar at Cornell University in which graduate students are invited to present their favourite pieces of mathematics.

Nominee for “Hessische Hochschulpreis”

2008 & 2009

Goethe University, Frankfurt am Main, Germany

Holding recitation classes and grading homework is time consuming, but worth every minute. I derived huge benefit from my classes and it seems that some of my students did so, too. They nominated me twice for “Hessische Hochschulpreis für Exzellenz in der Lehre”.

Qualifier for “Bundeswettbewerb Jugend forscht”

2000

Stiftung Jugend forscht, Hamburg, Germany

About one year before graduating from secondary school, a classmate and I carried out a physics project and qualified for “Bundeswettbewerb Jugend forscht”, the final round of a big youth science competition in Germany.

FURTHER ACTIVITIES AT UNIVERSITY

PH Ludwigsburg, Germany

01/10/2021 – now Study Advisor in Mathematics for Prospective Secondary School Teachers
 01/10/2021 – now IT Representative of the Institute of Mathematics II

TU Graz & University of Graz, Austria

15/10/2015 – 14/05/2016 Coordinator of the Doctoral Programme DK W1230 “Discrete Mathematics”
 08/04/2013 – 13/03/2014 Student Member of the Coordinating Team of the joint Doctoral School of Mathematics and Scientific Computing

Goethe University, Frankfurt am Main, Germany

01/10/2007 – 30/09/2010 Student Member of the Department Council (“Direktorium des IfM”)
 01/04/2007 – 31/03/2008 Student Member of the Faculty Council (“Fachbereichsrat des FB12”)
 01/04/2006 – 31/03/2007 Deputy Student Member of the Faculty Council (“Fachbereichsrat des FB12”)

FURTHER INTERESTS

- ▶ **Field Hockey**
- ▶ **Computer Programming**
- ▶ **Languages and Grammar**

My mother tongue is German and I am fluent in English. Since I have always been interested in languages and, particularly, in their grammar, I took classes in French, Italian, Swedish, Latin, Greek, and Sanskrit.

MY FAVOURITE POEM



*Schläft ein Lied in allen Dingen,
die da träumen fort und fort,
und die Welt hebt an zu singen,
triffst Du nur das Zauberwort.*

Joseph von Eichendorff

*Sleeps a song in things abounding
that keep dreaming to be heard:
Earth's tunes will start resounding
if you find the magic word.*

Translation by Walter A. Aue

Printed with permission of the author

Contact: waue@dal.ca

August 12, 2023