

CURRICULUM VITAE – DANIEL TUBBENHAUER

Personal Information

Daniel Tubbenhauer
Mathematisches Institut, Universität Bonn, Hausdorff center for mathematics (HCM),
Endenicher Allee 60, Room 1.003, 53115 Bonn, Germany
Postdoctoral researcher at the Hausdorff center for mathematics (HCM)
Personal homepage: <http://www.math.uni-bonn.de/people/dtubben/>
email: dtubben@math.uni-bonn.de

At the moment I am a postdoctoral researcher at the Hausdorff center for mathematics (HCM) of the Universität Bonn.

Starting in 2018, I will be a lecturer at the Institut für Mathematik der Universität Zürich.

Before that I was a visiting researcher (with my own funding) of the Université Catholique de Louvain, an invited Researcher at the TATA Institute of Fundamental Research (TIFR) in Mumbai and before that a postdoctoral researcher at the centre for Quantum Geometry of Moduli Spaces (QGM) of the university of Aarhus.

My research interests are higher representation theory, n -categories and categorification and applications in representation theory of Lie algebras, modular representation theory, knot theory and quantum groups.

Referees

- Prof. Henning Haahr Andersen, Centre for Quantum Geometry of Moduli Spaces, Aarhus University, Aarhus, Denmark, email: mathha@qgm.au.dk.
- Prof. Jørgen Ellegaard Andersen, Centre for Quantum Geometry of Moduli Spaces, Aarhus University, Aarhus, Denmark, email: andersen@qgm.au.dk.
- Prof. Mikhail Khovanov, Department of Mathematics, Columbia University, New York, NY, United states, email: khovanov@math.columbia.edu.
- Prof. Marco Ariën Mackaaij (Mackaay), Departamento de Matemática, FCT, Universidade do Algarve, Faro, Portugal, email: mmackaay@ualg.pt.
- Prof. Thomas Schick, Mathematisches Institut, Georg–August–Universität Göttingen, Göttingen, Germany, email: schick@uni-math.gwdg.de.
- Prof. Catharina Stroppel, Mathematisches Institut, Universität Bonn, Bonn, Germany, email: stroppel@math.uni-bonn.de.
- Prof. Pedro Vaz, Université Catholique de Louvain, Louvain, Belgium, email: pedro.vaz@uclouvain.be.
- Prof. Chenchang Zhu, Mathematisches Institut, Georg–August–Universität Göttingen, Göttingen, Germany, email: zhu@uni-math.gwdg.de.

Main scientific interests

Categorification.

Higher representation theory of quantum groups, Soergel bimodules etc.

Higher dimensional category theory.

Applications of the former in low dimensional topology, e.g. knot theory.

Applications of the former in geometry.

Applications of the former in “classical” representation theory, e.g. modular.

Publications

Michael Ehrig, Daniel Tubbenhauer and Paul Wedrich, *Functoriality of colored link homologies*. <https://arxiv.org/abs/1703.06691>

Antonio Sartori and Daniel Tubbenhauer, *Webs and q -Howe dualities in types BCD*. <https://arxiv.org/abs/1701.02932>

Marco Mackaay, Volodymyr Mazorchuk, Vanessa Miemietz and Daniel Tubbenhauer, *Simple transitive 2-representations via (co)algebra 1-morphisms*. <https://arxiv.org/abs/1612.06325>

Michael Ehrig, Daniel Tubbenhauer and Arik Wilbert, *Singular TQFTs, foams and type D arc algebras*. <https://arxiv.org/abs/1611.07444>

Marco Mackaay and Daniel Tubbenhauer, *Two-color Soergel calculus and simple transitive 2-representations*. <http://arxiv.org/abs/1609.00962>

Michael Ehrig, Catharina Stroppel and Daniel Tubbenhauer, *Generic \mathfrak{gl}_2 -foams, web and arc algebras*. <http://arxiv.org/abs/1601.08010>

Michael Ehrig, Catharina Stroppel and Daniel Tubbenhauer, *The Blanchet–Khovanov algebras, Categorification and Higher Representation Theory*, 183-226, Contemp. Math., 683, Amer. Math. Soc., Providence, RI, 2017. <http://arxiv.org/abs/1510.04884>

Henning Haahr Andersen, Catharina Stroppel and Daniel Tubbenhauer, *Semisimplicity of Hecke and (walled) Brauer algebras*, J. Aust. Math. Soc. 103 (2017), no. 1, 1-44. <http://arxiv.org/abs/1507.07676>

Daniel Tubbenhauer, Pedro Vaz and Paul Wedrich, *Super q -Howe duality and web categories*, to appear in Algebr. Geom. Topol. <http://arxiv.org/abs/1504.05069>

Henning Haahr Andersen, Catharina Stroppel and Daniel Tubbenhauer, *Cellular structures using U_q -tilting modules*, to appear in Pacific J. Math. <http://arxiv.org/abs/1503.00224>

David E. V. Rose and Daniel Tubbenhauer, *Symmetric webs, Jones–Wenzl recursions and q -Howe duality*, Int. Math. Res. Not. (IMRN), 2016-17 (2016), 5249-5290. <http://arxiv.org/abs/1501.00915>

Henning Haahr Andersen and Daniel Tubbenhauer, *Diagram categories for U_q -tilting modules at roots of unity*, Transform. Groups 22 (2017), no. 1, 29-89. <http://arxiv.org/abs/1409.2799>

Daniel Tubbenhauer, *\mathfrak{sl}_n -webs, categorification and Khovanov–Rozansky homologies*. <http://arxiv.org/abs/1404.5752>

Daniel Tubbenhauer, \mathfrak{sl}_3 -web bases, intermediate crystal bases and categorification, J. Algebraic Combin. 40-4 (2014), 1001-1076.

<http://arxiv.org/abs/1310.2779>

Marco Mackaay, Weiwei Pan and Daniel Tubbenhauer, The \mathfrak{sl}_3 web algebra, Math. Z. 277-1-2 (2014), 401-479. <http://arxiv.org/abs/1206.2118>

Daniel Tubbenhauer, Virtual Khovanov homology using cobordisms, J. Knot Theory Ramifications 23-9 (2014), 91 pages.

<http://arxiv.org/abs/1111.0609>

Other publications:

- Daniel Tubbenhauer, *Categorification and applications in topology and representation theory*, Ph.D thesis, published (2013). <http://arxiv.org/abs/1307.1011>
- Daniel Tubbenhauer, *Khovanov homology for virtual tangles and applications*, merged with “Virtual Khovanov homology using cobordisms”, J. Knot Theory Ramifications 23-9 (2014), 91 pages. <http://arxiv.org/abs/1212.0185>

Additional material for the papers above:

- Henning Haahr Andersen, Catharina Stroppel and Daniel Tubbenhauer, *Additional notes for the paper “Cellular structures using U_q -tilting modules”*. <http://www.math.uni-bonn.de/people/dtubben/cell-tilt-proofs.pdf>
- A MATHEMATICA based program for calculations of the virtual Khovanov complex that I have defined in the paper above. It is available at the arXiv together with the paper above or on my website.

Invited speaker

“Categorical representations of dihedral groups – Or: $\mathbb{Z}_{\geq 0}$ -valued matrices, my love”, Talk given at the Universidade do Algarve, Faro, Portugal (September 2017).

“Webs and q-Howe dualities in types **BCD** – Or: “Howe” not to define link invariants”, Talk given at the Isaac Newton Institute for Mathematical Sciences, Cambridge, England (June 2017).

“2-representation theory of Coxeter groups: a biased survey – Or: The “next generation” of representation theory of Coxeter groups!?”, Talk given at the Universität Zürich, Zürich, Switzerland (April 2017).

“Webs and q-Howe dualities in types **BCD** – Or: A story about “howe” I failed”, Talk given at the Uppsala universitet, Uppsala, Sweden (April 2017).

“2-representation theory of Coxeter groups: some first steps – Or: The ‘next generation’ of representation theory of Coxeter groups!?”, Talk given at the Columbia University, New York City, United states (February 2017).

“Some first steps towards 2-representation theory of Coxeter groups – Or: The ‘next generation’ of representation theory of Coxeter groups!?”, Talk given at the Université Catholique de Louvain, Louvain, Belgium (October 2016).

“Some first steps towards 2-representation theory of Coxeter groups – Or: The ‘next generation’ of representation theory of Coxeter groups!?”, Talk given at the Université Montpellier, Montpellier, France (October 2016).

- “(Singular) TQFTs, link homologies and Lie theory 2 – Or: fun with singular surfaces”, Talk given at the School of Mathematics of the University of Edinburgh, Edinburgh, Scotland (November 2015).
- “(Singular) TQFTs, link homologies and Lie theory 1 – Or: a story of foams and \mathcal{O} ”, Talk given at the School of Mathematics of the University of Edinburgh, Edinburgh, Scotland (November 2015).
- “Web calculi in representation theory – Or: the diagrammatic presentation machine”, Talk given at the Mathematisch Instituut of the Universiteit Leiden, Leiden, Netherlands (October 2015).
- “Cellular structures using U_q -tilting modules – Or: centralizer algebras are fun!”, Talk given at the Annual meeting of the Deutsche Mathematiker Vereinigung (DMV), Hamburg, Germany (September 2015).
- “Web calculi in representation theory – Or: the diagrammatic presentation machine”, Talk given at the “Representation theory afternoon” of the Max Planck Institute for Mathematics (MPI), Bonn, Germany (August 2015).
- “Cellular structures using U_q -tilting modules – Or: centralizer algebras are fun!”, Talk given at the Mathematisches Institut Universität Freiburg, Freiburg, Germany (July 2015).
- “From dualities to diagrams – Or: the diagrammatic presentation machine”, Talk given at the Institut de Mathématiques de Jussieu (IMJ) of the Université Paris-Diderot, Paris, France (June 2015).
- “ $U_q(\mathfrak{gl}_N)$ -diagram categories via super q -Howe duality – Or: the diagrammatic presentation machine”, Talk given at the Mathematics Department of the Faculty of Sciences of the University of Porto, Porto, Portugal (June 2015).
- “From dualities to diagrams – Or: the diagrammatic presentation machine”, Talk given at the Erwin Schrödinger International Institute for Mathematical Physics (ESI) of the Universität Wien, Vienna, Austria (May 2015).
- “Cellular structures using U_q -tilting modules – Or: centralizer algebras are fun!”, Talk given at the Mathematisches Institut Universität Bonn, Bonn, Germany (April 2015).
- “ $U_q(\mathfrak{sl}_n)$ -diagram categories via q -Howe duality – Or: from dualities to diagrams”, Talk given at the Hausdorff Research Institute for Mathematics (HIM), Bonn, Germany (March 2015).
- “ $U_q(\mathfrak{sl}_n)$ -diagram categories via q -Howe duality – Or: “Howe” to make diagram categories work!”, Talk given at the University of Sydney, Sydney, Australia (February 2015).
- “ $U_q(\mathfrak{sl}_n)$ -diagram categories via q -Howe duality – Or: “Howe” to make diagram categories work!”, Talk given at the Université Catholique de Louvain, Louvain, Belgium (February 2015).
- “Diagram categories for U_q -tilting modules at roots of unity – Or: Fun with diagrams!”, Talk given at the QGM Nielsen Retreat 2014, Sandbjerg Estate, Sønderborg, Denmark (October 2014).
- “Categorification in topology – Or: Fun with highest weight modules!”, Minitalk given at the MFO, Oberwolfach, Germany (September 2014).

- “ $U_q(\mathfrak{sl}_m)$ -highest weight theory governs \mathfrak{sl}_n -link homology”, Talk given at the Université Catholique de Louvain, Louvain, Belgium (May 2014).
- “ \mathfrak{sl}_n -link homologies using $U_q(\mathfrak{sl}_m)$ -highest weight theory – the m is not a typo!”, Talk given at the “QGM”, Aarhus, Denmark (April 2014).
- “Categorification: An introduction to the \mathfrak{sl}_n -link homologies”, Talk given at the “Kerala school of mathematics”, Kozhikode, India (March 2014).
- “The diagrammatic beauty of $\mathbf{Rep}(U_q(\mathfrak{sl}_n))$ – Part II”, Talk given at the “TATA institute of fundamental research”, Mumbai, India (March 2014).
- “The diagrammatic beauty of $\mathbf{Rep}(U_q(\mathfrak{sl}_n))$ – Part I”, Talk given at the “TATA institute of fundamental research”, Mumbai, India (March 2014).
- “ \mathfrak{sl}_3 -web bases, categorification and link invariants”, Talk given at the “QGM”, Aarhus, Denmark (November 2013).
- “ \mathfrak{sl}_3 -web bases, intermediate crystal bases and categorification”, Talk given at the “Mathematisches Institut” in Bonn, Germany (October 2013).
- “Web bases and categorification”, Talk given at the “QGM”, Aarhus, Denmark (October 2013).
- “Categorification and applications in topology and representation theory”, Talk given at the “Mathematisches Institut”, Göttingen, Germany (July 2013).
- “Categorification and (virtual) knots”, Talk given at the “Mathematical department” of the UCSF, San Francisco, United states (February 2013).
- “The \mathfrak{sl}_3 -web algebra”, Talk given at the meeting of the “GK-Göttingen”, Goslar, Germany (October 2012).
- “Why categories?: The history of categories in a nutshell”, Talk given at the “Mathematisches Institut”, Göttingen, Germany (April 2012).

Slides for all listed talks can be found on my website:

<http://www.math.uni-bonn.de/people/dtubben/talks.html>

Conference contributions

- Seminar on Representation Theory and Related Areas: 6th Workshop*, Faro, Portugal (September 2017).
- WARTHOG Workshop 2017 (Symplectic duality (the Abelian case))*, Eugene (Oregon), United States (August 2017).
- A conference on geometric representation theory, and related topics*, University of Glasgow, Glasgow, Scotland (July 2017).
- Workshop “Quantum topology and categorified representation theory”*, Isaac Newton Institute, Cambridge, United Kingdom (June 2017).
- Arbeitstagung 2017 on “Physical Mathematics” in honor of Yuri Manin’s contributions to the field*, Bonn, Germany (June 2017).
- Hausdorff School “Derived Noncommutative Geometry”*, Bonn, Germany (June 2017).
- 2-representation theory workshop*, Uppsala, Sweden (April 2017).
- 1¹/₂ day(s) for 2-categories and 3-manifolds*, Montpellier, France (September 2016).
- Lie Theory and Representation Theory Workshop*, Köln, Germany (August 2016).

WARTHOG Workshop 2016 (Knot homologies, Hilbert schemes, and Cherednik algebras), Eugene (Oregon), United States (July 2016).

Young Women in Representation Theory, Bonn, Germany (June 2016).

Workshop: Categorification, Organizer, Bonn, Germany (May 2016).

Hausdorff School; Derived categories: dimensions, stability conditions, and enhancements, Bonn, Germany (March/April 2016).

Panorama of Mathematics – A Conference of the Hausdorff Center, Bonn, Germany (October 2015).

Annual meeting of the Deutsche Mathematiker Vereinigung (DMV), Hamburg, Germany (September 2015).

Colloque Solstice, topic: representation theory and knot invariants, Paris, France (June 2015).

AMS–EMS–SPM international meeting, Mathematics Department of the Faculty of Sciences of the University of Porto, Porto, Portugal (June 2015)

Conference on the Interaction of Representation Theory with Geometry and Combinatorics, Hausdorff Research Institute for Mathematics (HIM), Bonn, Germany (March 2015).

Introductory Workshop connected to the Representation theory program at the Institute Mittag-Leffler, Uppsala, Sweden (February 2015).

QGM Research Retreat 2014, Centre for Quantum Geometry of Moduli Spaces, University Aarhus, Aarhus, Denmark (December 2014).

QGM Nielsen Retreat 2014, Sandbjerg Estate, Sønderborg, Denmark (October 2014).

MFO Workshop: Topology, Oberwolfach, Germany (September 2014).

International Congress of Mathematicians (ICM) Satellite Conference on Representation Theory and Related Topics, Daegu, South Korea (August 2014).

Algebraic Lie theory and representation theory, Glasgow, Scotland (August 2014).

Categorification and geometric representation theory, “Centre de recherches Mathématiques” in Montréal, Canada (June 2014).

Indian-Danish meeting of mathematicians, “Kerala school of mathematics” in Kozhikode, India (March 2014).

Quantum Mathematics and Computation (Clay research conference), Oxford, England (September/October 2013).

Higher Structures in China IV, Lanzhou, China (August 2013).

Summer school on category \mathcal{O} , Stuttgart, Germany (August 2013).

Representation theory and categorification, Shanghai, China (June 2013).

A new look and knot invariants arising from representation theory with a via towards categorification, Stuttgart, Germany (March 2013).

Higher Structures in China III, Changchun, China (August 2012).

Oporto Meetings on Geometry, Topology and Physics, Oporto, Portugal (July 2012).

Topology and groups, Berlin, Germany (June 2011).

Winter braids II, Caen, France (December 2011).
Higher Structures in mathematics and physics, Göttingen, Germany (December 2011).
Quantum groups, categorification and braids, Strasbourg, France (September 2011).
Swiss knots – knot theory and algebra, Thun, Switzerland (May 2011).

**Other research
visits**

Research visit, 1 week, Faro, Portugal (August/September 2017).
Research visit, 2 days, Louvain, Belgium (May 2017).
Research visit, 1 week, Zürich, Switzerland (April 2017).
Research visit, 2 weeks, Uppsala, Sweden (April 2017).
Research visit, 1 week, Faro, Portugal (February 2017).
Research visit, 1 week, New York City, United states (February 2017).
Research visit, 3 days, Louvain, Belgium (October 2016).
Research visit, 3 days, Montpellier, France (October 2016).
Research visit, 1 week, Faro, Portugal (September 2016).
Research visit, 5 days, Edinburgh, Scotland (November 2015).
Research visit, 3 days, Leiden, Netherlands (October 2015).
Research visit, 4 days, Bonn, Germany (July 2015).
Research visit, 3 days, Freiburg, Germany (July 2015).
Research visit, 5 days, Bonn, Germany (May 2015).
Research visit, 3 days, Wien, Austria (May 2015).
Research visit, 7 days, Bonn, Germany (April 2015).
Research visit, 14 days, Institute Mittag-Leffler, Sweden (April 2015).
Research visit, 10 days, Sydney, Australia (February 2015).
Research visit, 3 days, Louvain, Belgium (December 2014).
Research visit, 10 days, Bonn, Germany (December 2014).
Research meeting of the QGM, 1 week, Aarhus, Denmark (December 2014).
Invited researcher, 2 month, TATA institute, Bombay, India (November 2014 and partially December 2014).
Research visit, 1 week, Zürich, Switzerland (July 2014).
Invited researcher, 1 month, TATA institute, Bombay, India (March/April 2014).
Research visit, 1 week, Bonn, Germany (October 2013).
Research visit, 2 weeks, Faro, Portugal (September 2013).
Research visit, 2 weeks, Faro, Portugal (June 2013).
Research visit, 3 Month, Berkeley, US (November 2012 - February 2013).
Research visit, 1 week, Faro, Portugal (May 2012).
Research visit, 1 week, Faro, Portugal (December 2011).

Research visit, 1 week, Faro, Portugal (September 2011).

Conference plans

Workshop: A_∞ -structures in geometry and representation theory, 5 days, Bonn, Germany (December 2017).

Workshop: Categorification, representation theory and symplectic geometry, 5 days, Bonn, Germany (November 2017/December 2017).

Winter school: Categorification, representation theory and symplectic geometry, 5 days, Bonn, Germany (November 2017).

Workshop: Quantum geometric and algebraic representation theory, 5 days, Bonn, Germany (October 2017).

Symplectic Geometry and Representation Theory (Junior Hausdorff Trimester Program), Bonn, Germany (October till December 2017).

Positions

Lecturer, Department of Mathematics, University of Zurich, Zurich, Switzerland (01.01.2018-31.12.2021)

PostDoc, Hausdorff Center for Mathematics (HCM), University of Bonn, Bonn, Germany (01.09.2015-31.08.2017)

Stipend by the DFG, Researcher financed by a DFG research funding, Host: Université Catholique de Louvain, Louvain, Belgium (01.02.2015-31.08.2015)

PostDoc, Centre for Quantum Geometry of Moduli Spaces (QGM), University of Aarhus, Aarhus, Denmark (01.01.2015-31.01.2015)

Invited Researcher, TATA Institute of Fundamental Research (TIFR), Mumbai, India (01.11.2014-31.12.2014)

PostDoc, Centre for Quantum Geometry of Moduli Spaces (QGM), University of Aarhus, Aarhus, Denmark (01.11.2013-30.10.2014)

PostDoc, Mathematisches Institute and Graduiertenkolleg GRK 1493, Georg-August-Universität Göttingen, Göttingen, Germany (01.08.2013-30.03.2014)

Stipend while PhD-studies, GAUSS program of the Georg-August-Universität Göttingen and Graduiertenkolleg GRK 1493 “Mathematische Strukturen in der modernen Quantenphysik”, Georg-August-Universität Göttingen, Göttingen, Germany (01.11.2010-30.09.2013)

Education

I was part of the Graduiertenkolleg GRK 1493 “Mathematische Strukturen in der modernen Quantenphysik” in Göttingen and the Courant research center of the University Göttingen and I finished my PhD-thesis in July 2013.

The topic of my thesis is “*Categorification and applications in topology and representation theory*”. My supervisors were Prof. Dr. Thomas Schick, Mathematisches Institut, Georg-August-Universität Göttingen and Dr. Marco Ariën Mackaaij, Departamento de Matemática, FCT, Universidade do Algarve.

PhD student (Stipend), Graduiertenkolleg GRK 1493 “Mathematische Strukturen in der modernen Quantenphysik” (01.11.2010-defence 02.07.2013)

Diplom (univ.) degree in mathematics from the Georg–August–Universität Göttingen (01.10.2008-30.05.2010). Thesis advisor’s: Prof. Dr. Thomas Schick (Georg–August–Universität Göttingen) and Prof. Dr. Andreas Thom (Universität Leipzig).

Vordiplom (univ.) degree in mathematics from the Georg–August–Universität Göttingen (01.05.2006-30.09.2008).

Bunsen–Gymnasium Heidelberg (2003-2005) High school located in Heidelberg, Germany.

Städtisches Gymnasium Beverungen (1997-2003) High school located in Beverungen, Germany.

Städtische Grundschule Lauenförde (1993-1997) Primary school located in Lauenförde, Germany.

Teaching and organization

Organization (conferences, workshops etc.):

“Workshop: Categorification, representation theory and symplectic geometry”, 5 days, Bonn, Germany (November 2017/December 2017).

“Winter school: Categorification, representation theory and symplectic geometry”, 5 days, Bonn, Germany (November 2017).

“Symplectic Geometry and Representation Theory (Junior Hausdorff Trimester Program)”, 3 month, Bonn, Germany (Fall 2017).

“Workshop: Categorification”, 5 days, Bonn, Germany (May 2016).

Teaching at the **HCM in Bonn**:

Assistant of the Seminar “Representation theory finite groups”, Summer (2017).

Organizer of the Seminar “Representation theory of (tensor) categories”, Summer (2017).

Assistant “Oberseminar Darstellungstheorie”, Summer (2017).

Organizer of the Seminar “Affine Hecke algebras and their appearance in mathematics”, Winter (2016/2017).

Assistant “Oberseminar Darstellungstheorie”, Winter (2016/2017).

Organizer of the Seminar “Categorification at roots of unity for pedestrians”, Summer (2016).

Assistant “Oberseminar Darstellungstheorie”, Summer (2016).

Organizer of the Seminar “Recent topics in representation theory”, Winter (2015).

Assistant “Oberseminar Darstellungstheorie”, Winter (2015/2016).

Teaching at the **University of Aarhus**:

Research assistant “Calculus and Linear Algebra I - MATLAB”, Fall (2014).

Lecturer “Categorification - An introduction, aka the beauty of diagrams”, Spring (2014).

Research assistant “Calculus and Linear Algebra I - MATLAB”, Winter (2013).

Teaching at the **Georg-August-Universität Göttingen:**

Research assistant “Analysis I”, SoSe (2013).

Research assistant “Analysis I”, WiSe (2012/13).

Research assistant for the self organised seminar “Categorification”, SoSe (2012).

Research assistant “Analysis II”, SoSe (2012).

Research assistant for the self organised seminars “Category theory”, SoSe (2012).

Research assistant “Analysis II”, SoSe (2011).

Research assistant “Analysis I”, WiSe (2010/11).

Several times assisting courses as “Hilfswissenschaftler” (undergraduate research assistant), e.g. “Algebra I”, “Algebra II”, “Topology I”, “Topology II”, “Linear Algebra I”, “Linear Algebra II” etc.

Professional membership

Member of the “American Mathematical Society” (AMS).

Member of the “European Mathematical Society” (EMS).

Member of the “Deutsche Mathematiker Vereinigung” (DMV).

Programming skills

Advanced programming skills in C and C++.

Advanced programming skills in MATHEMATICA.

Advanced programming skills in Sage.

Basic programming skills in Java.

I am familiar with different computer algebra systems like MuPaD, MatLab etc.

Language skills

My mother tongue is German, but almost everything I write is in English. **German:** Native tongue. **English:** Fluent. **French:** low High-school level. **Latin:** low High-school level. **Danish:** interrupted learning process.