CURRICULUM VITAE

Thomas Willwacher
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Personal Data

Date of Birth:	April 12, 1983
Citizenship:	German
Civil status:	Married, two children
Address (office):	Department of Mathematics, Y27J20, University of Zurich, Winterthurerstrasse 190, 8057 Zurich, Switzerland
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Research Interests

Homological algebra, operads, interactions of mathematics and physics, in particular of quantum field theory and algebra, deformation quantization, graph complexes.

Education

2007-2009:	PhD in Mathematics ETH Zurich, advisor G. Felder (co-referees A. Alekseev and A. Cattaneo), thesis on "Cyclic Formality"
2002-2007:	Diploma in Physics ETH Zurich, advisor G. Felder, thesis: "Modules in Deformation Quantization"
1993-2001:	Highschool degree (*Abitur*) Privates Gymnasium der Zisterzienserabtei Marienstatt, Germany

Employment

2013-:	Assistant professor in pure mathematics, University of Zurich
2012-13:	Postdoctoral position at ETH Zurich, on a one-year leave from the Society of Fellows.
2010-13:	Junior Fellowship of the Society of Fellows, Harvard University.
2007-2010:	Assistant at the Department of Mathematics, ETH Zurich.

Teaching Experience

2015:	*Graph complexes*, University of Zurich
2014:	*Mathematics for Chemistry I*, University of Zurich
2014 & 15:	*Introduction to MATLAB*, University of Zurich.
2013:	*Analysis I*, University of Zurich.
2013:	*Basic group and representation theory*, ETH Zurich.
2012:	*The Grothendieck-Teichmüller group*, ETH Zurich.
2010:	*Linear Algebra II*, ETH Zurich.
2007-2009:	Teaching assistant for various courses at ETH Zurich.
2012-:	Co-organizer of the joint mathematical physics seminar of ETH Zurich and the University of Zurich.

PhD students: Ricardo Fonseca Gomes de Campos (2013-), Marko Živković (2013-), Jonathan Lorand (joint with Alberto Cattaneo, 2015-), Matteo Felder (joint with Anton Alekseev, 2015-).
MSc students: Matteo Felder, 2014-15.
First co-referee for J. Löffler (PhD at MPI Bonn 2015)

Grants, Awards and Distinctions

- Swiss National Science Foundation grant 200021_150012, 2013

- Swissmap NCCR grant (as part of a larger team)
- André Lichnerowicz prize in Poisson geometry 2012
- Junior Fellowship of the Harvard Society of Fellows, 2010-2013
- IPDE/EPDI postdoctoral fellowship, and Moore Instructorship at MIT (both declined, in favor of the Harvard Fellowship)
- ETH Medal, 2010
- Undergraduate Scholarship of the German National Merit Foundation ("Studienstiftung des Deutschen Volkes"), 2003-2007

Publications in pure mathematics: preprints/submitted

38. Anton Khoroshkin, Thomas Willwacher and Marko Živković, *Differentials on graph complexes II - hairy graphs*, arxiv:1508.01281.
37. Victor Turchin, Thomas Willwacher, *Hochschild-Pirashvili homology on suspensions and representations of $Out(F_n)$*, arXiv:1507.08483.
36. Thomas Willwacher, *Deformation quantization and the Gerstenhaber structure on the homology of knot spaces*, arxiv:1506.07078.
35. Thomas Willwacher, *Models for the n-Swiss Cheese operads*, arxiv:1506.07021.
34. Yuri Berest, Giovanni Felder, Sasha Patotski, Ajay C. Ramadoss, Thomas Willwacher, *Chern-Simons forms and higher character maps of Lie representations*, arXiv:1505.05377.
33. Benoit Fresse, Thomas Willwacher, *The intrinsic formality of E_n-operads*, arXiv:1503.08699.
32. Ricardo Campos, Thomas Willwacher, *Operadic Torsors*, arXiv:1412.3614.
31. Anton Khoroshkin, Thomas Willwacher, Marko Živković, *Differentials on graph complexes I*, arXiv:1411.2369.
30. Vasily A. Dolgushev, Thomas Willwacher, *A Direct Computation of the Cohomology of the Braces Operad*, arXiv:1411.1685.
29. Victor Turchin, Thomas Willwacher, *Relative (non-)formality of the little cubes operads and the algebraic Cerf Lemma*, arXiv:1409.0163.
28. Carlo A. Rossi, Thomas Willwacher, *P. Etingof's conjecture about Drinfeld associators*, arXiv:1404.2047.
27. Anton Alekseev, Carlo A. Rossi, Charles Torossian, Thomas Willwacher, *Logarithms and deformation quantization*, arXiv:1401.3200.
26. Pavol Ševera, Thomas Willwacher, *The cubical complex of a permutation group representation - or however you want to call it.* arXiv:1103.3283. (review article, not intended for journal publication)

Publications in pure mathematics: published/accepted

25. Ricardo Campos, Sergei Merkulov, Thomas Willwacher, *The Frobenius properad is Koszul*, arXiv:1402.4048, to appear in the Duke Math. Journal.
24. Yuri Berest, Giovanni Felder, Sasha Patotski, Ajay C. Ramadoss, Thomas Willwacher, *Representation Homology, Lie Algebra Cohomology and Derived Harish-Chandra Homomorphism*, arXiv:1410.0043, to appear in J. EMS.
23. Thomas Willwacher, *The Homotopy Braces Formality Morphism*, arXiv:1109.3520, to appear in the Duke Math. Journal.

22. Vasily Dolgushev, Christopher L. Rogers, Thomas Willwacher, *Kontsevich's graph complex, GRT, and the deformation complex of the sheaf of polyvector fields*, Annals of Mathematics 182(3):855–943 (2015).

21. Thomas Willwacher, Marko Živković, *Multiple edges in M. Kontsevich's graph complexes and computations of the dimensions and Euler characteristics*, Adv. Math. 272:553–578 (2015).

20. Damien Calaque, Thomas Willwacher, *Triviality of the higher Formality Theorem*, Proc. Amer. Math. Soc. 143:5181–5193 (2015).

19. Thomas Willwacher, *The Grothendieck-Teichmüller group action on differential forms and formality morphisms of chains*, J. Reine Ang. Math., DOI:10.1515/crelle-2014-0135, (2015).

18. Thomas Willwacher, *The oriented graph complexes*, Communications in Mathematical Physics 334(3):1649–1666 (2015).

17. Thomas Willwacher, *M. Kontsevich's graph complex and the Grothendieck-Teichmüller Lie algebra.* Invent. Math. 200(3):671–760, (2015).

16. Giovanni Felder, Thomas Willwacher, *Jointly orthogonal polynomials*, arXiv:1304.4482, J. Lond. Math. Soc. (2) 91(3):750–768 (2015).

15. Thomas Willwacher, *Characteristic classes in deformation quantization*, Int. Math. Res. Not. 15:6538–6557 (2015).

14. Vasily Dolgushev, Thomas Willwacher, *Operadic Twisting – with an application to Deligne's conjecture*, Journal of Pure and Applied Algebra 219(5):1349–1428 (2015).

13. Thomas Willwacher. *Cyclic Cohomology of the Weyl Algebra.* Journal of Algebra 425:277–312 (2015).

12. Thomas Willwacher, *The obstruction to the existence of a loopless star product*, C. R. Math. Acad. Sci. Paris 352(11):881–883 (2014).

11. Vasily Dolgushev, Thomas Willwacher, *The Deformation complex is a homotopy invariant of a homotopy algebra*, Current Developments and Retrospectives in Lie Theory, Springer 2014.

10. Thomas Willwacher, *Stable cohomology of polyvector fields*, Math. Res. Letters. 21(6):1501–1530 (2014).

9. Sergei Merkulov, Thomas Willwacher, *Grothendieck-Teichmüller and Batalin-Vilkovisky*, Lett. Math. Phys. 104(5):625–634 (2014).

8. Thomas Willwacher, with a section by Damien Calaque. *Formality of cyclic cochains.* Adv. Math. 231(2):624–650 (2012).

7. Andrea Ferrario, Carlo Rossi, Thomas Willwacher, *A Note on the Koszul Complex in Deformation Quantization.* Lett. Math. Phys. 95(1):27–39 (2011).

6. Alberto S. Cattaneo, Giovanni Felder, Thomas Willwacher. *The character map in deformation quantization.* Advances in Mathematics 228(4):1966–1989 (2011).

5. Pavol Ševera, Thomas Willwacher. *Equivalence of formalities of the little discs operad.* Duke Mathematical Journal 160(1):175–206 (2011).

4. Thomas Willwacher. *Formality of Cyclic Chains.* Int. Math. Res. Notices 17:3939–3956 (2011).

3. Giovanni Felder, Thomas Willwacher. *On the (ir)rationality of Kontsevich weights.* Int. Math. Res. Notices 4:701–716 (2010).

2. Alberto S. Cattaneo, Giovanni Felder, Thomas Willwacher. *On L-infinity morphisms of cyclic chains.* Lett. Math. Phys. 90:85–101 (2009).

1. Thomas Willwacher. *A Counterexample to the Quantizability of Modules.* Lett. Math. Phys. 81(3):265–280 (2007).

Publications in computer science

8. Andreas Velten, Thomas Willwacher, Otkrist Gupta, Ashok Veeraraghavan, Moungi G. Bawendi, Ramesh Raskar, *Recovering three-dimensional shape around a corner using ultrafast time-of-flight imaging*, Nature Communications 3, art. 745, 2012

7. Di Wu, Gordon Wetzstein, Christopher Barsi, Thomas Willwacher, Qionghai Dai, Ramesh Raskar, *Ultra-fast Lensless Computational Imaging through 5D Frequency Analysis of Time-resolved Light Transport*. Int. J. Comput. Vis. 110 (2014), no. 2, 128–140.

6. Otkrist Gupta, Thomas Willwacher, Andreas Velten, Ashok Veeraraghavan, and Ramesh Raskar, *Reconstruction of hidden 3D shapes using diffuse reflections*, Optics Express, Vol. 20, Issue 17, pp. 19096-19108 (2012)

5. Di Wu, Gordon Wetzstein, Christopher Barsi, Thomas Willwacher, Matthew O'Toole, Nikhil Naik, Qionghai Dai, Kyros Kutulakos, and Ramesh Raskar, *Frequency analysis of transient light transport with applications in bare sensor imaging*, In Proceedings of the 12th European conference on Computer Vision - Volume Part I (ECCV'12), Vol. Part I. 542–555, 2012

4. Ramesh Raskar, Paul A. Beardsley, Jeroen van Baar, Yao Wang, Paul H. Dietz, Johnny C. Lee, Darren Leigh, Thomas Willwacher, *RFIG lamps: interacting with a self-describing world via photosensing wireless tags and projectors*, ACM Trans. Graph. 01/2004; 23:406-415

3. Ramesh Raskar, Jeroen van Baar, Thomas Willwacher, Srinivas Rao, *Quadric Transfer for Immersive Curved Screen Displays*. Comput. Graph. Forum 23(3): 451-460 (2004).

2. Ramesh Raskar, Jeroen van Baar, Paul A. Beardsley, Thomas Willwacher, Srinivas Rao, Clifton Forlines: *iLamps: geometrically aware and self-configuring projectors*. ACM Trans. Graph. 22(3): 809-818 (2003).

1. Ramesh Raskar, Remo Ziegler, Thomas Willwacher: *Cartoon dioramas in motion*. NPAR 2002: 7-12.

Publications by my students, written under my supervision

- Ricardo Campos, *BV Formality*, arXiv:1506.07715.

Patents

- Ramesh Raskar, Thomas H. Willwacher, Srinivasa G. Rao, *Shape-adaptive projector system*, Patent number: US 6709116.

- Ramesh Raskar, Thomas H. Willwacher, Jeroen van Baar, *Method and system for displaying images on curved surfaces*, Patent number: US 6715888.

- Ramesh Raskar, Jeroen van Baar, Srinivasa G. Rao, Thomas H. Willwacher, *Projecting warped images onto curved surfaces*, Patent number: US 6793350.

- Ramesh Raskar, Thomas Willwacher, Srinivasa G. Rao, *Method for determining a largest inscribed rectangular image within a union of projected quadrilateral images*, Patent number: US 6729733.

Invited Talks

2015: GRT, MZV and Associators, Les Diablerets, on *Graph complexes*
2015: Seminar of the ANR HOGT, IRMA Strasbourg, on *Intrinsic Formality of the E_n operads II*
2015: Mathematics Seminar, EPFL Lausanne, on *Graph complexes*
2015: Recent progress in mathematics, ETH Zurich, on *Graph complexes*
2014: Topology Seminar, EPFL Lausanne, on *Deformation theory of the little n-cubes operad and graph complexes*
2014: Seminar talk, Université de Luxembourg, on *Jointly orthogonal polynomials and classical ODEs*
2014: Geometry and Physics, conference in the honor of Maxim Kontsevich, I.H.E.S., France, on *Recent progress and open problems in graph cohomology*
2014: Seminar talk, University of Geneva, on *Logarithmic Formality II - Drinfeld associators*
2014: Quantization of Moduli Spaces (conference), University of Geneva, on *The oriented graph complex*
2014: Discrete Mathematics Seminar, University of Zurich, on *Some open problems in "homological algebraic combinatorics"*
2013: Seminar talk, University of Geneva, on *Jointly orthogonal polynomials*
2013: Mathematical Physics Seminar, ETH Zurich, on *The oriented graph complex*
2013: Seminar talk, Université du Luxembourg, on *The oriented graph complex*
2013: Facets of Geometry, Stockholm, on *A family of Drinfeld associators and explicit formulas for graph cohomology classes*
2013: Higher Structures 2013, Cambridge, UK, on *Deformations of the E_n-operad*
2013: Les Diablerets Winter School, minicourse on *Graphs, Models, Quantization*
2012: Poisson 2012, University of Utrecht, on *Drinfeld associators, Kontsevich formality morphisms and P. Etingof's conjecture*
2012: GASC, Northeastern University, on *Operadic twisting and Deligne's conjecture*
2011: Mathematical Physics Seminar, ETH Zurich, on *Homotopy Braces Formality*
2011: Higher Structure 2011, Göttingen, on *Operadic twisting and Deligne's conjecture*
2011: Geometry/Physics Seminar, Northwestern University, Evanston, IL, *Towards a unification of deformation quantization*
2011: Geometry/Physics Seminar pre-talk, Northwestern University, Evanston, IL, on *Deformation Quantization*
2011: Geometry seminar, Boston University, on *Chern characters and polyvector fields*
2011: The Legacy of Deformations Quantization, Ascona, Switzerland, on *Chern characters and polyvector fields*
2011: Talk at V. Drinfeld's seminar in Chicago, IL, on *The Graph Complex*
2011: Algebra Seminar, Université de Lyon, France, on *M. Kontsevich's graph complex*
2011: Seminar talk, Université de Lille, France, on *M. Kontsevich's graph complex*
2010: Symplectic Geometry Seminar, University of Toronto, on *The graph complex and the Grothendieck-Teichmüller Lie algebra*
2010: Algebra Seminar, Temple University, on *The graph complex and the Grothendieck-Teichmüller Lie algebra*
2010: Seminar talk, University of Pennsylvania, Philadelphia, on *Brace-infinity formality using graphs*
2010: Higher structures in mathematics and physics 2010, Vienna. Minicourse (4 lectures) on *M. Kontsevich's graph complex and the Grothendieck-Teichmüller Lie algebra*
2010: Séminaire "Groupes de Lie et éspaces des modules", Univ. of Geneva, Switzerland, on *Graph cohomology and the Grothendieck-Teichmüller Lie algebra*
2010: Minicourse given at ETH Zurich on *Graph complexes, the Grothendieck-Teichmüller group and their role in Deformation Quantization*
2010: Algebra Seminar, Univ. Paris 6, France, on *Homotopy Gerstenhaber formality with graphs*
2010: Representation Theory and Quantization 2010, Zurich, Switzerland, on *KS-infinity formality using graphs*

2010: Seminar talk at Harvard University, Physics Department, on *M. Kontsevich's graph complex*
2010: Infinite dimensional algebra seminar, MIT, on *Unifying Deformation Quantization*
2009: Algebra Seminar, Univ. Paris 7, France, on *A Drinfeld associator and formality of the litle disks operad*
2009: Séminaire "Groupes de Lie et éspaces des modules", Univ. of Geneva, Switzerland, on *Homotopy Gerstenhaber formality using graphs*
2009: Summer meeting in mathematical physics 2009, ETH Zurich, on *Formalities of the little disks operad*
2009: Algebraic Analysis and Deformation Quantization 2009, Scalea, Italy, on *Equivalence of formalities of the little disks operad*
2009: Séminaire "Groupes de Lie et éspaces des modules", Univ. of Geneva, Switzerland, on *An L-infinity algebra extending sder and formalitites of the little disks operad*
2008: Higher Structures in Mathematics and Physics 2008, Lausanne, Switzerland, on *"Formality theorems" on cyclic (co) chains*
2008: Séminaire "Groupes de Lie et éspaces des modules", Univ. of Geneva, Switzerland, on *Weights of Kontsevich graphs*
2008: Summer meeting in mathematical physics 2008, ETH Zurich, on *Cyclic Formality*
2008: Seminar "Fundamentale Wechselwirkungen", Univ. of Freiburg, Germany, on *Quantizability of modules*

Referee Service

- Advances in Mathematics
- Communications in Mathematical Physics
- Compositio Mathematica
- Comptes Rendus Mathematique
- Crelle's Journal
- European Research Council (grant referee)
- Geometric and Functional Analysis
- Homology, Homotopy and Applications
- Journal de l'École polytechnique
- Journal of Algebra
- Journal of Homotopy and Related Structures
- Letters in Mathematical Physics
- Université du Luxembourg (grant referee)

Software

Author of the TikzEdt software, a combined textual and WYSIWYG editor for the TikZ language. Written in C#, .NET/WPF, ANTLR and TeX, available at http://www.tikzedt.org/.
Author of several components and articles on C# and .NET related topics on The CodeProject.