

# Henri Mühle

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## EDUCATION AND WORK EXPERIENCE

since 08/2022: Requirements Engineer.  
Qoniac GmbH.

06/2018–07/2022: Postdoc.  
Dresden University of Technology.  
Institute of Algebra.  
Habilitation project: “Parabolic Cataland”.  
Mentor: Manuel Bodirsky.

04/2018–05/2018: Parental Leave.

10/2016–03/2018: Postdoc.  
Dresden University of Technology.  
Institute of Algebra.

10/2015–09/2016: Postdoc.  
École Polytechnique.  
LIX, Équipe Modèles Combinatoires.

10/2014–09/2015: Postdoc.  
Université Paris Diderot.  
LIAFA, Équipe Combinatoire.

10/2010–09/2014: PhD Student.  
University of Vienna.  
Thesis title: “Combinatorics of Fuß-Catalan Posets Associated with Reflection Groups”.  
Advisor: Christian Krattenthaler.

03/2009–09/2010: Research Assistant.  
Dresden University of Technology.  
Database Technology Group.

03/2009–09/2010: Programmer.  
InterOffice GmbH CAD & Visualisierung.

10/2006–03/2007: Programmer.  
Gorille & Grodrian GbR.

10/2003–03/2009: Student.  
Dresden University of Technology.  
Thesis title: “Modellierung rollenbehafteter Typhierarchien unter Verwendung der Formalen Begriffsanalyse”.  
Advisors: Bernhard Ganter and Uwe Aßmann.

## TEACHING EXPERIENCE

Summer 2022 (TU Dresden):

- Exercise sessions: “Mathematische Methoden für Informatiker 1”.

Winter 2021 (TU Dresden):

- Exercise sessions: “Mathematik für Informatiker (Diskrete Strukturen)”.

Winter 2020 (TU Dresden):

- Teaching assistance: “Mathematik für Informatiker (Lineare Algebra)”.
- Exercise sessions: “Mathematische Methoden für Informatiker 2”.

Summer 2020 (TU Dresden):

- Exercise sessions: “Mathematische Methoden für Informatiker 1”.
- Exercise sessions: “Lineare Algebra—Weiterführende Konzepte”.

Winter 2019 (TU Dresden):

- Teaching assistance: “Mathematik für Informatiker (Lineare Algebra)”.
- Exercise sessions: “Mathematische Methoden für Informatiker 2”.

Summer 2019 (TU Dresden):

- Lecture: “Coxeter-Catalan Kombinatorik”.
- Exercise sessions: “Mathematische Methoden für Informatiker 1”.

Winter 2018 (TU Dresden):

- Teaching assistance: “Mathematik für Informatiker (Diskrete Strukturen)”.
- Exercise sessions: “Mathematische Methoden für Informatiker 2”.

Winter 2017 (TU Dresden):

- Lecture: “Geordnete Mengen in Hyperebenenarrangements”.
- Teaching assistance: “Algebra für Informationssystemtechniker”.
- Exercise sessions: “Mathematik für Informatiker (Lineare Algebra)”.

Summer 2017 (TU Dresden):

- Lecture: “Nichtkreuzende Partitionen”.
- Exercise session: “Algebra und Zahlentheorie”.

Winter 2016 (TU Dresden):

- Exercise sessions: “Mathematik für Informatiker (Diskrete Strukturen)”.

## RESEARCH INTERESTS

- Combinatorics of reflection groups.
- Fuß-Catalan combinatorics.
- Lattice theory.
- Poset topology and poset construction.

## AWARDS AND FUNDING

- Grant Proposal, DFG, 2021. (rejected)
- Travel Award, Graduiertenakademie TU Dresden, 2019.
- Postdoctoral Scholarship, Fondation Sciences Mathématiques de Paris, 2014.
- Nikolaus-Joachim-Lehmann-Award, TU Dresden, 2009.

## PEER-REVIEWED JOURNAL PUBLICATIONS

21. *The Rank Enumeration of Certain Parabolic Non-Crossing Partitions* (with C. Krattenthaler). *Algebraic Combinatorics* **5**(3), pp. 437–468. Centre Mersenne, 2022.
20. *F- and H-Triangles for  $v$ -Associahedra* (with C. Ceballos). *Combinatorial Theory* **2**(2), Article 3. 2022.
19. *Meet-Distributive Lattices have the Intersection Property*. *Mathematica Bohemica*, 2022.
18. *Hochschild Lattices and Shuffle Lattices*. *European Journal of Combinatorics* **103**, Article 103521. Elsevier, 2022.
17. *A Consecutive Lehmer Code for Parabolic Quotients of the Symmetric Group* (with W. Fang and J.-C. Novelli). *The Electronic Journal of Combinatorics* **28**(3), P3.53. 2021.
16. *Noncrossing Arc Diagrams, Tamari Lattices, and Parabolic Quotients of the Symmetric Group*. *Annals of Combinatorics* **25**, pp. 307–344, 2021.
15. *Connectivity Properties of Factorization Posets in Generated Groups* (with V. Ripoll). *Order* **37**(1), pp. 115–149. Springer, 2020.
14.  *$k$ -Indivisible Noncrossing Partitions* (with P. Nadeau and N. Williams). *Séminaire Lotharingien de Combinatoire* **81**, Article B81d. 2020.
13. *The Steep-Bounce Zeta Map in Parabolic Cataland* (with C. Ceballos and W. Fang). *Journal of Combinatorial Theory (Series A)* **172**, Article 105210. Elsevier, 2020.
12. *The Alternating Group Generated by 3-Cycles* (with P. Nadeau). *Algebraic Combinatorics* **2**(6), pp. 1285–1310. Centre Mersenne, 2019.
11. *Tamari Lattices for Parabolic Quotients of the Symmetric Group* (with N. Williams). *The Electronic Journal of Combinatorics* **26**(4), P4.34. 2019.
10. *The Core Label Order of a Congruence-Uniform Lattice*. *Algebra Universalis* **80**(1), Article 10. Springer, 2019.
9. *Two Posets of Noncrossing Partitions coming from Undesired Parking Spaces*. *Revista Colombiana de Matemáticas* **52**(1), pp. 65–86. 2018.
8. *A Heyting Algebra on Dyck Paths of Type A and B*. *Order* **34**(2), pp. 327–348. Springer, 2017.
7. *Symmetric Chain Decompositions and the Strong Sperner Property for Noncrossing Partition Lattices*. *Journal of Algebraic Combinatorics* **45**(3), pp. 745–775. Springer, 2017.
6. *Trimness of Closed Intervals in Cambrian Semilattices*. *Comptes Rendus – Mathématique* **354**, pp. 113–120. Elsevier, 2016.
5. *The  $m$ -Cover Posets and Their Applications* (with M. Kallipoliti). *Advances in Applied Mathematics* **69**, pp. 65–108. Elsevier, 2015.
4. *SB-Labelings, Distributivity, and Bruhat Order on Sortable Elements*. *The Electronic Journal of Combinatorics* **22**(2), P2.40. 2015.
3. *EL-Shellability and Noncrossing Partitions Associated with Well-Generated Complex Reflection Groups*. *European Journal of Combinatorics* **43**(C), pp. 249–278. Elsevier, 2015.
2. *Counting Proper Mergings of Chains and Antichains*. *Discrete Mathematics* **327**(C), pp. 118–129. Elsevier, 2014.

1. *On the Topology of the Cambrian Semilattices* (with M. Kallipoliti). The Electronic Journal of Combinatorics **20**(2), P48. 2013.

#### PEER-REVIEWED CONFERENCE CONTRIBUTIONS

18. *Shuffle Lattices and Bubble Lattices* (with T. McConville). Proceedings of the 34th International Conference on Formal Power Series and Algebraic Combinatorics (Bangalore, India), Article 86B.63. Séminaire Lotharingien de Combinatoire, 2022.
17. *Parabolic Tamari Lattices in Linear Type B* (with W. Fang and J.-C. Novelli). Proceedings of the 34th International Conference on Formal Power Series and Algebraic Combinatorics (Bangalore, India), Article 86B.62. Séminaire Lotharingien de Combinatoire, 2022.
16. *F- and H-Triangles for  $v$ -Associahedra* (with C. Ceballos). Proceedings of the 33rd International Conference on Formal Power Series and Algebraic Combinatorics (Ramat Gan, Israel), Article 85B.44. Séminaire Lotharingien de Combinatoire, 2021.
15. *The Steep-Bounce Zeta Map in Parabolic Cataland* (with C. Ceballos and W. Fang). Proceedings of the 31st International Conference on Formal Power Series and Algebraic Combinatorics (Ljubljana, Slovenia), Article 82B.36. Séminaire Lotharingien de Combinatoire, 2019.
14. *Ballot-Noncrossing Partitions*. Proceedings of the 31st International Conference on Formal Power Series and Algebraic Combinatorics (Ljubljana, Slovenia), Article 82B.7. Séminaire Lotharingien de Combinatoire, 2019.
13. *Connectivity Properties of Factorization Posets in Generated Groups* (with V. Ripoll). Proceedings of the 30th International Conference on Formal Power Series and Algebraic Combinatorics (Hanover, USA), Article 80B.56. Séminaire Lotharingien de Combinatoire, 2018.
12. *On the Lattice Property of Shard Orders*. Proceedings of the 30th International Conference on Formal Power Series and Algebraic Combinatorics (Hanover, USA), Article 80B.4. Séminaire Lotharingien de Combinatoire, 2018.
11. *Two Posets of Noncrossing Partitions*. Proceedings of the European Conference on Combinatorics, Graph Theory and Applications (Eurocomb'17, Vienna, Austria), pp. 885–891. Elsevier, 2017.
10. *The Alternating Group Generated by 3-Cycles* (with P. Nadeau). Proceedings of the 29th International Conference on Formal Power Series and Algebraic Combinatorics (London, UK), Article 78B.36. Séminaire Lotharingien de Combinatoire, 2017.
9. *Symmetric Chain Decompositions and the Strong Sperner Property for Noncrossing Partition Lattices*. Proceedings of the 28th International Conference on Formal Power Series and Algebraic Combinatorics (Vancouver, Canada), pp. 923–934. DMTCS, 2016.
8. *Tamari Lattices for Parabolic Quotients of the Symmetric Group* (with N. Williams). Proceedings of the 27th International Conference on Formal Power Series and Algebraic Combinatorics (Daejeon, South Korea), pp. 973–984. DMTCS, 2015.
7. *The  $m$ -Cover Posets and Their Applications* (with M. Kallipoliti). Proceedings of the 26th International Conference on Formal Power Series and Algebraic Combinatorics (Chicago, USA), pp. 393–404. DMTCS, 2014.
6. *On the Topology of the Cambrian Semilattices* (with M. Kallipoliti). Proceedings of the 25th International Conference on Formal Power Series and Algebraic Combinatorics (Paris, France), pp. 545–556. DMTCS, 2013.
5. *Proper Mergings of Stars and Chains are Counted by Sums of Antidiagonals in Certain Convolution Arrays*. Proceedings of the 11th International Conference on Formal Concept Analysis (Dresden, Germany), pp. 172–187. Springer, 2013.

4. *EL-Shellability and Noncrossing Partitions Associated with Well-Generated Complex Reflection Groups*. Proceedings of the 24th International Conference on Formal Power Series and Algebraic Combinatorics (Nagoya, Japan), pp. 527–538. DMTCS, 2012.
3. *Merging Ordered Sets* (with B. Ganter and C. Meschke). Proceedings of the 9th International Conference on Formal Concept Analysis (Nicosia, Cyprus), pp. 183–203. Springer, 2011.
2. *Using Bonds for Describing Method Dispatch in Role-Oriented Software Models*. Proceedings of the 7th International Conference on Concept Lattices and their Applications (Seville, Spain), pp. 344–349. University of Sevilla, 2010.
1. *Describing Role-Oriented Software Models in Terms of Formal Concept Analysis* (with C. Wende). Proceedings of the 8th International Conference on Formal Concept Analysis (Agadir, Morocco), pp. 241–254. Springer, 2010.

## PREPRINTS

6. *Refined Lattice Path Enumeration and Combinatorial Reciprocity* (with E. Tzanaki). Preprint, arXiv:2207.14544, 2022.
5. *Bubble Lattices I: Structure* (with T. McConville). Preprint, arXiv:2202.02874, 2022.
4. *Extremality, Left-Modularity and Semidistributivity*. Preprint, arXiv:2112.07959, 2021.
3. *Revisiting Generalization of the Dehn–Sommerville Relations* (with C. Ceballos). Preprint, arXiv:2108.13145, 2021.
2. *On the Poset of Multichains*. Preprint, arXiv:1506.04276, 2015.
1. *The Topology of the  $m$ -Tamari Lattices*. Preprint, arXiv:1201.2020, 2012.

## CONFERENCE TALKS AND POSTERS

32. *Chapoton’s Triangles, Lattice Paths and Reciprocity at Matroids, Ordered Sets, Arrangements in Combinatorics* in Manchester, UK, 2022. (Talk)
31. *Shuffle Lattices and Bubble Lattices* at the 34th International Conference on Formal Power Series and Algebraic Combinatorics in Bangalore, India, 2022. (Poster)
30. *Parabolic Tamari Lattices in Linear Type B* at the 34th International Conference on Formal Power Series and Algebraic Combinatorics in Bangalore, India, 2022. (Poster)
29. *Shuffle Lattices and Bubble Lattices* at AlCoVE (online), 2022. (Poster)
28. *F- and H-Triangles for  $v$ -Associahedra* at the 33rd International Conference on Formal Power Series and Algebraic Combinatorics in Ramat-Gan, Israel, 2022. (Poster)
27. *Shuffle Lattices and Bubble Lattices* at the 86th Séminaire Lotharingien de Combinatoire in Bad Boll, Germany, 2021. (Talk)
26. *F- and H-Triangles for  $v$ -Associahedra* at AlCoVE (online), 2021. (Poster)
25. *Ballot-Noncrossing Partitions* at the 31st International Conference on Formal Power Series and Algebraic Combinatorics in Ljubljana, Slovenia, 2019. (Poster)
24. *The Core Label Order of a Congruence-Uniform Lattice* at the 97th Arbeitstagung Allgemeine Algebra in Vienna, Austria, 2019. (Talk)
23. *Connectivity Properties of Factorization Posets in Generated Groups* at the 30th International Conference on Formal Power Series and Algebraic Combinatorics in Hanover, USA, 2018. (Poster)

22. *On the Lattice Property of Shard Orders* at the 30th International Conference on Formal Power Series and Algebraic Combinatorics in Hanover, USA, 2018. (Poster)
21. *Two Posets of Noncrossing Partitions* at Eurocomb, Vienna, Austria, 2017. (Talk)
20. *The Alternating Group Generated by 3-Cycles* at the 29th International Conference on Formal Power Series and Algebraic Combinatorics in London, UK, 2017. (Poster)
19. *Two Posets of Noncrossing Partitions Coming From Undesired Parking Spaces* at the 78th Séminaire Lotharingien de Combinatoire in Ottrott, France, 2017. (Talk)
18. *Symmetric Chain Decompositions and the Strong Sperner Property for Noncrossing Partition Lattices* at the 28th International Conference on Formal Power Series and Algebraic Combinatorics in Vancouver, Canada, 2016. (Poster)
17. *Symmetric Chain Decompositions and the Strong Sperner Property for Noncrossing Partition Lattices* at the 76th Séminaire Lotharingien de Combinatoire in Ottrott, France, 2016. (Talk)
16. *Symmetric Chain Decompositions and the Strong Sperner Property for Noncrossing Partition Lattices* at the Journées du GT Combinatoire Algébrique du GDR IM in Palaiseau, France, 2015. (Talk)
15. *Tamari Lattices for Parabolic Quotients of the Symmetric Group* at the 27th International Conference on Formal Power Series and Algebraic Combinatorics in Daejeon, South Korea, 2015. (Poster)
14. *Tamari Lattices for Parabolic Quotients of the Symmetric Group* at the 74th Séminaire Lotharingien de Combinatoire in Ellwangen, Germany, 2015. (Talk)
13. *Poset-Topological Aspects of Noncrossing Partition Lattices* at the Journées de Combinatoire in Bordeaux, France, 2015. (Talk)
12. *The  $m$ -Cover Posets and the Strip-Decomposition of  $m$ -Dyck Paths* at the IMA Workshop “Geometric and Enumerative Combinatorics” in Minneapolis, USA, 2014. (Poster)
11. *The  $m$ -Cover Posets and the Strip-Decomposition of  $m$ -Dyck Paths* at the 26th International Conference on Formal Power Series and Algebraic Combinatorics in Chicago, USA, 2014. (Poster)
10. *On  $m$ -Cover Posets and Their Applications* at the 72nd Séminaire Lotharingien de Combinatoire in Lyon, France, 2014. (Talk)
9. *On the Topology of the Cambrian Semilattices* at CoMeTA’13 in Cortona, Italy, 2013. (Poster)
8. *On the Topology of the Cambrian Semilattices* at the 25th International Conference on Formal Power Series and Algebraic Combinatorics in Paris, France, 2013. (Poster)
7. *Proper Mergings of Stars and Chains are Counted by Sums of Antidiagonals in Certain Convolution Arrays* at the 11th International Conference on Formal Concept Analysis in Dresden, Germany, 2013. (Talk)
6. *Counting Proper Mergings* at the 70th Séminaire Lotharingien de Combinatoire in Ellwangen, Germany, 2013. (Talk)
5. *The Cambrian Lattices are EL-Shellable* at the 69th Séminaire Lotharingien de Combinatoire in Strobl, Austria, 2012. (Talk)
4. *EL-Shellability of Generalized Noncrossing Partitions Associated to Well-Generated Complex Reflection Groups* at the 24th International Conference on Formal Power Series and Algebraic Combinatorics in Nagoya, Japan, 2012. (Poster)

3. *EL-Shellability of the  $m$ -Tamari Lattices* at the 68th Séminaire Lotharingien de Combinatoire in Ottrott, France, 2012. (Talk)
2. *Using Bonds for Describing Method Dispatch in Role-Oriented Software Models* at the 7th International Conference on Concept Lattices and their Applications in Seville, Spain, 2010. (Talk)
1. *Describing Role-Oriented Software Models in Terms of Formal Concept Analysis* at the 8th International Conference on Formal Concept Analysis in Agadir, Morocco, 2010. (Talk)

#### REFeree ACTIVITY

- Annals of Combinatorics.
- Algebraic Combinatorics.
- Discrete Mathematics.
- European Journal of Combinatorics.
- International Journal of Algebra and Computation.
- Journal of Algebraic Combinatorics.
- Journal of Combinatorial Theory, Series A.
- Journal of Combinatorics.
- Order.
- Proceedings of the International Conference on Formal Power Series and Algebraic Combinatorics.