

# Valentin Müller

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## Curriculum Vitae

### Personal Data

Name Dr. Valentin Leander Müller  
Address Zoology II, Biocenter (room D141), University of Würzburg,  
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### Work experience

since 04/2022 **Research assistant at the work group “Neuroethology of social insects”**, *Biocenter, University of Würzburg*  
10/2015 – **Research assistant at the work group “Experimental**  
3/2022 **Physics III”**, *Faculty of Physics and Astronomy, University of Würzburg*  
4 – 11/2019 **Parental leave**  
and 8/2021  
7 – 8/2015 **Research assistant at the work group “Hybrid systems at low**  
**dimensions”**, *Institut Néel, Grenoble*  
4/2011 – **Student teaching assistant**, *Department of Physics, Freie Universität*  
9/2013 *Berlin*  
9/2008 – **Alternative civilian service in the intensive care unit**, *St. Joseph*  
5/2009 *hospital, Berlin-Tempelhof*

### Education

10/2015 – **Julius-Maximilians-Universität Würzburg, Würzburg (Germany)**,  
3/2022 PhD project at the Faculty of Physics and Astronomy  
PhD thesis: “Transport signatures of topological and trivial states in  
the three-dimensional topological insulator HgTe”  
Supervisor: Prof. Dr. Hartmut Buhmann  
9/2014 – **Université Joseph Fourier, Grenoble (France)**, Erasmus Mundus  
9/2015 Master of Science in Nanoscience and Nanotechnology, specialization  
Nanophysics (2<sup>nd</sup> year)  
Master Thesis at Institut Néel, Grenoble: “Carbon-Based 2D Topological  
Insulators”, Supervisors: Dr. Laurence Magaud and Dr. Johann Coraux  
9/2013 – **Katholieke Universiteit Leuven, Leuven (Belgium)**, Erasmus  
9/2015 Mundus Master of Science in Nanoscience and Nanotechnology,  
specialization Nanophysics (1<sup>st</sup> year)

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- 9/2011 – **Helsingin Yliopisto, Helsinki (Finland)**, Participation in the  
5/2012 ERASMUS Program
- 10/2009 – **Freie Universität Berlin, Berlin (Germany)**, Bachelor of Science in  
6/2013 Physics  
Bachelor Thesis: “Iron-Octaethylporphyrin-Chloride on Au(111) –  
Tuning the magnetic interaction by modification of the ligands”,  
Supervisor: Prof. Dr. Katharina Franke
- 2005–2008 **Boarding school “Internatsschule Schloss Hansenberg” (Upper  
Level Secondary School), Geisenheim (Germany)**, 2008: Abitur  
(general qualification for university entrance)

## Selected internships, conferences, and schools

- 2019 **SRitp advanced school “Electron Hydrodynamics” at the  
Weizmann Institute of Science, Rehovot (Israel)**, Poster: “HgTe  
transport devices patterned by ICP etching utilizing water-soluble BaF<sub>2</sub>  
hard masks”
- 2017 **43<sup>rd</sup> international conference on micro and nanoengineering  
(MNE 2017), Braga (Portugal)**, Poster: “ICP etching for CdHgTe/HgTe  
microstructure devices using BaF<sub>2</sub> as hard mask”
- 2017 **Topological Matter School 2017 at the Donostia International  
Physics Center, Donostia - San Sebastián (Spain)**
- 2015 **XXIII<sup>e</sup> Congrès Général, Société Française de Physique,  
Strasbourg (France)**, Talk: “With nanoporous graphene towards organic  
topological insulators”
- 2013 **Six-week internship at Omicron NanoTechnology,  
Taunusstein (Germany)**
- 2008 **Two-week internship at CERN, Geneva (Switzerland)**
- 2006 **Four-week internship at Oy AGA ab, Espoo (Finland)**

## Teaching experience

- 9/2016 – **Supervision of basic laboratory courses in physics, Faculty of  
9/2021 Physics and Astronomy, University of Würzburg**
- 2017 **Co-supervision of bachelor thesis, Student: Julian Manuel Werther,**  
Bachelor thesis: “Induktiv gekoppeltes Plasmaätzen zur Strukturierung  
von CdHgTe/HgTe-Heterostrukturen”, Co-supervised with Prof. Dr.  
Hartmut Buhmann and Dr. Johannes Kleinlein
- 2017 **Co-supervision of bachelor thesis, Student: Lisa  
Schraut-May,** Bachelor thesis: “Vergleich von Gatedielektrika  
für CdHgTe/HgTe-Hallbarstrukturen: HfO<sub>2</sub> und (SiO<sub>2</sub>-Si<sub>3</sub>N<sub>4</sub>)<sub>n</sub>”,  
Co-supervised with Prof. Dr. Hartmut Buhmann and Dr. Johannes  
Kleinlein
- 10/2016 – **Supervision of student projects for introductory courses to  
3/2018 LabVIEW, Faculty of Physics and Astronomy, University of Würzburg**

- 2016 **Co-supervision of master thesis**, *Student: Jonas Strunz*, Master thesis: “Optimierung von BaF<sub>2</sub>-Masken zur Definition von Mikrokanalstrukturen für die Untersuchung hydrodynamischer Effekte in HgTe/HgCdTe-Heterostrukturen”, Co-supervised with Prof. Dr. Hartmut Buhmann and Dr. Johannes Kleinlein
- 4/2011 – **Supervision of basic laboratory courses in physics**, *Department of Physics, Freie Universität Berlin*  
9/2013

## Publications

- 2021 D. M. Mahler, **V. L. Müller**, C. Thienel, J. Wiedenmann, W. Beugeling, H. Buhmann, and L. W. Molenkamp. Massive and topological surface states in tensile-strained HgTe. *Nano Lett.*, 21(23):9869–9874.
- 2021 **V. L. Müller\***, Y. Yan\*, O. Kashuba, B. Trauzettel, M. Abdelghany, J. Kleinlein, W. Beugeling, H. Buhmann, and L. W. Molenkamp. Electron-hole scattering limited transport of Dirac fermions in a topological insulator. *Nano Lett.*, 21(12):5195–5200. (\* Shared first authorship)
- 2020 J. Strunz, J. Wiedenmann, C. Fleckenstein, L. Lunczer, W. Beugeling, **V. L. Müller**, P. Shekhar, N. T. Ziani, S. Shamim, J. Kleinlein, H. Buhmann, B. Trauzettel, and L. W. Molenkamp. Interacting topological edge channels. *Nat. Phys.*, 16(1):83–88.
- 2019 L. Lunczer, P. Leubner, M. Endres, **V. L. Müller**, C. Brüne, H. Buhmann, and L. W. Molenkamp. Approaching quantization in macroscopic quantum spin Hall devices through gate training. *Phys. Rev. Lett.*, 123(4):047701.
- 2018 P. N. Fleischmann, R. Grob, **V. L. Müller**, R. Wehner, and W. Rössler. The geomagnetic field is a compass cue in *Cataglyphis* ant navigation. *Curr. Biol.*, 28(9):1440–1444.
- 2017 J. Coraux, W. Hourani, **V. L. Müller**, S. Lamare, D. A. Kamaruddin, L. Magaud, N. Bendiab, M. Den Hertog, O. Leynaud, F. Palmino, R. Salut, and F. Chérioux. Soluble two-dimensional covalent organometallic polymers by (arene)ruthenium-sulfur chemistry. *Chem. Eur. J.*, 23(46):10969.
- 2016 P. N. Fleischmann, M. Christian, **V. L. Müller**, W. Rössler, and R. Wehner. Ontogeny of learning walks and the acquisition of landmark information in desert ants, *Cataglyphis fortis*. *J. Exp. Biol.*, 219(19):3137–3145.
- 2013 B. W. Heinrich, G. Ahmadi, **V. L. Müller**, L. Braun, J. I. Pascual, and K. J. Franke. Change of the magnetic coupling of a metal-organic complex with the substrate by a stepwise ligand reaction. *Nano Lett.*, 13(10):4840–4843.

Würzburg, 4<sup>th</sup> of April 2022

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