

# Curriculum Vitae - Patrick Rall

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Full name: **Patrick Julian Tassilo Rall**  
October 14, 1994 in Munich  
Nationality: German



## Contact Information

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Bozzarisstr. 39f 81545 Munich Germany Phone: +49 89 6422186	3320 Harmon Avenue Apt. 539 78705 Austin, TX USA

## Graduate Studies

*since August 2016:* **University of Texas at Austin** - Physics PhD Program  
Research scientist at the **Quantum Information Center** under Dr. Scott Aaronson

## Undergraduate Studies

*2012 - June 2016:* **California Institute of Technology (Caltech)** - Class of 2016  
**Major in Physics**, Minor in Computer Science

## Research

*Aug 30 2017:* Patrick Rall. **Fractal Properties of Magic State Distillation.**  
quant-ph/1708.09256

*Feb 24 2017:* Patrick Rall. **Signed quantum weight enumerators characterize qubit magic state distillation.** quant-ph/1702.06990

*2016-17:* **Quantum Circuit Simulator** An implementation of Sergei Bravyi and David Gosset's algorithm (quant-ph/1601.07601) written together with Iskren Vankov. Available on Github here: <https://github.com/patrickrall/circuitsimulator>

## Teaching

*Spring 2017:* TA for **Introduction to Quantum Information Science**  
Prof. Scott Aaronson (UT Austin)  
Undergraduate course in quantum information.  
<http://www.scottaaronson.com/cs378/>

*Fall 2016:* TA for **General Physics II** - Prof. Zhen Yao (UT Austin)  
Undergraduate physics course intended for pre-meds.

## Skills

**Programming languages:** C++, Python, Haskell, HTML, CSS, JS, PHP, L<sup>A</sup>T<sub>E</sub>X  
**Software:** Mathematica, Git, Django, Apache, Photoshop, ROOT  
**Computing:** Arch Linux, Ubuntu Linux, CentOS, Mac OS X, Windows  
**Languages:** English and German

**Pre-Graduate  
Research  
Experience**

**2015: California Institute of Technology**, Pasadena: Institute for Quantum Information and Matter (IQIM) - "The Quantum Game of Life" (3 months)  
Mentor: Dr. John Preskill (Richard P. Feynman Professor of Theoretical Physics)  
Co-mentors: Nicole Yunger Halpern, Dr. Ning Bao  
Seminar for Prof. Immanuel Bloch's research group at LMU, Munich on Dec. 15, 2015  
<http://patrickrall.ddns.net/pregrad/PatrickRallQuantumCellularAutomata.pdf>

**2014: California Institute of Technology**, Pasadena: IQIM  
High-sensitivity pump-probe spectroscopy to investigate ultrafast phase transitions in  $\text{Ca}_2\text{RuO}_4$  (3 months, SURF report and seminar)  
Mentor: Dr. David Hsieh, Co-mentor: Hao Chu

**2013: German Aerospace Center (DLR)**, Oberpfaffenhofen: Robotics and Mechatronics Center (RMC) - Fiber-optic sensor real-time signal processing (2 months)  
Helmholtz Association, Mentor: Patrick Leyendecker  
<http://patrickrall.ddns.net/pregrad/PatrickRallFiberBraggGratings.pdf>

**2011: Orbit Determination of 1951 Lick**  
with Fengning Ding and Jason Liu at SSP 2011  
<http://patrickrall.ddns.net/pregrad/PatrickRallOrbitDetermination.pdf>

**2012: Max-Planck-Institute for Physics**, Munich: Assistance with measurements of silicon detectors and software development for ATLAS data analysis (2 months)

**2010: Max-Planck-Institute for Physics**, Munich: Analysis of top-quark properties in simulated scattering events with the ATLAS experiment at the LHC (4 months)  
Werner Heisenberg Institute  
Mentor: Dr. habil. Richard Nisius (ATLAS Inner-Detector Group Leader)  
<http://patrickrall.ddns.net/pregrad/PatrickRallTopQuarkJets.pdf>

**High School  
Education**

**Munich International School - International Baccalaureate** - Class of 2012

*Last update: August 2017*