

# Richard Küng

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Institute for Theoretical Physics  
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## Personal

Date of birth 25.04.1988.  
Nationality Austria.

## Education

- since 2015 **Doctoral Candidate** (continuation), *University of Cologne*, Germany.  
Supervisor: Prof. Dr. David Gross  
Topic: *Ill-conditioned estimation problems in quantum mechanics and applied math*
- Spring 2015 **Visiting Researcher**, *The University of Sydney*, Australia.  
research affiliate in the group of Prof. Dr. Steven Flammia
- 2012–2014 **Doctoral Candidate**, *University of Freiburg*, Germany.  
Supervisor: J.-Prof. Dr. David Gross  
Topic: *Ill-conditioned estimation problems in quantum mechanics and applied math*
- 2011–2012 **Master in Physics**, *ETH Zürich*, Switzerland, top of my class.  
Master Thesis: *Calculating and bounding POVM norm constants*  
Supervisor: Prof. Dr. Matthias Christandl (Institute for Theoretical Physics, ETH Zürich, CH)
- 2007–2011 **Bachelor in Interdisciplinary Sciences**, *ETH Zürich*, Switzerland.  
Bachelor Thesis: *An RPMD approach to the tunneling splitting*  
Supervisor: Prof. Stuart Althorpe (Department of Chemistry, University of Cambridge, UK)
- 2010 **International Student Exchange Project**, *University of Cambridge*, United Kingdom.

## Work Experience

- Since 2009 **Teaching Assinstant**, *ETH Zürich and University of Freiburg*.  
Subjects taught at ETH Zürich: physical chemistry, quantum chemistry, partial differential equations (excellent evaluations)  
Subjects taught at University of Freiburg: classical mechanics I + II, electrostatics (excellent evaluations), electrodynamics
- 2010,2011 **Tutor**, *VCS (Chemistry Students Society at ETH Zürich)*, Switzerland.  
Repetition and exam preparation courses in mathematics (excellent evaluations)
- 2006 – 2009 **Organisation Member for International Conferences**, *DEXA Society*, Austria.  
DEXA 2006 in Krakow (Poland), DEXA 2007 in Regensburg (Germany), DEXA 2008 in Torino (Italy), DEXA 2009 in Linz (Austria)
- 2006 – 2007 **National Service**, *Betriebsseminar Linz*, Austria.

## Scholarships, Awards and Distinctions

- Since Oct. 2013 **PhD -Scholarship**, *recipient of scholarship funds from the State Graduate Funding Program of Baden-Württemberg*, Germany.

- 2013 **Willi-Studer-Prize**, *ETH Zürich*, Switzerland, May 2013.  
Awarded annually to the top student in the individual departments of ETH Zürich
- 2012 **Master of Physics with Distinction**, *ETH Zürich*, Switzerland.  
top of my class, grade: 6.0 (Swiss grading scale: 6.0, 5.9, . . . , 1.0)
- 2006 **Austrian Matura with Distinction**, *BG/BRG Freistadt*, Austria.  
top of my class, grade: 1.0 (Austrian grading scale: 1.0, 1.1, . . . , 5.0)
- 2004 – 2006 **Student Representative**, *BG/BRG Freistadt*, Austria.
- Class Representative: elected representative of the pupils in my class (2004 – 2006)
  - Head Boy: elected representative of all 500 pupils of my school (2005 – 2006)

## Languages

- German Mother Tongue.
- English Academic IELTS level: 8.5 (2011)  
+ half year stays in Sydney, Australia (2015) and Cambridge, UK (2010).
- Latin Latin Proficiency Certificate.
- Spanish Language Level B1.
- French Language Level A2.
- Ancient Greek Course I/III at University of Zürich, 4 ECTS, grade: 5.5 (Swiss grading scale: 6.0,5.9,...,1.0).

## Publications

### Preprints

- C. Ferrie, R. Kueng, *Near optimal tomography: estimators and bounds*, preprint: arXiv:1503.00677 (2015)
- R. Kueng, H. Rauhut, U. Terstiege, *low rank matrix recovery from rank one measurements*, to appear in Appl. Comput. Harmon. Anal., preprint: arXiv:1410.6913 (2014)
- D. Gross, F. Kraher, R. Kueng, *Improved Recovery Guarantees for Phase Retrieval from Coded Diffraction Patterns*, to appear in Appl. Comput. Harmon. Anal., preprint: arXiv:1402.6286 (2014)

### Journal Publications

- R. Chaves, R. Kueng, J.B. Brask, D. Gross, *A unifying framework for relaxations of the causal assumptions in Bell's theorem*, Phys. Rev. Lett. **114**, 140403 (2015)
- D. Gross, F. Kraher, R. Kueng, *A Partial Derandomization of PhaseLift using Spherical Designs*, J. Fourier Anal. Appl. **21**, 229 - 266 (2015)
- R. Kueng, D. Gross, *RIPless compressed sensing from anisotropic measurements*, Linear Algebra and its Applications **441**, 110–123 (2014)

### Conference Proceedings

- R. Kueng, *Low rank matrix recovery from few orthonormal basis measurements*, International Conference on Sampling Theory and Applications (SampTA) (2015)
- R. Kueng, D. Gross, F. Kraher, *Spherical designs as a tool for derandomization: The case of PhaseLift* International Conference on Sampling Theory and Applications (SampTA) (2015)

## Conference Presentations and Research Visits

### Conference Presentations

- Aug. 2015 Workshop: Applied Harmonic Analysis and Sparse Approximation , *Oberwolfach*, Germany  
**(Plenary talk)**.
- May 2015 SampTA, *Washington D.C.*, USA **(Invited talk)**.
- Jan. 2015 18th QIP, *Sydney*, Australia **(Poster)**.

- Sept. 2014 Workshop: New horizons in statistical decision theory, *Oberwolfach*, Germany **(Talk)**.  
June 2014 CEQIP Workshop, *Znojmo*, Czech Republic **(Talk)**.  
April 2014 Workshop: Mathematical Physics meets Sparse Recovery, *Oberwolfach*, Germany **(Talk)**.  
March 2014 DPG-Spring Meeting, *Humboldt University, Berlin*, Germany **(Talk)**.  
March 2014 85th Annual GAMM Meeting, *University of Erlangen*, Germany **(Talk)**.  
Feb. 2014 17th QIP, *Barcelona*, Spain **(Poster)**.  
Dec. 2013 Compressed Sensing and its Applications, *TU Berlin*, Germany **(Poster)**.  
Nov. 2013 Statistical Issues in Compressive Sensing, *University of Göttingen*, Germany **(Poster)**.  
March 2013 DPG-Spring Meeting, *University of Hannover*, Germany **(Talk)**.  
Feb. 2013 Fields Workshop on Mathematical Methods of Quantum Tomography, *Fields Institute, Toronto*, Canada **(Poster)**.  
Jan. 2013 16th QIP, *Tsinghua University, Beijing*, China **(Poster)**.

#### Research Visits

- Nov. 2015 **Group of Prof. Holger Boche**, *Munich*, Germany.  
Spring 2015 **Group of Prof. Steven Flammia**, *Sydney*, Australia.  
Nov. 2014 **Group of Prof. Jens Eisert**, *Berlin*, Germany.  
July 2014 **Group of Prof. Holger Rauhut**, *Aachen*, Germany.  
June 2014 **Group of Prof. Michael Wolf**, *Munich*, Germany.  
Feb. 2014 **Group of Prof. Renato Renner**, *Zürich*, Switzerland.  
Oct. 2013 **Group of Prof. Felix Krahmer**, *Göttingen*, Germany.  
Jan. 2013 **Group of Prof. Frank Verstraete**, *Vienna*, Austria.  
July 2011 **Group of Prof. Jens Eisert**, *Berlin*, Germany.