

Dr. Berthold Jäck

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EDUCATION AND TRAINING

Universität Würzburg, GER	Diploma Engineer Nanotechnology	2011
EPFL, CH	Dr. sc.	2015
Princeton University	Postdoctoral Research Fellow	2016-2020

<i>Graduate Thesis Advisor</i>	Prof. Klaus Kern
<i>Postdoctoral Mentor</i>	Prof. Ali Yazdani

PROFESSIONAL APPOINTMENTS

Assistant Professor	The Hong Kong University of Science and Technology, HK SAR	Since 01/2021
Visiting Scientist	Max-Planck-institute, GER	2020
Postdoctoral Research Fellow	Princeton University	2016-2020
Graduate Research Assistant	Max-Planck-institute, GER	2011-2015

HONORS AND AWARDS

Humboldt Foundation return fellowship	2020
Postdoctoral Fellow of the Alexander von Humboldt Foundation	2016
University diploma degree with distinction	2011
Undergraduate Fellow of the German Academic Exchange Association at UC Berkeley	2008

PUBLICATIONS (*notable publication)

- (1) 'Visualizing the multifractal wavefunctions of a disordered two-dimensional electron gas', **B.Jäck**, F. Zinser, E.J. König, S.N.P. Wissing, A.B. Schmidt, M. Donath, K. Kern, C.R. Ast, *in production at Phys. Rev. Research* (2021), arXiv:2010.07554 [cond-mat.mes-hall] (2020)
- (2) 'Evidence for a Monolayer Excitonic Insulator', Y. Jia, P. Wang, C.-L. Chiu, Z. Song, G. Yu, **B. Jäck**, S. Lei, S. Klemenz, F.A. Cevallos, M. Onyszczak, N. Fishchenko, X. Liu, G. Farahi, F. Xie, Y. Xu, K. Watanabe, T. Taniguchi, B.A. Bernevig, R.J. Cava, L.M. Schoop, A. Yazdani, S. Wu, *submitted*, arXiv:2010.05390 [cond-mat.mes-hall] (2020)
- (3) 'Microscopic Relaxation Channels in Materials for Superconducting Qubits', A. Premkumar, C. Weiland, S. Hwang, **B. Jäck**, A.P.M. Place, I. Waluyo, A. Hunt, V. Bisogni, J. Pellicciari, A. Barbour, M.S. Miller, P. Russo, F. Camino, K. Kisslinger, X. Tong, M.S. Hybertsen, A.A. Houck, I. Jarrige, *submitted*, arXiv:2004.02908 [physics.app-ph] (2020)
- (4) 'New material platform for superconducting transmon qubits with coherence times

- exceeding 0.3 milliseconds’, A.P.M. Place, L.V.H. Rodgers, P. Mundada, B.M. Smitham, M. Fitzpatrick, Z. Leng, A. Premkumar, J. Bryon, S. Sussman, G. Cheng, T. Madhavan, H.K. Babla, **B. Jäck**, A. Gyenis, N. Yao, R.J. Cava, N.P. de Leon, A.A. Houck, *submitted*, arXiv:2003.00024 [quant-ph] (2019)
- (5) *‘Tunneling spectroscopy of quantum spin liquids’, E.J. König, M.T. Randeria, **B. Jäck**, *Phys. Rev. Lett.* **125**, 267206 (2020)
 - (6) ‘Visualizing dissipative transport dynamics at the nanoscale with superconducting charge qubit microscopy’, **B. Jäck**, *Phys. Rev. Research* **2**, 043031 (2020)
 - (7) *‘Observation of backscattering induced by magnetism in the topological hinge state of bismuth’, **B. Jäck**, Y. Xie, B.A. Bernevig, A. Yazdani, *PNAS* **117**, 16214-16218 (2020)
 - (8) * ‘Spectroscopic signatures of many-body correlations in magic angle twisted bilayer graphene’, Y. Xie, B. Lian, **B. Jäck**, X. Liu, C.-L. Chiu, K. Watanabe, T. Taniguchi, B.A. Bernevig, A. Yazdani, *Nature* **572**, 101–105 (2019)
 - (9) * ‘Observation of a Majorana zero mode in a topologically protected edge channel’, **B. Jäck**, Y. Xie, J. Li, S. Jeon, B.A. Bernevig, A. Yazdani, *Science* **364**, 1255-1259 (2019)
 - (10) ‘Mapping of Yu-Shiba-Rusinov states from an extended scatterer’, *submitted* (2018), M. Etzkorn, M. Eltschka, **B. Jäck**, C.R. Ast and K. Kern
 - (11) * ‘Quantum Brownian motion at strong dissipation probed by superconducting tunnel junctions’, **B. Jäck**, J. Senkpiel, M. Etzkorn, J. Ankerhold, C.R. Ast and K. Kern, *Phys. Rev. Lett.* **119**, 147702, (2017)
 - (12) * ‘Sensing the quantum limit in scanning tunneling spectroscopy’, C.R. Ast, **B. Jäck**, J. Senkpiel, M. Eltschka, M. Etzkorn and K. Kern, *Nature Commun.* **7**, 13009 (2016)
 - (13) ‘Josephson Critical Current in the Dynamical Coulomb Blockade Regime’, **B. Jäck**, E. Eltschka M. Assig, M. Etzkorn, C.R. Ast and K. Kern, *Phys. Rev. B Rap. Commun.* **93**, 020504 (2016)
 - (14) ‘The Josephson Tunneling at the Atomic Scale - The Josephson Effect as a Local Probe’, **B. Jäck**, *Thesis No. 6750*, EPFL (2015)
 - (15) ‘Superconducting STM tip in a Magnetic Field: Geometrically-Controlled Order of the Phase Transition’, M. Eltschka, **B. Jäck**, M. Assig, O.V. Kondrashov, M.A. Skvortsov, M. Etzkorn, C.R. Ast and K. Kern, *Appl. Phys. Lett.* **107**, 122601 (2015)
 - (16) ‘A Nanoscale Gigahertz Source Realized with Josephson Scanning Tunneling Microscopy’, **B. Jäck**, E. Eltschka M. Assig, M. Etzkorn, C.R. Ast and K. Kern, *Appl. Phys. Lett.* **106**, 013109 (2015)
 - (17) ‘Probing Absolute Spin Polarization at the Nanoscale’, M. Eltschka, **B. Jäck**, M. Assig, O.V. Kondrashov, M.A. Skvortsov, M. Etzkorn, C.R. Ast and K. Kern, *Nano Lett.* **14**, 7171 (2014)

- (18) ,Exciton Dynamics in low Band Gap Donor-Acceptor Copolymers and Blends',
B. Giesecking, **B. Jäck**, E. Preis, S. Jung, M. Forster, U. Scherf, C. Deibel and V. Dyakonov,
Adv. Energy Mat. **2**, 1477 (2012)

INVITED TALKS

- (1) Stony Brook University, *September 2020, Zoom Seminar*
- (2) University of California Los Angeles, *March 2020, Seminar*
- (3) University of Notre Dame, *February 2020, Colloquium*
- (4) Hongkong University of Science and Technology, *November 2019, Seminar*
- (5) Universität Basel, *November 2019, Seminar*
- (6) ICFO Barcelona, *November 2019, Seminar*
- (7) Young Research Leaders in Topological Materials and Beyond, *Flatiron Institute, September 2019, Conference*
- (8) GRC on Topological and Correlated Matter, *Hong Kong, June 2019, Conference*
- (9) PRISM Research Symposium, *Princeton University, March 2019, Conference*
- (10) Universität Würzburg, *January 2019, Colloquium*
- (11) Universität Zürich, *January 2019, Seminar*
- (12) Max-Planck-Institute for Solid State Research, *January 2019, Seminar*
- (13) Universität Ulm, *January 2019, Seminar*
- (14) Seoul National University, *June 2018, Seminar*
- (15) Center for Quantum Nanoscience, Korea, *June 2018, Seminar*
- (16) Max-Planck-Institute for Solid State Research, *October 2017, Seminar*
- (17) Brookhaven National Laboratory, *October 2015, Seminar*
- (18) Princeton University, *October 2015, Seminar*
- (19) Collège de France, *July 2015, Seminar*
- (20) IBM Almaden, *July 2014, Seminar*
- (21) Columbia University, *July 2014, Seminar*
- (22) CEA Saclay, *June 2014, Seminar*

ACADEMIC SERVICE AND SCIENTIFIC LEADERSHIP

Organizer	Princeton Physics March Meeting	2020
Lecturer	NFS REU at Princeton	2016-2018
Board Member	PCCM Postdoctoral Council	2016-2017
Referee	PRX, Nature Communications	

TEACHING AND MENTORING ACTIVITIES

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|---|-----------|
| (1) Tutor, Physics Undergraduate Lab
<i>Universität Würzburg, GER</i> | 2009-2010 |
| (2) Tutor, Lecture, Introduction to quantum mechanics
<i>Universität Würzburg, GER</i> | 2010-2011 |
| (3) Mentor for master students (2)
<i>Max-Planck-Institute, GER</i> | 2012-2014 |
| (4) Mentor for graduate students (2)
<i>Princeton University</i> | 2016-2020 |
| (5) Supervisor for REU undergraduate students (2)
<i>Princeton University</i> | 2017-2019 |

PUBLIC SERVICE

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| Civil service man of the German federal government
<i>School for Handicapped Children Karlsbad, GER</i> | 2004-2005 |
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