

CURRICULUM VITAE

PERSONAL INFORMATION

Name NIGG, Simon Emmanuel
Adresse Gellertstrasse 38
4052, Basel, Switzerland
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Nationality Switzerland
Date of birth 24.11.1980



SCHOLARSHIPS

- ▷ Period 2013–Present
 - Employer **Universität Basel**
Klingelbergstrasse 82, 4056, Basel, Switzerland
Quantum information processing with superconducting circuits
Swiss NSF Ambizione Fellow
Research, Teaching
- ▷ Period 2010–2013
 - Employer **Prof. Steven Girvin, Yale University**
217 Prospect Street, 06511-8499, New Haven, USA
Theory of superconducting qubits
Swiss NSF Postdoctoral Fellow and
Yale Associate Postdoctoral Fellow
Research
- ▷ Period 2009–2010
 - Employer **Prof. Markus Büttiker, Université de Genève**
Quai Ernest-Ansermet 24, 1205, Genève, Switzerland
Mesoscopic transport theory
Postdoctoral researcher
Research, Teaching

EDUCATION

- ▷ Period 2005–2009
 - Degree **PhD in physics**
University of Geneva, group of Prof. Markus Büttiker
Mesoscopic electron transport, quantum computing

- ▷ Period
- Degree
- Institute
- Principal subjects

2000–2005

Diploma in physics

Technische Universität München

Max Planck Institute for Quantum Optics, group of Prof. I. Cirac
Quantum simulations, Many-body theory

DIPLOMAS

- ▷ PhD thesis
- ▷ Diploma thesis

"Dynamics of mesoscopic capacitors" — University of Geneva, Switzerland

"Cold atoms in optical lattices" — Max Planck Institute for Quantum Optics, Garching, Germany

RESEARCH INTERESTS

- ▷ Physics
- ▷ Computer science

Quantum information processing, Superconducting circuits, Mesoscopic physics, Quantum optics, Quantum measurement theory, Quantum chaos, Quantum information theory, Quantum error correction, Computational physics

Artificial intelligence, Machine learning, Deep Recurrent Neural Networks, Long Short Term Memories, Support Vector Machines, Hidden Markov Models, Hopfield Networks, Complex Valued Neural Networks, Monte Carlo methods, Bayesian inference, Programming languages

PUBLICATIONS

- ▷ Publication

J. Z. Blumoff, K. Chou, C. Shen, M. Reagor, C. Axline, R.T. Brierley, M. P. Silveri, C. Wang, B. Vlastakis, S. E. Nigg, L. Frunzio, M. H. Devoret, L. Jiang, S. M. Girvin, R. J. Schoelkopf: *Implementing and characterizing precise multi-qubit measurements*
arXiv-preprint: 1606:00817

- ▷ Publication

Simon E. Nigg and Anders Mathias Lunde: *Decoherence of high-energy electrons in weakly disordered quantum Hall edge states*
Submitted May 2016

- ▷ Publication

Anders Mathias Lunde and Simon E. Nigg: *Statistical theory of relaxation of high energy electrons in quantum Hall edge states*
arXiv-preprint: 1602:05039, (2016)

- ▷ Publication

Ehud Amitai, Rakesh Tiwari, Stefan Walter, Thomas Schmidt and Simon E. Nigg: *Nonlocal quantum state engineering with the Cooper pair splitter beyond the Coulomb blockade regime*
Physical Review B **93**, 075421, (2016)

- ▷ Publication Simon E. Nigg: *Correlated voltage probe model of relaxation in two coulomb-coupled edge channels*
Physica E: 75, 97-105, (2016)
- ▷ Publication Simon E. Nigg, Rakesh P. Tiwari, Stefan Walter and Thomas L. Schmidt: *Detecting nonlocal Cooper pair entanglement by optical Bell inequality violation*
Phys. Rev. A 89, 022340 (2015)
- ▷ Publication Simon E. Nigg: *Deterministic Hadamard gate for microwave cat-state qubits in circuit QED*
Physical Review A 89, 022340, (2014)
- ▷ Publication Brian Vlastakis, Gerhard Kirchmair, Zaki Leghtas, Simon E. Nigg, Luigi Frunzio, S. M. Girvin, Mazyar Mirrahimi, M. H. Devoret, and R. J. Schoelkopf: *Deterministically Encoding Quantum Information Using 100-Photon Schroedinger Cat States*
Science, 342, 6158, 607-610 (2014)
- ▷ Publication Gerhard Kirchmair, Brian Vlastakis, Zaki Leghtas, Simon E. Nigg, Hanhee Paik, Eran Ginossar, Mazyar Mirrahimi, Luigi Frunzio, S. M. Girvin, and R. J. Schoelkopf: *Observation of quantum state collapse and revival due to the single-photon Kerr effect*
Nature 495, 205, (2013)
- ▷ Publication F. Kos, Simon E. Nigg, and L. I. Glazman: *Frequency-dependent admittance of a short superconducting weak link*
Physical Review B 87, 174521, (2013)
- ▷ Publication Simon E. Nigg and Steven M. Girvin: *Stabilizer quantum error correction toolbox for superconducting qubits*
Physical Review Letters 110, 243604, (2013)
- ▷ Publication Simon E. Nigg, Hanhee Paik, Brian Vlastakis, Gerhard Kirchmair, Shyam Shankar, Luigi Frunzio, Michel Devoret, Robert Schoelkopf, and Steven Girvin: *Black-box superconducting circuit quantization*
Physical Review Letters 108, 240502, (2012)
- ▷ Publication G. Catelani, Simon E. Nigg, S. M. Girvin, R. J. Schoelkopf, and L. I. Glazman: *Decoherence of superconducting qubits caused by quasiparticle tunneling*
Physical Review B 86, 184514, (2012)
- ▷ Publication M. D. Reed, L. DiCarlo, Simon E. Nigg, L. Sun, L. Frunzio, S. M. Girvin, and R. J. Schoelkopf: *Realization of Three-Qubit Quantum Error Correction with Superconducting Circuits*
Nature 482, 382-385, (2012)

- ▷ Publication Anders Mathias Lunde, Simon E. Nigg, and Markus Buttiker: *Interaction induced edge channel equilibration* Physical Review B 81, 041311, (2010)
- ▷ Publication Simon E. Nigg and Markus Buttiker: *Universal detector efficiency of a mesoscopic capacitor* Physical Review Letters 102, 236801, (2009)
- ▷ Invited paper Markus Buttiker and Simon E. Nigg: *Mesoscopic Capacitance Oscillations* Nanotechnology 18, 044029, (2007)
- ▷ Invited paper Markus Buttiker and Simon E. Nigg: *Role of coherence in resistance quantization* Eur. Phys. J. Special Topics 172, 247-255, (2009)
- ▷ Publication Simon E. Nigg and Markus Buttiker: *Quantum to Classical Transition of the Charge Relaxation Resistance of a Mesoscopic Capacitor* Physical Review B 77, 0855312, (2008)
- ▷ Publication Simon E. Nigg, Rosa Lopez and Markus Buttiker: *Mesoscopic charge relaxation* Physical Review Letters 77, 206804, (2006)

LANGUAGES

FIRST LANGUAGE
OTHER LANGUAGES

French – Read: fluent, Write: fluent, Talk: fluent
English – Read: fluent, Write: fluent, Talk: fluent
German – Read: fluent, Write: fluent, Talk: fluent
Italian – Read: fluent, Write: good, Talk: fluent

ABILITIES

PROGRAMMING SKILLS

Scientific programming in python, matlab, c, maxima
 GUI/Mobile App programming with PyQt5, kivi

Basel, June 8, 2016

Simon E. Nigg