

16.2.2020

Curriculum Vitae*

Mikko Möttönen
POB 13500, Tietotie 3
00076 AALTO
Finland, EU
+358505940950
mikko.mottonen_AT_aalto.fi



Personal Information

Name	Mikko Pentti Matias Möttönen
Birth date	July 2, 1980
Nationality	Finland
Military service	Tikkakosken viestikoulu, Tikkakoski, Jul. 1999
ResearcherID	A-6929-2012
ORCID	0000-0001-5084-2298

Current position

Associate Professor (tenured) of Quantum Technology Aalto University, Department of Applied Physics and VTT Technical Research Centre of Finland 1.4.2019- (permanent)
(leader of the QCD group since October 2007, currently 15–25 group members)

Education

Doctor of Technology	Helsinki University of Technology, Technical Physics, 4.9/5.0, 25 Jan 2005, “ <i>Vortices and elementary excitations in dilute Bose-Einstein condensates</i> ” Advisors: Prof. Martti M. Salomaa and Dr. Sami M. M. Virtanen
Master of Science	Helsinki University of Technology (TKK), Technical Physics, GPA 4.9/5.0, Sep 2002 Advisors: Prof. Martti M. Salomaa and Dr. Sami M. M. Virtanen
Senior high school degree	Jyväskylän normaalikoulun lukio, GPA 9.9/10.0, Dec 1998

Previous work experience

Senior Scientist	Aalto University, Department of Applied Physics	1.8.2015-31.3.2019
Research Professor of Quantum Computing	University of Jyväskylä, Department of Mathematical Information Technology, part time	1.10.2015-30.9.2017
Columnist	Helsingin Sanomat, Sanoma Media Finland Oy	2.3.2015-26.11.2015

*See an updated version at <http://users.aalto.fi/~mpmotton/cv.pdf> and the QCD group home page at <http://physics.aalto.fi/qcd/>

Academy research fellow	Aalto University, Department of Applied Physics and Low Temperature Laboratory	1.8.2010-31.7.2015
Academy post doc. fellow	Aalto University, Department of Applied Physics and Low Temperature Laboratory Advisors: Prof. Jukka P. Pekola and Prof. Risto M. Nieminen	1.1.2010-31.7.2010
Academy post doc. fellow	TKK, Department of Applied Physics and Low Temperature Laboratory Advisors: Prof. Jukka P. Pekola and Prof. Risto M. Nieminen	1.1.2008-31.12.2009
Senior Research Fellow	University of New South Wales, Centre for Quantum Computer Technology Advisors: Prof. Robert G. Clark, Prof. Andrew S. Dzurak, and Prof. Andrea Morello	1.8.2008-31.7.2009
Post doc. researcher	TKK, Laboratory of Physics and Low Temperature Laboratory Advisors: Prof. Jukka P. Pekola and Prof. Risto M. Nieminen	1.9.2005-31.12.2007
Post doc. researcher	University of California, Berkeley Advisor: Prof. K. Birgitta Whaley	22.2.-31.8.2005
Post doc. researcher	TKK, Materials Physics Laboratory	25.1.2005-21.2.2005
Doctoral student	TKK, Materials Physics Laboratory Advisors: Prof. Martti M. Salomaa and Dr. Sami M. M. Virtanen	1.10.2002-25.1.2005
Research assistant	TKK, Materials Physics Laboratory	15.5.2001-30.9.2002
Teaching assistant	TKK, Institute of Mathematics	15.1.-30.4.2001
Teaching assistant	TKK, Institute of Mathematics	11.9.-8.12.2000
Research trainee	VTT Automation, Measurement Technology	24.7.-3.9.2000
Research trainee	VTT Automation, Measurement Technology	22.5.-25.6.2000
Technical trainee	University of Oulu, Measurement and Sensor Lab.	12.7.-7.8.1999

Titles of Docent

Title of docent in quantum computing, University of Jyväskylä, Nov. 2017, permanent

Title of docent in quantum computing, Aalto University, Feb. 2012, permanent

Title of docent in quantum computing, Helsinki University of Technology, Mar. 2007–Feb. 2012

Positions of trust

Founder and Chief Scientist of IQM Finland Oy, 28.4.2018 –

Member of MATINE – The Scientific Advisory Board for Defense, Ministry of Defense, Finland, 24.1.2019 – 23.1.2022.

Millennium Technology Prize (MTP) Fellow, Technology Academy of Finland, 19.3.2019 –

Management Committee Member, COST Action CA16221, 5.11.2018 –

Awards and honors

Chosen as one of the 100 influential Finnish persons in ICT by [TiVi](#), 13.12.2019

Chosen as one of the 120 Finnish technology professionals by [TEK](#), 30.3.2016.

Inspiration Award, *Monopole collaboration*, Electronic Products, USA, 2014

Memberships of scientific societies

Member of the American Physical Society, USA, 2016 –

Lifetime member of Physics Alumni, Finland, 2014 –

Member of the Finnish Physical Society, Finland, 2001 –

Referee of scientific journals

Applied Physics Letters

Europhysics Letters

International Journal of Quantum Information

Journal of Low Temperature Physics

Journal of Physics B

Journal of Statistical Mechanics

Nature

Nature Communications

Nature Nanotechnology

Nature Physics

New Journal of Physics

Physical Review A

Physical Review Applied

Physical Review B

Physical Review Letters

Quantum Information and Computation

Science

Science Advances

Superconductor Science and Technology

External reviewer in major scientific funding schemes

PRELUDIUM funding scheme, National Science Centre, Poland, 2017

START funding scheme, The Austrian Science Fund (FWF), Austria, 2016

OPUS funding scheme, National Science Centre, Poland, 2016

Quantum Technology Capital, EPSRC, United Kingdom, 2015

Editorships in scientific journals

Editor of Nature Publishing Group journal Scientific Reports, 2011–

Journal of Low Temperature Physics, guest editor for BEC part of the special issue SUR2010

Referee/pre-examiner of theses and docentships

PhD thesis: *Multimode Superconducting Circuits as Building Blocks for a Programmable Quantum Processor*, Tanay Roy, Tata Institute of Fundamental Research, India, 2018

Docentship: *Quantum gases, quantum crystals and semiconductors at low temperatures*, Jarno Järvinen, University of Turku, Finland, 2018

PhD thesis: *2-D and 3-D Periodic Nanostructures for Thermal Engineering Applications*, Tero Isotalo, University of Jyväskylä, Finland, 2014.

PhD thesis: *Exotic superfluid states of ultra-cold Fermi gases*, Tomi Paananen, University of Helsinki, Finland, 2009.

PhD thesis: *Fermionic superfluidity in optical lattices*, Timo Koponen, University of Jyväskylä, Finland, 2008.

Opponent at theses defenses

Licentiate thesis: *Superfluid Hydrodynamics of Spinor Bose Gases*, Dmitry Kobayakov, Umeå University, Sweden, 2012.

Raised major academic scholarships and grants (> 40 000€)

- PI in a project of ICT 2023: Beyond 5G Systems call, Academy of Finland, 2018 (290 000€, 3 years, 97 000€/year, part of 580 k€ consortium)
- PI in a project QMiCS of the first call in the FET Flagship on Quantum Technologies, European Commission, 2018 (415 k€, 3 years, part of 3.0 M€ consortium)
- PI in Academy of Finland Centre of Excellence in Quantum Technology, Academy of Finland, 2018 (171 k€ for the first two years of eight-year funding, 86 k€/year, part of 8 M€ consortium)
- PI in a project grant of RADDESS call, Academy of Finland, 2017 (333 k€, 4 years, part of 1.0 M€ consortium)
- CI in Future Makers project (head of the working group), Technology Industries of Finland Centennial Foundation and Jane and Aatos Erkko Foundation, 2017 (950 k€, 3 years, 320 k€/year)
- PI in Key Project Grant, Academy of Finland, 2016 (300 k€, 2 years, 150 k€/year)
- PI in ERC Proof of Concept Grant, European Research Council, 2016 (150 000€, 18 months, 100 k€/year)
- PI in ERC Consolidator Grant, European Research Council, 2016 (1 950 000€, 5 years, 390 000€/year)
- PI in a H2020 project e-SI-Amp, European Metrology Programme for Innovation and Research, 2015 (95 k€, 4 years, part of a 1.7 M€ consortium)

- PI in a project of ICT 2023: ICT sensors and actuators call, Academy of Finland, 2015 (133 000€, 2 years, 66 000€/year, part of 680 k€ consortium)
- PI in a Research Excellence Grant (REG), European Metrology Research Programme, 2013 (259 000€, 3 years, 86 000€/year, integral REG in a multi-million consortium)
- PI in the research expenses of the Academy Research Fellow, Academy of Finland, 2013 (140 000€, 2 years, 70 000€/year)
- PI in the ERC Starting Grant, European Research Council, 2011 (1 500 000€, 5 years, 300 000€/year)
- PI in a grant strengthening the competitiveness of ERC applicants, Academy of Finland, 2011 (120 000€, 1 year)
- PI in a project grant for QCD group, Academy of Finland, 2010 (384 000€, 4 years, 78 000€/year)
- PI in Academy Research Fellow grant, Academy of Finland, 2010 (390 000€, 5 years, 78 000€/year)
- PI in the research expenses of the Academy Research Fellow, Academy of Finland, 2010 (218 000€, 3 years, 73 000€/year)
- PI in project grant for QCD group, Emil Aaltonen Foundation, 2008 (200 000€, 3 years, 66 000€/year)
- PI in post doctoral researcher's project, Academy of Finland, 2007 (189 000€, 3 years, 63 000€/year)
- PI in annual scholarship for doctoral and post-doctoral research, The Finnish Cultural Foundation, 2004 (48 000€, 3 years, 16 000€/year)

Other major academic scholarships and grants for the QCD group members

- Center for Quantum Engineering grant of Jan Goetz, Aalto University, 2018 (40 k€ from a total of 80 k€ for the whole project, 1.5 years)
- Academy project of Kuan Yen Tan, Academy of Finland, 2018 (372 k€, 4 years, 93 k€/year)
- Marie Skłodowska-Curie Individual Fellowship of Jan Goetz, 2018 (180 000 €, 2 years, 90 000/year)
- Academy Research Fellow of Kuan Yen Tan, Academy of Finland, 2017 (434 000€, 5 years, 87 000€/year + 300 000€ of research expenses for the first 3 years)
- Key Project Grant of Russell Lake, Academy of Finland, 2016 (300 k€, 2 years, 150 k€/year)
- Postdoctoral researcher's project of Kuan Yen Tan, Academy of Finland, 2014 (260 000€, 3 years, 87 000€/year)
- Postdoctoral researcher's project of Russell Lake, Academy of Finland, 2013 (266 000€, 3 years, 89 000€/year)
- Postdoctoral researcher's project of Jukka Huhtamäki, Helsinki University of Technology, 2008 (180 000€, 3 years, 60 000€/year)
- QCD group has been a funded partner in the Academy of Finland Centre of Excellence for Computational Nanoscience (COMP) for 2007–2017

- QCD is a funded partner in in the Academy of Finland Centre of Excellence in Quantum Technology (QTF) for 2018–2025

Personally raised minor academic scholarships and grants (< 40 000€)

- Organization of a Finnish-Japanese seminar: Topological Structures in Quantum Matter, Academy of Finland, 2017 (5125€)
- Travel grant for attending the conference Quantum Dynamics in Dots and Junctions, Riva del Garda, Italy, Vilho, Yrjö, and Kalle Väisälä Foundation, 2008 (1600€)
- Travel grant for visiting UCB and USC, 2007, Magnus Ehrnrooth Foundation, 2006 (2600€)
- Travel grant for attending the Quantum Gases conference, Paris, Finnish Academy of Science and Letters, Vilho, Yrjö, and Kalle Väisälä Foundation, 2006 (1000€)
- Travel grant for attending the Asian Conference on Quantum Information Science 2005, Magnus Ehrnrooth Foundation, 2006 (2500€)
- Travel grant for visiting the Whaley group at University of California, Berkeley, Finnish Academy of Science and Letters, Vilho, Yrjö, and Kalle Väisälä Foundation, 2005 (3500€)
- Scholarship for a doctoral degree under 30 years of age, Helsinki University of Technology, 2005 (3000€)
- Grant for post-doctoral research at University of California, Berkeley, Academy of Finland, 2004 (5500€)
- Personal grant, Jenny and Antti Wihuri Foundation, 2004 (3000€)
- Travel grant for the conference EQIS 2004 in Tokyo, Japan, The Research Foundation of Helsinki University of Technology, (4000€)
- Scholarship for fast completion of the doctoral courses, Helsinki University of Technology, 2003 (1000€)
- PI in annual scholarship for doctoral studies, The Foundation of Technology, 2003 (15000€)
- Scholarship for fast graduation, Helsinki University of Technology, 2002 (840€)
- Scholarship for advanced students, HUT Student Union, 2001 (840€)

Raised venture capital and industrial grants

- Seed funding for IQM Finland Oy, one of the four founders, several investors, 2019 (11 450 000€)
- R&D grant for IQM Finland Oy, main applicant, Business Finland, 2019 (459 500€)

Language skills

Finnish, English, Swedish, and German

Leadership and media training

Future Research Leaders Program, Aalto University, 11.2010-9.2011

Aalto Leaders' Network, 11.2012-2015

Aalto Media Training (publicity seminar, writing clinic, TV-interview training), 10.2013

Pedagogical training

Tools for teaching, 1 day, Aalto University, 2013

PED-131.1000, *A! Peda Intro*, 5 ECTS, 2013

PED-131.2210, *Teaching at Aalto University II: Course design*, 5 ECTS, 2014

Demonstration lectures

Demonstration lecture *Quantum harmonic oscillator* for an interview of a tenure track position, 16.2.2018, Department of Applied Physics, Aalto University

Demonstration lecture *Post CMOS transistors* for an interview of a tenure track position, 13.1.2017, Department of Electronics and Nanoengineering, Aalto University, grade: good

Demonstration lecture *Temperature: from macroscopic to mesoscopic systems* for an interview of a tenure track position, 22.10.2013, Olli V. Lounasmaa Laboratory, Aalto University, grade: very good

Demonstration lecture *Phenomenological theory of superconductivity* for an interview of a professorship in theoretical physics, 13.9.2013, Department of Physics and Astronomy, University of Turku

Demonstration lecture *X-ray methods in condensed matter studies* for an interview of a tenure track position, 3.6.2013, Department of Applied Physics, Aalto University, grade: good

Demonstration lecture *Ginzburg-Landau model and the Josephson effect in superconductors* for an interview of a professorship in experimental condensed-matter physics, 27.4.2012, Department of Physics and Astronomy, University of Turku

Demonstration lecture *Bra-ket notation: what is the wavefunction really?* for an interview of a tenure track position, 12.1.2012, Department of Applied Physics, Aalto University

Demonstration lecture *Free-electron model for electrons in solids* for an interview of a professorship in experimental condensed-matter and materials physics, 12.5.2010, Department of Applied Physics, Aalto University, grade: good

Demonstration lecture *Quantum Gates* for the title of docent in Quantum Computing, 21.12.2006, Department of Engineering Physics and Mathematics, TKK, grade: excellent

Curriculum development

Responsible professor of the major and minor of Quantum Technology in Aalto Bachelor's Programme of Science and Technology, 10.5.2019-

In-class teaching experience

Lectures on *Introduction to quantization of electrical circuits and superconducting qubits* in Summer School on Engineered Quantum Systems, Helsinki, Finland, 2019

Lectures on *Quantum electric circuits: basis for engineered quantum technological devices* in Quantum Connections in Sweden 6: Physics Summer School on Quantum Frontiers, Stockholm, Sweden, 2019

Lectures on *Knots, monopoles, and skyrmions in a quantum order parameter* in Quantum Connections in Sweden 6: Physics Summer School on Quantum Frontiers, Stockholm, Sweden, 2019

Lectures on *Superconducting Quantum Computer* in QuICC Summer School, York, UK, 2018

Lecturer of course *Kvanttilaskennan perusteet*, 1–2 ECTS, 2018

Guest lecturer on course *ELEC-C3220 Kvantti-ilmiot*, 2018

Lecturer of course *Introduction to Quantum Computing*, 1–2 ECTS, 2017

Lecturer of course *Superconducting Quantum Computer* in Jyväskylä Summer School, 1 ECTS, 2016

Lecturer on *Low-Temperature Quantum Nanoelectronics* in the course Advanced Materials of Helsinki Summer School, 2012

Lecturer of the lecture series *Ultra-cold Bose gases and dilute Bose-Einstein condensates* in Nordita Winter School on Condensed Matter Physics, 2011.

Lecturer of the course *Quantum mechanics II*, Tfy-44.130, 6 ECTS, 2008.

Assistant on a seminar course Tfy-55.172 “Quantum gases”, 2004.

Assistant on a course Mat-1.402 Matematiikan peruskurssi L2 , 2001.

Assistant on a course Mat-1.401 Matematiikan peruskurssi L1 , 2000.

Supervised theses (all co-supervised thesis marked individually)

PhD thesis: *Photon-assisted tunneling and charge transport in hybrid circuits*, Maté Jenei, submitted in Nov 2019. (Co-supervised with Dr. Kuan Yen Tan.)

PhD thesis: *Creation and dynamics of topological structures in Bose-Einstein condensates*, Tuomas Ollikainen, 2019. (Co-supervised with Prof. David Hall.) (*The best PhD thesis of the year* award from Aalto University School of Science.)

PhD thesis: *Control of heat in superconducting microwave circuits*, Matti Partanen, 2019.

PhD thesis: *Quantum knots and monopoles*, Konstantin Tiurev, 2017. (*The best PhD thesis of the year* award from Department of Applied Physics and another one from School of Science.)

PhD thesis: *Towards calorimetric detection of individual itinerant microwave photons*, Joonas Govenius, 2016.

PhD thesis: *Single-electron pumping in silicon quantum dots*, Tuomo Tantt, 2016.

PhD thesis: *Magnetic-Monopole Analogues and Topological Textures in Dilute Bose–Einstein Condensates*, Emmi Ruokokoski, 2015. (*The best PhD thesis of the year* award from Department of Applied Physics and another one from School of Science.)

PhD thesis: *Control of Open Quantum Systems*, Juha Salmilehto, 2014.

PhD thesis: *Integration of normal-metal components into the framework of circuit quantum electrodynamics*, Philip Jones, 2013.

PhD thesis: *Electrostatic control of quasiparticle transport in superconducting hybrid nanostructures*, Olli-Pentti Saira, 2013. (grade: *passed with distinction = in the top 10%*. *The best PhD thesis of the year* award from School of Science. Co-supervised with Prof. Jukka Pekola.)

PhD thesis: *Exotic Vortex Structures in Dilute Bose–Einstein condensates*, Pekko Kuopanportti, 2012. (grade: *passed with distinction = in the top 10%*)

PhD thesis: *Topological defects and phase transitions in dilute Bose gases*, Ville Pietilä, 2010. (grade: *passed with distinction = in the top 10%*)

PhD thesis: *Stability and dynamics of quantized vortices in gaseous Bose-Einstein condensates*, Jukka Huhtamäki, 2008. (grade: *passed with distinction = in the top 10%*)

PhD thesis: *From the Control of Quantum Systems to Multiqubit Logic*, Ville Bergholm, 2007.

Licentiate thesis: *Entanglement-Enhanced Quantum Key Distribution*, Olli Ahonen, 2009.

Master's thesis: *Bath-induced persistent Rabi oscillations in a qubit*, Jesper Ilves, 2019. (Co-supervised with Jan Goetz.)

Master's thesis: *Radio frequency quantum-circuit refrigerator*, Arto Viitanen, 2019.

Master's thesis: *Exact Quantum Dynamics of Driven Dissipative Resonators*, Akseli Mäkinen, 2018. (Co-supervised with Joni Ikonen.)

Master's thesis: *Reaction coordinate approach to non-Markovian dynamics in the spin-boson model*, Santeri Kaupinmäki, 2018.

Master's thesis: *Characterizing superconducting qubits*, Sofia Patomäki, 2017. (This thesis obtained the exceptional grade *Laudatur* and the corresponding thesis award by the Department of Physics, University of Helsinki.)

Master's thesis: *Phase gate for microwave photons*, Roope Kokkonen, 2016.

Master's thesis: *Optimal quantum driving for single-qubit gates*, Joni Ikonen, 2016. (This thesis obtained the exceptional grade *Laudatur* and the corresponding thesis award by the Department of Physics, University of Helsinki.)

Master's thesis: *Two-qubit gates in a microwave photonic quantum computer*, Tuomas Ollikainen, 2015.

Master's thesis: *Quantum-limited heat conduction over macroscopic distances*, Matti Partanen, 2014.

Master's thesis: *Quantum computing with itinerant microwave photons*, Janne Kokkala, 2013.

Master's thesis: *Non-equilibrium fluctuation relations in driven single-electron devices*, Tuomo Tanttu, 2012.

Master's thesis: *Field-Programmable Gate Array Card for Readout and Control of Cryoelectronics*, Evgenia Bogdanova, 2012.

Master's thesis: *Monopoles in Dilute Bose-Einstein Condensates*, Emmi Ruokokoski, 2011.

Master's thesis: *Beyond the lowest-order approximation for decoherence in steered quantum evolution*, Juha Salmilehto, 2010.

Master's thesis: *Phosphorus dopant qubits in silicon*, Juha-Matti Pirkkalainen, 2009.

Master's thesis: *Creation and properties of multiply quantized vortices in dilute Bose-Einstein condensates*, Pekko Kuopanportti, 2008.

Master's thesis: *Thermal effects in Coulomb-blockaded nanostructures with superconductor-insulator-normal metal junctions*, Olli-Pentti Saira, 2007. (*The Best Master's thesis of the year award*, Helsinki University of Technology. Co-supervised with Prof. Jukka Pekola.)

Master's thesis: *Quantum Cryptography Protocol Based on Sending Entangled Qubit Pairs*, Olli Ahonen, 2007.

Master's thesis: *Vortex clusters and topological defects in dilute Bose-Einstein condensates*, Ville Pietilä, 2006.

Master's thesis: *Complexity analysis of quantum circuits*, Laura Koponen, 2004. (Co-supervised with Dr. Juha Vartiainen.)

Special Assignment: *Numerically exact simulations of qubit initialization with adiabatic decoupling*, Kassius Kohvakka, 2019. (Co-supervised with Jani Tuorila)

Special Assignment: *Electromagnetic simulations for quantum computing applications*, Aarne Keränen, 2018. (Co-supervised with Jan Goetz)

Special Assignment: *Creation and dynamics of polar-core vortices in spin-1 Bose-Einstein condensates*, Mikael Myllymäki, 2018. (Co-supervised with Tuomas Ollikainen)

Special Assignment: *Characterization of a graphene microwave bolometer*, Iiro Sallinen, 2018. (Co-supervised with Roope Kokkonen)

Special Assignment: *Randomized benchmarking of single-qubit gates*, András Gunyho, 2018. (Co-supervised with Jan Goetz)

Special Assignment: *Calibration of amplifier gain using normal-metal-insulator-superconductor junctions*, Eric Hyyppä, 2018.

Special Assignment: *Quantum-circuit refrigerator coupled to two parallel resonators*, Arto Viitanen, 2018. (Co-supervised with Matti Silveri)

Special Assignment: *Quantum-circuit refrigerator coupled to superconducting qubits*, András Gunyhó, 2017. (Co-supervised with Matti Silveri)

Special Assignment: *Microwave photodetector based on silver proximity Josephson junctions*, Niko Oinonen, 2017. (Co-supervised with Matti Partanen)

Special Assignment: *Dynamics of quasiprobability distributions in the Jaynes-Cummings model*, Akseli Mäkinen, 2017. (Co-supervised with Joni Ikonen)

Special Assignment: *Quantum driving of a superconducting qubit using a transmission line*, Jesper Ilves, 2017. (Co-supervised with Joni Ikonen)

Special Assignment: *Thermal bifurcations in a microwave photon detector*, Ari-Pekka Soikkeli, 2015. (Co-supervised with Joonas Govenius)

Special Assignment: *Monopoles in spin-2 Bose-Einstein condensates*, Tuomas Ollikainen, 2014. (Co-supervised with Emmi Ruokokoski)

Special Assignment: *Creation and dynamics of two-dimensional skyrmions in antiferromagnetic spin-1 Bose-Einstein condensates*, Tuomas Ollikainen, 2013. (Co-supervised with Emmi Ruokokoski.)

Special Assignment: *Heat Transport in a Superconducting Microwave Cavity*, Matti Partanen, 2012.

Special Assignment: *Voltage-biased Cooper pair pumps*, Janne Kokkala, 2012.

Special Assignment: *Observation of heat transfer mechanisms at sub-kelvin temperatures*, Matti Partanen, 2011.

Special Assignment: *Cooper pair pumping in the presence of decoherence*, Juha Salmilehto, 2009.

Special Assignment: *Topologically protected superconducting qubits*, Juha Salmilehto, 2009.

Special Assignment: *Elementary excitations in attractively interacting two-component Bose-Einstein condensates*, Pekko Kuopanportti, 2008.

Special Assignment: *Synthesis of hybrid quantum logic circuits by a matrix decomposition*, Tony Liimatainen, 2008.

Special Assignment: *Implementation of holonomic quantum computation in Josephson devices*, Juha-Matti Pirkkalainen, 2007.

Special Assignment: *Qubit dynamics in a noisy environment*, Olli-Pentti Saira, 2007.

Special Assignment: *Decompositions of permutation operators for quantum computers*, Olli-Pentti Saira, 2006.

Special Assignment: *Stability of stationary vortex rings in dilute Bose-Einstein condensates*, Juha-Matti Pirkkalainen, 2006.

Special Assignment: *Suppression of errors due to $1/f$ noise in one-qubit rotations*, Pekko Kuopanportti, 2006.

Bachelor's Thesis: *Characterization and charge detection methods for silicon quantum dots*, Heidi Kivijärvi, 2019. (Co-supervised with Maté Jenei)

Bachelor's Thesis: *Precise Characterization of Superconducting Microwave Resonators*, Otto Solatie, 2019. (Co-supervised with Johannes Heinsoo)

Bachelor's Thesis: *Traceable microwave power measurement at femtowatt level*, Eemil Visakorpi, 2019. (Co-supervised with Roope Kokkonen)

Bachelor's Thesis: *Simulation of a tunable coupler for implementing two-qubit gates between transmon qubits*, Severi Rissanen, 2018. (Co-supervised with Jan Goetz)

Bachelor's Thesis: *Pulsed quantum-circuit refrigeration*, Kassius Kohvakka, 2018. Co-supervised with Matti Partanen.

Bachelor's Thesis: *Time-dependent behavior of a phase shifter for microwave photons*, Osama Abuzaid, 2018. Co-supervised with Roope Kokkonen.

Bachelor's Thesis: *Single-charge pumping with a silicon quantum dot*, Elin Nyman, 2018. Co-supervised with Maté Jenei.

Bachelor's Thesis: *Creation of a two-quantum vortex in quadrupole-Ioffe-configuration trap*, Henrik Nortamo, 2017. Co-supervised with Tuomas Ollikainen.

Bachelor's Thesis: *Nanosecond Operation of a Quantum-Circuit Refrigerator*, Eric Hyyppä, 2017. Co-supervised with Kuan Yen Tan.

Bachelor's Thesis: *Characterization of Xmon qubits*, Aarne Keränen, 2017. Co-supervised with Jan Goetz.

Bachelor's Thesis: *Critical current in superconductor-normal-metal-superconductor junctions*, Niko Oinonen, 2017. Co-supervised with Matti Partanen.

Bachelor's Thesis: *Measurement of the Noise Equivalent Power of an Attowatt Microwave Detector*, András Gunyhó, 2017. Co-supervised with Joonas Govenius.

Bachelor's Thesis: *Charge capture mechanisms in quantum dot single-electron pumps*, Heikki Timonen, 2016. Co-supervised with Máté Jenei.

Bachelor's Thesis: *Deterministic creation of tailored vortex structures using three-dimensional phase imprinting*, Teijo Väärä, 2015. Co-supervised with Emmi Ruokokoski and Tuomas Ollikainen.

Bachelor's Thesis: *Photonic heat conduction in a microwave transmission line*, Miika Mäkelä, 2015. Co-supervised with Matti Partanen.

Bachelor's Thesis: *Single-electron pumping with a silicon quantum dot*, Akseli Mäkinen, 2015. Co-supervised with Tuomo Tantt.

Bachelor's Thesis: *Microwave response of superconductor–normal metal–superconductor junctions*, Roope Kokkonen, 2015. Co-supervised with Russell Lake.

Bachelor's Thesis: *Tunable phase gate for microwave photon qubits*, Sakari Saarenpää, 2014. Co-supervised with Russell Lake.

Bachelor's Thesis: *Quantum driving with a coherent state in the Jaynes–Cummings model*, Sofia Patomäki, 2014. Co-supervised with Elsi-Mari Laine.

Bachelor's Thesis: *Counting charge transitions in a single-electron pump*, Kukka-Emilia Huhtinen, 2014. Co-supervised with Tuomo Tantt.

Bachelor's Thesis: *Implementation of data acquisition and preprocessing with a field-programmable gate array*, Elsa Mannila, 2014.

Bachelor's Thesis: *Fabrication and cryogenic measurements of nanowires grown with focused ion and electron beams*, Antti Mäkinen, 2013.

Bachelor's Thesis: *Optimization of nearly adiabatic steering of two-level quantum systems*, Juha Kreula, 2011.

Bachelor's Thesis: *Quantum gate decompositions of many-particle state preparations for simulations of quantum chemistry*, Tuomo Tantt, 2009.

Bachelor's Thesis: *Nonadiabatic charge pumping in superconducting circuits*, Janne Kokkala, 2009.

Present members in the Quantum computing and devices (QCD) group

- Mikko Möttönen, Docent, group leader (since Oct 2007)
- Matti Kalliokoski, PhD, Staff Scientist
- Valtteri Lahtinen, PhD, postdoctoral researcher
- Chengyu Yan, PhD, postdoctoral researcher
- Roberto Zamora-Zamora, PhD, postdoctoral researcher
- Jean-Philippe Girard, PhD, postdoctoral researcher
- Suman Kundu, PhD, postdoctoral researcher
- Joni Ikonen, MSc, PhD student
- Roope Kokkonen, MSc, PhD student
- Akseli Mäkinen, MSc, PhD student

- Arto Viitanen, MSc, PhD student
- Timm Mörstedt, MSc, PhD student
- Giacomo Catto, MSc, PhD student
- Wallace Teixeira, MSc, PhD student
- Jinli Zhang, PhD student
- Eero Väisänen, BSc, MSc thesis student
- Marton Gunyho, BSc, MSc thesis student
- Aarne Keränen, BSc, MSc thesis student

Postdocs supervised and the next job

1. Wei Liu, Quantum Engineer, IQM, Finland
2. Vasilii Sevriuk, Quantum Engineer, IQM, Finland
3. Jani Tuorila, Quantum Engineer, IQM, Finland
4. Johannes Heinsoo, Quantum Engineer, IQM, Finland
5. Tianyi Li, Quantum Engineer, IQM, Finland
6. Leila Najafi, cleanroom engineer, VTT, Finland
7. Dibyendu Hazra, R&D staff, Microsoft, Finland
8. Matti Silveri, Group Leader at University of Oulu, Finland
9. Jan Goetz, Marie Skłodowska-Curie Fellow at Aalto University, Finland
10. Visa Vesterinen, Staff Scientist at VTT Technical Research Centre of Finland
11. Kuan Yen Tan, Academy Research Fellow at Aalto University, Finland
12. Shumpei Masuda, Tokyo Medical University (assistant professor), Japan
13. Russell Lake, postdoc at NIST and University of Boulder, USA
14. Ivan Savenko, Center for Theoretical Physics of Complex Systems, Republic of Korea (tenure track researcher)
15. Elsi-Mari Laine, University of Turku (postdoc)
16. Harri Mäkelä, Finnair Oy, Finland
17. Ville Pietilä, Varian Medical Systems, Finland
18. Paolo Solinas, SPIN – CNR (tenure track researcher), Genova, Italy
19. Jukka Huhtamäki, Eigenor Corporation, Finland
20. Yuichiro Mazusaki, NTT Research, Japan

Research Fellows and Staff Scientists supervised and the next job

1. MSC Fellow Jan Goetz, CEO of quantum computer company IQM, Finland
2. Academy Research Fellow Kuan Yen Tan, CTO of IQM, Finland

Organized scientific events

Member of Scientific Committee of *European Numerical Mathematics and Advanced Applications Conference 2019*, Delft University, 2019

Chair of the organizing committee of *Summer School on Engineered Quantum Systems*, Helsinki, 2019
Member of Program Committee of *Quantum Thermodynamics*, Aalto University, 2019
Main organizer of *International Workshop on Strong Coupling Effects in Open Quantum Systems*, Aalto University, 2018.
Main organizer of *International Workshop on Topological Structures in Quantum Matter*, Aalto University, Espoo, 2017.
Main organizer of the international summer school *Introduction to Quantum Systems and Devices*, Aalto University, Espoo, 2013.
Co-organizer of the *Symposia on superfluids under rotation: vortices, superfluid dynamics, and quantum turbulence*, Low Temperature Laboratory, Aalto University, Espoo, 2010.
Main organizer of the international summer school *Introduction to Quantum Systems and Devices*, Helsinki University of Technology, Espoo, 2008.
Session chair in 6 international conferences and workshops, 2013–

Columns in the main national newspaper Helsingin Sanomat

1. *Elon Musk pelkää turhaan tekoälyä*, 23.11.2015
2. *Tutkimusrahoista säästäminen torppaa haaveet ja aiheuttaa katastrofaalisia kerrannaisvaikutuksia*, 26.10.2015
3. *Nobelistin kannoilla*, 5.10.2015.
4. *Vapaan tahdon olemassaolon mysteeri on arjessa merkityksetön – tärkeintä on jakaa hyvää oloa*, 24.8.2015.
5. *Suomalaiset tekevät maailman parhaat superpakastimet*, 27.7.2015.
6. *Myydään: magneettinen monopoli*, 29.6.2015.
7. *Kilon mallilla voi heittää vesilintua*, 1.6.2015.
8. *Osta hyvä kvanttikone*, 4.5.2015.
9. *Kvantit pannaan töihin*, 30.3.2015.

Posts in the technology magazine Tekniikan Maailma

1. *Kvanttiherruus on ehkä saavutettu – Tekeekö tämä kvanttietokoneista ylivertaisia kaikessa?*, 26.9.2019
2. *Tiedätkö, miten kvanttietokone toimii? – Lukemalla tämän saat selville, miksi kubitti voi olla nolla ja ykkönen yhtä aikaa*, 1.8.2019
3. *Kvanttietokone kuluttaa sähköä ison kiukaan verran – ja juuri siksi se voi auttaa selättämään ilmastonmuutoksen*, 2.5.2019

Other Blog Posts and similar

1. [New record for bolometer noise and speed](#), Nature Research Device & Materials Engineering Community, 11.10.2019
2. [Quantum Technology – What is that?](#), VTT Technology Blog, 23.5.2019

Invited talks to elementary and high-school students

1. *How to utilize a quantum computer*, talk and challenge to high-school and elementary-school students for the Millennium Youth Prize 2020, Espoo, 7.2.2020
2. *Quantum Computer*, lesson to high-school students from Tampereen klassillinen lukio, Aalto University, Espoo, 16.1.2020
3. *Kvanttitietokone*, 1.5-hour talk to high-school students, Olarin lukio, Espoo, 16.11.2018
4. *Kvanttitietokone*, 1-hour talk to high-school students, Helsingin ranskalais-suomalainen koulu, Helsinki, 15.11.2018
5. *Kvanttitietokone*, 1.5-hour talk to high-school students, Etelä-Töölön lukio, Helsinki, 29.5.2018
6. *Kvanttitietokonetta rakentamassa*, 1.5-hour talk to high-school students, Etelä-Tapiolan lukio, Espoo, 3.4.2018
7. *Tarina kvanttitietokoneesta ja sen tekemisestä*, two one-hour talks to high-school students, Heureka, Vantaa, 12.10.2017
8. *Kvanteja*, two lessons to sixth graders, Iivisniemen koulu, 12.10.2017
9. *Sähkö*, double lessons to fourth graders, Kartanonkosken koulu, 1.12.2016
10. *Asiaa kvanttitietokoneista*, talk to high-school students, Ulvilan Lukio, 7.11.2016
11. *Tutkijan elämää*, two double lessons to fifth graders, Ilpoisten lukio, 7.10.2016
12. *Kvanttitietokoneet*, talk to high-school students, Aalto University, 20.10.2015
13. *Kysymyksiä*, [talk](#) to high-school students, Jyväskylän normaalikoulun lukio, 29.9.2015
14. *QCD Labs*, talk to high-school students on working as a researcher, Jyväskylän normaalikoulun lukio, 20.3.2015

Invited presentations to policy makers, general public, and journalist groups

1. *IQM We build quantum computers*, invited pitch at Physicists fair, Espoo, 11.2.2020
2. *Kvanttitietokone*, invited talk for Academic Association for Mathematics and Natural Sciences – MAL, Helsinki, 4.2.2020
3. *What is a quantum computer*, invited talk at EyesOn event by Airbus, Jyväskylä, 30.1.2020
4. *Quantum Computer Development*, invited talk for the Finnish Metrological Institute, Helsinki, 20.1.2020
5. *Quantum Computer: concepts, development, and opportunities*, plenary talk and panel discussion at Future Tech Forum, Taiwan, 6.12.2019
6. *Quantum Computing*, talk at The European Big Data Value Forum, Helsinki, 16.10.2019
7. *Quantum Computer*, talk at Hel Tech meetup, Helsinki, 6.9.2019
8. *Kvanttiteknologia: tietoisuus*, talk for policy makers, Ministry of Defense, Helsinki, 28.8.2019
9. *Kvanttiteknologia ja metrologia*, talk on the World Metrology Day event at MIKES, Espoo, 20.5.2019

10. *Kvanttitietokoneen kehityksen nykytila*, talk in the biannual seminar of the Signals Officers' Association, Helsinki, 11.2.2019
11. *Quantum computer and research in the QCD Labs*, talk for policy makers, Ministry of Defense, Helsinki, 9.11.2018
12. *Quantum computer and research in the QCD Labs*, talk for Aalto students at Aaltoes, Espoo, 27.9.2018
13. *Fysikkian monet tehtävät ja kvantti-infomaation vaikutus ilmiöiden selittämisessä*, public talk at a meeting of The Finnish Society for Natural Philosophy, Helsinki, 18.8.2018
14. *Quantum Computer*, invited talk at Future Data Summit, Espoo, 19.9.2018
15. *Superconducting quantum computer*, invited talk at Cryptodocks meetup, Helsinki, 30.5.2018
16. *Kvanttitietokone ja sen rakentaminen Suomessa*, invited talk at Bank of Finland, Helsinki, 5.4.2018
17. *Quantum Computers and Information security*, invited talk at Disobey (hacker conference), Helsinki, 12.2.2018
18. *Kvanttitietokone*, talk at the fall meeting of the Technology Industries of Finland, 15.11.2017
19. *Kansainvälisyys, ERC ja eurooppalainen tutkimusrahoitus*, invited interview by Jussi-Pekka Rantanen at Tiedefoorumi (Science Forum) organized by Academy of Finland and Ministry of Culture and Education, Turku, 6.6.2017.
20. *Topologiset rakenteet fysiikassa: vuoden 2016 Nobel-palkinnosta kvanttisolmuihin ja monopoleihin*, public talk at the annual meeting of The Finnish Society for Natural Philosophy, Helsinki, 21.3.2017
21. *Laatu mikrotasolla määrää aineen ihmeelliset ominaisuudet*, talk to general public on 2016 Nobel prize in Physics, Tampere City Library, 10.12.2016
22. *Quantum Technology*, talk to policy makers of research funding, Ministry of Education and Culture, 25.5.2016
23. *Johdatus kvanttitietokoneisiin ja -teknologiaan*, talk to policy makers on network security, Ministry of Finance, Helsinki, 28.4.2016
24. *Kvanttitietokone: turvallisuusuhka vai runsaudensarvi?*, public talk (the only university speaker), ICTexpo 2016, Helsinki, 27.4.2016
25. *Far Beyond 5G: the quantum information age*, talk to journalists at Elisa Academy (also live internet stream), 14.10.2015.
26. *Quantum Computers and Cryptography*, talk to policy makers on network security, Ministry of Finance, Helsinki, 10.4.2014

Other outreach and societal impact (see [QCD media room](#) for more links, the listed interviews are all personal individual interviews = no multiple counting of duplicate articles based on the same interview)

Interview by Tekniikan Maailma, *Teema-artikkeli: Kvanttitietokoneet*, 28.1.2020.

[News](#) and [podcast](#) about quantum computers by In Prace of Progress, Ville Vesterinen, 16.12.2019.

Interview by Helsingin Sanomat, *Arkijärjen vastainen laite tulee mullistamaan laskennan, ja suomalaisilla on valtti hihassa*, 3.11.2019.

Interview by TiVi, *Mikko Möttönen rakentaa Suomen ensimmäistä kvanttitietokonetta*, 2.11.2019.

TV interview by MTV3 News, *Google saavutti kvanttiherruuden – suomalaisprofessori: Valtavan suuri edistysaskel*, 24.10.2019

Interview by Helsingin Sanomat, *IBM kiistää Googlen kvanttiherruuden, mutta turhaan, sanovat asiantuntijat*, 26.10.2019.

Interview by Helsingin Sanomat, *Nyt se on virallista: Kvanttitietokone saavutti herruuden eli laski 200 sekunnissa sen, mikä olisi vienyt supertietokoneelta 10 000 vuotta*, 23.10.2019.

Interviews about QCD record-breaking bolometer by Tekniikan maailma and Tekniikka&Talous, 11.10.2019.

Interview by Tekniikan Maailma, *Tutkijat ratkaisivat tärkeän kvanttitietokoneiden kehittämiseen liittyvän ongelman – ”Informaatiota voidaan välittää kvanttimekaanisesti”*, 25.9.2019.

Interview by Helsingin Sanomat, *Google väittää, että se saavutti virstanpylvään kvanttitietokoneiden kehittämisessä – kilpailija IBM kiistää*, 25.9.2019.

Interview by Tekniikka&Talous, *Tutkimus vuoti verkkoon: Google uskoo saavuttaneensa kvanttiherruuden – suomalaistutkija: ”mahtava uutinen koko alalle, olettaen että se on totta”*, 24.9.2019.

Radio interview on quantum computers, *Kvanttiaikakausi on ovella - suomalainen startup-yritys kehittää kaupallista kvanttitietokonetta Otaniemessä*, national radio Yle Radio 1 in program Tiedeykkönen, 6.9.2019.

Interview by Tiede, *Miksi Suomen kvanttisiru kiinnostaa?*, 6.8.2019.

Live TV [interview](#) by Rosa Kettumäki, *Suomalaisstartup sai 11 miljoonaa kvanttitietokoneen kehittämiseen*, Yle aamu-TV, 10.7.2019

Interviews about the seed funding round of IQM by [STT](#), [Talouselämä](#), [Kauppalehti](#), [Tekniikan maailma](#), [Keskisuomalainen](#), and Superconductor week. These news were featured around the globe in ~300 stories with total potential audience of 2 billion according to [PR Newswire visibility report](#), 9.7.2019

Live radio [interview](#) by Sanna Pirkkalainen and Juho Blomberg/Yle Radio Suomi, 9.7.2019

Interview by Tekniikka&Talous, *Uusi askel kvanttiteknologian kehityksessä - Aalto-yliopistossa tiedetään, kuinka kvanttimuisti nollataan nopeasti*, 18.4.2019.

Interview by Helsinki Smart site, *The quantum computer will revolutionise data processing*, 1.4.2019

Radio [interview](#) by Juuso Pekkinen/Yle Puhe on quantum computers, 26.3.2019.

Interviews by [Tekniikka&Talous](#), [Yle](#), [Suomen Kuvalehti](#), Tekniikan Maailma, Apu, HelsinkiSmart, [Keskisuomalainen](#), Uudenmaan liitto, Superconductor Week, Ars Technica, and TiVi on fast qubit readout and/or Lamb shift, 11.3.2019

Interview by Physics World, *Studying impossible systems with analogues*, 14.8.2018

Interview by Ilta-Sanomat, *Tiesitkö nämä asiat salamaniskuista? 15 vastausta kesämyrskyjen keskelle*, 20.7.2018

Interview by Helsingin Sanomat, *$E = mc^2$ – mitä väliä?*, 12.6.2018

Interview by Skrolli magazine, *Suomen ensimmäinen kvanttitietokone*, 1.6.2018.

Interview by Tähdet ja avaruus magazine, *Pallosalama rinnastui kvanttiolosuhteeseen*, 1.5.2018

Interview by Tivi, *"Kubitit näyttävät yksittäin toimivan hyvin" – näin kehitetään suomalaista tulevaisuuden tietokonetta*, 8.4.2018.

Media interviews on the creation of a three-dimensional skyrmion by [Yle uutiset](#) (also in [radio news](#)), [Turun Sanomat](#) (also in [print](#)), [Gizmodo](#), [Science News](#), [Tekniikan Maailma](#), [Iltalehti](#) (also in [print](#)), [El País](#), [Tähdet ja avaruus](#), [New Scientist](#), [Suomen tietotoimisto](#), Tivi, and [Keskisuomalainen](#) in [print](#), 2.3.2018.

Podcast by Heureka on [Liikkuminen, liikenne ja tulevaisuus - Heikki Liimatainen, Mikko Möttönen](#), 19.2.2018

Radio interview by Juuso Pekkinen/Yle Puhe on quantum computers, 19.12.2017.

Interview by [Suomen Akatemia on quantum computers](#), 5.12.2017.

Interview by Tiede, [Kvanttilaskin valmistuu](#), 1.12.2017.

Live radio interview [on campaign Vaihtoehto Eskolle and on quantum computers](#) by YleX, program Etusivu (time stamp 1:18:00), 15.11.2017.

Radio interview on quantum computers, [Aalto-yliopistossa aletaan rakentaa kvanttietokonetta](#), national radio Yle Radio 1 in program Tiedeykkönen, 7.11.2017.

Interviews on quantum computers by Apu magazine, 2.11.2017.

Interview by Tiede, [Miksi Suomi rakentaa kvanttilaskimen?](#), 1.11.2017.

Live radio [interview on quantum computers](#) by Yle Radio Suomi, program Ajantasa, 16.10.2017.

Live [interview about quantum computers](#) on national morning TV, MTV3 program [Huomenta Suomi](#), 12.10.2017.

Interviews on quantum computers by [Iltalehti](#), Lännen Media (published in ten [newspapers](#)), [Tekniikan Maailma](#), Uudenmaan liitto, and [Tekniikka&Talous](#), 10.10.2017.

Interview by Tekniikan Maailma, [Milloin kvanttietokone mullistaa tietojenkäsittelyn?](#), 6.9.2017.

Radio interview on Bose–Einstein condensates and quantum computers, [Kvanttimekaniikkaa Bosen-Einsteinin kondensaatissa - kvanttimonopoli hajosi](#), national radio Yle Radio 1 in program Tiedeykkönen, 4.8.2017.

Book review in popular science magazine Tiede, Neroksta jännitystä, 6.7.2017.

Interview by Tekniikka&Talous, [Kiina väittää kehittäneensä kvanttitutkan - paljastaa myös häivekoneet](#), 21.6.2017.

Interview by Physics Today, [Quantum-circuit refrigerator](#), 1.6.2017.

Interview by Tiede, [Kuumat kubitit jäähyllle](#), 1.6.2017.

Live Radio interview by Juuso Pekkinen at [Yle Puhe](#) on quantum computers and the quantum circuit refrigerator, 17.5.2017.

Interviews on the quantum circuit refrigerator by [New Scientist](#), [IFLScience](#), [Superconductor Week](#), [Iltalehti](#), [Tekniikan Maailma](#), [Uusi Suomi](#), [Aamulehti](#) (also printed in [Kaleva](#)), [Suomen Kuvalehti](#), [Tekniikka&Talous](#), [Cleantech Concepts](#), [E&E Magazine](#), [Curiosity](#), 8.5.2017.

Video press release, [How to Cool Down a Quantum Bit](#), Aalto University, 8.5.2017

Interview by Tekniikka&Talous, [Suomalaiset opiskelijat pääsevät koodaamaan kvanttietokonetta – koneen tehot kuitenkin vielä vähissä](#), 10.4.2017.

Interviewed for content by Helsingin Sanomat, [Hyvin nopea kvanttietokone voi toteutua pian](#), 23.3.2017.

Guest in TV series, [Olipa kerran elämä](#), 1.3.2017.

Interview by Suomen Kuvalehti, [Ällistyttävä ennuste: Tietokoneet käyttävät kaiken tuotetun sähkön vuonna 2040 – jos nykymeno jatkuu](#), 23.2.2017.

Interview by Tiede magazine, [Näistä maailma puhuu 2017 – Kvanttihyppy tietokoneella](#), 5.12.2016

Online story by tietysti.fi, [Oikoreittiä kvanttietokoneilla](#), 2.12.2016.

Radio interview on our microwave detector, [Punasolua pienempi fotoni-ilmaisim - marraskuun tähtitaivaalla vilahtelevat leonidit](#), national radio Yle Radio 1 in program Tiedeykkönen, 4.11.2016.

Interview by Academy of Finland, [Tutkijanuraportaitko edistää tieteen parasta](#), 31.10.2016.

Invited talk at Fysikerfest, the annual student conference of Finnish Association of Physics and Mathematics Students, *Quantum Knots*, 22.10.2016

Interview Cleantech Concepts, <http://www.cleantechconcepts.com/2016/10/highly-efficient-heat-transfer-holds-promise-for-quantum-computing/>, 14.10.2016

Interview by Superconductor week, *Aalto Builds and Tests Efficient Photon Detector*, 25.8.2016

Interview by Iltalehti, *Otaniemessä tehtailaan tieteellisiä läpimurtoja. Kuumaa tutkimusryhmää johtaa epätavallinen kvanttifyysikko Mikko Möttönen*, 2-pages in print, 6.8.2016

Interviews about our microwave detector given to [EE Times](#), [Physics Buzz](#), [The Next Platform](#), [Iltalehti](#), [Suomen tietotoimisto](#) (published in 17 news papers), 8.7.2016

News on obtaining an ERC Proof-of-Concept Grant, [ERC Proof of Concept to Mikko Möttönen](#), Aalto University, 8.7.2016

Interview by Tiede-lehti, *Suomen kvanttijulkis*, 8.6.2016

Interview by YLE, *Kvanttiteknologian vallankumous kytee Otaniemessä*, 19.5.2016

Interview by Lännen Media, *Äärimmäisen tehokkaat*, appeared at least on Kainuun Sanomat, Turun Sanomat, Satakunnan Kansa, Lapin Kansa, Pohjolan Sanomat, 24.4.2016

Interview by Lännen Media, *Aalto-yliopisto tavoittelee uutta huippuyksikköä*, appeared at least on Turun Sanomat, Kaleva, Ilkka, Pohjalainen, Satakunnan Kansa, Hämeen Sanomat, 23.4.2016.

News on obtaining an ERC Consolidator Grant, *Aalto University research project on quantum technology awarded a seven-figure grant*, Aalto University, 23.3.2016.

Authored a popular science article, *Efficient Long-Distance Heat Transport by Microwave Photons*, 2Physics, 20.3.2016.

Interviewed on quantum computers for an article in mtv.fi, *Tietokoneen esi-isä mullisti maailman 70 vuotta sitten – teki sadan vuoden työt kahdessa viikossa*, 13.2.2016.

Radio interview on quantum knots and another interview on quantum-limited heat conduction, *Suomalaiskeksinnön avulla voidaan viilentää kvanttietokonetta tehokkaasti*, national radio Yle Radio 1 in program Tiedeykkönen, 5.2.2016.

Quantum-limited heat conduction featured in [Radio Aalto Tiedenurkka](#), 2.2.2016

Interviews on quantum-limited heat conduction given to [Physics World](#), [IFLScience](#), [Iltalehti](#), [Helsingin Sanomat](#), [Tekniikka & Talous](#), Lännen media (published in ten news papers), [mtv.fi](#), [Uusi Suomi](#), [Aamulehti](#), [Suomen tietotoimisto](#), [Tekniikan Maailma](#), [Turun Sanomat](#) (in print), [CSC Magazine](#), 1.2.2016.

Video press release, *Quantum-limited heat conduction over macroscopic distances*, Aalto University, 1.2.2016

Live radio interview on the quantum knots in Yle Puhe morning show, 19.1.2016.

Interviews on quantum knots given to [New Scientist](#), [de Volkskrant](#), [Digitoday](#), [Spektrum der Wissenschaft](#), [Wissenschaft Aktuell](#), [Gizmodo](#), [CSC Magazine](#), [Keskisuomalainen](#), [Helsingin Sanomat](#), [Tekniikka & Talous](#), [Iltalehti](#), [Apu](#), 18.1.2016

Video press release, *Tying Quantum Knots*, Aalto University, 18.1.2016

Interviewed for an article in Scientific Computing World magazine, *A quantum leap in processors?*, Dec 2015.

Interviewed for an article in Luonnontieteilijä magazine, Dec 2015.

Interviewed for a [documentary](#) on a claimed perpetual machine, 25.10.2015

Interview by online medium ELISA.NET, *Suomalaistutkija ratkaisi tiedemaailmaa 80 vuotta vaivanneen ongelman*, 15.10.2015

Video [interview](#) on why we should popularize science (in Finnish), Kaskas Media, 22.5.2015.

Radio interview, *Tieteellinen läpimurto syntyi unettomassa yössä*, live in Yle Puhe morning show, 12.5.2015.

Radio interview, *Toukokuu tarjoaa tähtiä, tähdenlentoja ja auringonpilkkujakin*, national radio Yle Radio 1 in program Tiedeykkönen, 8.5.2015.

Invited statement in *Ylioppilaslehti* about concepts in science that we should drop, May 2015.

Interviews on the quantum-mechanical monopole given to *Helsingin Sanomat*, *Keskisuomalainen*, *Yle*, *MTV* (two stories), *Savon Sanomat*, *Karjalainen*, *Etelä-Suomen Sanomat*, *Tekniikka&Talous*, *de Volkskrant*, 30.4.2015

Video press release, *Making Monopoles in the Lab*, Aalto University, 30.4.2015

Radio interview, *Kvanttitietokone tulossa, kvanttisalaus jo totta*, national radio Yle Radio 1 in program Tiedeykkönen, 22.8.2014.

Radio interview, *Elektronien pumppaamisella käytännön sovellus*, national radio Yle Radio 1 in program Tiedeykkönen, 20.6.2014.

Press release, *Transistor pumps electrons one by one*, Aalto University, 26.5.2014

MagNews Spring 2014 cover story

Tiede magazine 5/2014 featured our monopole work in a two-page article and in their cover text with the title *Mikko Möttönen's recipe worked – magnetic monopole was born*

Helsingin Sanomat wrote about my work in the editorial 31.3.2014 with the title *Rantatontteja voisi antaa myös fysiikan olympiamitalisteille*

Tekniikan Maailma (TM) wrote an article about my work in the issue 6/2014 with the title *Magneettinen Monopoli Laboratoriossa*

Feature article for general public on author's ERC grant SINGLEOUT, *Studying individual microwave photons*, *EU Research* 1/2014, p. 49.

Radio interview, *Keinotekoiset magneettiset monopolit*, <http://areena.yle.fi/radio/2104302>, national radio Yle Radio 1 in program Tiedeykkönen, 31.1.2014.

News published on the synthetic magnetic monopole in all relevant Finnish media and in important foreign media including The Guardian (editorial), BBC News, Nature, Scientific American, see <http://physics.aalto.fi/groups/comp/qcd/qcd-mediaroom/> for a more complete list. January 2014.

Newspaper interviews, interviews on the synthetic magnetic monopole given to Helsingin Sanomat, Keskisuomalainen, Suomen Kuvalehti, Suomen tietotoimisto (STT), Der Spiegel (German), and De Vokskrant (Dutch). January 2014.

Video press release, *Making Monopoles - Synthetic Magnetic Monopole Finally Observed*, <http://www.youtube.com/watch?v=HSDoIf5FY2s>, Aalto University, 30.1.2014

Press release, *Scientists discover long awaited synthetic particle*, http://physics.aalto.fi/wp-content/uploads/2014/01/Press_release_monopole_Finland_English_29012014.pdf, Aalto University, 29.1.2014

Magazine interview, *Builders of Our Future* http://physics.aalto.fi/wp-content/uploads/2013/04/trendi_march2013.pdf, chosen as the representative from science, Trendi Magazine, 5.3.2013.

Interview and article, *Computers Go Quantum*, http://issuu.com/aaltouniversity/docs/aum_03_web, Aalto Magazine, 9.5.2012

Newspaper interview, *Code that does not break*, http://physics.aalto.fi/wp-content/uploads/2012/03/HS_Kvanttikryptografia_web.pdf, national newspaper Helsingin sanomat, 6.3.2012

Newspaper interview, *Single-atom transistor*, http://physics.aalto.fi/wp-content/uploads/2012/03/hesari_transistori_2012.pdf, national newspaper Helsingin sanomat, 25.2.2012

Video press release, *EU grant for a basic component of the quantum computer*, http://www.youtube.com/watch?v=dWcT_qrBN_w, Aalto University, 2.11.2011

Press release, *EU grant for a basic component of the quantum computer*, Aalto University, 6.10.2011

Live internet presentation, *Kuinka ERC kesytetään*, http://akatemia.livepalvelu.com/video.php?video=2011_10_06_aka_erc_mikko_mottone_sd_001.mp4, Academy of Finland, 6.10.2011.

Radio interview, *Is quantum computer coming?*, http://physics.aalto.fi/wp-content/uploads/2012/03/Tuleeko_kvanttitietokone_Radiaattori27102010.mp3, national radio Yle Radio 1 in program Radiaattori, 27.10.2010.

Press release, *Detector for the single-electron magnet discovered—pathway to the silicon-based quantum computer*, Aalto University, 27.9.2010.

Press release, *Single-atom transistor discovered*, Helsinki University of Technology, 3.12.2009.

Press release, *Reaching for magnetic monopoles—an analogy for a point source of magnetic field found?*, Helsinki University of Technology, 14.7.2009.

Patents

Patent on *Detector of Single Microwave Photons Propagating in a Guide* (in Finnish *Menetelmä ja laite yksittäisten mikroaaltofotonien ilmaisemiseksi metallisessa aaltojohteessa*). Patent numbers FI 122887 B, US 9,255,839 B2, and JP 5973445 B2. First patent granted on 31.8.2012.

Patent application on *A Circuit Assembly, a System and a Method for Cooling a Quantum Electric Device*, Finnish patent application number FI 20156020 (submitted in 2015), international patent application number P-WO101022E (submitted in 2016), and US patent application number US16/066,207 (submitted in 2018).

Patent application on *Cryogenic Microwave Analyzer*, Finnish patent application number FI20176051 (submitted in 2017)

Patent application on *Method and Arrangement for Reading out the State of a Qubit*, Finnish patent application number FI20185847 (submitted in 2018)

Patent application on *Vector Signal Generator Operating on Microwave Frequencies, and Method for Generating Time-Controlled Vector Signals on Microwave Frequencies*, Finnish patent application number FI20195189 (submitted in 2019)

Invited talks in international conferences and major international workshops (other talks listed after the list of publications)

1. M. Möttönen et al., **invited talk** on *Fabrication of superconducting quantum electric circuits at OtaNano, Finland*, Workshop on Nanofabrication for basic research in Quantum Technology, October 2019, Finland.

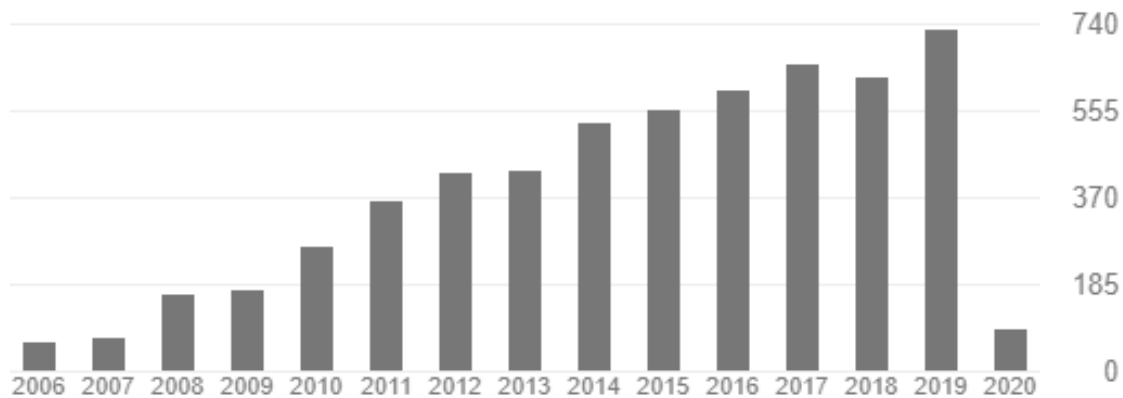
2. M. Möttönen et al., **invited talk** on *Readout and control for a superconducting quantum computer*, Quantum Technology: Academia Meets Industry, September 2019, China.
3. M. Möttönen et al., **invited talk** on *Quantum Detectors*, Axion Experiments in Germany, August 2019, Germany.
4. M. Möttönen et al., **invited talk** on *Ultrasensitive Microwave Bolometer*, 18th International Workshop on Low Temperature Detectors, July 2019, Italy.
5. M. Möttönen et al., **invited talk** on *Fast measurement and initialization of superconducting qubits*, FQMT'19, July 2019, Czech Republic.
6. M. Möttönen et al., **invited plenary talk** on *Techniques for qubit initialization and readout*, European Quantum Technologies Conference EQTC 2019, Feb 2019, France.
7. M. Möttönen et al., **invited talk** on *On-chip engineered heat baths for quantum devices*, QT60 – Workshop on thermodynamics, thermoelectrics and transport in quantum devices, Sep 2018, Finland.
8. M. Möttönen et al., **invited talk** on *Three-dimensionally non-trivial topological structures in spin-1 Bose–Einstein condensates*, Workshop on Unconventional Superfluids, Sep 2018, UK.
9. M. Möttönen et al., **invited talk** on *In-situ-controllable dissipators for superconducting electronics*, International conference on quantum technologies, Sep 2018, Russia.
10. M. Möttönen et al., **invited talk** on *Superconducting Quantum Computer*, ICPS 2018, Aug 2018, Finland.
11. M. Möttönen et al., **invited (midnight) talk** on *Quantum Technology – Quantum electronics*, 16th NAMIS Workshop, June 2018, Finland.
12. M. Möttönen et al., **invited talk** on *Computational Challenges and Opportunities Provided by Quantum Mechanics*, Innovative Methods in Scientific Computing, October 2017, Finland.
13. M. Möttönen et al., **invited talk** on *Experiments on temporally controllable dissipation in superconducting quantum circuits*, FQMT'17, July 2017, Czech Republic.
14. M. Möttönen et al., **invited talk** on *Quantum knots and monopoles*, Topological Effects in Ultra-Cold Atoms, November 2016, Brazil.
15. M. Möttönen et al., **invited talk** on *Quantum-limited heat conduction over macroscopic distances*, Energy Materials and Nanotechnology meeting on Quantum, April 2016, Thailand.
16. M. Möttönen et al., **invited plenary talk** on *Discoveries of magnetic-monopole analogues in Bose–Einstein condensates*, Workshop on Discovery of quantum-mechanical monopoles and its implications, December 2015, Turkey.

17. M. Möttönen et al., **invited talk** on *On-demand dissipation for quantum electric circuits*, 9th International Conference on Control of quantum correlations in tailored matter: Common perspectives of mesoscopic systems and quantum gases, October 2015, Germany.
18. M. Möttönen et al., **invited talk** on *Discoveries of magnetic-monopole analogues in Bose–Einstein condensates*, FQMT'15, July 2015, Czech Republic.
19. M. Möttönen et al., **invited talk** on *Fluctuation relations in single-electron devices*, Quantum Information and Thermodynamics, February 2015, Brazil.
20. M. Möttönen et al., **invited talk** on *Integrating normal-metal components into the framework of circuit quantum electrodynamics*, Superconducting Nanocircuits, September 2014, Maratea, Italy.
21. M. Möttönen, **invited plenary talk** on *Experimental studies of fluctuation relations in single-electron boxes*, Thermodynamics at the Quantum Scale, Belfast, UK, 19.8.2014.
22. M. Möttönen, **invited talk** on *QCD Labs*, Quantum Technologies for Metrology and Sensing, Lancaster, UK, 30.6.2014.
23. M. Möttönen et al., **invited talk** on *Exotic life of Cooper pairs in normal metal*, Nanophysics: from fundamentals to applications, July 2013, Quy.Nhon, Vietnam.
24. M. Möttönen et al., **invited talk** on *Experimental study of work and entropy fluctuations in a single-electron box*, Frontiers of Quantum and Mesoscopic Thermodynamics, August 2013, Prague, Czech Republic.
25. M. Möttönen, **invited talk** on *Single-atom transistor: study of single donors in silicon*, Nanowires 2010, 2010, Heraklion, Greece.
26. M. Möttönen, **invited talk** on *Topological vortex formation*, Symposia on superfluids under rotation: vortices, superfluid dynamics, and quantum turbulence, 2010, Lammi, Finland.
27. M. Möttönen et al., **invited talk** on *Recent progress on electron transport through single phosphorus donors in silicon*, Silicon Qubit Workshop, Berkeley, USA, Aug. 25th 2009.
28. M. Möttönen et al., **invited talk** on *Experimental determination of the Berry phase in a superconducting charge pump*, Quantum Dynamics in Dots and Junctions: Coherent Solid State Systems, 2008, Riva del Garda, Italy.
29. M. Möttönen et al., **invited talk** on, *Observation of the Berry phase in a superconducting charge pump*, Topological Aspects of Solid State Physics, 2008, Kyoto, Japan.
30. M. Möttönen et al., **invited talk** on *Recent progress on Cooper pair sluice*, EURAMET Expert Meeting on quantum electrical metrology, 2007, Espoo, Finland.

Scientific publications (first publication in 2002)

- ResearcherID A-6929-2012 (not always up to date, CV updated more often)
- **120** peer-reviewed articles (tracked by ISI)
- **5968** Google Scholar citations in total (**3590** in ISI)
- H-index **41** (**33** in ISI)
- **2** Nature, **1** Science, **1** Reviews of Modern Physics, **5** Nature Physics, **1** Science Advances, **1** Physical Review X, **3** Nano Letters, **2** Nature Communications, **15** Physical Review Letters, **2** npj Quantum Information, **1** Communications Physics
(journals listed roughly according to their impact factors)

Citations per year



2020 (including preprints and submitted articles)

1. S. Giblin, E. Mykkänen, A. Kemppinen, P. Immonen, A. Manninen, M. Jenei, M. Möttönen, G. Yamahata, A. Fujiwara, and M. Kataoka, *Realisation of a quantum current standard at liquid helium temperature with sub-ppm reproducibility*, Metrologia (accepted, 2020).
2. S. Alipour, A. T. Reza khani, A. P. Babu, K. Mølmer, M. Möttönen, and T. Ala-Nissila, *Correlation Picture Approach to Open-Quantum-System Dynamics*, submitted to Phys. Rev. X (2020), arXiv:1903.03861.
3. Máté Jenei, Ruichen Zhao, Kuan Y. Tan, Tuomo Tantt, Kok W. Chan, Yuxin Sun, Vasilii Sevriuk, Fay Hudson, Alessandro Rossi, Andrew Dzurak, and Mikko Möttönen, *Superconducting charge sensor coupled to an electron layer in silicon*, submitted to Phys. Rev. Appl. (2020), arXiv:1909.11976.

2019

4. M. Silveri, S. Masuda, V. Sevriuk, K. Y. Tan, Eric Hyppä, M. Partanen, J. Goetz, R. E. Lake, L. Grönberg, and M. Möttönen, *Broadband Lamb shift in an engineered quantum*, Nat. Phys. **15**, 533 (2019).

5. L. S. Weiss, M. O. Borgh, A. Blinova, T. Ollikainen, M. Möttönen, J. Ruostekoski, and D. S. Hall, *Controlled Creation of a Singular Spinor Vortex by Skirting the Dirac Belt Trick*, Nature Commun. **10**, 4772 (2019).
6. J. Ikonen, J. Goetz, J. Ilves, A. Keränen, A. M. Gunyho, M. Partanen, K. Y. Tan, L. Grönberg, V. Vesterinen, S. Simbierowicz, J. Hassel, and M. Möttönen, *Qubit Measurement by Multichannel Driving*, Phys. Rev. Lett. **122**, 080503 (2019).
7. R. Kokkonieniemi, J. Govenius, V. Vesterinen, R. E. Lake, A. M. Gunyho, K. Y. Tan, S. Simbierowicz, L. Grönberg, J. Lehtinen, M. Prunnila, J. Hassel, O.-P. Saira, and M. Möttönen, *Nanobolometer with Ultralow Noise Equivalent Power*, Commun. Phys. **2**, 124 (2018).
8. T. Ollikainen, A. Blinova, M. Möttönen, and D. S. Hall, *Decay of a Quantum Knot*, Phys. Rev. Lett. **123**, 163003 (2019), Editors' Suggestion.
9. J. Tuorila, J. Stockburger, T. Ala-Nissila, J. Ankerhold, M. Möttönen, *System-Environment Correlations in Qubit Initialization and Control*, Phys. Rev. Res. **1**, 013004 (2019).
10. K. Tiurev, P. Kuopanportti, and M. Möttönen, *Creation of a Dirac monopole-antimonopole pair in a spin-1 Bose-Einstein condensate*, Phys. Rev. A **99**, 023621 (2019).
11. E. Hyypä, M. Jenei, S. Masuda, K. Yen Tan, M. Silveri, J. Goetz, M. Partanen, R. E. Lake, L. Grönberg, M. Möttönen, *Calibration of cryogenic amplification chains using normal-metal-insulator-superconductor junctions*, Appl. Phys. Lett. **114**, 192603 (2019).
12. S. P. Giblin, A. Fujiwara, G. Yamahata, M.-H. Bae, N. Kim, A. Rossi, M. Möttönen, M. Kataoka, *Evidence for robustness and universality of tunable-barrier electron pumps*, Metrologia **56**, 044004 (2019).
13. V. Sevriuk, K. Y. Tan, E. Hyypä, M. Silveri, M. Partanen, M. Jenei, S. Masuda, J. Goetz, V. Vesterinen, L. Grönberg, and M. Möttönen, *Fast control of dissipation in a superconducting resonator*, Appl. Phys. Lett. **115**, 082601 (2019).
14. D. Basilewitsch, F. Cosco, N. Lo Gullo, M. Möttönen, T. Ala-Nissilä, C. P. Koch, S. Maniscalco, *Reservoir Engineering via Quantum Optimal Control for Qubit Reset*, submitted to New J. Phys. **21**, 093054 (2019).
15. A. Mäkinen, J. Ikonen, M. Partanen, M. Möttönen, *Reconstruction Approach to Quantum Dynamics of Bosonic Systems*, Phys. Rev. A **100**, 042109 (2019).
16. M. Partanen, J. Goetz, K. Y. Tan, K. Kohvakka, V. Sevriuk, R. E. Lake, R. Kokkonieniemi, J. Ikonen, D. Hazra, A. Mäkinen, E. Hyypä, L. Grönberg, V. Vesterinen, M. Silveri, M. Möttönen, *Optimized heat transfer at exceptional points in quantum circuits*, Phys. Rev. B **100**, 134505 (2019), Editor's Suggestion.
17. Máté Jenei, Elina Potanina, Ruichen Zhao, Kuan Y. Tan, Alessandro Rossi, Tuomo Tantt, Kok W. Chan, Vasilii Sevriuk, Mikko Möttönen, and Andrew Dzurak, *Waiting time distributions in a wo-level fluctuator coupled to a superconducting charge detector*, submitted to Phys. Rev. Research **1**, 033163 (2019), Editor's Suggestion.

2018


18. W. Lee, A.H. Gheorghe, K. Tiurev, T. Ollikainen, M. Möttönen, and D.S. Hall, *Synthetic Electromagnetic Knot in a Three-Dimensional Skyrmion*, *Science Adv.* **4**, eaao3820 (2018).
19. A. Rossi, J. Klochan, J. Timoshenko, F. E. Hudson, M. Möttönen, S. Rogge, A. S. Dzurak, V. Kashcheyevs, and G. C. Tettamanzi, *Gigahertz Single-Electron Pumping Mediated by Parasitic States*, *Nano Lett.* **18**, 4141 (2018).
20. S. Masuda, K. Y. Tan, M. Partanen, R. E. Lake, J. Govenius, M. Silveri, H. Grabert, and M. Möttönen, *Observation of microwave emission from incoherent electron tunneling through a normal-metal–insulator–superconductor junction*, *Sci. Rep.* **8**, 3966 (2018).
21. M. Partanen, K. Yen Tan, S. Masuda, J. Govenius, R. E. Lake, M. Jenei, L. Grönberg, J. Hassel, S. Simbierowicz, V. Vesterinen, J. Tuorila, T. Ala-Nissila, M. Möttönen, *Flux-tunable heat sink for quantum electric circuits*, *Sci. Rep.* **8**, 6325 (2018).
22. K. Tiurev, T. Ollikainen, P. Kuopanportti, M. Nakahara, D. S. Hall, M. Möttönen, *Three-dimensional skyrmions in spin-2 Bose-Einstein condensates*, *New J. Phys.* **20**, 055011 (2018).
23. J. Rabinä, P. Kuopanportti, M. Kivioja, M. Möttönen, and T. Rossi, *Three-dimensional splitting dynamics of giant vortices in Bose-Einstein condensates*, *Phys. Rev. A* **98**, 023624 (2018).
24. J. Ikonen and M. Möttönen, *Accelerated stabilization of coherent photon states*, *New J. Phys.* **20**, 103047 (2018).

2017

25. K. Y. Tan, M. Partanen, R. E. Lake, J. Govenius, S. Masuda, and M. Möttönen, *Quantum-Circuit Refrigerator*, *Nature Commun.* **8**, 15189 (2017).
26. T. Ollikainen, K. Tiurev, A. Blinova, W. Lee, D. S. Hall, and M. Möttönen, *Experimental realization of a Dirac monopole through the decay of an isolated monopole*, *Phys. Rev. X* **7**, 021023 (2017).
27. R. E. Lake, J. Govenius, R. Kokkonen, K. Y. Tan, M. Partanen, P. Virtanen, and M. Möttönen, *Microwave admittance of gold-palladium nanowires with proximity-induced superconductivity*, *Adv. Electron. Mat.* **3**, 1600227 (2017).
28. J. Ikonen, J. Salmilehto, and M. Möttönen, *Energy-efficient quantum computing*, *njp Quant. Inf.* **3**, 17 (2017).
29. T. Ollikainen, S. Masuda, M. Möttönen, and M. Nakahara, *Counterdiabatic vortex pump in spinor Bose-Einstein condensates*, *Phys. Rev. A* **95**, 013615 (2017).
30. V. Vesterinen, O.-P. Saira, I. Räisänen, Mikko Möttönen, Leif Grönberg, Jukka Pekola, and Juha Hassel, *Lumped-element Josephson parametric amplifier at 650 MHz for nano-calorimeter readout*, *Supercond. Sci. Technol.* **30**, 085001 (2017).

31. J. Tuorila, M. Partanen, T. Ala-Nissilä, M. Möttönen, *Efficient protocol for qubit initialization with a tunable environment*, npj Quantum Information **3**, 27 (2017).
32. M. Silveri, H. Grabert, S. Masuda, K. Y. Tan, and M. Möttönen, *Theory of quantum-circuit refrigeration by photon-assisted electron tunneling*, Phys. Rev. B **96**, 094524 (2017).
33. R. Zhao, A. Rossi, S. P. Giblin, J. D. Fletcher, F. E. Hudson, M. Möttönen, M. Kataoka, and A. S. Dzurak, *Thermal-error regime in high-accuracy gigahertz single-electron pumping*, Phys. Rev. Appl. **8**, 044021 (2017).
34. R. Kokkonen, T. Ollikainen, R. E. Lake, S. Saarenpää, K. Y. Tan, J. I. Kokkala, C. B. Dag, J. Govenius, and Mikko Möttönen, *Flux-tunable phase shifter for microwaves*, Sci. Rep. **7**, 14713 (2017).
35. T. Ollikainen, S. Masuda, M. Möttönen, and M. Nakahara, *Quantum knots in Bose–Einstein condensates created by counterdiabatic control*, Phys. Rev. A **96**, 063609 (2017).

2016

36. D. S. Hall, M. W. Ray, K. Tiurev, E. Ruokokoski, A. H. Gheorghe, and M. Möttönen, *Tying Quantum Knots*, Nature Phys. **12**, 478 (2016). Cover image of May issue.
37. M. Partanen, K. Y. Tan, J. Govenius, R. E. Lake, M. K. Mäkelä, T. Tantt, and M. Möttönen, *Quantum-limited heat conduction over macroscopic distances*, Nature Phys. **12**, 460 (2016).
38. J. Govenius, R. E. Lake, K. Y. Tan, and M. Möttönen, *Detection of zeptojoule microwave pulses using electrothermal feedback in proximity-induced Josephson junctions*, Phys. Rev. Lett. **117**, 030802 (2016).
39. K. Tiurev, E. Ruokokoski, H. Mäkelä, D. S. Hall, and M. Möttönen, *Decay of an isolated monopole into a Dirac monopole configuration*, Phys. Rev. A **93**, 033638 (2016).
40. T. Tantt, A. Rossi, K. Y. Tan, A. Mäkinen, K. W. Chan, A. S. Dzurak, and M. Möttönen, *Three-waveform bidirectional pumping of single electrons with a silicon quantum dot*, Sci. Rep. **6**, 36381 (2016).
41.  K. Tiurev, P. Kuopanportti, A. M. Gunyhó, M. Ueda, and M. Möttönen, *Evolution of an isolated monopole in a spin-1 Bose-Einstein condensate*, Phys. Rev. A **94**, 053616 (2016). Editors' suggestion.

2015

42. M. W. Ray, E. Ruokokoski, K. Tiurev, M. Möttönen, and D. S. Hall, *Observation of Isolated Monopoles in a Quantum Field*, Science **348**, 544 (2015).
43. S. Suomela, J. Salmilehto, I. G. Savenko, T. Ala-Nissila, and M. Möttönen, *Fluctuations of work in nearly adiabatically driven open quantum systems*, Phys. Rev. E **91**, 022126 (2015).

44. J. Govenius, Y. Matsuzaki, I. G. Savenko, and M. Möttönen, *Parity measurement of remote qubits using dispersive coupling and photodetection*, Phys. Rev. A **92**, 042305 (2015).
45. A. Rossi, T. Tantt, F. E. Hudson, M. Möttönen, and A. S. Dzurak, *Silicon Metal-Oxide-Semiconductor Quantum Dots for Single-Electron Pumping*, J. Vis. Exp. **100**, e52852 (2015).
46. H. Flayac, I. Savenko, M. Möttönen, T. Ala-Nissila, *Quantum treatment for Bose-Einstein condensation in non-equilibrium systems*, Phys. Rev. B **92**, 115117 (2015).
47. T. Tantt, A. Rossi, K. Y. Tan, K.-E. Huhtinen, K. W. Chan, M. Möttönen, A. S. Dzurak, *Electron counting in a silicon single-electron pump*, New J. Phys. **17**, 103030 (2015).

2014


48. M. W. Ray, E. Ruokokoski, S. Kandel, M. Möttönen, and D. S. Hall, *Observation of Dirac Monopoles in a Synthetic Magnetic Field*, Nature (London) **505**, 657 (2014).
Mentioned in journal cover.
49. A. Rossi, T. Tantt, K. Y. Tan, I. Iisakka, R. Zhao, K. W. Chan, G. C. Tettamanzi, S. Rogge, A. S. Dzurak, and M. Möttönen, *An accurate single-electron pump based on a highly tunable silicon quantum dot*, Nano Lett. **14**, 3405 (2014).
50. J. Govenius, R. E. Lake, K. Y. Tan, V. Pietilä, J. K. Julin, I. J. Maasilta, P. Virtanen, and M. Möttönen, *Microwave nanobolometer based on proximity Josephson junctions*, Phys. Rev. B **90**, 064505 (2014).
51. J. Salmilehto, P. Solinas, and M. Möttönen, *Quantum Driving and Work*, Phys. Rev. E **89**, 052128 (2014).
52. T. Ollikainen, E. Ruokokoski, and M. Möttönen, *Creation and dynamics of two-dimensional skyrmions in antiferromagnetic spin-1 Bose-Einstein condensates*, Phys. Rev. A **89**, 033629 (2014).

2013

53. J. V. Koski, T. Sagawa, O.-P. Saira, Y. Yoon, A. Kutvonen, P. Solinas, M. Möttönen, T. Ala-Nissila, and J. P. Pekola, *Distribution of Entropy Production in a Single-Electron Box*, Nature Phys. **9**, 644 (2013).
54. J. P. Pekola, O.-P. Saira, V. F. Maisi, A. Kemppinen, M. Möttönen, Yu. A. Pashkin, D. V. Averin, *Single-electron current sources: towards a refined definition of ampere*, Rev. Mod. Phys. **85**, 1421 (2013).
55. P. Kuopanportti, B. P. Anderson, and M. Möttönen, *Vortex pump for a Bose-Einstein condensate utilizing a time-averaged orbiting potential trap*, Phys. Rev. A **87**, 033623 (2013).

56. H. Wu, E. M. Gauger, R. E. George, M. Möttönen, H. Riemann, N. V. Abrosimov, P. Becker, H.-J. Pohl, K. M. Itoh, M. L. W. Thewalt, J. J. L. Morton, *Geometric Phase Gates with Adiabatic Control in Electron Spin Resonance*, Phys. Rev. A **87**, 032326 (2013).
57. P. Jones, J. Salmilehto, and M. Möttönen, *Highly controllable qubit-bath coupling based on a sequence of resonators*, J. Low Temp. Phys. **173**, 152 (2013).
58. P. Jones, J. A. M. Huhtamäki, J. Salmilehto, K. Y. Tan, and M. Möttönen, *Tunable electromagnetic environment for superconducting quantum bits*, Sci. Rep. **3**, 1987 (2013).
59. H. Mäkelä and M. Möttönen, *Effects of the rotating wave and secular approximations on non-Markovianity*, Phys. Rev. A **88**, 052111 (2013).

2012

60. O.-P. Saira, Y. Yoon, T. Tanttu, M. Möttönen, D. V. Averin, and J. P. Pekola, *Test of Jarzynski and Crooks fluctuation relations in an electronic system*, Phys. Rev. Lett. **109**, 180601 (2012).
-  61. F. Hoehne, Yu. A. Pashkin, O. V. Astafiev, M. Möttönen, J. P. Pekola, J. S. Tsai, *Coherent superconducting quantum pump*, Phys. Rev. B **85**, 140504(R) (2012).
Editors' suggestion.
62. J. Salmilehto and M. Möttönen, *Quantum effect of inductance on geometric Cooper pair transport*, Physical Review B **86**, 184512 (2012).
63. E. Ruokokoski, J. A. M. Huhtamäki, and M. Möttönen, *Stationary States of Trapped Spin-Orbit-Coupled Bose-Einstein Condensates*, submitted to Phys. Rev. A **86**, 051607(R) (2012).
64. P. J. Jones, J. A. M. Huhtamäki, M. Partanen, K. Y. Tan, and M. Möttönen, *Tunable single-photon heat conduction in electrical circuits*, Phys. Rev. B **86**, 035313 (2012).
65. P. Kuopanportti, J. A. M. Huhtamäki, and M. Möttönen, *Exotic vortex lattices in two-species Bose-Einstein condensates*, Phys. Rev. A **85**, 043613 (2012).
66. J. Salmilehto, P. Solinas, and M. Möttönen, *Conservation law of operator current in open quantum systems*, Phys. Rev. A **85**, 032110 (2012).
67. P. J. Jones, J. A. M. Huhtamäki, K. Y. Tan, and M. Möttönen, *Single-photon heat conduction in electrical circuits*, Phys. Rev. B **85**, 075413 (2012).
68. P. Solinas, M. Möttönen, J. Salmilehto, and J. P. Pekola, *Cooper pair current in the presence of flux noise*, submitted to Phys. Rev. B **85**, 024527 (2012).

2011

69. E. Ruokokoski, V. Pietilä, and M. Möttönen, *Ground-State Dirac Monopole*, Phys. Rev. A **84**, 063627 (2011).
70. D. V. Averin, M. Möttönen, and J. P. Pekola, *Maxwell's demon based on a single-electron pump*, Phys. Rev. B **84**, 032338 (2011).

71. V. Gramich, P. Solinas, M. Möttönen, J. P. Pekola, J. Ankerhold, *Measurement scheme for the Lamb shift in a superconducting circuit with broadband environment*, Phys. Rev. A **84**, 052103 (2011).
72. J. Salmilehto and M. Möttönen, *Superadiabatic theory for Cooper pair pumping under decoherence*, Phys. Rev. B **84**, 174507 (2011).
73. Y. Matsuzaki, P. Solinas, and M. Möttönen, *Entanglement generation between unstable optically active qubits without photodetectors*, Phys. Rev. A **84**, 032338 (2011).
74. V. Pietilä and M. Möttönen, *Phase transitions in dipolar spin-1 Bose gases*, Physical Review A **84**, 013605 (2011).
75. I. Kamleitner, P. Solinas, C. Müller, A. Shnirman, and M. Möttönen, *Geometric quantum gates with superconducting qubits*, Phys. Rev. B **83**, 214518 (2011).
76. K. W. Chan, M. Möttönen, A. Kemppinen, N. S. Lai, K. Y. Tan, W. H. Lim, and A. S. Dzurak, *Single-electron shuttle based on a silicon quantum dot*, Appl. Phys. Lett. **98**, 212103 (2011).
77. Y. Yoon, S. Gasparinetti, M. Möttönen, and J. P. Pekola, *Capacitively Enhanced Thermal Escape in Underdamped Josephson Junctions*, Journal of Low Temperature Physics **163**, 164 (2011).
78. P. Kuopanportti, J. A. M. Huhtamäki, and M. Möttönen, *Size and Dynamics of Vortex Dipoles in Dilute Bose-Einstein Condensates*, Physical Review A **83**, 011603(R) (2011).

2010

79. A. Morello, J. J. Pla, F. A. Zwanenbourg, K. W. Chan, H. Huebl, M. Möttönen, C. D. Nugroho, C. Yang, J. A. van Donkelaar, A. Alves, D. N. Jamieson, C. C. Escott, L. C. L. Hollenberg, R. G. Clark, A. S. Dzurak, *Single-shot readout of an electron spin in silicon*, Nature (London) **467**, 687 (2010).
80. J. P. Pekola, V. F. Maisi, S. Kafanov, N. Chekurov, A. Kemppinen, Yu. A. Pashkin, O.-P. Saira, M. Möttönen, and J. S. Tsai, *Environment-assisted tunneling as an origin of the Dynes density of states*, Phys. Rev. Lett. **105**, 026803 (2010).
81. J. P. Pekola, V. Brosco, M. Möttönen, P. Solinas, and A. Shnirman, *Decoherence in adiabatic quantum evolution: application to Cooper pair pumping*, Phys. Rev. Lett. **105**, 030401 (2010).
82. M. Möttönen, K. Y. Tan, K. W. Chan, F. A. Zwanenbourg, W. H. Lim, C. C. Escott, J.-M. Pirkkalainen, A. Morello, C. Yang, J. A. van Donkelaar, A. D. C. Alves, D. N. Jamieson, L. C. L. Hollenberg, A. S. Dzurak, *Probe and Control of the Reservoir Density of States in Single-Electron Devices*, Phys. Rev. B **81**, 161304(R) (2010).
83. K. Y. Tan, K. W. Chan, M. Möttönen, A. Morello, C. Yang, J. van Donkelaar, A. Alves, J.-M. Pirkkalainen, D. N. Jamison, R. G. Clark, and A. S. Dzurak, *Transport spectroscopy of single phosphorus donors in a silicon nanoscale transistor*, Nano Lett. **10**, 11 (2010).

84. J. Salmilehto, P. Solinas, J. Ankerhold, and M. Möttönen, *Adiabatically steered open quantum systems: Master equation and optimal phase*, Physical Review A **82**, 062112 (2010).
85. P. Solinas, J.-M. Pirkkalainen, and M. Möttönen, *Ground-state geometric quantum computation in superconducting systems*, Physical Review A **82**, 052304 (2010).
86. P. Kuopanportti and M. Möttönen, *Stabilization and pumping of giant vortices in dilute Bose-Einstein condensates*, J. Low Temp. Phys. ST **161**, 561 (2010).
87. O.-P. Saira, M. Möttönen, V. F. Maisi, and J. P. Pekola, *Environmentally Activated Tunneling Events in a Hybrid Single-Electron Box*, Phys. Rev. B **82**, 155443 (2010).
88. P. Solinas, M. Möttönen, J. Salmilehto, and J. P. Pekola, *Decoherence of adiabatically steered quantum systems*, Physical Review B **82**, 134517 (2010).
89. J.-M. Pirkkalainen, P. Solinas, J. P. Pekola, and M. Möttönen, *Non-Abelian geometric phases in ground state Josephson devices*, Phys. Rev. B **81**, 174506 (2010).
90. P. Kuopanportti and M. Möttönen, *Splitting dynamics of giant vortices in dilute Bose-Einstein condensates*, Phys. Rev. A **81**, 033627 (2010).
91. V. Pietilä, T. Simula, and M. Möttönen, *Finite-temperature phase transitions in quasi-two-dimensional spin-1 Bose gases*, Phys. Rev. A **81**, 033616 (2010).
92. P. Kuopanportti, E. Lundh, J. A. M. Huhtamäki, V. Pietilä, and M. Möttönen, *Core sizes and dynamic instabilities of giant vortices in dilute Bose-Einstein condensates*, Phys. Rev. A **81**, 023603 (2010).

2009



93. V. Pietilä and M. Möttönen, *Creation of Dirac monopoles in spinor Bose-Einstein condensates*, Phys. Rev. Lett. **103**, 030401 (2009). Editors' suggestion.
94. A. V. Timofeev, M. Helle, M. Meschke, M. Möttönen, and J. P. Pekola, *Electronic refrigeration at the quantum limit*, Phys. Rev. Lett. **102**, 200801 (2009).
95. V. Pietilä and M. Möttönen, *Non-Abelian magnetic monopole in a Bose-Einstein condensate*, Phys. Rev. Lett. **102**, 080403 (2009).
96. W. H. Lim, F. A. Zwanenburg, H. Huebl, M. Möttönen, K. W. Chan, A. Morello, A. S. Dzurak, *Observation of the single-electron regime in a highly tunable silicon quantum dot*, Appl. Phys. Lett. **95**, 242102 (2009).
97. M. Takahashi, V. Pietilä, M. Möttönen, T. Mizushima, and K. Machida, *Vortex splitting and phase separating instabilities of coreless vortices in $F=1$ spinor Bose-Einstein condensates*, Phys. Rev. A **79**, 023618 (2009).
98. A. Kemppinen, M. Meschke, M. Möttönen, D. V. Averin, and J. P. Pekola, *Quantized current of a hybrid single-electron transistor with superconducting leads and a normal-metal island*, European Physical Journal Special Topics **172**, 311 (2009).

2008



99. M. Möttönen, J. J. Vartiainen, and J. P. Pekola, *Experimental determination of the Berry phase in a superconducting charge pump*, Phys. Rev. Lett. **100**, 177201 (2008), Editors' suggestion.
100. J. P. Pekola, J. J. Vartiainen, M. Möttönen, O.-P. Saira, M. Meschke, and D. Averin, *Hybrid single-electron transistor as a source of quantized electric current*, Nature Phys. **4**, 120 (2008).
101. O. Ahonen, M. Möttönen, and J. O'Brien, *Entanglement-Enhanced Quantum Key Distribution*, Phys. Rev. A **78**, 032314 (2008).
102. V. Pietilä, M. Möttönen, and M. Nakahara, *Topological vortex creation in spinor Bose-Einstein condensates*, in a book *Electromagnetic, magnetostatic, and exchange-interaction vortices in confined magnetic structures*, E. O. Kamenetskii (Eds.), (Research signpost, Kerala), ISBN 978-81-7895-373-1, 2008.
103. P. Kuopanportti, M. Möttönen, V. Bergholm, O.-P. Saira, J. Zhang, and K. B. Whaley, *Suppression of $1/f^\alpha$ noise in one-qubit systems*, Phys. Rev. A **77**, 032334 (2008).
104. M. Möttönen, *Kvantti-informaatio — tämän vuosisadan vallankumous!?*, Arkhimedes (journal of the Finnish physical society) **1/2008**, 24 (2008).
105. A. Kemppinen, A. J. Manninen, M. Möttönen, J. J. Vartiainen, J. T. Peltonen, and J. P. Pekola, *Suppression of the critical current of a balanced superconducting quantum interference device*, Appl. Phys. Lett. **92**, 052110 (2008).

2007



106. M. Möttönen, V. Pietilä, and S. M. M. Virtanen, *Vortex pump for dilute Bose-Einstein condensates*, Phys. Rev. Lett. **99**, 250406 (2007).
107. J. A. M. Huhtamäki, M. Möttönen, J. Ankerhold, and S. M. M. Virtanen, *Effects of interactions and noise on tunneling of Bose-Einstein condensates through a potential barrier*, Phys. Rev. A **76**, 033605 (2007).
108. V. Pietilä, M. Möttönen, and S. M. M. Virtanen, *Stability of coreless vortices in ferromagnetic spinor Bose-Einstein condensates*, Phys. Rev. A **76**, 023610 (2007).
109. O.-P. Saira, M. Meschke, F. Giazotto, A. M. Savin, M. Möttönen, and J. P. Pekola, *Heat Transistor: Demonstration of Gate-Controlled Electron Refrigeration*, Phys. Rev. Lett. **99**, 027203 (2007), Editors' suggestion.
110. J. J. Vartiainen, M. Möttönen, J. P. Pekola, and A. Kemppinen, *Nanoampere pumping of Cooper pairs*, Appl. Phys. Lett. **90**, 082102 (2007).
111. O.-P. Saira, V. Bergholm, T. Ojanen, and M. Möttönen, *Equivalent qubit dynamics under classical and quantum noise*, Phys. Rev. A **75**, 012308 (2007).

2006

112. J.A.M. Huhtamäki, M. Möttönen, T. Isoshima, V. Pietilä, and S. M. M. Virtanen, *Splitting times of doubly quantized vortices in dilute Bose-Einstein condensates*, Phys. Rev. Lett. **97**, 110406 (2006).
113. J.A.M. Huhtamäki, M. Möttönen, and S. M. M. Virtanen, *Dynamically stable multiply quantized vortices in dilute Bose-Einstein condensates*, Phys. Rev. A **74**, 063619 (2006).
114. V. Pietilä, M. Möttönen, T. Isoshima, J.A.M. Huhtamäki, and S. M. M. Virtanen, *Stability and dynamics of vortex clusters in nonrotated Bose-Einstein condensates*, Phys. Rev. A **74**, 023603 (2006).
115. M. Möttönen, J. P. Pekola, J. J. Vartiainen, V. Brosco, and F. W. J. Hekking, *Measurement scheme of the Berry phase in superconducting circuits*, Phys. Rev. B **73**, 214523 (2006).
116. M. Möttönen, R. de Sousa, J. Zhang, and K. B. Whaley, *High fidelity one-qubit operations under random telegraph noise*, Phys. Rev. A **73**, 022332 (2006).
117. M. Möttönen and J. J. Vartiainen, *Decompositions of general quantum gates* in *Trends in Quantum Computing Research*, edited by S. Shannon, ISBN 1-59454-840-4 (Nova Science Publishers Inc., New York, 2006).

2005

118. M. Möttönen, S. M. M. Virtanen, T. Isoshima, and M. M. Salomaa, *Stationary vortex clusters in nonrotating Bose-Einstein condensates*, Phys. Rev. A **71**, 033626 (2005).
119. V. Bergholm, J. J. Vartiainen, M. Möttönen, and M. M. Salomaa, *Quantum circuits with uniformly controlled one-qubit gates*, Phys. Rev. A **71**, 052330 (2005).
120. M. Möttönen, S. M. M. Virtanen, and M. M. Salomaa, *Collapse and revival of excitations in Bose-Einstein condensates*, Phys. Rev. A **71**, 023604 (2005).
121. M. Möttönen, J. J. Vartiainen, V. Bergholm, and M. M. Salomaa, *Transformation of quantum states using uniformly controlled rotations*, Quant. Inf. Comp. **5**, 467 (2005).

2004

122. M. Möttönen, J. J. Vartiainen, V. Bergholm, and M. M. Salomaa, *Quantum circuits for general multiqubit gates*, Phys. Rev. Lett. **93**, 130502 (2004).
123. J. J. Vartiainen, M. Möttönen, and M. M. Salomaa, *Efficient decomposition of quantum gates*, Phys. Rev. Lett. **92**, 177902 (2004).
124. M. Möttönen, *Vortices and elementary excitations in dilute Bose-Einstein condensates*, PhD Thesis, Helsinki University of Technology (2004).

2003

125. M. Möttönen, T. Mizushima, T. Isoshima, M. M. Salomaa, and K. Machida, *Splitting of a doubly quantized vortex through intertwining in Bose-Einstein condensates*, Phys. Rev. A **68**, 023611 (2003).

2002

126. M. Möttönen, N. Matsumoto, M. Nakahara, and T. Ohmi, *Continuous Creation of a Vortex in a Bose-Einstein Condensate with Hyperfine Spin $F=2$* , J. Phys.: Condens. Matter **14**, 13481 (2002).
127. S-i. Ogawa, M. Möttönen, M. Nakahara, T. Ohmi, and H. Shimada, *Method to create a vortex in a Bose-Einstein condensate*, Phys. Rev. A **66**, 013617 (2002).
128. M. Möttönen, *Vortex dynamics in Bose-Einstein condensates at finite temperature*, MSc Thesis, Helsinki University of Technology (2002).

Talks in seminars, meetings, and colloquia abroad

1. *Superconducting Bolometer with Ultralow Noise Equivalent Power*, **invited talk**, Seminar series of IBS Center for Axion and Precision Physics, Daejeon, Republic of Korea, 23.1.2019.
2. *Controllable dissipators for quantum electric circuits*, **invited talk**, Seminar series of IBS Center for Theoretical Physics of Complex Systems, Daejeon, Republic of Korea, 22.1.2019.
3. *Aalto Partner Presentation*, **invited talk**, kickoff meeting of the EU Quantum Technology Flagship project OpenSuperQ, Bad Honnef, Germany, 17.1.2019.
4. *Aalto Partner Presentation*, **invited talk**, kickoff meeting of the EU Quantum Technology Flagship project QMiCS, Garching, Germany, 22.11.2018.
5. *In-situ-tunable dissipators for superconducting quantum circuits and a glimpse of electron pumps and magnetic monopole analogues*, **invited talk**, seminar series at Tata Institute for Fundamental Research, Mumbai, India, 22.10.2018.
6. *Tunable dissipators for superconducting quantum electronics*, **invited talk**, Workshop on Exact Dynamics of Open Quantum Systems, Ulm University, Ulm, Germany, 7.8.2018.
7. *Superconducting electric circuits: new physics and quantum technology*, **invited talk**, Mini-Symposium on Quantum Science and Technology, Technical University of Munchen, Garching, Germany, 11.7.2018.
8. *Tunable dissipators for superconducting quantum electronics*, **invited talk**, Google Quantum AI seminar, Google SBA, Santa Barbara, USA, 8.5.2018.
9. *Superconducting electric circuits for future technologies*, **invited talk**, Memento Physics Institute, EPFL, Lausanne, Switzerland, 10.4.2018.
10. *Refrigerator that absorbs photons from your circuit only when switched on*, Engineering Quantum Systems group, MIT, Cambridge, USA, 17.1.2018.

11. *Thermal-error regime in high-accuracy gigahertz single-electron pumping*, EURAMET DC and Quantum Metrology Meeting, VTT MIKES, Espoo, Finland, 2.6.2017
12. *Quantum Knots and Monopoles*, **invited talk**, University of Sao Paolo, Sao Paolo, Brazil, 11.5.2017
13. *Quantum Knots and Monopoles*, **invited talk**, Sao Carlos Institute of Physics, Sao Carlos, Brazil, 9.5.2017
14. *Quantum-Circuit Refrigerator*, **invited talk**, CNR NEST, Pisa, Italy, 15.2.2017.
15. *Tunable Engineered Reservoirs for Electric Quantum Circuits*, **invited talk**, Walther-Meissner-Institut, Garching, Germany, 19.1.2017.
16. *Recent progress at Quantum Computing and Devices Laboratories*, **invited talk**, Seminar series of IBS Center for Theoretical Physics of Complex Systems, Daejeon, Republic of Korea, 19.10.2016.
17. *Quantum Reservoir Engineering for Electric Quantum Circuits*, **invited talk**, Physics and Astronomy colloquium at University of Victoria, Canada 14.9.2016.
18. *On-Demand Dissipation for Electric Quantum Circuits*, D-Wave Systems Inc., Vancouver, Canada 12.9.2016.
19. *Quantum-Circuit Refrigerator*, Superconducting Quantum Devices, 2016, Cambridge, UK 9.9.2016.
20. *On-demand Dissipation for Quantum Devices*, Workshop on Quantum Computing and Computational Quantum Mechanics, **keynote talk**, Jyväskylä, Finland 12.8.2016.
21. *e-SI-Amp Aalto Partner Presentation*, e-SI-Amp EMPIR project kick-off meeting, London, UK 27.6.2016.
22. *Quantum reservoir engineering for circuit quantum electrodynamics*, Seminar series of London Centre for Nanotechnology, London, UK, 20.5.2016.
23. *Recent progress at Quantum Computing and Devices Laboratories*, **invited talk**, Cavendish Laboratory Seminar, Cambridge, UK, 19.5.2016.
24. *Recent results from the Quantum Computing and Devices group*, **invited talk**, Symposium for Experimental Physics, Ulm, Germany, 7.8.2015.
25. *Quantum Electronics Meets Dissipation*, **invited talk**, ETH Symposium on Quantum Engineering, Zurich, Switzerland, 14.4.2015.
26. *SNS detector and Incoherent photon sources*, MICROPHOTO EMRP project meeting, Torino, Italy, 10.6.2014.
27. *Thermometry and power sensing with superconductor-normal-superconductor proximity structures*, MICROPHOTO EMRP project kick-off, Braunschweig, Germany, 10.6.2013.
28. *Topological creation of vortices and monopoles in spin-1 Bose-Einstein condensates*, **invited talk**, Nordita program: Quantum solids, liquids, and gases, Stockholm, Sweden, July 21st 2010.

29. *Electron transport and spin qubit experiments on single-donor silicon devices*, Alan Aspuru-Guzik group seminar, Harvard/Cambridge, USA, Aug. 26th 2009.
30. *Topological phase imprinting and monopoles in coherent matter fields*, **invited talk**, Sydney Quantum Information Workshop, Sydney, Australia, Feb. 6th 2009.
31. *Experimental determination of the Berry phase in a superconducting charge pump*, **invited talk**, QSciTech seminar, Macquarie University, Sydney, Australia, Dec. 11th 2008.
32. *Single Cooper pair electronics at PICO group*, kick-off meeting for the European Research Council project SCOPE, KTH, Stockholm, Sweden, Oct. 15th 2008.
33. *Observation of the Berry phase in a superconducting charge pump*, **invited talk**, Annual Workshop of the Center for Quantum Computer Technology, The Naval and Military Club, Melbourne, Australia, Feb. 19th 2008.
34. *BEC research at QCD group*, **invited talk**, Machida group seminar, Okayama, Japan, Feb. 13th 2008.
35. *Observation of the Berry phase in a superconducting charge pump*, **invited talk**, Nakahara group seminar, Kinki University, Osaka, Japan, Feb. 11th 2008.
36. *Observation of the Berry phase in a superconducting charge pump*, **invited talk**, Solid state physics seminar, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, Dec. 13th 2007.
37. *First steps to geometric quantum computation in Josephson devices—Observation of the Berry phase*, **invited talk**, Special seminar, University Southern California, Los Angeles, USA, Sep. 11th 2007.
38. *First steps to geometric quantum computation in Josephson devices—Observation of the Berry phase*, **invited talk**, Special seminar, University of California, Berkeley, USA, Sep. 5th 2007.
39. *Suppression of decoherence and $1/f$ noise in one-qubit operations*, **invited talk**, Berkeley Quantum Information and Computation seminar, University of California, Berkeley, USA, Oct. 31th 2006.
40. *Measurement of the Berry phase in superconducting circuits*, **invited talk**, USC seminar class: Department of Physics and Astronomy, University of Southern California, Los Angeles, USA, Feb. 23th 2006.
41. *Measurement of the Berry phase in superconducting circuits*, J. Clarke group seminar, University of California, Berkeley, USA, Feb. 17th 2006.
42. *Topological creation and stability of vortices in dilute Bose-Einstein condensates*, **invited talk**, Research seminar, Institute for Scientific Interchange, Torino, Italy, Oct. 10th 2005.
43. *Efficient decompositions of arbitrary n -qubit gates*, **invited talk**, Quantum Information and Bose-Einstein Condensate seminar, National Institute of Standards and Technology, Gaithersburg, USA, Apr. 20th 2005.

44. *Efficient decompositions of arbitrary n-qubit gates*, Berkeley Quantum Information and Computation seminar, University of California, Berkeley, USA, Apr. 4th 2005.
45. *Vortices and elementary excitations in dilute Bose-Einstein condensates*, Nordic Project Meeting: Manipulating atomic matter, Nordita, Copenhagen, Denmark, Jan. 12th 2005.
46. *Quantum circuits for general multiqubit gates*, **invited talk**, Work shop on quantum information processing, Kinki University, Osaka, Japan, Sep. 7th 2004.

International conference presentations (excluding invited talks given above)

1. M. Möttönen et al., talk on *Observation of a Broadband Lamb Shift in a Superconducting Resonator*, APS March Meeting 2019, 2019, Boston, USA.
2. Joni Ikonen, Jan Goetz, Jesper Ilves, Aarne Keränen, Andras M. Gunyho, Matti Partanen, Kuan Y. Tan, Leif Grönberg, Visa Vesterinen, Slawomir Simbierowicz, Juha Hassel, and Mikko Möttönen, poster on *Qubit Measurement by Multi-Channel Driving*, 687. WE-Heraeus-Seminar on 'Scalable Hardware Platforms for Quantum Computing, 2019, Bad Honnef, Germany.
3. M. Möttönen et al., talk on *Superconducting Bolometer with Ultralow Noise Equivalent Power*, Kryo 2018 meeting, 2018, Schöntal, Germany.
4. W. Lee, A. H. Gheorghe, K. Tiurev, T. Ollikainen, M. Möttönen, and D. S. Hall, **invited poster** on *Synthetic electromagnetic knot in a three-dimensional skyrmion*, Humboldt Kolleg – Controlling quantum matter: From ultracold atoms to solids, 2018, Vilnius, Lithuania.
5. M. Möttönen et al., talk on *Ultrasensitive microwave detector*, The 27th Conference of the EPS Condensed Matter Division, 2018, Berlin, Germany.
6. M. Möttönen et al., talk on *Quickly Tunable Refrigerator for Superconducting Quantum Circuits*, APS March Meeting 2018, 2018, Los Angeles, USA.
7. M. Möttönen et al., poster on *Microwave Bolometer with Low Noise-Equivalent Power*, Nanoscience Days, 2017, Jyväskylä, Finland.
8. M. Möttönen et al., poster on *Tying quantum knots*, Bose-Einstein Condensation 2017: Frontiers in Quantum Gases, 2017, Sant Feliu, Spain.
9. M. Möttönen et al., talk on *High-precision transport of single electrons using a silicon quantum dot*, Silicon Quantum Electronics Workshop, 2017, Portland, USA.
10. M. Möttönen et al., poster on *Quantum-circuit refrigerator*, 28th International Conference on Low Temperature Physics, 2017, Gothenburg, Sweden.
11. M. Möttönen et al., talk on *Extremely Sensitive Microwave Bolometer Suitable for Quantum Sensing*, Mesoscopic Transport and Quantum Coherence, 2017, Espoo, Finland.
12. J. Govenius et al., and M. Möttönen, **invited poster** on *Microwave bolometer with an ultralow noise equivalent power*, FQMT'17, July 2017, Prague, Czech Republic.

13. M. Möttönen et al., talk on *Quantum-circuit refrigerator*, APS March Meeting 2017, 2017, New Orleans, USA.
14. M. Möttönen et al., poster on *Integrating normal-metal components into the framework of circuit quantum electrodynamics*, QuantERA partnering meeting, February 2017, Valetta, Malta.
15. M. Möttönen et al., poster on *On-demand Dissipation in Electric Quantum Circuits*, 635. WE-Heraeus-Seminar on Scalable Architectures for Quantum Simulation, January 2017, Bad Honnef, Germany.
16. M. Möttönen et al., talk on *Experiments on engineered on-chip heat reservoirs for superconducting devices*, The 26th Conference of the EPS Condensed Matter Division, 2016, Groningen, Netherlands.
17. M. Möttönen et al., talk on *Superconductor/normal-metal hybrids for quantum technology*, Silicon Quantum Information Processing 2016, Cambridge, UK.
18. M. Möttönen et al., poster on *Bidirectional electron pumping using a silicon quantum dot*, Silicon Quantum Information Processing 2016, Cambridge, UK.
19. M. Möttönen et al., poster on *Bidirectional electron pumping using a silicon quantum dot*, Silicon Quantum Electronics Workshop, 2016, Delft, Netherlands.
20. M. Möttönen et al., talk on *Engineered dissipative reservoirs for superconducting circuits*, Statistical Mechanics of Quantum Dynamics, 2016, Mariehamn, Åland.
21. M. Partanen et al., and M. Möttönen, poster on *Experiments on normal-metal components integrated into the framework of circuit quantum electrodynamics*, Statistical Mechanics of Quantum Dynamics, 2016, Mariehamn, Åland.
22. M. Möttönen et al., talk on *Detection of zeptojoule microwave pulses using electrothermal feedback*, MICROPHOTON 2016 Workshop, 2016, London, UK.
23. M. Möttönen et al., talk on *Quantum-limited heat conduction over macroscopic distances*, APS March Meeting 2016, 2016, Baltimore, USA.
24. M. Möttönen et al., poster on *Experimental Observations of Magnetic-Monopole Analogues in Spinor Bose-Einstein Condensates*, Bose-Einstein Condensation 2015: Frontiers in Quantum Gases, 2015, Sant Feliu, Spain.
25. J. Govenius et al., and M. Möttönen, **invited poster** on *Microwave detector and heat conduction in the framework of circuit quantum electrodynamics*, FQMT'15, July 2015, Prague, Czech Republic.
26. M. Möttönen et al., talk **by invitation** on *Integrating normal-metal components into the framework of circuit quantum electrodynamics*, The 25th Conference of the EPS Condensed Matter Division, August 2014, Paris, France.
27. M. Möttönen et al., talk on *Observations of Quantum-Mechanical Monopoles*, 27th International Conference on Low Temperature Physics, August 2014, Buenos Aires, Argentina.

28. M. Möttönen et al., talk on *Measurement and modeling of very low volume and critical current superconductor–normal-metal–superconductor junctions*, International Workshop “Cryogenic Nanodevices”, 2013, Kiruna, Sweden.
29. M. Möttönen et al., poster on *Creation of Dirac monopoles in spin-1 Bose-Einstein condensates*, Bose-Einstein Condensation 2013: Frontiers in Quantum Gases, 2013, Sant Feliu, Spain.
30. M. Möttönen and J. Salmilehto, talk on *Conservation law of operator current in open quantum systems*, International Workshop on Silicon Quantum Electronics, 2012, Sydney, Australia.
31. M. Möttönen, O.-P. Saira, Y. Yoon, T. Tantt, J. P. Pekola, talk on *Test of Jarzynski and Crooks fluctuation relations in an electronic system*, Capri Fall Workshop on "Non-equilibrium processes & fluctuation-dissipation theorems", 2012, Capri, Italy.
32. M. Möttönen, P. Solinas, I. Kamleitner, J.-M. Pirkkalainen, C. Müller, J. P. Pekola, and A. Shnirman, talk on *Geometric non-Abelian phases using Josephson devices*, Quantum Information Processing and Communication, 2011, Zurich, Switzerland.
33. K. W. Chang, M. Möttönen, A. Kemppinen, N. S. Lai, K. Y. Tan, W. H. Lim, and A. S. Dzurak, poster on *Single-electron shuttle based on a silicon quantum dot*, 26th International Conference on Low Temperature Physics, 2011, Beijing, China.
34. M. Möttönen et al., talk on *Transport and Single-Shot Readout of Electron Spins in Silicon*, Moriond 2011 – Quantum Mesoscopic Physics, 2011, La Thuile, Italy.
35. M. Möttönen and V. Pietilä, poster on *Creation of Dirac monopoles in spinor Bose-Einstein condensates*, Bose-Einstein Condensation 2009: Frontiers in Quantum Gases, 2009, Sant Feliu, Spain.
36. M. Möttönen, A. Kemppinen, M. Meschke, J. J. Vartiainen, O.-P. Saira, D. V. Averin, J. P. Pekola, talk on *Quantized current with SINIS turnstile*, Symposium on Quantum Phenomena and Devices at Low Temperatures, 2008, Espoo, Finland.
37. M. Möttönen, J. J. Vartiainen, A. Kemppinen, and J. P. Pekola, talk on *Observation of the Berry phase in a superconducting charge pump*, Moriond 2008 Quantum Transport and Nanophysics, 2008, La Thuile, Italy.
38. M. Möttönen, V. Pietilä, and S. M. M. Virtanen, poster on *Vortex pumping in dilute Bose-Einstein condensates*, Bose-Einstein Condensation 2007: Frontiers in Quantum Gases, 2007, Sant Feliu, Spain.
39. M. Möttönen, R. de Sousa, J. Zhang, and K. B. Whaley, poster on *High fidelity one-qubit operations under random telegraph noise*, ICTP Workshop on Noise and Instabilities in Quantum Mechanics, 2005, Trieste, Italy.
40. M. Möttönen, R. de Sousa, J. Zhang, and K. B. Whaley, talk on *High fidelity one-qubit operations under random telegraph noise*, Quantum computing 2005: Algorithms, Physical Realizations and Beyond, 2005, Osaka, Japan.
41. M. Möttönen, R. de Sousa, J. Zhang, and K. B. Whaley, *High fidelity one-qubit operations under random telegraph noise*, EQIS, 2005, Tokyo, Japan.

42. M. Möttönen, V. Bergholm, and J. J. Vartiainen, *Almost optimal fixed structure circuit for arbitrary n-qubit gates*, Gordon research conference: Quantum Information Science, 2005, Ventura, USA.
43. M. Möttönen, J. J. Vartiainen, V. Bergholm, and M. M. Salomaa, *Local preparation of quantum states*, EQIS, 2004, Tokyo, Japan.

National Conference presentations and proceedings (presenting author underlined)

(Years following 2014 not recorded)

2014

1. J. Govenius, R. E. Lake, K. Y. Tan, V. Pietilä, P. Virtanen, T. T. Heikkilä, J. K. Julin, I. J. Maasilta, and M. Möttönen, *Thermal Analysis of a Nanobolometer*, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.
2. M. W. Ray, E. Ruokokoski, S. Kandel, M. Möttönen, and D. S. Hall, Observation of Dirac Monopoles, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.
3. T. Tantt, A. Rossi, K. Y. Tan, I. Iisakka, R. Zhao, A. S. Dzurak, and M. Möttönen, High-precision single-electron current source based on a silicon quantum dot, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.
4. K. Y. Tan, M. P. Partanen, R. E. Lake, J. Govenius, P. J. Jones, and M. Möttönen, Single-Photon Heat Conduction in Electronic Circuits, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.
5. M. Möttönen, M. W. Ray, E. Ruokokoski, T. Ollikainen, S. Kandel, and D. S. Hall, Monopoles and Skyrmions in Bose–Einstein Condensates, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.
6. Juha Salmilehto, Paolo Solinas, and Mikko Möttönen, Quantum Driving and Work, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.
7. K. Tiurev, E. Ruokokoski, M. W. Ray, D. S. Hall, and M. Möttönen, Creation of an Isolated Monopole Excitation in a Dilute Bose-Einstein Condensate, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.
8. Russell Lake, Joonas Govenius, Kuan Yen Tan, Ville Pietelä, and Mikko Möttönen, Probing the Impedance of Superconducting Weak Links, XLVIII Annual Conference of the Finnish Physical Society, 2014, Tampere, Finland.

2013

9. R. Lake, J. Govenius, K. Y. Tan, P. Jones, and M. Möttönen, *Measuring ultrahigh-frequency impedance of superconductor-normal-superconductor junctions*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
10. T. Tantt, K. Y. Tan, A. Rossi, A. S. Dzurak, and M. Möttönen, *Single-electron shuttle for current metrology*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.

11. J. Govenius, R. Lake, V. Pietilä, P. Virtanen, T. Heikkilä, and M. Möttönen, *Measurement and modeling of very low volume and critical current superconductor–normal-metal–superconductor junctions*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
12. J. Salmilehto, P. Solinas, J. P. Pekola, and M. Möttönen, *Conservation of operator current in open quantum systems and application to cooper pair pumping*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
13. P. Kuopanportti, B. P. Anderson, and M. Möttönen, *Vortex pump for Bose–Einstein condensates utilizing a time-averaged orbiting potential trap*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
14. E. Ruokokoski, P. Kuopanportti, and M. Möttönen, *Vortex-dipole pump for dilute Bose–Einstein condensates*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
15. H. Mäkelä, J. Salmilehto, and M. Möttönen, *Detrimental effects of the rotating wave approximation on modeled non-Markovian dynamics*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
16. K. Y. Tan, M. P. Partanen, R. Lake, P. J. Jones, and M. Möttönen, *Single-photon heat conduction in a microwave circuit*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
17. P. J. Jones, J. A. M. Huhtamäki, K. Y. Tan, M. Partanen, and M. Möttönen, *Artificial tunable environments for superconducting quantum bits*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.
18. J. V. Koski, T. Sagawa, O.-P. Saira, P. Solinas, A. Kutvonen, Y. Yoon, M. Möttönen, T. Ala-Nissilä, and J. P. Pekola, *Distribution of Entropy Production in Nonequilibrium Single-Electron Tunneling*, XLVII Annual Conference of the Finnish Physical Society, 2013 Espoo, Finland.

2012

19. J. P. Pekola, O.-P. Saira, Y. Yoon, T. Tantt, M. Möttönen, A. Kutvonen, T. Ala-Nissilä, and D. V. Averin, *Test of Jarzynski and Crooks fluctuation relations in single-electron tunneling*, XLVI Annual Conference of the Finnish Physical Society, 2012 Joensuu, Finland.
20. J. Salmilehto and M. Möttönen, *Superadiabatic theory for Cooper pair pumping*, XLVI Annual Conference of the Finnish Physical Society, 2012 Joensuu, Finland.
21. P. Kuopanportti, J. A. M. Huhtamäki, and M. Möttönen, *Vortex lattices in two-species Bose-Einstein condensates*, XLVI Annual Conference of the Finnish Physical Society, 2012 Joensuu, Finland.
22. K. W. Chan, M. Möttönen, A. Kemppinen, N. S. Lai, K. Y. Tan, W. H. Lim, A. S. Dzurak, *Single-electron shuttle based on a silicon quantum dot*, XLVI Annual Conference of the Finnish Physical Society, 2012 Joensuu, Finland.

23. F. Hoehne, Yu. A. Pashkin, O. V. Astafiev, M. Möttönen, J. P. Pekola, and J. S. Tsai, *Coherent superconducting quantum pump*, XLVI Annual Conference of the Finnish Physical Society, 2012 Joensuu, Finland.
24. P. J. Jones, J. A. M. Huhtamäki, K. Y. Tan, and M. Möttönen, *Single-photon heat conduction in electrical circuits*, XLVI Annual Conference of the Finnish Physical Society, 2012 Joensuu, Finland.

2010

25. M. Möttönen, A. Morello, J. J. Pla, F. A. Zwanenburg, K. W. Chan, K. Y. Tan, H. Huebl, C. D. Nugroho, C. Yang, J. A. van Donkelaar, A. D. C. Alves, D. N. Jamieson, C. C. Escott, J.-M. Pirkkalainen, L. C. L. Hollenberg, R. G. Clark, and A. S. Dzurak, *Single-shot readout of individual electron spins in silicon*, XLV Annual Conference of the Finnish Physical Society, 2011 Helsinki, Finland.
26. O.-P. Saira, A. Kemppinen, V. Maisi, S. Lotkhov, M. Möttönen and J. Pekola, *Experimental studies on single-electron transport in the attoampere scale and below*, XLV Annual Conference of the Finnish Physical Society, 2011 Helsinki, Finland.
27. P. Kuopanportti, J. A. M. Huhtamäki, and M. Möttönen, *Size and dynamics of vortex dipoles in dilute Bose–Einstein condensates*, XLV Annual Conference of the Finnish Physical Society, 2011 Helsinki, Finland.
28. Y. Yoon, S. Gasparinetti, M. Möttönen, and J. P. Pekola, *Capacitively enhanced thermal escape in underdamped josephson junctions*, XLV Annual Conference of the Finnish Physical Society, 2011 Helsinki, Finland.
29. P. Solinas, J.-M. Pirkkalainen and M. Möttönen, *Ground-state geometric quantum computing in superconducting systems*, XLV Annual Conference of the Finnish Physical Society, 2011 Helsinki, Finland.
30. J. Salmilehto, P. Solinas, M. Möttönen, J. Ankerhold, and J. P. Pekola, *Addressing open quantum systems in adiabatic steering*, XLV Annual Conference of the Finnish Physical Society, 2011 Helsinki, Finland.
31. E. Ruokokoski and M. Möttönen, *Monopoles and dipoles in spinor Bose–Einstein condensates*, XLV Annual Conference of the Finnish Physical Society, 2011 Helsinki, Finland.

2010

32. V. F. Maisi, S. Kafanov, Yu. A. Pashkin, A. Kemppinen, N. Chekurov, O.-P. Saira, M. Möttönen, J. S. Tsai, A. Manninen, and J. P. Pekola, *Performance improvements of a single electron turnstile*, XLIV Annual Conference of the Finnish Physical Society, 2010 Jyväskylä, Finland.
33. M. Möttönen, K. Y. Tan, K. W. Chan, A. Morello, C. Yang, J. van Donkelaar, A. Alves, J.-M. Pirkkalainen, D. N. Jamieson, R. G. Clark, and A. S. Dzurak, *Single-atom transistor*, XLIV Annual Conference of the Finnish Physical Society, 2010 Jyväskylä, Finland.

34. O.-P. Saira, M. Möttönen, and J. P. Pekola, *Effect of environmental fluctuations on single-electron processes in hybrid tunnel junctions*, XLIV Annual Conference of the Finnish Physical Society, 2010 Jyväskylä, Finland.
35. V. F. Maisi, S. Kafanov, Yu. A. Pashkin, A. Kemppinen, N. Chekurov, O.-P. Saira, M. Möttönen, J. S. Tsai, A. Manninen, and J. P. Pekola, *Performance improvements of a single electron turnstile*, XLIV Annual Conference of the Finnish Physical Society, 2010 Jyväskylä, Finland.
36. J. P. Pekola, V. Brosco, M. Möttönen, P. Solinas, and A. Shnirman, *Decoherence in adiabatic quantum evolution – application to cooper pair pumping*, XLIV Annual Conference of the Finnish Physical Society, 2010 Jyväskylä, Finland.
37. J.-M. Pirkkalainen, P. Solinas, J. P. Pekola, and M. Möttönen, *Proposal for a ground state geometric qubit in superconducting circuits*, XLIV Annual Conference of the Finnish Physical Society, 2010 Jyväskylä, Finland.
38. P. Kuopanportti, E. Lundh, J. A. M. Huhtamäki, V. Pietilä, and M. Möttönen, *Dynamics of giant vortices in dilute bose-einstein condensates*, XLIV Annual Conference of the Finnish Physical Society, 2010 Jyväskylä, Finland.

2009

39. M. Helle, M. Möttönen, J. J. Vartiainen, and J. P. Pekola, *Experimental determination of the Berry phase in a superconducting charge pump*, XLIII Annual Conference of the Finnish Physical Society, 2009 Espoo, Finland.
40. P. Kuopanportti, M. Möttönen, and E. Lundh, *Dynamic instabilities of giant vortices in dilute Bose-Einstein condensates*, XLIII Annual Conference of the Finnish Physical Society, 2009 Espoo, Finland.
41. A. Kemppinen, S. Kafanov, Yu. A. Pashkin, M. Meschke, M. Möttönen, D. V. Averin, and J. P. Pekola, *Quantized current of the SINIS turnstile*, XLIII Annual Conference of the Finnish Physical Society, 2009 Espoo, Finland.
42. A. V. Timofeev, M. Helle, M. Meschke, M. Möttönen, and J. P. Pekola, *Electronic refrigeration at the quantum limit*, XLIII Annual Conference of the Finnish Physical Society, 2009 Espoo, Finland.
43. S. Kafanov, A. Kemppinen, Yu. A. Pashkin, M. Meschke, M. Möttönen, D. V. Averin, and J. P. Pekola, *Experimental observation of the microwave cooling in the (SINIS) turnstile*, XLIII Annual Conference of the Finnish Physical Society, 2009 Espoo, Finland.

2008

44. O. Ahonen, M. Möttönen, and J. O'Brien, *Entanglement-enhanced quantum key distribution*, XLII Annual Conference of the Finnish Physical Society, 2008 Turku, Finland.
45. M. Möttönen, V. Pietilä, and S. M. M. Virtanen, *Vortex pump for dilute Bose-Einstein condensates*, XLII Annual Conference of the Finnish Physical Society, 2008 Turku, Finland.

46. M. Meschke, O.-P Saira, F. Giazotto, A. M. Savin, M. Möttönen, and J. P. Pekola, *Gate-controlled electronic refrigeration in a normal metal-superconductor hybride single-electron transistor*, XLII Annual Conference of the Finnish Physical Society, 2008 Turku, Finland.
47. A. Kemppinen, M. Meschke, M. Möttönen, J. J. Vartiainen, J. T. Peltonen, A. J. Manninen, O.-P Saira, D. V. Averin, and J. P. Pekola, *Towards a quantum current standard*, XLII Annual Conference of the Finnish Physical Society, 2008 Turku, Finland.

2007

48. A. Kemppinen, J. J. Vartiainen, M. Möttönen, J. T. Peltonen, and J. P. Pekola, *Development of a Cooper pair pump: Towards a quantum current standard*, XLI Annual Conference of the Finnish Physical Society, 2007 Tallin, Estonia.
49. O.-P. Saira, V. Bergholm, T. Ojanen, and M. Möttönen, *Equivalent qubit dynamics under classical and quantum noise*, XLI Annual Conference of the Finnish Physical Society, 2007 Tallin, Estonia.
50. J. A. M. Huhtamäki, M. Möttönen, and S. M. M. Virtanen, *Dynamical stability of multiply quantized vortices in Bose-Einstein condensates*, XLI Annual Conference of the Finnish Physical Society, 2007 Tallin, Estonia.
51. V. Bergholm, P. Kuopanportti, M. Möttönen, O.-P. Saira, J. Zhang, and K. B. Whaley, *Suppression of $1/f$ noise in one-qubit systems*, XLI Annual Conference of the Finnish Physical Society, 2007 Tallin, Estonia.
52. V. Pietilä, M. Möttönen, and S. M. M. Virtanen, *Stability of coreless vortices in ferromagnetic spinor Bose-Einstein condensates*, XLI Annual Conference of the Finnish Physical Society, 2007 Tallin, Estonia.

2006

53. M. Möttönen, J. J. Vartiainen, J. P. Pekola, and F. W. K. Hekking, *Measurement scheme for Berry phase in superconducting circuits*, XL Annual Conference of the Finnish Physical Society, 2006 Tampere, Finland.
54. A. Kemppinen, J. J. Vartiainen, A. O. Niskanen, M. Möttönen, K. H. A. Baarman, A. Manninen, H. Seppä, and J. P. Pekola, *Development of a Cooper pair pump: towards a quantum current standard*, XL Annual Conference of the Finnish Physical Society, 2006 Tampere, Finland.
55. J. A. M. Huhtamäki, M. Möttönen, and S. M. M. Virtanen, *Splitting of doubly quantized vortices in dilute Bose-Einstein condensates*, XL Annual Conference of the Finnish Physical Society, 2006 Tampere, Finland.
56. V. Pietilä, M. Möttönen, S. M. M. Virtanen, and T. Isoshima, *Dynamics and stability of vortex clusters in nonrotating Bose-Einstein condensates*, XL Annual Conference of the Finnish Physical Society, 2006 Tampere, Finland.

2005

57. M. Möttönen, S. M. M. Virtanen, and M. M. Salomaa, *Collapse and revival of excitations in Bose-Einstein condensates*, XXXIX Annual Conference of the Finnish Physical Society, 2005 Espoo, Finland.
58. J. J. Vartiainen, M. Möttönen, and V. Bergholm, *Reducing unstructured unitary transformations to elementary gate sequences*, XXXIX Annual Conference of the Finnish Physical Society, 2005 Espoo, Finland.
59. S. M. M. Virtanen, M. Möttönen, T. Isoshima, and M. M. Salomaa, *Stationary vortex clusters in nonrotating Bose-Einstein condensates, theory*, XXXIX Annual Conference of the Finnish Physical Society, 2005 Espoo, Finland.

2004

60. M. Möttönen, S. M. M. Virtanen, and M. M. Salomaa, *Calculation of excitations in Bose-Einstein condensates within second order theory*, XXXVIII Annual Conference of the Finnish Physical Society, 2004 Oulu, Finland.
61. S. M. M. Virtanen, M. Möttönen, and M. M. Salomaa, *Stability of vortices in dilute Bose-Einstein condensates within mean-field theories*, XXXVIII Annual Conference of the Finnish Physical Society, 2004 Oulu, Finland.
62. J. Vartiainen, M. Möttönen, and M. M. Salomaa, *Efficient decomposition of quantum gates*, XXXVIII Annual Conference of the Finnish Physical Society, 2004 Oulu, Finland.

2003

63. M. Möttönen, T. Isoshima, and M. M. Salomaa, *Splitting of a multiply quantized vortex in Bose-Einstein condensates*, XXXVII Annual Conference of the Finnish Physical Society, 2003 Helsinki, Finland.

2002

64. Mikko Möttönen, *Creation of a vortex in Bose-Einstein condensate with hyperfine spin $F=2$* , XXXVI Annual Conference of the Finnish Physical Society, 2002 Joensuu, Finland.

2001

65. Mikko Möttönen, *Qbits with spins in quantum dots: physical basis*, HUT Report TKK-F-A810: "Quantum computing - physical realizations", 2001.

