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Fernando Brandão

Nationality: Brazilian
Born: 22/01/1983

Employment

2016- **Bren Professor of Theoretical Physics**, Physics, Mathematics and Astronomy Division, California Institute of Technology.

2015-2016 **Researcher**, Quantum Architectures and Computation Group, Microsoft Research.

2014-2016 **Reader**, Department of Computer Science, University College London.

2013-2014 **Lecturer**, Department of Computer Science, University College London.

2012-2013 **Senior Researcher**, Institute for Theoretical Physics, ETH Zürich.

2011-2012 **Assistant Professor**, Department of Physics, Universidade Federal de Minas Gerais.

2010-2011 **Research Fellow**, Department of Physics, Universidade Federal de Minas Gerais.

2008-2010 **Postdoctoral Fellow**, Department of Physics, Imperial College London.

Education

2008 **PhD in Physics**, Imperial College London, Supervisor: Martin Plenio.

2005 **MSc in Physics**, Universidade Federal de Minas Gerais.

2004 **BSc in Physics**, Universidade Federal de Minas Gerais.

Prizes and Distinctions

2014 **Block Award**, Aspen Center for Physics.

2013 **European Quantum Information Young Investigator Award**, QIPC.
Quotation: "for his highly appraised achievements in entanglement theory, quantum complexity theory, and quantum many-body physics, which combine dazzling mathematical ability and impressive physical insight".

2008 **PhD Thesis Prize 2008**, European Physical Society Quantum Electronics and Optics Division.

2008 **PhD Thesis Prize 2008**, Institute of Physics Quantum Electronics Division.

2006 **Valerie Myerscough Prize in Astronomy, Mathematics, and Physics**, University of London.

2000 **First Place**, admission exam of Universidade Federal de Minas Gerais for undergraduate studies in the science and engineering degrees (over 30,000 applicants). Second place in the overall classification (over 70,000 applicants).

2000 **First Place**, admission exam of Universidade Catolica de Minas Gerais for undergraduate studies in the science and engineering degrees (over 3,000 applicants). Second place in the overall classification (over 10,000 applicants).

Funding

2013-2017 **EPSRC Early Career Fellowship**, 1,100,000 pounds (1,700,000 dollars).

2014 **Leverhulme Visiting Professorship**, 20,000 pounds (34,000 dollars).
For hosting Prof. Aram Harrow (MIT) at UCL

2010-2011 **FAPEMIG "Conhecimento Novo" Fellowship**, 300,000 reais (180,000 dollars).

2008-2010 **EPSRC Postdoctoral Fellowship in Physics**, 240,000 pounds (385,000 dollars).

2005-2008 **CNPq Scholarship for PhD Studies**, 197,000 reais (120,000 dollars).

Membership

2016- **Cambridge Quantum Computing Limited**, Scientific Advisor.

2016- **Physics Reports**, Editorial Board.

2016 **AQIS**, Program Committee.

2014-2016 **QIP**, Steering Committee.

2014 **CEQIP 2014**, Program Committee.

2013 **QIP 2014**, Program Committee.

2013 **TQC 2013**, Program Committee, co-chair.

2011 **QIP 2012**, Program Committee.

2011-2016 **Brazilian Academy of Science**, Affiliated Member.

Visiting Positions

2014-2017 **Department of Mathematics, Universidade Federal de Minas Gerais**, *Visiting Professor*, "Professor Visitante Especial", Ciência sem Fronterias.
Belo Horizonte, Brazil

2013- **Perimeter Institute for Theoretical Physics**, *Visiting Fellow*.
Waterloo, Canada

2013-2014 **National Quantum Information Center of Gdansk**, *Scientific Consultant*.
Sopot, Poland

2014 Fev-May **Simons Institute for the Theory of Computing**, *Visiting Researcher*, Program on Quantum Hamiltonian Complexity.
Berkeley, US

2013 Sept-Dec **Isaac Newton Institute for Mathematical Sciences**, *Visiting Researcher*, Program on Mathematical Challenges in Quantum Information.
Cambridge, UK

2011-2012 **Center for Quantum Technologies**, *Visiting Senior Research Fellow*.
Singapore

2010 Sept-Dec **Institute Mittag-Leffler**, *Visiting Researcher*, Program on Quantum Information Theory.
Stockholm, Sweden

2009 Aug-Oct **The Erwin Schröndiger International Institute for Mathematical Physics**, *Visiting Researcher*, Long-Term Programme on Entanglement and Correlations in Many-Body Quantum Mechanics.
Vienna, Austria

2009 Jul-Aug **The Fields Institute For Research in Mathematical Sciences**, *Visiting Researcher*, Thematic Program on Mathematics of Quantum Information.
Toronto, Canada

Teaching

2015 **Lecturer**, *quantum information, thermodynamics and statistical mechanics*, summer school, 5 lecturing hours.
V Quantum Information School and Workshop, Paraty

2014 **Lecturer**, *area laws and information theory*, summer school, 7 lecturing hours.
The Institute of Mathematical Sciences, Chennai

2013 **Lecturer**, *the mathematics of entanglement*, summer school, 5 lecturing hours.
Universidad de los Andes, Bogota

2011 **Lecturer**, *quantum information theory*, graduate course, 60 lecturing hours.
Universidade Federal de Minas Gerais, Belo Horizonte

2011 **Lecturer**, *electromagnetism*, 2nd year undergraduate course, 60 lecturing hours.
Universidade Federal de Minas Gerais, Belo Horizonte

2005-2008 **TA**, *calculus, linear algebra, and quantum mechanics*, 1st year undergraduate courses.
Imperial College London, London

Supervision

2015 **Michael Beverland**, Intern, Microsoft Research.
joint supervision with Krysta Svore

2015 **Kohtaro Kato**, Intern, Microsoft Research.

2015 **Alex Kubica**, Intern, Microsoft Research.
joint supervision with Krysta Svore

2014-2016 **Zoltan Zimboras**, Postdoc, University College London.

2013-2015 **Winton Brown**, Postdoc, University College London.

2013-2016 **Max Frenzel**, PhD Student, Imperial College.

2012 **Arne Hansen**, Master Student, ETH Zürich.
joint supervision with Matthias Christandl

Invited Talks

51 talks, including 3 plenary talks at QIP[1]

2016 **Workshop on Approximation Algorithms**, *Fast algorithms for optimising over unentangled states: SDP hierarchies vs eps-nets*, IMS, NUS.
Singapore

2015 **30 Coloquio Brasileiro de Matematica**, *Teoria da Informacao e Computacao Quantica*, IMPA.
Rio de Janeiro, Brazil

[1] QIP is the most important and competitive conference in theoretical aspects of quantum information science. Yearly out of an average of 220 submissions, 10 are selected as featured talks and 25 as contributed talks. The 6 best results of the year are invited to give a plenary talk.

2015 **XVIII International Conference in Mathematical Physics**, *Quantum Gibbs Samplers*.
Santiago, Chile

2015 **Quantum Spin Systems: Recent Advances**, *Equivalence of Ensembles from Finite Correlation Length*, University Cergy-Pontoise.
Cergy-Pontoise, France

2015 **Q Retreat**, *Quantum Gibbs Samplers*, University of California Santa Barbara.
Santa Barbara, US

2015 **Quantum Hamiltonian Complexity Reunion Workshop**, *Quantum Gibbs Samplers*, Simons Institute for the Theory of Computing.
Berkeley, US

2015 **NSF Conference on Mathematical Science Challenges in Quantum Information**, *Quantum Information vs Statistical Mechanics*.
Washington DC, US

2015 **Peter Whittle Colloquim**, *Hypothesis Testing and Quantum Stein's Lemma for Quantum Systems*, Center for Mathematical Sciences, University of Cambridge.
Cambridge, UK

2015 **Coogee 2015**, *Fawzi-Renner Inequality by State Redistribution*.
Sydney, Australia

2014 **PCQC Inauguration Workshop**, *Entanglement Area Law from Heat Capacity*, Institute Henri Poincare.
Paris, France

2014 **International Iran Conferences on Quantum Information**, *Entanglement Area Law from Heat Capacity*, Isfahan University of Technology.
Isfahan, Iran

2014 **2nd Seefeld Workshop on Quantum Information**, *Equivalence of Ensembles in Quantum Statistical Mechanics*.
Seefeld, Austria

2014 **CEQIP 2014**, *Limitations for Quantum PCPs*.
Znojmo, Czech Republic

2014 **ColLoQuI 2014**, *Quantum Darwinism is Generic*, UCL.
London, UK

2014 **Beyond i.i.d. Conference 2014**, *Quantum de Finetti Theorems*, NUS.
Singapore

2014 **QuICS Workshop on Quantum Information and Computer Science**, *Area Laws for Entanglement*, Maryland University.
Washington DC, US

2014 **New Perspectives on Thermalization**, *Thermalization, Entanglement, and Quantum Information*, Aspen Center for Physics.
Aspen, US

2014 **Quantum Games and Protocols**, *Limitation for Quantum PCPs*, Simons Institute for the Theory of Computing.
Berkeley, US

2014 **Discrete and Analogue Quantum Simulators**, *Thermalization Algorithms: Digital vs Analogue*, Physikzentrum Bad Honnef.
Bad Honnef, Germany

2013 **QIP 2013, Plenary talk**, *The Sixteenth Workshop on Quantum Information Processing*, Exponential decay of correlations implies area law.
Beijing, China

2013 **Workshop on Information-Theoretic Approaches to Thermodynamics**, *Equilibration and Quantum Unitary Designs*, Institute for Mathematical Sciences, NUS.
Singapore

2013 **New Mathematical Directions in Quantum information**, *2 lectures*, Information-theoretic techniques in quantum many-body physics, Newton Institute for Mathematical Sciences.
Cambridge, UK

2013 **Intensive Month on Operator Algebras and Quantum Information**, The unique games conjecture and the quantum separability problem, ICMAT.
Madrid, Spain

2013 **Workshop on Hamiltonian Complexity**, Product-state approximations to quantum groundstates, Simons Institute.
Berkeley, USA

2013 **Workshop on Physics and Information**, Product-state approximations to quantum groundstates, Institute Henri Poincare.
Paris, France

2013 **Quo Vadis Quantum Physics**, Quantum Hamiltonian Complexity, International Physics Institute.
Natal, Brazil

2013 **Entropy in Quantum Mechanics: Recent Advances**, Exponential decay of correlations implies area law, Cergy-Pontoise University.
Paris, France

2013 **Coogee 2013**, *Sydney Quantum Information Theory Workshop*, Exponential decay of correlations implies area law.
Sydney, Australia

2013 **Beyond iid in information Theory**, Exponential decay of correlations implies area law: Single-Shot techniques.
Cambridge, UK

2012 **TQC 2012**, *The 7th Conference on Theory of Quantum Computation, Communication and Cryptography*, Exponential decay of correlations implies area law, Tokyo University.
Tokyo, Japan

2012 **AQIS 2012**, *12th Asian Quantum Information Science Conference*, Exponential decay of correlations implies area law.
Suzhou, China

2012 **Quantum Information Workshop**, Exponential decay of correlations implies area law.
Seefeld, Austria

2012 **Quantum Physics of Information Workshop**, New quantum de Finetti theorems.
Shanghai, China

2012 **International Conference on Quantum Computation and Quantum Information Processing**, Random quantum circuits are approximate polynomial-designs, Beijing Academy of Sciences.
Beijing, China

2012 **Journees Federation de Recherche en Mathematiques de Paris centre / GT Informatique Quantique**, The complexity of quantum entanglement.
Paris, France

2011 **QIP 2011, Plenary talk**, *The Fourteenth Workshop on Quantum Information Processing*, Faithful squashed entanglement.
Singapore

2011 **Workshop on Quantum information: codes, geometry, and random structures**, Random quantum circuits are approximate polynomial-designs, CRM.
Montreal, Canada

2011 **Brazilian Physical Society Meeting 2011**, A reversible framework for entanglement.
Foz to Iguacu, Brazil

2010 **New Directions in the Foundations of Physics**, A reversible framework for resource theories.
Washington DC, USA

2010 **Mittag Leffler Quantum Information Programme**, Faithful squashed entanglement, Institute Mittag Leffler.
Stockholm, Sweden

2010 **Random Matrix Techniques in Quantum Information Theory**, Hastings additivity counterexamples by measure concentration, Perimeter Institute.
Waterloo, Canada

2009 **Workshop on Operator Structures in Quantum Information**, A reversible framework for entanglement, Fields Institute.
Toronto, Canada

2009 **41th Symposium on Mathematical Physics**, A reversible framework for entanglement.
Torun, Poland

2009 **ITW 2008**, *IEEE Information Theory Workshop*, A reversible theory of entanglement and the second law of thermodynamics.
Porto, Portugal

2009 **II Quantum Information School and Workshop**, On finite minimum reversible entanglement generating sets.
Paraty, Brazil

2009 **Workshop on Quantum Computation and Quantum Spin Systems**, The complexity of poly-gapped quantum local Hamiltonians, The Erwin Schrodinger Institute.
Vienna, Austria

2008 **QIP 2008, Plenary Talk**, *The Eleventh Workshop on Quantum Information Processing*, A reversible theory of entanglement.
New Delhi, India

2008 **International Workshop on Statistical-Mechanical Informatics**, A reversible theory of entanglement and the second law of thermodynamics.
Sendai, Japan

2008 **Bellairs 2009 Workshop on "Quantum-mechanical resource theories"**, *5 lectures*, A reversible framework for entanglement, McGill Bellairs Research Center.
Holetown, Barbados

2008 **Tohoku Workshop on Quantum Information Theory**, A generalization of quantum Stein's Lemma.
Sendai, Japan

2007 **International Workshop on Strong Atom-Light Interactions**, Strongly correlated phenomena in quantum cavity electrodynamics.
London, UK

Invited Seminars and Colloquia

46 seminars and 5 colloquia

2016 **MIT**, Physics Department, Cambridge, US.

2016 **Dartmouth College**, Physics Department, Hanover, US.

2015, 2014, 2009, 2008 **(4x) University of Cambridge**, Department of Mathematics, Cambridge, UK.

2015 **University of Maryland**, QuICS and JQI, College Park, US.

2015, 2014 **(2x) Microsoft Research**, QuArC Group, Redmond, US.

2015, 2011, 2008 **(3x) University College London**, London, UK.

2014 **Stanford University**, Physics Department, Palo Alto, US.

2014, 2013, 2013 **(3x) Caltech**, IQIM, Pasadena, US.

2014 **Brunel University**, Math Department, London, UK.

2014 **Caltech**, Physics Department, Pasadena, US.

2014, 2012, 2009, 2008, 2007 **(5x) University of Bristol**, Department of Physics, Bristol, UK.

2014, 2007 **(2x) University of Nottingham**, Department of Mathematics, Nottingham, UK.

2014, 2011, 2010, 2009 **(4x) University of Gdansk**, Department of Physics, Gdansk, Poland.

2014, 2010, 2009, 2008 **(4x) Universidade Federal de Minas Gerais**, Belo Horizonte, Brazil.

2013 **Princeton University**, Electrical Engineering Department, Princeton, US.

2013, 2012, 2007 **(3x) Imperial College London**, Physics Department, London, UK.

2013 **Q+ Hangout**.

2012 **IBM**, Thomas J. Watson Research Center, Yorktown Heights, US.

2012 **Aachen University**, Physics Department, Aachen, Germany.

2012 **Technical University of Munich**, Mathematics Department, Munich, Germany.

2012 **MIT**, Mathematics Department, Cambridge, US.

2012 **NTT**, Tokyo, Japan.

2011 **Perimeter Institute**, Waterloo, Canada.

2011, 2011 **(2x) Hebrew University of Jerusalem**, Department of Computer Science, Jerusalem, Israel.

2011 **University of Calgary**, Inst. for Quant. Science and Technology, Calgary, Canada.

2011 **University of Ulm**, Department of Physics, Ulm, Germany.

2011 **Universidade Federal Fluminense**, Niteroi, Brazil.

2011, 2010 **(2x) University of Waterloo**, Institute for Quantum Computing, Waterloo, Canada.

2011 **ETH Zürich**, Institut for Theoretical Physics, Zürich, Switzerland.

2009 **ICFO**, Barcelona, Spain.

Selected Contributed Talks

(*) indicates delivery by co-author

*2016 **QIP 2016**, *The Nineteen Workshop on Quantum Information Processing*, Estimating operator norms using covering nets with applications to quantum information theory.
Calgary, Canada

*2015 **QCrypt 2015**, *5th International Conference on Quantum Cryptography*, Randomness amplification against no-signaling adversaries using two devices.
Tokyo, Japan

*2015 **QIP 2015**, *The Eighteenth Workshop on Quantum Information Processing*, A Berry-Esseen theorem for quantum lattice systems and the equivalence of statistical mechanical ensembles.
Sydney, Australia

*2015 **QIP 2015**, *The Eighteenth Workshop on Quantum Information Processing*, Quantum Gibbs samplers: the commuting case.
Sydney, Australia

*2014 **QIP 2014**, *The Seventeenth Workshop on Quantum Information Processing*, The second laws of quantum thermodynamics.
Barcelona, Spain

*2014 **QIP 2014**, *The Seventeenth Workshop on Quantum Information Processing*, Robust device-independent randomness amplification with few devices.
Barcelona, Spain

*2014 **ITCS 2014**, *5th Innovations in Theoretical Computer Science*, Adversarial hypothesis testing and a quantum Stein's lemma for restricted measurements.
Princeton, US

*2013 **QIP 2013**, *The Sixteenth Workshop on Quantum Information Processing*, Quantum de Finetti theorems under local measurements and applications.
Beijing, China

2013 **QIP 2013, Featured Talk**, *The Sixteenth Workshop on Quantum Information Processing*, Approximation guarantees for the quantum local Hamiltonian problem and limitations for quantum PCPs.
Beijing, China

*2013 **STOC 2013**, *45th ACM Symposium on Theory of Computing*, Product-state approximations to quantum ground states.
Palo Alto, US

*2013 **STOC 2013**, *45th ACM Symposium on Theory of Computing*, Quantum de Finetti theorems under local measurements with applications.
Palo Alto, US

2012 **QIP 2012, Featured Talk**, *The Fithteenth Workshop on Quantum Information Processing*, Random quantum circuits are approximate polynomial-designs.
Montreal, Canada

*2012 **STOC 2012**, *44th ACM Symposium on Theory of Computing*, Hypercontractivity, sum-of-squares proofs, and their applications.
New York, US

*2011 **QIP 2011, Featured Talk**, *The Fourteenth Workshop on Quantum Information Processing*, The quantum one-time pad and superactivation.
Singapore

2011 **QIP 2011**, *The Fourteenth Workshop on Quantum Information Processing*, Exponential quantum speed-ups are generic.
Singapore

*2011 **STOC 2011**, *43th ACM Symposium on Theory of Computing*, A quasipolynomial-time algorithm for the quantum separability problem.
San Jose, US

2009 **QIP 2009, Featured Talk**, *The Twelfth Workshop on Quantum Information Processing*, Quantum Stein's lemma for correlated states and asymptotic entanglement transformations.
Santa Fe, USA

Refereeing

Journals, Nature, Nature Physics, Nature Communications, Physical Review Letters, IEEE Transactions on Information Theory, Theory of Computing, Communications in Mathematical Physics, Annals of Statistics, Foundations of Physics, Journal of Mathematical Physics, Physical Review A, New Journal of Physics, Proceedings of the Royal Society A, Quantum Information and Computation, International Journal Quantum Information, Applied Physical Letters, Optical Communications, Physics Letters A.

Conferences, CCC, CEQIP, FOCS, QIP, RANDOM, STOC, TQC.

Funding Agencies, Engineering and Physical Sciences Research Council (EPSRC, UK), Natural Sciences and Engineering Research Council of Canada (NSERC, Canada), Netherlands Organization for Scientific Research (NWI, Netherlands), National Science Centre (NCN, Poland).

Publications

As of 1st August 2015, I have 51 published papers in refereed journals and 3 arXiv preprints under review for publication, with a total of 2816 citations and an h-index of 25 (according to google scholar). I published 3 papers in Nature Physics[2], 1 in PNAS, 2 in Nature Communications, 10 in Physical Review Letters, 7 in Communications in Mathematical Physics[3], 4 in IEEE Transactions on Information Theory[4], 4 in the proceedings of STOC[5], and 1 invited review paper in Laser and Photonics Review.

Publications [2, 4], [18, 19] and [24, 25] were presented at QIP 2008, QIP 2011, and QIP 2013 as plenary talks; [8], [15, 21], [23], [44] at QIP 2009, QIP 2011, QIP 2012, and QIP 2013 as featured talks; and [9], [10], [1], [43], [46] at QIP 2011, QIP 2013, QIP 2014, QIP 2014, and QIP 2015 as talks.

Published Papers

1 Robust device independent randomness amplification from few devices
F.G.S.L. Brandão, R. Ramanathan, A. Grudka, K. Horodecki, M. Horodecki, P. Horodecki
Nature Communications 7, 11345 (2016) arXiv:1310.4544
Talk QIP 2014
(15 citations)

2 Efficient Quantum Pseudorandomness
F.G.S.L. Brandão, A. Harrow, and M. Horodecki
Phys. Rev. Lett. 116, 170502 (2016)
arXiv:1605.00713
Featured talk QIP 2012
(0 citation)

3 Local random quantum circuits are approximate polynomial-designs
F.G.S.L. Brandão, A. Harrow, and M. Horodecki
Communications in Mathematical Physics 2016
arXiv:1208.0692
Featured talk QIP 2012
(24 citations)

4 Quantum Gibbs Samplers: the commuting case
M.J. Kastoryano and F.G.S.L. Brandão
Communications in Mathematical Physics 2016
arXiv:1409.3435
Talk QIP 2015
(6 citation)

[2]Nature, Science, PNAS, Nature Physics, and Physical Review Letters are the premier journals for publication in physics.

[3]Communications in Mathematical Physics is the premier journal in mathematical physics.

[4]IEEE Transactions on Information Theory is the premier journal in information theory.

[5]The premier publication venue for theoretical computer science are the proceedings of the STOC and FOCS conferences.

5 Entanglement area law from specific heat capacity
F.G.S.L. Brandão and M. Cramer
Phys. Rev. B 92, 115134 (2015)
arXiv:1409.5946
(2 citations)

6 Area law for fixed points of rapidly mixing dissipative quantum systems
F.G.S.L. Brandão, T. S. Cubitt, A. Lucia, S. Michalakis, D. Perez-Garcia
J. Math. Phys. 56, 102202 (2015)
arXiv:1505.02776
Talk TQC 2015
(1 citation)

7 The second laws of quantum thermodynamics
F.G.S.L. Brandão, M. Horodecki, N.H.Y. Ng, J. Oppenheim, S. Wehner
PNAS 112, 3275 (2015)
arXiv:1305.5278
Talk QIP 2014
(59 citations)

8 Generic emergence of classical features in quantum Darwinism
F.G.S.L. Brandão, Marco Piani, Pawel Horodecki
Nature Communications 6, 7908 (2015)
arXiv:1310.8640
(4 citations)

9 Quantum Conditional Mutual Information, Reconstructed States, and State Redistribution
F.G.S.L. Brandão, A.W. Harrow, J. Oppenheim and S. Strelchuk
Phys. Rev. Lett. 115, 050501 (2015)
arXiv:1411.4921
(5 citations)

10 Reversible framework for quantum resource theories
F.G.S.L. Brandão, G. Gour
Phys. Rev. Lett. 115, 070503 (2015)
arXiv:1502.03149
(6 citations)

11 Exponential decay of correlations implies area law
F.G.S.L. Brandão, M. Horodecki
Comm. Math. Phys. 333, 761 (2015)
arXiv:1206.2947
Plenary talk QIP 2013
(23 citations)

12 Adversarial hypothesis testing and quantum stein's lemma for restricted measurements
F.G.S.L. Brandão, A.W. Harrow, J.R. Lee and Y. Peres
ITCS '14
to appear in Annals of Statistics
arXiv:1308.6702
(1 citations)

13 An area law for entanglement from exponential decay of correlations
F.G.S.L. Brandão and M. Horodecki.
Nature Physics 9, 721 (2013)
Plenary Talk QIP 2013
(37 citation)

14 The Resource Theory of Quantum States Out of Thermal Equilibrium
F.G.S L. Brandão, M. Horodecki, J. Oppenheim, J.M. Renes, R.W. Spekkens
Phys. Rev. Lett. 111, 250404 (2013)
arXiv:1111.3882
(65 citations)

15 Entanglement cost of quantum channels
M. Berta, F.G.S.L. Brandão, M. Christandl and S. Wehner
IEEE Trans. Info. Theo. 59, 6779 (2013)
arXiv:1108.5357
(29 citations)

16 A smooth entropy approach to quantum hypothesis testing and the classical capacity of quantum channels
N. Datta, M-H. Hsieh, M. Mosonyi, and F.G.S.L. Brandão
arXiv:1106.3089
IEEE Trans. Inf. Theo. 59, 8014 (2013)
(10 citations)

17 Product-states approximations to quantum groundstates
F.G.S.L. Brandão and A.W. Harrow
Comm. Math. Phys. 342, 47 (2016)
STOC '13
Featured talk QIP 2013
arXiv:1310.0017
(13 citation)

18 Exponential quantum speed-ups are generic
F.G.S.L. Brandão and M. Horodecki
arXiv:1010.3654
Quantum Information and Computation 13, 0901 (2013)
Contributed talk QIP 2011
(14 citations)

19 Quantum De Finetti Theorems under Local Measurements with Applications
F.G.S.L. Brandão and A.W. Harrow
STOC '13
arXiv:1210.6367
Contributed talk QIP 2013
(34 citation)

20 Hypercontractivity, Sum-of-Squares Proofs, and their Applications
B. Barak, F.G.S.L. Brandão, A.W. Harrow, J.A. Kelner, D. Steurer, Y. Zhou
STOC '12
arXiv:1205.4484
(69 citations)

21 Entanglement distillation by extendible maps
L. Pankowski, F.G.S.L. Brandão, M. Horodecki, G. Smith
Quantum Information and Computation 13, 0751 (2013)
arXiv:1109.1779
(2 citation)

22 When does noise increase the quantum capacity?
F.G.S.L. Brandão, J. Oppenheim, S. Strelchuk
Phys. Rev. Lett. **108**, 040501 (2012)
arXiv:1107.4385
(14 citations)

23 Detection of Multiparticle Entanglement: Quantifying the Search for Symmetric Extensions
F.G.S.L. Brandão and M. Christandl
Phys. Rev. Lett. **109**, 160502 (2012)
arXiv:1011.2751
(11 citations)

24 Public Quantum Communication and Superactivation
F.G.S.L. Brandão and J. Oppenheim
IEEE Trans. Info. Theo. to appear, 2012
arXiv:1005.1975
Featured Talk QIP 2011
Invited Talk QCRYPT 2011
(9 citations)

25 Entangled inputs cannot make imperfect quantum channels perfect
F.G.S.L. Brandão, J. Eisert, M. Horodecki, D. Yang
Phys. Rev. Lett. **106**, 230502 (2011)
arXiv:1010.5074
(10 citation)

26 Convergence to equilibrium under random Hamiltonian
F.G.S.L. Brandão, P. Cwikliski, M. Horodecki, P. Horodecki, J. Korbicz, M. Mozrzymas
Phys. Rev. E **86**, 031101 (2012)
arXiv:1108.2885
(30 citation)

27 A quasipolynomial-time algorithm for the quantum separability problem
F.G.S.L. Brandão, M. Christandl, and J. Yard
STOC '11
arXiv:1011:2751
Plenary talk QIP 2011
(26 citations)

28 Faithful squashed entanglement
F.G.S.L. Brandão, M. Christandl, and J. Yard
Commun. Math. Phys. **306**, 805 (2011)
arXiv:1010.1750
Plenary talk QIP 2011
(64 citations)

29 One-shot rates for entanglement manipulation under non-entangling maps
F.G.S.L. Brandão and N. Datta
IEEE Trans. Inf. Theo. **57**, 1754 (2011)
arXiv:0905.2673
(14 citations)

30 The quantum one-time pad in the presence of an eavesdropper
F.G.S.L. Brandão and J. Oppenheim
Phys. Rev. Lett. **108**, 040504 (2012)
Selected as "Editors Suggestions"
arXiv:1004.3328
Featured talk QIP 2011
Invited Talk QCRYPT 2011
(6 citations)

31 On Hastings' counterexamples to the minimum output entropy additivity conjecture
F.G.S.L. Brandão and M. Horodecki
Open Syst. Inf. Dyn. **17**, 31 (2010)
arXiv:0907.3210
(37 citations)

32 A generalization of quantum Stein's lemma
F.G.S.L. Brandão and M.B. Plenio
Commun. Math. Phys. **295**, 791 (2010)
arXiv:0904.0281
Featured talk QIP 2009
(40 citations)

33 A reversible theory of entanglement and its connection to the second law
F.G.S.L. Brandão and M.B. Plenio
Commun. Math. Phys. **295**, 829 (2010)
arXiv:0710.5827
Plenary talk QIP 2008
(24 citations)

34 Entanglement theory and the second law of thermodynamics
F.G.S.L. Brandão and M.B. Plenio
Nature Physics **4**, 873 (2008)
arXiv:0810.2319
Plenary talk QIP 2008
(75 citations)

35 Quantum many-body phenomena in coupled cavity arrays
M.J. Hartmann, F.G.S.L. Brandão, and M.B. Plenio
Laser and Photonics Review **2**, 527 (2008)
arXiv:0808.2557
(261 citations)

36 A Polaritonic two-Component Bose-Hubbard Model
M.J. Hartmann, F.G.S.L. Brandão, and M.B. Plenio
New J. Phys. **10**, 033011 (2008)
arXiv:0706.2251
(32 citations)

37 Geometrically induced singular behaviour of entanglement
D. Cavalcanti, O.L. Saldanha, O. Cosme, F.G.S.L. Brandão, C.H. Monken, S. Padua, M. Franca Santos, and M.O. Terra Cunha
Phys. Rev. A **78**, 012318 (2008)
arXiv:0709.0301
(6 citations)

38 Correlated entanglement distillation and the structure of the set of undistillable states
F.G.S.L. Brandão and J. Eisert
J. Math. Phys. **49**, 042102 (2008)
arXiv:0709.3835
(9 citations)

39 Light-shift-induced photonic nonlinearities
F.G.S.L. Brandão, M.J. Hartmann, and M.B. Plenio
New J. Physics **10**, 043010 (2008)
arXiv:0705.2398
(32 citations)

40 Remarks on the equivalence of full additivity and monotonicity for the entanglement cost
F.G.S.L. Brandão, M. Horodecki, M.B. Plenio, and S. Virmani
Open Sys. Dynam. **14**, 333 (2007)
arXiv:quant-ph/0702136
(7 citations)

41 Effective spin systems in coupled micro-cavities
M.J. Hartmann, F.G.S.L. Brandão, and M.B. Plenio
Phys. Rev. Lett. **99**, 160501 (2007)
arXiv:0704.3056
(157 citations)

42 Entanglement activation and the robustness of quantum correlations
F.G.S.L. Brandão
Phys. Rev. A **76**, 030301(R) (2007)
arXiv:quant-ph/0510078
(20 citations)

43 Strongly interacting polaritons in coupled cavity arrays
M.J. Hartmann, F.G.S.L. Brandão, and M.B. Plenio
Nature Physics **2**, 849 (2006)
arXiv:quant-ph/0606097
(619 citations)

44 Quantitative entanglement witnesses
J. Eisert, F.G.S.L. Brandão and K.M.R. Audenaert
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