Mark M. Wilde

Assistant Professor
Department of Physics and Astronomy
447 Nicholson Hall, Tower Drive
Center for Computation and Technology
2156 Louisiana Digital Media Center
Louisiana State University
Baton Rouge, Louisiana, USA 70803-4001 http://www.markwilde.com/

Education

University of Southern California,
Ph.D., Electrical Engineering,
Los Angeles, California, August 2008.

Tulane University,
M.S., Electrical Engineering,
New Orleans, Louisiana, August 2004.

Texas A&M University,
B.S., Computer Engineering,
College Station, Texas, May 2002.

Research Experience

Assistant Professor — August 2013—present
Louisiana State University — Baton Rouge, Louisiana
Teaching courses on quantum information theory and quantum computation. Working with Ph.D. students on research topics in quantum information theory and quantum computation. Co-advised the following PhD students (graduation years given in parentheses):

Bhaskar Roy Bardhan (2014),

Kaushik P. Seshadreesan (2015),

Jonathan P. Olson (2016).

Visiting Professor — June 2013—August 2013
Seth Lloyd and Jeffrey Shapiro, MIT — Boston, Massachusetts
Developed the notion of the "locking capacity" of a quantum channel and proved several properties of it for certain channels. Proved that a strong converse theorem holds for the classical capacity of the pure-loss bosonic channel when imposing a maximum photon number constraint. Identified a second-order coding rate for the pure-loss bosonic channel.

Visiting Professor — April 2013—May 2013
Andreas Winter, Autonomous Univ. of Barcelona — Barcelona, Spain
Proved that it is possible to violate the no-cloning theorem of quantum mechanics if one is allowed access to a closed timelike curve behaving according to the model of David Deutsch. Proved that a strong converse theorem holds for the classical capacity of entanglement-breaking and Hadamard channels.

Postdoctoral Fellow — October 2009—April 2013
Patrick Hayden, McGill University — Montreal, Quebec
Completed a 670-page textbook on quantum information theory (published by Cambridge University

Press). Constructed polar codes for transmitting classical, private, and quantum data. Furthered the theory of quantum rate distortion (lossy quantum data compression). Advanced network quantum information theory with the discovery of a quantum simultaneous decoder. Determined channels for which two full triple trade-off regions are tractable, implying that we have a complete understanding of the communication abilities of these channels for classical communication, quantum communication, and entanglement consumption/generation and for public classical communication, private classical communication, and secret key consumption/generation. Determined a relation between the correlations available in Leggett-Garg tests of macrorealism and the cut vectors from the cut polytope in polyhedral combinatorics. Showed how postselected closed timelike curves enable enhanced information processing abilities. Determined achievable rates for the discrete memoryless and bosonic quantum interference channel. Developed a theory of entanglement-assisted quantum turbo codes and simulated their performance.

Visitor — October 2008—December 2008
Andreas Winter, Centre for Quantum Technology, National University of Singapore — Singapore
Proved trade-off capacity theorems for the transmission of classical and quantum information over an entanglement-assisted quantum channel.

Visitor — September 2008
Martin Rötteler, NEC Laboratories America — Princeton, New Jersey
Investigated the simulation of entanglement-assisted quantum codes under the assumption that entanglement may not be ideal. Investigated improving performance of the algorithm for encoding general quantum convolutional codes.

Research Assistant — September 2006–August 2008
Todd A. Brun, University of Southern California — Los Angeles, California
Developed several methods for error correction of quantum information including entanglement-assisted quantum convolutional coding, convolutional entanglement distillation, and entanglement-assisted operator error correction for continuous-variable systems. Derived several formulae that determine the number of entangled qubits that several variations of an entanglement-assisted quantum code require. Developed the continuous-variable coherent channel.

Research Assistant — Summer 2005, 2006
Jonathan P. Dowling, Louisiana State University — Baton Rouge, Louisiana
Developed a linear-optical implementation of a controlled-phase gate. Discovered a method to implement the coherent channel experimentally in a linear-optical system.

Research Assistant — September 2005–September 2006
Bart Kosko, University of Southern California — Los Angeles, California
Developed a model for stochastic resonance in a quantum-optical system. Highlighted the applications of this model in quantum key distribution. Also constructed models for stochastic resonance in quantum teleportation and continuous-variable superdense coding.

Industry Experience

Quantum Information Scientist — January–October 2009
Science Applications International Corporation — Arlington, Virginia
Developed the theory of a quantum shift register. Such a device may be useful in the implementation of a quantum error correction code for quantum communication. Proved the ultimate capability of a noisy quantum channel for consuming or generating noiseless quantum communication, noiseless classical communication, and noiseless entanglement. Proved the ultimate capability of a noisy quantum channel and a secret key to generate noiseless public communication and noiseless private communication. Developed a Leggett-Garg test for "quantumness" in a biomolecule.

Summer Intern — Summer 2005
Jet Propulsion Laboratory — Pasadena, California
Developed a low complexity, lossless image software in the C language that compresses hyperspectral images obtained from the Airborne Visible/Infrared Imaging Spectrometer (AVIRIS). Wrote a specialized tool to select specific regions of a hyperspectral image for output to a new image.

Books

[1] Mark M. Wilde, "Quantum Information Theory," Published by *Cambridge University Press* in June 2013. Second edition published in February 2017. Book preprint "From Classical to Quantum Shannon Theory," available at
`markwilde.com/teaching/notes` and arXiv:1106.1445, 774 pages, 301 exercises, 81 figures. This book has been used in graduate courses on quantum information theory at Caltech, University of Cambridge, McGill University, University of Southern California, University of Bristol, University of California, Davis, University of Washington, Leibniz Universitat Hannover, and Louisiana State University.

Peer-reviewed Articles

arXiv identifier: `http://arxiv.org/a/wilde_m_1`

Google Scholar profile: `http://scholar.google.com/citations?user=vANLRiYAAAAJ&hl`

[106] Marius Lemm and Mark M. Wilde, "Information-theoretic limitations on approximate quantum cloning and broadcasting," *Physical Review A* vol. 96, no. 1, page 012304, July 2017. arXiv:1608.07569.

[105] Mark M. Wilde, Marco Tomamichel, Mario Berta, "Converse bounds for private communication over quantum channels," *IEEE Transactions on Information Theory*, vol. 63, no. 3, pages 1792–1817, March 2017. arXiv:1602.08898.

[104] Todd A. Brun and Mark M. Wilde, "Simulations of closed timelike curves," *Foundations of Physics*, vol. 47, no. 3, pages 375–391, March 2017. arXiv:1504.05911.

[103] Haoyu Qi and Mark M. Wilde, "Capacities of Quantum Amplifier Channels," *Physical Review A*, vol. 95, no. 1, page 012339, January 2017. arXiv:1605.04922.

[102] Marco Tomamichel, Mark M. Wilde, Andreas Winter, "Strong converse rates for quantum communication," *IEEE Transactions on Information Theory*, vol. 63, no. 1, pages 715–727, January 2017. arXiv:1406.2946.

[101] Mark M. Wilde, "Squashed entanglement and approximate private states," *Quantum Information Processing*, vol. 15, no. 11, pages 4563–4580, November 2016. arXiv:1606.08028.

[100] Tom Cooney, Christoph Hirche, Ciara Morgan, Jonathan P. Olson, Kaushik P. Seshadreesan, John Watrous, Mark M. Wilde, "Operational meaning of quantum measures of recovery," *Physical Review A*, vol. 94, no. 2, page 022310, August 2016. arXiv:1512.05324

[99] Felix Leditzky, Mark M. Wilde, Nilanjana Datta, "Strong converse theorems using Renyi entropies," *Journal of Mathematical Physics*, vol. 57, no. 8, page 082202, August 2016. arXiv:1506.02635

[97] Mario Berta, Stephanie Wehner, Mark M. Wilde, "Entropic uncertainty and measurement reversibility," *New Journal of Physics*, vol. 18, no. 7, page 073004, July 2016. arXiv:1511.00267

[96] Francesco Buscemi, Siddhartha Das, Mark M. Wilde, "Approximate reversibility in the context of entropy gain, information gain, and complete positivity," *Physical Review A*, vol. 93, no. 6, page 062314, June 2016. arXiv:1601.01207

[95] Cosmo Lupo, Mark M. Wilde, Seth Lloyd, "Quantum data hiding in the presence of noise," *IEEE Transactions on Information Theory*, vol. 62, no. 6, pages 3745-3756, June 2016. arXiv:1507.06038

[94] Nilanjana Datta, Marco Tomamichel, and Mark M. Wilde, "On the second-order asymptotics for entanglement-assisted communication," *Quantum Information Processing*, vol. 15, no. 6, pages 2569-2591, June 2016. arXiv:1405.1797

[93] Tom Cooney, Milan Mosonyi, and Mark M. Wilde, "Strong converse exponents for a quantum channel discrimination problem and quantum-feedback-assisted communication," *Communications in Mathematical Physics*, vol. 344, no. 3, pages 797-829, June 2016. arXiv:1408.3373

[92] Kaushik P. Seshadreesan, Masahiro Takeoka, and Mark M. Wilde, "Bounds on entanglement distillation and secret key agreement for quantum broadcast channels," *IEEE Transactions on Information Theory*, vol. 62, no. 5, pages 2849-2866, May 2016. arXiv:1503.08139

[91] Frédéric Dupuis and Mark M. Wilde, "Swiveled Rényi entropies," *Quantum Information Processing*, vol. 15, no. 3, pages 1309-1345, March 2016. arXiv:1506.00981

[90] Mark M. Wilde, Joseph M. Renes, and Saikat Guha, "Second-order coding rates for pure-loss bosonic channels," *Quantum Information Processing*, vol. 15, no. 3, pages 1289-1308, March 2016. arXiv:1408.5328

[89] Christoph Hirche, Ciara Morgan, and Mark M. Wilde, "Polar codes in network quantum information theory," *IEEE Transactions on Information Theory*, vol. 62, no. 2, pages 915-924, February 2016. arXiv:1409.7246

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[83] Mark M. Wilde, "Multipartite quantum correlations and local recoverability," *Proceedings of the Royal Society A*, vol. 471, no. 2177, May 2015. arXiv:1412.0333

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[59] Ching-Yi Lai, Todd A. Brun, and Mark M. Wilde, "Duality in Entanglement-Assisted Quantum Error Correction," *IEEE Transactions on Information Theory*, vol. 59, no. 6, pages 4020-4024, June 2013. arXiv:1010.5506

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[57] Mark M. Wilde, Olivier Landon-Cardinal, and Patrick Hayden, "Towards efficient decoding of classical-quantum polar codes," *Proceedings of the 8th Conference on the Theory of Quantum Computation, Communication, and Cryptography*, pages 157-177, May 2013. arXiv:1302.0398

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[55] Mark M. Wilde and Saikat Guha, "Polar codes for classical-quantum channels," *IEEE Transactions on Information Theory*, vol. 59, no. 2, pages 1175-1187, February 2013. arXiv:1109.2591

[54] Monireh Houshmand, Saied Hosseini-Khayat, Mark M. Wilde, "Minimal-memory, non-catastrophic, polynomial-depth quantum convolutional encoders," *IEEE Transactions on Information Theory*, vol. 59, no. 2, pages 1198-1210, February 2013. arXiv:1105.0649

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channels," *Journal of Physics A: Mathematical and Theoretical*, vol. 46, no. 4, page 045306, February 2013. arXiv:1109.4147

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tion, and entanglement in quantum Shannon theory," *IEEE Transactions on Information Theory* vol. 56, no. 9, September 2010. arXiv:0901.3038

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[31] Nilanjana Datta, Min-Hsiu Hsieh, Mark M. Wilde, "Quantum rate distortion, reverse Shannon theorems, and source-channel separation," Oral presentation at the *15th Workshop on Quantum Information Processing*, Montreal, Quebec (December 2011).

[30] Omar Fawzi, Patrick Hayden, Ivan Savov, Pranab Sen, Mark M. Wilde, "Advances in classical communication for network quantum information theory," Oral presentation at the *15th Workshop on Quantum Information Processing*, Montreal, Quebec (December 2011).

[29] Mark M. Wilde and Saikat Guha, "Polar Codes for Classical, Private, and Quantum Communication," Oral presentation at the *Workshop on Quantum Information: Codes, Geometry and Random Structures*, Centre de Recherches Mathematiques (October 2011).

[28] Mark M. Wilde, Patrick Hayden, Saikat Guha, "Information Trade-offs for Optical Quantum Communication," Oral presentation at the *Biannual INTRIQ Workshop*, McGill University (October 2011).

[27] Mark M. Wilde and Min-Hsiu Hsieh, "Entanglement boosts quantum turbo codes," Oral presentation at the *2011 International Symposium on Information Theory*, St. Petersburg, Russia (July 2011).

[26] Monireh Houshmand, Saied Hosseini-Khayat, and Mark M. Wilde, "Minimal-Memory, Non-Catastrophic Quantum Convolutional Encoders," Oral presentation at the *2011 International Symposium on Information Theory*, St. Petersburg, Russia (July 2011).

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[22] Mark M. Wilde and Min-Hsiu Hsieh, "Entanglement boosts quantum turbo codes," Poster presentation at the *INTRIQ Biannual meeting* in Sherbrooke, Quebec, Canada (September 2010).

[21] Mark M. Wilde and Min-Hsiu Hsieh, "Trading Resources in Quantum Communication," Oral presentation at the *10th Asian Conference on Quantum Information Science* in Tokyo, Japan (August 2010).

[20] Mark M. Wilde and Min-Hsiu Hsieh, "Entanglement Generation with a Quantum Channel and a Shared State," Oral presentation at the *2010 International Symposium on Information Theory*,

Austin, Texas, USA (June 2010).

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[18] Mark M. Wilde and Min-Hsiu Hsieh, "Trading Resources in Quantum Communication," Poster presentation at the *QuantumWorks Fifth Annual General Meeting* in Ottawa, Ontario, Canada (June 2010).

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[16] Mark M. Wilde, "Additivity in quantum Shannon theory," Tutorial presentation at the *2010 International Workshop on Quantum Information Science*, Tokyo, Japan (March 2010).

[15] Kamil Bradler, Patrick Hayden, Dave Touchette, Mark M. Wilde, "Trade-off capacities of the quantum Hadamard channels," Rump session presentation at *The Thirteenth Workshop on Quantum Information Processing* in Zurich, Switzerland (January 2010).

[14] Mark M. Wilde, "Quantum shift-register circuits," Poster presentation at *The Thirteenth Workshop on Quantum Information Processing* in Zurich, Switzerland (January 2010).

[13] Min-Hsiu Hsieh and Mark M. Wilde, "Optimal trading of classical communication, quantum communication, and entanglement," Oral presentation at the *4th Workshop on Theory of Quantum Computation, Communication and Cryptography* in Waterloo, Ontario, Canada (May 2009).

[12] Jim Harrington, Mark M. Wilde and Todd A. Brun, "Closed timelike curves enable perfect state distinguishability," Poster presentation at *The Twelfth Workshop on Quantum Information Processing* in Santa Fe, New Mexico (January 2009).

[11] Min-Hsiu Hsieh and Mark M. Wilde, "The Classically-Enhanced Father Protocol," Poster presentation at *The Twelfth Workshop on Quantum Information Processing* in Santa Fe, New Mexico (January 2009).

[10] Mark M. Wilde and Dmitry B. Uskov, "Linear-Optical Hyperentanglement-Assisted Quantum Code," Poster presentation at the *Quantum Computing Program Review* in Atlanta, Georgia (August 2008).

[9] Mark M. Wilde and Todd A. Brun, "Unified Quantum Convolutional Coding," Oral presentation at the *International Symposium on Information Theory* in Toronto, Ontario, Canada (July 2008).

[8] Mark M. Wilde and Todd A. Brun, "Quantum Convolutional Coding with Entanglement Assistance," Oral presentation at the *American Physical Society March Meeting* in New Orleans, Louisiana (March 2008).

[7] Mark M. Wilde and Todd A. Brun, "Quantum Convolutional Coding with Entanglement Assistance," Oral presentation at the University of New Mexico for the *10th Annual Southwest Quantum Information and Technology Network Workshop* in Albuquerque, New Mexico (February 2008).

[6] Mark M. Wilde, Hari Krovi, and Todd A. Brun, "Convolutional Entanglement Distillation," Oral presentation at the University of Southern California for the *First International Conference on Quantum Error Correction* in Los Angeles, California (December 2007).

[5] Mark M. Wilde, Todd A. Brun, Hwang Lee, and Jonathan P. Dowling, "Coherent Communication with Linear Optics," Poster presentation at the *Quantum Computing Program Review* in Minneapolis (August 2007).

[4] Mark M. Wilde, Hari Krovi, Jonathan P. Dowling, and Todd A. Brun, "Coherent Communication of Continuous Quantum Variables with Linear Optics," Oral presentation at the University of Rochester for the *International Conference of Quantum Information* (June 2007).

[3] Mark M. Wilde, Hari Krovi and Todd A. Brun, "Coherent Communication with Continuous Variables," Oral presentation at Caltech for the *Southwest Quantum Information and Technology Network Workshop* (February 2007).

[2] Mark M. Wilde and Bart Kosko, "Quantum forbidden-interval theorems for stochastic resonance with squeezed light," in *Proceedings of the 8th International Conference on Quantum Communication, Measurement, and Computing*, pages 553–556, December 2006.

[1] Mark M. Wilde, Federico Spedalieri, Jonathan P. Dowling, and Hwang Lee, "Optical Cluster-State Generation without Number-Resolving Photon Detectors," Poster presentation at *Frontiers in Optics* in Rochester, NY (October 2006).

Book Chapters

[3] Mark M. Wilde, "Introduction to Quantum Convolutional Codes," Chapter in *Quantum Error Correction*, Cambridge University Press, October 2013.

[2] Mark M. Wilde, "Error Correction in Quantum Communication," Chapter in *Quantum Error Correction*, Cambridge University Press, October 2013.

[1] Bart Kosko, Ian Lee, Sanya Mitaim, Ashok Patel and Mark M. Wilde, "Applications of Forbidden Interval Theorems in Stochastic Resonance," Chapter in *Applications of Nonlinear Dynamics*, Springer Berlin / Heidelberg, February 2009.

Seminars

[37] "Converse bounds for private communication over quantum channels," Seminar for the Quantum Information Research Group at the Autonomous University of Barcelona, Barcelona, Spain, July 2016. Seminar at the University of Camerino, Camerino, Italy, June 2016. Seminar at QuTech, Technical University of Delft, Delft, Netherlands, May 2016.

[36] "Trading resources in quantum Shannon theory," NICT, Koganei, Tokyo 184-8795, Japan, December 2015.

[35] "Universal recoverability in quantum information theory," NICT, Koganei, Tokyo 184-8795, Japan, December 2015.

[34] "Recoverability in quantum information theory," LSU Department of Physics and Astronomy Colloquium, Baton Rouge, Louisiana, USA, September 2015.

[33] "Recoverability in quantum information theory," Seminar for the Quantum Information and Nonlinear Optics Group in the Department of Physics and Engineering Physics at Tulane University, New Orleans, Louisiana, USA, July 2015.

[32] "Attempting to reverse the irreversible in quantum physics," Seminar for the Centre for Quan-

tum Information and Foundations in the Centre for Mathematical Sciences at the University of Cambridge, Cambridge, UK, January 2015.

[31] "Strong converse exponents for a quantum channel discrimination problem," Seminar for the Center for Extreme Quantum Information Theory at the Massachusetts Institute of Technology, Cambridge, MA, USA, December 2014.

[30] "Renyi generalizations of the conditional mutual information," Seminar for the Quantum Information Processing Group at Raytheon BBN Technologies, Cambridge, MA, USA, April 2014. Seminar for the Mathematics Department at Louisiana State University, Baton Rouge, LA, USA, April 2014. Seminar for the Quantum Information Research Group at the Autonomous University of Barcelona, Barcelona, Spain, May 2014.

[29] "Strong converse for entanglement-assisted capacity," Seminar for the workshop "Mathematical Challenges in Quantum Information" at the Isaac Newton Institute, University of Cambridge, Cambridge, UK, December 2013.

[28] "The squashed entanglement of a quantum channel," Seminar for the quantum group at University College London, London, UK, December 2013.

[27] "Strong converse theorems in quantum information theory," Seminar for the Q+ group on Google Plus, November 2013.

[26] "Strong converse for the classical capacity of entanglement-breaking and Hadamard channels," Seminar for the Quantum Information Processing Group at Raytheon BBN Technologies, Cambridge, MA, USA, June 2013; Center for Theoretical Physics, Massachusetts Institute of Technology, July 2013.

[25] "Two-message quantum interactive proofs and the quantum separability problem," Seminar for the Centre for Quantum Information and Foundations in the Centre for Mathematical Sciences at the University of Cambridge, Cambridge, United Kingdom, January 2013; Quantum Chemistry and Quantum Computation Group at Harvard University, July 2013; Center for Quantum Information Science and Technologies at the University of Southern California, May 2013; Quantum Information Group at the Autonomous University of Barcelona, May 2013.

[24] "The Information-Theoretic Costs of Simulating Quantum Measurements," Seminar for the Quantum Information Theory Group at the Perimeter Institute for Theoretical Physics, Waterloo, Ontario, Canada, April 2012.

[23] "Quantum Information and Optical Communication," Seminar for the Department of Physics and Astronomy at Louisiana State University, Baton Rouge, Louisiana, USA, April 2012.

[22] "Quantum Computation and Quantum Error Correction," Seminar for the Center for Computation and Technology at Louisiana State University, Baton Rouge, Louisiana, USA, April 2012.

[21] "Explicit Receivers for Optical Communication and Quantum Reading," Seminar for the Physics of Information group at IBM Research, Yorktown Heights, New York, March 2012.

[20] "The Quest for a Quantum Simultaneous Decoder," Seminar for the Centre for Quantum Information and Foundations at the University of Cambridge, Cambridge, United Kingdom, July 2011.

[19] "Information Trade-offs for Quantum Optical Communication," Department of Physics Colloquium at the Université de Sherbrooke, Sherbrooke, Québec, Canada, June 2011.

[18] "How Alice should balance the photon budget in quantum communication," Seminar for the Disruptive Information Processing Technologies Group at Raytheon BBN, Boston, Massachusetts, USA (May 2011).

[17] "Entanglement boosts quantum turbo codes," Institute for Quantum Computing Colloquium, University of Waterloo, Waterloo, Ontario, Canada (November 2010).

[16] "Entanglement boosts quantum turbo codes," Center for Quantum Information and Quantum Control, University of Toronto, Toronto, Ontario, Canada (October 2010).

[15] "Trading Resources in Quantum Communication," Institute for Quantum Information, California Institute of Technology, Pasadena, California, USA (August 2010).

[14] "Trade-off capacities of the quantum Hadamard channels," ERATO-SORST Project of the Japan Science and Technology Agency, Tokyo, Japan (February 2010).

[13] "Non-classical Behavior of Biological Systems at Room Temperature," Department of Chemistry and Chemical Biology at Harvard University and Department of Physics and Astronomy at Louisiana State University (October 2009).

[12] "Claude Shannon Meets Quantum Mechanics: An Introduction to Quantum Shannon Theory," Department of Electrical Engineering and Department of Mathematics at the George Washington University (August 2009).

[11] "Optimal Trading of Classical Communication, Quantum Communication, and Entanglement," School of Computer Science at McGill University and Naval Research Laboratory in Washington, DC (July 2009).

[10] "Quantum Shift Register Circuits," Laser Cooled and Trapped Atoms Group of the Atomic Physics Division of the National Institute of Standards and Technology in Gaithersburg, Maryland (June 2009).

[9] "The Classically-Enhanced Father Protocol," Northtrop Grumman Space Technology Research Laboratory and Department of Electrical Engineering, University of Southern California (December 2008).

[8] "Entanglement-Assisted Quantum Error Correction," Centre for Quantum Technologies at the National University of Singapore (November 2008).

[7] "Closed Timelike Curves Enable Perfect State Distinguishability," Centre for Quantum Technologies at the National University of Singapore (October 2008).

[6] "Entanglement-Assisted Quantum Convolutional Coding," Quantum Group at NEC Laboratories America (September 2008).

[5] "Quantum Coding with Entanglement," Quantum Lunch Seminar for the Quantum Institute at Los Alamos National Laboratory (April 2008).

[4] "Quantum Convolutional Coding Techniques," Information Processing Group at the Jet Propulsion Laboratory (December 2007).

[3] "Quantum Convolutional Coding with Shared Entanglement for Distillation and Error Correction," Hearne Institute for Theoretical Physics at Louisiana State University (November 2007).

[2] "Quantum Communication, Quantum Entanglement, and All That Jazz," Tulane University (November 2007).

[1] "Entanglement-Assisted Quantum Error Correction," Hearne Institute for Theoretical Physics at Louisiana State University (July 2007).

Other Documents

[1] Mark M. Wilde, "Quantum coding with entanglement," Ph.D. Thesis, University of Southern California, *arXiv:0806.4214*, August 2008.

Service

Associate Editor for Quantum Information Theory at *IEEE Transactions on Information Theory*

Journal Editorial Board Member for *Quantum Information Processing*

Lead local organizer for 2017 Southwest Quantum Information and Technology Workshop (hosted at LSU CCT during February 2017)

Organizer of Focus Sessions on quantum information theory during the 2016 and 2017 APS March Meetings

Program Committee Member for *2014, 2016 Conference on Theory of Quantum Computation, Communication, and Cryptography*; *2014, 2015 International Symposium on Information Theory*; *2014 Asian Conference on Quantum Information Science*; *Quantum Information Processing 2013*

Reviewer for the U.S. National Science Foundation, the European Research Council, Czech Science Foundation

Journal Reviewer—*Physical Review Letters*, *Physical Review A*, *Nature*, *Nature Communications*, *Scientific Reports*, *IEEE Transactions on Information Theory*, *Communications in Mathematical Physics*, *Journal of Mathematical Physics*, *IEEE Communication Letters*, *IEEE International Symposium on Information Theory*, *Proceedings of the Royal Society A*, *Journal of Physics A: Mathematical and Theoretical*, *Journal of Physics B: Atomic, Molecular, and Optical Physics*, *Quantum Information Processing*, *Quantum Information and Computation*, *Optics Communications*

Writer for the *Quantum Times* (the newsletter for the Topical Unit on Quantum Information of the American Physical Society)

Honors and Awards

LSU College of Science Non-Tenured Faculty Research Award (2016)

LSU Alumni Association Rising Faculty Research Award (2015)

National Science Foundation Career Development Award (2014)

APS-IUSSTF Professorship Award in Physics (2014)

Senior Member of the IEEE (2013)

Centre de Recherches Mathématiques Thematic Postdoctoral Fellowship (2011-2013)

Best Teaching Assistant Award, Department of Electrical Engineering,
University of Southern California (2007)

School of Engineering Fellowship, University of Southern California (2004)

Teaching Assistantship, Tulane University (2002)

Thomas Barton Scholarship, Texas A&M University (1998)

Teaching Experience

Lecturer, Short course on Quantum Information Theory,
Delft University of Technology,
Delft, Netherlands, Summer 2015

Lecturer, Short course on Quantum Information Theory,
Tata Institute of Fundamental Research,
Mumbai, India, Summer 2014

Lecturer, Introduction to Quantum Computation,
Department of Physics and Astronomy,
Center for Computation and Technology,
Louisiana State University, Spring 2014

Lecturer, Introduction to Quantum Information Theory,
Department of Physics and Astronomy,
Center for Computation and Technology,
Louisiana State University, Fall 2013

Invited Lecturer, Summer School on Quantum Integrable Systems and Quantum Information,
Hosted by the Dublin Institute for Advanced Studies,
Dungarvan, County Waterford, Ireland, August 2013

Invited Lecturer, 12th Canadian Summer School on Quantum Information,
University of Waterloo, Waterloo, Ontario, Canada, June 2012

Lecturer, Full semester course entitled "Introduction to Quantum Shannon Theory,"
McGill University, Winter 2011

Guest Lecturer, Quantum Computation,
"Reversible Computation,"
McGill University, Winter 2010

Teaching Assistant, Quantum Computation,
McGill University, Winter 2010

Guest Lecturer, "Mysteries of the Quantum World,"
"Introduction to Quantum Error Correction,"
Tulane University, Fall 2008

Guest Lecturer, Linear Algebra,
"Introduction to Quantum Information Processing,"
University of Southern California, Spring 2007

Teaching Assistant, Linear Signals and Systems,
University of Southern California, Fall 2005–Spring 2007