Mario Berta

Publications

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Overview

- Journal articles (peer-reviewed): 65
- Conference proceedings (peer-reviewed): 30
- Preprints: 20
- Citations: 7948
- H-Index: 40

  (according to Google Scholar as of July 31, 2025)

- **Physics**: Nature Physics, Nature Communications, Reviews of Modern Physics, Physical Review X, Physical Review Letters
- **Mathematical Physics**: Communications in Mathematical Physics, Annales Henri Poincaré
- **Information Theory**: IEEE Transactions on Information Theory
- **Cryptography**: Advances in Cryptology — CRYPTO
- **Optimization**: SIAM Journal on Optimization, Mathematical Programming

Preprints

- Gereon Kossmann, Julius Zeiss, Omar Fawzi **Mario Berta**, *On approximate error correction for symmetric noise*, arXiv:2507.12326.
- Julius Zeiss, Gereon Kossmann, Omar Fawzi **Mario Berta**, *Approximating fixed size quantum correlations in polynomial time*, arXiv:2507.12302.
- Michael X. Cao, Yongsheng Yao, **Mario Berta**, *Channel coding against quantum jammers via minimax*, arXiv:2505.11362.
- **Mario Berta**, Yongsheng Yao, *Strong converse exponents of partially smoothed Information measures*, arXiv:2505.06050.
- Filippo Girardi, Aadil Oufkir, Bartosz Regula, Marco Tomamichel, **Mario Berta**, Ludovico Lami, *Quantum umlaut information*, arXiv:2503.21479.
- Filippo Girardi, Aadil Oufkir, Bartosz Regula, Marco Tomamichel, **Mario Berta**, Ludovico Lami, *Umlaut information*, arXiv:2503.18910.
- Štěpán Šmíd, Richard Meister, **Mario Berta**, Roberto Bondesan, *Polynomial time quantum Gibbs sampling for Fermi-Hubbard model at any temperature*, arXiv:2501.01412.
- Aadil Oufkir, **Mario Berta**, *Quantum channel coding: Approximation algorithms and strong converse exponents*, arXiv:2410.21124.
- Aditya Nema, Sreejith Sreekumar, **Mario Berta**, *One-shot multiple access channel simulation*, arXiv:2410.17198.

- Santiago Cifuentes, Samson Wang, Thais L. Silva, **Mario Berta**, Leandro Aolita, *Quantum computational complexity of matrix functions*, arXiv:2410.13937.
- **Mario Berta**, Yongsheng Yao, *Strong converse exponent of quantum dichotomies*, arXiv:2410.12576.
- Aadil Oufkir, Yongsheng Yao, **Mario Berta**, *Exponents for classical-quantum channel simulation in purified distance*, arXiv:2410.10770.
- Sreejith Sreekumar, Christoph Hirche, Hao-Chung Cheng, **Mario Berta**, *Distributed quantum hypothesis testing under zero-rate communication constraints*, arXiv:2410.08937.
- Aadil Oufkir, Omar Fawzi, **Mario Berta**, *Optimality of meta-converse for channel simulation*, arXiv:2410.08140.
- Aadil Oufkir, Michael X. Cao, Hao-Chung Cheng, **Mario Berta**, *Exponents for shared randomness-assisted channel simulation*, arXiv:2410.07051.
- Aadil Oufkir, Marco Tomamichel, **Mario Berta**, *Error exponent of activated non-signaling assisted classical-quantum channel coding*, arXiv:2410.01084.
- Ludovico Lami, **Mario Berta**, Bartosz Regula, *Asymptotic quantification of entanglement with a single copy*, arXiv:2408.07067.
- Sam McArdle, András Gilyén, **Mario Berta**, *Quantum state preparation without coherent arithmetic*, arXiv:2210.14892.
- Sam McArdle, András Gilyén, **Mario Berta**, *A streamlined quantum algorithm for topological data analysis with exponentially fewer qubits*, arXiv:2209.12887.
- **Mario Berta** and Fernando Brandão, *Robust randomness generation on quantum computers*, available at marioberta.info (2020).

Review Articles / Books

- Alexander M. Dalzell *et al.* — **Mario Berta**, *Quantum algorithms: A survey of applications and end-to-end complexities*, Cambridge University Press (2025).
- **Mario Berta** *et al.*, *The tangled state of quantum hypothesis testing*, Nature Physics, 20, 172 (2024).
- Stefano Pirandola *et al.* — **Mario Berta**, *Advances in quantum cryptography*, Advances in Optics and Photonics 12, 1012 (2020).
- Patrick J. Coles, **Mario Berta**, Marco Tomamichel, Stephanie Wehner, *Entropic uncertainty relations and their applications*, Reviews of Modern Physics 89, 015002 (2017).

Popular Articles

- **Mario Berta**, *Algorithmen für neue Hardware*, DPG Physik Journal 11 (2023), Schwerpunkt Quantencomputing, in German.
- Grant Salton *et al.* — **Mario Berta**, *Goldman Sachs and AWS examine efficient ways to load data into quantum computers*, AWS Quantum Computing Blog (2022).
- **Mario Berta**, *Generating quantum randomness with Amazon Braket*, AWS Quantum Computing Blog (2021).

Journal Articles

- Tobias Rippchen, Sreejith Sreekumar, **Mario Berta**, *Locally-measured Rényi divergences*, IEEE Transactions on Information Theory 71, 6105 (2025).
- Sven Danz, **Mario Berta**, Stefan Schröder, Pascal Kienast, Frank K. Wilhelm, Alessandro Ciani, *Calculating response functions of coupled oscillators using quantum phase estimation*, Physical Review Research 7, 023264 (2025).
- **Mario Berta**, Hao-Chung Cheng, Li Gao, *Quantum broadcast channel simulation via multipartite convex splitting*, Communications in Mathematical Physics 406, 36 (2025).
- **Mario Berta**, Ludovico Lami, Marco Tomamichel, *Continuity of entropies via integral representations*, IEEE Transactions on Information Theory 71, 1896 (2025).
- Sreejith Sreekumar, **Mario Berta**, *Limit distribution theory for quantum divergences*, IEEE Transactions on Information Theory, 71, 459 (2025).
- Michael X. Cao, Navneeth Ramakrishnan, **Mario Berta**, Marco Tomamichel, *Channel simulation: Finite blocklengths and broadcast channels*, IEEE Transactions on Information Theory, 70, 6780 (2024).
- Samson Wang, Sam McArdle, **Mario Berta**, *Qubit-efficient randomized quantum algorithms for linear algebra*, PRX Quantum, 5, 020324 (2024).
- **Mario Berta**, Marco Tomamichel, *Entanglement monogamy via multivariate trace inequalities*, Communications in Mathematical Physics, 405, 29 (2024).
- Chi-Fang Chen, Alexander M. Dalzell, **Mario Berta**, Fernando Brandão, Joel A. Tropp, *Sparse random Hamiltonians are quantumly easy*, Physical Review X, 14, 011014 (2024).
- Alexander M. Dalzell *et al.* — **Mario Berta**, *End-to-end resource analysis for quantum interior point methods and portfolio optimization*, PRX Quantum, 4, 040325 (2023).
- **Mario Berta** *et al.*, *On a gap in the proof of the generalised quantum Stein's lemma and its consequences for the reversibility of quantum resources*, Quantum, 7, 1103 (2023).
- Navneeth Ramakrishnan, Marco Tomamichel, **Mario Berta**, *Moderate deviation expansion for fully quantum tasks*, IEEE Transactions on Information Theory, 69, 5041 (2023).
- **Mario Berta**, David Sutter, Michael Walter, *Quantum Brascamp-Lieb dualities*, Communications in Mathematical Physics, 401, 1807 (2023).
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- David Clader, Alexander Dalzell, Nikitas Stamatopoulos, Grant Salton, **Mario Berta**, William Zeng, *Quantum resources required to block-encode a matrix of classical data*, IEEE Transactions on Quantum Engineering, 3, 1 (2023).
- Kianna Wan, **Mario Berta**, Earl T. Campbell, *A randomized quantum algorithm for statistical phase estimation*, Physical Review Letters, 129, 030503 (2022).
- **Mario Berta**, Francesco Borderi, Omar Fawzi, Volkher B. Scholz *Semidefinite programming hierarchies for constrained bilinear optimization*, Mathematical Programming, 194, 781 (2022).

- **Mario Berta**, Fernando Brandão, Christoph Hirche, *On composite quantum hypothesis testing*, Communications in Mathematical Physics 385, 55 (2021).
- Philippe Faist, **Mario Berta**, Fernando Brandão, *Thermodynamic implementations of quantum processes*, Communications in Mathematical Physics 384, 1709 (2021).
- Hyejung H. Jee, Carlo Sparaciari, **Mario Berta**, *Resource distillation in convex Gaussian resource theories*, Physical Review A 103, 022420 (2021).
- Navneeth Ramakrishnan, Raban Iten, Volkher B. Scholz, **Mario Berta**, *Computing quantum channel capacities*, IEEE Transactions on Information Theory 67, 946 (2021).
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- Mark M. Wilde, **Mario Berta**, Christoph Hirche, Eneet Kaur, *Amortized channel divergence for asymptotic quantum channel discrimination*, Letters in Mathematical Physics 100, 2277 (2020).
- Anurag Anshu, **Mario Berta**, Rahul Jain, Marco Tomamichel, *Partially smoothed information measures*, IEEE Transactions on Information Theory 66, 5022 (2020).
- Kun Fang, Xin Wang, Marco Tomamichel, **Mario Berta**, *Quantum channel simulation and the channel's smooth max-Information*, IEEE Transactions on Information Theory 66, 2129 (2020).
- Anurag Anshu, **Mario Berta**, Rahul Jain, Marco Tomamichel, *A minimax approach to one-shot entropy inequalities*, Journal of Mathematical Physics 60, 122201 (2019).
- Philippe Faist, **Mario Berta**, Fernando Brandão, *Thermodynamic capacity of quantum processes*, Physical Review Letters 122, 200601 (2019).
- **Mario Berta**, Fernando Brandão, Jutho Haegeman, Volkher B. Scholz, Frank Verstraete, *Thermal states as convex combinations of matrix product states*, Physical Review B 98, 235154 (2018).
- **Mario Berta**, Christian Majenz, *Disentanglement cost of quantum states*, Physical Review Letters 121, 190503 (2018).
- **Mario Berta**, Fernando Brandão, Christian Majenz, Mark M. Wilde, *Deconstruction and conditional erasure of quantum correlations*, Physical Review A 98, 042320 (2018).
- **Mario Berta**, Fernando Brandão, Christian Majenz, Mark M. Wilde, *Conditional decoupling of quantum information*, Physical Review Letters 121, 040504 (2018).
- **Mario Berta**, Mark M. Wilde, *Amortization does not enhance the max-Rains information of a quantum channel*, New Journal of Physics 20, 053044 (2018).
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- **Mario Berta**, Hrant Gharibyan, Michael Walter, *Entanglement-assisted capacities of compound quantum channels*, IEEE Transactions on Information Theory 63, 3306 (2017).
- Christian Majenz, **Mario Berta**, Frédéric Dupuis, Renato Renner, Matthias Christandl, *Catalytic decoupling of quantum information*, Physical Review Letters 118, 080503 (2017).
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- Mark M. Wilde, Marco Tomamichel, **Mario Berta**, *Converse bounds for private communication over quantum channels*, IEEE Transactions on Information Theory 63, 1792 (2017).
- **Mario Berta**, Omar Fawzi, Volkher B. Scholz, *Quantum bilinear optimization*, SIAM Journal on Optimization 26, 1529 (2016).
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- Marco Tomamichel, **Mario Berta**, Joseph M. Renes, *Quantum coding with finite resources*, Nature Communications 7, 11419 (2016).
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- **Mario Berta**, Matthias Christandl, Dave Touchette, *Smooth entropy bounds on one-shot quantum state redistribution*, IEEE Transactions on Information Theory 62, 1425 (2016).
- **Mario Berta**, Fabian Furrer, Volkher B. Scholz, *The smooth entropy formalism for von Neumann algebras*, Journal of Mathematical Physics 57, 015213 (2016), Special Issue: Operator Algebras and Quantum Information Theory.
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- **Mario Berta**, Kaushik P. Seshadreesan, Mark M. Wilde, *Rényi generalizations of quantum information measures*, Physical Review A 91, 022333 (2015).
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- Fabian Furrer, **Mario Berta**, Marco Tomamichel, Volkher B. Scholz, Matthias Christandl, *Position-momentum uncertainty relations in the presence of quantum memory*, Journal of Mathematical Physics 55, 122205 (2014)
- **Mario Berta**, Patrick J. Coles, Stephanie Wehner, *Entanglement-assisted guessing of complementary measurement outcomes*, Physical Review A 90, 062127 (2014).

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- Fabian Furrer, Torsten Franz, **Mario Berta**, Anthony Leverrier, Volkher B. Scholz, Marco Tomamichel, Reinhard F. Werner, *Continuous variable quantum key distribution: finite-key analysis of composable security against coherent attacks*, Physical Review Letters 109, 100502 (2012).
- Nelly Huei Ying Ng, **Mario Berta**, Stephanie Wehner, *A min-entropy uncertainty relation for finite size cryptography*, Physical Review A 86, 042315 (2012).
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- **Mario Berta**, Matthias Christandl, Roger Colbeck, Joseph M. Renes, Renato Renner, *The uncertainty principle in the presence of quantum memory*, Nature Physics 6, 659 (2010).

Conference Proceedings

- Shao-Lun Huang, Tobias Rippchen, **Mario Berta**, *Quantum entropy prover*, IEEE International Symposium on Information Theory, to appear (2025).
- Sreejith Sreekumar, Christoph Hirche, Hao-Chung Cheng, **Mario Berta**, *Distributed quantum hypothesis testing under zero-rate communication constraints*, IEEE International Symposium on Information Theory, to appear (2025).
- Aadil Oufkir, Michael X. Cao, Hao-Chung Cheng, **Mario Berta**, *Exponents for shared randomness-assisted channel simulation*, IEEE International Symposium on Information Theory, to appear (2025).
- **Mario Berta**, Lampros Gavalakis, Ioannis Kontoyiannis, *A third information-theoretic approach to finite de Finetti theorems*, IEEE International Symposium on Information Theory, pages 73-78 (2024).
- Sreejith Sreekumar, **Mario Berta**, *Limit distribution for quantum relative entropy*, IEEE International Symposium on Information Theory, pages 333-338 (2024).
- Tobias Rippchen, Sreejith Sreekumar, **Mario Berta**, *Locally-measured Rényi divergences*, IEEE International Symposium on Information Theory, pages 351-356 (2024).
- **Mario Berta**, Omar Fawzi, Aadil Oufkir, *Optimality of meta-converse for channel simulation*, IEEE International Symposium on Information Theory, pages 1209-1214 (2024).
- Aditya Nema, Sreejith Sreekumar, **Mario Berta**, *One-shot multiple access channel simulation*, IEEE International Symposium on Information Theory, pages 2981-2986 (2024).

- Michael X. Cao, Navneeth Ramakrishnan, **Mario Berta**, Marco Tomamichel, *Broadcast channel simulation*, IEEE International Symposium on Information Theory, pages 1430-1435 (2023).
- Michael X. Cao, Navneeth Ramakrishnan, **Mario Berta**, Marco Tomamichel, *One-shot point-to-point channel simulation*, IEEE International Symposium on Information Theory, pages 796-801 (2022).
- **Mario Berta**, Marco Tomamichel, *Chain rules for quantum channels*, IEEE International Symposium on Information Theory, pages 2427-2432 (2022).
- Navneeth Ramakrishnan, Marco Tomamichel, **Mario Berta**, *Moderate deviation analysis for quantum state transfer*, IEEE Information Theory Workshop (2021).
- Hyejung H. Jee, Carlo Sparaciari, Omar Fawzi, **Mario Berta**, *Quasi-polynomial time algorithms for free quantum games in bounded dimension*, International Colloquium on Automata, Languages and Programming, pages 81:1-81:20 (2020).
- Navneeth Ramakrishnan, Raban Iten, Volkher B. Scholz, **Mario Berta**, *Quantum Blahut-Arimoto algorithms*, IEEE International Symposium on Information Theory, pages 1909-1914 (2020), Jack Keil Wolf Student Paper Award.
- Arkin Tikku, Joseph M. Renes, **Mario Berta**, *Additivity in classical-quantum wiretap channels*, IEEE International Symposium on Information Theory, pages 1996-2001 (2020).
- **Mario Berta**, Francesco Borderi, Omar Fawzi, Volkher B. Scholz, *Quantum coding via semidefinite programming*, IEEE International Symposium on Information Theory, pages 260-264 (2019).
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- Anurag Anshu, **Mario Berta**, Rahul Jain, Marco Tomamichel, *Second-order characterizations via partial smoothing*, IEEE International Symposium on Information Theory, pages 937-941 (2019).
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