Felix Leditzky

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Employment

Jan 2021 – present	**Assistant Professor** Department of Mathematics & Department of Electrical and Computer Engineering (Affiliate), University of Illinois Urbana-Champaign
Dec 2019 – Dec 2020	**Postdoctoral Fellow** Institute for Quantum Computing, University of Waterloo Perimeter Institute for Theoretical Physics
Nov 2016 – Nov 2019	**Postdoctoral Research Associate** JILA, University of Colorado Boulder

Education

Oct 2013 – Oct 2016	**PhD**, Department of Pure Mathematics and Mathematical Statistics, University of Cambridge, supervised by Nilanjana Datta Thesis: "Relative entropies and their use in quantum information theory"
Oct 2006 – Apr 2013	**Diploma**,* Physics, University of Vienna, graduated with distinction (thesis)
Oct 2006 – Feb 2012	**Diploma**, Mathematics, University of Vienna, grad. with distinction (thesis)

**An Austrian "Diploma" degree in Mathematics or Physics is a 5-year degree equivalent to a combined Bachelor's and Master's degree. The awarded academic title is "Magister rerum naturalium" (Mag. rer. nat.).*

Research interests

Quantum information theory, in particular mathematical and information-theoretic aspects:

- Additivity problems in quantum information theory, quantum channels and their capacities, quantum Shannon theory, relative entropies, strong converse theorems, second order asymptotics
- Multipartite entanglement, symmetries and representation theory, group theory
- Semidefinite programming, convex optimization theory, global optimization techniques

Publications

Preprints

[31] C. Kim, E. Chitambar, and **F. Leditzky**. "A resource theory of asynchronous quantum information processing". *arXiv preprint* (2025). arXiv: 2504.12945 [quant-ph]

[30] J. Zhou, S. Chessa, E. Chitambar, and **F. Leditzky**. "On the distinguishability of geometrically uniform quantum states". *arXiv preprint* (2025). arXiv: 2501.12376 [quant-ph]

[29] X. Chen, S. Chessa, I. George, **F. Leditzky**, and E. Chitambar. "Capacities of Entanglement Distribution From a Central Source". *arXiv preprint* (2024). arXiv: 2411.04977 [quant-ph]

[28] C. Vairogs, S. Hermes, and **F. Leditzky**. "Localizing multipartite entanglement with local and global measurements". *arXiv preprint* (2024). arXiv: 2411.04080 [quant-ph]

[27] B. Doolittle, **F. Leditzky**, and E. Chitambar. "Operational Nonclassicality in Quantum Communication Networks". *arXiv preprint* (2024). arXiv: 2403.02988 [quant-ph]

Published articles

[26] T. Nuradha, H. K. Mishra, **F. Leditzky**, and M. M. Wilde. "Multivariate Fidelities". *Journal of Physics A: Mathematical and Theoretical* (2025). arXiv: 2404.16101 [quant-ph]

[25] N. LaRacuente and **F. Leditzky**. "Approximate Unitary k-Designs from Shallow, Low-Communication Circuits". *16th Innovations in Theoretical Computer Science Conference (ITCS 2025)*. Ed. by R. Meka. Vol. 325. Leibniz International Proceedings in Informatics (LIPIcs). Dagstuhl, Germany: Schloss Dagstuhl – Leibniz-Zentrum für Informatik, 2025, 69:1–69:2. arXiv: 2407.07876 [quant-ph]

[24] G. A. Hamilton and **F. Leditzky**. "Probing Multipartite Entanglement Through Persistent Homology". *Communications in Mathematical Physics* 405.5 (May 2024), p. 125. arXiv: 2307.07492 [quant-ph]

[23] E. Chitambar and **F. Leditzky**. "On the Duality of Teleportation and Dense Coding". *IEEE Transactions on Information Theory* 70.5 (2024), pp. 3529–3537. arXiv: 2302.14798 [quant-ph]

[22] A. Seshadri, **F. Leditzky**, V. Siddhu, and G. Smith. "On the Separation of Correlation-Assisted Sum Capacities of Multiple Access Channels". *IEEE Transactions on Information Theory* 69.9 (2023), pp. 5805–5844. arXiv: 2205.13538 [cs.IT]

[21] **F. Leditzky**, D. Leung, V. Siddhu, G. Smith, and J. A. Smolin. "Generic Nonadditivity of Quantum Capacity in Simple Channels". *Physical Review Letters* 130 (20 May 2023), p. 200801. arXiv: 2202.08377 [quant-ph]

[20] **F. Leditzky**, D. Leung, V. Siddhu, G. Smith, and J. A. Smolin. "The Platypus of the Quantum Channel Zoo". *IEEE Transactions on Information Theory* 69.6 (2023), pp. 3825–3849. arXiv: 2202.08380 [quant-ph]

[19] A. Shlosberg, A. J. Jena, P. Mukhopadhyay, J. F. Haase, **F. Leditzky**, and L. Dellantonio. "Adaptive estimation of quantum observables". *Quantum* 7 (2023), p. 906. arXiv: 2110.15339 [quant-ph]

[18] C. Hirche and **F. Leditzky**. "Bounding Quantum Capacities via Partial Orders and Complementarity". *IEEE Transactions on Information Theory* 69.1 (2023), pp. 283–297. arXiv: 2202.11688 [quant-ph]

[17] **F. Leditzky**. "Optimality of the pretty good measurement for port-based teleportation". *Letters in Mathematical Physics* 112.5 (2022), p. 98. arXiv: 2008.11194 [quant-ph]

[16] R. Arnon-Friedman and **F. Leditzky**. "Upper bounds on device-independent quantum key distribution rates and a revised Peres conjecture". *IEEE Transactions on Information Theory* 67.10 (2021), pp. 6606–6618. arXiv: 2005.12325 [quant-ph]

[15] J. Bausch and **F. Leditzky**. "Error Thresholds for Arbitrary Pauli Noise". *SIAM Journal on Computing* 50.4 (2021), pp. 1410–1460. arXiv: 1910.00471 [quant-ph]

[14] E. I. Rosenthal, C. M. F. Schneider, M. Malnou, Z. Zhao, **F. Leditzky**, B. J. Chapman, W. Wustmann, X. Ma, D. A. Palken, M. F. Zanner, L. R. Vale, G. C. Hilton, J. Gao, G. Smith, G. Kirchmair, and K. W. Lehnert. "Efficient and Low-Backaction Quantum Measurement Using a Chip-Scale Detector". *Physical Review Letters* 126 (9 Mar. 2021), p. 090503. arXiv: 2008.03805 [quant-ph]

[13] M. Christandl, **F. Leditzky**, C. Majenz, G. Smith, F. Speelman, and M. Walter. "Asymptotic Performance of Port-Based Teleportation". *Communications in Mathematical Physics* 381.1 (Jan. 2021), pp. 379–451. arXiv: 1809.10751 [quant-ph]

[12] **F. Leditzky**, M. A. Alhejji, J. Levin, and G. Smith. "Playing Games with Multiple Access Channels". *Nature Communications* 11, 1497 (2020). arXiv: 1909.02479 [quant-ph]

[11] J. Bausch and **F. Leditzky**. "Quantum codes from neural networks". *New Journal of Physics* 22.2, 023005 (Feb. 2020). arXiv: 1806.08781 [quant-ph]

[10] **F. Leditzky**, D. Leung, and G. Smith. "Dephrasure Channel and Superadditivity of Coherent Information". *Physical Review Letters* 121 (16 Oct. 2018), p. 160501. arXiv: 1806.08327 [quant-ph]

[9] **F. Leditzky**, N. Datta, and G. Smith. "Useful states and entanglement distillation". *IEEE Transactions on Information Theory* 64.7 (July 2018), pp. 4689–4708. arXiv: 1701.03081 [quant-ph]

[8] **F. Leditzky**, D. Leung, and G. Smith. "Quantum and Private Capacities of Low-Noise Channels". *Physical Review Letters* 120 (16 Apr. 2018), p. 160503. arXiv: 1705.04335 [quant-ph]

[7] **F. Leditzky**, E. Kaur, N. Datta, and M. M. Wilde. "Approaches for approximate additivity of the Holevo information of quantum channels". *Physical Review A* 97 (1 Jan. 2018), p. 012332. arXiv: 1709.01111 [quant-ph]

[6] **F. Leditzky**, C. Rouzé, and N. Datta. "Data processing for the sandwiched Rényi divergence: a condition for equality". *Letters in Mathematical Physics* 107.1 (2017), pp. 61–80. arXiv: 1604.02119 [quant-ph]

[5] S. Beigi, N. Datta, and **F. Leditzky**. "Decoding Quantum Information via the Petz recovery map". *Journal of Mathematical Physics* 57.8, 082203 (2016). arXiv: 1504.04449 [quant-ph]

[4] **F. Leditzky**, M. M. Wilde, and N. Datta. "Strong converse theorems using Rényi entropies". *Journal of Mathematical Physics* 57.8, 082202 (2016). arXiv: 1506.02635 [quant-ph]

[3] **F. Leditzky** and N. Datta. "Second order asymptotics of visible mixed quantum source coding via universal codes". *IEEE Transactions on Information Theory* 62.7 (2016), pp. 4347–4355. arXiv: 1407.6616 [quant-ph]

[2] N. Datta and **F. Leditzky**. "Second-Order Asymptotics for Source Coding, Dense Coding, and Pure-State Entanglement Conversions". *IEEE Transactions on Information Theory* 61.1 (2015), pp. 582–608. arXiv: 1403.2543 [quant-ph], N. Datta and **F. Leditzky**. "Corrections to "Second-Order Asymptotics for Source Coding, Dense Coding, and Pure-State Entanglement Conversions"". *IEEE Transactions on Information Theory* 64.4 (2017), pp. 2625–2627

[1] N. Datta and **F. Leditzky**. "A limit of the quantum Rényi divergence". *Journal of Physics A: Mathematical and Theoretical* 47.4 (2014), p. 045304. arXiv: 1308.5961 [quant-ph]

Grants

Oct 2025 – Sep 2030	National Science Foundation No. 2442410 CAREER: Symmetries in noisy multipartite quantum systems Principal Investigator (PI): Felix Leditzky (UIUC) Amount awarded: **$633,770**
Dec 2024 – Dec 2027	National Science Foundation No. 2426103 FET: Small: NSF-NSERC: Fundamental limits on quantum communications PI: Felix Leditzky (UIUC) Amount awarded: **$599,848**
Jul 2024 – Jul 2025	National Science Foundation No. 2409823

	Conference: Beyond IID in Information Theory 12 PI: Felix Leditzky (UIUC) Co-PIs: Marius Junge, Eric Chitambar, Roy Araiza, Amanda Young (UIUC) Amount awarded: **$46,000**
Apr 2023 – Feb 2025	UIUC Campus Research Board Award No. RB23076 "Quantum capacity thresholds from symmetric codes" PI: Felix Leditzky (UIUC) Amount awarded: **$30,000**, Arnold O. Beckman Research Award
Sep 2021 – Aug 2025	National Science Foundation No. 2137953 QuIC-TAQS: Quantum Networking with Multipartite Entangled Photons PI: Shuo Sun (University of Colorado Boulder) Co-PIs: Edwin Barnes (Virginia Tech), Paul Kwiat, Felix Leditzky (UIUC) Amount awarded to Co-PI: **$388,377** (total award amount: $2,499,999)
Aug 2021 – Aug 2025	IBM-Illinois Discovery Accelerator Institute Grant "Efficient implementation of optimal measurements in state discrimination" PIs: Srinivasan Arunachalam (IBM), Eric Chitambar, Felix Leditzky (UIUC) Amount awarded to PI: **$408,450** (total award amount: $8,750,000)
Aug 2018	National Science Foundation No. 1834515 Travel Support for Workshop: Rocky Mountain Summit on Quantum Information PI: Felix Leditzky; Co-PI: Graeme Smith (University of Colorado Boulder) Amount awarded: **$10,000**
May 2018	AI Grant "Search for new quantum error correction codes using neural networks" PIs: Johannes Bausch (University of Cambridge), Felix Leditzky (University of Colorado Boulder) Amount awarded: **$2,500 plus $20,000 GPU credits**

Awards

Aug 2023 – Aug 2025	Lincoln Excellence for Assistant Professor (LEAP) Scholar College of Liberal Arts and Sciences, University of Illinois Urbana-Champaign Includes discretionary fund of **$10,000** for scholarly activities.
Apr 2023 – Feb 2025	Arnold O. Beckman Research Award University of Illinois Urbana-Champaign
Jan 2023 – Jan 2025	David H. Blackwell Scholar Department of Mathematics, University of Illinois Urbana-Champaign Includes discretionary fund of **$12,000** for scholarly activities.
Apr 2015	Smith-Knight and Rayleigh-Knight Prize (essay) University of Cambridge

Supervision & Mentoring

Postdoctoral scholars

Aug 2024 – Aug 2027	Jacob L. Beckey
Aug 2022 – Aug 2024	Stefano Chessa (jointly advised with Eric Chitambar)

PhD students

Spring 2024 – present	Christopher Vairogs
Spring 2023 – present	Sujeet Bhalerao
Spring 2022 – present	Haneul Kim (jointly advised with Eric Chitambar)
Spring 2022 – present	Stephen Zhou

Master's students

Aug 2024 – present	Yulie Arad
Aug 2024 – present	Mayank Bhatia

Undergraduate students

Aug 2024 – present	Sungjai Lee (undergraduate research)
Aug 2023 – Aug 2024	Yulie Arad (undergraduate research)
Jan 2022 – Aug 2024	Mayank Bhatia (undergraduate research, undergraduate thesis supervision)
Jan 2022 – Dec 2022	Mason Camp (undergraduate research)
Aug 2021 – Aug 2022	Nouralhoda Bayat (undergraduate research)

Teaching experience

Courses at University of Illinois Urbana-Champaign

Spring 2025	Math 257 Linear Algebra with Computational Applications First course in linear algebra for STEM majors, 482 students
Spring 2024	Math 257 Linear Algebra with Computational Applications First course in linear algebra for STEM majors, 575 students
Spring 2023	Math 595 Quantum channels Advanced graduate topics course, 18 students Listed as a "Teacher ranked as excellent by their students"
Fall 2022	Math 595 Representation-theoretic methods in quantum information theory Advanced graduate topics course, 28 students Listed as a "Teacher ranked as excellent by their students" with outstanding ratings
Fall 2021	Math 416 Abstract Linear Algebra Proof-based linear algebra course for math majors, 61 students Listed as a "Teacher ranked as excellent by their students"
Spring 2021	Math 595 Quantum channels I & Math 595 Quantum channels II Advanced graduate topics course, 28 students Listed as a "Teacher ranked as excellent by their students" with outstanding ratings

Note: 1xx-4xx courses are at the undergraduate level, while 5xx courses are at the graduate level.

Undergraduate research projects at University of Illinois Urbana-Champaign

2024 – 2025	Measuring entanglement witnesses for (weighted) graph states

	Students: Yulie Arad, Mayank Bhatia
	Postdoc mentor: Jacob Beckey
2023 – 2024	Optimizing Quantum Teleportation Protocols
	IBM-Illinois Discovery Accelerator Institute REU project
	Students: Yulie Arad, Mayank Bhatia
Fall 2023	Mapping out the quantum channel zoo
	Illinois Geometry Lab project
	Students: Ben Booker, Tianshun Gao, Anne Que, Yuxuan Wan, Lumi Xu
	Graduate student mentor: Sujeet Bhalerao
2022 – 2023	Variational Quantum Optimization of Teleportation Protocols with Noisy Resources
	IBM-Illinois Discovery Accelerator Institute REU project
	Students: Hani Al Majed, Mayank Bhatia, Palak Kotwani
	Graduate student mentor: Brian Doolittle
Fall 2022	Quantum teleportation and quantum state discrimination
	Illinois Geometry Lab project
	Students: M. Bhatia, M. Camp, D. Chakrabarti, R. Narayanan, P. Rathi
	Graduate student mentors: Sujeet Bhalerao, Stephen Zhou
Spring 2022	Quantum Capacity Bounds and Semidefinite Programming
	Illinois Geometry Lab project
	Students: M. Bhatia, M. Camp, Y. Chen, P. Ge, E. Papoutsis, J. Solak, J. Wang, T. Xu, B. Yuan
	Graduate student mentors: Joe Groszkiewicz, Peixue Wu

Courses at University of Cambridge

Fall 2015	Exercise classes for lecture "Quantum Information Theory"
	Master's course (Part III), ca. 30 students
Fall 2014	Exercise classes for lecture "Quantum Information Theory"
	Master's course (Part III), ca. 30 students
Fall 2013	Exercise classes for lecture "Quantum Information Theory"
	Master's course (Part III), ca. 30 students

Extended research visits

Mar 2019	Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA
	Program "Machine Learning for Quantum Many-Body Physics"
Dec 2017	Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA
	Program "Quantum Physics of Information"
Sep 2017	Institute Henri Poincaré, Paris, France
	Program "Analysis in Quantum Information Theory"

Presentations

Contributed talks

†*Talk given online.* **Talk delivered by co-author.*

Feb 2025* *Quantum Information Processing (QIP)*, Raleigh, USA
Title: "Approximate Unitary k-Designs from Shallow, Low-Communication Circuits"
Long plenary talk

Jan 2025* *Innovations in Theoretical Computer Science (ITCS)*, New York, USA
Title: "Approximate Unitary k-Designs from Shallow, Low-Communication Circuits"

Aug 2024* *Beyond I.I.D. in Information Theory*, Champaign, USA
Title: "Approximate Unitary k-Designs from Shallow, Low-Communication Circuits"

Aug 2023 *Beyond I.I.D. in Information Theory*, Tübingen, Germany
Title: "Probing multipartite entanglement through persistent homology"

Jul 2023† *Theory of Quantum Computation, Communication and Cryptography*, Aveiro, Portugal
Title: "On the Duality of Teleportation and Dense Coding"

Jun 2023* *IEEE International Symposium on Information Theory*, Taipeh, Taiwan
Title: "On the Duality of Teleportation and Dense Coding"

Sep 2022† *Beyond I.I.D. in Information Theory*, Shenzhen, China
Title: "Bounding Quantum Capacities via Partial Orders and Complementarity"

Jun 2022† *IEEE International Symposium on Information Theory*, Espoo, Finland
Title: "The platypus of the quantum channel zoo"

Jun 2022* *IEEE International Symposium on Information Theory*, Espoo, Finland
Title: "On the separation of correlation-assisted sum capacities of multiple access channels"

Jun 2022* *IEEE International Symposium on Information Theory*, Espoo, Finland
Title: "Bounding quantum capacities via partial orders and complementarity"

Mar 2022* *Quantum Information Processing*, Pasadena, USA
Title: "The platypus of the quantum channel zoo"

Sep 2021†* *Beyond I.I.D. in Information Theory*, Taipei, Taiwan
Title: "The platypus of the quantum channel zoo"

Aug 2021† *International Congress on Mathematical Physics*, Geneva, Switzerland
Title: "Asymptotic performance of port-based teleportation"

Jul 2021† *Theory of Quantum Computation, Communication and Cryptography*, Riga, Latvia
Title: "Upper bounds on device-independent quantum key distribution rates"

Nov 2020† *Beyond I.I.D. in Information Theory*, Stanford, USA
Title: "Playing games with multiple access channels"

Nov 2020†* *Beyond I.I.D. in Information Theory*, Stanford, USA
Title: "Upper bounds on device-independent quantum key distribution rates and a revised Peres conjecture"

Jun 2020† *Theory of Quantum Computation, Communication and Cryptography*, Riga, Latvia
Title: "Playing games with multiple access channels"

Jan 2020 *Quantum Information Processing*, Shenzhen, China
Title: "Error thresholds for arbitrary Pauli noise"

Jul 2019 *Beyond I.I.D. in Information Theory*, Sydney, Australia

Title: "Quantum codes from neural networks"

Feb 2019 *Southwest Quantum Information and Technology*, Albuquerque, USA
Title: "Dephrasure channel and superadditivity of coherent information"

Jan 2019* *Quantum Information Processing*, Boulder, USA
Title: "Asymptotic performance of port-based teleportation"

Jul 2018 *Beyond I.I.D. in Information Theory*, Cambridge, UK
Title: "Dephrasure channel and superadditivity of coherent information"

Jul 2017 *Beyond I.I.D. in Information Theory*, Singapore, Singapore
Title: "Useful states and entanglement distillation"

Jun 2017 *IEEE International Symposium on Information Theory*, Aachen, Germany
Title: "Degradable states and one-way entanglement distillation"

Jul 2016 *IEEE International Symposium on Information Theory*, Barcelona, Spain
Title: "Strong converse theorem for state redistribution using Rényi entropies"

Sep 2015 *Quantum Information Processing and Communication*, Leeds, UK
Title: "Second Order Asymptotics of Quantum Mixed Source Coding"

Invited talks

Oct 2024 *Quantum Networks Workshop*, Institute for Mathematical and Statistical Innovation, Chicago, USA
Title: "Enhancing classical communication networks with quantum resources"

Aug 2024 *Symposium Bridging Quantum Information and Mathematical Physics*, University of Cambridge, Cambridge, UK
Title: "On the duality of teleportation and dense coding"

May 2024 *15th KCIK-ICTQT Symposium on Quantum Information*, Sopot, Poland
Title: "Enhancing classical communication networks with quantum resources"

May 2023 *Photonic interfaces for quantum technologies* (NSF QuIC-TAQS meeting), Arlington, USA
Title: "Entanglement in weighted graph states and LOCC transformations"

Nov 2021 *Mathematics Colloquium*, University of South Carolina, USA
Title: "Symmetries in quantum information theory"

Oct 2020 *Recent developments in quantum information and computing*, The Graduate Center, City University of New York, USA
Title: "Symmetries and asymptotics of port-based teleportation"

Jul 2020 *Tutte Colloquium*, Department of Combinatorics & Optimization, University of Waterloo, Canada
Title: "Symmetries and asymptotics of port-based teleportation"

Sep 2019 *57th Annual Allerton Conference on Communication, Control and Computing*, University of Illinois Urbana-Champaign, Monticello, USA
Title: "Quantum codes from neural networks"

Jul 2019 *Algebraic and Statistical ways into Quantum Resource Theories* (BIRS workshop), Banff, Canada
Title: "Asymptotic performance of port-based teleportation"

May 2019 *Symposium on Quantum resources and their application*, ICTQT & KCIK, Gdansk, Poland
Title: "Quantum Codes from Neural Networks"

Oct 2018 *Quantum Innovators in computer science and mathematics*, IQC, University of Waterloo, Canada
Title: "Quantum Codes from Neural Networks"

Apr 2018 *IQC Colloquium*, IQC, University of Waterloo, Canada
Title: "Asymptotic performance of port-based teleportation"

Nov 2017 *IEEE Information Theory Workshop*, Kaohsiung, Taiwan
Title: "Quantum and private capacities of low-noise channels"

Aug 2015 *Young Researchers in Mathematics*, University of Oxford, UK
Title: "Second Order Asymptotics in Quantum Information Theory: Quantum Source Coding"

Jul 2015 *Beyond I.I.D. in Information Theory*, Banff, Canada
Title: "Strong converse theorems using Rényi entropies"

Aug 2014 *QUTE-Europe Summer School*, Smolenice, Slovakia
Title: "Source coding for a mixed source: determination of second order asymptotics"

Poster presentations

Feb 2019 *Southwest Quantum Information and Technology*, Albuquerque, USA
Title: "Quantum codes from neural networks"

Jan 2019 *Quantum Information Processing*, Boulder, USA
Title: "Quantum codes from neural networks"

Jul 2018 *Beyond I.I.D. in Information Theory*, Cambridge, UK
Title: "Port-based teleportation in arbitrary dimension – asymptotics and a converse bound"

Jan 2018 *Quantum Information Processing*, Delft, Netherlands
Title: "Bounds on quantum channel capacities from approximate additivity of channel information quantities"
Title: "Quantum and private capacities of low-noise channels"

Jan 2017 *Quantum Information Processing*, Seattle, USA
Title: "Degradable states and one-way entanglement distillation"

Jul 2016 *Beyond I.I.D. in Information Theory*, Barcelona, Spain
Title: "Degradable states: Upper bounds on one-way distillable entanglement and quantum capacity"

Jan 2016 *Quantum Information Processing*, Banff, Canada
Title: "Strong converse theorems using Rényi entropies"

Feb 2014 *Quantum Information Processing*, Barcelona, Spain
Title: "A limit of the quantum Rényi divergence"

Seminar talks

Sep 2024 *HKUST Guangzhou Quantum Seminar*, remote talk
Title: "Enhancing classical communication networks with quantum resources"

Oct 2023 *Seminar*, Cornell University
Title: "On the duality of teleportation and dense coding"

Jun 2023 *Seminar*, Ruhr Universität Bochum
Title: "Probing multipartite entanglement through persistent homology"

Mar 2023	*Seminar*, Weizmann Institute of Science, Israel Title: "The platypus of the quantum channel zoo"
Nov 2022	*Seminar*, Virginia Tech, USA Title: "The platypus of the quantum channel zoo"
Sep 2022	*Applied Mathematics Seminar*, University of California Berkeley, USA Title: "The platypus of the quantum channel zoo"
Mar 2022	*Seminar*, University of Delaware, USA Title: "The platypus of the quantum channel zoo"
Sep 2021	*QST seminar*, Louisiana State University, USA Title: "Optimality of the pretty good measurement for port-based teleportation"
May 2021	*IQUIST Young researcher seminar*, University of Illinois at Urbana-Champaign, USA Title: "Entanglement in quantum communication"
Mar 2021	*Quasar seminar*, University of Ottawa, Canada Title: "Symmetries and asymptotics of port-based teleportation"
Apr 2020	*ICTQT Seminar*, ICTQT/KCIK, University of Gdansk, Poland Title: "Playing games with multiple access channels" (remote talk)
Mar 2020	*IQUIST Seminar*, University of Illinois Urbana-Champaign, USA Title: "Symmetries and entanglement in channel coding problems" (remote talk)
Feb 2020	*IQC Seminar*, IQC, University of Waterloo, Canada Title: "Error thresholds for arbitrary Pauli noise"
Jan 2020	*KdVI Seminar*, Korteweg-de Vries Institute for Mathematics, University of Amsterdam, Netherlands Title: "Symmetries and entanglement in channel coding problems"
Nov 2019	*QuICS Seminar*, QuICS, University of Maryland, USA Title: "Playing games with multiple access channels"
Sep 2019	*IQUIST Seminar*, University of Illinois Urbana-Champaign, USA Title: "Symmetries and asymptotics of port-based teleportation"
Mar 2019	*Machine Learning for Quantum Many-Body Physics*, KITP, University of California Santa Barbara, USA Title: "Quantum codes from neural networks"
Nov 2018	*CQIF group seminar*, University of Cambridge, UK Title: "Asymptotic performance of port-based teleportation"
Sep 2018	*IQOQI Seminar*, Austrian Academy of Sciences & University of Vienna, Austria Title: "Dephrasure channel and superadditivity of coherent information"
Jun 2018	*Stanford University Seminar*, Stanford University, USA Title: "Dephrasure channel and superadditivity of coherent information"
May 2018	*MIT Seminar*, Massachussetts Institute of Technology, USA Title: "Asymptotic performance of port-based teleportation"
May 2018	*PI Seminar*, Perimeter Institute for Theoretical Physics, Canada Title: "Asymptotic performance of port-based teleportation"
Jan 2018	*QuSoft Seminar*, QuSoft, University of Amsterdam, Netherlands Title: "Useful states and entanglement distillation, and a toy channel exhibiting super-additivity of coherent information"
Nov 2017	*Hunter College group seminar*, City University of New York, USA

	Title: "Bounds on quantum channel capacities from approximate additivity of channel information quantities"
Sep 2017	*Analysis in Quantum Information Theory: Junior research seminar*, IHP, Paris, France Title: "Bounds on quantum channel capacities from approximate additivity of channel information quantities"
Jul 2017	*IQI Seminar*, Caltech, USA Title: "Useful states and entanglement distillation"
May 2017	*LSU group seminar*, Louisiana State University, USA Title: "On the quantum capacity of the qubit depolarizing channel"
May 2017	*LSU group seminar*, Louisiana State University, USA Title: "Relative entropies and their use in quantum information theory"
Apr 2017	*CTQM seminar*, University of Colorado Boulder, USA Title: "Upper bounds on the one-way and two-way distillable entanglement from suitable convex decompositions"
Apr 2017	*CQIF group seminar*, University of Cambridge, UK Title: "On the quantum capacity of the qubit depolarizing channel"
Feb 2016	*CAKE seminar*, University of Cambridge, UK Title: "Equality condition in the data processing inequality for the quantum relative entropy"
Jan 2016	IBM Thomas J. Watson Research Center, Yorktown Heights, USA Title: "Strong converse theorems using Rényi entropies"

Academic service

Committee service

Aug 2024 – present	Education Committee IQUIST, University of Illinois Urbana-Champaign
Aug 2024 – present	Steering Committee Beyond IID in Information Theory
Aug 2024 – present	International Association for Quantum Information (https://iaqi.org/) Founding member, contact for TQC local organizers
Jan 2021 – present	Science Advisory Board IQUIST, University of Illinois Urbana-Champaign
Aug 2024 – May 2026	Graduate Affairs Committee Department of Mathematics, University of Illinois Urbana-Champaign
Aug 2023 – May 2024	Climate, Equity & Inclusion Committee Department of Mathematics, University of Illinois Urbana-Champaign
Aug 2022 – May 2023	Strategic Planning Committee Department of Mathematics, University of Illinois Urbana-Champaign
Aug 2021 – May 2022	Faculty search committee for tenure-track position in Applied Mathematics Department of Mathematics, University of Illinois Urbana-Champaign
Aug 2020 – Dec 2020	Quantum information group seminar Perimeter Institute for Theoretical Physics
Oct 2013 – Jun 2015	Organizing committee for the graduate community

Girton College, University of Cambridge

Conference organization

Aug 2024 – present	*Additivity problems in Quantum Information Theory* Banff International Research Station, Canada, July 12-17, 2026 (tentatively) Co-organizers: Nilanjana Datta, Debbie Leung, Graeme Smith
Sep 2023 – Aug 2024	*Bridging Quantum Information and Mathematical Physics* University of Cambridge, UK, August 14-16, 2024 Co-organizers: Nilanjana Datta, Mark Wilde Website: https://felixleditzky.info/bqm/
Sep 2023 – Jul 2024	*Beyond IID in Information Theory* University of Illinois Urbana-Champaign, USA, July 29 - August 2, 2024 Co-organizers: Roy Araiza, Eric Chitambar, Marius Junge, Amanda Young Website: https://beyondiid2024.iquist.illinois.edu/
Jan 2022 – Nov 2022	*QLA meets QIT II* Illini Center, Chicago, USA, November 3-4, 2022 Co-organizers: Roy Araiza, Marius Junge, Thomas Sinclair Website: https://sites.google.com/view/qlameetsqitii/
Aug 2021 – Jul 2022	*Theory of Quantum Computation, Communication, and Cryptography (TQC)* University of Illinois Urbana-Champaign, USA, July 11-14, 2022 Co-organizers: Eric Chitambar, Emily Edwards Website: https://tqc2022-conference.iquist.illinois.edu/
Jan 2018 – Jan 2019	*Quantum Information Processing (QIP)* University of Colorado Boulder, USA, January 14-18, 2019 Co-organizer: Graeme Smith Website: http://jila.colorado.edu/qip2019
Nov 2017 – Jun 2018	*Rocky Mountain Summit on Quantum Information* University of Colorado Boulder, USA, June 25-29, 2018 Co-organizers: Graeme Smith, Mark M. Wilde Website: http://jila.colorado.edu/rmsqi

Editorial services

Mar 2022 – present	Editor for *Quantum* (https://quantum-journal.org/)
Nov 2020 – present	Editor for *Illinois Journal of Mathematics* (https://ijm.math.illinois.edu/)

Referee services

Mar 2025 – Apr 2025	Member of program committee (PC) for conference TQC 2025
Jan 2025 – Apr 2024	PC member for conference ISIT 2025
Jan 2025	Member of National Science Foundation review panel
Feb 2024 – Apr 2024	PC member for conference (https://tqc-conference.org/)
Sep 2023 – Nov 2023	PC member for conference (https://qip2024.tw/)
Mar 2023 – Apr 2023	PC member for conference Beyond IID in Information Theory
Oct 2022 – Nov 2022	PC member for conference QIP 2023

Feb 2022 – Mar 2022	PC member for conference TQC 2022
Aug 2021	PC member for conference Beyond IID in Information Theory
Mar 2021 – Apr 2021	PC member for conference TQC 2021
April 2018	PC member for conference CEQIP 2018
Oct 2013 – present	Reviewing for: *Annales Henri Poincaré*, *Communications in Mathematical Physics*, *IEEE Transactions on Information Theory*, *Journal of Mathematical Physics*, *Journal of Physics A: Mathematical and Theoretical*, *Letters in Mathematical Physics*, *Mathematical Programming*, *Nature Communications*, *Nature Communications Physics*, *Nature Physics*, *New Journal of Physics*, *npj Quantum Information*, *Physical Review A*, *Physical Review Letters*, *Quantum*, *Quantum Information Processing*, various conferences (*AQIS*, *CEQIP*, *ISIT*, *ITW*, *QIP*, *Q-Turn*, *STOC*, *TQC*)

Language & IT skills

Languages: German (native), English (fluent), Spanish (conversational), Latin (translation)
IT: Matlab, Mathematica, Python, HTML, CSS, Linux, LaTeX

Interests

Music, playing guitar, reading, playing football, running, traveling