Marco Mondelli

Institute of Science and Technology (IST) Austria
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Research Interests

Data science, machine learning, information theory.

Current Employment

Sept. 2019 - onwards **Assistant Professor**, *Institute of Science and Technology (IST) Austria.*

Previous Employment

Feb. 2017 - Aug. 2019 **Postdoctoral Scholar**, *Information Systems Laboratory, Stanford University, USA. Host: Prof. Andrea Montanari.*

Aug. 2018 - Dec. 2018 **Research Fellow**, *Simons Institute for the Theory of Computing, Berkeley, USA. Program: Foundations of Data Science.*

Aug. - Dec. 2015 **Visiting Graduate Student**, *Information Systems Laboratory, Stanford University, USA. Advisor: Prof. Andrea Montanari.*

Mar. - Apr. 2015 **Visiting Graduate Student**, *Simons Institute for the Theory of Computing, Berkeley, USA. Program: Information Theory.*

Education

Sept. 2012 - Jan. 2017 **Ph.D. in Computer and Communication Sciences**, *École Polytechnique Fédérale de Lausanne (EPFL), Switzerland. Advisor: Prof. Rüdiger Urbanke.*
Dissertation title: "*From Polar to Reed-Muller Codes: Unified Scaling, Non-standard Channels, and a Proven Conjecture*".
Recipient of the **2018 EPFL Doctorate Award** and the **2017 Patrick Denantes Memorial Prize**.

Oct. 2010 - July 2013 **Honors College Master's Student in Engineering**, *Sant'Anna School of Advanced Studies, Italy. Grade: 100/100 cum laude.*

Oct. 2010 - July 2012 **Master's Degree in Telecommunications Engineering**, *University of Pisa, Italy. Grade: 110/110 cum laude.*

Oct. 2007 - Nov. 2010 **Honors College Bachelor's Student in Engineering**, *Sant'Anna School of Advanced Studies, Italy. Grade: 100/100 cum laude.*

Oct. 2007 - July 2010 **Bachelor's Degree in Telecommunications Engineering**, *University of Pisa, Italy. Grade: 110/110 cum laude.*

Honors and Awards

2021 **Information Theory Society Paper Award** for "Reed-Muller Codes Achieve Capacity on Erasure Channels" (with S. Kudekar, S. Kumar, H. D. Pfister, E. Şaşoğlu, and R. Urbanke).

2019 **Lopez-Loreta Prize** (1M EUR for a 5-year research project).

2018 **Simons-Berkeley Research Fellowship** for the program "Foundations of Data Science".

2018 **EPFL Doctorate Award** (given among all departments at EPFL).

2017 **Patrick Denantes Memorial Prize** for the best Ph.D. thesis in the School of Computer and Communication Sciences at EPFL.

2017 **Early Postdoc.Mobility Fellowship**, Swiss National Science Foundation.

2016 **STOC Best Paper Award** for "Reed-Muller Codes Achieve Capacity on Erasure Channels" (with S. Kudekar, S. Kumar, H. D. Pfister, E. Şaşoğlu, and R. Urbanke).

2016 **2nd Place** in the **Shannon Centennial Student Competition**.

2015 **IEEE Jack Keil Wolf ISIT Student Paper Award** for "Unified Scaling of Polar Codes: Error Exponent, Scaling Exponent, Moderate Deviations, and Error Floors".

2015 **Dan David Prize Scholarship**.

Professional Activities

Technical Program Committee Member

- International Conference on Machine Learning (ICML), 2022 (*Meta-Reviewer*).
- IEEE International Symposium on Information Theory (ISIT), 2021.
- IEEE GLOBECOM Workshop on Channel Coding beyond 5G, 2021.
- International Symposium on Topics in Coding (ISTC), 2021.
- IEEE Information Theory Workshop (ITW), 2020.
- IEEE International Symposium on Information Theory (ISIT), 2019.
- IEEE International Symposium on Information Theory (ISIT), 2018.

Event Organization

- Online conference *Youth in High Dimensions*, International Centre for Theoretical Physics (ICTP), Trieste, Italy, June 2021 (with J. Barbier, M. Gabrié, and S. Goldt).
- Session "Theory of Deep Learning" at the *Information Theory and Applications Workshop (ITA)*, UC San Diego, San Diego, USA, February 2020.
- *Workshop on Theory of Deep Learning (ToDL)*, IST Austria, September 2019 (with D. Alistarh and C. Lampert).
- *Summer School on Information Processing for Large Networks (IPLN)*, Les Diablerets, Switzerland, June 2015 (with J. Djolonga, A. Gkotovos, and H. Hassani).

Reviewing Activities

Journals: Entropy, IEEE Communications Letters, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Communications, IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE Transactions on Vehicular Technology, IEEE Transactions on Wireless Communications, Journal of Machine Learning Research, Physical Review X, SIAM Journal on Mathematics of Data Science.

Conferences: Conference on Artificial Intelligence (AAAI), International Conference on Artificial Intelligence and Statistics (AISTATS), Conference on Learning Theory (COLT), Annual Symposium on Foundations of Computer Science (FOCS), IEEE Global Communications Conference (GLOBECOM), International Conference on Learning Representations (ICLR), International Conference on Machine Learning (ICML), IEEE International Symposium on Information Theory (ISIT), International Symposium on Turbo Codes & Iterative Information Processing (ISTC), IEEE Information Theory Workshop (ITW), Conference on Neural Information Processing Systems (NeurIPS), ACM-SIAM Symposium on Discrete Algorithms (SODA), ACM Symposium on Theory of Computing (STOC), IEEE Wireless Communications and Networking Conference (WCNC).

Publications

Submitted / Preprints

(S1) D. Fathollahi and M. Mondelli, "Polar Coded Computing: The Role of the Scaling Exponent", `arXiv:2201.10082`, Feb. 2022.

(S2) R. Venkataramanan, K. Kögler, and M. Mondelli, "Estimation in Rotationally Invariant Generalized Linear Models via Approximate Message Passing", `arXiv:2112.04330`, Dec. 2021.

(S3) A. Shevchenko, V. Kungurtsev, and M. Mondelli, "Mean-field Analysis of Piecewise Linear Solutions for Wide ReLU Networks", `arXiv:2111.02278`, Nov. 2021.

(S4) N. Doan, S. A. Hashemi, M. Mondelli, and W. J. Gross, "Decoding Reed-Muller Codes with Successive Factor-Graph Permutations", `arXiv:2109.02122`, Sept. 2021.

Journal Papers

(J1) M. Mondelli, C. Thrampoulidis, and R. Venkataramanan, "Optimal Combination of Linear and Spectral Estimators for Generalized Linear Models", *Foundations of Computational Mathematics*, to appear, 2021.

(J2) S. A. Hashemi, M. Mondelli, A. Fazeli, A. Vardy, J. Cioffi, and A. Goldsmith, "Parallelism versus Latency in Simplified Successive-Cancellation Decoding of Polar Codes", *IEEE Transactions on Wireless Communications*, to appear, 2021.

(J3) A. Fazeli, S. H. Hassani, M. Mondelli, and A. Vardy, "Binary Linear Codes with Optimal Scaling: Polar Codes with Large Kernels", *IEEE Transactions on Information Theory*, vol. 67, no. 9, pp. 5693–5710, Sept. 2021.

(J4) M. Mondelli, S. A. Hashemi, J. Cioffi, and A. Goldsmith, "Sublinear Latency for Simplified Successive Cancellation Decoding of Polar Codes", *IEEE Transactions on Wireless Communications*, vol. 20, no. 1, pp. 18–27, Jan. 2021.

(J5) A. Javanmard, M. Mondelli and A. Montanari, "Analysis of a Two-Layer Neural Network via Displacement Convexity", *Annals of Statistics*, vol. 48, no. 6, pp. 3619–3642, 2020.

(J6) S. A. Hashemi, C. Condo, M. Mondelli, and W. J. Gross, "Rate-Flexible Fast Polar Decoders", *IEEE Transactions on Signal Processing*, vol. 67, no. 22, pp. 5689–5701, Nov. 2019.

(J7) M. Mondelli, S. H. Hassani, and R. Urbanke, "A New Coding Paradigm for the Primitive Relay Channel", *Algorithms*, vol. 12, no. 10, Oct. 2019.

(J8) M. Mondelli, S. H. Hassani, and R. Urbanke, "Construction of Polar Codes with Sublinear Complexity", *IEEE Transactions on Information Theory*, vol. 65, no. 5, pp. 2782–2791, May 2019.

(J9) M. Mondelli and A. Montanari, "Fundamental Limits of Weak Recovery with Applications to Phase Retrieval", *Foundations of Computational Mathematics*, pp. 1–71, Sept. 2018.

(J10) S. A. Hashemi, M. Mondelli, S. H. Hassani, C. Condo, R. Urbanke, and W. J. Gross, "Decoder Partitioning: Towards Practical List Decoding of Polar Codes", *IEEE Transactions on Communications*, vol. 66, no. 9, pp. 3749–3759, Sept. 2018.

(J11) M. Mondelli, S. H. Hassani, and R. Urbanke, "How to Achieve the Capacity of Asymmetric Channels", *IEEE Transactions on Information Theory*, vol. 64, no. 5, pp. 3371–3393, May 2018.

(J12) S. Kudekar, S. Kumar, M. Mondelli, H. D. Pfister, E. Şaşoğlu, and R. Urbanke, "Reed-Muller Codes Achieve Capacity on Erasure Channels", *IEEE Transactions on Information Theory*, vol. 63, no. 7, pp. 4298–4316, July 2017.

(J13) M. Mondelli, S. H. Hassani, and R. Urbanke, "Unified Scaling of Polar Codes: Error Exponent, Scaling Exponent, Moderate Deviations, and Error Floors", *IEEE Transactions on Information Theory*, vol. 62, no. 12, pp. 6698–6712, Dec. 2016.

(J14) M. Mondelli, S. H. Hassani, and R. Urbanke, "Scaling Exponent of List Decoders with Applications to Polar Codes", *IEEE Transactions on Information Theory*, vol. 61, no. 9, pp. 4838–4851, Sept. 2015.

(J15) M. Mondelli, S. H. Hassani, I. Sason, and R. Urbanke, "Achieving Marton's Region for Broadcast Channels Using Polar Codes", *IEEE Transactions on Information Theory*, vol. 61, no. 2, pp. 783–800, Feb. 2015.

(J16) M. Mondelli, S. H. Hassani, and R. Urbanke, "From Polar to Reed-Muller Codes: a Technique to Improve the Finite-Length Performance", *IEEE Transactions on Communications*, vol. 62, no. 9, pp. 3084–3091, Sept. 2014.

(J17) M. Mondelli, Q. Zhou, V. Lottici, and X. Ma, "Joint Power Allocation and Path Selection for Multi-Hop Noncoherent Decode and Forward UWB Communications", *IEEE Transactions on Wireless Communications*, vol. 13, no. 3, pp. 1397–1409, Mar. 2014.

Refereed Conference Papers

(C1) M. Mondelli, and R. Venkataramanan, "PCA Initialization for Approximate Message Passing in Rotationally Invariant Models", in *Proceedings of 2021 Conference on Neural Information Processing Systems (NeurIPS'21)*, online, Dec. 2021.

(C2) Q. Nguyen, P. Bréchet, and M. Mondelli, "When Are Solutions Connected in Deep Networks?", in *Proceedings of 2021 Conference on Neural Information Processing Systems (NeurIPS'21)*, online, Dec. 2021.

(C3) S. A. Hashemi, M. Mondelli, J. Cioffi, and A. Goldsmith, "Successive Syndrome-Check Decoding of Polar Codes", in *Proceedings of 2021 Asilomar Conference on Signals, Systems, and Computers*, online, Nov. 2021.

(C4) D. Fathollahi, N. Farsad, S. A. Hashemi, and M. Mondelli, "Sparse Multi-Decoder Recursive Projection Aggregation for Reed-Muller Codes", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'21)*, online, July 2021.

(C5) S. A. Hashemi, M. Mondelli, A. Fazeli, A. Vardy, J. Cioffi, and A. Goldsmith, "Parallelism versus Latency in Simplified Successive-Cancellation Decoding of Polar Codes", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'21)*, online, July 2021.

(C6) Q. Nguyen, M. Mondelli and G. Montufar, "Tight Bounds on the Smallest Eigenvalue of the Neural Tangent Kernel for Deep ReLU Networks", in *Proceedings of International Conference on Machine Learning (ICML'21)*, online, July 2021.

(C7) M. Mondelli, and R. Venkataramanan, "Approximate Message Passing with Spectral Initialization for Generalized Linear Models", in *Proceedings of 24th International Conference on Artificial Intelligence and Statistics (AISTATS'21)*, online, Apr. 2021.

(C8) Q. Nguyen and M. Mondelli, "Global Convergence of Deep Networks with One Wide Layer Followed by Pyramidal Topology", in *Proceedings of 2020 Conference on Neural Information Processing Systems (NeurIPS'20)*, online, Dec. 2020.

(C9) A. Shevchenko and M. Mondelli, "Landscape Connectivity and Dropout Stability of SGD Solutions for Over-parameterized Neural Networks", in *Proceedings of International Conference on Machine Learning (ICML'20)*, online, July 2020.

(C10) M. Mondelli, S. A. Hashemi, J. Cioffi, and A. Goldsmith, "Simplified Successive Cancellation Decoding of Polar Codes Has Sublinear Latency", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'20)*, online, June 2020.

(C11) S. A. Hashemi, C. Condo, M. Mondelli, and W. J. Gross, "Rate-Flexible Fast Polar Decoders", in *Proceedings of IEEE Information Theory Workshop (ITW'19)*, invited paper, Visby, Aug. 2019.

(C12) M. Mondelli and A. Montanari, "On the Connection Between Learning Two-Layer Neural Networks and Tensor Decomposition", in *Proceedings of 22nd International Conference on Artificial Intelligence and Statistics (AISTATS'19)*, Okinawa, Apr. 2019.

(C13) S. A. Hashemi, N. Doan, M. Mondelli, and W. J. Gross, "Decoding Reed-Muller and Polar Codes by Successive Factor Graph Permutations", in *Proceedings of International Symposium on Turbo Codes & Iterative Information Processing (ISTC'18)*, Hong Kong, Dec. 2018.

(C14) N. Doan, S. A. Hashemi, M. Mondelli, and W. J. Gross, "On the Decoding of Polar Codes on Permuted Factor Graphs", in *Proceedings of Global Communications Conference (GLOBECOM'18)*, Abu Dhabi, Dec. 2018.

(C15) A. Fazeli, S. H. Hassani, M. Mondelli, and A. Vardy, "Binary Linear Codes with Optimal Scaling: Polar Codes with Large Kernels", in *Proceedings of IEEE Information Theory Workshop (ITW'18)*, invited paper, Guangzhou, Nov. 2018.

(C16) M. Mondelli and A. Montanari, "Fundamental Limits of Weak Recovery with Applications to Phase Retrieval", presented at *Conference on Learning Theory (COLT'18)*, extended abstract, Stockholm, July 2018.

(C17) M. Mondelli, S. H. Hassani, and R. Urbanke, "A New Coding Paradigm for the Primitive Relay Channel", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'18)*, Vail, pp. 351–355, June 2018.

(C18) S. A. Hashemi, M. Mondelli, S. H. Hassani, R. Urbanke, and W. J. Gross, "Partitioned List Decoding of Polar Codes: Analysis and Improvement of Finite Length Performance", in *Proceedings of IEEE Global Communications Conference (GLOBECOM'17)*, Singapore, Dec. 2017.

(C19) M. Mondelli, S. H. Hassani, and R. Urbanke, "Construction of Polar Codes with Sublinear Complexity", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'17)*, Aachen, pp. 1853–1857, June 2017.

(C20) M. Mondelli, S. H. Hassani, I. Marić, D. Hui, and S.-N. Hong, "Capacity-Achieving Rate-Compatible Polar Codes for General Channels", in *Proceedings of IEEE Wireless Communications and Networking Conference Workshops (WCNCW'17)*, Mar. 2017.

(C21) S. Kudekar, S. Kumar, M. Mondelli, H. D. Pfister, and R. Urbanke, "Comparing the Bit-MAP and Block-MAP Decoding Thresholds of Reed-Muller Codes on BMS Channels", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'16)*, Barcelona, pp. 1755–1759, July 2016.

(C22) S. Kudekar, S. Kumar, M. Mondelli, H. D. Pfister, E. Şaşoğlu, and R. Urbanke, "Reed-Muller Codes Achieve Capacity on Erasure Channels", in *Proceedings of 48th ACM Symposium on Theory of Computing (STOC'16)*, Boston, MA, pp. 658–669, June 2016. **STOC Best Paper Award**.

(C23) M. Mondelli, S. H. Hassani, and R. Urbanke, "Unified Scaling of Polar Codes: Error Exponent, Scaling Exponent, Moderate Deviations, and Error Floors", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'15)*, Hong Kong, pp. 1422–1426, June 2015. **IEEE Jack Keil Wolf ISIT Student Paper Award**.

(C24) M. Mondelli, S. H. Hassani, and R. Urbanke, "How to Achieve the Capacity of Asymmetric Channels", in *Proceedings of 52nd Annual Allerton Conference on Communication, Control, and Computing (ALLERTON'14)*, Monticello, IL, pp. 789–796, Oct. 2014.

(C25) M. Mondelli, S. H. Hassani, Igal Sason, and R. Urbanke, "Achieving Marton's Region for Broadcast Channels Using Polar Codes", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'14)*, Honolulu, HI, pp. 306–310, July 2014.

(C26) M. Mondelli, S. H. Hassani, and R. Urbanke, "From Polar to Reed-Muller Codes: a Technique to Improve the Finite-Length Performance", in *Proceedings of IEEE International Symposium on Information Theory (ISIT'14)*, Honolulu, HI, pp. 131–135, July 2014.

(C27) M. Mondelli, S. H. Hassani, and R. Urbanke, "Scaling Exponent of List Decoders with Applications to Polar Codes", in *Proceedings of IEEE Information Theory Workshop (ITW'13)*, Sevilla, pp. 1–5, Sept. 2013.

(C28) M. Mondelli, Q. Zhou, X. Ma, and V. Lottici, "A Cooperative Approach for Amplify-and-Forward Differential Transmitted Reference IR-UWB Relay Systems", in *Proceedings of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'12)*, Kyoto, pp. 2905–2908, Mar. 2012.

Patents

(P1) M. Mondelli, S. H. Hassani, I. Marić, S.-N. Hong, and D. Hui, "Generalized Rate-Compatible Polar Codes", *Ericsson Research*, San Jose, 2020.

Invited Talks

(T1) "Tight Bounds on the Smallest Eigenvalue of the Neural Tangent Kernel for Deep Neural Networks", *DeepMind*, Dec. 2021 (Online).

(T2) "Analysis of a Two-Layer Neural Network via Displacement Convexity", *Geometric Methods in Optimization and Sampling, Working Group: Mean Field NN*, Simons Institute for the Theory of Computing, Berkeley, Oct. 2021 (Online).

(T3) "Mode Connectivity and Convergence of Gradient Descent for (Not So) Over-parameterized Deep Neural Networks", *Know-Center*, Graz, Oct. 2021 (Online).

(T4) —, *Theory of Neural Nets Seminar*, EPFL, June 2021 (Online).

(T5) "Inference in High Dimensions for Generalized Linear Models: the Linear, the Spectral and the Approximate", *ISOR Colloquium*, University of Vienna, May 2021 (Online).

(T6) "Mode Connectivity and Convergence of Gradient Descent for (Not So) Over-parameterized Deep Neural Networks", *International School for Advanced Studies (SISSA)*, Mar. 2021 (Online).

(T7) "Understanding Gradient Descent for Over-parameterized Deep Neural Networks", *Mathematics of Data Seminar*, Max Planck Institute for Mathematics in the Sciences (MPI MiS), Leipzig, Aug. 2020 (Online).

(T8) —, *Youth in High Dimensions*, International Centre for Theoretical Physics (ICTP), July 2020 (Online).

(T9) —, *Technical University of Munich (TUM)*, June 2020 (Online).

(T10) "Landscape Connectivity and Dropout Stability of SGD Solutions for Over-parameterized Neural Networks", *Information Theory and Applications Workshop (ITA)*, UCSD, San Diego, Feb. 2020.

(T11) "Analysis of a Two-Layer Neural Network via Displacement Convexity", *Foundations of Data Science Reunion*, Simons Institute for the Theory of Computing, Berkeley, Dec. 2019.

(T12) —, *Deep Learning Seminar*, University of Vienna, Oct. 2019.

(T13) "Fundamental Limits and Practical Algorithms in Inference: From Communication to Learning", *School of Electrical and Computer Engineering*, Cornell University, Apr. 2019.

(T14) —, *Electrical Engineering Department*, Columbia University, Apr. 2019.

(T15) —, *Institute of Science and Technology (IST) Austria*, Mar. 2019.

(T16) —, *Electrical and Computer Engineering Department*, UCSB, Mar. 2019.

(T17) —, *Department of Electrical Engineering*, Princeton University, Feb. 2019.

(T18) —, *Electrical and Computer Engineering Department*, UCLA, Feb. 2019.

(T19) —, *Max-Planck Research Group Selection Symposium*, Feb. 2019.

(T20) —, *Electrical and Computer Engineering Department*, University of Wisconsin-Madison, Feb. 2019.

(T21) —, *College of Engineering*, Purdue University, Jan. 2019.

(T22) —, *Department of Statistics*, London School of Economics, Jan. 2019.

(T23) —, *International School for Advanced Studies (SISSA)*, Jan. 2019.

(T24) "Analysis of a Two-Layer Neural Network via Displacement Convexity", *Scientific Computing Seminar*, UC Berkeley, Apr. 2019.

(T25) —, *Linear Algebra and Optimization Seminar*, Stanford University, Mar. 2019.

(T26) "Fundamental Limits of Weak Recovery with Applications to Phase Retrieval", Institute of Science and Technology (IST) Austria, Nov. 2018.

(T27) "On the Connection Between Learning Two-Layers Neural Networks and Tensor Decomposition", *IPG Seminar*, EPFL, July 2018.

(T28) —, *Theory Lunch*, Stanford University, Apr. 2018.

(T29) —, *Conference on Information Sciences and Systems (CISS)*, Princeton University, Mar. 2018.

(T30) "Fundamental Limits of Weak Recovery with Applications to Phase Retrieval", *Information Theory and Applications Workshop (ITA)*, UCSD, San Diego, Feb. 2018.

(T31) —, *BLISS Seminar*, UC Berkeley, Dec. 2017.

(T32) —, *Technical University of Munich (TUM)*, Munich, Dec. 2017.

(T33) "3 Polar Bits: Non-asymptotic Scaling, Sublinear Construction and Decoder Partitioning", *German Aerospace Center (DLR)*, Wessling, Dec. 2017.

(T34) "Reed-Muller Codes Achieve Capacity on Erasure Channels", *Highlights of Algorithms (HALG)*, TU Berlin, June 2017.

(T35) "3 Polar Bits", *Intel Labs*, Santa Clara, May 2017.

(T36) "Construction of Polar Codes with Sublinear Complexity", *Information Theory and Applications Workshop (ITA)*, UCSD, San Diego, Feb. 2017.

(T37) "Polar Codes: What Are They, How Well They Perform, and How to Make Them Better", *University of Pisa*, Nov. 2016.

(T38) "Capacity via Symmetry I – A New Proof for an Old Code", *Algorithmic Coding Theory Workshop*, *Institute for Computational and Experimental Research in Mathematics (ICERM)*, Brown University, Providence, June 2016.

(T39) "Capacity via Symmetry", *Shannon Centennial Student Competition*, Bell Labs, Nokia, Murray Hill, Apr. 2016.

(T40) "Reed-Muller Codes: Thresholds and Weight Distribution", *International Zurich Seminar on Communications (IZS)*, Zürich, Mar. 2016.

(T41) "Chaining, Scaling and Reed-Muller: Two Polar Paradigms and a Conjecture Solved", *Graduation-Day*, *Information Theory and Applications Workshop (ITA)*, UCSD, San Diego, Feb. 2016.

(T42) "Polar Codes: How Well They Perform and How to Make Them Better", *Ericsson Research*, San Jose, Nov. 2015.

(T43) "Everything You Always Wanted to Know about Scaling of Polar Codes (But Were Afraid to Ask)", *Simons Institute for the Theory of Computing*, Berkeley, Apr. 2015.

(T44) "Unified Scaling of Polar Codes: Error Exponent, Scaling Exponent, Moderate Deviations, and Error Floors", *Technische Universität München (TUM)*, Munich, Feb. 2015.

(T45) —, *Graduation-Day Poster Session*, *Information Theory and Applications Workshop (ITA)*, UCSD, San Diego, Feb. 2015.

(T46) "Achieving Marton's Region for Broadcast Channels Using Polar Codes", *Conference on Information Sciences and Systems (CISS)*, Princeton University, Mar. 2014.