



# **2016 IEEE International Symposium on Information Theory**

Universitat Pompeu Fabra  
Barcelona, Spain  
July 10-15, 2016



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# ISIT 2016 Conference Program

## Sunday, July 10

19:00–21:00 **Welcome Reception**, Sala Marqués de Comillas, Museu Marítim (Drassanes Reials)

## Monday, July 11

9:00–10:00 **Plenary Talk by Elza Erkip: *From 3T to 5G—Theory and Practice of Cooperation in Wireless Networks***

10:20–11:40 **Session Mo-AM-1**

11:40–12:00 **Coffee Break**, Roger de Llúria Central Courtyard

12:00–13:20 **Session Mo-AM-2**

13:40–15:10 **WITHITS: The Samoan Circle Event**, Room 40.S03

15:10–16:50 **Session Mo-PM-1**

16:50–17:10 **Coffee Break**, Roger de Llúria Central Courtyard

17:10–18:50 **Session Mo-PM-2**

19:00–20:00 **Outreach Committee Event: Roundtable mentoring, or all the mentoring you need in 60 minutes**, Room 40.S02

## Tuesday, July 12

9:00–10:00 **Plenary Talk by Daniel A. Spielman: *The Laplacian Matrices of Graphs***

10:20–11:40 **Session Tu-AM-1**

11:40–12:00 **Coffee Break**, Roger de Llúria Central Courtyard

12:00–13:20 **Session Tu-AM-2**

13:30–15:00 **Awards Luncheon**, Roger de Llúria Central Courtyard

15:10–16:50 **Session Tu-PM-1**

16:50–17:10 **Coffee Break**, Roger de Llúria Central Courtyard

17:10–18:50 **Session Tu-PM-2**

## Wednesday, July 13

9:00–10:00 **Shannon Lecture by Alexander S. Holevo: *The Classical Capacity of a Quantum Channel***

10:20–13:40 **Recent Results Poster Session**, Roger de Llúria Central Courtyard

10:20–11:40 **Session We-AM-1**

11:40–12:00 **Coffee Break**, Roger de Llúria Central Courtyard

12:00–13:40 **Session We-AM-2**

## Thursday, July 14

9:00–10:00 **Plenary Talk by Giorgio Parisi:**

*The SAT-UNSAT Transition for Random Satisfiability Problems in the Case of Continuous Variables*

10:20–11:40 **Session Th-AM-1**

11:40–12:00 **Coffee Break**, Roger de Llúria Central Courtyard

12:00–13:40 **Session Th-AM-2**

14:00–15:00 **Meet the Shannon Awardee**, Roger de Llúria Auditorium

15:10–16:50 **Session Th-PM-1**

16:50–17:10 **Coffee Break**, Roger de Llúria Central Courtyard

20:00–23:00 **Conference Banquet**, Sala Oval, Museu Nacional d'Art de Catalunya

## Friday, July 15

9:00–10:00 **Plenary Talk by Alexander Barg: *Codes, Metrics, and Applications***

10:20–11:40 **Session Fr-AM-1**

11:40–12:00 **Coffee Break**, Roger de Llúria Central Courtyard

12:00–13:40 **Session Fr-AM-2**

15:10–16:30 **Session Fr-PM-1**

16:30–16:50 **Coffee Break**, Roger de Llúria Central Courtyard

16:50–18:10 **Session Fr-PM-2**

# ISIT 2016 Technical Program

## Monday, July 11

Plenary Talk by Elza Erkip: *From 3T to 5G—Theory and Practice of Cooperation in Wireless Networks*

<b>Mo-AM-1-1:</b> Lossless Source Coding  Room 40.002	<b>Mo-AM-1-2:</b> Change-Point Detection  Room 40.144	<b>Mo-AM-1-3:</b> Polar Codes 1  Room 40.146	<b>Mo-AM-1-4:</b> Distributed Storage 1  Room 40.148	<b>Mo-AM-1-5:</b> Matrix Completion  Room 40.004	<b>Mo-AM-1-6:</b> Sequences 1  Room 40.006	<b>Mo-AM-1-7:</b> Index Coding 1  Room 40.008	<b>Mo-AM-1-8:</b> Multi-Terminal Source Coding 1  Room 40.010	<b>Mo-AM-1-9:</b> Broadcast Channels  Room 40.150
<b>Mo-AM-2-1:</b> Approximate Message Passing  Room 40.002	<b>Mo-AM-2-2:</b> Constrained Coding 1  Room 40.144	<b>Mo-AM-2-3:</b> Polar Codes 2  Room 40.146	<b>Mo-AM-2-4:</b> Distributed Storage 2  Room 40.148	<b>Mo-AM-2-5:</b> Information Theory in Biology 1  Room 40.004	<b>Mo-AM-2-6:</b> Wireless Communications 1  Room 40.006	<b>Mo-AM-2-7:</b> Feedback 1  Room 40.008	<b>Mo-AM-2-8:</b> Multiple Antennas 1  Room 40.010	<b>Mo-AM-2-9:</b> Multiple Access Channels 1  Room 40.150
<b>Mo-PM-1-1:</b> Point Process Channels  Room 40.002	<b>Mo-PM-1-2:</b> Constrained Coding 2  Room 40.144	<b>Mo-PM-1-3:</b> Coded Caching  Room 40.146	<b>Mo-PM-1-4:</b> Distributed Storage 3  Room 40.148	<b>Mo-PM-1-5:</b> Energy Harvesting 1  Room 40.004	<b>Mo-PM-1-6:</b> Sequences 2  Room 40.006	<b>Mo-PM-1-7:</b> Secrecy  Room 40.008	<b>Mo-PM-1-8:</b> Lossy Compression 1  Room 40.010	<b>Mo-PM-1-9:</b> JKW Award Finalists 1 / Interference  Room 40.S02
<b>Mo-PM-2-1:</b> Information Measures 1  Room 40.002	<b>Mo-PM-2-2:</b> Communications  Room 40.144	<b>Mo-PM-2-3:</b> Coding for Insertion and Deletion Channels  Room 40.146	<b>Mo-PM-2-4:</b> Distributed Storage 4  Room 40.148	<b>Mo-PM-2-5:</b> Compressed Sensing 1  Room 40.004	<b>Mo-PM-2-6:</b> Entropy  Room 40.006	<b>Mo-PM-2-7:</b> Interference in Wireless Networks 1  Room 40.008	<b>Mo-PM-2-8:</b> Lossy Compression 2  Room 40.010	<b>Mo-PM-2-9:</b> JKW Award Finalists 2  Room 40.S02

## Tuesday, July 12

Plenary Talk by Daniel A. Spielman: *The Laplacian Matrices of Graphs*

<b>Tu-AM-1-1:</b> Belief Propagation  Room 40.002	<b>Tu-AM-1-2:</b> Cryptography and Security 1  Room 40.144	<b>Tu-AM-1-3:</b> Polar Codes 3  Room 40.146	<b>Tu-AM-1-4:</b> Distributed Storage 5  Room 40.148	<b>Tu-AM-1-5:</b> Clustering  Room 40.004	<b>Tu-AM-1-6:</b> Wireless Communications 2  Room 40.006	<b>Tu-AM-1-7:</b> Channel Uncertainty and CSI  Room 40.008	<b>Tu-AM-1-8:</b> Channel Capacity 1  Room 40.010	<b>Tu-AM-1-9:</b> Reed-Solomon Codes  Room 40.150
<b>Tu-AM-2-1:</b> Constrained Coding 3  Room 40.002	<b>Tu-AM-2-2:</b> Statistical Inference 1  Room 40.144	<b>Tu-AM-2-3:</b> Polar Codes 4  Room 40.146	<b>Tu-AM-2-4:</b> Distributed Storage 6  Room 40.148	<b>Tu-AM-2-5:</b> Information Theory in Biology 2  Room 40.004	<b>Tu-AM-2-6:</b> Inequalities 1  Room 40.006	<b>Tu-AM-2-7:</b> Multiple Antennas 2  Room 40.008	<b>Tu-AM-2-8:</b> Multi-Terminal Source Coding 2  Room 40.010	<b>Tu-AM-2-9:</b> BCH Codes / Quasi-Cyclic Codes  Room 40.150
<b>Tu-PM-1-1:</b> Information Measures 2  Room 40.002	<b>Tu-PM-1-2:</b> Learning 1  Room 40.144	<b>Tu-PM-1-3:</b> Superposition Codes / Group Testing 1  Room 40.146	<b>Tu-PM-1-4:</b> Distributed Storage 7  Room 40.148	<b>Tu-PM-1-5:</b> Data Compression  Room 40.004	<b>Tu-PM-1-6:</b> Heterogeneous Networks  Room 40.006	<b>Tu-PM-1-7:</b> Feedback 2  Room 40.008	<b>Tu-PM-1-8:</b> DoF in Wireless Networks  Room 40.010	<b>Tu-PM-1-9:</b> Combinatorial Coding Theory  Room 40.150
<b>Tu-PM-2-1:</b> Network Structures  Room 40.002	<b>Tu-PM-2-2:</b> Cryptography and Security 2  Room 40.144	<b>Tu-PM-2-3:</b> Group Testing 2  Room 40.146	<b>Tu-PM-2-4:</b> Distributed Storage 8  Room 40.148	<b>Tu-PM-2-5:</b> Compressed Sensing 2  Room 40.004	<b>Tu-PM-2-6:</b> Scheduling  Room 40.006	<b>Tu-PM-2-7:</b> Interference in Wireless Networks 2  Room 40.008	<b>Tu-PM-2-8:</b> Multiple Access Channels 2  Room 40.010	<b>Tu-PM-2-9:</b> Lattice Codes  Room 40.150

## Wednesday, July 13

Shannon Lecture by Alexander S. Hovelo: *The Classical Capacity of a Quantum Channel*

We-AM-1-1: Error Exponents 1  Room 40.002	We-AM-1-2: Statistical Inference 2  Room 40.144	We-AM-1-3: LDPC Codes 1  Room 40.146	We-AM-1-4: Distributed Storage 9 / Deletion Channel  Room 40.148	We-AM-1-5: Wireless Communications 3  Room 40.004	We-AM-1-6: Game Theory  Room 40.006	We-AM-1-7: Information Measures 3  Room 40.008	We-AM-1-8: Relay Channels  Room 40.010	We-AM-1-9: Quantum Capacity and Quantum Channels  Room 40.150
We-AM-2-1: Error Exponents 2  Room 40.002	We-AM-2-2: Statistical Inference 3  Room 40.144	We-AM-2-3: LDPC Codes 2 / RM Codes  Room 40.146	We-AM-2-4: Network Coding 1  Room 40.148	We-AM-2-5: Information Theory in Biology 3  Room 40.004	We-AM-2-6: Caching and Computation  Room 40.006	We-AM-2-7: Source-Channel Coding over BC  Room 40.008	We-AM-2-8: Relay and Two Way Channels  Room 40.010	We-AM-2-9: Channel Capacity 2  Room 40.150

Recent Results Poster Session

## Thursday, July 14

Plenary Talk by Giorgio Parisi: *The SAT-UNSAT Transition for Random Satisfiability Problems in the Case of Continuous Variables*

Th-AM-1-1: Community Detection  Room 40.002	Th-AM-1-2: Code Construction and Analysis  Room 40.144	Th-AM-1-3: LDPC Codes 3  Room 40.146	Th-AM-1-4: Network Coding 2  Room 40.148	Th-AM-1-5: Energy Harvesting 2  Room 40.004	Th-AM-1-6: Estimation  Room 40.006	Th-AM-1-7: Source-Channel Coding over MAC  Room 40.008	Th-AM-1-8: Caching in Wireless Networks  Room 40.010	Th-AM-1-9: Classical-Quantum Channels  Room 40.150
Th-AM-2-1: Lossy Compression and Rate-Distortion Room 40.002	Th-AM-2-2: Learning 2  Room 40.144	Th-AM-2-3: LDPC Codes 4  Room 40.146	Th-AM-2-4: Network Coding 3  Room 40.148	Th-AM-2-5: Applications of Random Matrix Theory  Room 40.004	Th-AM-2-6: Wireless Communications 4  Room 40.006	Th-AM-2-7: Interference Channels  Room 40.008	Th-AM-2-8: Covert Communications  Room 40.010	Th-AM-2-9: Quantum Information Theory  Room 40.150
Th-PM-1-1: Quantum Codes 1  Room 40.002	Th-PM-1-2: Inequalities 2  Room 40.144	Th-PM-1-3: Data Exchange Problems  Room 40.146	Th-PM-1-4: Network Coding 4  Room 40.148	Th-PM-1-5: Compressed Sensing 3  Room 40.004	Th-PM-1-6: Information Theory in Control  Room 40.006	Th-PM-1-7: Finite Blocklength Topics  Room 40.008	Th-PM-1-8: Physical Layer Security  Room 40.010	Th-PM-1-9: Wireless Sensor Networks  Room 40.150

## Friday, July 15

Plenary Talk by Alexander Barg: *Codes, Metrics, and Applications*

Fr-AM-1-1: Quantum Codes 2  Room 40.002	Fr-AM-1-2: Secret Keys and Secret Sharing  Room 40.144	Fr-AM-1-3: LDPC Codes 5  Room 40.146	Fr-AM-1-4: Gabidulin Codes  Room 40.148	Fr-AM-1-5: Age of Information  Room 40.004	Fr-AM-1-6: Wireless Communications 5  Room 40.006	Fr-AM-1-7: Special Topics in Shannon Theory 1  Room 40.008	Fr-AM-1-8: Interference in Wireless Networks 3  Room 40.010	Fr-AM-1-9: DNA-based Storage  Room 40.150
Fr-AM-2-1: Random Coding Bounds  Room 40.002	Fr-AM-2-2: Distributions and Hypothesis Testing  Room 40.144	Fr-AM-2-3: LDPC Codes 6  Room 40.146	Fr-AM-2-4: Network Coding 5  Room 40.148	Fr-AM-2-5: Energy Harvesting 3  Room 40.004	Fr-AM-2-6: Wireless Communications 6  Room 40.006	Fr-AM-2-7: Special Topics in Shannon Theory 2  Room 40.008	Fr-AM-2-8: Wiretap Channels 1  Room 40.010	Fr-AM-2-9: Permutations in Coding Theory / Index Coding 2  Room 40.150
Fr-PM-1-1: Quantum Information and Communication  Room 40.002	Fr-PM-1-2: Group Testing 3  Room 40.144	Fr-PM-1-3: LDPC Codes 7  Room 40.146	Fr-PM-1-4: Delays in Networks  Room 40.148	Fr-PM-1-5: Complexity and Cryptography 1  Room 40.004	Fr-PM-1-6: Wireless Communications 7  Room 40.006	Fr-PM-1-7: Lossy Compression 3  Room 40.008	Fr-PM-1-8: Delays in Wiretap Channels 2  Room 40.010	Fr-PM-1-9: MIMO and Space-Time Coding  Room 40.150
		Fr-PM-2-3: LDPC Codes 8  Room 40.146	Fr-PM-2-4: Graphical Methods / Weight Distribution  Room 40.148	Fr-PM-2-5: Complexity and Cryptography 2  Room 40.004		Fr-PM-2-7: Source and Channel Coding  Room 40.008	Fr-PM-2-8: Wiretap Channels 3  Room 40.010	



# Claude E. Shannon Award Lecture

Wednesday, July 13

9:00–10:00

## The Classical Capacity of a Quantum Channel

Alexander S. Holevo, Steklov Mathematical Institute, Russia

Chair: Alon Orlicsky

Quantum information theory studies the laws of transmission, transformation and storage of information in the systems obeying the rules of quantum physics. One of its major achievements is the creation and thorough investigation of the concept of quantum communication channels. This has resulted in an elaborated structural theory and was accompanied by the discovery of a whole spectrum of entropic quantities characterizing the information-processing performance of the channels.

The topic of this lecture—the capacity of a quantum channel for transmitting classical information—is intended to make a bridge between the classical and the quantum theories and is especially convenient for a smooth transition from the former to the latter. Moreover, being the earliest and perhaps the most mature part of quantum Shannon theory, this topic continues to develop actively. Several recent achievements mentioned in the lecture, as well as intriguing open questions, are pertinent to this line of research.

Basing on simple matrix analysis, we begin with the demonstration of a close parallelism between classical and quantum statistical descriptions of information transmission processes; on the other hand, we stress the fundamental peculiarities of the quantum description, namely “complementarity” and “entanglement” which are absent in the classical picture.

Then we introduce a basic notion of a classical-quantum channel as a channel with classical input and quantum output, and give a brief survey of a variety of the relevant results: from the analog of Shannon’s channel coding theorem to the most recent achievements concerning error exponents, higher order asymptotics and strong converses. Next, we discuss the general concept of a (quantum) channel, its algebraic structure and the classical capacities, and touch upon the remarkable quantum phenomenon of superadditivity of information in memoryless channels due to entanglement in the decoding and encoding procedures. We then describe quantum Gaussian channels and report on the progress concerning the noncommutative analogs of Shannon’s famous capacity formula based on the recent solution of the long-standing “Gaussian optimizer conjecture”.

Finally, we comment on the “zoo” of different capacities of a quantum channel. Remarkably, in the quantum case the notion of channel capacity splits, giving a whole spectrum of information-processing characteristics depending on the kind of the data transmitted (classical or quantum) as well as on the available additional resources such as entanglement assistance or the feedback.

## Biography



A. S. Holevo’s scientific interests lie in the foundations of quantum theory, quantum statistics and quantum information theory. In 1973 he obtained an upper bound on the amount of classical information that can be extracted from an ensemble of quantum states by quantum measurements (this result is known as Holevo’s theorem). He also developed the mathematical theory of quantum communication channels, the noncommutative theory of statistical decisions, proved coding theorems in quantum information theory and revealed the structure of quantum Markov semigroups and measurement processes.

Alexander S. Holevo graduated from Moscow Institute of Physics and Technology in 1966, defended a PhD Thesis in 1969 and a Doctor Science Thesis in 1975. Since 1986 A. S. Holevo is Professor in the Moscow State University and Moscow Institute of Physics and Technology. Among other honors, Alexander Holevo received the Andrey Markov Prize of the Russian Academy of Sciences (1997), prizes for the best scientific achievements of the Russian Academy of Sciences (1992, 1995, 2008), the Quantum Communication Award (1996), the Alexander von Humboldt Research Award (1999) and the Claude E. Shannon Award (2016). He is a member of the Steklov Mathematical Institute, Moscow, since 1969.

# Plenary Talks

Monday, July 11

9:00–10:00

## From 3T to 5G—Theory and Practice of Cooperation in Wireless Networks

Elza Erkip, New York University, USA

Chair: Ioannis Kontoyiannis

Information theoretic foundations of cooperation dates back to van der Meulen's three-terminal network, and Cover and El Gamal's seminal work on the relay channel. During the past 45 years, information theory literature has provided a wide range of fundamental results establishing benefits of cooperation in various wireless scenarios. Protocols developed to facilitate cooperation among terminals result in significant improvements in communication rates and reliability. The impending 5G wireless revolution provides the perfect setting for implementing some of these protocols and reaping the potential gains of cooperation: Large number of antennas and wide bandwidth, as in millimeter wave systems, provide abundant degrees of freedom; cloud computing and cheap storage enable enhanced computing capabilities at the network edge; full-duplex radio designs allow nodes to transcend traditional duplexing limitations; and applications such as Internet of Things provide a natural setting for cooperative communication and compression. This talk provides a brief overview of the theoretical foundations of cooperative communications along with a few examples of how even simple forms of cooperation could make big impact in future 5G wireless networks.

### Biography



Elza Erkip's research interests are in multiuser information theory, communication theory, and wireless communications.

Elza Erkip received the B.S. degree in Electrical and Electronics Engineering from Middle East Technical University, Turkey, and the M.S. and Ph.D. degrees in Electrical Engineering from Stanford University. Currently, she is a Professor of Electrical and Computer Engineering with New York University Tandon School of Engineering.

Elza Erkip received the NSF CAREER award in 2001, the IEEE Communications Society Stephen O. Rice Paper Prize in 2004, the IEEE ICC Communication Theory Symposium Best Paper Award in 2007, and the IEEE Communications Society Award for Advances in Communication in 2013. She has been a member of the Board of Governors of the IEEE Information Theory Society since 2012 where she is currently the Second Vice President. She was a Distinguished Lecturer of the IEEE Information Theory Society from 2013 to 2014. She is a Fellow of the IEEE, a member of the Science Academy Society of Turkey and is among the 2014 and 2015 Thomson Reuters Highly Cited Researchers.

Tuesday, July 12

9:00–10:00

## The Laplacian Matrices of Graphs

Daniel A. Spielman, Yale University, USA

Chair: Yossef Steinberg

The Laplacian matrices of graphs are used to solve problems in many fields, including Machine Learning, Computer Vision, Optimization, Computational Science, and of course Network Analysis. We will explain what these matrices are and why they arise in so many applications.

We then introduce ideas that allow us to solve systems of linear equations in Laplacian matrices in nearly linear time, emphasizing the utility of graph sparsification—the approximation of a graph by a sparser one. As an application, we explain how Laplacian system solvers can be used to quickly solve network optimization problems.

### Biography



D. A. Spielman's research interests include the design and analysis of algorithms, network science, machine learning, digital communications and scientific computing.

Daniel Alan Spielman received his B.A. in Mathematics and Computer Science from Yale in 1992, and his Ph.D in Applied Mathematics from M.I.T. in 1995. He spent a year as a NSF Mathematical Sciences Postdoc in the Computer Science Department at U.C. Berkeley, and then taught in the Applied Mathematics Department at M.I.T. until 2005. Since 2006, he has been a Professor at Yale University. He is presently the Henry Ford II Professor of Computer Science, Mathematics, and Applied Mathematics.

Among others, D. A. Spielman received the 1995 ACM Doctoral Dissertation Award, the 2002 IEEE Information Theory Paper Award, the 2008 and 2015 Godel Prize, the 2009 Fulkerson Prize, the 2010 Nevanlinna Prize, the 2014 Pólya Prize, an inaugural Simons Investigator Award, and a MacArthur Fellowship. He is a Fellow of the Association for Computing Machinery and a member of the Connecticut Academy of Science and Engineering.



## The SAT-UNSAT Transition for Random Satisfiability Problems in the Case of Continuous Variables

Giorgio Parisi, University of Rome I, La Sapienza, Italy

Chair: Venkat Anantharam

Random constraint satisfaction problems have been widely studied in the past. In many systems, when the number  $M$  of random constraints and the number  $N$  of variables go simultaneously to infinity at a fixed ratio  $\alpha = M/N$ , at low  $\alpha$ 's we are in the SAT region, where there is a choice of the variables that satisfies all the constraints, while at high  $\alpha$ 's we are in the UNSAT region, where there is no choice of the variables that satisfies all the constraints. The transition from the SAT to the UNSAT region is sharp.

Analytic computations have been done for the value of the transition point in many cases, e.g., the K-SAT problem. However, in the past, the behavior at the transition has been mostly studied in the case where the variables are Boolean. In this talk, I will describe new features that are present near and at the transition in the case where the variables are continuous. In the continuous case, the  $N$  Boolean variables are replaced by real variables belonging to an  $N$ -dimensional manifold and the usual  $M$  Boolean constraints are replaced by  $M$  inequalities.

A familiar example of a continuous satisfaction problem is to find a feed-forward neural network such that  $M$  input patterns are correctly classified; here the  $N$  synaptic strengths play the role of the variables and each input pattern provides a constraint.

### Biography



Giorgio Parisi is best known for his works concerning statistical mechanics, quantum field theory and various aspects of physics, mathematics and philosophy of science. Giorgio Parisi's research focused mainly on disordered systems, in particular on spin glass theory. He suggested a crucial concept in spin glass theory, known as Parisi functional. He also found many applications of spin glass theory to optimization theory, biology and immunology.

Giorgio Parisi graduated from University of Rome La Sapienza in 1970, supervised by Nicola Cabibbo. He became a researcher at the Laboratori Nazionali di Frascati (1971–1981) while visiting Columbia University in New York (1973–1974), the Institut des Hautes Études Scientifiques (1976–1977), and the École Normale Supérieure (1977–1978). He got a Professor ordinarius position in 1981 at University of Rome Tor Vergata, and in 1992 at University of Rome La Sapienza.

Giorgio Parisi has been awarded several honors, including the Boltzmann Medal (1992) and the Dirac Medal (1999). He also received the Enrico Fermi Award (2002), Microsoft Award (2007), Lagrange Prize (2009), Max Planck Medal (2011) and the High Energy and Particle Physics Prize – EPS HEPP Prize (2015). He is a member of the American National Academy of Sciences.

## Codes, Metrics, and Applications

Alexander Barg, University of Maryland, USA

Chair: Pascal Vontobel

Applications of coding in communication and computer science give rise to various metrics on strings over a finite alphabet. We consider a class of metrics induced by partial orders on the code coordinates, paying special attention to one such metric (the Niederreiter-Rosenbloom-Tsfasman metric) and its applications in wireless, list decoding, approximation theory, and polar coding. We discuss combinatorics of the ordered metric space, and extend some of the results to general partial orders. We continue with several results related to distance distributions of linear codes and their extensions to the ordered case, as well as links with matroids on partial orders. In conclusion, we mention a further extension to infinite orders and an unexpected appearance of wavelet-like functions.

This line of work has developed over a number of years and draws on joint papers with many colleagues, including, in particular, (former) students Andrew McGregor, Punarbasu Purkayastna, and Woomyoung Park.

### Biography



A. Barg's research interests are in coding and information theory, algebraic combinatorics, and related areas of applied mathematics. Among other topics he has worked on extremal problems of coding and information theory, where he proved new bounds on the reliability function of the binary symmetric and Gaussian channels, codes on graphs, digital fingerprinting, and combinatorics of ordered metric spaces. His recent work concerns algebraic codes for storage applications.

A. Barg received a Ph.D. in electrical engineering from the Institute for Problems in Information Transmission (IPPI) of the Russian Academy of Sciences, Moscow. He has been a senior researcher at the IPPI since 1987. He was with the Bell Laboratories of Lucent Technologies between 1997-2002. Since 2003 he has been a Professor in the University of Maryland.

A. Barg received the 2015 Information Theory Society paper award for his work with Itzhak Tamo on codes with locality constraints. At this ISIT, together with I. Tamo they are presenting a tutorial on codes with locality.

10:20 10:40 11:00 11:20  
**Mo-AM-1-1: Lossless Source Coding** Chair: Gadiel Seroussi Room 40.002

Almost Lossless Variable-Length Source Coding on Countably Infinite Alphabets <i>Jorge Silva, Pablo Piantanida</i>	Tight Upper Bounds on the Redundancy of Optimal Binary AIFV Codes <i>Weihua Hu, Hirotsuke Yamamoto, Junya Honda</i>	On the Stationary Distribution of Asymmetric Binary Systems <i>Hidetoshi Yokoo</i>	A Survey of Bratteli Information Source Theory <i>John C Kieffer</i>
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**Mo-AM-1-2: Change-Point Detection** Chair: George V. Moustakides Room 40.144

Data Driven Quickest Change Detection: An Algorithmic Complexity Approach <i>Husheng Li</i>	Sequentially Detecting Transitory Changes <i>George V. Moustakides, Venugopal Veeravalli</i>	Non-Bayesian Multiple Change-Point Detection Controlling False Discovery Rate <i>Jie Chen, Wenyi Zhang, H. Vincent Poor</i>	Decentralized Sequential Change Detection with Ordered CUSUM <i>Sourabh Banerjee, Georgios Fellouris</i>
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**Mo-AM-1-3: Polar Codes 1** Chair: Emre Telatar Room 40.146

Capacity-Achieving Rate-Compatible Polar Codes <i>SongNam Hong, Dennis Hui, Ivana Marić</i>	Capacity-Achieving Rateless Polar Codes <i>Bin Li, David Tse, Kai Chen, Hui Shen</i>	Construction of Polar Codes for Arbitrary Discrete Memoryless Channels <i>Talha Cihad Gulcu, Min Ye, Alexander Barg</i>	Channel polarization and Blackwell measures <i>Maxim Raginsky</i>
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**Mo-AM-1-4: Distributed Storage 1** Chair: Alexandros Dimakis Room 40.148

Constructions of High-Rate Minimum Storage Regenerating Codes over Small Fields <i>Netanel Raviv, Natalia Silberstein, Tuvia Etzion</i>	An outer bound on the storage-bandwidth tradeoff of exact-repair cooperative regenerating codes <i>Hyeok Lee, Jungwoo Lee</i>	On MBR codes with replication <i>Nikhil Krishnan Muralee Krishnan, P. Vijay Kumar</i>	Minimum Storage Regenerating Codes For All Parameters <i>Arman Fazeli, Sreechakra Goparaju, Alexander Vardy</i>
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**Mo-AM-1-5: Matrix Completion** Chair: Bruce Hajek Room 40.004

Optimal Sample Complexity for Stable Matrix Recovery <i>Yanjun Li, Kiryung Lee, Yoram Bresler</i>	Simple algorithms and guarantees for low rank matrix completion over $F_2$ <i>James Saunderson, Maryam Fazel, Babak Hassibi</i>	Similarity Clustering in the Presence of Outliers: Exact Recovery via Convex Program <i>Ramya Korlakai Vinayak, Babak Hassibi</i>	A Converse to Low-Rank Matrix Completion <i>Daniel L Pimentel-Alarcon, Rob Nowak</i>
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**Mo-AM-1-6: Sequences 1** Chair: Tara Javidi Room 40.006

New Ternary Binomial Bent Functions <i>Tor Helleseeth, Alexander Kholosha</i>	Correlation properties of sequences from the 2-D array structure of Sidelnikov sequences of different lengths and their union <i>Min Kyu Song, Hong-Yeop Song, Dae San Kim, Jang Yong Lee</i>	On constructions of bent functions from involutions <i>Siheem Mesnager</i>	Perfect Gaussian Integer Sequences from Cyclic Difference Sets <i>Xinjiao Chen, Chunlei Li, Chunming Rong</i>
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**Mo-AM-1-7: Index Coding 1** Chair: Aaron Wagner Room 40.008

A Polynomial-Time Algorithm for Pliable Index Coding <i>Linzi Song, Christina Fragouli</i>	Optimal Vector Linear Index Codes for Some Symmetric Side Information Problems <i>Mahesh Vaddi, B. Sundar Rajan</i>	A class of index coding problems with rate 1/3 <i>Prasad Krishnan, Lalitha Vadlamani</i>	On Caching with More Users than Files <i>Kai Wan, Daniela Tuninetti, Pablo Piantanida</i>
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**Mo-AM-1-8: Multi-Terminal Source Coding 1** Chair: Michael Gastpar Room 40.010

Coding for Lossy Function Computation: Analyzing Sequential Function Computation with Distortion Accumulation <i>Yaoqing Yang, Pulkit Grover, Soumya Kar</i>	Structural results for two-user interactive communication <i>Jhelum Chakravorty, Aditya Mahajan</i>	Two-way Lossy Compression via a Relay with Self Source <i>Ebrahim MolavianJazi, Aylin Yener</i>	Integer-Forcing Source Coding: Successive Cancellation and Source-Channel Duality <i>Wenbo He, Bobak Nazer</i>
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**Mo-AM-1-9: Broadcast Channels** Chair: Michèle A. Wigger Room 40.150

Single-User CSIT Can be Quite Useful for State-Dependent Broadcast Channels <i>Shih-Chun Lin, I-Hsiang Wang</i>	Bit-Additive Superposition Coding for the Bandwidth Limited Broadcast Channel <i>Ahmed Abotab, Aria Nosratinia</i>	A Proof of the Strong Converse Theorem for Gaussian Broadcast Channels via the Gaussian Poincaré Inequality <i>Silas L. Fong, Vincent Y. F. Tan</i>	A Unified Inner Bound for the Two-Receiver Memoryless Broadcast Channel with Channel State and Message Side Information <i>Behzad Asadi, Lawrence Ong, Sarah J Johnson</i>
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**Monday, July 11****12:00–13:20**

12:00

12:20

12:40

13:00

**Mo-AM-2-1: Approximate Message Passing** Chair: Tolga M. Duman Room 40.002

On the Performance of Mismatched Data Detection in Large MIMO Systems

*Charles Jeon, Arian Maleki, Christoph Studer*

Asymptotic Mutual Information for the Binary Stochastic Block Model

*Yash Deshpande, Emmanuel Abbe, Andrea Montanari*

Expectation Consistent Approximate Inference: Generalizations and Convergence

*Alyson Fletcher, Mojtaba Sahræe-Ardakan, Sundeeep Rangan, Philip Schniter***Mo-AM-2-2: Constrained Coding 1** Chair: İñaki Esnaola Room 40.144

Minimum Pearson Distance Detection in the Presence of Unknown Slowly Varying Offset

*Vitaly Skachek, Kees A. Schouhamer Imminck*

Rates of Constant-Composition Codes that Mitigate Intercell Interference

*Yeow Meng Chee, Johan Chrisnata, Han Mao Kiah, San Ling, Tuan Thanh Nguyen, Van Khu Vu*

Efficient Encoding/Decoding of Capacity-Achieving Constant-Composition ICI-Free Codes

*Yeow Meng Chee, Johan Chrisnata, Han Mao Kiah, San Ling, Tuan Thanh Nguyen, Van Khu Vu*

Generalized Belief Propagation Based TDMR Detector and Decoder

*Chaitanya K Matcha, Mohsen Bahrami, Shounak Roy, Shayan Garani, Bane Vasić***Mo-AM-2-3: Polar Codes 2** Chair: Cong Ling Room 40.146

Near-Optimal Finite-Length Scaling for Polar Codes over Large Alphabets

*Henry D Pfister, Ruediger L Urbanke*

A Partial Order for the Synthesized Channels of a Polar Code

*Christian Schuerch*

Polar Coding for Processes with Memory

*Eren Şaşođlu, İdo Tal*

Algebraic Properties of Polar Codes From a New Polynomial Formalism

*Magali Bardet, Vlad Dragoi, Ayoub Otmani, Jean-Pierre Tillich***Mo-AM-2-4: Distributed Storage 2** Chair: Natalia Silberstein Room 40.148

Bandwidth Adaptive &amp; Error Resilient Regenerating Codes with Minimum Repair Bandwidth

*Kaveh Mahdavi, Ashish Khisti, Soheil Mohajer*

On Storage Allocation for Maximum Service Rate in Distributed Storage Systems

*Moslem Noori, Ermina Soljanin, Masoud Ardakani*

Double Regenerating Codes for Hierarchical Data Centers

*Yuchong Hu, Patrick Pak-Ching Lee, Xiaoyang Zhang*

Placement and Read Algorithms for High Throughput in Coded Network Switches

*Rami Cohen, Yuval Cassuto***Mo-AM-2-5: Information Theory in Biology 1** Chair: Negar Kiyavash Room 40.004

The Boltzmann Sequence-Structure Channel

*Abram Magner, Daisuke Kihara, Wojciech Szpankowski*

On the Duplication Distance of Binary Strings

*Noga Alon, Jehoshua Bruck, Farzad Farnoud (Hassanzadeh), Siddharth Jain*

Sequence assembly from corrupted shotgun reads

*Shrishendu Ganguly, Elchanan Mossel, Miklos Racz*

The Capacity of Some Pólya String Models

*Ohad Elishoo, Farzad Farnoud (Hassanzadeh), Moshe Schwartz, Jehoshua Bruck***Mo-AM-2-6: Wireless Communications 1** Chair: Mehul Motani Room 40.006

Broadcast Channel under Unequal Coherence Intervals

*Mohamed Fadel, Aria Nosratinia*

Optimizing the Spatial Content Caching Distribution for Device-to-Device Communications

*Derya Malak, Mazin Al-Shalash, Jeffrey Andrews*

Edge Caching for Coverage and Capacity-aided Heterogeneous Networks

*Ejder Bastuđ, Mehdi Bennis, Marios Kountouris, M rouane Debbah*

To Feedback or Not to Feedback

*Changho Suh, David Tse, Jaewoong Cho***Mo-AM-2-7: Feedback 1** Chair: Shraga Bross Room 40.008

On the capacity of the chemical channel with feedback

*Jui Wu, Achilleas Anastasopoulos*

Sequential Necessary and Sufficient Conditions for Optimal Channel Input Distributions of Channels with Memory and Feedback

*Photios A. Stavrou, Charalambos D Charalambous, Christos K Kourtellis*

Analysis on LT codes for Unequal Recovery Time with Complete and Partial Feedback

*Rana Abbas, Mahyar Shirvanimoghaddam, Yonghui Li, Branka Vucetic*

A Single-Letter Upper Bound on the Feedback Capacity of Unifilar Finite-State Channels

*Oron Sabag, Haim H Permuter, Henry D Pfister***Mo-AM-2-8: Multiple Antennas 1** Chair: Daniela Tuninetti Room 40.010

Joint Optimization of Cloud and Edge Processing for Fog Radio Access Networks

*Seok-Hwan Park, Osvaldo Simeone, Shlomo Shamai (Shitz)*

Sum Capacity of Massive MIMO Systems with Quantized Hybrid Beamforming

*An Liu, Vincent Lau*

The Capacity of Gaussian MISO Channels Under Total and Per-Antenna Power Constraints

*Sergey Loyka*

SNR Gap Between MIMO Linear Receivers: Characterization and Applications

*Giuseppa Allano, Carla-Fabiana Chiasserini, Alessandro Nardio***Mo-AM-2-9: Multiple Access Channels 1** Chair: Yingbin Liang Room 40.150

Sharper Upper Bounds for Unbalanced Uniquely Decodable Code Pairs

*Per Austrin, Petteri Kaski, Mikko Koivisto, Jesper Nederlof*

The Unbounded Benefit of Encoder Cooperation for the k-User MAC

*Parham Noorzad, Michelle Effros, Michael Langberg*

On the Design of Universal Schemes for Massive Uncoordinated Multiple Access

*Austin Taghavi, Avinash Vem, Jean-Francois Chamberland, Krishna Narayanan*

Uncoordinated Multiple Access Schemes for Visible Light Communications and Positioning

*Siu-Wai Ho, Chi Wan Sung*

Monday, July 11

15:10–16:50

15:10 15:30 15:50 16:10 16:30  
**Mo-PM-1-1: Point Process Channels** Chair: Anthony Ephremides Room 40.002

On the Continuous-Time Poisson Channel with Varying Dark Current Known to the Transmitter  
*Ligong Wang*

The Stochastic-Calculus Approach to Multi-Receiver Poisson Channels  
*Nirmal V Shende, Aaron Wagner*

An Achievable Rate Region for Superposed Timing Channels  
*Guido C. Ferrante, Tony Q. S. Quek, Moe Win*

Timing Capacity of Queues with Random Arrival and Modified Service Times  
*Guido C. Ferrante, Tony Q. S. Quek, Moe Win*

On the Sum-Rate Capacity of Non-Symmetric Poisson Multiple Access Channel  
*Ain Ul Aisha, Yingbin Liang, Lifeng Lai, Shlomo Shamai (Shitz)*

**Mo-PM-1-2: Constrained Coding 2** Chair: Wojciech Szpankowski Room 40.144

Encoding and Decoding of Balanced  $q$ -ary Sequences Using a Gray Code Prefix  
*Elie Mambou, Theo G. Swart*

Simple Systematic Pearson Coding  
*Jos H. Weber, Theo G. Swart, Kees A. Schouhamer Immink*

Balanced Permutation Codes  
*Ryan Gabrys, Olga Milenkovic*

Encoding Semiconstrained Systems  
*Ohad Elishoo, Tom Meyerovitch, Moshe Schwartz*

Bounds on Asymptotic Rate of Capacitive Crosstalk Avoidance Codes for On-chip Buses  
*Tadashi Wadayama, Taizuke Izumi*

**Mo-PM-1-3: Coded Caching** Chair: Chung Chan Room 40.146

Centralized Coded Caching for Heterogeneous Lossy Requests  
*Qianqian Yang, Deniz Gunduz*

Simplifying Wireless Social Caching  
*Mohammed Karmoose, Martina Cardone, Christina Fragouli*

A Layered Caching Architecture for the Interference Channel  
*Jad Hachem, Urs Niesen, Suhas Diggavi*

Coded Caching for Networks with the Resolvability Property  
*Li Tang, Aditya Ramamoorthy*

Fundamental Limits of Secretive Coded Caching  
*Vaishakh Ravindrakumar, Parthasarathi Panda, Nikhil Karamchandani, Vinod M Prabhakaran*

**Mo-PM-1-4: Distributed Storage 3** Chair: P Vijay Kumar Room 40.148

Optimal Systematic Distributed Storage Codes with Fast Encoding  
*Preetum Nakkin, K. v. Rashmi, Kannan Ramchandran*

Codes with Unequal Locality  
*Swanand Kadhe, Alex Sprintson*

Some Results on Optimal Locally Repairable Codes  
*Jie Hao, Shutao Xia, Bin Chen*

Two Classes of  $(r,t)$ -Locally Repairable Codes  
*Anyu Wang, Zhihang Zhang*

Coding for Locality in Reconstructing Permutations  
*Netanel Raviv, Eitan Yaakobi, Muriel Médard*

**Mo-PM-1-5: Energy Harvesting 1** Chair: Ayfer Özgür Room 40.004

A Non-Asymptotic Achievable Rate for the AWGN Energy-Harvesting Channel using Save-and-Transmit  
*Silas L. Fong, Vincent Y. F. Tan, Jing Yang*

Performance Bounds for Remote Estimation with an Energy Harvesting Sensor  
*Ayca Ozcelikkale, Tomas McKelvey, Mats Viberg*

Finite Blocklength Achievable Rates for Energy Harvesting AWGN Channels with Infinite Buffer  
*Konchady Gautam Shenoy, Vinod Sharma*

Optimizing Energy Efficiency over Energy-Harvesting LTE Cellular Networks  
*Hajar Mahdavi-Doost, Narayan Prasad, Sampath Rangarajan*

Optimal Energy Management for Energy Harvesting Transmitters under Battery Usage Constraint  
*Xianwen Wu, Jing Yang, Jingxian Wu*

**Mo-PM-1-6: Sequences 2** Chair: Alexander Kholosha Room 40.006

On the (non-)existence of APN  $(n,n)$ -functions of algebraic degree  $n$   
*Lilya Budaghyan, Claude Carlet, Tor Helleseth, Nian Li*

New results about Tu-Deng's conjecture  
*Soukayna Qarboua, Julien Schrek, Caroline Fontaine*

On Vectorial Bent Functions with Dillon-type Exponents  
*Lucien Lapierre, Petr Lisonek*

On the Optimal Boolean Function for Prediction Under Quadratic Loss  
*Nir Weinberger, Ofer Shayevitz*

An Improved Upper Bound for the Most Informative Boolean Function Conjecture  
*Or Ordentlich, Ofer Shayevitz, Omri Weinstein*

**Mo-PM-1-7: Secrecy** Chair: Ashish Khisti Room 40.008

Strong Secrecy Capacity of the Wiretap Channel II with DMC Main Channel  
*Dan He, Yuan Luo, Ning Cai*

Secret Key Generation over Noisy Channels with Common Randomness  
*Germán Bassi, Pablo Piantanida, Shlomo Shamai (Shitz)*

A Lattice Coding Scheme for Secret Key Generation from Gaussian Markov Tree Sources  
*Shashank Vatedka, Navin Kashyap*

Maximal Leakage Minimization for The Shannon Cipher System  
*Ibrahim Issa, Sudeep Kamath, Aaron Wagner*

**Mo-PM-1-8: Lossy Compression 1** Chair: Ertem Tuncel Room 40.010

Information Theoretic Caching: The Multi-User Case  
*Sung Hoon Lim, Chien-Yi Wang, Michael Gastpar*

Lossy Compression with Near-uniform Encoder Outputs  
*Badri N Vellambi, Joerg Kliewer, Matthieu Bloch*

An LP Lower Bound for Rate Distortion with Variable Side Information  
*Sinem Unal, Aaron Wagner*

Multiterminal Compress-and-Estimate Source Coding  
*Alon Kipnis, Stefano Rini, Andrea Goldsmith*

**Mo-PM-1-9: JKW Award Finalists 1 / Interference** Chair: Amos Lapidoth Room 40.S02

Guiding Blind Transmitters for K-user MISO Interference Relay Channels with Imperfect Channel Knowledge  
*Wonjae Shin, Namyoon Lee, Jungwoo Lee, H. Vincent Poor*

Topological Interference Management with Decoded Message Passing  
*Xinping Yi, Giuseppe Caire*

Topological Interference Management with Reconfigurable Antennas  
*Heecheol Yang, NaderiAlizadeh, Salman Avestimehr, Jungwoo Lee*

Blind Interference Alignment for Private Information Retrieval [JKW Award Finalist]  
*Hua Sun, Syed Ali Jafar*

Distributed Simulation of Continuous Random Variables [JKW Award Finalist]  
*Cheuk Ting Li, Abbas El Gamal*

17:10 17:30 17:50 18:10 18:30

**Mo-PM-2-1: Information Measures 1** Chair: Mokshay Madiman Room 40.002

Evaluating hypercontractivity parameters using information measures <i>Chandra Nair, Yan Nan Wang</i>	Information Decomposition on Structured Space <i>Mahito Sugiyama, Hiroyuki Nakahara, Koji Tsuda</i>	Chained Kullback-Leibler Divergences <i>Dmitri Pavlichin, Tsachy Weissman</i>	Operational Interpretation of Rényi Conditional Mutual Information via Composite Hypothesis Testing Against Markov Distributions <i>Marco Tomamichel, Masahito Hayashi</i>
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**Mo-PM-2-2: Communications** Chair: Angel Lozano Room 40.144

Lower Bounds on Joint Modulation-Estimation Performance for the Gaussian MAC <i>Ayşe Ünsal, Raymond Knopp, Neri Merhav</i>	Adaptive Protocols for Interactive Communication <i>Shweta Agrawal, Ran Gelles, Amit Sahai</i>	Caching-Aided Multicast for Partial Information <i>Tetsunao Matsuta, Tomohiko Uyematsu</i>	Achievable Rates of Soliton Communication Systems <i>Qun Zhang, Terence H. Chan</i>	On the Soliton Spectral Efficiency in Non-linear Optical fibers <i>Pavlos Kazakopoulos, Aris L. Moustakas</i>
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**Mo-PM-2-3: Coding for Insertion and Deletion Channels** Chair: Lara Dolecek Room 40.146

Exact Sequence Reconstruction for Insertion-Correcting Codes <i>Frederic Sala, Ryan Gabrys, Clayton Schoeny, Kayvon Mazooji, Lara Dolecek</i>	Efficiently decodable insertion/deletion codes for high-noise and high-rate regimes <i>Venkatesan Guruswami, Ray Li</i>	On Ordered Syndromes for Multi Insertion/Deletion Error-Correcting Codes <i>Manabu Hagiwara</i>	Codes Correcting a Burst of Deletions or Insertions <i>Clayton Schoeny, Antonia Wachter-Zeh, Ryan Gabrys, Eitan Yaakobi</i>	Coding of Insertion-Deletion-Substitution Channels without Markers <i>Ryohei Goto, Kenta Kasai, Haruhiko Kaneko</i>
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**Mo-PM-2-4: Distributed Storage 4** Chair: Soheil Mohajer Room 40.148

Bounds and Constructions of Codes with Multiple Localities <i>Alexander Zeh, Eitan Yaakobi</i>	Recursive Bounds for Locally Repairable Codes with Multiple Repair Groups <i>Jie Hao, Shutao Xia, Bin Chen</i>	A Connection Between Locally Repairable Codes and Exact Regenerating Codes <i>Toni Ernvall, Thomas Westerback, Ragnar Freij-Hollanti, Camilla Hollanti</i>	Binary Codes with Locality for Multiple Erasures Having Short Block Length <i>Balaji Srinivasan Babu, K P Prasanth, P. Vijay Kumar</i>	Consecutive Switch Codes <i>Sarit Buzaglo, Eitan Yaakobi, Yuval Cassuto, Paul H. Siegel</i>
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**Mo-PM-2-5: Compressed Sensing 1** Chair: Urbashi Mitra Room 40.004

The Replica-Symmetric Prediction for Compressed Sensing with Gaussian Matrices is Exact <i>Galen Reeves, Henry D Pfister</i>	On the Design of Linear Projections for Compressive Sensing with Side Information <i>Meng-Yang Chen, Francesco Renna, Miguel Rodrigues</i>	Phase transition and noise sensitivity of $\ell_p$ -minimization for $0 \leq p \leq 1$ <i>Haolei Weng, Le Zheng, Arian Maleki, Xiaodong Wang</i>	Performance Trade-Offs in Multi-Processor Approximate Message Passing <i>Junan Zhu, Ahmad Beirami, Dror Baron</i>
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**Mo-PM-2-6: Entropy** Chair: Imre Csiszár Room 40.006

Estimation of entropy rate and Rényi entropy rate for Markov chains <i>Sudeep Kamath, Sergio Verdú</i>	Novel Lower Bounds on the Entropy Rate of Binary Hidden Markov Processes <i>Or Ordentlich</i>	On the Entropy and Mutual Information of Point Processes <i>Francois Baccelli, Jae Oh Woo</i>	Highly Sensitive Universal Statistical Test <i>Hirosuke Yamamoto, Qiqiang Liu</i>	Thinning, photonic beamsplitting, and a general discrete entropy power inequality <i>Saikat Guha, Jeffrey H Shapiro, Raul Garcia-Patron</i>
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**Mo-PM-2-7: Interference in Wireless Networks 1** Chair: Pablo Piantanida Room 40.008

On Layered Erasure Interference Channels without CSI at Transmitters <i>Yan Zhu, Cong Shen</i>	Approximately achieving the feedback interference channel capacity with point-to-point codes <i>Joyson Sebastian, Can Karakus, Suhas Diggavi</i>	On the Two-User MISO Interference Channel with Single User Decoding and Partial CSIT <i>Yair Noam, Naama Kimelfeld, Benjamin Zaidel</i>	GDoF region characterization of the weak MIMO IC with No CSIT <i>Sanjay Karmakar</i>
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**Mo-PM-2-8: Lossy Compression 2** Chair: Stefano Rini Room 40.010

Quasi Linear Codes: Application to Point-to-Point and Multi-Terminal Source Coding <i>Farhad Shirani Chaharsooghi, Mohsen Heidari Khoozani, Sandeep Pradhan</i>	A General Rate-Distortion Converse Bound for Entropy-Constrained Scalar Quantization <i>Tobias Koch, Gonzalo Vazquez-Vilar</i>	Information Rates of Sampled Wiener Processes <i>Alon Kipnis, Yonina C. Eldar, Andrea Goldsmith</i>	On the Smooth Rényi Entropy and Variable-Length Source Coding Allowing Errors <i>Shigeaki Kuzuoka</i>
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**Mo-PM-2-9: JKW Award Finalists 2** Chair: Elza Erkip Room 40.S02

Minimax Estimation of the $L_1$ Distance [JKW Award Finalist] <i>Jiantao Jiao, Yanjun Han, Tsachy Weissman</i>	Finite-Sample Analysis of Approximate Message Passing [JKW Award Finalist] <i>Cynthia Rush, Ramji Venkataramanan</i>	Strengthened Monotonicity of Relative Entropy via Pinched Petz Recovery Map [JKW Award Finalist] <i>David Sutter, Marco Tomamichel, Aram W Harrow</i>	A Large Deviations Approach to Secure Lossy Compression [JKW Award Finalist] <i>Nir Weinberger, Neri Merhav</i>
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10:20 10:40 11:00 11:20

**Tu-AM-1-1: Belief Propagation** Chair: Ruediger L Urbanek Room 40.002

<p>Effects of the approximations from BP to AMP for small-sized problems</p> <p><i>Arise Kuriya, Toshiyuki Tanaka</i></p>	<p>EXIT Analysis for Belief Propagation in Degree-Correlated Stochastic Block Models</p> <p><i>Hussein Saad, Ahmed Abotabl, Aria Nosratinia</i></p>	<p>Clustering from Sparse Pairwise Measurements</p> <p><i>Alaa Saade, Florent Krzakala, Marc Lelarge, Lenka Zdeborova</i></p>	<p>Low-Complexity Stochastic Generalized Belief Propagation</p> <p><i>Farzin Haddadpour, Mahdi Jalari Slavoshani, Morteza Noshad</i></p>
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**Tu-AM-1-2: Cryptography and Security 1** Chair: Paul Cuff Room 40.144

<p>New Perspectives on Weak Oblivious Transfer</p> <p><i>Ueli Maurer, João Ribeiro</i></p>	<p>Soft McEliece: MDPC code-based McEliece cryptosystems with very compact keys through real-valued intentional errors</p> <p><i>Marco Baldi, Paolo Santini, Franco Chiaraluce</i></p>	<p>An Encryption Scheme based on Random Split of St-Gen Codes</p> <p><i>Simona Samardjiska, Danilo Gilgoroski</i></p>	<p>Inter-Class vs. Mutual Information as Side-Channel Distinguishers</p> <p><i>Olivier Rioul, Annelie Heuser, Sylvain Guilley, Jean-Luc Danger</i></p>
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**Tu-AM-1-3: Polar Codes 3** Chair: Ivana Marić Room 40.146

<p>Energy Complexity of Polar Codes</p> <p><i>Christopher Blake, Frank R. Kschischang</i></p>	<p>Simplified Successive-Cancellation List Decoding of Polar Codes</p> <p><i>Seyyed Ali Hashemi, Carlo Condo, Warren Gross</i></p>	<p>Erasure Schemes Using Generalized Polar Codes: Zero-Undetected-Error Capacity and Performance Trade-offs</p> <p><i>Rajai Nasser</i></p>	
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**Tu-AM-1-4: Distributed Storage 5** Chair: Urs Niesen Room 40.148

<p>Symmetry, Demand Types and Outer Bounds in Caching Systems</p> <p><i>Chao Tian</i></p>	<p>Caching and Delivery via Interference Elimination</p> <p><i>Chao Tian, Jun Chen</i></p>	<p>Content Delivery in Erasure Broadcast Channels with Cache and Feedback</p> <p><i>Asma Ghorbel, Mari Kobayashi, Sheng Yang</i></p>	
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**Tu-AM-1-5: Clustering** Chair: Yihong Wu Room 40.004

<p>Crossing the KS threshold in the stochastic block model with information theory</p> <p><i>Emmanuel Abbe, Colin Sandon</i></p>	<p>Cluster-Seeking Shrinkage Estimators</p> <p><i>Pavan Srinath, Ramji Venkataramanan</i></p>	<p>On deterministic conditions for subspace clustering under missing data</p> <p><i>Wenqi Wang, Shuchin Aeron, Vaneet Aggarwal</i></p>	<p>An Unconventional Clustering Problem: User Service Profile Optimization</p> <p><i>Fabio D'Andreagiovanni, Giuseppe Caire</i></p>
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**Tu-AM-1-6: Wireless Communications 2** Chair: Changho Suh Room 40.006

<p>Two-Stage Compressed Sensing for Millimeter Wave Channel Estimation</p> <p><i>Yonghee Han, Jungwoo Lee</i></p>	<p>Ginibre Sampling and Signal Reconstruction</p> <p><i>Flavio Zabini, Andrea Conti</i></p>	<p>Statistical Group Sparse Beamforming for Green Cloud-RAN via Large System Analysis</p> <p><i>Yuanming Shi, Jun Zhang, Khaled B. Letaief</i></p>	<p>Efficient Optimal Joint Channel Estimation and Data Detection for Massive MIMO Systems</p> <p><i>Haider Alshamary, Weiyou Xu</i></p>
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**Tu-AM-1-7: Channel Uncertainty and CSI** Chair: Haim H Permuter Room 40.008

<p>A bit of delay is sufficient and stochastic encoding is necessary to overcome online adversarial erasures</p> <p><i>Bikash K Dey, Sidharth Jaggi, Michael Langberg, Anand D. Sarwate</i></p>	<p>On the Capacity of the Dirty Paper Channel with Fast Fading and Discrete Channel States</p> <p><i>Stefano Rini, Shlomo Shamai (Shitz)</i></p>	<p>When is Noisy State Information at the Encoder as Useless as No Information or as Good as Noise-Free State?</p> <p><i>Rui Xu, Jun Chen, Tsachy Weissman, Jian-Kang Zhang</i></p>	<p>Empirical Coordination, State Masking and State Amplification: Core of the Decoder's Knowledge</p> <p><i>Mael Le Treust, Matthieu Bloch</i></p>
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**Tu-AM-1-8: Channel Capacity 1** Chair: Anatoly Khina Room 40.010

<p>Capacity and Degree-of-Freedom of OFDM Channels with Amplitude Constraint</p> <p><i>Saeid Haghghatshoar, Peter Jung, Giuseppe Caire</i></p>	<p>Algorithmic Aspects of Optimal Channel Coding</p> <p><i>Sidharth Barman, Omar Fawzi</i></p>	<p>Algebraic Lattice Codes Achieve the Capacity of the Compound Block-Fading Channel</p> <p><i>Antonio Campello, Cong Ling, Jean-Claude Belffiore</i></p>	<p>The Capacity of Online (Causal) <math>q</math>-ary Error-Erasure Channels</p> <p><i>Zitan Chen, Sidharth Jaggi, Michael Langberg</i></p>
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**Tu-AM-1-9: Reed-Solomon Codes** Chair: Ron M. Roth Room 40.150

<p>On (Partial) Unit Memory Codes based on Reed-Solomon Codes for Streaming</p> <p><i>Margreta Kuijper, Martin Bossert</i></p>	<p>On Deep Holes of Projective Reed-Solomon Codes</p> <p><i>Jun Zhang, Daqing Wan</i></p>	<p>Using Reed-Solomon codes in the <math>(U U+V)</math> construction and an application to cryptography</p> <p><i>Irene Márquez-Corbella, Jean-Pierre Tillich</i></p>	<p>Balanced Reed-Solomon Codes</p> <p><i>Wael Halbawi, Zihan Liu, Babak Hassibi</i></p>
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**Tuesday, July 12****12:00–13:20**

12:00

12:20

12:40

13:00

**Tu-AM-2-1: Constrained Coding 3** Chair: Osvaldo Simeone Room 40.002

d-imbalance WOM Codes for Reduced Inter-Cell Interference in Multi-Level NVMS  
*Evyatar Hemo, Yuval Cassuto*

On the Capacity of Non-Binary Write-Once Memory  
*Michal Horovitz, Eitan Yaakobi*

Write Sneak-Path Constraints Avoiding Disturbs in Memristor Crossbar Arrays  
*Yuval Cassuto, Shahar Kvatinsky, Eitan Yaakobi*

Performance of Flash Memories with Different Binary Labelings: A Multi-User Perspective  
*Pengfei Huang, Paul H. Siegel, Eitan Yaakobi*

**Tu-AM-2-2: Statistical Inference 1** Chair: Ofer Shayevitz Room 40.144

Minimax Structured Normal Means Inference  
*Akshay Krishnamurthy*

Minimax Lower Bounds for Linear Independence Testing  
*David Isenberg, Aaditya Ramdas, Aarti Singh, Larry Wasserman*

Chernoff Information of Bottleneck Gaussian Trees  
*Binglin Li, Shuangqing Wei, Yue Wang, Jian Yuan*

The rates of convergence of neural network estimates of hierarchical interaction regression models  
*Michael Kohler, Adam Krzyzak*

**Tu-AM-2-3: Polar Codes 4** Chair: Ido Tal Room 40.146

Polar Codes and Polar Lattices for Independent Fading Channels  
*Ling Liu, Cong Ling*

Polar Coding for the Multiple Access Wiretap Channel via Rate-Splitting and Cooperative Jamming  
*Remi A Chou, Aylin Yener*

Polar Coded Non-Orthogonal Multiple Access  
*Jincheng Dai, Kai Niu, Zhongwei Si, Jiaru Lin*

Polar Codes for Broadcast Channels with Receiver Message Side Information and Noncausal State Available at the Encoder  
*Jun Sima, Wei Chen*

**Tu-AM-2-4: Distributed Storage 6** Chair: Kenneth W. Shum Room 40.148

Design of Membership Matrices for  $(r, t)$ -Availability in Distributed Storage  
*Yi-Sheng Su*

Centralized Repair of Multiple Node Failures  
*Ankit Singh Rawat, Onur Ozan Koyluoglu, Sriram Vishwanath*

Combinatorial and LP bounds for LRC codes  
*Sihuang Hu, Ilzhak Tamo, Alexander Barg*

Reliability-Bandwidth Tradeoffs for Distributed Storage Allocations  
*Siddhartha Brahma, Hugues Mercier*

**Tu-AM-2-5: Information Theory in Biology 2** Chair: Manoj Gopalkrishnan Room 40.004

Overlap-Based Genome Assembly from Variable-Length Reads  
*Joseph Hui, Ilan Shomorony, Kannan Ramchandran, Thomas Courtade*

On the Capacity of Diffusion-Based Molecular Timing Channels  
*Nariman Farsad, Yonathan Murin, Andrew Eckford, Andrea Goldsmith*

Duplication-Correcting Codes for Data Storage in the DNA of Living Organisms  
*Siddharth Jain, Farzad Farnoud (Hassanzadeh), Moshe Schwartz, Jehoshua Bruck*

Distribution of First Arrival Position in Molecular Communication  
*Yen-Chi Lee, Chiun-Chuan Chen, Ping-Cheng Yeh, Chia-Han Lee*

**Tu-AM-2-6: Inequalities 1** Chair: Sudeep Kamath Room 40.006

Equivalent characterization of reverse Brascamp-Lieb-type inequalities using information measures  
*Salman Beigi, Chandra Nair*

Smoothing Brascamp-Lieb Inequalities and Strong Converses for Common Randomness Generation  
*Jingbo Liu, Thomas Courtade, Paul Cuff, Sergio Verdú*

Brascamp-Lieb Inequality and Its Reverse: An Information Theoretic View  
*Jingbo Liu, Thomas Courtade, Paul Cuff, Sergio Verdú*

On additive-combinatorial affine inequalities for Shannon entropy and differential entropy  
*Ashok Makkuva, Yihong Wu*

**Tu-AM-2-7: Multiple Antennas 2** Chair: Dongning Guo Room 40.008

The Capacity of Discrete-Time Gaussian MIMO Channels with Periodic Characteristics  
*Nir Shlezinger, Ron Dabora*

Universal Outer Behavior of Randomly Precoded Integer Forcing Over MIMO Channels  
*Elad Domanovitz, Uri Erez*

Dispersion of the Coherent MIMO Block-Fading Channel  
*Austin Collins, Yury Polyanskiy*

On the Symmetries and the Capacity Achieving Input Covariance Matrices of Multiantenna Channels  
*Mario Diaz*

**Tu-AM-2-8: Multi-Terminal Source Coding 2** Chair: Bobak Nazer Room 40.010

Privacy-Constrained Remote Source Coding  
*Kittipong Kittichokechai, Giuseppe Caire*

Distributed Information-Theoretic BiClustering  
*Georg Pichler, Pablo Piantanida, Gerald Matz*

Practical Interactive Scheme for Extremum Computation in Distributed Networks  
*Solmaz Torabi, Jie Ren, John M. Walsh*

Universal decoding for source-channel coding with side information  
*Neri Merhav*

**Tu-AM-2-9: BCH Codes / Quasi-Cyclic Codes** Chair: Margreta Kuijper Room 40.150

Generalized Integrated Interleaving BCH Codes  
*Yingquan Wu*

Long Cyclic Codes over GF(4) and GF(8) Better Than BCH Codes in the High-Rate Region  
*Ron M. Roth, Alexander Zeh*

On Spectral Design Methods for Quasi-Cyclic Codes  
*Ron M. Roth, Alexander Zeh*

Spectral Analysis of Quasi-Cyclic Product Codes  
*Alexander Zeh, San Ling*

# Tuesday, July 12

15:10–16:50

15:10	15:30	15:50	16:10	16:30
<b>Tu-PM-1-1: Information Measures 2</b> Chair: Babak Hassibi Room 40.002				
Estimation of KL Divergence Between Large-Alphabet Distributions <i>Yuheng Bu, Shaofeng Zou, Yingbin Liang, Venugopal Veeravalli</i>	On Projections of the Rényi Divergence on Generalized Convex Sets <i>M. Ashok Kumar, Igal Sason</i>	Information concentration for convex measures <i>Jiange Li, Matthieu Fradelizi, Mokshay Madiman</i>	Improving Convergence of Divergence Functional Ensemble Estimators <i>Kevin Moon, Kumar Sricharan, Kristjan Greenewald, Alfred Hero III</i>	Approximating probability distributions with short vectors, via information theoretic distance measures <i>Ferdinando Cicalese, Luisa Gargano, Ugo Vaccaro</i>
<b>Tu-PM-1-2: Learning 1</b> Chair: Robert Calderbank Room 40.144				
Speeding Up Distributed Machine Learning Using Codes <i>Kangwook Lee, Maximilian Lam, Ramtin Pedarsani, Dimitris Papailopoulos, Kannan Ramchandran</i>	Minimax Lower Bounds for Kronecker-Structured Dictionary Learning <i>Zahra Shakeri, Waheed U. Bajwa, Anand D. Sarwate</i>	Feeling the Bern: Adaptive Estimators for Bernoulli Probabilities of Pairwise Comparisons <i>Nihar B Shah, Sivaraman Balakrishnan, Martin Wainwright</i>	Interventional Dependency Graphs: an Approach for Discovering Influence Structure <i>Jalal Etesami, Negar Kiyavash</i>	Deep Convolutional Neural Networks on Cartoon Functions <i>Philipp Grohs, Thomas Wiatowski, Helmut Bölcskei</i>
<b>Tu-PM-1-3: Superposition Codes / Group Testing 1</b> Chair: Andrew R Barron Room 40.146				
An Improved Upper Bound on Block Error Probability of Least Squares Superposition Codes with Unbiased Bernoulli Dictionary <i>Yoshinari Takeishi, Junichi Takeuchi</i>	Proof of Threshold Saturation for Spatially Coupled Sparse Superposition Codes <i>Jean Barbier, Mohamad Dia, Nicolas Macris</i>	On Multistage Learning a Hidden Hypergraph <i>Arkadij Dyachkov, Ilya Vorobyev, Nikita Polyanski, Vladislav Shchukin</i>	On a Hypergraph Approach to Multistage Group Testing Problems <i>Arkadij Dyachkov, Ilya Vorobyev, Nikita Polyanski, Vladislav Shchukin</i>	Polar Coding for Group Testing <i>Sreechakra Goparaju, Yonatan Kaspri, Alexander Vardy, Lele Wang</i>
<b>Tu-PM-1-4: Distributed Storage 7</b> Chair: Salim El Rouayheb Room 40.148				
Bounds for Batch Codes with Restricted Query Size <i>Hui Zhang, Vitaly Skachek</i>	Constructions of Batch Codes with Near-Optimal Redundancy <i>Alexander Vardy, Eitan Yaakobi</i>	Explicit constructions of MDS array codes and RS codes with optimal repair bandwidth <i>Min Ye, Alexander Barg</i>	Spider Codes: Practical Erasure Codes for Distributed Storage Systems <i>Luis Parnies-Juarez, Cyril Guyot, Robert Matescu</i>	New Exact-Repair Codes for Distributed Storage Systems Using Matrix Determinant <i>Mehran Elyasi, Soheil Mohajer</i>
<b>Tu-PM-1-5: Data Compression</b> Chair: David L Neuhoff Room 40.004				
Lossless Compression of Binary Trees with Correlated Vertex Names <i>Abram Magner, Krzysztof Turowski, Wojciech Szpankowski</i>	Context Set Weighting Method <i>Zsolt Talata, Hee Sun Kim</i>	A New Type Size Code for Universal One-to-One Compression of Parametric Sources <i>Nematollah Iri, Oliver Kosut</i>	Cutset Width and Spacing for Reduced Cutset Coding of Markov Random Fields <i>Matthew G. Reyes, David L Neuhoff</i>	Generalisation of Kraft inequality for source coding into permutations <i>Kristo Visk, Ago-Erik Riet</i>
<b>Tu-PM-1-6: Heterogeneous Networks</b> Chair: Andrew Thangaraj Room 40.006				
Throughput Maximization in Uncooperative Spectrum Sharing Networks <i>Thomas Stahlbuhk, Brooke Shrader, Eytan Modiano</i>	Caching in Mobile HetNets: A Throughput-Delay Trade-off Perspective <i>Trung-Anh Do, Sang-Woon Jeon, Won-Yong Shin</i>	Cognitive Hierarchy Theory for Heterogeneous Uplink Multiple Access in the Internet of Things <i>Nat Abuzainab, Walid Saad, H. Vincent Poor</i>	Bandlimited Field Estimation from Samples Recorded by a Location-Unaware Mobile Sensor <i>Animesh Kumar</i>	Simultaneous Connectivity in Heterogeneous Cognitive Radio Networks <i>Michal Yemini, Anelia Somekh-Baruch, Reuven Cohen, Amir Leshem</i>
<b>Tu-PM-1-7: Feedback 2</b> Chair: Aylin Yener Room 40.008				
Feedback Does Not Increase the Capacity of Compound Channels with Additive Noise <i>Sergey Loyka, Charalambos D Charalambous</i>	The Zero-Error Capacity of the Gelfand-Pinsker Channel with a Feedback Link <i>Annina Bracher, Amos Lapidoth</i>	Conveying Data and State with Feedback <i>Shraga Brass, Amos Lapidoth</i>	On Optimal Transmission Strategies for Channels with Noiseless Feedback <i>Maral F Burnashev, Hirotsuke Yamamoto</i>	Information Structures of Capacity Achieving Distribution for Channels with Memory and Feedback <i>Christos K Kourtellis, Charalambos D Charalambous</i>
<b>Tu-PM-1-8: DoF in Wireless Networks</b> Chair: Natasha Devroye Room 40.010				
Canonical Conditions for K/2 Degrees of Freedom <i>David Stotz, Syed Ali Jafar, Helmut Bölcskei, Shlomo Shamai (Shitz)</i>	GDoF of the MISO BC: Bridging the Gap between Finite Precision CSIT and Perfect CSIT <i>Arash Gholami Davoodi, Syed Ali Jafar</i>	Degrees of Freedom of MIMO Y Channel with Multiple Relays <i>Tian Ding, Xiaojun Yuan, Soung Chang Liew</i>	Generalized DoF of the Symmetric K-User Interference Channel under Finite Precision CSIT <i>Arash Gholami Davoodi, Syed Ali Jafar</i>	Degrees of Freedom of the Bursty MIMO X Channel without Feedback <i>Shih-Yi Yeh, I-Hsiang Wang</i>
<b>Tu-PM-1-9: Combinatorial Coding Theory</b> Chair: Tuvit Etzion Room 40.150				
PD-sets for Z4-linear codes: Hadamard and Kerdock codes <i>Roland Barroleta, Merce Villanueva</i>	Revisiting the Sanders-Bogolyubov-Ruzsa Theorem in $F_p^n$ and its Application to Non-malleable Codes <i>Divesh Aggarwal, Jop Briet</i>	Two Classes of Zero Difference Balanced Functions and Their Optimal Constant Composition Codes <i>Yang Yang, Zhengchun Zhou, Xiaohu Tang</i>	Rate-distance tradeoff for codes above graph capacity <i>Daniel F Cullina, Marco Dalai, Yuri Polyanskiy</i>	Metrics based on Finite Directed Graphs <i>Marcelo Firer, Tuvit Etzion</i>



17:10 17:30 17:50 18:10 18:30

**Tu-PM-2-1: Network Structures** Chair: Chandra Nair Room 40.002

Quickest Detection of Markov Networks <i>Javad Heydari, Ali Tajer, H. Vincent Poor</i>	Information-Theoretic Lower Bounds for Recovery of Diffusion Network Structures <i>Keekwan Park, Jean Honorio</i>	Inference of latent network features via co-intersection representations of graphs <i>Hoang Dau, Olgica Milenkovic</i>
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**Tu-PM-2-2: Cryptography and Security 2** Chair: Gilles Zémor Room 40.144

A p-ary MDPC scheme <i>Qian Guo, Thomas Johansson</i>	Lower Bounds and Optimal Protocols for Three-Party Secure Computation <i>Sundara Rajan S, Shijin Rajakrishnan, Andrew Thangaraj, Vinod M Prabhakaran</i>	Worst case QC-MDPC decoder for McEliece cryptosystem <i>Julia Chalelet, Nicolas Sendrier</i>	Message Partitioning and Limited Auxiliary Randomness: Alternatives to Honey Encryption <i>AmirEmad Ghassami, Daniel F Cullina, Negar Kiyavash</i>
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**Tu-PM-2-3: Group Testing 2** Chair: Arya Mazumdar Room 40.146

Estimating the Number of Defectives with Group Testing <i>Moein Falahatgar, Ashkan Jafarpour, Alon Orlitsky, Venkatasubramanian Pichapati, Ananda Theertha Suresh</i>	Improved group testing rates with constant column weight designs <i>Matthew Aldridge, Oliver Johnson, Jonathan Scarlett</i>	Data Extraction via Histogram and Arithmetic Mean Queries: Fundamental Limits and Algorithms <i>I-Hsiang Wang, Shao-Lun Huang, Kuan-Yun Lee, Kwang-Cheng Chen</i>	Secure Group Testing <i>Alejandro Cohen, Asaf Cohen, Omer Gurewitz</i>
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**Tu-PM-2-4: Distributed Storage 8** Chair: Sriram Vishwanath Room 40.148

Staircase Codes for Secret Sharing with Optimal Communication and Read Overheads <i>Rawad Bitar, Salim El Rouayheb</i>	Secure RAID Schemes for Distributed Storage <i>Wentao Huang, Jehoshua Bruck</i>	The Rate Region of Secure Exact-Repair Regenerating Codes for 5 Nodes <i>Fangwei Ye, Kenneth W. Shum, Raymond W. Yeung</i>	Private Information Retrieval from MDS Coded Data in Distributed Storage Systems <i>Razane Tajeddine, Salim El Rouayheb</i>
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**Tu-PM-2-5: Compressed Sensing 2** Chair: Galen Reeves Room 40.004

Super-resolution MIMO radar <i>Reinhard Heckel</i>	Variational Bayesian Dynamic Compressive Sensing <i>Hongwei Wang, Hang Yu, Micheal Hoy, Justin Dauwels, Heping Wang</i>	Support Recovery from Noisy Random Measurements via Weighted L1 Minimization <i>Jun Zhang, Urbashi Mitra, Kuan-Wen Huang, Nicolo Michelusi</i>	Adaptivity provably helps: information-theoretic limits on l-0 cost of non-adaptive sensing <i>Sanghamitra Dutta, Pulkit Grover</i>
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**Tu-PM-2-6: Scheduling** Chair: Eytan Modiano Room 40.006

Routing with Blinkers: Online Throughput Maximization without Queue Length Information <i>Georgios S. Paschos, Mathieu Leconte, Apostolos Destounis</i>	Constructing Sub-exponentially Large Optical Priority Queues with Switches and Fiber Delay Lines <i>Bin Tang, Xiaoliang Wang, Cam-Tu Nguyen, Sanglu Lu</i>	A General Optimality Condition of Link Scheduling for Emptying a Wireless Network <i>Qing He, Di Yuan, Anthony Ephremides</i>	Delay-optimal Computation Task Scheduling for Mobile-Edge Computing Systems <i>Juan Liu, Yiyi Mao, Jun Zhang, Khaled B. Letaief</i>
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**Tu-PM-2-7: Interference in Wireless Networks 2** Chair: Benjamin Zaidel Room 40.008

Collaboration Alignment in Distributed Interference Management in Uplink Cellular Systems <i>Borna Kananian, Mohammad A. Maddah-Ali, Seyed Pooya Shariatpanahi, Babak H. Khalaj</i>	Cell Associations that Maximize the Average Uplink-Downlink Degrees of Freedom <i>Aly El Gamal</i>	Network MIMO: Transmitters with no CSI Can Still be Very Useful <i>Paul de Kerret, David Gesbert</i>	Advanced Factorization Strategies for Lattice-Reduction-Aided Preequalization <i>Sebastian Stern, Robert F.H. Fischer</i>	Real Interference Alignment for Vector Channels <i>Pritam Mukherjee, Sennur Ulukus</i>
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**Tu-PM-2-8: Multiple Access Channels 2** Chair: Gregory Wornell Room 40.010

The Dirty MIMO Multiple-Access Channel <i>Anatoly Khina, Yuval Kochman, Uri Erez</i>	On the Capacity of Strong Asynchronous Multiple Access Channels with a Large Number of Users <i>Sara Shahi, Daniela Tuninetti, Natasha Devroye</i>	Multiple Access Channel with Unreliable Cribbing <i>Wasim Huleihel, Yossef Steinberg</i>	Helper-Assisted State Cancellation for Multiple Access Channels <i>Yunhao Sun, Ruchen Duan, Yingbin Liang, Ashish Khisti, Shlomo Shamai (Shitz)</i>
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**Tu-PM-2-9: Lattice Codes** Chair: Hans-Andrea Loeliger Room 40.150

On LCD Codes and Lattices <i>Xiaolu Hou, Frederique Oggier</i>	Voronoi Constellations for High-Dimensional Lattice Codes <i>Nuwan S. Ferdinand, Matthew Nokleby, Behnaam Aazhang</i>	On The Construction of Capacity-Achieving Lattice Gaussian Codes <i>Wael Alghamdi, Walid Abediseid, Mohamed-Slim Alouini</i>	Uniformity Properties of Construction C <i>Maiara Bollauf, Ram Zamir</i>
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10:20 10:40 11:00 11:20  
**We-AM-1-1: Error Exponents 1** Chair: Tsachy Weissman Room 40.002

Exact Random Coding Secrecy Exponents for the Wiretap Channel <i>Mani Bastani Parizi, Emre Telatar, Neri Merhav</i>	Distributed Detection over Connected Networks via One-Bit Quantizer <i>Shengyu Zhu, Biao Chen</i>	Computing the Optimal Exponent of Correct Decoding for Discrete Memoryless Sources <i>Yutaka Jitsumatsu, Yasutada Ohama</i>	Remaining Uncertainties and Exponents under Rényi Information Measures <i>Masahito Hayashi, Vincent Y. F. Tan</i>
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**We-AM-1-2: Statistical Inference 2** Chair: Zsolt Talata Room 40.144

Asymptotically Achievable Error Probabilities for Multiple Hypothesis Testing <i>Pierre Moulin</i>	Optimal Sequential Test with Finite Horizon and Constrained Sensor Selection <i>Shang Li, Xiaou Li, Xiaodong Wang, Jingchen Liu</i>	Deterministic Performance Analysis of Subspace Methods for Csisoid Parameter Estimation <i>Céline Aubel, Helmut Bölcskei</i>	A statistical perspective of sampling scores for linear regression <i>Siheng Chen, Rohan Varma, Aarti Singh, Jelena Kovacevic</i>
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**We-AM-1-3: LDPC Codes 1** Chair: Henry D Pfister Room 40.146

Guaranteed Error Correction of Faulty Bit-Flipping Decoders under Data-Dependent Gate Failures <i>Srdan Brkic, Predrag N. Ivanis, Bane Vasic</i>	Performance Evaluation of Faulty Iterative Decoders using Absorbing Markov Chains <i>Predrag N. Ivanis, Bane Vasic, David Declercq</i>	Performance Analysis of Fault Erasure Belief Propagation Decoder based on Density Evolution <i>Hiroki Mori, Tadashi Wadayama</i>	LDPC Decoders with Missing Connections <i>Linjia Chang, Avhishek Chatterjee, Lav R. Varshney</i>
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**We-AM-1-4: Distributed Storage 9 / Deletion Channel** Chair: Alexander Vardy Room 40.148

Improved Erasure List Decoding Locally Repairable Codes Using Alphabet-Dependent List Recovery <i>Alexander Zeh, Antonia Wachter-Zeh</i>	Bounds on the Maximal Minimum Distance of Linear Locally Repairable Codes <i>Antti Pöllänen, Thomas Westerbäck, Ragnar Freij-Hollanti, Camilla Hollanti</i>	New Constructions of SD and MR Codes over Small Finite Fields <i>Guangda Hu, Sergey Yekhanin</i>	Sequence Reconstruction over the Deletion Channel <i>Ryan Gabrys, Eitan Yaakobi</i>
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**We-AM-1-5: Wireless Communications 3** Chair: Salman Avestimehr Room 40.004

A Lower Bound on the Optimum Feedback Rate for Downlink Multi-Antenna Cellular Networks <i>Jeonghun Park, Namyoong Lee, Jeffrey Andrews, Robert Heath</i>	An Uplink-Downlink Duality for Cloud Radio Access Network <i>Liang Liu, Pratik Patil, Wei Yu</i>	Gaussian Approximation for the Downlink Interference in Heterogeneous Cellular Networks <i>Serkan Ak, Hazer Inaltekin, H. Vincent Poor</i>	Downlink Outage Performance of Heterogeneous Cellular Networks <i>Serkan Ak, Hazer Inaltekin, H. Vincent Poor</i>
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**We-AM-1-6: Game Theory** Chair: Gireeja Ranade Room 40.006

High Probability Guarantees in Repeated Games: Theory and Applications in Information Theory <i>Payam Delgosha, Amin Gohari, Mohammad Akbarpour</i>	On the Role of Side Information in Strategic Communication <i>Enrah Akyol, Cédric Langbort, Tamer Başar</i>	Dynamic Signaling Games under Nash and Stackelberg Equilibria <i>Serkan Saritaş, Serdar Yüksel, Sinan Gezici</i>	Secondary Spectrum Market: To acquire or not to acquire side information? <i>Arnob Ghosh, Saswati Sarkar, Randall A Berry</i>
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**We-AM-1-7: Information Measures 3** Chair: Victoria Kostina Room 40.008

Relations Between Conditional Shannon Entropy and Expectation of $\ell_\alpha$ -Norm <i>Yuta Sakai, Ken-ichi Iwata</i>	On the Minimum Mean p-th Error in Gaussian Noise Channels and its Applications <i>Alex Dytso, Ronit Bustin, Daniela Tuninetti, Natasha Devroye, H. Vincent Poor, Shlomo Shamai (Shitz)</i>	Consistency of the Plug-In Estimator of the Entropy Rate for Ergodic Processes <i>Lukasz Jerzy Debowski</i>	A characterization of statistical manifolds on which the relative entropy is a Bregman divergence <i>Hiroshi Nagaoka</i>
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**We-AM-1-8: Relay Channels** Chair: Lalitha Sankar Room 40.010

Achievable Rate Regions for Cooperative Relay Broadcast Channels with Rate-limited Feedback <i>Yulong Wu</i>	Capacity of Two-Relay Diamond Networks with Rate-Limited Links to the Relays and a Binary Adder Multiple Access Channel <i>Shirin Saedi Bidokhti, Gerhard Kramer</i>	An Achievable Rate Region for the Two-Way Multiple Relay Channel <i>Jonathan Ponniah, Liang-Liang Xie</i>	Improving on The Cut-Set Bound for General Primitive Relay Channels <i>Xiugang Wu, Ayfer Özgür</i>
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**We-AM-1-9: Quantum Capacity and Quantum Channels** Chair: Alexander Holevo Room 40.150

Entanglement Assisted Classical Capacity of Compound Quantum Channels <i>Stephan Kaltensadler, Gisbert Janßen, Holger Boche</i>	Quantum Capacities for Entanglement Networks <i>Shawn Cui, Zhengfeng Ji, Nengkun Yu, Bei Zeng</i>	A semidefinite programming upper bound of quantum capacity <i>Xin Wang, Runyao Duan</i>	Operator Algebra Approach to Quantum Capacities <i>Marius Junge, Li Gao, Nicolas Laracuente</i>
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12:00 12:20 12:40 13:00 13:20

**We-AM-2-1: Error Exponents 2** Chair: Pierre Moulin Room 40.002

<p>Unequal Error Protection Coding Approaches to the Noisy 20 Questions Problem</p> <p><i>Hye Won Chung, Lizhong Zheng, Brian Sadler, Alfred Hero III</i></p>	<p>Collaborative Distributed Hypothesis Testing with General Hypotheses</p> <p><i>Gil Katz, Pablo Piantanida, Mérouane Debbah</i></p>	<p>Reliability of Sequential Hypothesis Testing Can Be Achieved by an Almost-Fixed-Length Test</p> <p><i>Anusha Lalitha, Tara Javidi</i></p>	<p>Bounds on the reliability of a typewriter channel</p> <p><i>Marco Dalai, Yury Polyanskiy</i></p>
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**We-AM-2-2: Statistical Inference 3** Chair: Maxim Raginsky Room 40.144

<p>Asymptotically tight bounds on the depth of estimated context trees</p> <p><i>Álvaro Martín, Gadiel Seroussi</i></p>	<p>Structure Learning and Universal Coding when Missing Values Exist</p> <p><i>Joe Suzuki</i></p>	<p>Latent Tree Ensemble of Pairwise Copulas for Spatial Extremes Analysis</p> <p><i>Hang Yu, Junwei Huang, Justin Dauwels</i></p>	<p>Sparse Approximations of Directed Information Graphs</p> <p><i>Christopher J Quinn, Ali Pinar, Jing Gao, Lu Su</i></p>
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**We-AM-2-3: LDPC Codes 2 / RM Codes** Chair: Ilya Dumer Room 40.146

<p>Stopping Sets for MDS-based Product Codes</p> <p><i>Fanny Jardel, Joseph Jean Boutros, Mireille Sarkiss</i></p>	<p>Probabilistic bounds on the trapping redundancy of linear codes</p> <p><i>Yuichiro Fujiwara, Yu Tsunoda</i></p>	<p>Reed-Muller Codes Achieve Capacity on the Quantum Erasure Channel</p> <p><i>Santhosh Kumar, Robert Calderbank, Henry D Pfister</i></p>	<p>Comparing the Bit-MAP and Block-MAP Decoding Thresholds of Reed-Muller Codes on BMS Channels</p> <p><i>Shrinivas Kudekar, Santhosh Kumar, Marco Mondelli, Henry D Pfister, Ruediger L Urbanke</i></p>	<p>Enhanced Recursive Reed-Muller Erasure Decoding</p> <p><i>Alexandre Soro, Jerome Lacan, Vincent Roca, Valentin Savin, Mathieu Cunche</i></p>
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**We-AM-2-4: Network Coding 1** Chair: Mayank Bakshi Room 40.148

<p>A Characterization of the Capacity Region for Network Coding with Dependent Sources</p> <p><i>Woong Kim, Michael Langberg, Michelle Effros</i></p>	<p>On Tightness of an Entropic Region Outer Bound for Network Coding and the Edge Removal Property</p> <p><i>Ming Fai Wong, Michelle Effros, Michael Langberg</i></p>	<p>A Reduction Approach to the Multiple-Unicast Conjecture in Network Coding</p> <p><i>Xunrui Yin, Zongpeng Li, Xin Wang</i></p>	<p>On the Relationship Between Edge Removal and Strong Converses</p> <p><i>Oliver Kosut, Joerg Killewer</i></p>	<p>Can Negligible Cooperation Increase Network Reliability?</p> <p><i>Parham Noorzad, Michelle Effros, Michael Langberg</i></p>
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**We-AM-2-5: Information Theory in Biology 3** Chair: I-Hsiang Wang Room 40.004

<p>Design of Geometric Molecular Bonds</p> <p><i>David Doty, Andrew Winslow</i></p>	<p>Fundamental limits on source-localization accuracy of EEG-based neural sensing</p> <p><i>Pulkit Grover</i></p>	<p>Partial DNA Assembly: A Rate-Distortion Perspective</p> <p><i>Ilan Shomorony, Govinda M Kamath, Fai Xia, Thomas Courtade, David Tse</i></p>	<p>Shannon Capacity of Signal Transduction for Multiple Independent Receptors</p> <p><i>Peter J Thomas, Andrew Eckford</i></p>
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**We-AM-2-6: Caching and Computation** Chair: Jeffrey Andrews Room 40.006

<p>New Proofs of Retrievability using Locally Decodable Codes</p> <p><i>Julien Lavauzelle, Françoise Levy-dit-Vehel</i></p>	<p>Fundamental Tradeoff between Computation and Communication in Distributed Computing</p> <p><i>Songze Li, Mohammad Ali Maddah-Ali, Salman Avestimehr</i></p>	<p>Erasure Broadcast Networks with Receiver Caching</p> <p><i>Shirin Saeedi Bidokhti, Roy Timo, Michèle A. Wigger</i></p>	<p>How to Compute Modulo Prime-Power Sums</p> <p><i>Mohsen Heidari Khoozani, Sandeep Pradhan</i></p>
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**We-AM-2-7: Source-Channel Coding over BC** Chair: Shlomo Shamai (Shitz) Room 40.008

<p>Energy-Distortion Tradeoff for the Gaussian Broadcast Channel with Feedback</p> <p><i>Yonathan Murin, Yonatan Kaspri, Ron Dabora, Deniz Gündüz</i></p>	<p>Distortion Bounds for Source Broadcast over Degraded Channel</p> <p><i>Lei Yu, Houqiang Li, Weiping Li</i></p>	<p>On the Energy-Distortion Tradeoff for the Gaussian Broadcast Problem</p> <p><i>Erman Köken, Ertem Tuncel</i></p>	<p>Joint Source-Channel Coding for Broadcasting Correlated Sources</p> <p><i>Erman Köken, Ertem Tuncel</i></p>
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**We-AM-2-8: Relay and Two Way Channels** Chair: Patrick Mitran Room 40.010

<p>The Capacity Gap Calculation for Multi-Pair Bidirectional Gaussian Relay Networks Based on Successive Compute-and-Forward Strategy</p> <p><i>Leila Ghabeli, Milan S. Derpich</i></p>	<p>Adaptation is Useless for Two Discrete Additive-Noise Two-Way Channels</p> <p><i>Lin Song, Fady Alajaji, Tamas Linder</i></p>	<p>Capacity and Power Scaling Laws for Finite Antenna Amplify-and-Forward Relay Networks</p> <p><i>David Simmons, Justin P Coon, Naqeeb Warsi</i></p>	<p>On Full Duplex Gaussian Relay Channels with Self-interference</p> <p><i>Arash Behboodi, Anas Chaaban, Rudolf Mathar, Mohamed-Slim Alouini</i></p>
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**We-AM-2-9: Channel Capacity 2** Chair: Anand D. Sarwate Room 40.150

<p>On the Capacity of Multilevel NAND Flash Memory Channels</p> <p><i>Yonglong Li, Aleksandar Kavcic, Guangyue Han</i></p>	<p>Achievable Rates for Additive Isotropic <math>\alpha</math>-Stable Noise Channels</p> <p><i>Malcolm Egan, Mauro de Freitas, Laurent Clavier, Alban Goupil, Gareth Peters, Nourdine Azaoui</i></p>	<p>On the Capacity of Fading Channels with Amplitude-Limited Inputs</p> <p><i>Ahmad A ElMoslmany, Tolga M. Duman</i></p>	<p>Capacity of Block Rayleigh Fading Channels Without CSI</p> <p><i>Mainak Chowdhury, Andrea Goldsmith</i></p>
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**Note:** These posters have not gone through a formal review process and will not appear in the published proceedings of ISIT 2016.

A Permutation-based Model for Crowd Labeling: Optimal Estimation and Robustness  
*Nihar B. Shah, Sivaraman Balakrishnan, Martin J. Wainwright*

Active Ranking from Pairwise Comparisons and the Futility of Parametric Assumptions  
*Reinhard Heckel, Nihar B. Shah, Kannan Ramchandran, Martin J. Wainwright*

An Efficient Method to Recursively Encode Spatially Coupled LDPC Codes  
*Hongwei Si, Sijie Wang, Junyang Ma*

Asymptotic Error Probability Expressions for the MAP Detector and Multidimensional Constellations  
*Alex Alvarado, Erik Agrell, Fredrik Brännström*

Branching MERA Codes: Achieving Capacity  
*Andrew J. Ferris, Christoph Hirche, David Poulin*

Catalytic Decoupling  
*Christian Majenz, Mario Berta, Frédéric Dupuis, Renato Renner, Matthias Christandl*

Cooperative Data Exchange with Adversarial Clients  
*Anoosheh Heidarzadeh, Alex Sprintson*

Degrees of Freedom of Full-Duplex Multicell Networks  
*Sung Ho Chae, Sang-Woon Jeon, Sung Hoan Lim*

Feedback Capacity of ARMA(1,2) Gaussian Channels  
*Tao Liu, Guangyue Han*

Forward Secret-Key Distillation from Compound Memoryless Classical-Quantum-Quantum Sources  
*Holger Boche, Gisbert Janßen*

Fundamental Limits of Cache-Aided Wireless BC: Interplay of Coded-Caching and CSIT Feedback  
*Jingjing Zhang, Petros Elia*

Improving the Secrecy of Distributed Storage Systems using Interference Alignment  
*Natasa Paunkoska, Ninoslav Marina*

Info-Clustering: A Mathematical Theory of Data Clustering  
*Chung Chan*

Network Coding for Extended Multiple Descriptions  
*Tao Guo, Raymond W. Yeung*

On Information Spreading in Multiplex Networks with Gossip Mechanism  
*Yufan Huang, Huaiyu Dai*

Optimal Beamforming with Partial CSIT for Massive MISO Interfering Broadcast Channels and Large System Analysis  
*Wassim Tabikh, Dirk Slock, Yi Yuan-Wu*

Optimal Design of Interdependent Networks  
*Srinjoy Chattopadhyay, Huaiyu Dai*

Optimally Bridging the Gap from Delayed to Perfect CSIT in the K-user MISO BC  
*Paul de Kerret, David Gesbert, Jingjing Zhang, Petros Elia*

Performance Analysis of Regenerating Codes  
*Katrina Kravevska, Danilo Gligoroski, Harald Øverby*

Polar Coded Non-Orthogonal Multiple Access  
*Jincheng Dai, Kai Niu, Zhongwei Si, Jiaru Lin*

Rate-Cost Tradeoffs in Control  
*Victoria Kostina, Babak Hassibi*

Rayleigh Quotient Based Analysis of MIMO Linear Receivers  
*Giusi Alfano, Carla-Fabiana Chiasserini, Alessandro Nordin*

Two-Dimensional Golay Complementary Array Pairs  
*Cheng-Ting Chang, Ying Li*

Unifying Generalized Weights for Security on Wire-Tap Networks  
*Umberto Martínez-Peñas, Ryutaroh Matsumoto*

Universal Random Access Error Exponent for Codebooks with Different Word-Lengths  
*Lóránt Farkas, Tamás Kófi*

Universal Remote Generation of Continuous Random Variables  
*Cheuk Ting Li, Abbas El Gamal*

10:20 10:40 11:00 11:20  
**Th-AM-1-1: Community Detection** Chair: Emmanuel Abbe Room 40.002

<p>Active Learning for Community Detection in Stochastic Block Models</p> <p><i>Akshay Gadde, Eyal En Gad, Salman Avestimehr, Antonio Ortega</i></p>	<p>Information Limits for Recovering a Hidden Community</p> <p><i>Bruce Hajek, Yihong Wu, Jiaming Xu</i></p>	<p>Community Detection with Colored Edges</p> <p><i>Narae Ryu, Sae-Young Chung</i></p>	<p>Partial Recovery Bounds for the Sparse Stochastic Block Model</p> <p><i>Jonathan Scarlett, Volkan Cevher</i></p>
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**Th-AM-1-2: Code Construction and Analysis** Chair: Amir Bahiashemi Room 40.144

<p>Short Block Length Code Design for Interference Channels</p> <p><i>Shahrouz Sharifi, Mehdi Dabirnia, A. Korhan Tanc, Tolga M. Duman</i></p>	<p>Approaching the Capacity of AWGN Channels using Multi-Layer Raptor Codes and Superposition Modulation</p> <p><i>Mahyar Shirvanimoghaddam, Sarah J Johnson</i></p>	<p>Two-Way Spinal Codes</p> <p><i>Weiqiang Yang, Ying Li, Xiaopu Yu, Yue Sun</i></p>	<p>Further Results on Independent Metropolis-Hastings-Klein Sampling</p> <p><i>Zheng Wang, Cong Ling</i></p>
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**Th-AM-1-3: LDPC Codes 3** Chair: Tadashi Wadayama Room 40.146

<p>Systematic Block Markov Superposition Transmission of Repetition Codes</p> <p><i>Kechao Huang, Xiao Ma, Baoming Bai</i></p>	<p>Computing Linear Transforms with Unreliable Components</p> <p><i>Yaoqing Yang, Pulkit Grover, Soumyya Kar</i></p>	<p>Constructing Valid Convex Hull Inequalities for Single Parity-Check Codes Over Prime Fields</p> <p><i>Eirik Rosnes, Michael Helmling</i></p>	<p>Linear Programming Decoding of Binary Linear Codes for Symbol-Pair Read Channels</p> <p><i>Shunsuke Horii, Toshiyasu Matsushima, Shigeichi Hirasawa</i></p>
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**Th-AM-1-4: Network Coding 2** Chair: Michael Langberg Room 40.148

<p>Vector Network Coding Based on Subspace Codes Outperforms Scalar Linear Network Coding</p> <p><i>Tuvi Etzion, Antonia Wachter-Zeh</i></p>	<p>On the Construction of Jointly Superregular Lower Triangular Toeplitz Matrices</p> <p><i>Jonas Hansen, Jan Østergaard, Johnny Kudukh, John Madsen</i></p>	<p>Generalized rank weights of reducible codes, optimal cases and related properties</p> <p><i>Umberto Martínez-Peñas</i></p>	<p>A Class of Non-Linearly Solvable Networks</p> <p><i>Joseph Connelly, Ken Zeger</i></p>
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**Th-AM-1-5: Energy Harvesting 2** Chair: Vincent Y. F. Tan Room 40.004

<p>Subblock Energy-Constrained Codes for Simultaneous Energy and Information Transfer</p> <p><i>Anshoo Tandon, Mehul Motani, Lav R. Varshney</i></p>	<p>Feedback Enhances Simultaneous Energy and Information Transmission in Multiple Access Channels</p> <p><i>Selma Bethadj Amor, Samir M. Perlaza, Ioannis Krikidis, H. Vincent Poor</i></p>	<p>Capacity of Remotely Powered Communication</p> <p><i>Dor Shaviv, Ayler Özgür, Haim H Permuter</i></p>	<p>Online Scheduling for Energy Harvesting Broadcast Channels with Finite Battery</p> <p><i>Abdulrahman Baknina, Sennur Ulukus</i></p>
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**Th-AM-1-6: Estimation** Chair: Prakash Narayan Room 40.006

<p>Privacy-Aware MMSE Estimation</p> <p><i>Shahab Asoodeh, Fady Alajaji, Tamas Linder</i></p>	<p>A tiger by the tail: when multiplicative noise stymies control</p> <p><i>Jian Ding, Yuval Peres, Gireeja Ranade</i></p>	<p>Continuity and Robustness to Incorrect Priors in Estimation and Control</p> <p><i>Graeme Baker, Serdar Yüksel</i></p>	<p>Uncertain Wiretap Channels and Secure Estimation</p> <p><i>Moritz Wiese, Karl H. Johansson, Tobias J. Oechtering, Panagiotis Papadimitratos, Henrik Sandberg, Mikael Skoglund</i></p>
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**Th-AM-1-7: Source-Channel Coding over MAC** Chair: Gerhard Kramer Room 40.008

<p>On Lossy Transmission of Correlated Sources over a Multiple Access Channel</p> <p><i>Basak Güler, Deniz Gündüz, Aylin Yener</i></p>	<p>Communicating Correlated Sources Over a MAC in the absence of a Göcs-Körner Common Part</p> <p><i>Arun Padakandla</i></p>	<p>New Sufficient Conditions for Multiple-Access Channel with Correlated Sources</p> <p><i>Mohsen Heidari Khoozani, Farhad Shirani Chaharsooghi, Sandeep Pradhan</i></p>	<p>A Necessary Condition for the Transmissibility of Correlated Sources over a MAC</p> <p><i>Amos Lapidoth, Michèle A. Wigger</i></p>
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**Th-AM-1-8: Caching in Wireless Networks** Chair: Ron Dabora Room 40.010

<p>Cloud-Aided Wireless Networks with Edge Caching: Fundamental Latency Trade-Offs in Fog Radio Access Networks</p> <p><i>Ravi Tandon, Osvaldo Simeone</i></p>	<p>Cooperative Tx/Rx Caching in Interference Channels: A Storage-Latency Tradeoff study</p> <p><i>Fan Xu, Kangqi Liu, Meixia Tao</i></p>	<p>Topological Coded Caching</p> <p><i>Xinping Yi, Giuseppe Caire</i></p>	<p>Fundamental Limits of Cache-Aided Interference Management</p> <p><i>Navid NaderiAlizadeh, Mohammad Ali Maddah-Ali, Salman Avestimehr</i></p>
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**Th-AM-1-9: Classical-Quantum Channels** Chair: Andreas Winter Room 40.150

<p>Classical-quantum channels with causal and non-causal channel state information at the sender</p> <p><i>Hoàng Roche, Ning Cai, Janis Noetzel</i></p>	<p>Coding for classical-quantum channels with rate limited side information at the encoder: An information-spectrum approach</p> <p><i>Naqeeb Warsi, Justin P Coon</i></p>	<p>Classical-Quantum Arbitrarily Varying Wiretap Channel: Common Randomness Assisted Code and Continuity</p> <p><i>Minglai Cai, Holger Boche, Christian Deppe, Janis Nötzel</i></p>	<p>Covert Communication over Classical-Quantum Channels</p> <p><i>Azadeh Sheikholeslami, Boulalt Bash, Don Towseley, Dennis Goeckel, Saikat Guha</i></p>
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12:00	12:20	12:40	13:00	13:20
<b>Th-AM-2-1: Lossy Compression and Rate-Distortion</b> Chair: Ram Zamir				Room 40.002
Optimal Differential Privacy Mechanisms under Hamming Distortion for Structured Source Classes <i>Kousha Kalantari, Lalitha Sankar, Anand D. Sarwate</i>	Analog Coding of a Source with Erasures <i>Marina Haikin, Ram Zamir</i>	Rate-distortion dimension of stochastic processes <i>Farideh Ebrahim Rezagah, Shirin Jalali, Elza Erkip, H. Vincent Poor</i>	Windowed Encoding of Spatially Coupled LDGM Codes for Lossy Source Compression <i>Ahmad Golmohammadi, David G. M. Mitchell, Joerg Klawer, Daniel J. Costello</i>	
<b>Th-AM-2-2: Learning 2</b> Chair: Venugopal Veeravalli				Room 40.144
Are Imperfect Reviews Helpful in Social Learning? <i>Tho Ngoc Le, Vijay Subramanian, Randall A Berry</i>	Pattern Maximum Likelihood Estimation of Finite-State Discrete-Time Markov Chains <i>Shashank Vatedka, Pascal Vontobel</i>	Rate-Distortion Bounds on Bayes Risk in Supervised Learning <i>Matthew Noleby, Ahmad Beirami, Robert Calderbank</i>	An Explicit Rate Bound for the Over-Relaxed ADMM <i>Guilherme Franca, Jose Bento</i>	
<b>Th-AM-2-3: LDPC Codes 4</b> Chair: Daniel J. Costello				Room 40.146
Finite-Length Scaling Based on Belief Propagation for Spatially Coupled LDPC Codes <i>Markus Sinner, Luca Barletta, Pablo M. Olfos</i>	Deterministic and Ensemble-Based Spatially-Coupled Product Codes <i>Christian Häger, Henry D Pfister, Alexandre Graell i Amat, Fredrik Brännström</i>	The Velocity of the Decoding Wave for Spatially Coupled Codes on BMS Channels <i>Rafah El-Khatib, Nicolas Macris</i>	Decoding Analysis Accounting for Mis-Corrections for Spatially-Coupled Split-Component Codes <i>Dmitri Truhachev, Alireza Karami, Lei Zhang, Frank R. Kschischang</i>	A Progressive Edge Growth Algorithm for Bit Mapping Design of LDPC Coded BICM Schemes <i>Junyi Du, Jinhong Yuan, Liang Zhou, Xuan He</i>
<b>Th-AM-2-4: Network Coding 3</b> Chair: Aditya Ramamoorthy				Room 40.148
Coding Across Unicast Sessions can Increase the Secure Message Capacity <i>Gaurav Kumar Agarwal, Martina Cardone, Christina Fragouli</i>	Arbitrarily varying networks: capacity-achieving computationally efficient codes <i>Peida Tian, Sidharth Jaggi, Mayank Bakshi, Oliver Kosut</i>	Linear Network Coding Capacity Region of The Smart Repeater with Broadcast Erasure Channels <i>Jaemin Han, Chih-Chun Wang</i>	Superposition coding in the combination network <i>Henry Romero, Mahesh Kumar Varanasi</i>	Approximate Capacity of Index Coding for Some Classes of Graphs <i>Fatemeh Arbabjolfaei, Young-Han Kim</i>
<b>Th-AM-2-5: Applications of Random Matrix Theory</b> Chair: Serdar Yüksel				Room 40.004
Time and frequency selective Ricean MIMO capacity: an ergodic operator approach <i>Walid Hachem, Aris L. Moustakas, Leonid Pastur</i>	Optical Fiber MIMO Channel Model and its Analysis <i>Apostolos Karadimitrakis, Aris L. Moustakas, Hartmut Hafermann, Axel Müller</i>	Limiting eigenvalue distributions of block random matrices with one-dimensional coupling structure <i>Toshiyuki Tanaka</i>	Exact Closed-Form Expression for the Inverse Moments of One-sided Correlated Gram Matrices <i>Khalil Elkhalil, Abta Kammoun, Tareq Y. Al-Naffouri, Mohamed-Slim Alouini</i>	
<b>Th-AM-2-6: Wireless Communications 4</b> Chair: Yanina Shkel				Room 40.006
Outage-Optimized Distributed Quantizers for Multicast Beamforming <i>Erdem Koyuncu, Christian Remling, Xiaoyi Liu, Hamid Jafarkhani</i>	The Impact of Independence Assumptions on Wireless Communication Analysis <i>Ezio Biglieri, I-Wei Lai</i>	On Utility Optimization in Distributed Multiple Access over a Multi-packet Reception Channel <i>Yanru Tang, Faeze Heydaryan, Jie Luo</i>	Robustness Of Cooperative Communication Schemes To Channel Models <i>Vasuki Narasimha Swamy, Gireeja Ranade, Anant Sahai</i>	
<b>Th-AM-2-7: Interference Channels</b> Chair: Igal Sason				Room 40.008
Some Results on the Scalar Gaussian Interference Channel <i>Salman Beigi, Sida Liu, Chandra Nair, Mehdi Yazdanpanah</i>	The Maximum Han-Kobayashi Sum-Rate for Gaussian Interference Channels <i>Ali Haghi, Amir K. Khandani</i>	Converse bounds for interference channels via coupling and proof of Costa's conjecture <i>Yury Polyanskiy, Yihong Wu</i>	Trade-off between Communication and Cooperation in the Interference Channel <i>Farhad Shikri, Chaharsoghbi, Sandeep Pradhan</i>	
<b>Th-AM-2-8: Covert Communications</b> Chair: Ziv Goldfeld				Room 40.010
Plausible Deniability over Broadcast Channels <i>Mayank Bakshi, Vinod M Prabhakaran</i>	Second-Order Asymptotics of Covert Communications over Noisy Channels <i>Mehrdad Tahmasbi, Matthieu Bloch</i>	Keyless Covert Communication over Multiple-Access Channels <i>Keerthi Suria Kumar Arumugam, Matthieu Bloch</i>	Computationally Efficient Deniable Communication <i>Qiaosheng Zhang, Mayank Bakshi, Sidharth Jaggi</i>	
<b>Th-AM-2-9: Quantum Information Theory</b> Chair: Ning Cai				Room 40.150
A Bayesian view of Single-Qubit Clocks, and an Energy versus Accuracy tradeoff <i>Manoj Gopalkrishnan, Varshith Kandula, Praveen Sriram, Abhishek Deshpande, Bhaskaran Muralidharan</i>	On the quantum no-signalling assisted zero-error classical simulation cost of non-commutative bipartite graphs <i>Xin Wang, Runyao Duan</i>	Comparison of quantum channels and statistical experiments <i>Anna Jencova</i>	Stronger Attacks on Causality-Based Key Agreement <i>Benno Salwey, Stefan Wolf</i>	Parallel distinguishability of quantum operations <i>Runyao Duan, Cheng Guo, Chi-Kwong Li, Yinan Li</i>

15:10 15:30 15:50 16:10 16:30  
**Th-PM-1-1: Quantum Codes 1** Chair: Alexei Ashikhmin Room 40.002

<p>Codeword Stabilized Quantum Codes for Asymmetric Channels  <i>Tyler Jackson, Markus Grassl, Bei Zeng</i></p>	<p>Concatenated Codes for Amplitude Damping  <i>Tyler Jackson, Markus Grassl, Bei Zeng</i></p>	<p>Correction of Data and Syndrome Errors by Stabilizer Codes  <i>Alexei Ashikhmin, Ching-Yi Lai, Todd A. Brun</i></p>	<p>Generalized Fault-Tolerant Quantum Computation over Nice Rings  <i>Sangjun Lee, Andreas Klappenecker</i></p>
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**Th-PM-1-2: Inequalities 2** Chair: Deniz Gündüz Room 40.144

<p>Reverse entropy power inequalities for <math>s</math>-concave densities  <i>Peng Xu, James Melbourne, Mokshay Madiman</i></p>	<p>On Rényi Entropy Power Inequalities  <i>Eshed Ram, Igal Sason</i></p>	<p>Strengthening the Entropy Power Inequality  <i>Thomas Courtade</i></p>	<p>Cyclically Symmetric Entropy Inequalities  <i>Jun Chen, Hao Ye, Chao Tian, Tie Liu, Zhiqing Xiao</i></p>	<p>Generalized Fisher Information and Upper Bounds on the Differential Entropy of Independent Sums  <i>Jihad Fahs, Ibrahim Abou-Faycal</i></p>
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**Th-PM-1-3: Data Exchange Problems** Chair: Joerg Kliewer Room 40.146

<p>Coding Advantage in Communications among Peers  <i>Kai Cai, Guangyue Han</i></p>	<p>Fairness in Communication for Omniscience  <i>Ni Ding, Chung Chan, Qiaoqiao Zhou, Rodney Andrew Kennedy, Parastoo Sadeghi</i></p>	<p>Further results on lower bounds for coded caching  <i>Hooshang Ghasemi, Aditya Ramamoorthy</i></p>	<p>Cooperative Data Exchange with Priority Classes  <i>Anoosheh Heidarzadeh, Muxi Yan, Alex Sprintson</i></p>	<p>Universal Multiparty Data Exchange  <i>Himanshu Tyagi, Shun Watanabe</i></p>
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**Th-PM-1-4: Network Coding 4** Chair: Chih-Chun Wang Room 40.148

<p>On the Energy Benefit of Compute-and-forward for Multiple Unicasts  <i>Zhijie Ren, Jasper Goseling, Jos H. Weber, Michael Gastpar</i></p>	<p>Universally Secure Network Coding with Feedback  <i>Gabriele Spini, Gilles Zémor</i></p>	<p>A Linearithmic Time Algorithm for a Shortest Vector Problem in Compute-and-Forward Design  <i>Jinming Wen, Xiao-Wen Chang</i></p>	<p>Adaptive Recoding for BATS Codes  <i>Hoover H.F. Yin, Shenghao Yang, Qiaoqiao Zhou, Lily M.L. Yung</i></p>	<p>On Computation Rates for Arithmetic Sum  <i>Ardendu Tripathy, Aditya Ramamoorthy</i></p>
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**Th-PM-1-5: Compressed Sensing 3** Chair: Gonzalo Vazquez-Vilar Room 40.004

<p>Coded Compressive Sensing: A Compute-and-Recover Approach  <i>Namyoon Lee, SongNam Hong</i></p>	<p>A Sharp Condition for Exact Support Recovery of Sparse Signals With Orthogonal Matching Pursuit  <i>Jinming Wen, Zhengchun Zhou, Jian Wang, Xiaohu Tang, Qun Mo</i></p>	<p>Universal Compressed Sensing  <i>Shirin Jalali, H. Vincent Poor</i></p>	<p>Two-stage Orthogonal Subspace Matching Pursuit for Joint Sparse Recovery  <i>Kyung Su Kim, Sae-Young Chung</i></p>	<p>A Geometric Analysis of Phase Retrieval  <i>Ju Sun, Qing Qu, John Wright</i></p>
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**Th-PM-1-6: Information Theory in Control** Chair: Anant Sahai Room 40.006

<p>Zero-rate achievability of posterior matching schemes for channels with memory  <i>Jui Wu, Achilleas Anastasopoulos</i></p>	<p>State Estimation, Wireless Tropes, Demons and Uncertainty  <i>Christopher Rose</i></p>	<p>Stationarity and Ergodicity of AWGN Channels with Feedback under the Expected Power Constraint  <i>Serdar Yüksel</i></p>	<p>Rate of Prefix-free Codes in LQG Control Systems  <i>Takashi Tanaka, Karl Henrik Johansson, Tobias J. Oechtering, Henrik Sandberg, Mikael Skoglund</i></p>	<p>(Almost) Practical Tree Codes  <i>Anatoly Khina, Wael Halbawi, Babak Hassibi</i></p>
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**Th-PM-1-7: Finite Blocklength Topics** Chair: Yury Polyanskiy Room 40.008

<p>Second-Order Coding Region for the Discrete Lossy Gray-Wyner Source Coding Problem  <i>Lin Zhou, Vincent Y. F. Tan, Mehul Motani</i></p>	<p>Second-Order Coding Region for the Discrete Successive Refinement Source Coding Problem  <i>Lin Zhou, Vincent Y. F. Tan, Mehul Motani</i></p>	<p>On Second-Order Asymptotics of AWGN Channels with Feedback under the Expected Power Constraint  <i>Lan V. Truong, Silas L. Fong, Vincent Y. F. Tan</i></p>	<p>Fixed-Length Compression for Letter-Based Fidelity Measures in the Finite Blocklength Regime  <i>Lars Palzer, Roy Timo</i></p>	<p>On channel dispersion per unit cost  <i>Yücel Altuğ, H. Vincent Poor, Sergio Verdú</i></p>
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**Th-PM-1-8: Physical Layer Security** Chair: Matthieu Bloch Room 40.010

<p>Security in The Gaussian Interference Channel: Weak and Moderately Weak Interference Regimes  <i>Parisa Babaeidarian, Somayeh Salimi, Panagiotis Papadimitratos</i></p>	<p>Multuser Authentication with Anonymity Constraints over Noisy Channels  <i>Remi A Chou, Aylin Yener</i></p>	<p>Security in Broadcast Channel with Combating Helpers and Interference Channel with Selfish Users  <i>Karim A. Banawan, Sennur Ulukus</i></p>	<p>On Secrecy Rates and Outage in Letter-Based Multi-Eavesdroppers MISO Systems  <i>Joseph Kampeas, Asaf Cohen, Omer Gurewitz</i></p>	<p>Secure Lossy Helper and Gray-Wyner Problems  <i>Meryem Benammar, Abdellatif Zaidi</i></p>
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**Th-PM-1-9: Wireless Sensor Networks** Chair: Pulkit Grover Room 40.150

<p>Connectivity in inhomogeneous random key graphs  <i>Osman Yağan</i></p>	<p>Minimum node degree in inhomogeneous random key graphs with unreliable links  <i>Rashad Eletreby, Osman Yağan</i></p>	<p>Improved Active Sensing Performance in Wireless Sensor Networks via Channel State Information  <i>Alessandro Blason, Urbashi Mitra, Michele Zorzi</i></p>	<p>Optimal Byzantine Attack for Distributed Interference with M-ary Quantized Data  <i>Po-Ning Chen, Yungshiang Sam Han, Hsuan-Yin Lin, Pramod Varshney</i></p>	<p>MMSE Estimation in a Sensor Network in the Presence of an Adversary  <i>Craig Wilson, Venugopal Veeravalli</i></p>
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10:20

10:40

11:00

11:20

**Fr-AM-1-1: Quantum Codes 2** Chair: Alexander Barg Room 40.002

Unconstrained distillation capacities of a pure-loss bosonic broadcast channel

Masahiro Takeoka, Kaushik Seshadreesan, Mark M Wilde

Asymptotic Analysis of a Three State Quantum Cryptographic Protocol

Walter Krawec

Universal recoverability in quantum information

Marius Junge, Renato Renner, David Sutter, Mark M Wilde, Andreas Winter

Coherent state constellations for Bosonic Gaussian channels

Felipe Lacerda, Joseph M. Renes, Volkher Scholz

**Fr-AM-1-2: Secret Keys and Secret Sharing** Chair: Sandeep Pradhan Room 40.144

Bounds on the communication rate needed to achieve SK capacity in the hypergraphical source model

Manuj Mukherjee, Chung Chan, Navin Kashyap, Qiaoqiao Zhou

Nearly Optimal Robust Secret Sharing

Mahdi Cheraghchi

Incremental and Decremental Secret Key Agreement

Chung Chan, Ali Al-Bashashbeh, Qiaoqiao Zhou

Quantum Resistant Random Linear Code Based Public Key Encryption Scheme RLCE

Yongge Wang

**Fr-AM-1-3: LDPC Codes 5** Chair: Bane Vasić Room 40.146

Minimal Characterization and Provably Efficient Exhaustive Search Algorithm for Elementary Trapping Sets of Variable-Regular LDPC Codes

Yoones Hashemi Toroghi, Amir Banihashemi

Distance verification for LDPC codes

Ilya Dumer, Alexey Kovalev, Leonid P Pryadko

Near-Capacity Protograph Doubly-Generalized LDPC Codes with Block Thresholds

Asit Kumar Pradhan, Andrew Thangaraj

Performance Bounds for Quantized LDPC Decoders Based on Absorbing Sets

Homayoon Hatami, David G. M. Mitchell, Daniel J. Costello, Thomas E Fuja

**Fr-AM-1-4: Gabidulin Codes** Chair: Frank R. Kschischang Room 40.148

Considerations for Rank-based Cryptosystems

Anna-Lena Horlemann-Trautmann, Kyle Marshall, Joachim Rosenthal

An Alternative Decoding Method for Gabidulin Codes in Characteristic Zero

Sven Muelich, Sven Puchinger, David Mödinger, Martin Bossert

Sub-Quadratic Decoding of Gabidulin Codes

Sven Puchinger, Antonia Wachter-Zeh

A quadratic Welch-Berlekamp algorithm to decode generalized Gabidulin codes, and some variants

Gwezheneg Robert

**Fr-AM-1-5: Age of Information** Chair: Christopher Rose Room 40.004

Age of Information with a Packet Deadline

Clement Kam, Sastry Kompella, Gam Nguyen, Jeffrey Wieselthier, Anthony Ephremides

Optimizing Data Freshness, Throughput, and Delay in Multi-Server Information-Update Systems

Ahmed M Bedewy, Yin Sun, Ness B. Shroff

Age of Information: The Gamma Awakening

Elie Najm, Rajai Nasser

Age-of-Information in the Presence of Error

Kun Chen, Longbo Huang

**Fr-AM-1-6: Wireless Communications 5** Chair: Yasutada Oohama Room 40.006

Wireless Networks of Bounded Capacity

Grace Villacrés Estrada, Tobias Koch

On Network Simplification for Gaussian Half-Duplex Diamond Networks

Martina Cardone, Christina Fragouli, Daniela Tuninetti

Wireless Network Simplification: Beyond Diamond Networks

Yahya H. Ezzeldin, Ayan Sengupta, Christina Fragouli

Throughput of Two-Hop Wireless Channels with Queueing Constraints and Finite Blocklength Codes

Yi Li, M. Cenk Gursoy, Senem Velipaslar

**Fr-AM-1-7: Special Topics in Shannon Theory 1** Chair: Helmut Bölcskei Room 40.008

The  $\rho$ -Capacity of a Graph

Sihuang Hu, Ofer Shayevitz

Convergence of generalized entropy minimizers in sequences of convex problems

Imre Csiszár, František Matúš

Orbit-Entropy Cones and Extremal Pairwise Orbit-Entropy Inequalities

Jun Chen, Amir Salimi, Tie Liu, Chao Tian

Information stabilization of images over discrete memoryless channels

Eric Graves, Tan Wong

**Fr-AM-1-8: Interference in Wireless Networks 3** Chair: Giuseppe Caire Room 40.010

When Does Spatial Correlation Add Value to Delayed Channel State Information?

Aleaza Vahid, Robert Calderbank

On the Optimality of Zero-Forcing and Treating Interference as Noise for K-user MIMO Interference Channels

Chunhua Geng, Syed Ali Jafar

On the Impact of Sparsity on the Broadcast Capacity of Wireless Networks

Serj Haddad, Olivier Lévêque

Role of a Relay in Bursty Networks with Correlated Transmissions

Sunghyun Kim, Soheil Mohajer, Changho Suh

**Fr-AM-1-9: DNA-based Storage** Chair: Moshe Schwartz Room 40.150

Codes in the Damerau Distance for DNA Storage

Ryan Gabrys, Eitan Yaakobi, Olga Milenkovic

Weakly Mutually Uncorrelated Codes

Seyed Mohammadhossein Tabatabaei Yazdi, Han Mao Kiah, Olga Milenkovic

On the Number of DNA Sequence Profiles for Practical Values of Read Lengths

Zuling Chang, Johan Chrisnata, Martinus Frederic Ezerman, Han Mao Kiah



12:00	12:20	12:40	13:00	13:20
<b>Fr-AM-2-1: Random Coding Bounds</b> Chair: Neri Merhav				Room 40.002
The generalized stochastic likelihood decoder: random coding and expurgated bounds <i>Neri Merhav</i>	The Dispersion of Nearest-Neighbor Decoding for Additive Non-Gaussian Channels <i>Jonathan Scarlett, Vincent Y. F. Tan, Giuseppe Durisi</i>	A Beta-Beta Achievability Bound with Applications <i>Wei Yang, Austin Collins, Giuseppe Durisi, Yury Polyanskiy, H. Vincent Poor</i>	Variable-Length Coding with Stop-Feedback for the Common-Message Broadcast Channel <i>Kasper F. Trillingsgaard, Wei Yang, Giuseppe Durisi, Petar Popovski</i>	
<b>Fr-AM-2-2: Distributions and Hypothesis Testing</b> Chair: Tobias Koch				Room 40.144
Distributed Recursive Composite Hypothesis Testing: Imperfect Communication <i>Anit Kumar Sahu, Soumyya Kar</i>	Sharp minimax bounds for testing discrete monotone distributions <i>Yuting Wei, Martin Wainwright</i>	Learning Markov Distributions: Does Estimation Trump Compression? <i>Moein Falahatgar, Alon Orlitsky, Venkatatheeraj Pichapati, Ananda Theertha Suresh</i>	Locally Differentially-Private Distribution Estimation <i>Adriano Pastore, Michael Gastpar</i>	Asynchronous Decentralized Algorithms for the Noisy 2Q Questions Problem <i>Theodoros Tsiligkaridis</i>
<b>Fr-AM-2-3: LDPC Codes 6</b> Chair: Dmitri Truhachev				Room 40.146
Low Complexity Algorithm Approaching the ML Decoding of Binary LDPC Codes <i>Irina Bocharova, Boris D. Kudryashov, Vitaliy Skachek, Yauhen Yakimenka</i>	The Weight Consistency Matrix Framework for General Non-Binary LDPC Code Optimization: Applications in Flash Memories <i>Ahmed Hareedy, Chinmayi Lanka, Clayton Schoeny, Lara Dolecek</i>	Construction of Full-Diversity 1-Level LDPC Lattices for Block-Fading Channels <i>Hassan Khodaiemehr, Mohammad-Reza Sadeghi, Daniel Panario</i>	Spatially-Coupled Codes Approach Symmetric Information Rate of Finite-State Markov Fading Channels <i>Hiroshi Abe, Kenta Kasai</i>	
<b>Fr-AM-2-4: Network Coding 5</b> Chair: Sidharth Jaggi				Room 40.148
Rate and Delay for Coded Caching with Carrier Aggregation <i>Nikhil Karamchandani, Suhas Diggavi, Giuseppe Caire, Shlomo Shamai (Shitz)</i>	Sparse Random Linear Network Coding for Data Compression in WSNs <i>Wenjie Li, Francesca Bassi, Michel Kieffer</i>	Energy Efficient Distributed Coding for Data Collection in a Noisy Sparse Network <i>Yaoqing Yang, Soumyya Kar, Pulkit Grover</i>		
<b>Fr-AM-2-5: Energy Harvesting 3</b> Chair: Thomas E Fuja				Room 40.004
Online Policies for Multiple Access Channel with Common Energy Harvesting Source <i>Abdulrahman Baknina, Sennur Ulukus</i>	Capacity of the Energy Harvesting Gaussian MAC <i>Huseyin A Inan, Dor Shaviv, Ayfer Ozgur</i>	Optimization of Time-Switching Energy Harvesting Receivers over Multiple Transmission Blocks <i>Zhengwei Ni, Mehul Motani</i>	Optimal Aging-Aware Channel Access Control for Wireless Networks with Energy Harvesting <i>Roberto Valentini, Marco Levorato</i>	
<b>Fr-AM-2-6: Wireless Communications 6</b> Chair: Oron Sabag				Room 40.006
On the Capacity of a Class of Dual-Band Interference Channels <i>Subhajit Majhi, Patrick Mitran</i>	Multuser Two-Way Ranging <i>Ryan Keating, Dongning Guo</i>	QoS-Driven Energy-Efficient Power Control with Markov Arrivals and Finite-Alphabet Inputs <i>Gozde Ozcan, Mustafa Ozmen, M. Can Gursucy</i>	Lattice Strategies for the Ergodic Fading Dirty Paper Channel <i>Ahmed Hindy, Aria Nosratinia</i>	
<b>Fr-AM-2-7: Special Topics in Shannon Theory 2</b> Chair: Chao Tian				Room 40.008
Cascade Channels with Infinite Memory <i>Martin Mittelbach, Eduard Jorswieck</i>	Quickest Sequence Phase Detection <i>Lele Wang, Sihuang Hu, Ofer Shayevitz</i>	Lossless linear analog compression <i>Helmut Bölcskei, Erwin Riegler, Günther Kolander, Giovanni Alberti, Camillo De Lellis</i>	Mutual Information, Relative Entropy and Estimation Error in Semi-Martingale Channels <i>Jiantao Jiao, Kartik Venkat, Tschy Weissman</i>	
<b>Fr-AM-2-8: Wiretap Channels 1</b> Chair: Holger Boche				Room 40.010
Semantic-Security Capacity for Wiretap Channels of Type II <i>Ziv Goldfeld, Paul Cuff, Haim H Permuter</i>	A New Wiretap Channel Model and its Strong Secrecy Capacity <i>Mohamed Nafea, Aylin Yener</i>	Strong Secrecy and Stealth for Broadcast Channels with Confidential Messages <i>Igor Bjelakovic, Jafar Mohammadi, Slawomir Stanczak</i>	Achievable Secrecy Rates in the Multiple Access Wiretap Channel with Deviating Users <i>Karim A. Banawan, Sennur Ulukus</i>	Secure Degrees of Freedom of the Gaussian Diamond-Wiretap Channel <i>Si-Hyeon Lee, Wanyao Zhao, Ashish Khisti</i>
<b>Fr-AM-2-9: Permutations in Coding Theory / Index Coding 2</b> Chair: Paul H. Siegel				Room 40.150
String Concatenation Construction for Chebyshev Permutation Channel Codes <i>Yeow Meng Chee, Han Mao Kiah, San Ling, Tuan Thanh Nguyen, Van Khu Vu, Xiande Zhang</i>	Limited-Magnitude Error-Correcting Gray Codes for Rank Modulation <i>Yonatan Yehezkeally, Moshe Schwartz</i>	Secure Index Coding: Existence and Construction <i>Lawrence Ong, Badri N Vellambi, Phee Lep Yeoh, Joerg Kliewer, Jinhong Yuan</i>	New Error Correcting Codes for Informed Receivers <i>Lakshmi Prasad Natarajan, Yi Hong, Emanuele Viterbo</i>	

**Friday, July 15****15:10–16:30**

15:10

15:30

15:50

16:10

**Fr-PM-1-1: Quantum Information and Communication** Chair: Saikat Guha Room 40.002

Exploiting Variational Formulas for Quantum Relative Entropy

*Mario Berta, Omar Fawzi, Marco Tomamichel*

Strong converse theorems using Rényi entropies

*Felix Leditzky, Mark M Wilde, Nilanjana Datta*

Multiple Quantum Hypothesis Testing Expressions and Classical-Quantum Channel Converse Bounds

*Gonzalo Vazquez-Vilar*

"Pretty strong" converse for the private capacity of degraded quantum wiretap channels

*Andreas Winter***Fr-PM-1-2: Group Testing 3** Chair: Olgica Milenkovic Room 40.144

Group testing schemes from low-weight codewords of BCH codes

*Shashanka Ubaru, Arya Mazumdar, Alexander Barg*

Converse Bounds for Noisy Group Testing with Arbitrary Measurement Matrices

*Jonathan Scarlett, Volkan Cevher*

SAFFRON: A Fast, Efficient, and Robust Framework for Group Testing based on Sparse-Graph Codes

*Kangwook Lee, Ramtin Pedarsani, Kannan Ramchandran*

Strong Divergence of the Shannon Sampling Series for an Infinite Dimensional Signal Space

*Holger Boche, Ulrich J Mönich, Ezra Tampubolon***Fr-PM-1-3: LDPC Codes 7** Chair: Alexandre Graell i Amat Room 40.146

Generalized turbo signal recovery for nonlinear measurements and orthogonal sensing matrices

*Ting Liu, Chao-Kai Wen, Shi Jin, Xiaohu You*

Information Bottleneck Graphs for Receiver Design

*Jan Lewandowsky, Maximilian Stark, Gerhard Bauch*

Asymptotic MAP upper bounds for LDPC codes

*David Matas, Meritxell Lamarca***Fr-PM-1-4: Delays in Networks** Chair: Raymond W. Yeung Room 40.148

Low Delay Network Streaming Under Burst Losses

*Rafid Mahmood, Ahmed Badr, Ashish Khisti*

Delay-Constrained Capacity For Broadcast Erasure Channels: A Linear-Coding-Based Study

*Chih-Chun Wang*

On Coding Capacity of Delay-constrained Network Information Flow: An Algebraic Approach

*Minghua Chen, Ye Tian, Chih-Chun Wang***Fr-PM-1-5: Complexity and Cryptography 1** Chair: Himanshu Tyagi Room 40.004

Affine-malleable Extractors, Spectrum Doubling, and Application to Privacy Amplification

*Divesh Aggarwal, Kaave Hosseini, Shachar Lovett*

Key Generation with Limited Interaction

*Jingbo Liu, Paul Cuff, Sergio Verdú*

Binarizations in Random Number Generation

*Sung-il Pae*

On the Entropy of Physically Unclonable Functions

*Olivier Rioul, Patrick Solé, Sylvain Guilley, Jean-Luc Danger***Fr-PM-1-6: Wireless Communications 7** Chair: Aly El Gamal Room 40.006

An Extended Tanner Graph Approach to Decoding LDPC Codes over Decode-and-Forward Relay Channels

*Bin Qian, Wai Ho Mow*

A Blind Matching Algorithm for Cognitive Radio Networks

*Doha Hamza Mohamed, Jeff Shamma*

Channel Coding for Wireless Communication via Electromagnetic Polarization

*Xiaobin Wu, Thomas E Fuja, Thomas Pratt*

A Systematic Design Approach for Non-coherent Grassmannian Constellations

*Kareem M. Attiah, Karim G Seddik, Ramy Gohary, Halim Yanikomeroglu***Fr-PM-1-7: Lossy Compression 3** Chair: Or Ordentlich Room 40.008

A single-shot approach to lossy source coding under logarithmic loss

*Yanina Shkel, Sergio Verdú*

Variable-Length Lossy Source Coding Allowing Some Probability of Union of Overflow and Excess Distortion

*Ryo Nomura, Hideki Yagi*

Soft Covering with High Probability

*Paul Cuff*

Independent and Memoryless Sampling Rate Distortion

*Vinay Praneeth Boda, Prakash Narayan***Fr-PM-1-8: Wiretap Channels 2** Chair: Sennur Ulukus Room 40.010

On SDoF of Multi-Receiver Wiretap Channel With Alternating CSIT

*Zohaib Awan, Abdellatif Zaidi, Aydin Sezgin*

Towards a Constant-Gap Sum-Capacity Result for the Gaussian Wiretap Channel with a Helper

*Rick Fritschenk, Gerhard Wunder*

The Multiple Access Wiretap Channel II with a Noisy Main Channel

*Mohamed Nafea, Aylin Yener*

Low Complexity Precoding for MIMO Wiretap Channels Based on Cut-off Rate

*Sina Rezaei Aghdam, Tolga M. Duman***Fr-PM-1-9: MIMO and Space-Time Coding** Chair: Martin Bossert Room 40.150

Towards a complete DMT classification of division algebra codes

*Laura Luzzi, Roope Vehkalahti, Alexander Gorodnik*

On the Throughput Rate of Wireless Multipoint Multicasting

*Michał Kaliszán, Giuseppe Caire, Sławomir Stanczak*

On the decoding delay of rate-1/2 Complex Orthogonal Designs

*Smarajit Das*

16:50

17:10

17:30

17:50

<b>Fr-PM-2-3: LDPC Codes 8</b>		Chair: David G. M. Mitchell		Room 40.146
Set Min-Sum Decoding Algorithm for Non-Binary LDPC Codes <i>Liyuan Song, Qin Huang, Zulin Wang</i>	Integrated Parallel Interleaved Concatenation for Lowering Error Floors of LDPC Codes <i>Naoaki Kokubun, Hironori Uchikawa</i>	Cutsize Distributions of Balanced Hypergraph Bipartitions for Random Hypergraphs <i>Takayuki Nozaki</i>	Multiplicative Repetition Based Superposition Transmission of Nonbinary Codes <i>Xijin Mu, Baoming Bai, Rui Zhang</i>	

<b>Fr-PM-2-4: Graphical Methods / Weight Distribution</b>		Chair: Pablo M. Olmos		Room 40.148
Defect Tolerance: Fundamental Limits and Examples <i>Jennifer Tang, Da Wang, Yury Polyanskiy, Gregory Wornell</i>	Graph-Based Lossless Markov Lumpings <i>Bernhard C. Geiger, Christoph Holer-Temmel</i>	Weight Distribution of the Syndrome of Linear Codes and Connections to Combinatorial Designs <i>Christoph Pacher, Philipp Grabenweger, Dimitris Simos</i>		

<b>Fr-PM-2-5: Complexity and Cryptography 2</b>		Chair: Stefan M. Moser		Room 40.004
Signature codes for the A-channel and collusion-secure multimedia fingerprinting codes <i>Grigory Kabatiansky, Marcel Fernández, Moon Ho Lee, Elena Egorova</i>	Hierarchy of Three-Party Consistency Specifications <i>Daniel Tschudi, Julian Loss, Ueli Maurer</i>	Secure Computation of Randomized Functions <i>Deepesh Data</i>	On the Impossibility of Information-Theoretic Composable Coin Toss Extension <i>Gregor Seiler, Ueli Maurer</i>	

<b>Fr-PM-2-7: Source and Channel Coding</b>		Chair: Anelia Somekh-Baruch		Room 40.008
Joint Source-Channel Coding with One-Bit ADC Front End <i>Morteza Varasteh, Osvaldo Simeone, Deniz Gündüz</i>	Distance Preserving Maps and Combinatorial Joint Source-channel Coding for Large Alphabets <i>Arya Mazumdar, Yury Polyanskiy, Ankit Singh Rawat, Hajir Roozbehani</i>	Streaming Data Transmission in the Moderate Deviations and Central Limit Regimes <i>Si-Hyeon Lee, Vincent Y. F. Tan, Ashish Khisti</i>		

<b>Fr-PM-2-8: Wiretap Channels 3</b>		Chair: Mohamed Nafea		Room 40.010
Super-Activation as a Unique Feature of Arbitrarily Varying Wiretap Channels <i>Rafael F. Schaefer, Holger Boche, H. Vincent Poor</i>	Almost universal codes for fading wiretap channels <i>Laura Luzzi, Cong Ling, Roope Vehkalahti</i>	Finite-Blocklength Bounds for Wiretap Channels <i>Wei Yang, Rafael F. Schaefer, H. Vincent Poor</i>		

