

**FIFTIETH  
ASILOMAR CONFERENCE ON  
SIGNALS, SYSTEMS AND  
COMPUTERS**

**SS&C Conf. Corp.  
P.O. Box 8236  
Monterey, CA 93943**



**50<sup>th</sup>  
ANNIVERSARY**

**November 6–9, 2016**  
Asilomar Hotel and  
Conference Grounds

**Technical Co-sponsor**



**FIFTIETH  
ASILOMAR CONFERENCE ON  
SIGNALS, SYSTEMS AND COMPUTERS**

**Technical Co-Sponsor**

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**Welcome from the General Chairman**

Prof. Phil Schniter  
The Ohio State University, USA

Welcome the 50th Asilomar Conference on Signals, Systems, and Computers! I am honored to serve as the general chair for this special "50th anniversary" edition of the Conference. I first attended in 1997 and have returned almost every year since then. What keeps me coming back are the high-quality technical program, the relaxed and friendly atmosphere, and the natural beauty of Asilomar State Park.

This year, we come together to celebrate the remarkable impact that Asilomar has made, over the last 50 years, on the fields of signal processing, communications, circuits, and control. As we know, these fields are key to many of the core technologies that we use in our day-to-day lives.

For 50 years now, Asilomar has brought together top researchers from academia, industry, and government laboratories to advance the frontier of knowledge. As our lives become ever more enriched by technology, the importance of Asilomar will only grow in the years to come.

I am very excited by this year's technical program, which was brilliantly crafted by the Technical Program Chair, Gerald Matz, and his team: Jeff Andrews, Andreas Burg, Romain Couillet, Joakim Jaldén, Marco Lops, Antonia Papandreou-Suppapola, Marios Pattichis, Alejandro Ribeiro, and Wei Yu.

This year's program consists of 392 accepted papers, of which 208 were invited. Among these papers, 81 were submitted to the student paper contest, from which a list of 7 finalists were selected. On Sunday afternoon before the Welcome Reception, these finalists will present their work before a panel of judges organized by Scott Acton. We encourage everyone to attend this special session. The top 3 finishers will be announced before Tuesday's plenary lecture.

This year we are honored to have two plenary talks. The first plenary will be given on Sunday evening by Dr. John Treichler of Raytheon, Inc. John, who has been attending Asilomar since 1978, is famous for many contributions to signal processing and communications. I am very much looking forward to his lecture on "Fifty years of the Asilomar conference and its role in the flowering of DSP technology."

The second plenary will be given on Tuesday morning by Prof. Thomas Strohmer of the University of California at Davis. Thomas is an eminent researcher on the mathematics of signal processing, where he has made many lasting contributions. I am very excited about his lecture, entitled "You can have it all: Rapid, robust, and reliable solution of bilinear problems in signal processing."

I am thrilled and honored to serve as the General Chair of the 50th Asilomar Conference. I hope that you all enjoy the conference this year and discover everything that it has to offer.

Phil Schniter, Columbus, OH, June 2016.

\*participating in his or her personal capacity

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Vienna University of Technology

## 2016 Asilomar

## Technical Program Committee Members

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University of Texas at Austin, USA

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### TRACK D: SIGNAL PROCESSING AND ADAPTIVE SYSTEMS

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### TRACK E: ARRAY SIGNAL PROCESSING

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University of Cassino, Italy

### TRACK F: BIOMEDICAL SIGNAL AND IMAGE PROCESSING

Antonia Papandreou-Suppapola

Arizona State University, USA

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Andreas Burg  
EPFL, Switzerland

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University of New Mexico, USA

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Wei Yu  
University of Toronto, Canada

\*participating in his or her personal capacity

## 2016 Asilomar Conference Session Schedule

### Sunday Afternoon, November 6, 2016

3:00–7:00 PM	Registration — Merrill Hall
3:00–5:15 PM	Student Paper Contest — Heather Hall
5:30–6:30 PM	50th Anniversary Address, John Treichler —Nautilus Hall
6:30–9:00 PM	Welcoming Reception — Merrill Hall

### Monday Morning, November 7, 2016

7:30–9:00 AM	Breakfast – Crocker Dining Hall
8:00 AM–6:00 PM	Registration
9:45–10:15 AM	Coffee Social
8:15–11:55 AM	MORNING SESSIONS
MA1	Towards 5G (Invited)
MA2a	Spectrum Sharing Between Communication and Radar Systems (Invited)
MA2b	Hybrid Analog/Digital Precoding (Invited)
MA3a	Topology of Networks (Invited)
MA3b	Smart Grid (Invited)
MA4a	High Dimensional Inference, Random Matrices, and Applications (Invited)
MA4b	Information Theory and Statistical Learning (Invited)
MA5a	Sequential Signal Processing (Invited)
MA5b	Multisensor Systems and Statistical Inference (Invited)
MA6	Signals and Systems in Visual Cultural Heritage (Invited)
MA7a	Computer Arithmetic I
MA7b	Neural Signal Processing
MA8a1	Efficient Hardware Implementation (Poster)
MA8a2	Error Correction and Network Coding (Poster)
MA8a3	Massive MIMO (Poster)
MA8a4	Neural Imaging (Poster)
MA8b1	Design Methodologies for Signal Processing Systems (Poster)
MA8b2	Sparse Methods and Compressive Sensing (Poster)
MA8b3	Speech and Image Analysis (Poster)

12:00–1:00 PM Lunch – Crocker Dining Hall

### Monday Afternoon, November 7, 2016

1:30–5:10 PM	AFTERNOON SESSIONS
MP1a	Algorithm and Hardware Aspects for 5G Wireless Systems (Invited)
MP1b	Wireless Networks (Invited)
MP2a	Interference Limited Next Generation Satellite Communications (SatnexIV) (Invited)
MP2b	Signal Processing for Low-Resolution Sampling (Invited)
MP3a	Communication and Coding for Distributed Computing (Invited)
MP3b	Distributed Optimization (Invited)
MP4a	Sparse Sampling for Data Analytics (Invited)
MP4b	High-dimensional Inference (Invited)
MP5a	Recent Advances in Nonstationary Signal Processing (Invited)
MP5b	Recent Advances in Covariance Matrix Estimation for Array Processing (Invited)
MP6a	Emerging Models and Methods in Image and Video Processing (Invited)
MP6b	Speech Signal Processing and Health Applications (Invited)
MP7a	Advances in Neuronal Modeling (Invited)
MP7b	Advances in Neural Array Processing (Invited)
MP8a1	Beamforming and Array-based Estimation I (Poster)
MP8a2	Communication Networks (Poster)
MP8a3	Estimation and Learning Theory for Communications (Poster)
MP8a4	Model Selection, Source Separation and Classification (Poster)
MP8b1	Beamforming and Array-based Estimation II (Poster)
MP8b2	Communication Theory (Poster)
MP8b3	Implementations of DSP Kernels (Poster)

## 2016 Asilomar Conference Session Schedule (continued)

### Monday Evening, November 7, 2016

6:30–9:30 PM	50th Anniversary Conference Banquet at the Monterey Bay Aquarium. Buses leave Asilomar grounds at 5:40 pm and 6:00 pm. See registration materials for details and fees.
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### Tuesday Morning, November 8, 2016

7:30–9:00 AM	Breakfast — Crocker Dining Hall
8:00 AM–5:00 PM	Registration
8:15–9:45 AM	TA1a — Conference Welcome and Plenary Session — Chapel
10:15–11:55 AM	MORNING SESSIONS
TA1b	Biological Communications (Invited)
TA2b	Recent Advances in Massive MIMO (Invited)
TA3b	Distributed Signal Processing
TA4b	Sketching and Optimizing for Big Data (Invited)
TA5b	Hardware Aspects for Compressive Sensing and Analog-to-Information Conversion (Invited)
TA6b	Phase Retrieval for Imaging: Theory and Methods (Invited)
TA7b	Biological Neural Systems (Invited)
TA8b1	Array Processing and Wireless Communications (Poster)
TA8b2	Communication System Theory (Poster)
TA8b3	MIMO and Multistatic Radars (Poster)

12:00–1:00 PM Lunch – Crocker Dining Hall

### Tuesday Afternoon, November 8, 2016

1:30–5:35 PM	AFTERNOON SESSIONS
TP1a	Millimeter Wave Cellular Systems (Invited)
TP1b	5G Cellular Theory
TP2a	Implementation of Decoders for Polar Codes (Invited)
TP2b	Beamforming and Linear Processing
TP3a	Multiagent Systems and Game Theory (Invited)
TP3b	Graph Signal Processing (Invited)
TP4a	Bilinear Inverse Problems (Invited)
TP4b	Five Puzzles and Euclid's Bag of Tricks (Invited)
TP5a	Detection over Very Large Datasets (Invited)
TP5b	Source Localization and Sparse Array Design
TP6a	Big Data Analytics for Image and Video Processing (Invited)
TP6b	Optimization and Adaptive Methods
TP7a	Signal Processing for Dynamic Functional Brain Network Analysis (Invited)
TP7b	Implementation of Full-Duplex Radio Transceivers (Invited)
TP8a1	Network Data Analysis (Poster)
TP8a2	Relaying and Full Duplex Communications (Poster)
TP8a3	Subspaces, Covariances and Tensors (Poster)
TP8b1	Computer Arithmetic II (Poster)
TP8b2	Image and Video Sensor Processing and Communications (Poster)
TP8b3	Processing of Physiological Signals (Poster)

**Tuesday Evening Open Evening — Enjoy the Monterey Peninsula**

## 2016 Asilomar Conference Session Schedule (continued)

### Wednesday Morning, November 9, 2016

- 7:30–9:00 AM Breakfast — Crocker Dining Hall  
8:00 AM–12:00 PM Registration — Copyright forms must be turned in before the registration closes at 12:00 noon.
- 8:15 AM–11:30 PM MORNING SESSIONS
- WA1a Approximate Computing and Fault Tolerance (Invited)  
WA1b Communication System Development  
WA2a Physical Layer Security (Invited)  
WA2b Massive MIMO in the Field  
WA3a Cognitive Networking (Invited)  
WA3b Signal Processing with Lattices (Invited)  
WA4a Decentralized Optimization and Learning (Invited)  
WA4b Modelling and Inference with Graphs  
WA5 Tensor Signal Processing (Invited)  
WA6a Emerging Sensing Technologies for Assisted Living (Invited)  
WA6b Image and Video Quality Assessment  
WA7 Cognitive Radar (Invited)
- 12:00–1:00 PM Lunch — This meal is not included in the registration.

## Student Paper Contest

Heather - Sunday, November 6, 2016, 3:00–5:15 PM

### Track A

*“On the Impact of Blockage on the Throughput of Multi-tier Millimeter-Wave Networks”*

**Shuqiao Jia**, David Ramirez, Rice University, United States; Lei Huang, Yi Wang, Huawei Technologies Co. Ltd., China; Behnaam Aazhang, Rice University, United States

*“Fundamental Limits of Secure Device-to-Device Coded Caching”*

**Ahmed A. Zewail**, Aylin Yener, Pennsylvania State University, United States

### Track B

*“Robust Precoding Design for Massive MISO Downlink”*

**Mostafa Medra**, Timothy Davidson, McMaster University, Canada

### Track C

*“A Distributed Range-based Algorithm for Localization in Mobile Networks”*

**Sam Safavi**, Usman Khan, Tufts University, United States

### Track D

*“Parallel Asynchronous Lock-free Algorithms for Nonconvex Big-Data Optimization”*

**Loris Cannelli**, Gesualdo Scutari, Purdue University, United States; Francisco Facchinei, University of Rome, La Sapienza, Italy; Vyacheslav Kungurtsev, Czech Technical University in Prague, Czech Republic

### Track E

*“Two-Dimensional Sparse Arrays with Hole-Free Coarray and Reduced Mutual Coupling”*

**Chun-Lin Liu**, Palghat Vaidyanathan, California Institute of Technology, United States

### Track G

*“Memristor Based Adder Circuit Design”*

**Nagaraja Revanna**, Earl Swartzlander, University of Texas at Austin, United States

## 2016 Asilomar Conference Session Schedule

Coffee breaks will be at 9:55 AM and 3:10 PM. (except Tuesday morning when refreshments will be served outside the Chapel from 9:45–10:15 AM)

**Sunday, November 6, 2016**

**PLENARY SESSION 5:30–6:30 PM**

50<sup>th</sup> Anniversary Asilomar Distinguished Lecture

**Fifty years of the Asilomar conference, and its role in the flowering of DSP technology**

**John Treichler**

Raytheon Applied Signal Technology, USA

### Abstract

When this conference was first held at Asilomar in 1967, computers were rare beasts, control systems were mostly analog, digital signals processing was mostly theory, and Silicon Valley hadn't even been named yet [That happened in 1971]. This talk chronicles the incredible evolution of those technologies over the past 50 years and highlights many of the points where the research and practice brought together at this annual conference proved highly influential in the progress of the tightly related fields of communications, control, estimation, coding, and signal processing algorithm design. Little did the founders of this conference understand the impact that it, and the technology it helped develop, would have on the world.

### Biography

John Treichler received his BA and MEE degrees from Rice University, Houston, TX in 1970 and his PhDEE from Stanford in 1977. He served as a line officer aboard destroyers in the US Navy from 1970 to 1974. In 1977 he joined ARGO Systems in Sunnyvale, CA and then helped found Applied Signal Technology, Inc. in 1984 after serving for a year as an Associate Professor of Electrical Engineering at Cornell University. Applied Signal Technology, now a mission area within the Space and Airborne Systems (SAS) business unit of Raytheon, Inc, designs and builds advanced signal processing equipment used by the United States government and its allies for foreign intelligence collection. For three years he was the president

of the Raytheon Applied Signal Technology business unit and continues as the unit's Chief Technical Officer. He was elected a Fellow in the Institute of Electrical and Electronics Engineers (IEEE) in 1991. He was awarded the IEEE Signal Processing Society's Technical Achievement Award in 2000 and its first Industrial Leader Award in 2016. He recently completed a three-year tour as the IEEE Signal Processing Society's Vice President for Membership and Awards and is on the board of directors of the IEEE Foundation. In 2016 he was elected a member of the National Academy of Engineering.

**Tuesday, November 8, 2016**

**CONFERENCE WELCOME AND PLENARY SESSION 8:15–9:45 AM**

1. Welcome from the General Chair

**Prof. Philip Schniter**

The Ohio State University, USA

2. Session TA1a Distinguished Lecture for the 2016 Asilomar Conference

**You can have it all: Rapid, robust, and reliable solution of bilinear problems in signal processing**

**Thomas Strohmer**

University of California, Davis, USA

### Abstract

I will first describe how I once failed to catch a murderer (dubbed the "graveyard murderer" by the media), because I failed in solving a blind deconvolution problem. Here, blind deconvolution refers to the following problem: Assume we are given a function  $y$  which arises as the convolution of two unknown functions  $g$  and  $h$ . When and how is it possible to recover  $g$  and  $h$  from the knowledge of  $y$ ? Blind deconvolution pervades many areas of science and technology, including astronomy, medical imaging, optics, and communications engineering. Blind deconvolution is obviously ill-posed and even under additional assumptions this is a very difficult non-convex problem full of undesirable local minima. I will present the first numerically efficient blind deconvolution algorithm that comes with rigorous convergence guarantees. We will also

consider more general bilinear problems, such as the case where we are given a mixture of blind deconvolution problems. Here we need to correctly blindly deconvolve and separate (demix) multiple functions at the same time from just a single measured function. I will describe a powerful convex framework for the solution of this problem and discuss its importance for the future Internet-of-Things.

### **Biography**

Thomas Strohmer is Professor of Mathematics at the University of California, Davis. His research interests are in applied harmonic analysis, numerical analysis, signal- and image processing, high-dimensional data analysis, and mathematics of information. He got his M.S. and Ph.D. in Mathematics in 1991 and 1994 respectively from the University of Vienna, Austria. He spent one year as Erwin-Schroedinger fellow at the Department of Statistics at Stanford University in 1997 before joining the University of California, Davis in 1998. His recent awards include the 2013 IEEE Signal Processing Society Best Paper Award and the 2014 SIAM Outstanding Paper Prize. Dr. Strohmer is on the editorial board of several journals. He also serves as consultant to industry in the areas of telecommunications, bioengineering, and signal- and image processing.

## **Program of the 2016 Asilomar Conference on Signals, Systems, and Computers**

**Technical Program Chairman  
Prof. Gerald Matz  
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## Session MA1 Towards 5G (invited)

Co-Chairs: *Angel Lozano, UPF, Barcelona and Maxime Guillaud, Huawei Research, Paris*

- MA1-1 A Novel Alternative to Cloud-RAN for Throughput Densification: Coded Pilots and Fast User-Packet Scheduling at Remote Radio Heads 8:15 AM  
*Ozgun Y. Bursalioglu, Chenwei Wang, Haralabos Papadopoulos, DOCOMO Innovations Inc, United States; Giuseppe Caire, Technische Universität Berlin, Germany*
- MA1-2 Integer-Forcing Analog-To-Digital Conversion for Massive MIMO Systems 8:40 AM  
*Luis G. Ordóñez, Iñaki Estella, Maxime Guillaud, Huawei Technologies, France*
- MA1-3 Analytical Handle for ZF Reception in Distributed Massive MIMO 9:05 AM  
*Rajitha Senanayake, University of Melbourne, Australia; Angel Lozano, Universitat Pompeu Fabra, Spain; Peter Smith, Victoria University of Wellington, New Zealand; Jamie Evans, University of Melbourne, Australia*
- MA1-4 The Impact of Beamforming and Coordination on Spectrum Pooling in MmWave Cellular Networks 9:30 AM  
*Hossein Shokri, KTH Royal Institute of Technology, Sweden; Federico Boccardi, Ofcom, United Kingdom; Elza Erkip, New York University, United States; Carlo Fischione, KTH Royal Institute of Technology, Sweden; Gabor Fodor, Ericsson, Sweden; Marios Kountouris, Huawei Technologies Co. Ltd., France; Petar Popovski, Aalborg University, Denmark; Michele Zorzi, University of Padova, Italy*
- BREAK 9:55 AM
- MA1-5 Limited Feedback Based Double-Sided Full-Dimension MIMO for Mobile Backhauling 10:15 AM  
*Stefan Schwarz, Markus Rupp, Technische Universität Wien, Austria*
- MA1-6 Downlink Massive MIMO Capacity Bound with Blind Gain Estimation at the Terminal 10:40 AM  
*Hien Quoc Ngo, Erik G. Larsson, Linköping University, Sweden*
- MA1-7 Overloaded MU-MISO Transmission with Imperfect CSIT 11:05 AM  
*Enrico Piovano, Hamdi Joudeh, Bruno Clerckx, Imperial College London, United Kingdom*
- MA1-8 Enforcing Coordination in Network MIMO with Unequal CSIT 11:30 AM  
*Paul de Kerret, Antonio Bazco, David Gesbert, EURECOM, France*

## Session MA2a Spectrum Sharing Between Communication and Radar Systems (invited)

Chair: *Athina Petropulu, Rutgers University*

- MA2a-1 Bargaining over Fair Performing Dual Radar and Communication Task 8:15 AM  
*Andrey Garnaev, Wade Trappe, Rutgers University, WINLAB, United States; Athina Petropulu, Rutgers University, United States*
- MA2a-2 Spectrum Sharing Between MIMO-MC Radars and Communication Systems 8:40 AM  
*Bo Li, Athina Petropulu, Rutgers University, United States*
- MA2a-3 Spectrum Sharing with Radars: Impact of Radars on Wi-Fi 9:05 AM  
*Hossein-Ali Safavi-Naeini, Sumit Roy, University of Washington, United States*
- MA2a-4 Spectrum Maps for Cognition and Co-Existence of Communication and Radar Systems 9:30 AM  
*Maarit Melvasalo, Visa Koivunen, Jarmo Lunden, Aalto University, Finland*

## Session MA2b Hybrid Analog/Digital Precoding (invited)

Co-Chairs: *Mats Bengtsson, KTH Royal Institute of Technology; Hadi Ghauch, KTH Royal Institute of Technology and Taejoon Kim, City University of Hong Kong*

- MA2b-1 Alternating Minimization for Hybrid Precoding in Multiuser OFDM mmWave Systems 10:15 AM  
*Xianghao Yu, Jun Zhang, Hong Kong University of Science and Technology, Hong Kong SAR of China; Khaled B. Letaief, Hong Kong University of Science and Technology, Hong Kong and Hamad bin Khalifa University, Qatar*
- MA2b-2 Subspace Estimation and Hybrid Precoding for Wideband Millimeter-Wave MIMO System 10:40 AM  
*Wai Ming Chan, Taejoon Kim, City University of Hong Kong, Hong Kong SAR of China; Hadi Ghauch, Mats Bengtsson, KTH Royal Institute of Technology, Sweden*
- MA2b-3 Multiuser Hybrid Precoding for Frequency Selective Millimeter Wave Systems 11:05 AM  
*Nuria Gonzalez-Prelcic, University of Vigo, Spain; Robert W. Heath, University of Texas at Austin, United States*
- MA2b-4 Hybrid Precoding for Millimeter Wave Systems with a Constraint on User Electromagnetic Radiation Exposure 11:30 AM  
*David Love, Miguel Castellanos, Purdue University, United States; Bertrand Hochwald, University of Notre Dame, United States*



### Session MA3a Topology of Networks (invited)

Co-Chairs: *Harish Chintakunta, Florida Polytechnic University and Hamid Krim, North Carolina State University*

- MA3a-1 Influence of Topology in Information Flow in Social Networks 8:15 AM  
*Harish Chintakunta, Athanasios Gentimis, Florida Polytechnic University, United States*
- MA3a-2 Persistent Homology Lower Bounds on Distances in the Space of Networks 8:40 AM  
*Weiyu Huang, Alejandro Ribeiro, University of Pennsylvania, United States*
- MA3a-3 Node Dominance: Discovering Hypernym-Hyponym Relations for Building Taxonomies 9:05 AM  
*Hui Guan, North Carolina State University, United States; Harish Chintakunta, Florida Polytechnic University, United States; Hamid Krim, North Carolina State University, United States*
- MA3a-4 Persistent Homology of Directed Networks 9:30 AM  
*Samir Chowdhury, Facundo Memoli, The Ohio State University, United States*

### Session MA3b Smart Grid (invited)

Chair: *Hao Zhu, University of Illinois at Urbana Champaign*

- MA3b-1 A Learning Based Method for Real Time Prediction of Cascading Failures 10:15 AM  
*Yue Zhao, Stony Brook University, United States; Jianshu Chen, Microsoft Research, United States*
- MA3b-2 On the Solution of the Three-Phase Load Flow in Distribution Networks 10:40 AM  
*Mohammadhafez Bazrafshan, Nikolaos Gatsis, University of Texas at San Antonio, Iran*
- MA3b-3 A Compressive Sensing Framework for the Analysis of Solar Photo-Voltaic Power 11:05 AM  
*Raksha Ramakrishna, Anna Scaglione, Bitá Analui, Arizona State University, United States*
- MA3b-4 Power Network Topology Control for Mitigating the Effects of Geomagnetically Induced Currents 11:30 AM  
*Cecilia Klauber, Hao Zhu, University of Illinois, United States*

### Session MA4a High Dimensional Inference, Random Matrices, and Applications (invited)

Chair: *Matthew McKay, Hong Kong University of Science and Technology*

- MA4a-1 Free Component Analysis 8:15 AM  
*Hao Wu, Raj Rao Nadakuditi, University of Michigan, United States*

- MA4a-2 Random Matrix Improved Subspace Clustering 8:40 AM  
*Romain Couillet, CentraleSupélec, France; Abba Kammoun, King Abdullah University of Science and Technology, France*
- MA4a-3 Inference of Principal Components of Noisy Correlation Matrices with Prior Information: from Statistical Physics to Applications to Proteins 9:05 AM  
*Remi Monasson, CNRS & Ecole Normale Supérieure, France*
- MA4a-4 A Tailored Sparse PCA Method for Finding Vaccine Targets Against Hepatitis C 9:30 AM  
*Ahmed Abdul Quadeer, David Morales-Jimenez, Matthew McKay, Hong Kong University of Science and Technology, Hong Kong SAR of China*

### Session MA4b Information Theory and Statistical Learning (invited)

Chair: *Pablo Piantanida, CentraleSupélec*

- MA4b-1 Information-Theoretic Analysis of Stability and Bias of Learning Algorithms 10:15 AM  
*Maxim Raginsky, University of Illinois at Urbana-Champaign, United States*
- MA4b-2 Estimation from Pairwise Comparisons: Statistical and Computational Aspects 10:40 AM  
*Nihar Shah, University of California, Berkeley, United States; Sivaraman Balakrishnan, Carnegie Mellon University, United States; Martin Wainwright, University of California, Berkeley, United States*
- MA4b-3 Beyond Maximum Likelihood: Boosting the Chow-Liu Algorithm for Large Alphabets 11:05 AM  
*Jiantao Jiao, Yanjun Han, Tsachy Weissman, Stanford University, United States*
- MA4b-4 Adaptive Sequential Learning 11:30 AM  
*Craig Wilson, Google, Inc., United States; Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States*

### Session MA5a Sequential Signal Processing (invited)

Co-Chairs: *Venugopal Veeravalli, University of Illinois at Urbana Champaign and George Moustakides, University of Patras*

- MA5a-1 On Parallel Sequential Change Detection Controlling False Discovery Rate 8:15 AM  
*Jie Chen, Wenyi Zhang, H. Vincent Poor, University of Science and Technology of China, China*
- MA5a-2 Distributed Quickest Detection with Optional Observations at the Fusion Center 8:40 AM  
*Bo Jiang, Lifeng Lai, Worcester Polytechnic Institute, United States*

- MA5a-3 How to Quickly Detect a Change While Sleeping (almost) All the Time 9:05 AM  
*Venkat Chandar, D.E. Shaw, United States; Aslan Tehamkerten, Télécom Paristech, France*
- MA5a-4 Dynamic Change-Point Detection using Correlation Networks 9:30 AM  
*Shanshan Cao, Yao Xie, Georgia Institute of Technology, United States; Yuxin Chen, Stanford University, United States*

### Session MA5b Multisensor Systems and Statistical Inference (invited)

Chair: *Visa Koivunen, Aalto University*

- MA5b-1 How to Capture a Stopping Time: the Independent Case 10:15 AM  
*George Moustakides, University of Patras, Greece*
- MA5b-2 Wideband Capon Beamforming with Pre-Steering 10:40 AM  
*Richard Kozick, Bucknell University, United States; Christian Coviello, University of Oxford, United Kingdom*
- MA5b-3 Sparsity-Promoting Bootstrap Method for Large-Scale Data 11:05 AM  
*Visa Koivunen, Emad Mozafari, Aalto University, Finland*
- MA5b-4 New Contributions to Estimation Theory with Applications in Wave Energy, IEEE 1588, Cybersecurity, MIMO Radar and the Internet of Things 11:30 AM  
*Qian He, University of Electronic Science and Technology, China; Jiangfan Zhang, Anand Guruswamy, Basel Alnajjab, Rick S. Blum, Lehigh University, United States*

### Session MA6 Signals and Systems in Visual Cultural Heritage (invited)

Co-Chairs: *Andy Klein, Western Washington University and Rick Johnson, Cornell University*

- MA6-1 Automated Classification of Pen Strokes in Van Gogh's Drawings 8:15 AM  
*Rosaleena Mohanty, University of Wisconsin-Madison, United States; William Sethares, University of Wisconsin-Madison and Rijksmuseum, United States; Teio Meedendorp, Louis van Tilborgh, Van Gogh Museum, Netherlands*
- MA6-2 Non-Negative Dictionary Learning for Paper Watermark Similarity 8:40 AM  
*David Picard, Thomas Henn, ETIS ENSEA/Université de Cergy-Pontoise/CNRS, France; Georg Dietz, papierstruktur.de, France*

- MA6-3 Automated Chain Line Marking and Pattern Matching in Radiographs of Rembrandt's Prints 9:05 AM  
*Xuelie Xi, Cornell University, United States; Devin Conathan, University of Wisconsin, United States; Amanda House, Cornell University, United States; William Sethares, University of Wisconsin-Madison and Rijksmuseum, United States; C. Richard Johnson, Jr., Cornell University, United States*

- MA6-4 Deep Learning Classification of Photographic Paper Based on Clustering by Domain Experts 9:30 AM  
*Andrea Frost, Western Washington University, United States; Sally Wood, Santa Clara University, United States; Paul Messier, Yale University, United States; David Palzer, Andrew G. Klein, Western Washington University, United States*

BREAK 9:55 AM

- MA6-5 Applying Measures of Texture Similarity to Wove Paper 10:15 AM  
*Patrice Abry, CNRS / ENS Lyon, France; Andrew G. Klein, Western Washington University, United States; Paul Messier, Yale University, United States; Margaret H. Ellis, Morgan Library & Museum, United States; William A. Sethares, University of Wisconsin, United States; David Picard, ENSEA, France; Yuanhao Zhai, David L. Neuhoff, University of Michigan, United States; Stephane Roux, ENS Lyon, France; Stephane Jaffard, Université Paris-Est - Créteil Val-de-Marne, France; Herwig Wendt, CNRS / University of Toulouse, France; C. Richard Johnson, Jr., Cornell University, United States*

- MA6-6 Multispectral Imaging at the Interface of Cultural Heritage Research and Undergraduate Education 10:40 AM  
*Erich Uffelman, Mallory Stephenson, Washington and Lee University, United States; John Delaney, Kathryn Dooley, National Gallery of Art (Washington, DC), United States*

- MA6-7 Spatial-Spectral Representation for X-Ray Fluorescence Image Super-Resolution 11:05 AM  
*Qiqin Dai, Northwestern University, United States; Emeline Pouyet, Northwestern University / Art Institute of Chicago Center for Scientific Studies in the Arts, United States; Oliver Cossairt, Marc Walton, Aggelos Katsaggelos, Northwestern University, United States*

- MA6-8 Automatic Registration and Mosaicking of Color, Infrared, and X-Radiograph Images of Old Master Paintings Along with Automated Thread Counting 11:30 AM  
*Damon Conover, John Delaney, National Gallery of Art, George Washington University, United States; Murray Loew, George Washington University, United States*

## Session MA7a Computer Arithmetic I

Co-Chairs: *Earl Swartzlander, University of Texas at Austin and Keshab Parhi, University of Minnesota*

- MA7a-1 A Theoretical Analysis of Square versus Rectangular Component Multipliers in Recursive Multiplication 8:15 AM  
*Behrooz Parhami, University of California, Santa Barbara, United States*
- MA7a-2 Memristor Based Adder Circuit Design 8:40 AM  
*Nagaraja Revanna, Earl Swartzlander, University of Texas at Austin, United States*
- MA7a-3 Synthesis of Correlated Bit Streams for Stochastic Computing 9:05 AM  
*Megha Parhi, Yin Liu, Marc D. Riedel, Keshab K. Parhi, University of Minnesota, United States*

## Session MA7b Neural Signal Processing

Chair: *P.P. Vaidyanathan, California Institute of Technology*

- MA7b-1 Efficiency of Estimators in Fluorescence Microscopy 10:15 AM  
*Amir Tahmasbi, Texas A&M University, United States; E. Sally Ward, Texas A&M Health Science Center, United States; Raimund Ober, Texas A&M University, United States*
- MA7b-2 Detection of Protein Repeats using the Ramanujan Filter Bank 10:40 AM  
*Srikanth V. Tenneti, Vaidyanathan P.P., California Institute of Technology, United States*
- MA7b-3 On Inferring Functional Connectivity with Directed Information in Neuronal Networks 11:05 AM  
*Zhiting Cai, Rice University, United States; Curtis Neveu, John Byrne, University of Texas Health Science Center at Houston, United States; Behnaam Aazhang, Rice University, United States*
- MA7b-4 Seizure Prediction using Long-Term Fragmented Intracranial Canine and Human EEG Recordings 11:30 AM  
*Zisheng Zhang, Keshab Parhi, University of Minnesota, United States*

## Session MA8a1 Efficient Hardware Implementation

Chair: *Harald Enzinger, Graz University of Technology*

8:15 AM–9:55 AM

- MA8a1-1 Cost-Performance Tradeoffs in Unreliable Computation Architectures  
*Mehmet Donmez, Maxim Raginsky, Andrew Singer, Lav Varshney, University of Illinois at Urbana Champaign, United States*

- MA8a1-2 Baseband Volterra Filters with Even-Order Terms: Theoretical Foundation and Practical Implications  
*Harald Enzinger, Karl Freiberger, Gernot Kubin, Graz University of Technology, Austria; Christian Vogel, FH Joanneum - University of Applied Sciences, Austria*
- MA8a1-3 Fast Time-Domain Volterra Filtering  
*Harald Enzinger, Karl Freiberger, Gernot Kubin, Graz University of Technology, Austria; Christian Vogel, FH Joanneum - University of Applied Sciences, Austria*
- MA8a1-4 Hardware Implementation of a Series of Transform Matrices Based on Discrete Hirschman Transform  
*Peng Xi, Victor Debrunner, Florida State University, United States*

## Session MA8a2 Error Correction and Network Coding

Chair: *Jeff Andrews, UT Austin*

8:15 AM–9:55 AM

- MA8a2-1 On the Catastrophic Puncturing Patterns for Finite-Length Polar Codes  
*Song-Nam Hong, Ajou University, ; Dennis Hui, Ivana Maric, Ericsson Research, United States*
- MA8a2-2 On Error Correction for Asynchronous Communication  
*Chen Yi, Joerg Kliewer, New Jersey Institute of Technology, United States*
- MA8a2-3 Linear Superposition Coding for the Asymmetric Gaussian MAC with Quantized Feedback  
*Stefan Farthofer, Gerald Matz, Vienna University of Technology, Austria*
- MA8a2-4 Physical-Layer Network Coded QAM with Trellis Shaping for the Two-Way Relay Channel  
*Daniela Donati, Mark Flanagan, University College Dublin, Ireland*
- MA8a2-5 Construction of Minimal Sets for Capacity- Approaching Variable-Length Constrained Sequence Codes  
*Congzhe Cao, Ivan Fair, University of Alberta, Canada*

## Session MA8a3 Massive MIMO

Chair: *Timothy Davidson, McMaster University*

8:15 AM–9:55 AM

- MA8a3-1 Massive MIMO via Cooperative Users  
*Sha Hu, Fredrik Rusek, Ove Edfors, Lund University, Sweden*
- MA8a3-2 Robust Precoding Design for Massive MISO Downlink  
*Mostafa Medra, Timothy Davidson, McMaster University, Canada*

- MA8a3-3 Analysis and Evaluation of a Practical Downlink Multiuser MIMO Scheduler over LTE Advanced Massive MIMO Systems  
*Rob Arnott, NEC Telecom Modus, United States; Kengo Oketani, NEC Corporation, United States; Narayan Prasad, Sampath Rangarajan, NEC Laboratories America, United States; Patricia Wells, NEC Telecom Modus, United States*
- MA8a3-4 Grassmannian Training for Massive MIMO Cellular Networks  
*Yonghee Han, Jungwoo Lee, Seoul National University, Republic of Korea*
- MA8a3-5 Power Allocation for Downlink Path-Based Precoding in Multiuser FDD Massive MIMO Systems Without CSI Feedback  
*Chin-Wei Hsu, Ming-Fu Tang, Borching Su, National Taiwan University, Taiwan*
- MA8a3-6 Performance of Cell-Free Massive MIMO Systems with MMSE and PCP Receivers  
*Elina Nayebe, University of California, San Diego, United States; Alexei Ashikhmin, Thomas L. Marzetta, Bell Laboratories, United States; Bhaskar D. Rao, University of California, San Diego, United States*
- MA8a3-7 A Path Selection Algorithm for Sparse Massive MIMO Channels  
*Maliheh Soleimani, Mahmood Mazrouei-Sebdani, Witold A. Krzymien, University of Alberta, Canada; Jordan Melzer, TELUS Communications, Canada*

### Session MA8a4 Neural Imaging

Chair: *Konstantinos Slavakis, University of Buffalo*

8:15 AM–9:55 AM

- MA8a4-1 Detection of Diabetic Peripheral Neuropathy using Spatial-Temporal Analysis in Infrared Videos  
*Peter Soliz, Carla Agurto, Ana Edwards, Zyden Jarry, VisionQuest Biomedical LLC, United States; Janet Simon, Foot & Ankle Associates of New Mexico, United States; Mark Burge, University of New Mexico Health Sciences Center, United States*
- MA8a4-2 Clustering Brain-Network-Connectivity States using Kernel Partial Correlations  
*Konstantinos Slavakis, Shiva Salsabilian, David Wack, Sarah Muldoon, Henry Baidoo-Williams, University at Buffalo, United States; Jean Vettel, US Army Research Laboratory, United States; Matt Cieslak, Scott Grafton, University of California, Santa Barbara, United States*
- MA8a4-3 Automated Selection of Uniform Regions for CT Image Quality Detection  
*Maitham Naeemi, University of Washington - Bothell, United States; Adam Alessio, University of Washington, United States; Sohini Roychowdhury, University of Washington - Bothell, United States*

- MA8a4-4 Big Data Spark Solution for Functional Magnetic Resonance Imaging  
*Saman Sarraf, Rotman Research Institute at Baycrest, University of Toronto, United States; Mehdi Ostadhashem, Rogers, United States*

### Session MA8b1 Design Methodologies for Signal Processing Systems

Chair: *Endri Bezati, EPFL*

10:15 AM–11:55 AM

- MA8b1-1 A New Open-Source SIMDVector libm Fully Implemented with High-Level Scalar C  
*Christoph Lauter, Sorbonne Universités, UPMC Univ Paris 6, UMR 7606, LIP6, France*
- MA8b1-2 Fast Digital Design Space Exploration with High-Level Synthesis: A Case Study with Approximate Conjugate Gradient Pursuit  
*Benjamin Knoop, Karthik Vinod, Sebastian Schmale, Dagmar Peters-Drolshagen, Steffen Paul, University of Bremen, Germany*
- MA8b1-3 High-Level System Synthesis and optimization of Dataflow Programs for MPSoCs  
*Endri Bezati, Simone Casale Brunet, Marco Mattavelli, École polytechnique fédérale de Lausanne, Switzerland; Jorn Janneck, Lund University, Sweden*
- MA8b1-4 Analyzing Streaming Application Performance on Processor Arrays  
*Jorn Janneck, Lund University, Sweden*
- MA8b1-5 Trace-Based Manycore Partitioning of Stream-Processing Applications  
*Jorn Janneck, Lund University, Sweden; Michalska Malgorzata, Simone Casale-Brunet, Endri Bezati, Marco Mattavelli, École polytechnique fédérale de Lausanne, Switzerland*

### Session MA8b2 Sparse Methods and Compressive Sensing

Chair: *Todd Moon, Utah State University*

10:15 AM–11:55 AM

- MA8b2-1 Time-Recursive Multi-Pitch Estimation using Group Sparse Recursive Least Squares  
*Filip Elvander, Johan Sward, Andreas Jakobsson, Lund University, Sweden*
- MA8b2-2 Quantized Low-Rank Matrix Recovery with Erroneous Measurements: Application to Data Privacy in Power Grids  
*Meng Wang, Rensselaer Polytechnic Institute, United States*
- MA8b2-3 Bayesian Method for Image Recovery from Block Compressive Sensing  
*Uditha Wijewardhana, Marian Codreanu, Matti Latva-aho, University of Oulu, Finland*

- MA8b2-4 Stable Compressive Low Rank Toeplitz Covariance Estimation Without Regularization  
*Heng Qiao, Piya Pal, University of Maryland, United States*
- MA8b2-5 Sparse Bayesian Learning Boosted by Partial Erroneous Support Knowledge  
*Mohammad Shekaramiz, Todd K. Moon, Jacob H. Gunther, Utah State University, United States*
- MA8b2-6 Hyperparameter-Free Sparse Linear Regression of Grouped Variables  
*Ted Kronvall, Stefan Ingi Adalbjörnsson, Santhosh Nadig, Andreas Jakobsson, Lund University, Sweden*
- MA8b2-7 One-Bit Compressive Sampling with Time-Varying Thresholds: Maximum Likelihood and the Cramer-Rao Bound  
*Christopher Gianelli, Luzhou Xu, Jian Li, University of Florida, United States; Petre Stoica, Uppsala University, Sweden*

### Session MA8b3 Speech and Image Analysis

Chair: *Marios Pattichis, University of New Mexico*

10:15 AM–11:55 AM

- MA8b3-1 A Joint EMD and Teager-Kaiser Energy Approach Towards Normal and Nasal Speech Analysis  
*Chris De La Cruz, Balu Santhanam, University of New Mexico, United States*
- MA8b3-2 Iris Recognition using Cross-Spectral Comparison  
*Jennifer Webb, Delores Etter, Vianka Barboza, Elena Sharp Sharp, Southern Methodist University, United States*
- MA8b3-3 Efficient Facial Recognition using Vector Quantization of 2D DWT Features  
*Ahmed Aldhahab, Taif Al Obaidi, Wasfy B. Mikhael, University of Central Florida, United States*
- MA8b3-4 An Efficient DCT template-based Object Detection Method using Phase Correlation  
*Markus Hörhan, Horst Eidenberger, Vienna University of Technology, Austria*
- MA8b3-5 Transfer of Multimodal Emotion Features in Deep Belief Networks  
*Hiranmayi Ranganathan, Shayok Chakraborty, Panchanathan Sethuraman, Arizona State University, United States*
- MA8b3-6 Direct Classification from Compressively Sensed Images via Deep Boltzmann Machine  
*Henry Braun, Pavan Turaga, Cihan Tepedelenlioglu, Andreas Spanias, Arizona State University, United States*

### Session MP1a Algorithm and Hardware Aspects for 5G Wireless Systems (invited)

Chair: *Christoph Studer, Cornell University*

- MP1a-1 Many-Antenna MU-MIMO Channel Measurements  
*Clayton Shepard, Abeer Javed, Ryan Guerra, Jian Ding, Lin Zhong, Rice University, United States* 1:30 PM
- MP1a-2 Decentralized Data Detection for Massive MU-MIMO on a GPU Cluster  
*Kaipeng Li, Rice University, United States; Rishi Sharan, Cornell University, United States; Yujun Chen, Joseph Cavallaro, Rice University, United States; Christoph Studer, Cornell University, United States* 1:55 PM
- MP1a-3 An Energy Efficiency Perspective on Massive MIMO Quantization  
*Muris Sarajlic, Liang Liu, Ove Edfors, Lund University, Sweden* 2:20 PM
- MP1a-4 Limited Feedback in Multi-User MIMO System with Low Resolution ADCs  
*Jianhua Mo, Robert Heath, University of Texas at Austin, United States* 2:45 PM

### Session MP1b Wireless Networks (invited)

Chair: *Andrea Goldsmith, Stanford University*

- MP1b-1 From Niche to Renaissance: Why 5G will be the last G  
*Mischa Dohler, Kings College London, United Kingdom; Ali Hossaini, Cinema Arts Network, United Kingdom; Prokar Dasgupta, NHS, United Kingdom; Peter Marshall, Ericsson, United Kingdom; Toktam Mahmoodi, Maria Lema, Kings College London, United Kingdom* 3:30 PM
- MP1b-2 CEAL: Research Challenges in Fog Networking  
*Mung Chiang, Princeton University, United States* 3:55 PM
- MP1b-3 The Beam Alignment Problem in mmWave Wireless Networks  
*Saeid Haghghatshoar, Giuseppe Caire, Technische Universität Berlin, Germany* 4:20 PM
- MP1b-4 Staying Alive - Network Coding for Data Persistence in Volatile Networks  
*Vitaly Abdrashitov, Muriel Medard, Massachusetts Institute of Technology, United States* 4:45 PM

## Session MP2a Interference Limited Next Generation Satellite Communications (SatnexIV) (invited)

Chair: *Ana Perez-Neira, Universitat Politecnica de Catalunya - Centre Tecnologic de Comunicacions de Catalunya*

- MP2a-1 User Selection for Multibeam Satellite Systems: A Stochastic Geometry Perspective. 1:30 PM  
*Mathini Sellathurai, Heriot Watt University, United Kingdom; Satyanarayana Vuppala, Tharm Ratnarajah, University of Edinburgh, United Kingdom*
- MP2a-2 Efficient Satellite Systems Based on Interference Management and Exploitation 1:55 PM  
*Alessandro Ugolini, University of Parma, Italy; Amina Piemontese, Chalmers University of Technology, Sweden; Alessandro Vanelli-Coralli, University of Bologna, Italy; Giulio Colavolpe, University of Parma, Italy*
- MP2a-3 Noma and Interference Limited Satellite Communications 2:20 PM  
*Ana Perez-Neira, Universitat Politecnica de Catalunya, Spain; Marius Caus, Miguel Angel Vazquez, Centre Tecnologic de Comunicacions de Catalunya, Spain*
- MP2a-4 Optimized Link Adaptation for DVB-S2x Precoded Waveforms Based on SNIR Estimation 2:45 PM  
*Stefano Andrenacci, Danilo Spano, University of Luxembourg, Luxembourg; Dimitrios Christopoulos, Newtec, Belgium; Symeon Chatzinotas, University of Luxembourg, Luxembourg; Jens Krause, SES, Luxembourg; Björn Ottersten, University of Luxembourg, Luxembourg*

## Session MP2b Signal Processing for Low-Resolution Sampling (invited)

Chair: *Robert Heath, University of Texas at Austin*

- MP2b-1 Spatial Coding Based on Minimum BER in 1-Bit Massive MIMO Systems 3:30 PM  
*Hela Jemma, Technische Universität München, Germany; Amine Mezghani, University of California, Irvine, United States; Jawad Munir, Fabian Steiner, Josef A. Nossek, Technische Universität München, Germany*
- MP2b-2 Analysis of One-Bit Quantized ZF Precoding for Downlink Multiuser Massive MIMO 3:55 PM  
*Amodh Kant Saxena, University of California, Irvine, United States; Inbar Fijalkow, ETIS / ENSEA - University Cergy-Pontoise - CNRS, France; Amine Mezghani, Lee Swindlehurst, University of California, Irvine, France*
- MP2b-3 Quantized Channel Estimation and Data Detection in Massive MU-MIMO-OFDM Systems 4:20 PM  
*Christoph Studer, Cornell University, Sweden; Giuseppe Durisi, Chalmers University, Sweden*

- MP2b-4 Channel Estimation in Mixed Hybrid-Low Resolution MIMO Architectures for Millimeter Wave Communication 4:45 PM  
*Nuria Gonzalez-Precic, Universidade de Vigo, Spain; Cristian Rusu, University of Vigo, Spain; R Heath, University of Texas at Austin, United States*

## Session MP3a Communication and Coding for Distributed Computing (invited)

Chair: *Salman Avestimehr, University of Southern California*

- MP3a-1 Coded Distributed Computing: Fundamental Limits and Practical Challenges 1:30 PM  
*Songze Li, Qian Yu, University of Southern California, United States; Mohammad-Ali Maddah-Ali, Bell Labs, Alcatel-Lucent, United States; Salman Avestimehr, University of Southern California, United States*
- MP3a-2 Trade-Offs Between Asynchrony, Concurrency and Storage Cost in Consistent Distributed Storage Systems. 1:55 PM  
*Viveck Cadambe, Pennsylvania State University, United States*
- MP3a-3 Codes Can Speed Up Large-Scale Distributed Computing 2:20 PM  
*Kangwook Lee, Maximilian Lam, Ramtin Pedarsani, Dimitris Papailiopoulos, Kannan Ramchandran, University of California, Berkeley, United States*
- MP3a-4 Avoiding Coordination in Parallel Machine Learning 2:45 PM  
*Dimitris Papailiopoulos, University of California, Berkeley, United States*

## Session MP3b Distributed Optimization (invited)

Chair: *Qing Ling, University of Science and Technology China*

- MP3b-1 Distributed Proximal Gradient Methods for Constrained Consensus Optimization 3:30 PM  
*Necdet Serhat Aybat, Erfan Yazdandoost, Pennsylvania State University, United States*
- MP3b-2 ESOM: Exact Second-Order Method for Consensus Optimization 3:55 PM  
*Aryan Mokhtari, University of Pennsylvania, United States; Wei Shi, University of Illinois at Urbana-Champaign, United States; Qing Ling, University of Science and Technology of China, China*
- MP3b-3 Distributed Nonconvex Multiagent Optimization over Time-Varying Networks 4:20 PM  
*Ying Sun, Hong Kong University of Science and Technology, Hong Kong SAR of China; Gesualdo Scutari, Purdue University, United States; Daniel Palomar, Hong Kong University of Science and Technology, United States*

MP3b-4 Space-Time Scheduling for Green Data Center Networks 4:45 PM  
*Tianyi Chen, University of Minnesota, United States; Antonio Marques, Rey Juan Carlos University, Spain; Georgios Giannakis, University of Minnesota, United States*

### Session MP4a Sparse Sampling for Data Analytics (invited)

Chair: *Geert Leus, Delft University of Technology*

MP4a-1 Solving Inverse Source Problems for Linear PDEs using Sparse Sensor Measurements 1:30 PM  
*John Murray-Bruce, Pier Luigi Dragotti, Imperial College London, United Kingdom*

MP4a-2 Rethinking Sketching as Sampling: Linear Transforms of Graph Signals 1:55 PM  
*Fernando Gama, University of Pennsylvania, United States; Antonio García Marques, King Juan Carlos University, Spain; Gonzalo Mateos, University of Rochester, United States; Alejandro Ribeiro, University of Pennsylvania, United States*

MP4a-3 Distributed Adaptive Learning of Signals Defined over Graphs 2:20 PM  
*Paolo Di Lorenzo, Paolo Banelli, University of Perugia, Italy; Sergio Barbarossa, Stefania Sardellitti, Sapienza University of Rome, Italy*

MP4a-4 Subsampling for Graph Signal Detection 2:45 PM  
*Sundeep Prabhakar Chepuri, Geert Leus, Delft University of Technology, Netherlands*

### Session MP4b High-dimensional Inference (invited)

Chair: *Galen Reeves, Duke University*

MP4b-1 Dynamics of Stochastic Gradient Method for Online Estimation 3:30 PM  
*Chuang Wang, Yue Lu, Harvard University, United States*

MP4b-2 Fast and Robust Learning for Mixture of Sparse Linear Models Using Codes 3:55 PM  
*Dong Yin, Ramtin Pedarsani, University of California, Berkeley, United States; Yudong Chen, Cornell University, United States; Kannan Ramchandran, University of California, Berkeley, United States*

MP4b-3 A Conditional Central Limit Theorem for Random Projections 4:20 PM  
*Galen Reeves, Duke University, United States*

MP4b-4 Tensor Decompositions and Sparse Log-Linear Models 4:45 PM  
*James J. Ahn, Stanford University, United States; Anirban Bhattacharya, Texas A&M University, United States; David Dunson, Duke University, United States*

### Session MP5a Recent Advances in Nonstationary Signal Processing (invited)

Chair: *Antonio Napolitano, Università di Napoli*

MP5a-1 Algorithms for Analysis of Signals with Time-Warped Cyclostationarity 1:30 PM  
*Antonio Napolitano, University of Napoli, Italy; William Gardner, University of California, Davis, United States*

MP5a-2 The Sound of Silence: Recovering Signals from Time-Frequency Zeros 1:55 PM  
*Patrick Flandrin, CNRS & ENS de Lyon, France*

MP5a-3 Nonstationary Signal Design for Coexisting Radar and Communications Systems 2:20 PM  
*John Kota, Antonia Papandreou-Suppappola, Arizona State University, United States; Garry Jacyna, MITRE Corporation, United States*

MP5a-4 Benefits of Noncircular Statistics for Nonstationary Signals 2:45 PM  
*Scott Wisdom, Les Atlas, James Pitton, Greg Okopal, University of Washington, United States*

### Session MP5b Recent Advances in Covariance Matrix Estimation for Array Processing (invited)

Chair: *Frederic Pascal, Supelec*

MP5b-1 Bounds for Estimating the Parameters of Low-Rank Compound-Gaussian Clutter and White Gaussian Noise 3:30 PM  
*Olivier Besson, ISAE-Supaéro, France*

MP5b-2 Robust Rank Constrained Kronecker Covariance Matrix Estimation 3:55 PM  
*Arnaud Breloy, LEME, France; Ying Sun, Hong Kong University of Science and Technology, Hong Kong SAR of China; Guillaume Ginolhac, LISTIC, France; Daniel Palomar, Hong Kong University of Science and Technology, Hong Kong SAR of China*

MP5b-3 Quaternion Structured Non-Paranormal Distributions 4:20 PM  
*Yonatan Woodbridge, Hebrew University of Jerusalem, Israel; Gal Elidan, Hebrew University of Jerusalem and Google Inc., Israel; Ami Wiesel, Hebrew University of Jerusalem, Israel*

MP5b-4 New Properties for the Tyler's Covariance Matrix Estimator 4:45 PM  
*Gordana Draskovic, Frederic Pascal, CentraleSupélec, France*

## Session MP6a Emerging Models and Methods in Image and Video Processing (invited)

Chair: *Balasubramaniam Santhanam, University of New Mexico*

- MP6a-1 Sampled Efficient Full-Reference Image Quality Assessment Models 1:30 PM  
*Christos Bampis, Todd Goodall, Alan Bovik, University of Texas at Austin, United States*
- MP6a-2 Feature Extraction and Image Recognition from Superpixels on an Automata Architecture 1:55 PM  
*Tiffany Ly, Rituparna Sarkar, Scott Acton, Kevin Skadron, University of Virginia, United States*
- MP6a-3 Distributed Video Analysis for the Advancing Out of School Learning in Mathematics and Engineering Project 2:20 PM  
*Cody Eilar, Venkatesh Jatla, Marios Pattichis, Carlos Lopez-Leiva, Sylvia Celedon-Pattichis, University of New Mexico, United States*
- MP6a-4 Fingerprint Feature Extraction and Classification using Multirate Frequency Transformations and Wideband AM-FM Energy Demodulation 2:45 PM  
*Wenjing Liu, Balu Santhanam, University of New Mexico, United States*

## Session MP6b Speech Signal Processing and Health Applications (invited)

Chair: *Visar Berisha, Arizona State University*

- MP6b-1 Models for Objective Evaluation of Dysarthric Speech from Data Annotated by Multiple Listeners 3:30 PM  
*Ming Tu, Yishan Jiao, Visar Berisha, Julie Liss, Arizona State University, United States*
- MP6b-2 Speech and Language Processing for Mental Health Research and Care 3:55 PM  
*Daniel Bone, James Gibson, Theodora Chaspari, Dogan Can, Shrikanth Narayanan, University of Southern California, United States*
- MP6b-3 Characterization of the Relationship Between Semantic and Structural Language Features in Psychiatric Diagnosis 4:20 PM  
*Natália Bezerra Mota, Federal University of Rio Grande do Norte, Brazil; Facundo Carrillo, Diego Fernandez Slezak, Universidad de Buenos Aires, Argentina; Mauro Copelli, Federal University of Pernambuco, Brazil; Sidarta Ribeiro, Federal University of Rio Grande do Norte, Brazil*
- MP6b-4 Detecting Mild Cognitive Impairment (MCI) from Unstructured Spontaneous Speech 4:45 PM  
*Meysam Asgari, Jeffrey Kaye, Hiroko Dodge, Oregon Health and Science University, United States*

## Session MP7a Advances in Neuronal Modeling (invited)

Chair: *Behtash Babadi, University of Maryland*

- MP7a-1 Tracking Epileptic Seizure Activity via Information Theoretic Graphs 1:30 PM  
*Andrea Goldsmith, Jeremy Kim, Yonathan Morin, Stanford University, United States*
- MP7a-2 A Neural Model of High-Acuity Vision in the Presence of Fixational Eye Movements 1:55 PM  
*Alexander Anderson, Kavitha Ratnam, Austin Roorda, Bruno Olshausen, University of California, Berkeley, United States*
- MP7a-3 Towards Automating Sleep Scoring from Polysomnography Data 2:20 PM  
*Kristin M. Gunnarsdottir, Sridevi V. Sarma, Johns Hopkins University, United States; Rachel M.E. Salas, Charlene E. Gamaldo, Johns Hopkins Medicine, United States*
- MP7a-4 Probing the Functional Circuitry Underlying Auditory Attention via Dynamic Granger Causality Analysis 2:45 PM  
*Alireza Sheikhattar, Sina Miran, Jonathan Fritz, Shihab Shamma, Behtash Babadi, University of Maryland, United States*

## Session MP7b Advances in Neural Array Processing (invited)

Chair: *Jun (Jason) Zhang, University of Denver*

- MP7b-1 Analysis of Signals Recorded from Human Cerebral Cortex using Micro-Scale Electrode Arrays During Articulate Movements and Epileptiform Activity 3:30 PM  
*Kevin O'Neill, Denise Oswald, Arizona State University, United States; Kari Ashmont, David Adelson, Phoenix Children's Hospital, United States; Bradley Greger, Arizona State University, United States*
- MP7b-2 Decoding Human Intent using a Wearable System and Multi-Modal Sensor Data 3:55 PM  
*Md Muztoba, Cemil Geyik, Umit Y. Ogras, Daniel W. Bliss, Arizona State University, United States*
- MP7b-3 Suppression of Neurostimulation Artifacts and Adaptive Clustering of Parkinson's Patients Behavioral Tasks using EEG 4:20 PM  
*Alexander Maurer, Arizona State University, United States; Sara Hanrahan, Joshua Nedrud, Adam Hebb, Colorado Neurological Institute, United States; Antonia Papandreou-Suppappola, Arizona State University, United States*
- MP7b-4 Causality Analysis in Parkinson's Disease Patients during Behavior Tasks 4:45 PM  
*Abdulaziz Almalaq, Jun Zhang, University of Denver, United States; Sara Hanrahan, Adam Hebb, Joshua Nedrud, Colorado Neurological Institute, United States*



## Session MP8a1 Beamforming and Array-based Estimation I

Chair: *Rick Blum, Lehigh University*

1:30 PM–3:10 PM

- MP8a1-1 **Multipath Mitigation Techniques for Nonlinear Adaptive Beamforming**  
*Peter Vouras, Naval Research Laboratory, United States*
- MP8a1-2 **Array Self Calibration using Multiple Data Sets**  
*Benjamin Friedlander, University of California, Santa Cruz, United States*
- MP8a1-3 **Convex-Optimization based Geometric Beamforming for FD-MIMO Arrays**  
*Stefan Schwarz, Technische Universität Wien, Austria; Tal Philoosof, General Motors, Israel; Markus Rupp, Technische Universität Wien, Austria*
- MP8a1-4 **Reduced-Complexity Direction-of-Arrival Estimation for Large-Aperture Antenna Arrays Employing Spatial Ambiguities**  
*Chung-Cheng Ho, Scott C. Douglas, Southern Methodist University, United States*
- MP8a1-5 **Constraint Pursuit Estimator for Covariance-Based Array Processing**  
*Yassine Zniyed, L2S lab., France; Remy Boyer, University of Paris-Sud - L2S lab., France; Mohammed Nabil El Korso, University of Paris X - LEME, France; Sylvie Marcos, CNRS - L2S lab., France*
- MP8a1-6 **On Spatial Security Outage Probability Derivation of Exposure Region Based Beamforming with Randomly Located Eavesdroppers**  
*Yuanrui Zhang, Youngwook Ko, Roger Woods, Queen's University Belfast, United Kingdom; Alan Marshall, University of Liverpool, United Kingdom; Joe Cavallaro, Kaipeng Li, Rice University, United States*

## Session MP8a2 Communication Networks

Chair: *Chester Sungchung Park, Konkuk University*

1:30 PM–3:10 PM

- MP8a2-1 **Partial Interference Cancellation in Ultra-Dense Cellular Networks: Performance Analysis and Optimization**  
*Italo Atzeni, Marios Kountouris, Huawei Technologies, France*
- MP8a2-2 **Leader Selection in Cooperative Network Based on MDL Subspace Algorithm for Cognitive Radio**  
*Sander Ulp, Tõnu Trump, Tallinn University of Technology, Estonia*
- MP8a2-3 **Optimal De-Anonymization in Random Graphs with Community Structure**  
*Efe Onaran, Siddharth Garg, Elza Erkip, New York University, United States*

- MP8a2-4 **Joint Optimization of Communication Scheduling and Online Power Allocation in Remote Estimation**  
*Xiaobin Gao, Emrah Akyol, Tamer Basar, University of Illinois, Urbana-Champaign, United States*

- MP8a2-5 **Layered Caching for Heterogeneous Storage**  
*Avik Sengupta, Virginia Tech, United States; Ravi Tandon, University of Arizona, United States; T. Charles Clancy, Virginia Tech, United States*

- MP8a2-6 **Energy-Efficient Random Sleep Protocol based on Distributed Coding for Sensor-to-Vehicle Communications**  
*Yuki Goto, Shun Ogata, Koji Ishibashi, University of Electro-Communications, Japan*

- MP8a2-7 **Long-Term Power Allocation for Multi-Channel Device-to-Device Communication Based on Limited Feedback Information**  
*Ruhallah AliHemmati, Ben Liang, University of Toronto, Canada; Min Dong, University of Ontario Institute of Technology, Canada; Gary Boudreau, S. Hossein Seyedmehdi, Ericsson Canada, Canada*

- MP8a2-8 **Decentralized Coded Caching with Distinct Cache Capacities**  
*Mohammad Mohammadi Amiri, Qianqian Yang, Deniz Gunduz, Imperial College London, United Kingdom*

## Session MP8a3 Estimation and Learning Theory for Communications

Chair: *Mario Huemer, Johannes Kepler Universität Linz*

1:30 PM–3:10 PM

- MP8a3-1 **On the Log-Likelihood Ratio Evaluation of CWCU Linear and Widely Linear MMSE Data Estimators**  
*Oliver Lang, Mario Huemer, Johannes Kepler University, Austria; Christian Hofbauer, Linz Center of Mechatronics GmbH, Austria*

- MP8a3-2 **Improved SNR-based Estimation of the Attainable Net-Data-Rates in Vectoring VDSL2**  
*Driton Statovci, Martin Wolkerstorfer, Sanda Drakulic, Technische Universität Wien, Austria*

- MP8a3-3 **Effects of Channel Environment on Timing Advance for Mobile Device Positioning in Long-Term Evolution Networks**  
*Allison Hunt, Alex DeGabriele, John Roth, Justin A. Blanco, T. Owens Walker III, Jeremy Martin, United States Naval Academy, United States*

- MP8a3-4 **Benchmarking of Learning Architectures for Digital Predisortion**  
*Thomas Magesacher, Lund University, Sweden; Peter Singerl, Infineon Technologies AG, Austria*

MP8a3-5 Supervised Machine Learning for Signals Having RRC Shaped Pulses  
*Mohammad Bari, George Washington University, United States; Hussain Taher, University of Engineering & Technology Peshawar, Pakistan; Syed Saad Sherazi, University of Engineering & Technology Bannu, Pakistan; Milos Doroslovacki, George Washington University, United States*

MP8a3-6 Nonstationary Jammers Suppression Based on Parametric Sparse Reconstruction  
*Ben Wang, Harbin Engineering University, China; Yimin Zhang, Temple University, United States; Wei Wang, Harbin Engineering University, China*

MP8a3-7 Radio Transformer Networks: Attention Models for Learning to Synchronize in Wireless Systems  
*Timothy J O'Shea, Latha Pemula, Dhruv Batra, T. Charles Clancy, Virginia Tech, United States*

### **Session MP8a4 Model Selection, Source Separation and Classification**

Chair: *Peter Schreier, Universität Paderborn*

1:30 PM–3:10 PM

MP8a4-1 Cross-Validation Techniques for Determining the Number of Correlated Components Between Two Data Sets When the Number of Samples Is Very Small  
*Christian Lameiro, Peter J. Schreier, Universität Paderborn, Germany*

MP8a4-2 Model Selection for High-Dimensional Data  
*Arash Owrang, Magnus Jansson, KTH Royal Institute of Technology, Sweden*

MP8a4-3 Bootstrap-Based Detection of the Number of Signals Correlated Across Multiple Data Sets  
*Tanuj Hasija, Universität Paderborn, Germany; Yang Song, Nanyang Technological University, Singapore; Peter Schreier, Universität Paderborn, Germany; David Ramirez, University Carlos III of Madrid, Spain*

MP8a4-4 Demixing Sparse Signals from Nonlinear Observations  
*Mohammadreza Soltani, Chinmay Hegde, Iowa State University, United States*

MP8a4-5 Dictionary Driven Vehicle Classification  
*Jeff Druce, Stefano Gonella, Jarvis Haupt, University of Minnesota, United States*

MP8a4-6 Obfuscating Poisson & Gaussian Data Using a Rotation in the Complex Plane  
*Ruaridh Macdonald, Muriel Medard, Massachusetts Institute of Technology, United States*

MP8a4-7 Multiscale Tensor Decomposition  
*Alp Ozdemir, Mark A. Iwen, Selin Aviyente, Michigan State University, United States*

### **Session MP8b1 Beamforming and Array-based Estimation II**

Chair: *Benjamin Friedlander, Jack Baskin School of Engineering*

3:30 PM–5:10 PM

MP8b1-1 The Advanced TOA Trilateration Algorithms with Performance Analysis  
*Sajina Pradhan, Seokjoo Shin, Goo-Rak Kwon, Jae-young Pyun, Suk-seung Hwang, Chosun University, Nepal*

MP8b1-2 Design and Implementation of a Three-layer Cognitive Radar Architecture  
*Stefan Brueggenwirth, Fraunhofer FHR, Germany*

MP8b1-3 Real-Time Underdetermined Source Separation for Low-Latency Speech Enhancement  
*Ryan Corey, Andrew Singer, University of Illinois at Urbana-Champaign, United States*

MP8b1-4 On the Resolution of Diversely Polarized Arrays  
*Benjamin Friedlander, University of California, Santa Cruz, United States*

MP8b1-5 Super-resolution Direction-of-Arrival Estimation Using a Coprime Sensor Array With the Min Processor  
*Yang Liu, John R. Buck, University of Massachusetts Dartmouth, United States*

MP8b1-6 Dynamic Formulation of Co-prime Array for DOA Estimation  
*Xiaomeng Wang, Xin Wang, Stony Brook University, United States*

MP8b1-7 Alternating Optimization Low-Rank Expansion Algorithm to Estimate a Linear Combination of Separable Filters to Approximate 2D Filter Banks  
*Paul Rodriguez, Pontifical Catholic University of Peru, Peru*

### **Session MP8b2 Communication Theory**

Chair: *James A. Ritcey, University of Washington*

3:30 PM–5:10 PM

MP8b2-1 Fundamental BER Performance Trade-off in Cooperative Cognitive Radio Systems with Random Number of Secondary Users  
*Ruo Chen Zeng, Cihan Tepedelenlioglu, Arizona State University, United States*

MP8b2-2 Performance of OFDM Systems with Adaptive DFT-Precoding  
*Yusaku Yamashita, Hideki Ochiai, Yokohama National University, Japan*

MP8b2-3 Physical Layer Security Analysis for Cooperative Communications with Full-Duplex Relaying under Nakagami-m Fading Model  
*Yohannes Jote Tolossa, Abreu Giuseppe, Jacobs University Bremen, Germany*

- MP8b2-4 On Zero-Forcing Equalization for Short-Filtered Multicarrier Faster-than-Nyquist Signaling  
*Albert Abelló, Damien Roque, ISAE-Supaéro, France; Cyrille Siclet, Alexandre Marquet, GIPSA-lab, France*
- MP8b2-5 Secret Communication on Z-Channel with Cooperative Receivers  
*Abdallah M.Fayed, Tamer Khattab, Qatar University, Qatar; Lifeng Lai, Worcester Polytechnic Institute, United States*
- MP8b2-6 Joint Precoding and Transmit Antenna Selection for Spatial Modulation  
*Michael Carosino, James Ritcey, University of Washington, United States*

### Session MP8b3 Implementations of DSP Kernels

Chair: *Alexios Balatsoukas-Stimming, EPFL*

3:30 PM–5:10 PM

- MP8b3-1 Hardware Architecture for Positive Definite Matrix Inversion Based on LDL Decomposition and Back-Substitution  
*Carl Ingemarsson, Oscar Gustafsson, Linköping University, Sweden*
- MP8b3-2 A Scalable Architecture for Massive MIMO Base Stations Using Distributed Processing  
*Erik Bertilsson, Oscar Gustafsson, Erik G. Larsson, Linköping University, Sweden*
- MP8b3-3 Interpolated FIR Based Practically Perfect Reconstruction Filter Bank  
*Jorge Cadena, A.A. (Louis) Beex, Virginia Tech, United States*
- MP8b3-4 Design of a Multi-Core Hardware Architecture for Consensus-based MIMO Detection Algorithms  
*Konstantin Tscherkaschin, Benjamin Knoop, Jochen Rust, Steffen Paul, University of Bremen, Germany*
- MP8b3-5 Dynamically-Loaded Hardware Libraries (HLL) Technology for Audio Applications  
*Andrea Lomuscio, Angelo Esposito, Gian Carlo Cardarilli, Leonardo Di Carlo, University of Rome Tor Vergata, Italy; Alberto Nannarelli, Technical University of Denmark, Denmark; Marco Re, University of Rome Tor Vergata, Italy*

### Session TA1b Biological Communications (invited)

Co-Chairs: *Ubli Mitra, University of Southern California and Nicolo Michelusi, Purdue University*

- TA1b-1 Model and Analysis of Population Density Estimation via Quorum Sensing 10:15 AM  
*Nicolo Michelusi, Purdue University, United States; Urbashi Mitra, University of Southern California, United States*

- TA1b-2 A Fundamental Approach to Communication using Individual Molecules 10:40 AM  
*Christopher Rose, Brown University, United States*
- TA1b-3 Multicellular Information Relays 11:05 AM  
*Ilya Nemenman, Emory University, United States; Andrew Mugler, Purdue University, United States; Andre Levchenko, Yale University, United States; Tyler Smith, Emory University, United States; Sean Fancher, Purdue University, United States*

### Session TA2b Recent Advances in Massive MIMO (invited)

Chair: *Erik G. Larsson, Linköping University*

- TA2b-1 Dual-regularized Precoding: A Robust Approach for D2D-Enabled Massive MIMO 10:15 AM  
*Junting Chen, Haifan Yin, Laura Cottatellucci, David Gesbert, EURECOM, France*
- TA2b-2 FD-MIMO versus Massive MIMO Performance: What do the Data Say? 10:40 AM  
*Jose Flordelis, Fredrik Rusek, Fredrik Tufvesson, Ove Edfors, Lund University, Sweden; Erik G. Larsson, Linköping University, Sweden*
- TA2b-3 Base Station Cooperation in Massive MIMO Systems: Large System Analysis 11:05 AM  
*Luca Sanguinetti, University of Pisa, Italy; Emil Bjornson, Linköping University, Sweden; Merouane Debbah, CentraleSupélec, France*
- TA2b-4 Pilot Decontamination Through Compressive Wideband Channel Estimation 11:30 AM  
*Saeid Haghighatshoar, Giuseppe Caire, Technische Universität Berlin, Germany*

### Session TA3b Distributed Signal Processing

Chair: *Qing Ling, University of Science and Technology of China*

- TA3b-1 Doubly Partial-Diffusion LMS over Adaptive Networks 10:15 AM  
*Ibrahim El Khalil Harrane, Rémi Flamary, Cédric Richard, University Nice Sophia Antipolis, France*
- TA3b-2 Decentralized Consensus Optimization with Asynchrony and Delay 10:40 AM  
*Tianyu Wu, Kun Yuan, University of California, Los Angeles, United States; Qing Ling, University of Science and Technology of China, China; Wotao Yin, Ali H. Sayed, University of California, Los Angeles, United States*
- TA3b-3 Thermodynamic Limit of Interacting Particle Systems over Dynamical Networks 11:05 AM  
*Augusto Santos, Soumya Kar, José M. F. Moura, Carnegie Mellon University, United States; João Xavier, University of Lisbon, Portugal*
- TA3b-4 Distributed Dictionary Learning 11:30 AM  
*Amir Daneshmand, Gesualdo Scutari, Purdue University, United States; Francisco Facchinei, University of Rome, Italy*

## Session TA4b Sketching and Optimizing for Big Data (invited)

Co-Chairs: *Georgios Giannakis, University of Minnesota and Gonzalo Mateos, University of Rochester*

- TA4b-1 Parallel Asynchronous Lock-free Algorithms for Nonconvex Big-Data Optimization 10:15 AM  
*Loris Cannelli, Gesualdo Scutari, Purdue University, United States; Francisco Facchinei, University of Rome, La Sapienza, Italy; Vyacheslav Kungurtsev, Czech Technical University in Prague, Czech Republic*
- TA4b-2 Sketching for Numerical Linear Algebra and Recent Developments 10:40 AM  
*David P. Woodruff, IBM Almaden Research Center, United States*
- TA4b-3 Large Scale Subspace Clustering Algorithms 11:05 AM  
*Chong You, Claire Donnat, Daniel Robinson, Rene Vidal, Johns Hopkins University, United States*
- TA4b-4 Randomized Approaches to Large-Scale Subspace Clustering 11:30 AM  
*Panagiotis Traganitis, Georgios Giannakis, University of Minnesota, United States*

## Session TA5b Hardware Aspects for Compressive Sensing and Analog-to-Information Conversion (invited)

Chair: *Christoph Studer, Cornell University*

- TA5b-1 Exploiting System Configurability Towards Dynamic Accuracy-Performance Trade-Offs in AIC and CS Front-ends 10:15 AM  
*Laura Isabel Galindez Olascoaga, Steven Lauwereins, Komail Badami, Juan-Carlos Pena, KU Leuven, Belgium; Rajesh Venkata, Marian Verhelst, KU Leuven and IMEC, Belgium*
- TA5b-2 Band-Pass Compressive Sampling As an Enabling Technology for Rapid Wideband RF Spectrum Sensing 10:40 AM  
*Rabia Tugce Yazicigil, Tanbir Haque, John Wright, Peter R. Kinget, Columbia University, United States*
- TA5b-3 Adaptive Compressive Sensing for Radio-Frequency Receivers 11:05 AM  
*Michael Pelissier, CEA, LETI, MINATEC Campus & Cornell University, France; Christoph Studer, Cornell University, United States*
- TA5b-4 Compressed Sampling for Astrophysical Signal Processing 11:30 AM  
*Patrick Loumeau, Yosra Gargouri, Hervé Petit, Telecom ParisTech Institut Mines-Telecom, France; Baptiste Ceconi, Observatoire de Paris, France; Patricia Desgreys, Telecom ParisTech Institut Mines-Telecom, France*

## Session TA6b Phase Retrieval for Imaging: Theory and Methods (invited)

Chair: *Daniel Weller, University of Virginia*

- TA6b-1 Nonconvex Phase Retrieval: From Theory to Physical Implementation 10:15 AM  
*Mahdi Soltanolkotabi, University of Southern California, United States*
- TA6b-2 Robust PhaseLift for Phase Retrieval under Corruptions 10:40 AM  
*Paul Hand, Rice University, United States; Thang Huynh, New York University, United States*
- TA6b-3 Solving Random Quadratic Systems of Equations Is Nearly As Easy As Solving Linear Systems 11:05 AM  
*Yuxin Chen, Emmanuel Candes, Stanford University, United States*
- TA6b-4 Robust Phase Retrieval with Sparsity under Nonnegativity Constraints 11:30 AM  
*Daniel Weller, University of Virginia, United States*

## Session TA7b Biological Neural Systems (invited)

Chair: *Francisco Solis, Arizona State University*

- TA7b-1 A Pulse-Gated, Predictive Neural Circuit 10:15 AM  
*Yuxiu Shao, Peking University, China; Andrew Sornborger, University of California, Davis, United States; Louis Tao, Peking University, China*
- TA7b-2 A Multitaper, Causal Decomposition for Stochastic, Multivariate Time Series: Application to High-Frequency Calcium Imaging Data 10:40 AM  
*Andrew Sornborger, University of California, Davis, United States; James D Lauderdale, University of Georgia, United States*
- TA7b-3 The Neural Basis for Sleep Regulation - Data Assimilation from Animal to Model 11:05 AM  
*Fatemeh Bahari, Camila Tulyaganova, Myles Billard, Kevin Alloway, Bruce Gluckman, Pennsylvania State University, United States*
- TA7b-4 Neuronal Network Models for Sensory Discrimination 11:30 AM  
*Mohammad Samavat, Genevieve Toutain, Sharon Crook, Arizona State University, United States*

## Session TA8b1 Array Processing and Wireless Communications

Chair: *Xavier Leturc, Telecom ParisTech*

- 10:15 AM–11:55 AM
- TA8b1-1 An Exact Bayesian Detector for Multistatic Passive Radar  
*Stephen D. Howard, Songsri Sirianunpiboon, DST Group Australia, Australia; Douglas Cochran, Arizona State University, United States*

TA8b1-2 Compressive Direction-of-Arrival Estimation Off The Grid  
*Shermin Hamzehei, Marco Duarte, University of Massachusetts, United States*

TA8b1-3 Bandpass Signal Design for Passive Time Delay Estimation  
*Jeffrey Nanzer, Matthew Sharp, Johns Hopkins Applied Physics Laboratory, United States; Donald Brown, Worcester Polytechnic Institute, United States*

TA8b1-4 Estimation of the Ricean K-Factor from Noisy Complex Channel Coefficients  
*Xavier Leturc, Thales Communications and Security, France; Philippe Ciblat, Télécom Paristech, France; Christophe Le Martret, Thales Communications and Security, France*

TA8b1-5 A Novel Non-Linear Equalizer Structure for Single Carrier Wideband Communication  
*fredric harris, Xiaofei Chen, San Diego State University, United States; Elettra Venosa, SpaceMicro, United States*

## Session TA8b2 Communication System Theory

Chair: *Lara Dolecek, UCLA*

10:15 AM–11:55 AM

TA8b2-1 From Dedicated Redundant Subcarriers to Distributed Redundancy in UW-OFDM  
*Christian Hofbauer, Linz Center of Mechatronics, Austria; Carl Böck, Mario Huemer, Johannes Kepler University, Austria*

TA8b2-2 Coordinated Medium Access in Wireless Industrial D2D Networks: Fast Handshake Procedures Based on Stable Matching Variants  
*Bernd Hoffeld, Thomas Wirth, Fraunhofer Heinrich Hertz Institute, Germany*

TA8b2-3 A User Cooperative Beamforming Approach to PAPR Reduction in MIMO-OFDM Uplink  
*Antti Arvola, Antti Tölli, University of Oulu, Finland; David Gesbert, EURECOM, France*

TA8b2-4 Delay-Optimal Scheduling and Power Control for Instantaneous-Interference-Limited CRs  
*Ahmed Ewaisha, Cihan Tepedelenligolu, Arizona State University, United States*

TA8b2-5 Non-Orthogonal Multiple Access with Sub-Constellation Alignment  
*Sanjeeva Herath, Afshin Haghighat, InterDigital Communications, Inc., Canada*

TA8b2-6 On the Capacity of Diffusion-Based Molecular Timing Channels with Diversity  
*Nariman Farsad, Yonathan Murin, Milind Rao, Andrea Goldsmith, Stanford University, United States*

TA8b2-7 On Global Channel State Estimation and Dissemination in Ring Networks  
*Shahab Farazi, Donald Brown, Worcester Polytechnic Institute, United States; Andrew Klein, Western Washington University, United States*

TA8b2-8 Spatially-Coupled LDPC Codes Optimized for 1-D Magnetic Recording Channels  
*Homa Esfahanizadeh, Ahmed Hareedy, Lara Dolecek, University of California, Los Angeles, United States*

## Session TA8b3 MIMO and Multistatic Radars

Chair: *Braham Himed, Air Force Research Laboratory*

10:15 AM–11:55 AM

TA8b3-1 Analyzing and Improving MIMO Radar Detection Performance in the Presence of Cybersecurity Attacks  
*Hao Chen, Boise State University, United States; Braham Himed, Air Force Research Laboratory, United States*

TA8b3-2 Direct Tracking of Multiple Targets in MIMO Radar  
*Phuoc Vu, Alexander Haimovich, New Jersey Institute of Technology, United States; Braham Himed, Air Force Research Lab (AFRL/RVMD), United States*

TA8b3-3 Super-Resolution in Position and Velocity Estimation for Short-Range mmWave Radar  
*Anant Gupta, Upamanyu Madhow, University of California, Santa Barbara, United States; Amin Arbabian, Stanford University, United States*

TA8b3-4 High Resolution Geolocation with a Multi-Static Radar  
*Benjamin Friedlander, University of California, Santa Cruz, United States*

TA8b3-5 Using WCP-OFDM Signals with Time-Frequency Localized Pulses for Radar Sensing  
*Damien Roque, Stephanie Bidon, University of Toulouse, ISAE-SUPAERO, France*

TA8b3-6 Canonical Correlations for Target Detection in a Passive Radar Network  
*Yuan Wang, Washington State University, United States; Louis Scharf, Colorado State University, United States; Ignacio Santamaria, University of Cantabria, Spain; Haonan Wang, Colorado State University, United States*

TA8b3-7 Compressive Radar Sensing via One-Bit Sampling with Time-Varying Thresholds  
*Jian Li, University of Florida, United States; Mohammad Mahdi Naghsh, Sayed Jala Zahabi, Mahmoud Modarres-Hashemi, Isfahan University of Technology, Iran*

## Session TP1a Millimeter Wave Cellular Systems (invited)

Co-Chairs: *Robert Heath, University of Texas at Austin and Nuria Gonzalez Prelcic, University of Vigo*

- TP1a-1 mmWave Overlaid 5G Heterogeneous Cellular Networks - From Central Resource Management to Distributed Edge Cloud 1:30 PM  
*Kei Sakaguchi, Tokyo Institute of Technology / Fraunhofer HHI, Germany; Gia Khanh Tran, Tokyo Institute of Technology, Japan; Thomas Haustein, Fraunhofer Heinrich Hertz Institute, Germany*
- TP1a-2 On the Design and Performance of Initial Access in mmWave Cellular Networks 1:55 PM  
*Yingzhe Li, Jeffrey Andrews, Francois Baccelli, University of Texas at Austin, United States; Thomas Novlan, Charlie Zhang, Samsung Research America, United States*
- TP1a-3 On the Feasibility of Interference Alignment in Ultra Dense Millimeter Wave Cellular Networks 2:20 PM  
*Jian Song, Thanh Tu Lam, Marco Di Renzo, Paris-Saclay University / CNRS, France*
- TP1a-4 Performance Characteristics of 5G mmWave Wireless To-the-Home 2:45 PM  
*Frederick Vook, Eugene Visotsky, Timothy Thomas, Amitava Ghosh, Nokia Bell Labs, United States*

## Session TP1b 5G Cellular Theory

Chair: *Robert Heath, University of Texas at Austin*

- TP1b-1 5G New Radio and Ultra Low Latency Applications: A PHY Implementation Perspective 3:30 PM  
*Thomas Wirth, Bernd Holfeld, Matthias Mehlhose, Jens Pilz, Dennis Wieruch, Fraunhofer Heinrich Hertz Institute, Germany*
- TP1b-2 Fundamental Limits of Secure Device-to-Device Coded Caching 3:55 PM  
*Ahmed A. Zewail, Aylin Yener, Pennsylvania State University, United States*
- TP1b-3 On the Impact of Blockage on the Throughput of Multi-tier Millimeter-Wave Networks 4:20 PM  
*Shuqiao Jia, David Ramirez, Rice University, United States; Lei Huang, Yi Wang, Huawei Technologies Co. Ltd., China; Behnaam Aazhang, Rice University, United States*
- TP1b-4 Spatial Channel Covariance Estimation for mmWave Hybrid MIMO Architecture 4:45 PM  
*Sungwoo Park, Robert Heath, University of Texas at Austin, United States*
- TP1b-5 Joint User Association and Resource Allocation in Small Cells with Limited Backhaul Capacity 5:10 PM  
*Jong Gyu Jang, Woojin Park, Hyun Jong Yang, Ulsan National Institute of Science and Technology, Republic of Korea; Hye Gyung Jwa, Electronics and Telecommunications Research Institute, Republic of Korea*

## Session TP2a Implementation of Decoders for Polar Codes (invited)

Co-Chairs: *Alexios Balatsoukas-Stimming, EPFL and Pascal Giard, McGill University & EPFL*

- TP2a-1 Low Complexity SC Stack Polar Decoder Based on Segmented CRC Scheme 1:30 PM  
*Yi Zhao, Chuan Zhang, Southeast University, China; Shunqing Zhang, Intel Labs, China; Xiaohu You, Southeast University, China*
- TP2a-2 Low Memory Complexity Successive Cancellation Decoder for Very Long Polar Codes 1:55 PM  
*Bertrand Le Gal, Camille Leroux, Christophe Jego, University of Bordeaux, France*
- TP2a-3 A Multi-Gbps Unrolled Hardware List Decoder 2:20 PM  
*Pascal Giard, McGill University, Canada; Alexios Balatsoukas-Stimming, Thomas Christoph Müller, Andreas Burg, École polytechnique fédérale de Lausanne, Switzerland; Claude Thibeault, École de technologie supérieure, Canada; Warren J. Gross, McGill University, Canada*
- TP2a-4 Error Patterns in Belief Propagation Decoding of Polar Codes and Their Mitigation Methods 2:45 PM  
*Shuanghong Sun, Sung-Gun Cho, Zhengya Zhang, University of Michigan, United States*

## Session TP2b Beamforming and Linear Processing

Chair: *Mojtaba Soltanalian, University of Illinois at Chicago*

- TP2b-1 Max-Min Transmit Beamforming via Iterative Regularization 3:30 PM  
*Ahmad Gharanjik, University of Luxembourg / KTH Royal Institute of Technology, Luxembourg; Bhavani Shankar, University of Luxembourg, Luxembourg; Mojtaba Soltanalian, University of Illinois at Chicago, United States Virgin Islands; Björn Ottersten, University of Luxembourg / KTH Royal Institute of Technology, Luxembourg*
- TP2b-2 Two-Stage Downlink Beamforming in MISO Multicell Networks with Limited Backhaul Signaling 3:55 PM  
*Youjin Kim, Hyun Jong Yang, Ulsan National Institute of Science and Technology, Republic of Korea*
- TP2b-3 A Class of Scalable Feedback Algorithms for Beam and Null-forming from Distributed Arrays 4:20 PM  
*Sairam Goguri, Ben Peiffer, Raghu Mudumbai, Soura Dasgupta, University of Iowa, United States*
- TP2b-4 Dirty Paper Coding versus Beamforming in Multi-user MIMO under OFDM 4:45 PM  
*Ajay Mohanan, Arjun Nadh, Andrew Thangaraj, Radha Krishna Ganti, Indian Institute of Technology, Madras, India*

TP2b-5 Linear Detection Schemes for MIMO 5:10 PM  
UW-OFDM  
*Sher Ali Cheema, Jianshu Zhang, Ilmenau University of Technology, Germany; Mario Huemer, Johannes Kepler University, Austria; Martin Haardt, Ilmenau University of Technology, Germany*

### Session TP3a Multiagent Systems and Game Theory (invited)

Chair: *Ceyhun Eksin, Georgia Tech*

TP3a-1 Strategic Communication in Multi-Agent 1:30 PM  
Systems  
*Emrah Akyol, Cedric Langbort, Tamer Basar, University of Illinois at Urbana Champaign, United States*

TP3a-2 A Decentralized Algorithm with Signaling for 1:55 PM  
Learning Nash Equilibria in Bilinear Graphical Games  
*Ceyhun Eksin, Georgia Institute of Technology, United States; Jeff S. Shama, King Abdullah University of Science and Technology, Saudi Arabia*

TP3a-3 Computationally Efficient Learning in 2:20 PM  
Large-Scale Games: Sampled Fictitious Play Revisited  
*Brian Swenson, Soumya Kar, Carnegie Mellon University, United States; Joao Xavier, Instituto Superior Tecnico, Portugal*

TP3a-4 Equivalence Between Dynamic Games and its 2:45 PM  
Effect on Equilibrium Characterization  
*Dhruva Kartik, Ashutosh Nayyar, University of Southern California, United States*

### Session TP3b Graph Signal Processing (invited)

Co-Chairs: *Mike Rabbat, McGill University and Antonio Ortega, University of Southern California*

TP3b-1 Network Topology Identification from 3:30 PM  
Imperfect Spectral Templates  
*Santiago Segarra, University of Pennsylvania, United States; Antonio Marques, King Juan Carlos University, Spain; Gonzalo Mateos, University of Rochester, United States; Alejandro Ribeiro, University of Pennsylvania, United States*

TP3b-2 Models that Generate Approximately 3:55 PM  
Band-limited Graph Signals  
*Takeshi Musgrave, Michael Rabbat, McGill University, Canada*

TP3b-3 Representations for Localized Signals on 4:20 PM  
Graphs  
*Rohan Varma, Siheng Chen, Jelena Kovacevic, Carnegie Mellon University, United States*

TP3b-4 Graph Learning with Laplacian Constraints: 4:45 PM  
Modeling Attractive Gaussian Markov Random Fields  
*Hilmi Enes Egilmez, Eduardo Pavez, Antonio Ortega, University of Southern California, United States*

TP3b-5 Discrete Uncertainty Principles on Graphs 5:10 PM  
*Oguzhan Teke, Palghat Vaidyanathan, California Institute of Technology, United States*

### Session TP4a Bilinear Inverse Problems (invited)

Chair: *Yuejie Chi, The Ohio State University*

TP4a-1 Simultaneous Blind Deconvolution and Blind 1:30 PM  
Demixing via Convex Programming  
*Shuyang Ling, Thomas Strohmer, University of California, Davis, United States*

TP4a-2 Ambiguities of Convolutions with 1:55 PM  
Application to Phase Retrieval Problems  
*Philipp Walk, California Institute of Technology, United States; Peter Jung, Technische Universität Berlin, Germany; Goetz E. Pfander, Philipps-University Marburg, Germany*

TP4a-3 Blind Deconvolution with Sparsity: Optimal 2:20 PM  
Identifiability Conditions and Efficient Recovery  
*Yanjun Li, University of Illinois at Urbana-Champaign, United States; Kiryung Lee, Georgia Institute of Technology, United States; Yoram Bresler, University of Illinois at Urbana-Champaign, United States*

TP4a-4 Time-Varying Narrowband Channel 2:45 PM  
Estimation: Exploiting Low-Rank and Sparsity Structures in Delay-Doppler Domain via Bilinear Representation  
*Sajjad Beygi, Urbashi Mitra, University of Southern California, United States*

### Session TP4b Five Puzzles and Euclid's Bag of Tricks (invited)

Co-Chairs: *Ivan Dokmanic, Ecole Polytechnique Fédérale de Lausanne and Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne*

TP4b-1 Recovering Spatial Organization of Genomes 3:30 PM  
from Hi-C Contact Maps: High-Dimensional Statistical Estimation and Optimization with Euclidean Distance Matrices  
*Aleksandr Aravkin, University of Washington, United States; Stephen Becker, University of Colorado at Boulder, United States; Dmitriy Drusvyatskiy, University of Washington, United States; Aurelie Lozano, IBM T.J. Watson Research Center, United States*

TP4b-2 Graph Rigidity, Unassigned Distance 3:55 PM  
Geometry and the Nanostructure Problem  
*Phillip Duxbury, Michigan State University, United States; Simon Billinge, Columbia University, United States*

TP4b-3 Biologically Inspired Unsupervised 4:20 PM  
Algorithms for Streaming Data Analysis  
*Dmitri Chklovskii, Simons Center for Data Analysis, United States*

- TP4b-4 Look, no beacons! Optimal all-in-one EchoSLAM 4:45 PM  
*Miranda Krekovic, Ivan Dokmanic, Martin Vetterli, École polytechnique fédérale de Lausanne, Switzerland*
- TP4b-5 Eternity II Insoluble: Damn You, Monckton 5:10 PM  
*Jon Dattorro, Systems Optimization Laboratory, United States*

### Session TP5a Detection over Very Large Datasets (invited)

Co-Chairs: *Vincent H. Poor, Princeton University and Yingbin Liang, Syracuse University*

- TP5a-1 Detection of Sparse Mixtures: the Finite Alphabet Case 1:30 PM  
*Jonathan Ligo, University of Illinois at Urbana-Champaign, United States; George Moustakides, University of Patras, Greece; Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States*
- TP5a-2 Quickest Hub Discovery in Correlation Graphs 1:55 PM  
*Taposh Banerjee, Massachusetts Institute of Technology, United States; Alfred Hero, University of Michigan, Ann Arbor, United States*
- TP5a-3 Quickest Combined Anomaly Detection and Estimation in Networked Data 2:20 PM  
*Javad Heydari, Ali Tajer, Rensselaer Polytechnic Institute, United States*
- TP5a-4 Nonparametric Composite Outlier Detection 2:45 PM  
*Weiguang Wang, Yingbin Liang, Syracuse University, United States; H. Vincent Poor, Princeton University, United States*

### Session TP5b Source Localization and Sparse Array Design

Chair: *Marco Lops, University of Cassino*

- TP5b-1 An Ideal-Theoretic Criterion for Localization of an Unknown Number of Sources 3:30 PM  
*Matthew W. Morency, Delft University of Technology, Netherlands; Sergiy A. Vorobyov, Aalto University, Finland; Geert Leus, Delft University of Technology, Netherlands*
- TP5b-2 Exact Localization of Correlated Sources using 2D Harmonics Retrieval 3:55 PM  
*Ali Koochakzadeh, Piya Pal, University of Maryland, College Park, United States*
- TP5b-3 Two-Dimensional Sparse Arrays with Hole-Free Coarray and Reduced Mutual Coupling 4:20 PM  
*Chun-Lin Liu, Palghat Vaidyanathan, California Institute of Technology, United States*
- TP5b-4 Multiple Source Detection Performance of Linear Sparse Arrays 4:45 PM  
*Yu Rong, Daniel Bliss, Arizona State University, United States*

- TP5b-5 Gridless Super-Resolution Direction Finding for Strictly Non-Circular Sources Based on Atomic Norm Minimization 5:10 PM  
*Jens Steinwandt, Florian Roemer, Ilmenau University of Technology, Germany; Christian Steffens, Technische Universität Darmstadt, Germany; Martin Haardt, Ilmenau University of Technology, Germany; Marius Pesavento, Technische Universität Darmstadt, Germany*

### Session TP6a Big Data Analytics for Image and Video Processing (invited)

Chair: *Marios Pattichis, University of New Mexico*

- TP6a-1 Food Image Analysis: the Big Data Problem You Can Eat! 1:30 PM  
*Yu Wang, Chang Liu, Shaobo Fang, Fengqing Zhu, Purdue University, United States; Deborah Kerr, Curtin University, Australia; Carol Boushey, University of Hawaii, United States; Edward Delp, Purdue University, United States*
- TP6a-2 Automated Monitoring by Behavior Classification of Healthcare Providers using Big Data Analysis 1:55 PM  
*Nasrin Sadeghzadehyazdi, Laura Barnes, Scott Acton, University of Virginia, United States*
- TP6a-3 Building a Living Atlas of the Earth in the Cloud 2:20 PM  
*Daniela I. Moody, Steven P. Brumby, Michael S. Warren, Samuel W. Skillman, Ryan Keisler, Rick Chartrand, Tim Kelton, Mark Mathis, Descartes Labs, United States*
- TP6a-4 A Review of Big Data Technologies and Challenges in Image and Video Analytics in Healthcare 2:45 PM  
*Andreas Panayides, University of New Mexico, United States; Constantinos Pattichis, University of Cyprus, Cyprus; Marios Pattichis, University of New Mexico, United States*

### Session TP6b Optimization and Adaptive Methods

Chair: *Philip Schniter, Ohio State University*

- TP6b-1 A New Formulation of Generalized Approximate Message Passing 3:30 PM  
*Subrata Sarkar, Philip Schniter, The Ohio State University, United States; Alyson Fletcher, University of California, Los Angeles, United States; Sundeeep Rangan, New York University, United States*
- TP6b-2 Mean-Reverting Portfolio Design via Majorization-Minimization Method 3:55 PM  
*Ziping Zhao, Daniel P. Palomar, Hong Kong University of Science and Technology, Hong Kong SAR of China*



- TP6b-3 Online Kernel Dictionary Learning on a Budget 4:20 PM  
*Jeon Lee, University of Texas Southwestern Medical Center, United States; Seung-Jun Kim, University of Maryland, Baltimore County, United States*
- TP6b-4 A New Strategy for Effective Learning in Adaptive Importance Sampling 4:45 PM  
*Monica Bugallo, Stony Brook University, United States; Victor Elvira, Universidad Carlos III de Madrid, Spain; Luca Martino, Universidad de Valencia, Spain*
- TP6b-5 A Bayesian Framework for Robust Kalman Filtering Under Uncertain Noise Statistics 5:10 PM  
*Roozbeh Dehghannasiri, Texas A&M University, United States; Mohammad Shahrokh Esfahani, Stanford School of Medicine, United States; Edward Dougherty, Texas A&M University, United States*

**Session TP7a Signal Processing for Dynamic Functional Brain Network Analysis (invited)**

Chair: *Seline Aviyente, Michigan State University*

- TP7a-1 Connectivity Dynamics from Wakefulness to Sleep 1:30 PM  
*Eswar Damaraju, Robyn Miller, Devon Hjelm, Vince Calhoun, Mind Research Network, United States*
- TP7a-2 An EEG and fTCD based BCI for Control 1:55 PM  
*Matthew Sybeldon, Aya Khalaf, Ervin Sejdic, Murat Akcakaya, University of Pittsburgh, United States*
- TP7a-3 Source-Informed Segmentation: Towards Capturing the Dynamics of Brain Functional Networks Through Eeg 2:20 PM  
*Ali Haddad, Laleh Najafzadeh, Rutgers University, United States*
- TP7a-4 Functional Connectivity Metrics for Wavelet Clustering of rs-fMRI Data 2:45 PM  
*Alessio Medda, Georgia Tech Research Institute, United States; Jacob Billings, Emory University, United States; Shella Keilholz, Georgia Institute of Technology and Emory University, United States*

**Session TP7b Implementation of Full-Duplex Radio Transceivers (invited)**

Co-Chairs: *Joseph Cavallaro, Rice University and Ashutosh Sabharwal, Rice University*

- TP7b-1 Advanced Architectures for Self-Interference Cancellation in Full-Duplex Radios: Algorithms and Measurements 3:30 PM  
*Dani Korpi, Mona Aghababaeetafreshi, Mauno Püülilä, Lauri Anttila, Mikko Valkama, Tampere University of Technology, Finland*

- TP7b-2 Self-Interference Cancellation for Full-Duplex Wireless Communications 3:55 PM  
*Tho Le-Ngoc, Robert Morawski, Ahmed Masmoudi, McGill University, Canada*
- TP7b-3 Real Time Adaptive RF and Digital Self-Interference Cancellation for Full-Duplex Transceivers 4:20 PM  
*Visa Tapio, Markku Juntti, Aarno Pärssinen, Kari Rikkinen, University of Oulu, Finland*
- TP7b-4 Full-Duplex in a Hand-held Device - From Fundamental Physics to Complex Integrated Circuits, Systems and Networks: An Overview of the Columbia FlexICoN project 4:45 PM  
*Harish Krishnaswamy, Gil Zussman, Jin Zhou, Jelena Marasevic, Tolga Dinc, Negar Reiskarimian, Tingjun Chen, Columbia University, United States*
- TP7b-5 Integrating Full-duplex Capabilities in Heterogeneous Spectrum Sharing 5:10 PM  
*Wessam Afifi, Marwan Krunz, Mohammed Hirzallah, University of Arizona, United States*

**Session TP8a1 Network Data Analysis**

Chair: *Usman Khan, Tufts University*

1:30 PM–3:10 PM

- TP8a1-1 A New Approach to Distributed Hypothesis Testing 1:30 PM  
*Gil Katz, Pablo Piantanida, Merouane Debbah, CentraleSupélec, France*
- TP8a1-2 Worst-case Robust Attacks by Limited Adversaries Against Electricity Markets 1:45 PM  
*Mengheng Xue, Ali Tajer, Rensselaer Polytechnic Institute, United States*
- TP8a1-3 Efficient and Cooperative Smart Grid Failure Control with Low Communication Overhead 2:00 PM  
*Jose Cordova-Garcia, Xin Wang, Stony Brook University, United States*
- TP8a1-4 A Distributed Range-Based Algorithm for Localization in Mobile Networks 2:15 PM  
*Sam Safavi, Usman Khan, Tufts University, United States*
- TP8a1-5 Random Matrix Improved Community Detection in Heterogeneous Networks 2:30 PM  
*Hafiz Tiomoko Ali, Romain Couillet, CentraleSupélec, University of Paris-Saclay, France*
- TP8a1-6 Distributed Learning over Multitask Networks with Linearly Related Tasks 2:45 PM  
*Roula Nassif, Cédric Richard, André Ferrari, University of Nice-Sophia-Antipolis, France; Ali H. Sayed, University of California, Los Angeles, United States*
- TP8a1-7 Distributed Linear Prediction of a Single Source 3:00 PM  
*Kevin Wagner, Naval Research Laboratory, United States; Milos Doroslovacki, George Washington University, United States*

TP8a1-8 A Latent Variable Clustering Method for Wireless Sensor Networks  
*Vladislav Vasilev, Georgi Iliev, Vladimir Poulkov, Technical University of Sofia, Bulgaria; Alben Mihovska, Aalborg University, Denmark*

## Session TP8a2 Relaying and Full Duplex Communications

Chair: *Min Dong, University of Ontario Institute of Technology*

1:30 PM–3:10 PM

- TP8a2-1 Robust Message Recovery for Non-Cooperative Compute-And-Forward Relaying  
*Miruna Raceala-Motoc, Jan Schreck, Peter Jung, Slawomir Stanczak, Fraunhofer Heinrich Hertz Institute, Germany*
- TP8a2-2 Performance Analysis for Multi-Source Multi-Relay Transmission over  $\kappa$ - $\mu$  Fading Channels  
*Shen Qian, Japan Advanced Institute of Science and Technology, Japan; Jiguang He, Markku Juntti, University of Oulu, Finland; Tad Matsumoto, Japan Advanced Institute of Science and Technology, Japan*
- TP8a2-3 Randomized Space-Time Codes with Imperfect Channel Estimation  
*Behrouz Shayesteh, Birsen Sirkeci, San Jose State University, United States*
- TP8a2-4 Joint Relay Beamforming and Receiver Processing for Multi-way Multi-antenna Relaying  
*Wen Li, Min Dong, University of Ontario Institute of Technology, Canada*
- TP8a2-5 Spatial Half-duplex: Precoder Design and Experimental Evaluation  
*Niranjana M Gowda, Ashutosh Sabharwal, Rice University, United States*
- TP8a2-6 Degrees of Freedom of Spatial Self-Interference Suppression for In-Band Full-Duplex with Inter-node Interference  
*Yujun Chen, Ashutosh Sabharwal, Rice University, United States*
- TP8a2-7 On the Achievability of Interference Alignment for Full-Duplex Cellular Networks with Multiple Antennas  
*Wonjae Shin, Seoul National University, Republic of Korea; Jong-Bu Lim, Samsung Electronics, Republic of Korea; Hyun-Ho Choi, Hankyong National University, Republic of Korea; Jungwoo Lee, Seoul National University, Republic of Korea*

## Session TP8a3 Subspaces, Covariances and Tensors

Chair: *Louis Scharf, Colorado State University*

1:30 PM–3:10 PM

- TP8a3-1 Covariance Estimation in Terms of Stokes Parameters with Application to Vector Sensor Imaging  
*Ryan Volz, Mary Knapp, Frank Lind, Frank Robey, Massachusetts Institute of Technology, United States*
- TP8a3-2 Principal Subspace Estimation for Low-rank Toeplitz Covariance Matrices with Binary Sensing  
*Haoyu Fu, Yuejie Chi, The Ohio State University, United States*
- TP8a3-3 Complexity and Search Space Reduction in Cyclic-by-Row PEVD Algorithms  
*Fraser Coutts, Jamie Corr, Keith Thompson, Stephan Weiss, University of Strathclyde, United Kingdom; Ian Proudler, Loughborough University, United Kingdom; John McWhirter, Cardiff University, United Kingdom*
- TP8a3-4 Investigation of a Polynomial Matrix Generalised EVD for Multi-Channel Wiener Filtering  
*Jamie Corr, Jennifer Pestana, Stephan Weiss, University of Strathclyde, United Kingdom; Soydan Redif, European University of Lefke, Cyprus; Marc Moonen, KU Leuven, Belgium*
- TP8a3-5 Maximum Likelihood Identification of an Information Matrix Under Constraints in a Corresponding Graphical Model  
*Randy Paffenroth, Nan Li, Worcester Polytechnic Institute, United States; Louis Scharf, Colorado State University, United States; Myung Hee Lee, Weill Cornell Medical College, United States*

## Session TP8b1 Computer Arithmetic II

Chair: *Pascal Giard, EPFL*

3:30 PM–5:35 PM

- TP8b1-1 Optimized Memristor-Based Ripple Carry Adders  
*Lauren Guckert, Earl Swartzlander, Jr., University of Texas at Austin, United States*
- TP8b1-2 Computing Subtraction and Polynomial Computation using Unipolar Stochastic Logic  
*Yin Liu, Keshab Parhi, University of Minnesota, Twin Cities, United States*
- TP8b1-3 Precise Digital Implementations of Hyperbolic Tanh and Sigmoid Function  
*Shaghayegh Gomar, Mitra Mirhassani, Majid Ahmadi, University of Windsor, Canada*
- TP8b1-4 Optimized Multipartite Table Methods for Elementary Functions Computation  
*James Stine, Masoud Sadeghian, Oklahoma State University, United States*

TP8b1-5 Radix-4 Energy Efficient Carry-Free Truncated Multiplier  
*Wen Yan, Beijing Institute of Technology, China; Milos Ercegovac, University of California, Los Angeles, United States*

## Session TP8b2 Image and Video Sensor Processing and Communications

Chair: *Sally Wood, Santa Clara University*

3:30 PM–5:35 PM

TP8b2-1 Focal Plane Processing for HOG Detection with Bayer Pattern Sensors  
*Allen Rush, Sally Wood, Santa Clara University, United States*

TP8b2-2 Performance of Maximum Likelihood Temperature/Emissivity Separation of Hyperspectral Images with Correlated Gaussian Downwelling Radiance  
*David Neal, Todd Moon, Jacob Gunther, Utah State University, United States; Gus Williams, Brigham Young University, United States*

TP8b2-3 Spatially Scalable Video Broadcasting in Multiple Antenna Systems  
*Arash Vosoughi, LG Electronics, United States; Seok-Ho Chang, Dankook University, Republic of Korea; Sang-Hyo Kim, Sungkyunkwan University, Republic of Korea; Pamela Cosman, Laurence Milstein, University of California, San Diego, United States*

## Session TP8b3 Processing of Physiological Signals

Chair: *Antonia Papandreou-Suppappola, Arizona State University*

3:30 PM–5:35 PM

TP8b3-1 Modeling the P300-based Brain-computer Interface as a Channel with Memory  
*Vaishakhi Mayya, Boyla Mainsah, Galen Reeves, Duke University, United States*

TP8b3-2 The Addition of Adaptive Comb Filtering to Sequential Adaptive Processing for Fetal Electrocardiograms (ECGs)  
*Yuqing Dong, Jacob Kovarskiy, William Jenkins, Pennsylvania State University, United States*

TP8b3-3 Fast Respiratory Rate Estimation from PPG Signal Using Sparse Signal Reconstruction Based on Orthogonal Matching Pursuit  
*Xiaorong Zhang, San Francisco State University, United States; Quan Ding, The Home Depot Techshed, United States*

TP8b3-4 Modeling of Oxygen Saturation and Respiration for Sleep Apnea Detection  
*Sandeep Gutta, Qi Cheng, Oklahoma State University, United States*

TP8b3-5 Do Retinal Ganglion Cells Project Natural Scenes to Their Principal Subspace?  
*Reza Abbasi-Asl, University of California, Berkeley, United States; Cengiz Pehlevan, Simons Foundation, United States; Bin Yu, University of California, Berkeley, United States; Dmitri B. Chklovskii, Simons Foundation, United States*

TP8b3-6 Surface charge method for the forward EEG problem  
*Francisco J. Solis, Antonia Papandreou-Suppappola, Arizona State University, United States*

## Session WA1a Approximate Computing and Fault Tolerance (invited)

Co-Chairs: *Andrew Singer, University of Illinois at Urbana Champaign and Pulkit Grover, Carnegie Mellon University*

WA1a-1 Approximate and Error-Tolerant Computing: 8:15 AM  
From Shannon-Theory to Circuits  
*Pulkit Grover, Carnegie Mellon University, United States; Andrew Singer, University of Illinois at Urbana Champaign, United States*

WA1a-2 Energy Efficiency Limits in Approximate 8:40 AM  
Computing: A Fundamental Physical Perspective  
*Neal Anderson, University of Massachusetts Amherst, United States*

WA1a-3 Flash Memories in High Radiation 9:05 AM  
Environments: LDPC Decoder Study  
*Frederic Sala, Clayton Schoeny, Shahroze Kabir, University of California, Los Angeles, United States; Dariush Divsalar, NASA Jet Propulsion Laboratory, United States; Lara Dolecek, University of California, Los Angeles, United States*

WA1a-4 Analog Processing to Enable Scalable 9:30 AM  
High-Throughput mm-Wave Wireless Fiber  
Systems  
*Mahmoud Sawaby, Stanford University, United States; Babak Mamandipour, Upamanyu Madhow, University of California, Santa Barbara, United States; Amin Arbabian, Stanford University, United States*

## Session WA1b Communication System Development

Chair: *Raghuraman Mudumbai, University of Iowa*

WA1b-1 Maximizing Wireless Power Transfer using 10:15 AM  
Distributed Beamforming  
*Sairam Goguri, University of Iowa, United States; Dennis Ogbe, Purdue University, United States; Raghuraman Mudumbai, University of Iowa, United States; David Love, Purdue University, United States; Soura Dasgupta, University of Iowa, United States; Patrick Bidigare, BBN Technologies, United States*

WA1b-2 Digitally Enhanced Inter-modulation Distortion Compensation in Wideband Spectrum Sensing 10:40 AM  
*Han Yan, Danijela Cabric, University of California, Los Angeles, United States*

WA1b-3 Hybrid Analog-Digital Transceiver Designs for Cognitive Radio Millimeter Wave Systems 11:05 AM  
*Christos G. Tsinos, Sina Maleki, Symeon Chatzinotas, Bjorn Ottersten, University of Luxembourg, Luxembourg*

### Session WA2a Physical Layer Security (invited)

Chair: *Rafael Schaefer, TU Berlin*

WA2a-1 Keyless Authentication over Noisy Channel 8:15 AM  
*Wenwen Tu, Lifeng Lai, Worcester Polytechnic Institute, United States*

WA2a-2 Secure Computation of Linear Functions over Linear Discrete Multiple-Access Wiretap Channels 8:40 AM  
*Mario Goldenbaum, Princeton University, United States; Holger Boche, Technical University of Munich, Germany; H. Vincent Poor, Princeton University, United States*

WA2a-3 Physical Layer Based Authentication Without Phase Detection 9:05 AM  
*Sarah Rumpel, Anne Wolf, Eduard A. Jorswieck, Technische Universität Dresden, Germany*

WA2a-4 Private Authentication with Controllable Measurement 9:30 AM  
*Kittipong Kittichokechai, Rafael F. Schaefer, Giuseppe Caire, Technische Universität Berlin, Germany*

### Session WA2b Massive MIMO in the Field

Chair: *Lars Thiele, Fraunhofer Heinrich Hertz Institute*

WA2b-1 Massive MIMO Proof-of-Concept: Emulations and Hardware-in-the-Loop Field Trials at 3.5 GHz 10:15 AM  
*Thomas Wirth, Lars Thiele, Martin Kurras, Matthias Mehlhose, Thomas Haustein, Fraunhofer Heinrich Hertz Institute, Germany*

WA2b-2 Directional Propagation Measurements and Modeling in an Urban Environment at 3.7 GHz 10:40 AM  
*Leszek Raschkowski, Stephan Jaeckel, Fabian Undi, Lars Thiele, Wilhelm Keusgen, Fraunhofer Heinrich Hertz Institute, Germany; Boonsarn Pitakdumrongkija, Masayuki Ariyoshi, NEC Corporation, Japan*

WA2b-3 Massive MIMO Properties based on Measured Channels: Channel Hardening, User Decorrelation and Channel Sparsity 11:05 AM  
*Alex Oliveras Martinez, Elisabeth De Carvalho, Jesper Ødum Nielsen, Aalborg University, Denmark*

### Session WA3a Cognitive Networking (invited)

Chair: *Tara Javidi, University of California, San Diego*

WA3a-1 On the Equivalence Between Information Acquisition-Utilization and Generalized Tracking 8:15 AM  
*Tara Javidi, University of California, San Diego, United States*

WA3a-2 Correlation-Aware Sensing in Active and Passive Modes for Source Localization 8:40 AM  
*Ali Koochakzadeh, Heng Qiao, Pia Pal, University of Maryland, College Park, United States*

WA3a-3 Approximate K-Means++ in Sublinear Time 9:05 AM  
*Hamed Hassani, ETH, Switzerland*

WA3a-4 A POMDP Approach for Active Collision Detection via Networked Sensors 9:30 AM  
*Daphney-Stavroula Zois, University of Illinois, Urbana Champaign, United States*

### Session WA3b Signal Processing with Lattices (invited)

Chair: *Vaughan Clarkson, University of Queensland*

WA3b-1 Convolutional Lattices 10:15 AM  
*Joseph Boutros, Nicola Di Pietro, Texas A&M University at Qatar, Qatar; Fanny Jardel, Télécom Paristech, France*

WA3b-2 Typical Sumsets of Lattice Points 10:40 AM  
*Jingge Zhu, Michael Gastpar, École polytechnique fédérale de Lausanne, Switzerland*

WA3b-3 Lattice Parameter Estimation from Sparse, Noisy Measurements 11:05 AM  
*Vaughan Clarkson, University of Queensland, Australia; Robby McWilliam, Myriota Pty Ltd, Australia; Barry Quinn, Macquarie University, Australia*

### Session WA4a Decentralized Optimization and Learning (invited)

Co-Chairs: *Cédric Richard, Université de Nice Sophia-Antipolis and Pascal Bianchi, Telecom ParisTech*

WA4a-1 Doubly Stochastic Algorithms for Large-Scale Optimization 8:15 AM  
*Alec Koppel, Aryan Mokhtari, Alejandro Ribeiro, University of Pennsylvania, United States*

WA4a-2 On Hypothesis Testing in Networks 8:40 AM  
*Angelia Nedich, Alexander Olshevsky, Cesar Uribe, University of Illinois, United States*

WA4a-3 Expander Graph and Communication-Efficient Decentralized Optimization 9:05 AM  
*Yat-Tin Chow, University of California, Los Angeles, United States; Wei Shi, University of Illinois at Urbana Champaign, United States; W Yin, University of California, Los Angeles, United States*

WA4a-4 An Empirical Comparison of Multi-Agent Optimization Methods for Distributed Learning 9:30 AM  
*Mahmoud Assran, Michael Rabbat, McGill University, Canada*

### Session WA4b Modelling and Inference with Graphs

Chair: *Georgios Giannakis, University of Minnesota*

WA4b-1 Semi-parametric Reconstruction of Signals over Graphs 10:15 AM  
*Vassilis N. Ioannidis, Daniel Romero, Georgios B. Giannakis, University of Minnesota, United States*

WA4b-2 Hierarchical Representations of Network Data with Optimal Distortion Bounds 10:40 AM  
*Zane Smith, Samir Chowdhury, Facundo Memoli, The Ohio State University, United States*

WA4b-3 Efficient Graph Signal Recovery over Big Networks 11:05 AM  
*Gabor Hannak, Peter Berger, Gerald Matz, Vienna University of Technology, Austria; Alexander Jung, Aalto University, Finland*

### Session WA5 Tensor Signal Processing (invited)

Chair: *Nicholas D. Sidiropoulos, University of Minnesota*

WA5-1 First-Order Perturbation Analysis of Low-Rank Tensor Approximations Based on the Truncated HOSVD 8:15 AM  
*Emilio Rafael Balda, Sher Ali Cheema, Jens Steinwandt, Martin Haardt, Ilmenau University of Technology, Germany; Amir Weiss, Arie Yeredor, Tel-Aviv University, Israel*

WA5-2 Extension of the Semi-Algebraic Framework for Approximate CP Decompositions via Simultaneous Matrix Diagonalization to the Efficient Calculation of Coupled CP Decompositions 8:40 AM  
*Kristina Naskovska, Martin Haardt, Ilmenau University of Technology, Germany*

WA5-3 Tensorlab 3.0 – Numerical Optimization Strategies for Large-Scale (Constrained, Coupled) Matrix/Tensor Factorization 9:05 AM  
*Nico Vervliet, Otto Debals, Lieven De Lathauwer, KU Leuven, Belgium*

WA5-4 Inferring Directed Network Topologies via Tensor Factorization 9:30 AM  
*Yanning Shen, Brian Baingana, Georgios Giannakis, University of Minnesota, United States*

BREAK 9:55 AM

WA5-5 Robust PCA via Tensor Outlier Pursuit 10:15 AM  
*Jineng Ren, Xingguo Li, University of Minnesota, United States; Jarvis Haupt, University of Minnesota, Twin Cities, United States*

WA5-6 Tensor Completion via Group-Sparse Regularization 10:40 AM  
*Bo Yang, Gang Wang, Nikos Sidiropoulos, University of Minnesota, United States*

WA5-7 Coupled Graph Tensor Factorization 11:05 AM  
*Ahmed S. Zamzam, Vassilis Ioannidis, Nikos D. Sidiropoulos, University of Minnesota, United States*

### Session WA6a Emerging Sensing Technologies for Assisted Living (invited)

Co-Chairs: *Yimin D. Zhang, Temple University and Fauzia Ahmad, Villanova University*

WA6a-1 Continuous-Wave Sensors for Non-contact Physiological Monitoring and Human-Aware Localization 8:15 AM  
*Changzhi Li, Texas Tech University, United States*

WA6a-2 Training-Free Sleep Behavior Monitoring using Smartphones 8:40 AM  
*Rui Wang, Dartmouth College, United States; Saeed Abdullah, Cornell University, United States; Fazlay Rabbi, Xiao Zeng, Mi Zhang, Michigan State University, United States*

WA6a-3 Breathing Detection Based on the Topological Features of IR Sensor and Accelerometer Signals 9:05 AM  
*Fatih Erden, Atilim University, Turkey; Ahmet Enis Cetin, Bilkent University, Turkey*

WA6a-4 Wideband Radar Based Fall Motion Detection for a Generic Elderly 9:30 AM  
*Baris Erol, Moeness Amin, Fauzia Ahmad, Villanova University, United States; Yimin Zhang, Temple University, United States*

### Session WA6b Image and Video Quality Assessment

Chair: *Balasubramaniam Santhanam, University of New Mexico*

WA6b-1 No-Reference Image Quality Assessment for High Dynamic Range Images 10:15 AM  
*Debarati Kundu, Deepti Ghadiyaram, Alan Bovik, Brian Evans, University of Texas at Austin, United States*

WA6b-2 A Multi-Stage Temporal Pooling Mechanism for Video Quality Assessment 10:40 AM  
*Venkata Phani Kumar M, Sudipta Mahapatra, Indian Institute of Technology, Kharagpur, India*

WA6b-3 Sparsity Based Stereoscopic Image Quality Assessment 11:05 AM  
*Sameeulla Khan, Sumohana Channappayya, Indian Institute of Technology, Hyderabad, India*

## Session WA7 Cognitive Radar (invited)

Co-Chairs: *Hugh Griffiths, University College London and Muralidhar Rangaswamy, Air Force Research Laboratory*

- WA7-1 Semi-Cognitive Angle Estimation for Adaptive Array Radars 8:15 AM  
*Michal Meller, PIT-RADWAR S.A., Poland*
- WA7-2 Challenge Problems in Cognitive Radar 8:40 AM  
*Hugh Griffiths, University College London, United Kingdom; Alex Charlish, Fraunhofer Institute for Communication, Information Processing and Ergonomics (FKIE), Germany; Nathan Goodman, University of Oklahoma, United States*
- WA7-3 Joint Design of Waveform and Receive Filter for MIMO Radar using Parametric Programming 9:05 AM  
*Bosung Kang, Omar Aldayel, Vishal Monga, Pennsylvania State University, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States*
- WA7-4 Experimental Validation of Cognitive Radar Anticipation using Stochastic Control 9:30 AM  
*Colin Horne, Matthew Ritchie, Hugh Griffiths, University College London, United Kingdom; Folker Hoffmann, Alex Charlish, Fraunhofer Institute for Communication, Information Processing and Ergonomics (FKIE), Germany*
- BREAK 9:55 AM
- WA7-5 Learning Radar for Airborne Maritime Surveillance Applications 10:15 AM  
*Myriam Nouvel, Stéphane Kemkemian, THALES Airborne Systems, France*
- WA7-6 Cognitive Radar Testbed Development 10:40 AM  
*Roland Oechslin, armasuisse, Science and Technology, Switzerland; Graeme Smith, The Ohio State University, United States; Uwe Aulenbacher, Klaus Rech, Sebastian Hinrichsen, Ingenieurbüro für Sensorik und Signalverarbeitung, Germany; Kristine Bell, Metron, Inc., United States; Peter Wellig, armasuisse, Science and Technology, Switzerland*
- WA7-7 Big Data Capon Beamforming: Random Matrix Theory Perspectives 11:05 AM  
*Pawan Sethur, AFRL/WSRI, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States*

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Hörhan, Markus	MA8b3-4	Jwa, Hye Gyung	TP1b-5	Krzymien, Witold A.	MA8a3-7	Ling, Qing	TA3b-2
Horne, Colin	WA7-4	Kabir, Shahroze	WA1a-3	Kubin, Gernot	MA8a1-2	Ling, Shuyang	TP4a-1
Hossaini, Ali	MP1b-1	Kammoun, Abla	MA4a-2	Kubin, Gernot	MA8a1-3	Liss, Julie	MP6b-1
House, Amanda	MA6-3	Kang, Bosung	WA7-3	Kundu, Debarati	WA6b-1	Liu, Chang	TP6a-1
Howard, Stephen D.	TA8b1-1	Kar, Soumya	TA3b-3	Kungurtsev, Vyacheslav	TA4b-1	Liu, Chun-Lin	TP5b-3
Hsu, Chin-Wei	MA8a3-5	Kar, Soumya	TP3a-3	Kurras, Martin	WA2b-1	Liu, Liang	MP1a-3
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Huemer, Mario	TP2b-5	Keisler, Ryan	TP6a-3	Lameiro, Christian	MP8a4-1	Lomuscio, Andrea	MP8b3-5
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Huynh, Thang	TA6b-2	Kerr, Deborah	TP6a-1	Larsson, Erik G.	MA1-6	Love, David	MA2b-4
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Ishibashi, Koji	MP8a2-6	Kim, Jeremy	MP7a-1	Lauwereins, Steven	TA5b-1	Ly, Tiffany	MP6a-2
Iwen, Mark A.	MP8a4-7	Kim, Sang-Hyo	TP8b2-3	Le Gal, Bertrand	TP2a-2	M, Venkata Phani Kumar	WA6b-2
Jacyna, Garry	MP5a-3	Kim, Seung-Jun	TP6b-3	Le Martret, Christophe	TA8b1-4	M Gowda, Niranjan	TP8a2-5
Jaeckel, Stephan	WA2b-2	Kim, Taejoon	MA2b-2	Lee, Jeon	TP6b-3	M.Fayed, Abdallah	MP8b2-5
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Janneck, Jorn	MA8b1-5	Klein, Andrew G.	MA6-5	Le-Ngoc, Tho	TP7b-2	Mahmoodi, Toktam	MP1b-1
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Jardel, Fanny	WA3b-1	Knapp, Mary	TP8a3-1	Letur, Xavier	TA8b1-4	Maleki, Sina	WA1b-3
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Jatla, Venkatesh	MP6a-3	Knoop, Benjamin	MP8b3-4	Leus, Geert	TP5b-1	Mamandipour, Babak	WA1a-4
Javed, Abeer	MP1a-1	Ko, Youngwook	MP8a1-6	Levchenko, Andre	TA1b-3	Marasevic, Jelena	TP7b-4
Javidi, Tara	WA3a-1	Koivunen, Visa	MA2a-4	Li, Bo	MA2a-2	Marcos, Sylvie	MP8a1-5
Jedda, Hela	MP2b-1	Koivunen, Visa	MA5b-3	Li, Changzhi	WA6a-1	Maric, Ivana	MA8a2-1
Jego, Christophe	TP2a-2	Koochakzadeh, Ali	TP5b-2	Li, Jian	MA8b2-7	Marques, Antonio	MP3b-4
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Masmoudi, Ahmed	TP7b-2	Moon, Todd K.	MA8b2-5	Oliveras Martinez, Alex	WA2b-3	Pemula, Latha	MP8a3-7
Mateos, Gonzalo	MP4a-2	Moonen, Marc	TP8a3-4	Olshausen, Bruno	MP7a-2	Pena, Juan-Carlos	TA5b-1
Mateos, Gonzalo	TP3b-1	Morales-Jimenez, David	MA4a-4	Olshevsky, Alexander	WA4a-2	Perez-Neira, Ana	MP2a-3
Mathis, Mark	TP6a-3	Morawski, Robert	TP7b-2	Onaran, Efe	MP8a2-3	Pesavento, Marius	TP5b-5
Matsumoto, Tad	TP8a2-2	Morency, Matthew W.	TP5b-1	O'Neill, Kevin	MP7b-1	Pestana, Jennifer	TP8a3-4
Mattavelli, Marco	MA8b1-3	Morin, Yonathan	MP7a-1	Ordóñez, Luis G.	MA1-2	Peters-Drolshagen, Dagmar	MA8b1-2
Mattavelli, Marco	MA8b1-5	Moura, José M. F.	TA3b-3	Ortega, Antonio	TP3b-4	Petit, Hervé	TA5b-4
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Maurer, Alexander	MP7b-3	Mozafari, Emad	MA5b-3	Oswalt, Denise	MP7b-1	Pfander, Goetz E.	TP4a-2
Mayya, Vaishakhi	TP8b3-1	Mudumbai, Raghu	TP2b-3	Ottersten, Björn	WA1b-3	Philosof, Tal	MP8a1-3
Mazrouei-Sebdani, Mahmood	MA8a3-7	Mudumbai, Raghuraman	WA1b-1	Ottersten, Björn	MP2a-4	Piantanida, Pablo	TP8a1-1
McKay, Matthew	MA4a-4	Mugler, Andrew	TA1b-3	Ottersten, Björn	TP2b-1	Picard, David	MA6-2
McKilliam, Robby	WA3b-3	Muldoon, Sarah	MA8a4-2	Owring, Arash	MP8a4-2	Picard, David	MA6-5
McWhirter, John	TP8a3-3	Müller, Thomas Christoph	TP2a-3	Ozdemir, Alp	MP8a4-7	Piemontese, Amina	MP2a-2
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Medard, Muriel	MP8a4-6	Murin, Yonathan	TA8b2-6	Paffenroth, Randy	TP8a3-5	Pilz, Jens	TP1b-1
Medda, Alessio	TP7a-4	Murray-Bruce, John	MP4a-1	Pal, Pia	WA3a-2	Piovano, Enrico	MA1-7
Medra, Mostafa	MA8a3-2	Musgrave, Takeshi	TP3b-2	Pal, Piya	MA8b2-4	Pitakdumrongkija, Boonsarn	WA2b-2
Meedendorp, Teio	MA6-1	Muztoba, Md	MP7b-2	Pal, Piya	TP5b-2	Pitton, James	MP5a-4
Mehlhose, Matthias	TP1b-1	Nadakuditi, Raj Rao	MA4a-1	Palomar, Daniel	MP3b-3	Poor, H. Vincent	MA5a-1
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Meller, Michal	WA7-1	Nadig, Santhosh	MA8b2-6	Palomar, Daniel P.	TP6b-2	Poor, H. Vincent	WA2a-2
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Memoli, Facundo	WA4b-2	Nannarelli, Alberto	MP8b3-5	Papailiopoulos, Dimitris	MP3a-3	Pradhan, Sajina	MP8b1-1
Messier, Paul	MA6-4	Nanzer, Jeffrey	TA8b1-3	Papailiopoulos, Dimitris	MP3a-4	Prasad, Narayan	MA8a3-3
Messier, Paul	MA6-5	Napolitano, Antonio	MP5a-1	Papandreou-Suppappola, Antonia	MP5a-3	Proudler, Ian	TP8a3-3
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Mezghani, Amine	MP2b-2	Naskovska, Kristina	WA5-2	Papandreou-Suppappola, Antonia	MP7b-3	Qian, Shen	TP8a2-2
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Mihovska, Albena	TP8a1-8	Nayebi, Elina	MA8a3-6	Parhami, Behrooz	MA7a-1	Qiao, Heng	WA3a-2
Mikhael, Wasfy B.	MA8b3-3	Nayyar, Ashutosh	TP3a-4	Parhi, Keshab	MA7b-4	Quadeer, Ahmed Abdul	MA4a-4
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Milstein, Laurence	TP8b2-3	Nedich, Angela	WA4a-2	Parhi, Keshab	TP8b1-2	Rabbat, Michael	TP3b-2
Miran, Sina	MP7a-4	Nedrud, Joshua	MP7b-3	Parhi, Keshab K.	MA7a-3	Rabbat, Michael	WA4a-4
Mirhassani, Mitra	TP8b1-3	Nedrud, Joshua	MP7b-4	Parhi, Megha	MA7a-3	Rabbi, Fazlay	WA6a-2
Mitra, Urbashi	TA1b-1	Nemenman, Ilya	TA1b-3	Park, Sungwoo	TP1b-4	Raceala-Motoc, Miruna	TP8a2-1
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Mokhtari, Aryan	WA4a-1	Ochiai, Hideki	MP8b2-2	Paul, Steffen	MP8b3-4	Rangan, Sundeep	TP6b-1
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Monga, Vishal	WA7-3	Oechsli, Roland	WA7-6	Pedarsani, Ramtin	MP3a-3	Rangarajan, Sampath	MA8a3-3
Moody, Daniela I.	TP6a-3	Ogata, Shun	MP8a2-6	Pedarsani, Ramtin	MP4b-2	Rangaswamy, Muralidhar	WA7-3
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		Ogras, Umit Y.	MP7b-2	Peiffer, Ben	TP2b-3	Rao, Bhaskar D.	MA8a3-6
		Oketani, Kengo	MA8a3-3	Pelissier, Michael	TA5b-3	Rao, Milind	TA8b2-6
		Okopal, Greg	MP5a-4			Raschkowski, Leszek	WA2b-2

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Ratnam, Kavitha	MP7a-2	Sanguinetti, Luca	TA2b-3	Shen, Yanning	WA5-4	Sward, Johan	MA8b2-1
Ratnarajah, Tharm	MP2a-1	Santamaria, Ignacio	TA8b3-6	Shepard, Clayton	MP1a-1	Swartzlander, Earl	MA7a-2
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Rech, Klaus	WA7-6	Santhanam, Balu	MP6a-4	Shi, Wei	MP3b-2	Swenson, Brian	TP3a-3
Redif, Soydan	TP8a3-4	Santos, Augusto	TA3b-3	Shi, Wei	WA4a-3	Swindlehurst, Lee	MP2b-2
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Ren, Jineng	WA5-5	Sarkar, Subrata	TP6b-1	Siclet, Cyrille	MP8b2-4	Tajer, Ali	TP5a-3
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Ribeiro, Alejandro	WA4a-1	Sayed, Ali H.	TA3b-2	Singer, Andrew	MP8b1-3	Tapio, Visa	TP7b-3
Ribeiro, Sidarta	MP6b-3	Sayed, Ali H.	TP8a1-6	Singer, Andrew	WA1a-1	Tchamkerten, Aslan	MA5a-3
Richard, Cédric	TA3b-1	Scaglione, Anna	MA3b-3	Singerl, Peter	MP8a3-4	Teke, Oguzhan	TP3b-5
Richard, Cédric	TP8a1-6	Schaefer, Rafael F.	WA2a-4	Sirianunpiboon, Songsri	TA8b1-1	Tenneti, Srikanth V.	MA7b-2
Riedel, Marc D.	MA7a-3	Scharf, Louis	TA8b3-6	Sirkeci, Birsan	TP8a2-3	Tepedelenligolu, Cihan	TA8b2-4
Rikkinen, Kari	TP7b-3	Scharf, Louis	TP8a3-5	Skadron, Kevin	MP6a-2	Tepedelenlioglu, Cihan	MA8b3-6
Ritcey, James	MP8b2-6	Schmale, Sebastian	MA8b1-2	Skillman, Samuel W.	TP6a-3	Tepedelenlioglu, Cihan	MP8b2-1
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Roemer, Florian	TP5b-5	Schreier, Peter J.	MP8a4-1	Smith, Zane	WA4b-2	Thomas, Timothy	TP1a-4
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Rong, Yu	TP5b-4	Schwarz, Stefan	MP8a1-3	Solis, Francisco J.	TP8b3-6	Tiomoko Ali, Hafiz	TP8a1-5
Roorda, Austin	MP7a-2	Scutari, Gesualdo	MP3b-3	Soliz, Peter	MA8a4-1	Tölli, Antti	TA8b2-3
Roque, Damien	MP8b2-4	Scutari, Gesualdo	TA3b-4	Soltanalian, Mojtaba	TP2b-1	Tolossa, Yohannes Jote	MP8b2-3
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Rupp, Markus	MP8a1-3	Sethares, William A.	MA6-5	Stanczak, Slawomir	TP8a2-1	Tu Lam, Thanh	TP1a-3
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Rust, Jochen	MP8b3-4	Shah, Nihar	MA4b-2	Steinwandt, Jens	TP5b-5	Uffelmann, Erich	MA6-6
Rusu, Cristian	MP2b-4	Shahrokh Esfahani, Mohammad		Steinwandt, Jens	WA5-1	Ugolini, Alessandro	MP2a-2
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Safavi, Sam	TP8a1-4	Shao, Yuxiu	TA7b-1	Studer, Christoph	MP1a-2	Vaidyanathan, Palghat	TP5b-3
Safavi-Naeini, Hossein-Ali	MA2a-3	Sharan, Rishi	MP1a-2	Studer, Christoph	MP2b-3	Valkama, Mikko	TP7b-1
Sakaguchi, Kei	TP1a-1	Sharp, Elena Sharp	MA8b3-2	Studer, Christoph	TA5b-3	van Tilborgh, Louis	MA6-1
Sala, Frederic	WA1a-3	Sharp, Matthew	TA8b1-3	Su, Borching	MA8a3-5	Vanelli-Coralli, Alessandro	MP2a-2
Salas, Rachel M.E.	MP7a-3	Shayesteh, Behrouz	TP8a2-3	Sun, Shuanghong	TP2a-4	Varma, Rohan	TP3b-3
Salsabilian, Shiva	MA8a4-2	Sheikhhattar, Alireza	MP7a-4	Sun, Ying	MP3b-3	Varshney, Lav	MA8a1-1
Samavat, Mohammad	TA7b-4	Shekaramiz, Mohammad	MA8b2-5	Sun, Ying	MP5b-2	Vasilev, Vladislav	TP8a1-8

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Vazquez, Miguel Angel	MP2a-3	Wiesel, Ami	MP5b-3	Zhang, Jiangfan	MA5b-4		
Veeravalli, Venugopal	MA4b-4	Wijewardhana, Uditha	MA8b2-3	Zhang, Jianshu	TP2b-5		
Veeravalli, Venugopal	TP5a-1	Williams, Gus	TP8b2-2	Zhang, Jun	MA2b-1		
Venkata, Rajesh	TA5b-1	Wilson, Craig	MA4b-4	Zhang, Jun	MP7b-4		
Venosa, Elettra	TA8b1-5	Wirth, Thomas	TA8b2-2	Zhang, Mi	WA6a-2		
Verhelst, Marian	TA5b-1	Wirth, Thomas	TP1b-1	Zhang, Shunqing	TP2a-1		
Vervliet, Nico	WA5-3	Wirth, Thomas	WA2b-1	Zhang, Wenyi	MA5a-1		
Vettel, Jean	MA8a4-2	Wisdom, Scott	MP5a-4	Zhang, Xiaorong	TP8b3-3		
Vetterli, Martin	TP4b-4	Wolf, Anne	WA2a-3	Zhang, Yimin	MP8a3-6		
Vidal, Rene	TA4b-3	Wolkerstorfer, Martin	MP8a3-2	Zhang, Yimin	WA6a-4		
Vinod, Karthik	MA8b1-2	Wood, Sally	MA6-4	Zhang, Yuanrui	MP8a1-6		
Visotsky, Eugene	TP1a-4	Wood, Sally	TP8b2-1	Zhang, Zhengya	TP2a-4		
Vogel, Christian	MA8a1-2	Woodbridge, Yonatan	MP5b-3	Zhang, Zisheng	MA7b-4		
Vogel, Christian	MA8a1-3	Woodruff, David P.	TA4b-2	Zhao, Yi	TP2a-1		
Volz, Ryan	TP8a3-1	Woods, Roger	MP8a1-6	Zhao, Yue	MA3b-1		
Vook, Frederick	TP1a-4	Wright, John	TA5b-2	Zhao, Ziping	TP6b-2		
Vorobyov, Sergiy A.	TP5b-1	Wu, Hao	MA4a-1	Zhong, Lin	MP1a-1		
Vosoughi, Arash	TP8b2-3	Wu, Tianyu	TA3b-2	Zhou, Jin	TP7b-4		
Vouras, Peter	MP8a1-1	Xavier, Joao	TP3a-3	Zhu, Fengqing	TP6a-1		
Vu, Phuoc	TA8b3-2	Xavier, João	TA3b-3	Zhu, Hao	MA3b-4		
Vuppala, Satyanarayana	MP2a-1	Xi, Peng	MA8a1-4	Zhu, Jingge	WA3b-2		
Wack, David	MA8a4-2	Xi, Xuelie	MA6-3	Zniyed, Yassine	MP8a1-5		
Wagner, Kevin	TP8a1-7	Xie, Yao	MA5a-4	Zois, Daphney-Stavroura	WA3a-4		
Wainwright, Martin	MA4b-2	Xu, Luzhou	MA8b2-7	Zorzi, Michele	MA1-4		
Walk, Philipp	TP4a-2	Xue, Mengheng	TP8a1-2	Zussman, Gil	TP7b-4		
Walker III, T. Owens	MP8a3-3	Yamashita, Yusaku	MP8b2-2				
Walton, Marc	MA6-7	Yan, Han	WA1b-2				
Wang, Ben	MP8a3-6	Yan, Wen	TP8b1-5				
Wang, Chenwei	MA1-1	Yang, Bo	WA5-6				
Wang, Chuang	MP4b-1	Yang, Hyun Jong	TP1b-5				
Wang, Gang	WA5-6	Yang, Hyun Jong	TP2b-2				
Wang, Haonan	TA8b3-6	Yang, Qianqian	MP8a2-8				
Wang, Meng	MA8b2-2	Yazdandoost, Erfan	MP3b-1				
Wang, Rui	WA6a-2	Yazicigil, Rabia Tugce	TA5b-2				
Wang, Wei	MP8a3-6	Yener, Aylin	TP1b-2				
Wang, Weiguang	TP5a-4	Yeredor, Arie	WA5-1				
Wang, Xiaomeng	MP8b1-6	Yi, Chen	MA8a2-2				
Wang, Xin	MP8b1-6	Yin, Dong	MP4b-2				
Wang, Xin	TP8a1-3	Yin, Haifan	TA2b-1				
Wang, Yi	TP1b-3	Yin, W	WA4a-3				
Wang, Yu	TP6a-1	Yin, Wotao	TA3b-2				
Wang, Yuan	TA8b3-6	You, Chong	TA4b-3				
Ward, E. Sally	MA7b-1	You, Xiaohu	TP2a-1				
Warren, Michael S.	TP6a-3	Yu, Bin	TP8b3-5				
Webb, Jennifer	MA8b3-2	Yu, Qian	MP3a-1				
Weiss, Amir	WA5-1	Yu, Xianghao	MA2b-1				
Weiss, Stephan	TP8a3-3	Yuan, Kun	TA3b-2				
Weiss, Stephan	TP8a3-4	Zahabi, Sayed Jala	TA8b3-7				
Weissman, Tsachy	MA4b-3	Zamzam, Ahmed S.	WA5-7				
Weller, Daniel	TA6b-4	Zeng, Ruochen	MP8b2-1				
Wellig, Peter	WA7-6	Zeng, Xiao	WA6a-2				
Wells, Patricia	MA8a3-3	Zhai, Yuanhao	MA6-5				
Wendt, Herwig	MA6-5	Zhang, Charlie	TP1a-2				
Wieruch, Dennis	TP1b-1	Zhang, Chuan	TP2a-1				

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