25th International Conference on

Noise and Fluctuations

ICNF 2019

Proceedings

18 - 21 June 2019

EPFL Neuchâtel campus - Neuchâtel, Switzerland

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RÉPUBLIQUE ET CANTON DE NEUCHÂTEL

Ville de Neuchâtel

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SCHEDULE AT GLANCE

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- 09:00-09:45 Plenary 1 (Auditorium)
- 09:45-10:25 Session 2A Materials 1 (Auditorium)
- 09:45-10:25 Session 2B Fundamental Theory 1 (Room 1)
- 10:25-11:05 Coffee break/Registration
- 11:05-12:35 Session 3A Devices and Materials 1 (Auditorium)
- 11:05-12:15 Session 3B Fundamental Theory 2 (Room 1)
- 12:35-14:00 Launch Break
- 14:00-15:30 Session 4A Fundamental Theory 3 (Auditorium)
- 14:00-15:30 Session 4B Fundamental Theory and Materials 1 (Room 1)
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- 18:30-19:15 Cultural Visit: Musée d'art et d'histoire
- 19:30-22:00 Gala Dinner

THURSDAY, JUNE 20th

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- 11:15-12:45 Session 16B Devices and Materials 2 (Room 1)
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FRIDAY, JUNE 21st

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- 10:15-11:25 Session 4B Session 18B: Devices and Optoelectronics 1 (Room 1)
- 12:05-12:30 Closing Ceremony

Introduction

The International Conference on Noise and Fluctuations (ICNF) is a biennial event that brings together researchers interested in theoretical and experimental aspects of fluctuations across a wide spectrum of scientific and technological fields. Since the development of the theory of Brownian motion, the science of fluctuation has been one of the most important parts of physics. The investigation of noise and fluctuation is indispensable for the understanding of the physical processes in various microscopic and macroscopic systems.
This conference will be a great opportunity for noise researchers operating in very different areas of scientific and technological endeavor to come together and create the basis for continued and renewed cross-fertilization and collaboration. The International Conference on Fluctuation Phenomena started in 1968 and moved all over the world.
For the first time the conference is taking place in Switzerland: the 25th edition (ICNF 2019) will be held in Neuchâtel (Switzerland), from June 18 to June 21, 2019.

About Neuchâtel

Neuchâtel is located on the northwestern shore of the Lake of Neuchâtel, in West Switzerland. On the side of the Jura Mountains, the environment is characterized by remote, windswept settlements and deep, rugged valleys. Neuchâtel is also in the heartland of the celebrated Swiss watchmaking industry.

EPFL

The Ecole Polytechnique Fédérale de Lausanne (EPFL) was founded in 1853 and became a national school in 1969. It is considered to be among the world's most prestigious universities of technology.

EPFL Neuchâtel campus

At the heart of the Microcity pole of innovation, the Canton of Neuchâtel is hosting an important part of EPFL's Microengineering Institute (IMT). This institute's research activities cover topics such as health, microsystems, photovoltaic and watchmaking. The installation of EPFL Neuchâtel campus, in 2013, is part of the EPFL's strategy to bring research activities closer to industrial interests at all stage of the innovation process. They benefit from the proximity of other research institutions and high-tech manufacturing societies active in micro- and nano-technologies and advanced manufacturing.

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Prof. SHOJI KAWAHITO
Imaging Devices Laboratory, Research Institute of Electronics, Shizuoka University.

Ultra-Low-Noise Design of CMOS Image Sensors toward Photoelectron-Counting-Based Wide Dynamic Range Imaging

Tuesday, June 18th
09:00-09:45

Auditorium

Shoji Kawahito (F'09) received the Ph.D. degree from Tohoku University, Sendai, Japan, in 1988. He joined Tohoku University as a Research Associate in 1988. From 1989 to 1999, he was with the Toyohashi University of Technology, Toyohashi, Japan. From 1996 to 1997, he was a Visiting Professor with ETH Zurich, Zürich, Switzerland. Since 1999, he has been a Professor with the Research Institute of Electronics, Shizuoka University, Shizuoka, Japan. Since 2006, he has been the Chief Technology Officer of Brookman Technology Inc., Shizuoka, a university spin-off company for CMOS imager developments. He has authored over 300 papers in peer-reviewed journals and international conference proceedings. His current research interests include CMOS imaging devices, sensor interface circuits, and mixed analog/digital circuits designs.,Dr. Kawahito is a fellow of the Institute of Image Information and Television Engineers and a member of the Institute of Electronics, Information and Communication Engineers (IEICE) and the International Society for Optics and Photonics. He has received plenty of awards, including the Outstanding Paper Award at the IEEE International Symposium on Multiple-Valued Logic in 1987, the Special Feature Award in LSI Design Contest at the Asia and South Pacific Design Automation Conference in 1998, the Beatrice Winner Award for Editorial Excellence at the IEEE International Solid-State Circuits Conference (ISSCC) in 2005, the IEICE Electronics Society Award in 2010, the Takayanagi Memorial Award in 2010, and the Walter Kosonocky Award in 2013. He served as a Technical Program Committee Member of ISSCC from 2009 to 2012, and the Program Committee Chair of the 2011 International Image Sensor Workshop. He was the Chair of the SSCS Japan Chapter from 2013 to 2014.

Prof. ALPER DEMIR
Department of Electrical & Electronics Engineering, College of Engineering, Koç University.

Nonstationary Low Frequency Noise in Switched MOSFET Circuits and Circuit Simulation

Wednesday, June 19th
08:40-09:25

Auditorium

Alper Demir received the BS degree from Bilkent University in Turkey and the MS and PhD degrees from the University of California at Berkeley in the USA. Dr. Demir previously spent time at Motorola, Cadence Design Systems, Bell Laboratories Research, MIT, and UC Berkeley. He has been with Koç University in Istanbul as a faculty member since 2002. His work on noise won several best paper awards: 2002 Best of ICCAD Award, 2003 and 2014 IEEE/ACM William J. McCalla ICCAD Best Paper Awards, and the 2004 IEEE Circuits & Systems Society Guillemin-Cauer Award. He was named an IEEE Fellow in 2012 for his contributions to stochastic modelling and analysis of phase noise.

Prof. ENRICO RUBIOLA
Université de Franche Comté & Department of Time and Frequency of the CNRS FEMTO-ST Institute, Besançon, France

The Origin and the Measurement of Phase Noise in Oscillators

Thursday, June 20th
09:00-09:45

Auditorium

Enrico Rubiola is full professor at the Université de Franche Comté and deputy director of the Department of Time and Frequency of the CNRS FEMTO-ST Institute, Besançon, France. Since 2012, he is the PI of the Oscillator IMP project, a platform for the measurement of short-term frequency stability and spectral purity. Formerly, he was a full professor at the Université Henri Poincaré, Nancy, France, a guest scientist at the NASA JPL, a guest professor at the Università di Parma, Italy, and an assistant professor at the Politecnico di Torino, Italy.

He graduated in electronic engineering at the Politecnico di Torino in 1983, received a Ph.D. in Metrology from the Italian Minister of University and Research, Roma (1989), and a Sc.D. degree from the Université de Franche Comté in 1999.

Enrico's interests are high-spectral purity oscillators from low RF to optics, general time and frequency metrology, phase noise, amplitude noise, noise in digital systems, frequency synthesis, spectral analysis, wavelet (Allan-like) variances, microwave photonics, precision electronics form dc to microwaves, and precision instrumentation. He has developed innovative instruments for AM/PM noise measurement with ultimate sensitivity, and a variety of dedicated signal-processing methods. He introduced the "Leeson effect" and "Π and Λ frequency counters," and the full theory underneath, and he received the IEEE W. G. Cady Award (2018) for his contributions.

Enrico founded the European Frequency and Time Seminar (http://efts.eu) in 2013, and he has been chairing it since. A wealth of articles, reports, conference presentations, and lectures for PhD students and young scientists are available on the Enrico's home page http://rubiola.org.

Prof. ALEXANDE BALANDIN
University of California, Riverside

Low-Frequency Noise in Low-Dimensional van der Waals Materials

Friday, June 21st
09:00-09:45

Auditorium

Alexander A. Balandin received his BS and MS degrees *Summa Cum Laude* in Applied Mathematics and Applied Physics from the Moscow Institute of Physics and Technology (MIPT), Russia. He received his second MS degree and PhD degree in Electrical Engineering from the University of Notre Dame, USA. From 1997 till 1999, he worked as a Research Engineer at the Department of Electrical Engineering, UCLA. In 1999 he joined UCR, where he is presently Distinguished Professor of Electrical and Computer Engineering, University of California Presidential Chair Professor of Materials Science, Director of the Phonon Optimized Engineered Materials (POEM) Center, Director of UCR Nanofabrication Facility, and Associate Director of DOE EFRC Spins and Heat in Nanoscale Electronic Systems (SHINES) Center. Professor Balandin is a Founding Chair of UCR campus-wide Materials Science and Engineering (MS&E) Program. His research expertise covers a wide range of nanotechnology, materials science, electronics, low-frequency noise, phononics and spintronics fields. He is recognized as a pioneer of the graphene thermal research field. His current research interests include charge-density-wave effects in two-dimensional materials and their device applications, low-frequency current fluctuations and electronic noise in materials and devices, Brillouin – Mandelstam and Raman spectroscopy of advanced materials, practical applications of graphene in thermal management, electronics and energy conversion. Professor Balandin is a recipient of The MRS Medal from the Materials Research Society, and *Pioneer of Nanotechnology Award* from IEEE Society for his graphene and nanotechnology research. He is an elected Fellow of eight professional societies: MRS, APS, IEEE, OSA, SPIE, IOP, IOM3 and AAAS. He is among the Clarivate Analytics and Thomson Reuters Highly Cited Researchers (Physics). He serves as Deputy Editor-in-Chief of the Applied Physics Letters. For more information, visit his group web-site: http://balandingroup.ucr.edu/

Conference Technical Program

Day 1