MOCAST

International Conference on
Modern Circuits And Systems Technologies.

28-30 June 2023
Athens, Greece

Conference Guide

University of West Attica
Athens Campus, 196 Alexandras Av.

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About MOCAST

The International Conference on Modern Circuits and Systems Technologies (MOCAST) on Electronics and Communications aims to bring together leading academic and industrial scientists and researchers to exchange and share their knowledge and experiences about all aspects of Circuits and Systems. It also provides a forum for exchanging ideas, discussing research results, and presenting practical applications in the areas of modeling, design, simulation, synthesis and implementation of Circuits and Systems. It provides an interdisciplinary and multidisciplinary forum for researchers, engineers and educators to present and discuss the most recent innovations, trends, and concerns, practical challenges encountered and the solutions adopted in these fields.

MOCAST 2023 will take place in Athens. Athens is one of the world's oldest cities, with its recorded history spanning over 3,400 years and its earliest human presence beginning somewhere between the 11th and 7th millennia BC. Classical Athens was a powerful city-state. It was a centre for the arts, learning and philosophy, and the home of Plato's Academy and Aristotle's Lyceum. It is widely referred to as the cradle of Western Civilization and the birthplace of democracy, largely because of its cultural and political impact on the European continent - particularly Ancient Rome. In modern times, Athens is a large cosmopolitan metropolis and central to economic, financial, industrial, maritime, political and cultural life in Greece.
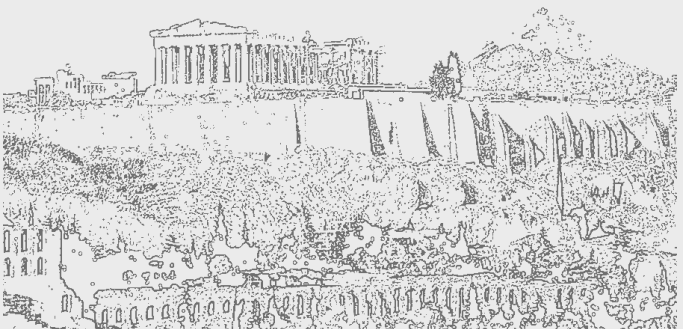
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Plenary, Keynote and Invited Speeches.

Plenary Speech 1

Some insights on the Implementation of the smart EM environment - Scenarios, Architectures, Devices, and Planning

Prof. Andrea Massa, IEEE Fellow, University of Trento, Italy

Abstract: Future wireless applications and services such as autonomous vehicles, real-time remote health care, and intelligent industrial automation will require higher capacity, lower latency, and higher reliability than those achievable with the current wireless coms standard. Moreover, the need to provide a massive access and ubiquitous wireless coverage will also impose severe energy-efficiency constraints. The wireless infrastructures for future generation mobile communications systems will have to fit such challenging requirements for guaranteeing unprecedented link performance levels, while minimizing the complexity, the power consumption, and the costs of the communication architecture. Therefore, new architectural solutions, alternative to the classical approaches that achieve better coverage and higher data throughput by using more power and more emissions of electromagnetic waves, are required because of the electromagnetic congestion.

The implementation of a Smart Electromagnetic Environment, as an evolution of the standard concepts of wireless infrastructure and wireless channel, could be a possible answer. Indeed, while traditional communication systems focus the radiated power along the direction of the end-user terminals in order to maximize the link quality and the overall system capacity by increasing standard LOS parameters, the maximization of the signal-to-noise ratio for next generation wireless networks can be yielded by spatially distributing the radiated power to constructively exploit the wave scattering phenomena in the multi-path propagation environment. Whether in the past the scatterers and objects present in the environment were considered as obstructions and blockage structures for the EM signal propagation, it is now mandatory to introduce holistic wireless network design concepts in which the environment plays a fundamental role since it is becoming an essential degree-of-freedom for the wireless planning and system design. This talk will review these theoretical and technological trends by also dealing with the complex task of planning such a heterogeneous electromagnetic scenario to achieve the user requirements with cost-effective integrated solutions. Future applications of such a smart EM environment will be also envisaged, as well.

Short CV: Andrea Massa (IEEE Fellow, IET Fellow, Electromagnetic Academy Fellow) has been a Full Professor of Electromagnetic Fields @ University of Trento since 2005. At present, Prof. Massa is the director of the network of federated laboratories "ELEDIA Research Center" located in Brunei, China, Czech, France, Greece, Italy, Japan, Perù, Tunisia with more than 150 researchers. Moreover, he is holder of a Chang-Jiang Chair Professorship @ UESTC (China), Visiting Research Professor @ University of Illinois at Chicago (USA), Visiting Professor @ Tsinghua (China), and Professor @ Centrale-Supélec (France). He has been holder of a Senior DIGITEO Chair at L2S-CentraleSupélec and CEA LIST in Saclay (France), UC3M-Santander Chair of Excellence @ Universidad Carlos III de Madrid (Spain), Adjunct Professor at Penn State University (USA), Guest Professor @ UESTC (China), and Visiting Professor at the Missouri University of Science and Technology

Plenary, Keynote and Invited Speeches.

(USA), the Nagasaki University (Japan), the University of Paris Sud (France), the Kumamoto University (Japan), and the National University of Singapore (Singapore). He has been appointed IEEE AP-S Distinguished Lecturer (2016 -2018) and served as Associate Editor of the "IEEE Transaction on Antennas and Propagation" (2011-2014). His research activities are mainly concerned with inverse problems, antenna analysis/synthesis, radar systems and signal processing, cross-layer optimization and planning of wireless/RF systems, system-by-design and material-by-design and theory/applications of optimization techniques to engineering problems. Prof. Massa published more than 900 scientific publications among which more than 350 on international journals (>14.700 citations, h-index=63 [Scopus]; >12.000 citations, h-index=58 [ISI-oS]; >23.900 citations, h-index = 88 [Google Scholar]) and more than 570 in international conferences where he presented more than 210 invited contributions (> 50 invited keynote speaker) (www.eledia.org/publications). He has organized more than 100 scientific sessions in international conferences and has participated to several technological projects in the national and international framework with both national agencies and companies.

Plenary Speech 2

Edge of Chaos Theory Sheds Light into the Emergence of a Fundamental Bifurcation Phenomenon in Neuronal Axon Membranes

Dr Ing. habil. Alon Ascoli, IEEE Senior Member, Chair of Fundamentals of Electrical Engineering, TU Dresden, Germany

Abstract: The origin for emergent phenomena in non-isolated physical media, eg the propagation of a train of all-or-none electrical spikes across a biological neuronal network, or the destabilization of the homogeneous solution in reaction-diffusion cellular arrays, may only be explained by recurring to the universal theory of Local Activity, and particularly, to its fundamental Physics Principle, referred to as Edge of Chaos. More specifically, complex phenomena may appear in a physical system, let interact with its external environment, if and only if the physical system itself may be poised on the Edge of Chaos, which implies its polarization on some asymptotically stable operating point, around which amplification of infinitesimal fluctuations in energy is possible. The Physics Principle of the Edge of Chaos, extending the Second Law of Thermodynamics to non-isolated physical systems, is invoked in this presentation to elucidate the mechanisms, underlying the emergence of a fundamental bifurcation phenomenon in neuronal axon membranes. Concepts from Circuit and System Theory are also employed to complement the small-signal analysis with global behavior investigations, enabling to draw a complete picture of the complex nonlinear dynamics of these biological structures. This work sheds light into the powerful capability of concepts and methods from the quantitative Theory of the Edge of Chaos to guide scientists toward the resolution of open questions on emergent phenomena in nature.

Short CV: Alon Ascoli (Senior IEEE Member) received the German Habilitation as Full Professor in 2022 (expertise: Nonlinear Circuit Theory), a PhD Degree in Electronic Engineering from University College Dublin in 2006, and a First Class Honours MSc Degree in Electronic Engineering from Universita' degli Studi Roma Tre in 2001. He is affiliated with Technische Universität Dresden since 2012, where he holds a lifelong position as researcher and

Plenary, Keynote and Invited Speeches.

lecturer since 2018. He develops theoretical concepts enabling to harness disruptive nanotechnologies to overcome traditional circuits' limitations for applications of interest to the more-than-Moore electronics era. In 2017 he was conferred the habilitation title as Associate Professor in Electrical Circuit Theory from the Italian Ministry of Education. He is President of the IEEE Circuits and Systems (CAS) Cellular Nanoscale Networks and Memristor Array Computing (CNN-MAC) Technical Committee (TC) since 2021. He served as President of the IEEE CAS Cellular Nanoscale Networks and Array Computing TC from 2019 to 2021. He was a Visiting Research Scholar at University of California Santa Cruz in 2019. In 2007 he was honoured with the International Journal of Circuit Theory and Applications (IJCTA) Best Paper Award for the manuscript "Modelling the dynamics of log-domain circuits". In September 2020 and June 2022, he was conferred the Best Paper Award on Electronics at the International Conference on Modern Circuits and Systems Technologies (MOCAST) for the manuscripts entitled "Image Mem-Processing Bio-Inspired Cellular Arrays with Bistable and Analogue Dynamic Memristors" and "SPICE Compact Model for an Analog Switching Niobium Oxide Memristor", respectively. Since October 2020 he is Member of the IEEE Nanoelectronics and Gigascale Systems Technical Committee (Nano-Giga TC). He was the Chair of the 7th Memristor and Memristive Symposium, held in Catania, Italy, in 2021. He is the Guest Co-Editor for the Special Issue on Memristive Circuits and Systems for Edge Computing Applications, to appear in December 2022 on the IEEE CAS Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS). He served as Co-Chair of the IEEE Circuits and Systems Society (CASS) Seasonal School on Intelligence in Chips: Integrated Sensors and Memristive Computing, held online, over the time span 1-7 November 2022.

Session Speech A3

Challenges for the upgrade of large, long-lifetime collider detectors, with examples mostly from ATLAS and its muon system

Dr. Massimo Corradi, INFN Roma-I, Sapienza Universita, Italy

Abstract: The design of new collider detectors or the upgrade of existing ones is often driven by optimization of physics performance over cost. Anyway aspects such as reliability, flexibility, easiness of operation and maintenance are often crucial for large collider experiments that are expected to collect data reliably for several decades. Examples taken mostly from ATLAS and muon systems are presented.

Short CV: Massimo Corradi is a senior researcher at INFN Roma-I. He has been working on the analysis of physics of Standard Model and beyond in the ZEUS experiment at the DESY HERA Collider (where he had the role of physics chairman in 2006) and later in the ATLAS experiment at the CERN LHC. In both experiments he has been working on the maintenance of muon systems and on the muon trigger, and in the calibration and determination of performance for muon detectors. Since 2014 he has been one of the proposers of the ATLAS Muon Phase-2 upgrade of which he has been the project leader from 2017 to 2022. He is currently working on the operation and the upgrade of the ATLAS muon trigger system.

Plenary, Keynote and Invited Speeches.

Plenary Speech 3

Title: Hybrid pixel detectors: from the discovery of the Higgs Boson to advances in medical imaging

Dr. Michael Campbell, CERN, Geneva, Switzerland

Abstract: On July 4, 2012, the ATLAS and CMS experiments at CERN's Large Hadron Collider (LHC) announced the discovery of the long sought-after Higgs boson. This was the culmination of a huge scientific endeavor involving theorists, detector, and machine physics and an army of engineers and technicians. The presentation will start with a lay-person's description of a large high-energy physics experiment and review some of the challenges presented for detector and ASIC designers by the LHC environment. The talk will then focus on inner tracking detectors based on hybrid pixels. Such detectors provide the possibility of unambiguous (noise hit free) particle detection with high spatial resolution, an essential feature for disentangling complicated particle collisions taking place 40 million times per second. The same technology has been adapted for applications beyond high-energy physics in successive generations of the Medipix and Timepix chips. That work has led to numerous novel applications stretching from particle detection in classrooms to recent ground-breaking results in spectroscopic medical X-ray imaging. Particle detection in real time will be demonstrated and a number of related applications described.

Short CV: Michael Campbell is a team leader in the Microelectronics Section in the Experimental Physics Department at CERN in Geneva, Switzerland where he has worked for over 30 years. He was one of the pioneers of pixel detector readout and of the use of radiation-hard-by-design techniques for ASICs both of which are now exploited widely at the LHC experiments. He is spokesperson of the Medipix2, Medipix3 and Medipix4 Collaborations who seek to disseminate pixel detector technology to many different fields. He has acted as host of a series of bi-annual workshops on Medical Applications of Spectroscopic X-ray Detectors at CERN. Michael received his PhD from the University of Strathclyde, Glasgow, Scotland and has authored several hundred scientific publications. In 2016, he was appointed Honorary Professor of the Dpt of Physics and Astronomy at the University of Glasgow.

Session Speech A3b
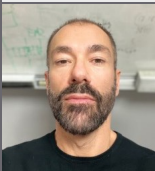
Hardware Triggering in High Energy Physics

Dr. Riccardo Vari, Sapienza Universita e INFN. Roma, Italy

Abstract: Modern high energy physics experiments require triggering systems capable of performing complex selection algorithms with low latency. Hardware-based first level triggering is typically used to significantly reduce the particle detectors input rate to a value acceptable by the second level software triggering. Hardware trigger examples will be shown.

Short CV: Riccardo Vari is a researcher at INFN-Rome. He works for the ATLAS experiment at the CERN Large Hadron Collider since 2001. He is responsible of the first level muon trigger system in the barrel region and he coordinates the upgrade of the first level muon trigger for the High Luminosity

LHC. He is member of the ATLAS TDAQ Upgrade Steering group and of the ATLAS TDAQ Institute Board. He is reviewer of many ATLAS upgrade trigger hardware projects, he has been reviewer for the "IEEE Transactions on Nuclear Science" and "Journal of Instrumentation" journals. Riccardo Vari is author of more than 1100 publications.

Session Speech A4

Developing complex front-end read out systems and ASICs for HL-LHC experiments; the CMS Outer Tracker case

Dr. Kostas Kloukinas, CERN, Geneva, Switzerland.

Abstract: This talk presents the challenges and the design methodologies involved in the development of modern front-end readout systems and ASICs employing real-time on-detector particle momentum discrimination for operation in harsh radiation environment associated with experiments in the HL-LHC at CERN. The presentation covers several key areas including, front-end system level modeling and simulation, ASIC design conception, implementation and verification, low power design techniques and radiation hardness design methodologies. The talk uses the front-end readout system of the CMS Outer Tracker for HL-LHC upgrades as a case example. The presentation concludes by discussing the potential impact of these design methodologies on future particle physics detectors.

Short CV: Kostas Kloukinas is a senior staff applied physicist and a team leader in the Microelectronics Section in the Experimental Physics Department at CERN in Geneva, Switzerland. Kostas is specializing in the fields of electronics and microelectronics engineering. He has worked for many years in the conception, development and commissioning of readout and control systems for particle physics experiments focusing on the design of low-power, radiation-tolerant ASICs for on-detector electronics. He has led several ASIC projects and he is the coordinator of the ASIC design support and Foundry access services that CERN provides to its collaborating Institutes and Universities in the High Energy Physics community. His research interests are in the field of low power, radiation tolerant ASIC design on advanced semiconductor processes. He is author and co-author of about 60 publications and has been an IEEE member since 1997.

Session Speech A5

Present and Future Accelerator Physics Challenges at CERN

Dr. Yannis Papaphilippou, Principal Accelerator Physicist, CERN

Abstract: This talk will review the challenges at the forefront of accelerator physics research as emerging for operating and future accelerators at CERN, through theoretical, numerical and experimental studies. It will include the LHC Injector Upgrade (LIU) implementation and performance ramp-up for protons and ions, the LHC Run 3 for paving the path towards High Luminosity-LHC (HL-LHC), and the study and development of new concepts for the design of future circular and linear colliders such as FCC, CLIC, the

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Muon Collider, and for accelerators with applications in medicine and industry. Finally, the testing of new acceleration, beam manipulation and measurement techniques in AWAKE and CLEAR accelerator test facilities and the development and support of accelerator physics computer codes using state of the art algorithms and high-performance computing resources will be addressed.

Short CV: Yannis Papaphilippou is a Principal Accelerator Physicist at CERN with ~30 years of research and professional experience. He received his diploma of Physics from the Un.of Athens (1988-1992) and pursued postgraduate studies in the Un.of Paris with a DEA in Astrophysics (1993) and a PhD in non-linear dynamical systems (1997), conducted in the Observatory of Paris. His activities in accelerator physics and beam dynamics started with an EU post-doctoc at INFN-Legnaro and a senior fellowship at CERN. After holding staff positions at Brookhaven National Laboratory (BNL) and European Synchrotron Radiation Facility (ESRF), he moved back to CERN, as staff applied physicist of the Accelerator and Beam Physics (ABP) group (2005). He worked on the operation of several lepton and hadron accelerator rings (ESRF, PS, SPS, LHC), design studies and upgrades (SNS, HL-LHC, LIU, CLIC, FCC) and coordinated activities for the low-emittance rings community within European projects (TIARA, EUCARD2, ARIES, I.FAST). During 2016-2020, he led the Hadron Synchrotron Incoherent effects section of the ABP group, and, in 2021, he was appointed as the group leader. He has supervised an important number of students and post-doctoral fellows in research themes such as optics design, non-linear dynamics, intrabeam scattering, space-charge, beam-beam, luminosity modelling and optimisation, with results published in more than 400 scientific papers and technical reports. For more than 20 years, he has lectured in accelerator schools (USPAS, JUAS, Linear Collider school, CAS) and as visiting professor of the Un. of Thessaloniki (since 2017) on topics ranging from general accelerator physics, optics, linear and non-linear correction, non-linear beam dynamics, high-intensity and low emittance rings' design.

Session Speech A5

Development of Radiation-Tolerant and High-Reliability Beam Loss Monitoring Electronics for HL-LHC at CERN

Dr. Christos Zamantzas, CERN

Abstract: The Large Hadron Collider at CERN holds an unprecedented amount of energy in its circulating beams. The loss of even a small fraction of a beam can induce a quench in the superconducting magnets or cause physical damage to machine components. The Beam Loss Monitoring (BLM) system is crucial for machine protection and optimization. The system was designed with reliability and availability in mind, and it follows strict operational and fail-safety standards to ensure its functionality, and to maintain the expected reliability requires extensive continuous testing and verification.

This presentation will explore the current BLM system, focusing on its limitations and operational needs. It will also present solutions that we envision to address these issues in the upcoming upgrade for the HL-LHC era. These solutions include custom-designed radiation-hard integrated circuits (ASICs),

Plenary, Keynote and Invited Speeches.

electronic modules, and power supplies that can withstand the harsh environment of the machine. Additionally, real-time processing, telemetry, and supervision functionalities will be implemented to improve availability and facilitate on-time maintenance.

Short CV: Dr. Christos Zamantzas completed his studies with a BEng & MEng in Electronic & Computer Engineering at Brunel University, UK, and holds a PhD in Real-Time Data Analysis and Decision Systems for Particle Flux Detection. He has been working at CERN in Switzerland since 2002 and has been leading the Beam Loss Measurements section in the Beam Instrumentation group since 2016. He is an expert in electronics engineering, particularly in the fields of Field-Programmable Gate Arrays (FPGAs), and the design of reliable electronics for safety-critical systems. He has been at the forefront of testing and implementing radiation-hard electronics and FPGAs for high-reliability systems. Together with his team, he takes responsibility for one of the largest and most complex instrumentation systems essential to LHC operation, ensuring excellent availability and machine protection. In his free time, he enjoys scuba diving, music, snowboarding, and traveling.

Plenary Speech 4

How to program a memristor for high frequency inputs?

Prof. Ronald Tetzlaff, Institute of Circuits and Systems, TU Dresden, Germany

Short CV: Ronald Tetzlaff is a Full Professor of Fundamentals of Electrical Engineering at the Technische Universtität Dresden, Germany. From 1999 to 2003 Ronald Tetzlaff was Associate Editor of the IEEE, Transactions on Circuits and Systems: part I. He was "Distinguished Lecturer" of the IEEE CAS Society (2001 to 2002). He is a member of the scientific committee of different international conferences. He was the chair of the 7th IEEE International Workshop on Cellular Neural Networks and their Applications (CNNA 2002) and organized several special sessions at circuit and systems related conferences. From 2005 to 2007 he was the chair of the IEEE Technical Committee Cellular Neural Networks & Array Computing. Ronald Tetzlaff is a member of the Informationstechnische Gesellschaft (ITG) and the German Society of Electrical Engineers and of the German URSI Committee. Ronald Tetzlaff is in the Editorial Board of the International Journal of Circuit Theory and Applications since 2007 and he is also in the Editorial Board of the IEEE, Transactions on Circuits and Systems: part II since 2016. He was Associate Editor of the AEÜ – International Journal of Electronics and Communications from 2008 to 2016. Ronald Tetzlaff was the chair of the 18th IEEE Workshop on Nonlinear Dynamics of Electronic Systems (NDES 2010), the chair of the 5th International Workshop on Seizure Prediction (IWSP5 2012) , the chair of the 21st European Conference on Circuit Theory and Design (ECCTD 2013), the chair of the 5th Memristor and Memristive Symposium 2016, and of the 15th IEEE International Workshop on Cellular Nanoscale Networks and their Applications (CNNA 2016). Since 2014 he serves as the leader of working group 2 (Memristor Theory, Modelling and Simulation) in the EU COST action MemoCIS (IC 1401) on Memristors – Devices, Models, Circuits, Systems and Applications. Ronald Tetzlaff serves as a reviewer for several journals and for the European Commission.

Wednesday, June 28th	
08:20-09:00 (GMT+03:00)	**Registration**
09:00-09:30 (GMT+03:00)	**Opening Session**
09:30-11:00 (GMT+03:00)	**Session A1: Analog RF and mixed signal Circuits** **Session Chair: Prof. Costas Psychalinos**
paper 14 22 min	Modified Pre-Processing Stage for Improving the Noise Immunity of the Pan-Tompkins Algorithm. Julia Nako[1], Costas Psychalinos[1] and Ahmed S. Elwakil[2] [1]Electronics Lab, Physics Dpt, Univ. of Patras, Greece [2]Dpt of Electrical and Computer Engineering, Univ. of Sharjah, United Arab Emirates
paper 26 22 min	An Integrated LNA and SPDT Switch with a Notch Filter in 65-nm SOI CMOS Technology Xiaowei Wang, Zhiqun Li, Hao Yuan, Jiancong Du, Zhennan Li Institute of RF-& OE-ICs, Southeast Univ, Nanjing, China Engineering Research Center of RF-ICs and RF-Systems, Ministry of Education, China Engineering Research Center of RF-& OE-ICs, Jiangsu Province, Southeast Univ, Nanjing, China
paper 41 22 min	A 80 GHz VCO using Transformer Based Frequency Doubler Ioannis Dimitrios Psycharis and Grigorios Kalivas Department of Electrical and Computer Engineering, University of Patras, Greece
paper 73 22 min	A 2.1-fJ/Conversion-Step 10-bit 125-KS/s SAR ADC with Vcm-based Bidirectional Single-side Switching Scheme Linlin Huang, Junhui Li, Xupeng Jiang, Jianhui Wu School of Electronic Science and Engineering, Southeast University, Nanjing, China
09:30-11:00 (GMT+03:00)	**Session B1: ML in Communications** **Session Chair: Prof. Alberto Garcia-Oritz**
paper 12 22 min	Machine Learning-Based Surrogate Modelling of Reflectarray Unit Cell in a 4-D Parallelotope-Shaped Domain Daniel R. Prado, Jesus A. Lopez-Fernandez and Manuel Arrebola Group of Signal Theory and Communications, Universidad de Oviedo, Spain.

Wednesday, June 28th	
paper 18 22 min	Programmable Metasurface-Based Beam Forming by Physics-Driven Deep Learning Network Jianghan Bao[1,2], Wen Ming Yu[1,2], Tie Jun Cui[1,2], Che Liu[1,2] [1]Inst. of Electromagnetic Space, Southeast Univ, Nanjing, China [2]State Key Lab of Millimeter Wave, Southeast Univ, Nanjing, China
paper 63 22 min	Supervised Machine Learning for Refractive Index Structure Parameter Modeling Antonios Lionis[1], Konstantinos Peppas[1], Andreas Tsigkopoulos[2], Hector E. Nistazakis[3], Keith Cohn[4], Kyle R. Drexler[5] [1]Univ of Peloponnese, Tripoli, Greece [2]Hellenic Naval Academy, Piraeus, Greece [3]National and Kapodistrian Univ, Athens, Greece [4]Naval Postgraduate School, Monterey, California, USA [5]Naval Information Warfare Center Pacific, San Diego, California, USA
paper 80 22 min	GLRP: Guided by Layer-wise Relevance Propagation – Selecting Crucial Neurons in Artificial Neural Networks Fin H. Bahnsen[1], Bernhard J. Berger[2], Goerschwin Fey[2] [1]University Medicine Essen, Germany [2]Hamburg University of Technology, Germany
11:00-11:30 **(GMT+03:00)**	**Coffee Break**
11:30-12:30 **(GMT+03:00)**	**Plenary Speech 1: Some Insights on the implementation of the smart EM environment - Scenarios, Architectures, Devices and Planning.** **Speaker: Prof. Andrea Massa** **Session Chair: Prof. Sotirios Goudos**
12:30-14:00 **(GMT+03:00)**	**Lunch Break**
14:00-15:00 **(GMT+03:00)**	**Plenary Speech 2: Edge of Chaos theory of Sheds Light into the emergence of a fundamental bifurcation phenomenon in neuronal axon membranes** **Speaker: Dr. Alon Ascoli** **Session Chair: Prof. Ioannis Vourkas**

Wednesday, June 28th	
15:00-15:30 **(GMT+03:00)**	**Coffee Break, Poster Session**
15:30-16:30 **(GMT+03:00)**	**Poster Session 1: Analog and Digital Circuits** **Session Chair : Prof. Efstathios Kyriakis-Bitzaros**
paper 5	A 30-GHz Frequency Doubler Using a Current Folding Technique in 90-nm CMOS Technology Ke-Chiao Chou, Chun-Hung Lin and Ching-Yuan Yang National Chung Hsing University, Taiwan (ROC)
paper 6	Service recommendation for a group of users on the Internet of things using the most popular service Seyed Salar Sefati, Simona Halunga University Polytehnic of Bucharest, Bucharest, Romania
paper 13	A CMOS VCO ring oscillator suitable for wide supply range applications Vasileios Kalenteridis[1], Konstantinos P. Pagkalos[2], Orfeas Panetas-Felouris[2], Spyridon Vlassis[2] [1]Thess IC SMPC, Thessaloniki, Greece [2]Electronics Lab, Physics Dpt, Univ of Patras, Greece
paper 24	An Improved Memristor Model and Applications Valeri Mladenov and Stoyan Kirilov Dpt Fundamentals of Electrical Engineering, Technical University of Sofia, Bulgaria
paper 27	A 2.4 GHz Doherty Power Amplifier Based on Voltage Combining in 22 nm CMOS Jiancong Du[1,2,3], Zhiqun Li[1,2,3], Zhennan Li[1,2,3] [1] Inst. of RF-& OE-ICs, Southeast Univ, Nanjing, China [2] Engineering Research Center of RF-ICs and RF-Systems, Ministry of Education, China [3] Engineering Research Center of RF-& OE-ICs, Jiangsu Province, Southeast Univ, Nanjing, China
paper 47	An Area-Efficient, Analog Integrated Image Edge Detector based on the Robert's Cross Operator Georgios Gennis, Argyro Kamperi, Vassilis Alimisis, Christos Dimas and Paul P. Sotiriadis National Technical University of Athens, Greece
paper 68	Analog Latch for Time-Mode PWM Signal Processing Konstantinos P. Pagkalos[1], Orfeas Panetas-Felouris[1], Vasileios Kalenteridis[2], Spyridon Vlassis[1] [1]Electronics Lab, Physics Dpt, Univ of Patras, Greece [2]Thess IC SMPC, Thessaloniki, Greece

Wednesday, June 28th	
paper 75	Low-Power Data Streaming in Systolic Arrays with Bus-Invert Coding and Zero-Value Clock Gating Christodoulos Peltekis[1], Dionysios Filippas[1], Giorgos Dimitrakopoulos[1] and Chrysostomos Nicopoulos[2] [1]Democritus University of Thrace, Xanthi, Greece [2]University of Cyprus, Cyprus
paper 79	An ultra low-power and low-cost IoT node with LoRa/LTE/GPRS connectivity Evangelos Skoubris and George Hloupis University of West Attica, Athens, Greece
paper 82	A generic compact and stochastic model for non-filamentary analog resistive switching devices Sahitya Yarragolla, Torben Hemke, and Thomas Mussenbrock Ruhr University Bochum, Bochum, Germany
paper 83	Improved Fault Detection of Analog Circuits by utilizing the Fundamental RMS of the Supply Current Fluctuation Vassilios Vassios, Argirios Hatzopoulos and Dimitrios Papakostas International Hellenic University, Thessaloniki, Greece
paper 86	Wave-Pipelined Source-Synchronous Circuit-Switched Data Transmission Sebastian Fischer, Amir Najafi, and Alberto Garcia-Ortiz ITEM.ids, University of Bremen, Germany
paper 88	High-Performance and Low-Cost Approximation of ANN Sigmoid Activation Functions on FPGAs Kostantinos Tatas, Michalis Gemenaris Frederick University, Nicosia, Cyprus
paper 89	Modeling of memristor-based RF switches E. Tsipas[1], E. Stavroulakis[1], I. K. Chatzipaschalis[1,2], K. Rallis[1,2], N. Vasileiadis[1], P. Dimitrakis[3], A. Kostopoulos[4], G. Konstantinidis[4], and G. Ch. Sirakoulis[1] [1]Democritus University of Thrace, Xanthi, Greece [2]Universitat Politecnica de Catalunya, Barcelona, Spain [3]National Center for Scientific Research "Demokritos", Athens, Greece [4]Foundation for Research & Technology Hellas (FORTH), Heraklion, Greece

Wednesday, June 28th	
paper 96	Modelling and Verification of MOS Transistors at Cryogenic Temperature
	A.Andreani[1,2], L.Frontini[1,2], V.Liberali[1,2], A.Stabile[1.2] and V. Trabattoni[1]
	[1]Dpt of Physics, Universita degli Studi di Milano, Italy
	[2]INFN – Sezione di Milano, Italy
paper 97	MetaSPICE: Metaprogramming SPICE Framework for the Design Space Exploration of PUF Circuits
	Athanasios Xynos, Vasileios Tenentes
	University of Ioannina, Greece
paper 106	A CMOS Threshold Voltage Monitoring Sensor
	K.Moustakas[1], V.Gogolou[2], T.Noulis[2], D.Tassis[2] and S.Siskos[2]
	[1]Paul Scherrer Institute, Switzerland
	[2]Aristotle University of Thessaloniki, Greece.
paper 107	CMOS Folded-Cascode versus Inverter-based CSA towards Noise Performance and Speed
	Vasiliki Gogolou[1], Thomas Noulis[1] and J. Dingfelder[2]
	[1]Aristotle University of Thessaloniki, Greece.
	[2]Universität Bonn, Physikalisches Institut, Germany
paper 108	Digital to Pulse-Width Converter for Time-Mode PWM signal processing
	Orfeas Panetas-Felouris[1], Konstantinos P. Pagkalos[1], Spyridon Vlassis[1] and Vasileios Kalenteridis[2]
	[1]Electronics Lab., Physics Dpt, Univ of Patras, Greece
	[2]Thess IC SMPC, Thessaloniki, Greece
paper 109	Hardware Accelerators based on wavelets for detection of Transient phenomena in smart grids
	N.Papanikolaou, N.Tzanis, E.Mylonas, M.Birbas, A.Birbas
	Univ of Patras, Greece
16:30-18:20 **(GMT+03:00)**	**Session A2: Circuit design aspects** **Session Chair : Prof. Georgios Sirakoulis**
paper 19 22 min	Multi-Armed Bandits for Autonomous Test Application in RISC-V Processor Verification
	G. Dimitrakopoulos[1], E. Kallitsounakis[1], Z. Takakis[1], A. Stefanidis[1] and C. Nicopoulos[2]
	[1]Democritus University of Thrace, Xanthi, Greece
	[2]University of Cyprus, Cyprus

Wednesday, June 28th	
paper 46 22 min	Construction of Piecewise Chaotic Maps With Tunable Statistical Mean Lazaros Moysis [1,2], Marcin Lawnik [3], Murilo S. Baptista [4], Sotirios Goudos [1], Christos Volos [1] [1]Physics Dpt, Aristotle Univ of Thessaloniki, Greece. [2]University of Western Macedonia, Kozani, Greece. [3]Silesian University of Technology, Poland [4]University of Aberdeen, UK
paper 56 22 min	A Wide Tuning Range Bandpass Filter Using Unequal Width Parallel-Coupled Dual- Mode Resonator D. Chatzichristodoulou[1,2], M. Yiannakou[2], D.E. Anagnostou[3], S. Nikolaou[2,4], Ph. Vryonides[2,4] [1]RF and Microwave Solutions LTD, Cyprus [2]Frederick Research Center, Nicosia, Cyprus [3]Herriot Watt University, Edinburg, UK [4]Frederick University, Nicosia, Cyprus
paper 57 22 min	A Novel Design Methodology for Modular, Digitally Controlled, Multiband, mmWave LNAs Georgios Chararas[1], Athanasios Stefanou[1,2], Alkiviadis Hatzopoulos[1], and Vasilis F. Pavlidis[1] [1]Aristotle Univ. of Thessaloniki, Greece, [2]SKG-IC LTD, UK
paper 69 22 min	BTI Aging Influence and Mitigation in Neural Networks Oriented In-Memory Computing SRAMs Christina Dilopoulou and Yiorgos Tsiatouhas University of Ioannina, Greece
16:30-18:20 (GMT+03:00)	Session B2: Complementary aspects of Artificial Intelligence, Unmanned Aerial Vehicles, and Future Wireless Networks Session Chair : Dr. Zaharias Zacharis
paper 33 22 min	The Human Blockage Impact on ARIS Assisted D2D Communication Systems Ahmed M. Nor[1,2], Octavian Fratu[2], Simona Halunga[2] [1] Univ. Politehnica of Bucharest, Romania [2] Aswan University, Egypt
paper 120 22 min	DOA Estimation for 6G Communication Systems H. Al Kassir[1], I. T. Rekanos[1], P. I. Lazaridis[2], T. V. Yioultsis[1], N. V. Kantartzis[1], C. S. Antonopoulos[1], G. K. Karagiannidis[1], Z. D. Zaharis[1] [1]Aristotle University of Thessaloniki, Greece, [2]University of Huddersfield, U.K.

Wednesday, June 28th	
paper 121 22 min	3D Adaptive Beamforming Approach with a Fine-Tuned Deep Neural Network Ioannis Mallioras[1,2], Traianos V. Yioultsis[1], Nikolaos V. Kantartzis[1], Pavlos I. Lazaridis[3], Zaharias D. Zaharis[1] [1]Aristotle University of Thessaloniki, Greece [2]Maggioli SpA, Santarcangelo Di Romagna, Italy [3]University of Huddersfield, U.K.
paper 122 22 min	A Review of Deep Learning Solutions in 360° Video Streaming Moatasim Mahmoud[1], Stamatia Rizou[1], Andreas S. Panayides[2], Pavlos I. Lazaridis[3], Nikolaos V. Kantartzis[4], George K. Karagiannidis[4], Zaharias D. Zaharis[4] [1]Singular Logic, Athens, Greece [2]VIDEOMICS Group, CYENS Centre of Excellence, Nicosia, Cyprus [3]University of Huddersfield, U.K. [4]Aristotle University of Thessaloniki, Greece
paper 123 22 min	FDTD modeling of graphene-based materials and its application in sensing devices Pablo H. Zapata Cano[1], Stamatios Amanatiadis[1], Nikolaos V. Kantartzis[1], Pavlos Lazaridis[2], Traianos V. Yioultsis[1], Zaharias D. Zaharis[1] [1]Aristotle University of Thessaloniki, Greece

Thursday, June 29th	
08:40-09:00 **(GMT+03:00)**	**Registration**
09:00-11:00 **(GMT+03:00)**	**Workshop on Technology and Instrumentation for Particle Physics (TIPP)** **Session A3: Detector and Electronics** **Session Chair: Prof. K. Kordas**
09:00-09:40 **(GMT+03:00)**	**Invited Talk: Novel Picosecond Detectors** **Speaker: Prof. Spyros Tzamarias,** **Aristotle Univ. of Thessaloniki, Greece.**
09:40-10:20 **(GMT+03:00)**	**Invited Talk: Challenges for the upgrade of large, long-lifetime collider detectors, with examples mostly from ATLAS and its muon system** **Speaker: Dr. Massimo Corradi** **INFN-Roma, Italy**
10:20-10:40 (GMT+03:00) paper 119	Muon Tomography Application with Micromegas Detectors D. Sampsonidis[1,2], D. Amperiadou[1,2], C. Petridou[1,2], S. Tzamarias[1,2], K. Kordas[1,2], C. Lampoudis[1,2], A. Leisos[3], A. Tsirigotis[3], C. Tsiafis[2,4], S. Kompogiannis[2,4] [1]Dpt of Physics, Aristotle Univ. of Thessaloniki, Greece [2]Center for Interdisciplinary Research and Innovation, Thessaloniki, Greece [3]Physics Lab., School of Science and Technology, Hellenic Open University, Patras, Greece [4]Dpt of Mech. Engineering, Aristotle Univ of Thessaloniki, Greece Speaker: Prof. Dimos Sampsonidis, AUTh. Greece
10:40-11:00 (GMT+03:00) paper 124	Performance of MicroMegas Electronics in a High-Radiation Environment F. Kolitsi[1], T. Alexopoulos[2], V. D'Amico[3], F. Fallavollita[4], R. Hertenberger[3], G. Iakovidis[7], N. Kanellos[2], Ch. Kitsaki[2], S. Kompogiannis[6], E. Kyriakis-Bitzaros[1], I. Mesolongitis[1], G. Sekhniaidze[5], F. Vogel[3], K. Zachariadou[1] [1]University of West Attica, Greece [2]National Technical University of Athens, Greece [3]Ludwig Maximilian University of Munich, Germany [4]Institut fuer Physik, Universitaet Mainz, Germany [5]INFN and Universita di Napoli, Naples, Italy [6]Aristotle University of Thessaloniki, Greece [7]Brookhaven National Laboratory, USA Speaker: Mrs. Fotini Kolitsi, UNIWA, Greece

Thursday, June 29th	
09:00-11:00	**Session B3: Communication Systems**
(GMT+03:00)	**Session Chairs: Prof. Maria Papadopoulou and Dr. Achilles Boursianis**

paper 25 22 min	A Game Theoretic Approach to Enhance DCF Performance in Full Duplex Ad-hoc WLANs
	Anastasios C. Politis, Hristos T. Anastassiu and Constantinos S. Hilas
	Dpt of Computer, Informatics and Telecommunications Eng., International Hellenic Univ, Serres, Greece
paper 44 22 min	Smart Electromagnetic Environments Empowering Future Communication Systems: A Real-World Indoor Experimental Validation
	Federico Capra[1], Federico Albi[1], Arianna Benoni[1], Danilo Erricolo[2], Giacomo Oliveri[1], Paolo Rocca[1,3], Marco Salucci[1], Shiwen Yang[4], and Andrea Massa[4,1,5]
	[1]ELEDIA Research Center, Univ. of Trento, DICAM, Trento, Italy
	[2]ELEDIA Research Center, Univ. of Illinois Chicago, Chicago, IL, USA
	[3]ELEDIA Research Center, Xidian University, Xi'an, Shaanxi Province, China
	[4]ELEDIA Research Center, UESTC, Chengdu, China
	[5]ELEDIA Research Center, Tsinghua Univ, Beijing, China
paper 48 22 min	MIMO Channel Measurements in a Tree Covered Urban Environment for Low-Altitude UAVs
	Konstantinos Psychogios, Nektarios Moraitis, and Athanasios D. Panagopoulos
	National Technical Univ. of Athens, Greece
paper 62 22 min	ABER Estimation of NLOS UV Links with Time Diversity over K-Turbulent Channels and Path Loss
	G.K. Varotsos[1], H.E. Nistazakis[1], E. Kapotis[1], E.V. Chatzikontis[1], K. Aidinis[2], C.K. Volos[3]
	[1]National and Kapodistrian University of Athens, Greece
	[2]Ajman University, United Arab Emirates
	[3]Aristotle University of Thessaloniki, Greece
paper 87 22 min	Periodic Magnetically-biased Graphene Gratings for Effective Transmission Enhancement and Polarization Selective Features
	Stamatios Amanatiadis, Vasileios Salonikios, Nikolaos Kantartzis, Traianos Yioultsis
	Dpt of Electrical & Computer Eng, Aristotle University of Thessaloniki, Thessaloniki, Greece

Thursday, June 29th	
11:00-11:30 **(GMT+03:00)**	**Coffee break**
11:30-12:30 **(GMT+03:00)**	**Plenary Speech 3: Hybrid pixel detectors: from the discovery of the Higgs Boson to advances in medical imaging** **Speaker: Dr. Michael Campbell, CERN, Switzerland** **Session Chair: Dr. Kostas Kloukinas**
12:30-13:30 **(GMT+03:00)**	**Workshop on Technology and Instrumentation for Particle Physics (TIPP)** **Session A3b: Triggering & DAQ** **Session Chair: Prof. Aikaterini Zachariadou**
12:30-13:10 **(GMT+03:00)**	**Invited Talk: Hardware Triggering in High Energy Physics** **Speaker: Dr. Riccardo Vari** **INFN-Roma, Italy**
13:10-13:30 (GMT+03:00) paper 118	The ATLAS RPC-BIS78 Readout and Trigger System Andreas Vgenopoulos[1], Riccardo Vari[2], Federico Lasagni[3], Kostas Kordas[1], Alessandro Polini[3] [1]Physics Dpt, Aristotle Univ. of Thessaloniki, Greece [2]INFN-Rome, Rome, Italy [3]INFN Sezione di Bologna, INFN, Bologna, Italy Speaker: Mr. Andreas Vgenopoulos, AUTh, Greece
12:30-13:30 **(GMT+03:00)**	**Poster Session 2: Communication Systems** **Session Chair : Prof. Spyridon Nikolaidis**
paper 10	Synthesis of Ultra-Wideband Rectenna for RF Energy Harvesting From Wireless Communications Networks Georgios Korompilis and Katherine Siakavara School of Physics, Aristotle University of Thessaloniki, Greece
paper 17	On the Additive Manufacturing of Conformal Slotted Waveguide Antennas Charalampos Stoumpos[1], Thierry Le Gouguec[2], Rozenn Allanic[2], Maria Garcia-Vigueras[1], Sarra Abedrabba[2], Erwan Fourn[1], Thomas Merlet[3], Anne-Charlotte Amiaud[3] [1]Institut d'Electronique et des Technologies du numeRique, INSA de Rennes, Rennes, France [2]Lab-STICC, Universite de Bretagne, Occidentale, Brest, France [3]Thales LAS France SAS, Elancourt, France

Thursday, June 29th	
paper 21	A Vision-based Deep Learning Platform for Human Motor Activity Recognition Mobina Mobaraki, Anushree Bannadabhavi, Matthew J. Yedlin, and Bhushan Gopaluni University of British Columbia, Vancouver, BC, Canada
paper 38	Using Fulkerson-Ford Algorithm for UE - AP Association in mmWave Cellular Networks K.N. Manganaris[1], F.I. Lazarakis[1] and K.P. Peppas[2] [1]National Centre for Scientific Research "Demokritos", Greece, [2]University of Peloponnese, Tripoli, Greece
paper 49	A Comparative Study of a Reflectarray Antenna Based on Optical Transparent Materials E. Vassos[1], P.I. Theoharis[2], S. Chalkidis[1], F. Tubbal[2], R. Raad[2], A. Feresidis[1] [1]University of Birmingham, Birmingham, UK [2]University of Wollongong, Wollongong, NSW, Australia
paper 50	Progressive Multi-Secret Sharing of Color Images Using Lorenz Chaotic System B.K. Sharobim[1], S.K. Abd-El-Hafiz[2], A.G. Radwan[2,3] [1]Nanoelectronics Integrated Systems Center, Nile University, Giza, Egypt [2]Engineering Mathematics Dpt, Faculty of Engineering, Cairo University, Giza, Egypt [3]School of Engineering and Applied Sciences, Nile University, Giza, Egypt
paper 53	A portable RF signal attenuation testbed A.Sakkas[1], V. Christofilakis[1], G. Tatsis[1], G.Baldoumas[1], E.K. Evangelou[1], H.E.Nistazakis[2] [1]University of Ioannina, Ioannina, Greece. [2]National and Kapodistrian University of Athens, Athens, Greece
paper 58	DAQ system for the readout of a flash-ADC based front-end channel matrix A. Galliani, L. Gaioni, G. Traversi Universita degli Studi di Bergamo, Dalmine , Italy and INFN, Sezione di Pavia, Italy
paper 60	A Real-time Chaos-based Audio Encryption Scheme Ioannis Kafetzis[1], Christos Volos[1], Hector E. Nistazakis[2], Sotirios Goudos[1], Nikolaos G. Bardis[3] [1]Physics Dpt, Aristotle Univ. of Thessaloniki, Greece [2]National and Kapodistrian University of Athens, Greece [3]Hellenic Army Academy, Vari, Greece

Thursday, June 29th

paper 67	Divergent Gaussian Beams of FSO Links with Power Losses and Pointing Errors P.J. Gripeos[1], H.E. Nistazakis[1], E. Roditi[1], E. Kapotis[1], C.K. Volos[2], V. Christofilakis[3] [1]National and Kapodistrian Univ. of Athens, Greece [2]Physics Dpt, Aristotle Univ. of Thessaloniki, Greece [3]Physics Dpt, University of Ioannina, Ioannina, Greece
paper 71	Implementation of Robots in Autism Spectrum Disorder Research: Diagnosis and Emotion Recognition and Expression Konstantinos-Filippos Kollias[1], Luis Miguel Maia Marques Torres E Silva[2], Panagiotis Sarigiannidis[1], Christine K. Syriopoulou-Delli[3], George F. Fragulis[1] [1]University of Western Macedonia, Kozani, Greece [2]University of Porto, Porto, Portugal [3]University of Macedonia, Thessaloniki, Greece
paper 72	A Dataset for Aftermath Victim Detection Behind Walls or Obstacles Using an UWB Radar Sensor D. Uzunidis[1], E. Margaritis[2], C. Chatzigeorgiou[1], C.Z. Patrikakis[1], S. A. Mitilineos[1] [1]University of West Attica, Athens, Greece [2]ASPETE Athens, Greece
paper 81	Numerical Validation of Analytical Results for FSO Links with Chromatic Dispersion and Normally Distributed Time Jitter P.J. Gripeos[1], H.E. Nistazakis[1], E. Kapotis[1], E.V. Chatzikontis[1], A. Katsis[2], V. Christofilakis[3] [1]National and Kapodistrian Univ. of Athens, Greece [2]University of the Peloponnese, Korinthos, Greece [3]Physics Dpt, University of Ioannina, Ioannina, Greece
paper 94	Non-standalone (NSA) 5G system measurements George V. Tsoulos, Georgia Athanasiadou, George Nikitopoulos, Vassilios Tsoulos University of Pelloponeese, Tripolis, Greece
paper 112	5G Core PFCP Intrusion Detection Dataset G. Amponis[1,2], P. Radoglou-Grammatikis[1,3], G. Nakas[1], S. Goudos[4], V. Argyriou[5], T. Lagkas[2] and P. Sarigiannidis[3] [1]K3Y Ltd. Sofia, Bulgaria [2]International Hellenic University, Kavala, Greece [3]University of Western Macedonia, Kozani, Greece [4]Aristotle University of Thessaloniki, Greece [5]Kingston Univ. London, Kingston upon Thames, UK

Thursday, June 29th	
paper 113	Evaluating the Effect of Volatile Federated Timeseries on Modern DNNs: Attention over Long/Short Memory I.Siniosoglou[1], K.Xouveroudis[2], V.Argyriou[3], T.Lagkas[4], S.K. Goudos[5], K.E. Psannis[6] and P. Sarigiannidis[1] [1]University of Western Macedonia, Kozani, Greece [2]MetaMind Innovations P.C., Kozani, Greece [3]Kingston University, Kingston upon Thames, UK [4]International Hellenic University, Kavala, Greece [5]Aristotle University of Thessaloniki, Greece [6]University of Macedonia, Thessaloniki, Greece
13:30-14:45 **(GMT+03:00)**	**Lunch Break**
14:45-16:35 **(GMT+03:00)**	**Workshop on Technology and Instrumentation for Particle Physics (TIPP)** **Session A4: Front ends for Readout and Control** **Session Chair: Prof. Efstathios Kyriakis-Bitzaros**
14:45-15:15 **(GMT+03:00)**	**Invited talk: Developing complex front-end read out systems and ASICs for HL-LHC experiments; the CMS Outer Tracker case** **Speaker: Dr. Kostas Kloukinas** **CERN, Switzerland**
15:15-15:45 **(GMT+03:00)**	**Invited talk: Precision Timing ASIC development for LGAD-based CMS Endcap Timing Layer (ETL) upgrade** **Speaker: Dr. Tiehui Ted Liu** **Fermi National Accelerator Lab, USA**
15:45-16:10 (GMT+03:00) paper 125	Radiation-Tolerant SoC and Application-Specific Processors for On-Detector Programmability and Data Processing in Future High-Energy Physics Experiments Marco Andorno, Alessandro Caratelli, Davide Ceresa, Jashandeep Dhaliwal, Kostas Kloukinas, Anvesh Nookala, Risto Pejasinovic CERN, Geneva, Switzerland Speaker : Marco Adorno, CERN, Switzerland
16:10-16:30 (GMT+03:00) paper 20	Data Preparation And Optimization For Real Time Track Reconstruction On The ATLAS HTT PRM Board Konstantinos Axiotis, on behalf of the ATLAS TDAQ collaboration Universite de Geneve, CERN, Geneva, Switzerland Speaker: Konstantinos Axiotis, CERN, Switzerland
14:45-16:35 **(GMT+03:00)**	**Session B4: Special Session on Novel Theoretical and Practical Developments in Memristor Device, Circuit, and System Research** **Session Chair: Dr. Alon Ascoli**

	Thursday, June 29th
paper 9 22 min	Brain-like features of MemComputing machines Massimiliano Di Ventra University of California, San Diego, La Jolla, CA, USA
paper 16 22 min	Cellular Nonlinear Network Circuit Model with Application to Seizures Prediction Angela Slavova[1], Ventsislav Ignatov[2] [1]Bulgarian Academy of Sciences, Sofia, Bulgaria [2]University of Ruse "Angel Kanchev", Russe, Bulgaria
paper 37 22 min	A pseudo-memcapacitive neurotransistor for spiking neural networks Richard Schroedter[1], Ahmet Samil Demirkol[1], Alon Ascoli[1], Benjamin Max[2], Florian Nebe[2], Thomas Mikolajick[2], Ronald Tetzlaff[1] [1]Chair of Fundamentals of Electrical Engineering, Technische Universitat Dresden, Dresden, Germany [2]Chair of Nanoelectronics, Technische Universitat Dresden, Dresden, Germany
paper 42 22 min	DC Characterization of Numerically Efficient and Stable Locally Active Device Models A.S. Demirkol, I. Messaris, A. Ascoli and R. Tetzlaff Technical University of Dresden, Dresden, Germany
paper 51 22 min	A Reference-less Sense Amplifier to Sense pA Currents in Ferroelectric Tunnel Junction Memories John Reuben[1], Dietmar Fey[1], Stefan Slesazeck[2] [1]Friedrich-Alexander-Universitat Erlangen-Nurnberg, Erlangen, Germany [2]NaMLab gGmbH, Dresden, Germany
16:35-17:00 (GMT+03:00)	**Coffee Break**
17:00-18:20 (GMT+03:00)	**Workshop on Technology and Instrumentation for Particle Physics (TIPP)** **Session A5: Accelerators and Beam Instrumentation** **Session Chair: Prof. Aikaterini Zachariadou**
17:00-17:40 (GMT+03:00)	**Invited talk: Present and Future Accelerator Physics Challenges at CERN** **Speaker: Dr. Yannis Papaphilippou** **CERN, Switzerland**
17:40-18:20 (GMT+03:00)	**Invited Talk: Development of Radiation-Tolerant and High-Reliability Beam Loss Monitoring Electronics for HL-LHC at CERN** **Speaker: Dr. Christos Zamantzas** **CERN, Switzerland**

Thursday, June 29th	
17:00-18:50 **(GMT+03:00)**	**Session B5: Special Session: Novel Theoretical and Practical Developments in Memristor Device, Circuit, and System Research** **Session Chair: Dr. Alon Ascoli**
paper 117 22 min	The Design of a Resistive Switching Characterisation Platform Based on Discrete Current-Conveyors Adil Malik, Andrea Mifsud, Abdulaziz Alshaya, Christos Papavassiliou Imperial College London, London, Britain
paper 98 22 min	Empirical Analysis of Full-System Approximation on Non-Spiking and Spiking Neural Networks Amir Najafi, David Rotermund, Ardalan Najafi, Klaus R. Pawelzik, and Alberto Garcia-Ortiz University of Bremen, Germany
paper 104 22 min	Implementation of the XOR gate with two memristive neurons Andras Horvath[1], Alon Ascoli[2], Ronald Tetzlaff[2] [1]Peter Pazmany Catholic Univ., Budapest, Hungary [2]Technische Universitat Dresden, Dresden, Germany
paper 110 22 min	RevI-Ve: A Comprehensive Software Interface for Easy ReRAM Device Characterization Juan Riquelme[1], Matias Melivilu[1], Ioannis Vourkas[1], Albert Cirera[2] [1]Univ. Tecnica Federico Santa Maria, Valparaiso, Chile [2]Universitat de Barcelona, Barcelona, Spain
paper 116 22 min	Exploration of Bistable Oscillatory Dynamics in a Memristor from Forschungszentrum Julich N. Schmitt[1], A. Ascoli[1], I. Messaris[1], A.S. Demirkol[1], V. Ntinas[1], D. Prousalis[1], and R. Tetzlaff[1], S. Nikolaidis[2], S. Menzel[3], V. Rana[4] [1]Institute of Circuits and Systems, Faculty of Electrical and Computer Engineering, Technische Universitat Dresden, Dresden, Germany [2]Aristotle Univ. of Thessaloniki, Thessaloniki, Greece [3]Peter Grunberg Institut 7,Forschungszentrum Julich GmbH, [4]Peter Grunberg Institut 10, Forschungszentrum Julich GmbH
20:45- **(GMT+03:00)**	**Conference Dinner**

Friday, June 30th

09:10-09:30 (GMT+03:00)	**Registration**
09:30-10:30 (GMT+03:00)	**Plenary Speech 4: How to program a memristor for high frequency inputs?** **Speaker: Prof. Ronald Tetzlaff** **Session Chair: Dr. Alon Ascoli**
10:30-11:00 (GMT+03:00)	**Coffee Break**
11:00-12:50 (GMT+03:00)	**Session A6: Applications and power management** **Session Chairs: Prof. Stelios Mitilineos and Prof. Alkis Hatzopoulos**

paper 8 22 min	Real-time Energy Management System for a Multiport DC/AC Inverter
	Michail Dakanalis, Iason Kalaitzakis, Ioannis Roditis, Eftichios Koutroulis, Fotios D. Kanellos, Eleftheria Sergaki
	Technical University of Crete, Chania, Greece
paper 74 22 min	APNIWAVE: An Efficient Radar-Based Sleep-Apnea Screening Device for Use at Home
	Dimitris Uzunidis[1], Dimitris Liapis[2], Panagiotis Kasnesis[1], Christos Ferles[1], Evangelos Margaritis[3], Charalampos Z. Patrikakis[1], Georgios Tzanis[2], Simos Symeonidis[4], Stelios A. Mitilineos[1]
	[1]University of West Attica Athens, Greece
	[2]"Vascular Research" Private Medical Center Athens, Greece
	[3]ASPETE Athens, Greece
	[4]Eight Bells Greek branch, Athens, Greece
paper 76 22 min	Design Considerations of an LLC Converter for TEG-based WHR Systems in Shipboard Microgrids
	Nick Rigogiannis[1], Ioannis Roussos[1], Christos Pechlivanis[1], Ioannis Bogatsis[1], Anastasios Kyritsis[2], Nick Papanikolaou[1], Michael Loupis[3]
	[1]Department of Electrical and Computer Engineering, Democritus University of Thrace, Xanthi, Greece
	[2]Department of Environment, Ionian University., Zakynthos, Greece
	[3]General Department, National and Kapodistrian University of Athens, Psachna, Greece

Friday, June 30th	
paper 93 22 min	Acoustic Emission Source Localization using Approximate Discrete Wavelet Transform
	Ardalan Najafi, Wanli Yu, Yarib Nevarez, Amir Najafi, Andreas Beering, Karl-Ludwig Krieger, A. Garcia-Ortiz
	University of Bremen, Bremen, Germany
paper 111 22 min	HW Implementation of Cellular Automata Models Supporting AgriFood Quality Control Processes
	R. Mardones[1], I. Vourkas[1], G. Ch. Sirakoulis[2]
	[1]Universidad Tecnica Federico Santa Maria, Valparaiso, Chile
	[2]Democritus University of Thrace, Xanthi, Greece
12:50-14:00 (GMT+03:00)	Lunch Break
14:00-15:00 (GMT+03:00)	Poster Session 3: Modeling, Systems and ML applications Session Chair Prof. Sotiria Galata
paper 3	Novel Environmental Magnetic Field Measurement Using A Drone
	Che-Peng Chao and Kun-Long Chen
	National Taiwan University of Science and Technology, Taipei City, Taiwan (ROC)
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	Binjin Chen, Weiting Liu, Meng Wang, Yawu Su, Zhiguo Shao, Ligang Qi, Huiqin Yao
	China Construction Eighth Engineering Division Corp, LTD, Shanghai, China
paper 23	Design and simulation of a classic controller to reduce undesired coupling axial and torsional vibrations in a horizontal drill string
	Amir Hossein Barjini, Hamed Moradi
	Sharif University of Technology, Tehran, Iran
paper 31	Energy Consumption Assessment in Refrigeration Equipment: The SmartFridge Project
	A.I. Griva[1], V.P. Rekkas[1], K. Koritsoglou[2], S.P. Sotiroudis[1], A.D. Boursianis[1], M.S. Papadopoulou[3], S.K. Goudos[1]
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	[3]Department of Information and Electronic Engineering, International Hellenic University, Sindos, Greece

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paper 32	Model-Agnostic Meta-Learning Techniques: A State-of-The-Art Short Review
	A.I. Griva[1], A.D. Boursianis[1], L.A. Iliadis[1], P. Sarigiannidis[2], G. Karagiannidis[1], S.K. Goudos[1]
	[1]Aristotle Univ. of Thessaloniki, Thessaloniki, Greece
	[2]University of Western Macedonia, Kozani, Greece
paper 34	Greek Orthodox Church Hymns Recognition Using Deep Learning Techniques
	N. Tsakatanis[1], L. A. Iliadis[1], A. D. Boursianis[1], K.I. D. Kokkinidis[2], G. Patronas[2], P. Serafeim[2], M. S. Papadopoulou[3], S. K. Goudos[1]
	[1]Aristotle Univ of Thessaloniki, Thessaloniki, Greece
	[2]University of Macedonia, Thessaloniki, Greece
	[3]International Hellenic University, Sindos, Greece
paper 39	A Discrete Memristive Hyperchaotic Map with a Modulo Function
	Lazaros Laskaridis, Christos Volos, Ioannis Stouboulos and Ioannis P. Antoniades
	Aristotle Univ of Thessaloniki, Thessaloniki, Greece
paper 54	The Challenges of Music Deep Learning for Traditional Music
	L. Moysis [1,2], L. A. Iliadis[1], S. P. Sotiroudis[1], K. Kokkinidis[3], P. Sarigiannidis[2], S. Nikolaidis[1], Ch. Volos[1], A.D. Boursianis[1], D. Babas[1], M. S. Papadopoulou[1,4], S.K. Goudos[1]
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	[4]International Hellenic University, Greece
paper 59	A Lightweight CNN Model for Tomato Crop Diseases on Heterogeneous Embedded System
	Theodora Sanida[1], Maria Vasiliki Sanida[2], Argyrios Sideris[1] and Minas Dasygenis[1]
	[1]University of Western Macedonia, Kozani, Greece
	[2]University of Piraeus, Piraeus, Greece
paper 64	Study on Calibration Method using Pseudo Acceleration for MEMS Accelerometers
	Takahiro Natori[1] and Naoyuki Aikawa[2]
	[1]Tokai University, Kumamoto, Japan
	[2]Tokyo University of Science, Tokyo, Japan

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paper 66	Implementation of a Physically Unclonable Function using LEDs and LDRs
	Emil Hristov[1], Rodrigo Picos[1], Carol de Benito[1], Stavros G. Stavrinides[2], Tolga Arul[3], Nikolaos A. Anagnostopoulos[3], M. Moner Al Chawa[4]
	[1]Universitat de les Illes Balears, Palma, Spain
	[2]International Hellenic University, Kavala, Greece
	[3]University of Passau, Passau, Germany
	[4]Technical University Dresden, Dresden, Germany
paper 70	A Low-Cost Real-Time Cyber Physical System for Overcoming Excess Braking Issues In Race Cars
	V. Samaras, K. Tatas and A. Lontos
	Frederick University, Nicosia, Cyprus
paper 85	A novel dermatological diagnosis support device based on Electrical Impedance Spectroscopy (DermaSense)
	A. Moraitopoulos[1], K. Mitsopoulos[1], C. Kemanetzi[1,2], E. Lazaridou[1,2], A. Astaras[1] and P. Bamidis[1]
	[1]School of Medicine, AUTh, Thessaloniki, Greece
	[2]Papageorgiou General Hospital, Thessaloniki, Greece
paper 90	A Fractional Order Tumor Growth Model and Its Synchronization
	H. J. Contreras-Mendoza[1], J. M. Munoz-Pacheco[1], F. E. Serrano-Moncada[2], R. Torrealba-Melendez[1], C. Volos[3]
	[1]Benemerita Universidad Autonoma de Puebla, Puebla, Mexico
	[2]Universidad Nacional Autonoma de Honduras, Tegucigalpa, Honduras
	[3]Aristotle Univ. of Thessaloniki, Thessaloniki, Greece
paper 92	A novel electrical muscle stimulation device for neurorehabilitation applications with adaptable parameter optimization using AI algorithms
	A. Arsenidis[1], A. Moraitopoulos[2], A. Athanasiou[2], P. Bamidis[2], P. Stefaneas[1] and A. Astaras[3]
	[1]NTUA, Athens, Greece
	[2]AUTh, Thessaloniki, Greece
	[3]American College of Thessaloniki, Thessaloniki, Greece
paper 95	Implementation of Agricultural Path Planning with Unmanned Ground Vehicles (UGV) based on Enhanced A* Algorithm
	A. Chatzisavvas, M. Louta and M. Dasygenis
	University of Western Macedonia, Kozani, Greece

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paper 102	Delayless Controllers for Exact Model Matching and Disturbance Rejection of Time Delay Systems with Measurable and Non-measurable Disturbances Fotis N. Koumboulis and Nikolaos D. Kouvakas National and Kapodistrian University of Athens, Greece
paper 103	Approximate Computing in Critical Applications: ECG Arrhythmia Classification Ardalan Najafi, Amir Najafi, Julia Muller, Wanli Yu, Alberto Garcia-Ortiz University of Bremen, Bremen, Germany
15:00-15:20 **(GMT+03:00)**	**Coffee Break**
15:20-16:50 **(GMT+03:00)**	**Session A7: Digital Circuits** **Session Chair: Prof. Minas Dasygenis**
paper 22 22 min	Efficient ASIC Implementation for Satellite-IoT Security Co-processor Eslam AbdelBary[1], Mohamed A. Sharaf[1], Ahmed Hussein[1], Amin M. Nassar[1], and Hassan Mostafa [1,2] [1]Cairo University, Giza, Egypt [2]Zewail City for Science and Technology, Giza, Egypt
paper 36 22 min	Minimal Resource Required E-Health System with End-to-End Authenticated Encryption Mechanism Kyriaki Tsantikidou and Nicolas Sklavos University of Patras, Hellas
paper 77 22 min	Digital Implementation of I^2t Protection Scheme by means of Solid-State Devices Symeon Fountoukidis[1], Nick Rigogiannis[1], Nick Papanikolaou[1] and Michael Loupis[2] [1]Democritus Univ. of Thrace, Kimmeria-Xanthi, Greece [2]National and Kapodistrian University of Athens, Psachna, Greece
paper 91 22 min	Evaluating Versal ACAP and conventional FPGA platforms for AI inference A. Leftheriotis[1], A. Tzomaka[2], D. Danopoulos[2], G. Lentaris[2], G. Theodoridis[1], D. Soudris[2] [1]University of Patras, Patras, Greece [2]National Technical Univ. of Athens, Greece
15:20-16:50 **(GMT+03:00)**	**Session B7: Special Session: Machine Learning Applications in Communications and Electronics** **Session Chair: Prof. Sotirios Goudos**

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paper 43 22 min	Machine Learning-based Inversion of Wireless Signals for Real-Time Gesture Recognition A. Polo[1], F. Capra[1], S. Lusa[1], P. Rocca[1,2], A.Á. Salas-Sánchez[1], and M. Salucci[1] [1] ELEDIA Research Center (ELEDIA@UniTN - University of Trento), DICAM, Trento, Italy [2] ELEDIA Research Center (ELEDIA@XIDIAN - Xidian University), Xi'an, Shaanxi Province, China
paper 35 22 min	Ensemble Learning Technique for Artificial Intelligence Assisted IVF Applications G. Vergos[1], L.A. Iliadis[1], P. Kritopoulou[2], A. Papatheodorou[3], A. Boursianis[1], K.I. Kokkinidis[2], M. Papadopoulou[4] and S. Goudos[1] [1] Aristotle University of Thessaloniki, Greece [2] University of Macedonia, Thessaloniki, Greece [3] Embryolab Fertility Clinic, Thessaloniki, Greece [4] International Hellenic University, Sindos, Greece
paper 45 22 min	On the Exploitation of Time-Space Priors for AI-Assisted Biomedical Imaging and Follow-Up Luca Tosi[1], Francesco Zardi[1], Marco Salucci[1], and Andrea Massa [2,1,3] [1] ELEDIA Research Center (ELEDIA@UniTN - University of Trento), DICAM, Trento, Italy [2] ELEDIA Research Center (ELEDIA@UESTC – UESTC), Chengdu, China [3] ELEDIA Research Center (ELEDIA@TSINGHUA – Tsinghua University), Beijing, China
22 min	**Invited talk: Highly Efficient Synthesis of On-Chip T-coils Using Knowledge-Guided Machine Learning Assisted Optimization and Its Application to ESD Protection Circuits** **Prof. Haiming Wang, Ph.D.** **School of Information Science and Engineering, Southeast University, Nanjing, China**
16:50-17:10 **(GMT+03:00)**	**Awards - Closing Ceremony**

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At a glance

Wednesday, June 28th

Time	Event
08:20-09:00	Registration
09:00-09:30	Opening
09:30-11:00	Session A1: Analog RF and mixed signal Circuits
	Session B1: ML in Communications
11:00-11:30	Coffee Break
11:30-12:30	Plenary Speech 1 : Prof. Andrea Massa
12:30-14:00	Lunch Break
14:00-15:00	Plenary Speech 2 : Dr. Alon Ascoli
15:00-15:30	Coffee Break & Poster Session
15:30-16:30	Poster Session 1 : Analog and digital circuits
16:30-18:20	Session A2 : Circuit design aspects
	Special Session B2 : Complementary aspects of AI, UAVs & FWNs

Thursday, June 29th

Time	Event
08:40-09:00	Registration
09:00-11:00	Session A3 : Workshop on TIPP – Detector and electronics
	Session B3 : Communication Systems
11:00-11:30	Coffee Break
11:30-12:30	Plenary Speech 3 : Dr. Michael Campbell
12:30-13:30	Session A3b: Workshop on TIPP- Triggering & DAQ
	Poster Session 2 : Communication systems
13:30-14:45	Lunch Break
14:45-16:35	Session A4: Workshop on TIPP- Front ends for Readout & Control
	Special Session B4: Novel Theoretical and Practical Developments in Memristor Device, Circuit, and System Research
16:35-17:00	Coffee Break
17:00-18:20	Session A5: Workshop on TIPP- Accelerators & Beam Instrumentation
17:00-18:50	Special Session B5: Novel Theoretical and Practical Developments in Memristor Device, Circuit, and System Research
20:45-	Conference Dinner

Friday, June 30th

Time	Event
09:10-09:30	Registration
09:30-10:30	Plenary Speech 4 : Prof. Ronald Tetzlaff
10:30-11:00	Coffee Break
11:00-12:50	Session A6 : Applications and power management
12:50-14:00	Lunch Break
14:00-15:00	Poster Session 3 : Modeling, Systems and ML applications
15:00-15:20	Coffee Break
15:20-16:50	Session A7 : Digital circuits
	Special Session B7: ML Applications in Communications & Electronics
16:50-17:10	Awards – Closing Ceremony