



# Technical Program

49TH ANNUAL MEETING OF THE  
ASSOCIAZIONE SOCIETÀ ITALIANA DI ELETTRONICA

*Shaping our future with Electronics*



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# Program at a glance

## Wednesday, June 21

- Sala delle Capriate*
- 8:30 Registration desk is open
- 9:10 - 11:00 Exhibitors' showcases
- 11:00 - 13:00 SIE Scientific Council
- 13:00 - 14:00 **LUNCH** (only for SIE Scientific Council Members and Sponsors)
- Sala Magna*
- 14:00 – 14:30 Welcome Address  
Opening Speech  
*Andrea Lacaita, SIE President*
- 14:30 – 15:10 IEEE Distinguished Lecture  
**THE ENERGY AND VARIABILITY EFFICIENT ERA (E.V.E.) IS AHEAD OF US**  
*Simon Deleonibus, IEEE Electron Devices Society*
- 15:10 – 16:30 *Sala Magna* Oral Session  
**MICRO- AND NANO- ELECTRONIC DEVICES**
- Sala delle Capriate* Oral Session  
**ELECTRONIC SYSTEMS AND APPLICATIONS I**
- 16:30 - 17:00 **COFFEE BREAK**
- 17:00 – 19:00 *Sala Magna* Oral Session  
**SENSORS, MICROSYSTEMS AND INSTRUMENTATION I**
- Sala delle Capriate* Oral Session  
**MICROWAVE ELECTRONICS**
- 21:00 **WELCOME DINNER**  
*Villa Malfitano*


# Program at a glance

## Thursday, June 22

	<i>Sala Magna</i>	
8:30 – 9:10	Invited Lecture <b>ROOM-TEMPERATURE BLUE EMITTING HIGH-BETA GAN NANOBEAM CAVITY LASERS</b> <i>Raphaël Butté, EPFL, Switzerland</i>	
9:10 - 9:50	Invited Lecture <b>ARRAY META-SURFACES FOR BIOMEDICAL SENSING AT INFRA-RED WAVELENGTHS</b> <i>Richard M. De La Rue, University of Glasgow, UK</i>	
9:50 – 10:30	Poster Session	
10:30 – 11:00	<b>COFFEE BREAK</b>	
11:00 – 13:00	<i>Sala Magna</i> Oral Session <b>POWER ELECTRONICS</b>	<i>Sala delle Capriate</i> Oral Session <b>SENSORS, MICROSYSTEMS AND INSTRUMENTATION II</b>
13:00 - 14:00	<b>LUNCH</b>	
	<i>Sala Magna</i>	
14:00 – 14:40	Invited Lecture <b>ENERGY-QUALITY SCALABLE ADAPTIVE VLSI CIRCUITS AND SYSTEMS – THE WAY TOWARDS THE NEXT 10X ENERGY REDUCTION</b> <i>Massimo Alioto, NUS, Singapore</i>	
14:40 – 15:10	Poster Session	
15:10 – 16:30	<i>Sala Magna</i> Oral Session <b>INTEGRATED CIRCUITS AND SYSTEMS I</b>	<i>Sala delle Capriate</i> Oral Session <b>OPTOELECTRONICS AND PHOTONICS</b>
16:30 - 17:00	<b>COFFEE BREAK</b>	
17:00 – 19:00	<i>Sala Magna</i> Oral Session <b>INTEGRATED CIRCUITS AND SYSTEMS II</b>	<i>Sala delle Capriate</i> Oral Session <b>ELECTRONIC SYSTEMS AND APPLICATIONS II</b>
21:00	<b>GALA DINNER</b> <i>Castello a mare</i>	

# Program at a glance

## Friday, June 23

- Sala Magna*
- 8:50 - 9:30 IEEE Fellow Lecture  
**CMOS MULTISTAGE AMPLIFIERS**  
*Salvo Pennisi, University of Catania*
- 9:30 - 10:10 IEEE Fellow Lecture  
**DTC-BASED DIGITAL PLLS**  
*Carlo Samori, Politecnico di Milano*
- 10:10 – 10:30 Recognitions and Awards
- 10:30 – 11:00 **COFFEE BREAK**
- 11:00 – 11:30 **ECSEL PROGRAM PRESENTATION**  
*Yves Gigase, ECSEL Joint Undertaking Head of Programme*
- 11:30 – 12:00 **INSIGHT PROJECT PRESENTATION**  
*Giancarlo Forlanini, ECSEL IT President*
- The logo for ECSEL Italy features a stylized flag with green, white, and red vertical stripes and a blue triangle at the top containing three yellow stars. To the right, the text 'ECSEL Italy' is displayed in blue, with a smaller version of the flag graphic below it.
- 12:00 - 13:30 Round table on Funding for Smart Systems & ECSEL  
**SMART SYSTEM INTEGRATION FOR ECSEL PROGRAM**
- 13:30 - 14:30 **LUNCH**
- 14:30 - 16:00 SIE General Assembly
- 16:00 - 18:00 **SOCIAL TOUR**  
*Palazzo Abatellis*

## Simon DELEONIBUS



CEA Research Director Past Chief Scientist

14:30 – 15:10, Wednesday, June 21

*Sala Magna*

### THE ENERGY AND VARIABILITY EFFICIENT ERA (E.V.E.) IS AHEAD OF US

#### ABSTRACT

Major power consumption reduction will drive future design of technologies and architectures that will request less greedy devices and interconnect systems. The electronic market will be able to face an exponential growth thanks to the availability and feasibility of autonomous and mobile systems necessary to societal needs. The increasing complexity of high volume fabricated systems will be possible if we aim at zero intrinsic variability, and generalize 3-dimensional integration of hybrid, heterogeneous technologies at the device, functional and system levels. Weighing on the world energy saving balance will be possible and realistic by maximizing the energy efficiency of co integrated Low Power and High Performance Logic and Memory devices. The future of Nanoelectronics will face the major concerns of being Energy and Variability Efficient (E.V.E.).

#### BIOGRAPHY

Simon Deleonibus, retired from CEA-LETI on Jan 1st 2016 as Chief Scientist after 30 years of Research on Micro Nanoelectronics Devices Architectures. Before joining CEA-LETI, he was with Thomson Semiconductors(1981-1986), where he developed and transferred to production advanced microelectronics devices and products. He gained his PhD in Applied Physics from Paris University(1982). He is Visiting Professor at Tokyo Institute of Technology(Tokyo, Japan) since 2014 , National Chiao Tung University(Hsinchu, Taiwan) since 2015 and at Chinese Academy of Science(Beijing, PRC) since 2016 . He is distinguished CEA Research Director(2002), IEEE Distinguished Lecturer(2004), Fellow of the IEEE (2006), Fellow of the Electrochemical Society (2015). He was awarded the titles of Chevalier de l'Ordre National du Mérite(2004) and Chevalier de l'Ordre des Palmes Académiques(2011), the 2005 Grand Prix de l'Académie des Technologies. He is member of the ITRS since 1998, the European Research Council Panel(2007), the Nanosciences Foundation Board of Trustees( 2007). He was Associate Editor of IEEE Trans. on Elect. Dev.(2008-2014) and Member of the IEEE Electron Devices Society Board of Governors(01/2009-12/2014) and reelected(2016-2018) ; Chair of IEEE EDS Region 8 SRC (2015-2016). He is currently Secretary of IEEE Electron Devices Society (2016-2017).



## Raphaël BUTTE'



Senior Scientist at Ecole Polytechnique Fédérale de Lausanne

8:30 – 9:10, Thursday, June 22

*Sala Magna*

### ROOM-TEMPERATURE BLUE EMITTING HIGH-BETA GAN NANOBEAM CAVITY LASERS

#### ABSTRACT

Over the past few years recent advances in nanofabrication led to the emergence of dielectric nanocavities that can confine light to a nearly diffraction limited volume. By combining such cavities with a gain medium, the resulting nanolasers exhibit a peculiar emission compared to conventional lasers. In contrast to the traditional signatures of lasing—i.e., a sharp increase in the intensity in parallel with a narrowing of the emission spectrum, due to the amplification of stimulated emission—the lasing transition becomes blurred in the nanolaser case. This blurring occurs because spontaneous photon emission is efficiently coupled to the nanocavity mode. As a result, the conventional intensity increase and emission linewidth are not frequently observed in nanolasers. In this talk we will report on the main features of blue emitting high-quality factor (Q) III-nitride nanobeam photonic crystal cavities containing an InGaN/GaN quantum well (QW) gain medium. Transition from incoherent to coherent light emission is monitored using power-dependent second-order autocorrelation function measurements. Fabrication statistics performed on a second generation of blue nanobeam cavities show a twofold increase in the average Q value ( $> 4000$ ) with a high fabrication yield thanks to the use of a single-step pattern transfer process. Interestingly, such statistical analysis also indicates that conventional disorder models could not explain the dominant contribution to experimental Q factors. Additionally, the introduction of a sidewall grating outcoupler increased the integrated far-field intensity of those structures by nearly one order of magnitude.

#### BIOGRAPHY

Raphaël Butté received the PhD degree from the University Claude Bernard, Lyon, France, in 2000 for his research on the structural and optoelectronic properties of hydrogenated nanostructured silicon thin films. After a three-year postdoctoral stay at the University of Sheffield where his research shifted to the optical properties of III-V semiconductors, he moved to Ecole Polytechnique Fédérale de Lausanne (EPFL) in 2004 in a newly established laboratory directed by Prof. Nicolas Grandjean. In 2010, he became a permanent member of staff and was promoted to the position of Senior Scientist in April 2016.

His current research activity mainly deals with microcavities, planar waveguides and photonic crystals made from III-nitride semiconductors. He is the author of more than 90 scientific articles published in peer-reviewed international journals ( $> 3000$  citations, h-index: 28) and 6 book chapters. He has given 26 invited talks in international conferences. In 2012, he was one of the 149 scientists recognized by the Outstanding Referee program of the American Physical Society (APS) selected from a pool of roughly 60,000 currently active referees.

## Richard M. DE LA RUE



Honorary Senior Research Fellow at the University of Glasgow

9:10 – 9:50, Thursday, June 22

*Sala Magna*

### ARRAY META-SURFACES FOR BIOMEDICAL SENSING AT INFRA-RED WAVELENGTHS

#### ABSTRACT

Detection and identification of biomedically significant molecules is an important application in infra-red (IR) spectroscopy. This presentation will consider some of the significant features of the different alternative building-block elements that can be used in array metasurfaces for enhanced detection sensitivity. The presentation will also address techniques and issues associated with the deposition and localisation of biological and organic chemical molecular material for detection and measurement using IR spectroscopy.

#### BIOGRAPHY

Richard De La Rue retired formally from the University of Glasgow in September 2010 and joined the Photonics Research Centre at the University of Malaya in April 2011, where he spent a year as Visiting Professor. In August 2012 he became Research Professor of Optoelectronics in the School of Engineering at the University of Glasgow - and completed his tenure in July 2014. He currently has the status of Honorary Senior Research Fellow (Professor Emeritus) in Optoelectronics – at the University of Glasgow.

He is Fellow of the European Optical Society; Fellow of the IEEE; Fellow of the OSA; Fellow of the Royal Academy of Engineering; Fellow of the Royal Society of Edinburgh and Fellow of the Institution of Engineering and Technology.

His Hirsch index, according to Google Scholar, is 56.

# Invited Lecture

## Massimo ALIOTO



Associate Professor at the National University of Singapore

14:00 – 14:40, Thursday, June 22

*Sala Magna*

### ENERGY-QUALITY SCALABLE ADAPTIVE VLSI CIRCUITS AND SYSTEMS – THE WAY TOWARDS THE NEXT 10X ENERGY REDUCTION

#### ABSTRACT

In this talk, the concept of energy-quality (EQ) scalable systems is introduced and explored, as novel design dimension to scale down energy in integrated systems for the Internet of Things (IoT). EQ-scalable systems explicitly trade off energy and quality at different levels of abstraction (“vertically”), and sub-systems (“horizontally”), creating new opportunities to improve energy efficiency for a given task and expected “quality”. The concept of quality slack, a taxonomy of techniques to trade off energy and quality, and a general EQ-scalable architecture are introduced. The generality of the EQ-scaling concept is shown through several examples, ranging from logic to analog circuits, to memories and Analog-Digital Converters. Challenges, opportunities and expected energy gains are discussed to gain an understanding of the potential of the EQ-scalable integrated circuits and systems. Ultimately, EQ scalable systems are expected to substantially improve the energy efficiency of systems for IoT, compensating the limited energy gains that will be offered by technology and voltage scaling in the decade ahead..

#### BIOGRAPHY

Massimo Alioto is Associate Professor at the Department of Electrical and Computer Engineering, National University of Singapore, where he leads the Green IC group and the Integrated Circuits and Embedded Systems area (60+ people). He has also held positions at the University of Siena, Intel Labs – CRL (2013), University of Michigan - Ann Arbor (2011-2012), University of California – Berkeley (2009-2011) and EPFL – Lausanne (2007). He is (co)author of 230 publications on journals (80, mostly IEEE Transactions) and conference proceedings, and three books with Springer. His primary research interests include ultra-low power VLSI circuits, self-powered and wireless nodes, near-threshold circuits for green computing, widely energy-scalable VLSI circuits, circuit techniques for emerging technologies, and hardware cybersecurity. Prof. Alioto was the Chair of the “VLSI Systems and Applications” Technical Committee of the IEEE CASS (2010-2012), and Distinguished Lecturer (2009-2010). He is currently Associate Editor in Chief of the IEEE Transactions on VLSI Systems. He also serves or has served as Associate Editor of several journals (e.g., ACM Transactions on Design Automation of Electronic Systems, IEEE Transactions on CAS - part I/II). He served as Guest Editor of various journal special issues (including the up-coming issue on “Circuits and systems for the Internet of Things – from sensing to sensemaking” on IEEE Transactions on Circuits and Systems – part I). He was Technical Program Chair of the SOCC 2016, PRIME 2016, ICECS 2015, VARI 2015, ICECS 2013, NEWCAS 012, ICM 2010 conferences, and Track Chair in several others (ICCD, ISCAS, ICECS, VLSI-SoC, APCCAS, ICM). He is currently member of the IEEE CASS Board of Governors. Prof. Alioto is an IEEE Fellow.

## Salvatore PENNISI



Full Professor at the University of Catania

8:50 – 9:30, Friday, June 23

*Sala Magna*

### CMOS MULTISTAGE AMPLIFIERS

#### ABSTRACT

CMOS multistage amplifier design has relentlessly drawn remarkable research attention. Indeed, growing applications demanding high-gain, wide-bandwidth and fast-settling amplifiers in heavy-load and low-power conditions provide motivations for challenging efforts towards global performance enhancement. In this framework, three-stage and four-stage operational transconductance amplifiers (OTAs) are attractive for high-gain high-accuracy buffering/amplifying operation, owing to their speed, area and power efficiencies under low-voltage and low-power constraints. Their design however is not trivial. In this talk, design and optimization of multistage CMOS operational amplifiers in terms of architectures, frequency compensation techniques, Slew Rate, and other relevant issues are discussed in detail to provide a look at the latest results and future trends.

#### BIOGRAPHY

Salvatore Pennisi received the laurea degree in Electronic Engineering in 1992 and the Ph.D. degree in Electrical Engineering in 1997, both from the University of Catania, Italy. He is now full professor at the Dipartimento di Ingegneria Elettrica, Elettronica e Informatica of the University of Catania, where he teaches courses for first level and master laurea degrees and is presently the coordinator of the Laurea Magistrale Course in Electronic Engineering.

His main research interests include circuit theory and analog design with emphasis on low-voltage and current-mode techniques, multi-stage amplifiers with related frequency compensation, data converters and high-frequency distortion analysis in analog circuits. More recently, his research activities have involved driving circuits and techniques for liquid crystal displays and circuits for efficient energy harvesting. He is the (co)author of more than 90 international journal papers (mostly IEEE), over 130 conference proceedings, and is the co-author of the books CMOS Current Amplifiers (1999), Feedback Amplifiers: Theory and Design (2001) both edited by Kluwer Academic Publishers, and Liquid Crystal Display Drivers-Techniques and Circuits (Springer, 2009).

Prof. Pennisi is member of the IEEE CASS Analog Signal Processing Technical Committee and served as an Associate Editor of the IEEE Transactions on Circuits and Systems-Part II: Express Briefs and of the Wiley International Journal of Circuit Theory and Applications. He is involved in the technical committee of several conferences including IEEE ISCAS, IEEE NEWCAS, ESSCIRC, etc and has been the General Chair of PRIME 2017. Prof. Pennisi is an IEEE Fellow.

## Carlo SAMORI



Full Professor at Politecnico di Milano

9:30 – 10:10, Friday, June 23

*Sala Magna*

### DTC-BASED DIGITAL PLLS

#### ABSTRACT

Digital phase-locked loops (DPLLs) have emerged in last ten years as an important alternative to analog PLLs, also for fractional-N synthesis in wireless applications where a very demanding spectral purity is required. While in the initial implementations the key building block of DPLLs was a multibit time to digital converter (TDC), which is power consuming circuit analog to an ADC, record performance have been ultimately obtained by exploiting an architecture featuring a time arbiter, i.e. a single-bit TDC, driven by a multi bit digital-to-time converter (DTC). The key enabling idea is to exploit the dithering property of the thermal noise always present in a circuit.

The presentation reviews the path that has led to this approach, which epitomize how scaled CMOS technologies may enable powerful calibration techniques achieving unprecedented performance.

#### BIOGRAPHY

Carlo Samori received the Ph.D. in electrical engineering in 1995, from the Politecnico di Milano, Italy, where he is now a professor.

His research interests are in the area of RF circuits, in particular of design and analysis of VCOs and high performance frequency synthesizers. He has collaborated with several semiconductor companies. He is a co-author of more than 100 papers and of the book *Integrated Frequency Synthesizers for Wireless Systems* (Cambridge University Press, 2007). Prof. Samori has been a member of the Technical Program Committee (TPC) of the IEEE International Solid-State Circuits Conference and he is a member of the TPC of the European Solid-State Circuits Conference. He has been Guest Editor for the December 2014 issue of the *Journal of Solid-State Circuits*.

Carlo Samori is a Distinguished Lecturer of the IEEE Solid-State Circuits Society and an IEEE Fellow.

# Exhibitors' showcases

9:10 – 11:00, Wednesday, June 21

*Sala delle Capriate*

9:10 – 9:30     **SOLUZIONI DI MISURA TEKTRONIX PER CARATTERIZZARE CONVERTITORI DI POTENZA AD ALTA EFFICIENZA IN TECNOLOGIA SiC E GAN**

*Andrea Vinci*

Tektronix

9:30 – 9:50     **EMI DEBUGGING WITH RTO DIGITAL SCOPE**

*Dario Scarano*

Rohde & Schwarz

9:50 – 10:10     **R&D AND MANUFACTURING TECHNOLOGIES. FOCUS ON POWER DEVICES TESTING**

*Roberto Radice*

Electron Mec

10:10 – 10:30     **LE TECNOLOGIE DEL FUTURO IN KEYSIGHT OGGI**

*Giovanni D'Amore*

Microlease / Keysight

10:30 – 11:00     **A SIMPLIFIED APPROACH TO DIGITAL POWER MANAGEMENT**

*Ermanno Moscheni*

Teledyne LeCroy

# Micro- and Nano- Electronic Devices

15:10 – 16:30, Wednesday, June 21

*Sala Magna*

*Chair: Gian Franco Dalla Betta*

- 15:10 – 15:30    **CONDUCTIVITY AND MORPHOLOGY STUDY OF INKJET PRINTED GLOSSY PAPER AND PET SENSORS**  
*Giulio Rosati, Nicola Posenato, Marco Ravarotto, Alessandro De Toni and Alessandro Paccagnella*  
Department of Information Engineering, University of Padova, Padova, Italy  
ARC – Centro Ricerche Applicate, via J. Da Montagnana, 49, Padova, Italy
- 15:30 - 15:50    **A 64-CHANNELS NEURAL INTERFACE FOR BIO-POTENTIAL RECORDING AND NEURAL STIMULATION**  
*Roberto Puddu, Lorenzo Bisoni, Caterina Carboni, Luigi Raffo and Massimo Barbaro*  
Department of Electrical and Electronic Engineering University of Cagliari, Cagliari, Italy
- 15:50 - 16:10    **SILICON-ON-DIAMOND SENSORS DESIGNED TO BE APPLIED TO PARTICLE DETECTION**  
*Arianna Morozzi, Daniele Passeri, Keida Kanxheri, Leonello Servoli, Stefano Lagomarsino and Silvio Sciortino*  
Department of Engineering, University of Perugia, Perugia, Italy  
INFN Section of Perugia, Perugia, Italy  
INFN Section of Florence, Florence, Italy
- 16:10 – 16:30    **SIMULATION STUDY OF THE GRAPHENE BASE TRANSISTOR**  
*Stefano Venica, Francesco Driussi, Pierpaolo Palestri and Luca Selmi*  
Dipartimento Politecnico di Ingegneria e Architettura, Università degli Studi di Udine, Udine, Italy

# Electronic Systems and Applications I

15:10 – 16:30, Wednesday, June 21

*Sala delle Capriate*

*Chair: Alessandro De Gloria*

- 15:10 – 15:30    **APPROXIMATE CORDIC IMPLEMENTATION FOR TACTILE DATA PROCESSING**  
*Marta Franceschi, Vincent Camus, Ali Ibrahim, Christian Enz and Maurizio Valle*  
Cosmic Lab, DITEN, University of Genova, Italy  
ICLAB, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
- 15:30 - 15:50    **ELECTRONIC CONTROL SYSTEM OF LED-INDUCED CNT'S PHOTO-IGNITION FOR IMPROVED FUELS COMBUSTION IN ADVANCED ENGINES**  
*Paolo Visconti, Patrizio Primiceri, Roberto de Fazio and Paolo Carlucci*  
Department of Innovation Engineering, University of Salento, Lecce, Italy
- 15:50 - 16:10    **ARCHITECTURE ANALYSIS AND DESIGN FOR 802.11P/CELLULAR-V2X WIRELESS NETWORKING WITH EMBEDDED CYBERSECURITY**  
*Sergio Saponara, Gabriele Ciarpi, Luca Fanucci and Bruno Neri*  
Dip. Ingegneria della Informazione, Università di Pisa, via G. Caruso 16, 56122, Pisa, Italy
- 16:10 – 16:30    **RF POWERED TRANSCEIVERS FOR LONG AND SHORT RANGE COMMUNICATIONS**  
*Gianluca Pellecchia, Nunzio Greco, Giuseppe Papotto, Alessandro Finocchiaro and Giuseppe Palmisano*  
Facoltà di Ingegneria, DIEEI, 95125 Catania Italy  
STMicroelectronics s.r.l., 95121 Catania, Italy



# Microwave Electronics

17:00 – 19:00, Wednesday, June 21

*Sala delle Capriate*

*Chair: Giovanni Ghione*

- 17:00 – 17:20 **GAN S-BAND INTEGRATED FRONT-END FOR HIGH PERFORMANCE MICROWAVE ELECTRONICS**  
*Marco Vittori, Ferdinando Costanzo, Rocco Giofrè, Mirko Palomba, Giorgio Polli, Alessandro Salvucci, Paolo Colantonio, Elisa Cipriani, Giancarlo Orengo and Ernesto Limiti*  
University of Rome “Tor Vergata”, Rome (Italy)
- 17:20 - 17:40 **BROADBAND DOHERTY HIGH-POWER AMPLIFIERS DESIGN BY NONLINEAR VECTOR CHARACTERIZATION**  
*Alessandro Cidronali, Marco Passafiume, Vincenzo Golisciano, Stefano Maurri and Giovanni Collodi*  
Department of Information Engineering, University of Florence, Florence, Italy
- 17:40 - 18:00 **MMIC AND SPATIALLY COMBINED MILLIMETER WAVE FUNCTIONALITIES: LNA AND HPA STATE-OF-THE-ART**  
*Riccardo Cleriti, Sergio Colangeli, Walter Ciccognani, Antonio Serino, Lucio Scucchia, Davide Passi, Franco Di Paolo and Ernesto Limiti*  
Electronic Engineering Dep., University of Rome “Tor Vergata”, Rome, Italy
- 18:00 – 18:20 **TEMPERATURE EFFECTS ON A RF ENERGY HARVESTER DESIGNED FOR UHF APPLICATIONS**  
*Massimo Merenda, Francesco G. Della Corte, Gennaro G. Bellizzi and Tommaso Isernia*  
DIIES, Università Mediterranea, Reggio Calabria, Italy  
HWA srl - Spin Off UNIRC, Rovereto, Italy  
IREA-CNR, Napoli
- 18:20 – 18:40 **WAVEFORM ENGINEERED PAs: AN EXTENSION OF THE DESIGN SPACE**  
*Elisa Cipriani, Paolo Colantonio, Franco Giannini, Antonio Raffo, Valeria Vadalà, Gianni Bosi and Giorgio Vannini*  
Dipartimento di Ingegneria Elettronica, Università di Roma Tor Vergata, Roma, Italy  
Dipartimento di Ingegneria, Università di Ferrara, Ferrara, Italy
- 18:40 – 19:00 **ULTRA-BROADBAND COHERENT DETECTION OF THZ PULSES VIA CMOS-COMPATIBLE DEVICES**  
*Alessandro Tomasino, Anna Mazhorova, Matteo Clerici, Marco Peccianti, Yoann Jestin, Alessia Pasquazi, Andrey Markov, Xin Jin, Riccardo Piccoli, Sebastien Delprat, Mohamed Chaker, Alessandro Busacca, Luca Razzari and Roberto Morandotti*  
INRS-EMT, Varennes, Québec, Canada  
DEIM, University of Palermo, Palermo, Italy  
School of Engineering, University of Glasgow, Glasgow, UK  
Department of Physics and Astronomy, University of Sussex, Brighton, UK

17:00 – 19:00, Wednesday, June 21

*Sala Magna*

*Chair: Vittorio Ferrari*

- 17:00 – 17:20 **MICROFLUIDIC DEVICES FOR THE ELECTRICAL DETECTION OF AGGREGATES OF PROTEINS AND INFECTED RED BLOOD CELLS.**  
*Marco Giacometti, Marco Sampietro, Sergio Chiodini, Riccardo Bertacco and Giorgio Ferrari*  
Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy  
National Systems, Somma Lombardo (VA), Italy  
Dipartimento di Fisica, Politecnico di Milano, Milano, Italy
- 17:20 - 17:40 **DETECTING MICROPARTICLES AND THEIR CHARGE-STATE BY NANORIBBONS SENSORS AND PHYSICAL MODELING**  
*Paolo Scarbolo and Luca Selmi*  
DPIA, University of Udine, Udine, Italy
- 17:40 - 18:00 **ALL-GLASS DIGITAL MICROFLUIDIC SYSTEM FOR LAB-ON-CHIP APPLICATIONS**  
*Nicola Lovecchio, Augusto Nascetti, Giampiero de Cesare and Domenico Caputo*  
DIET, Sapienza University of Rome, Rome, Italy  
SAE, Sapienza University of Rome, Rome, Italy
- 18:00 – 18:20 **A CIRCULAR ELECTROSTATIC SENSORS ARRAY FOR THE MEASUREMENT OF MOVING CHARGED PARTICLES**  
*Tommaso Addabbo, Ada Fort, Marco Mugnaini, Enza Panzardi, Valerio Vignoli and Santina Rocchi*  
Department of Information Engineering and Mathematics, University of Siena, Italy
- 18:20 – 18:40 **TIME-GATED CONTACTLESS INTERROGATION SYSTEM FOR CAPACITIVE SENSORS**  
*Mehedi Masud, Marco Baiù, Marco Demori, Marco Ferrari and Vittorio Ferrari*  
Department of Information Engineering, University of Brescia, Brescia, Italy
- 18:40 – 19:00 **IPIPE MESUREMENT OF THE BEAM INDUCED HEATING**  
*Francesco Fienga, Salvatore Buontempo, Michele Riccio, Luca Maresca, Andrea Irace, Giovanni Breglio, Szillasi Zoltan, Noemi Beni, Andrea Cusano, Marco Consales, Fabio Mennella and Armando Laudati*  
Department of Electrical Engineering and Information Technology, University of Naples Federico II, Napoli, Italy  
INFN sezione di Napoli, Napoli, Italy  
CERN, Genève, Switzerland

# Power Electronics

11:00 – 13:00, Thursday, June 22

*Sala Magna*

*Chair: Paolo Mattavelli*

- 11:00 – 11:20 **P-GAN GATE BREAKDOWN IN GAN POWER HEMTs**  
*Andrea Natale Tallarico, Steve Stoffels, Paolo Magnone, Niels Posthuma, Denis Marcon, Steefan Decoutere, Enrico Sangiorgi and Claudio Fiegna*  
ARCES-DEI, University of Bologna, Cesena, Italy  
PMST, imec vzw, Heverlee, Belgium; 3DTG, University of Padova, Vicenza, Italy
- 11:20 - 11:40 **HYBRID INDUCTOR/SWITCHED-CAPACITOR TOPOLOGY WITH REDUCED AVERAGE INDUCTOR CURRENT FOR HIGH STEP-UP APPLICATIONS**  
*Stefano Marconi, Giorgio Spiazzi and Andrea Bevilacqua*  
Department of Information Engineering (DEI), Università degli Studi di Padova, Padova, Italy  
Infineon Technologies Italia Srl, Padova, Italy
- 11:40 - 12:00 **ON THE SHORT-CIRCUIT FAILURE MECHANISMS OF SILICON CARBIDE POWER MOSFETs**  
*Gianpaolo Romano, Michele Riccio, Luca Maresca, Alberto Castellazzi, Andrea Irace and Giovanni Breglio*  
Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Naples, Italy  
PEMC Group, University of Nottingham, Nottingham UK
- 12:00 – 12:20 **REDUCTION OF THE EMI IN BLDC MOTOR DRIVES BASED ON DELAY COMPENSATION**  
*Michele Perotti and Franco Fiori*  
Department of Electronics and Telecommunications, Politecnico di Torino, Torino, Italy
- 12:20 – 12:40 **DESIGN AND REALIZATION OF A DC/DC CONVERTER WITH A PARTIALLY SATURATED INDUCTOR**  
*Gianpaolo Vitale, Giuseppe Lullo and Daniele Scirè*  
Dipartimento di Energia, Ingegneria dell'Informazione e Modelli Matematici, Università degli Studi di Palermo, Palermo, Italy  
Istituto di Studi sui Sistemi Intelligenti per l'Automazione, Consiglio Nazionale delle Ricerche, Palermo, Italy
- 12:40 – 13:00 **INSULATED ZERO-VOLTAGE TRANSITION INVERTER**  
*Davide Tedesco, Abbate Carmine, Giovanni Busatto, Francesco Iannuzzo, Annunziata Sanseverino and Francesco Velardi*  
DIEI, University of Cassino and Southern Lazio, Cassino, Italy

11:00 – 13:00, Thursday, June 22

*Sala delle Capriate*

*Chair: Vittorio Ferrari*

- 11:00 – 11:20 **AN AUTOBALANCING DIFFERENTIAL CAPACITANCE TO DC VOLTAGE CONVERSION FOR SENSOR APPLICATIONS**  
*Emiliano Sisinni, Gianluca Barile, Alessandro Depari, Giuseppe Ferri, Alessandra Flammini, Francesca Romana Parente and Vincenzo Stornelli*  
Dept. of Industrial and Information Engineering and Economics, University of L'Aquila  
Dept. of Information Engineering, University of Brescia, Brescia, Italy
- 11:20 - 11:40 **HIGH-PERFORMANCE INTEGRATED FRONT END FOR SPAD ARRAYS IN TIME CORRELATED SINGLE PHOTON COUNTING**  
*Giulia Acconcia, Alessandro Cominelli, Pietro Peronio, Massimo Ghioni and Ivan Rech*  
Dipartimento di Elettronica Informazione e Bioingegneria, Politecnico di Milano, Italy
- 11:40 - 12:00 **MEMS SUB-NANONEWTON FORCE SENSOR WITH TUNABLE SENSITIVITY AND SERVO-ASSISTED POSITION-FEEDBACK**  
*Alessandro Nastro, Marco Ferrari, Alfio-Lip Russo, Raffaele Ardito and Vittorio Ferrari*  
Department of Information Engineering, University of Brescia, Brescia, Italy  
STMicroelectronics, Italy  
Department of Civil and Environmental Engineering, Politecnico di Milano, Italy
- 12:00 – 12:20 **ELECTRONIC SYSTEM ARCHITECTURE FOR STRUCTURAL HEALTH MONITORING WITH GUIDED-WAVE ULTRASOUND**  
*Pietro Giannelli, Andrea Bulletti, Eugenio Marino Merlo, Marco Calzolari and Lorenzo Capineri*  
Department of Information Engineering, University of Florence, Firenze, Italy
- 12:20 – 12:40 **POLYDIMETHYLSILOXANE (PDMS) BASED MICROFLUIDIC DEVICES: TECHNOLOGY AND APPLICATIONS**  
*Stefania Torino, Mario Iodice, Ivo Rendina and Giuseppe Coppola*  
Institute for Microelectronics and Microsystems, National Research Council, Naples 80131, Italy
- 12:40 – 13:00 **ENERGY HARVESTING IN WEARABLE SENSOR NETWORKS**  
*Ivan Mazgetta, Ardian Kita, Moreno Maule, Michael Prisco and Fernanda Irrera*  
DIET, Sapienza University of Rome, Italy  
BWAY, Via Cesare Giulio Viola 48, Rome, Italy

# Integrated Circuits and Systems I

15:10 – 16:30, Thursday, June 22

*Sala Magna*

*Chair: Gaetano Palumbo*

- 15:10 – 15:30    **A BICMOS E-BAND POWER AMPLIFIER LEVERAGING CURRENT CLAMPING IN A COMMON-BASE STAGE**  
*Elham Rabimi, Junlei Zhao, Francesco Svelto and Andrea Mazzanti*  
Department of Electrical, Computer and Biomedical Engineering, University of Pavia, Pavia, Italy
- 15:30 - 15:50    **OPTIMIZATION OF AN ALL-CMOS DNA HYBRIDIZATION BIOSENSOR WITH DIRECT ANALOG TO TIME DIGITAL CONVERSION**  
*Corrado Napoli and Massimo Barbaro*  
Department of Electrical and Electronic Engineering University of Cagliari, Cagliari, Italy
- 15:50 - 16:10    **AUTOMATED FLOW FOR HYBRID CLOCK AND POWER GATING IN COARSE-GRAINED RECONFIGURABLE ARCHITECTURES**  
*Francesca Palumbo, Tiziana Fanni, Carlo Sau, Paolo Meloni and Luigi Raffo*  
University of Sassari, PolComIng – Information Eng. Unit, Sassari, Italy  
University of Cagliari, Diee – Microelectronics and Bioengineering Group, Cagliari, Italy
- 16:10 – 16:30    **A UNIFIED APPROACH FOR THE ANALYSIS OF RF AND MICROWAVE NONLINEAR CIRCUITS**  
*Leonardo Pantoli, Domenico Spina, Daniele Romano, Giorgio Leuzzi, Giulio Antonini and Tom Dhaene*  
Dept. Industrial and Information Engineering and Economics, University of L'Aquila, L'Aquila, Italy  
IDLab, iGent Tower, Dept. of Information Technology, Ghent University - Imec, Ghent, Belgium

# Optoelectronics and Photonics

15:10 – 16:30, Thursday, June 22

*Sala delle Capriate*

*Chair: Antonello Cutolo*

- 15:10 – 15:30    **PHOTONIC/PLASMONIC NANOTWEEZER FOR HIGH-EFFICIENCY SINGLE NANOPARTICLE TRAPPING**  
*Donato Conteduca, Christopher Reardon, Mark G. Scullion, Francesco Dell'olio, Giuseppe Brunetti, Caterina Ciminelli, Thomas Krauss and Mario Nicola Armenise*  
Optoelectronics Laboratory, Politecnico di Bari, Bari, Italy  
Photonics Group, Department of Physics, Univ. of York, Heslington, UK
- 15:30 - 15:50    **TAPERED AND PATTERNED OPTICAL FIBERS FOR OPTICAL CONTROL AND ELECTRICAL RECORDING OF NEURAL ACTIVITY**  
*Marco Pisanello, Leonardo Sileo, Rui Peixoto, Bernardo L. Sabatini, Ferruccio Pisanello and Massimo De Vittorio*  
Center for Biomolecular Nanotechnologies, Istituto Italiano di Tecnologia, Arnesano (LE), Italy  
Dipartimento di Ingegneria dell'Innovazione, Università del Salento, Lecce, Italy  
Department of Neurobiology, Harvard Medical School, Boston (MA), U.S.A.
- 15:50 - 16:10    **ENGINEERED DIATOMS AS SMART MATERIAL FOR OPTOELECTRONIC BIOSENSING**  
*Luca De Stefano, Annalisa Lamberti, Ilaria Rea, Monica Terracciano, Principia Dardano and Ivo Rendina*  
IMM-CNR, Institute for Microelectronics and Microsystems, Napoli, Italy  
Department of Molecular Medicine and Medical Biotechnology, University of Naples "Federico II", Napoli, Italy
- 16:10 – 16:30    **INTEGRATED MICROWAVE PHOTONIC DEVICES AND CIRCUITS IN SPACE**  
*Francesco Dell'olio, Giuseppe Brunetti, Donato Conteduca, Noè Giovinazzzi, Caterina Ciminelli and Mario Nicola Armenise*  
Optoelectronics Laboratory, Politecnico di Bari, Bari, Italy

# Integrated Circuits and Systems II

17:00 – 19:00, Thursday, June 22

*Sala Magna*

*Chair: Gaetano Palumbo*

- 17:00 – 17:20    **A HYBRID INSTRUCTION PREFETCHING MECHANISM FOR ULTRA LOW-POWER MULTI-CORE CLUSTERS**  
*Maryam Payami, Erfan Azarkhish, Igor Loi and Luca Benini*  
DEI , University of Bologna, , University of Bologna, Bologna, Italy  
ETH ETH, Swiss Federal Institute of Technology Zurich, Switzerland
- 17:20 - 17:40    **INTEGRATED POWER AND DATA TRANSFER SYSTEMS WITH GALVANIC ISOLATION**  
*Alessandro Parisi, Nunzio Greco, Nunzio Spina, Egidio Ragonese and Giuseppe Palmisano* DIEEI,  
Università degli Studi di Catania, Catania, Italy  
STMicroelectronics, Catania, Italy.
- 17:40 - 18:00    **DESIGN OF A TWO-STAGE CMOS OPERATIONAL AMPLIFIERS WITH ENHANCED COMPENSATION**  
*Riccardo Zurlo, Alessandro Cabrini, Marco Pasotti and Guido Torelli*  
Department of Electrical, Computer and Biomedical Engineering University of Pavia,  
Pavia, Italy  
STMicroelectronics, Agrate Brianza, Italy.
- 18:00 – 18:20    **AN RF ENERGY HARVESTING SYSTEM TO POWER BATTERY FREE WIRELESS SENSORS**  
*Roberto La Rosa, Calogero Alessio Di Carlo, Loreto Di Donato, Patrizia Livreri, Gino Sorbello and Giulio Zoppi* STMicroelectronics, Catania, Italy  
Dipartimento di Ingegneria Elettrica Elettronica ed Informatica, Università di Catania, Catania, Italy  
Department of Energy, Information Engineering, and Mathematical Models, University of Palermo, Palermo, Italy
- 18:20 – 18:40    **A TVWS LNTA WITH BALANCED OUTPUT EMPLOYING A LOW-NOISE CURRENT MULTIPLIER**  
*Arianna Coccia, Danilo Manstretta and Rinaldo Castello*  
Microelectronics Group, University of Pavia 27100, Italy
- 18:40 – 19:00    **LOW-COMPLEXITY IMPLEMENTATION OF ODD TYPE DCT/DST FOR VIDEO CODING**  
*Maurizio Maserà, Maurizio Martina and Guido Maserà*  
Electronics and Telecommunications Department, Politecnico di Torino, Torino, Italy

# Electronic Systems and Applications II

17:00 – 18:40, Thursday, June 22

*Sala delle Capriate*

*Chair: Alessandro De Gloria*

- 17:00 – 17:20    **AN ALGORITHM FOR ACCURATE LOCALIZATION OF IMPACTS FOR INTEGRATION IN A REAL-TIME PROCESSING PLATFORM**  
*Eugenio Marino Merlo, Pietro Giannelli, Andrea Bulletti, Marco Calzolari and Lorenzo Capineri*  
Department of Information Engineering, University of Florence, Firenze, Italy
- 17:20 - 17:40    **CHARM - A NEW MIXED-FIELD FACILITY FOR IONIZING RADIATION TEST OF ELECTRONICS AT CERN**  
*Stefano Bonaldo, Alessandro Paccagnella and Salvatore Danzeca*  
Department of Information Engineering, Università di Padova, Padova, Italy  
CERN, Geneva, Switzerland
- 17:40 - 18:00    **FPGAS AND MEAS IN CLOSED-LOOP SYSTEMS**  
*Giovanni Pietro Seu, Gian Nicola Angotzi, Giuseppe Tuveri, Luigi Raffo, Luca Berdondini, Alessandro Maccione and Paolo Meloni*  
Department of Electrical and Electronic Engineering (DIEE), University of Cagliari, Cagliari, Italy  
Department of Neuroscience and Brain Technologies, Istituto Italiano di Tecnologia, Genova, Italy
- 18:00 – 18:20    **IEEE802.11S MESH NETWORKS PERFORMANCE EVALUATION**  
*Emiliano Sisinni, Alessandro Depari, Paolo Ferrari, Alessandra Flammini and Federico Tramarin*  
Dept. of Information Engineering, University of Brescia, Brescia  
National Research Council of Italy, CNR-IEIIT, Padova, Italy
- 18:20 – 18:40    **COARSE-GRAINED RECONFIGURATION: RUN-TIME ADAPTIVITY IN CYBER PHYSICAL SYSTEMS**  
*Francesca Palumbo, Carlo Sau, Paolo Meloni and Luigi Raffo*  
University of Sassari, PolComIng – Information Eng. Unit, Sassari, Italy  
University of Cagliari, Diee – Microelectronics and Bioengineering Group, Cagliari, Italy



# Round table meeting

11:00 – 13:30, Friday, June 23

*Sala Magna*

*Chair: Andrea Lacaita*

11:00 – 11:30 **ECSEL PROGRAM PRESENTATION**  
*Yves Gigase, ECSEL Joint Undertaking Head of Programme*

11:30 – 12:00 **INSIGHT PROJECT PRESENTATION**  
*Giancarlo Forlanini, ECSEL IT President*



12:00 - 13:30 Round table on Funding for Smart Systems & ECSEL  
**SMART SYSTEM INTEGRATION FOR ECSEL PROGRAM**

*Chair:*

*Enrico Sangiorgi* *Università di Bologna, Prorettore per la didattica*

*Panel Members:*

*Yves Gigase* *ECSEL Joint Undertaking Head of Programme*

*Aldo Covello* *MIUR, Direzione Generale per il coordinamento, la promozione e la valorizzazione della ricerca*

*Alessandro Ferrara* *Regione Sicilia: Dipartimento Attività Produttive, Dirigente Generale*

*Enrico Macii* *Politecnico di Torino, Membro di ECSEL PAB e GB*

*Dario Tornabene* *Regione Sicilia: Dipartimento Attività Produttive*

*Mario Aleo* *STMicroelectronics, ADG Group Vice President, Power Transistor General Manager*

*Danilo Crippa* *LPE R&D Director*

*Sergio D'Alberto* *LFoundry Director*

*Fabrizio Famà* *LFoundry Senior VP*

*Filippo D'Arpa* *Amministratore Delegato del Distretto Tecnologico Sicilia Micro e NanoSistemi*

*Livan Fratini* *Delegato del Rettore dell'Università degli studi di Palermo alla gestione operativa delle attività di ricerca dell'Ateneo ed ai rapporti di ricerca con l'UE.*

# Poster Session

Posters will remain on display during the whole duration of the conference

*Room: Cortile porticato*

*Chair: Corrado Di Natale, Luigi Raffo, Luigi Zeni*

- P1. **ROTOSAR FOR STATIC TEST OF A BRIDGE**  
*Lapo Miccinesi and Massimiliano Pieraccini*  
Department of Information Engineering, University of Florence, Florence, Italy
- P2. **WEARABLE DEVICE FOR THE DETECTION OF ELECTROMYOGRAPHY SIGNALS**  
*Paolo Gentile, Marco Pessione, Antonio Suppa, Alessandro Zampogna, Ivan Mazzezza and Fernanda Irrera*  
Department of Information Engineering, Electronics and Communications, Sapienza University, Rome  
STMicroelectronics, Via Olivetti, Agrate Brianza, Italy  
Dept. of Neurology and Psychiatry, Sapienza University- 4IRCSS-NEUROMED, Pozzilli (Is)
- P3. **WIENER NONLINEAR FILTER IDENTIFICATION USING PERFECT PERIODIC SEQUENCES WITH MULTIPLE-VARIANCES**  
*Alberto Carini, Simone Orcioni and Stefania Cecchi*  
DiSPeA, University of Urbino, Urbino, Italy  
DII, Università Politecnica delle Marche, Ancona, Italy
- P4. **REMOTE SENSING SYSTEM FOR CONDITION MONITORING OF MODERN WOODEN STRUCTURES**  
*Leonardo Pantoli, Mirco Muttillo, Giuseppe Ferri, Vincenzo Stornelli, Rocco Alaggio, Daniele Vettori, Luca Chinzari and Ferdinando Chinzari*  
Dept. Industrial and Information Engineering and Economics, University of L'Aquila, L'Aquila, Italy  
Dept. of Civil, Construction-Architectural and Environmental Engineering, Univ. of L'Aquila, Italy  
L.E.R. s.r.l., Via Ventiquattro Maggio, 46, 00187, Rome, Italy
- P5. **A NEW MINIMALLY INVASIVE WIDE BANDWIDTH FIBER-OPTIC ULTRASOUND PROBE IN MOMS TECHNOLOGY**  
*Enrico Vannacci, Simona Granchi, Alberto Roncaglia, Luca Belsito and Elena Biagi*  
Department of Information Engineering, University of Florence, Florence, Italy
- P6. **DECOUPLED CONTROL SCHEME OF GRID-CONNECTED SPLIT-SOURCE INVERTERS**  
*Ahmed Abdelbakim, Paolo Mattavelli, Valeria Boscaino and Giuseppe Lullo*  
Department of Management and Engineering, University of Padova, Padova, Italy  
Department of Energy, Information Engineering, and Mathematical Models, University of Palermo, Palermo, Italy
- P7. **PIEZOELECTRIC ACTUATORS FOR MICROFLUIDIC ACOUSTIC-WAVE MANIPULATION OF IN-LIQUID PARTICLES**  
*Marco Demori, Marco Baiù, Simone Dalola, Marco Ferrari and Vittorio Ferrari*  
Department of Information Engineering, University of Brescia, Brescia, Italy
- P8. **NEW DEVELOPMENTS IN WEARABLE AND IMPLANTABLE ELECTRONICS**  
*Vito Errico, Antonio Pallotti, Mariachiara Ricci, Franco Giannini, Giovanni Costantini and Giovanni Saggio*  
Department of Electronic Engineering, University of Rome Tor Vergata, Rome, Italy

- P9. **MFC PERFORMANCE AND APPLICATIONS**  
*Andrea Pietrelli, Vincenzo Ferrara, Bruno Allard, Francois Buret, Irene Bavasso, Francesca Costantini and Firas Khaled*  
 DIET, Sapienza University of Rome, Rome, Italy  
 Laboratoire Ampère, INSA de Lyon, Ecole Centrale de Lyon, Lyon, France  
 Department of Chemical Engineering, Sapienza University of Rome, Rome, Italy  
 Department of Chemistry, Sapienza University of Rome, Rome, Italy
- P10. **3D FEM MODELING OF CMUTs MADE BY REVERSE FABRICATION PROCESS**  
*Monica La Mura, Nicola Lamberti, Alessandro Stuart Savoia and Giosuè Caliano*  
 Department of Industrial Engineering, University of Salerno, Fisciano (SA), Italy  
 Department of Engineering, University of Roma Tre, Rome, Italy
- P11. **ELECTRICAL TUNING OF OPTICAL LC:PDMS WAVEGUIDES**  
*Luca Civita, Katarzyna Rutkowska, Rita Asquini and Antonio d'Alessandro*  
 Department of Information Engineering, Electronics, Telecommunications, Sapienza University of Rome, Italy  
 Faculty of Physics, Warsaw University of Technology Koszykowa 75, 00-662 Warszawa, Poland
- P12. **INFLUENCE OF GATE OXIDE FILMS ON GRAPHENE FIELD EFFECT TRANSISTORS MICROWAVE PERFORMANCE**  
*Antonio Benfante, Marco Angelo Giambra, Riccardo Pernice, Enrico Calandra, Salvatore Stivala, Alessandro Busacca and Romain Danneau*  
 Department of Energy, Information engineering and Mathematical models, University of Palermo, Palermo, Italy  
 Institute of Nanotechnology, Karlsruhe Institute of Technology, Karlsruhe, Germany
- P13. **A LOW-COMPLEXITY PROGRAMMABLE CURRENT MODE CIRCUIT TO DESIGN THE SAWTOOTH CHAOTIC MAP**  
*Tommaso Addabbo, Ada Fort, Marco Mugnaini, Hadis Takaloo, Santina Rocchi and Valerio Vignoli*  
 Dept. of Information Engineering and Mathematics, University of Siena, Siena, Italy  
 Dept. of Electrical and Information Technology Engineering, University of Napoli Federico II, Italy
- P14. **AN ELECTRONIC INTERFACE FOR ARRAYS OF SELF-ADAPTED TEMPERATURE MODULATED GAS SENSORS**  
*Alexandro Catini, Eugenio Martinelli and Corrado Di Natale*  
 Department of Electronic Engineering, University of Rome Tor Vergata, Roma, Italy
- P15. **ENHANCED FLUORESCENCE EMISSION AND RAMAN SCATTERING USING BOUND STATES IN THE CONTINUUM OF A PHOTONIC CRYSTAL MEMBRANE**  
*Silvia Romano, Gianluigi Zito, Stefano Managò, Anna Chiara De Luca, Stefano Cabrini and Vito Mocella*  
 Institute for Microelectronics and Microsystems, CNR-IMM – Unità di Napoli, Napoli, Italy  
 Institute of Protein Biochemistry, CNR-IBP, Napoli, Italy  
 Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, USA
- P16. **EFFECT OF HEAT SOURCES MODELING IN DC CIRCUIT-LEVEL ELECTROTHERMAL SIMULATION OF POWER MOSFETS**  
*Antonio Pio Catalano, Vincenzo d'Alessandro, Gianpaolo Romano, Michele Riccio, Alessandro Magnani, Lorenzo Codecasa, Niccolò Rinaldi, Andrea Irace and Giovanni Breglio*  
 Department of Electrical Engineering and Information Technology, University Federico II, Naples, Italy  
 Department of Electronics, Information, and Bioengineering, Politecnico di Milano, Milan, Italy

- P17. **NEW SPR SENSOR BASED ON A SLAB WAVEGUIDE IN SPECIAL HOLDER AND OPTICAL FIBERS**  
*Nunzio Cennamo, Francesco Mattiello and Luigi Zeni*  
 Department of Industrial and Information Engineering, University of Campania “Luigi Vanvitelli”,  
 Aversa, Italy
- P18. **A NEURAL NETWORK BASED SYSTEM FOR FACE IDENTIFICATION BY A BLIND USER**  
*Carrato Sergio, Stefano Marsi, Giovanni Ramponi, Jhiliik Bhattacharya and Herbert Frey*  
 Department - University of Trieste, Italy  
 Thapar University, India  
 Ulm University of Applied Sciences, Germany
- P19. **OPEN-SOURCE SOFTWARE/HARDWARE SYSTEM FOR GEOMETRY TEACHING**  
*Ahmad Kobeissi, Francesco Bellotti, Riccardo Berta and Alessandro De Gloria*  
 DITEN, University of Genoa, Genoa, Italy
- P20. **WEARABLE SPINE POSTURE REAL TIME MONITORING AND DISPLAY SYSTEM**  
*Ahmad Kobeissi, Flavio Ansovini, Francesco Bellotti, Riccardo Berta and Alessandro De Gloria*  
 DITEN, University of Genoa, Genoa, Italy
- P21. **DESIGN AND TESTING OF A CONTROL SYSTEM BASED ON STM X-NUCLEO DEVELOPMENT  
 BOARDS FOR DETECTION AND WIRELESS TRANSMISSION OF SENSORS DATA APPLIED TO A  
 SINGLE-SEAT FORMULA SAE CAR**  
*Paolo Visconti, Bernardo Sbarro and Patrizio Primiceri*  
 Department of Innovation Engineering, University of Salento, Lecce, Italy
- P22. **TRANSRADIAL PROSTHESIS BASED ON WIRELESS MIOELECTRONIC BRACELET: DESIGN OF THE  
 SENSING ELECTRONIC SYSTEM AND HAND MOVEMENTS CONTROL**  
*Paolo Visconti, Federico Gaetani, Patrizio Primiceri and Roberto de Fazio*  
 Department of Innovation Engineering, University of Salento, Lecce, Italy.
- P23. **BRILLOUIN SENSORS WITH REFRACTOMETER CAPABILITIES**  
*Ester Catalano, Agnese Coscetta, Aldo Minardo and Luigi Zeni*  
 Department of Information and Industrial Engineering, Università della Campania “Luigi Vanvitelli”,  
 Aversa, Italy
- P24. **DONOR/ACCEPTOR HETEROJUNCTION ORGANIC SOLAR CELLS**  
*Pasquale Cusumano*  
 Dep. of Energy, Information engineering and Mathematical models, University of Palermo, Palermo, Italy
- P25. **FABRICATION AND CHARACTERIZATION OF MICROSCALE HFO<sub>2</sub>-BASED MEMRISTORS**  
*Roberto Macaluso, Salvatore Barcellona, Andrea Zaffora, Ugo Lo Cicero, Giuseppe Lullo, Mauro Mosca, Claudio Cali,  
 Francesco Di Franco and Monica Santamaria*  
 Dipartimento di Energia, Ingegneria dell’Informazione e modelli Matematici, Università di Palermo,  
 Palermo, Italy  
 Dipartimento di Ingegneria Civile, Ambientale, Aerospaziale, dei Materiali, Università di Palermo, Palermo  
 Istituto Nazionale di Astrofisica, Palermo, Italy
- P26. **THRESHOLD VOLTAGE VARIABILITY AND SENSITIVITY TO PROCESS VARIATIONS IN INGAAS DG-  
 UTB MOSFETS**  
*Nicolò Zagni, Francesco Maria Puglisi, Giovanni Verzellesi and Paolo Pavan*  
 DIEF and DISMI, Università di Modena e Reggio Emilia, Modena, Italy

- P27. **HARMONIC RFID SENSORS FOR SMART IOT APPLICATIONS**  
*Federico Alimenti, Valentina Palazzini, Paolo Mezzanotte and Luca Roselli*  
 Department of Engineering, University of Perugia, Perugia, Italy
- P28. **PASSIVATION BUFFER LAYER FOR HETEROJUNCTION SOLAR CELLS: A-SiO<sub>x</sub>:H AND A-Si:H COMPARISON**  
*Luca Martini, Luca Serenelli and Rita Asquini*  
 Department DIET University of Rome "Sapienza", Rome Italy  
 ENEA ResearchCentre "Casaccia", Rome Italy
- P29. **SUPERPRISM-BASED OPTICAL BEAM DEFLECTOR**  
*Valentina Di Meo, Alessio Crescitelli, Emanuela Esposito, Vito Mocella, Ivo Rendina, Caterina Summonte and Giuseppe Cocorullo*  
 D.I.M.E.S. Department, University of Calabria, Rende, Italy  
 Institute for Microelectronic and Microsystems, CNR, Napoli, Italy  
 Institute for Microelectronic and Microsystems, CNR, Bologna, Italy
- P30. **PYROELECTRIC SENSOR FOR MICROFLUIDIC DEVICES**  
*Salvatore Andrea Pullano, Ifana Mabbub, Syed Kamrul Islam and Antonino S. Fiorillo*  
 Dept. of Health Sciences, University Magna Græcia, Catanzaro, Italy  
 Dept. of Electrical Engineering and Computer Science, University of Tennessee, Knoxville USA
- P31. **DEVELOPMENT ASPECTS OF A MODULAR INTEGRATED 1200V-35A SiC MOSFET BI-DIRECTIONAL SWITCH**  
*Nicola Delmonte, Diego Chiozzzi, Michele Caselli, Paolo Cova, Giovanni Chiorboli, Attabir Murtala Aliyu, Alberto Castellazzi and Philippe Lasserre*  
 Department of Engineering and Architecture, University of Parma, Italy  
 PEMC Group, University of Nottingham, Nottingham, UK  
 PRIMES Association, Tarbes, France
- P32. **FPGA-BASED LOCK-IN TECHNIQUES FOR BRAIN MONITORING APPLICATIONS**  
*G. Costantino Giaconia, Giuseppe Greco, Leonardo Mistretta and Raimondo Rizzo*  
 Department of Energy, Information engineering and Mathematical models, University of Palermo, Palermo, Italy
- P33. **IMPACT OF THE ERASE ALGORITHMS ON FLASH MEMORY LIFETIME**  
*Ginevve Alieri, G. Costantino Giaconia, Leonardo Mistretta, Francesco La Rosa and A. Angelo Cimino*  
 Department of Energy, Information engineering and Mathematical models, University of Palermo, Palermo, Italy  
 MDG Group R&D, STMicroelectronics, Rousset, France  
 MDG Group R&D, STMicroelectronics, Palermo, Italy
- P34. **3D PALMPRINT THROUGH A RELIABLE ULTRASOUND SYSTEM FOR BIOMETRIC RECOGNITION**  
*Antonio Inla and Donatella Nardiello*  
 Scuola di Ingegneria, University of Basilicata, Potenza, Italy
- P35. **A NEW APPROACH TO CHARACTERIZE COMPLEX ICs IN TERMS OF SCATTERING PARAMETERS**  
*Matteo Vincenzo Quitadamo and Franco Fiori*  
 Electronics and Telecommunication Dept., Politecnico di Torino, Italy

- P36. **CHARACTERIZATION OF INDUCTORS IN PARTIAL SATURATION FOR SMPS APPLICATIONS**  
*Samuele Rosato, Gianpaolo Vitale and Giuseppe Lullo*  
 Dipartimento di Energia, Ingegneria dell'Informazione e Modelli Matematici, Università degli Studi di Palermo, Palermo, Italy  
 Istituto di Studi sui Sistemi Intelligenti per l'Automazione, Consiglio Nazionale delle Ricerche, Palermo, Italy
- P37. **NEUTRON EFFECTS ON MEMORY SYSTEMS: THE NEMESYS PROJECT**  
*Marco Ottavi, Gian Carlo Cardarilli, Luca Di Nunzio, Marco Re, Rocco Fazzolari and Gianluca Furano*  
 Department of Electronic Engineering, University of Rome Tor Vergata, Rome, Italy  
 Department of Electronic Engineering, Rome, University of Rome Tor Vergata, Italy  
 ESTEC - ESA (European Space Agency), Keplerlaan 1 2201AZ Noordwijk, The Netherlands
- P38. **RF ENERGY HARVESTING FOR WIRELESS SENSOR NODES**  
*Michele Caselli, Andrea Boni and Matteo Tonelli*  
 Department of Engineering and Architecture, University of Parma, Parma, Italy  
 ST Microelectronics, Agrate, Italy
- P39. **DEFLECTION MONITORING OF A MULTILAYER PANEL BY FIBER BRAGG GRATING SENSORS**  
*Pasquale Di Palma, Giovanna Palumbo, Agostino Iadicicco and Stefania Campopiano*  
 Department of Engineering, University of Naples "Parthenope", Naples, Italy
- P40. **ARC-INDUCED LONG PERIOD GRATINGS IN FIBERS WITH DIFFERENT COMPOSITION AND STRUCTURE**  
*Rajeev Ranjan, Flavio Esposito, Stefania Campopiano and Agostino Iadicicco*  
 Department of Engineering, University of Naples "Parthenope", Naples, Italy
- P41. **INFLUENCE OF ELECTRODES LAYOUT ON HYDROTHERMALLY-GROWN GAN/ZNO LEDs**  
*Mauro Mosca, Davide Caltagirone, Giuseppe Lullo, Roberto Macaluso, Claudio Calì, Isodiana Crupi, Fulvio Caruso and Eric Felin*  
 Dep. of Energy, Information engineering and Mathematical models, University of Palermo, Palermo, Italy  
 Novagan, Sàrl, Lausanne, Switzerland
- P42. **THE CHIPIX65 ASYNCHRONOUS FRONT-END FOR FUTURE PIXEL DETECTORS**  
*Luigi Gaioni, Francesco De Canio, Massimo Manghisoni, Lodovico Ratti, Valerio Re and Gianluca Traversi*  
 University of Bergamo, Dept. of Engineering and Applied Sciences, Dalmine(BG)  
 University of Pavia, Dept. of Electrical, Computer and Biomedical Engineering, Pavia, Italy  
 INFN, Sezione di Pavia, Italy
- P43. **PROGRAMMABLE AND MODULAR CONTROL SYSTEM FOR FLUID NETWORKS**  
*Stefano Noli and Carla Vacchi*  
 Department of Electrical, Computer and Biomedical Engineering, Pavia, Italy
- P44. **POWER MONITORING AND CONTROL OF HIGH PERFORMANCE COMPUTING CLUSTERS**  
*Andrea Bartolini*  
 DEI, University of Bologna, Bologna, Italy
- P45. **PERFORMANCE ENHANCEMENT PHENOMENON IN RUTHENIUM-BASED DYE SENSITIZED SOLAR CELLS**  
*Antonino Parisi, Riccardo Pernice, Gabriele Adamo, Alfonso Cino and Alessandro Busacca*  
 Dep. of Energy, Information engineering and Mathematical models, University of Palermo, Palermo, Italy

- P46. **MULTICHANNEL ECG-PPG COMBO PORTABLE SYSTEM: HARDWARE DESCRIPTION AND PHYSIOLOGICAL PARAMETERS**  
*Antonino Parisi, Saverio Guarino, Riccardo Pernice, Alfonso Cino and Alessandro Busacca*  
Department of Energy, Information engineering and Mathematical models, University of Palermo, Palermo, Italy
- P47. **BIOCOMPATIBLE PRESSURE SENSORS ACHIEVED BY NANointerFACES OF GRAPHENE OXIDE**  
*Antonino Parisi, Andrea Maio, Simone Musca, Riccardo Pernice, Roberto Scaffaro and Alessandro Busacca*  
Dipartimento di Energia, ingegneria dell'Informazione e modelli Matematici (DEIM), Università di Palermo, Palermo, Italy  
Dipartimento di Ingegneria Civile, Ambientale, Aerospaziale, dei Materiali (DICAM), Università di Palermo, Palermo, Italy
- P48. **LINEAR AND NONLINEAR GAN HEMT MODELLING**  
*Alina Caddemi, Emanuele Cardillo and Giovanni Crupi*  
Department of Engineering, University of Messina, Messina, Italy  
Department of Biomedical and Dental Sciences and Morphofunctional Imaging, University of Messina, Messina, Italy
- P49. **ALL-DIELECTRIC METAMATERIALS WITH THIN PHASE CHANGE MATERIAL LAYERS FOR ALL-OPTICAL SWITCHING**  
*Valentina Di Meo, Emilija Petronijevic, Alessio Crescitelli, Principia Dardano, Giuseppe Coppola, Emanuela Esposito, Ivo Rendina, Grigore Leabu, Maria Miritello, Maria Grazia Grimaldi, Concita Sibilìa*  
Department D.I.M.E.S, University of Calabria, Rende, Italy  
Institute for Microelectronics and Microsystems – CNR Napoli, Naples, Italy  
Department S.B.A.I., La Sapienza University of Rome, Rome, Italy  
Institute for Microelectronics and Microsystems – CNR Catania, Catania, Italy



# Social events

## Welcome Dinner



### Villa Malfitano

*Via Dante, 167 - 90145 Palermo (PA)*

21:00 – 23:30, Wednesday, June 21

Transport has been arranged by bus:

- ✓ 19:00 from Palazzo Steri to Piazza Borsa
- ✓ 20:00 from Piazza Borsa to Villa Malfitano

The Welcome Dinner will take place at Villa Malfitano, currently the headquarters of the Whitaker Foundation. The villa, located in the quarter of Politeama, was built between 1886 and 1889 by the will of the Sicilian-English Joseph Whitaker. It was designed by the architect Ignazio Greco and represents a synthesis of Neo-Renaissance and Eclecticism styles. The villa is decorated with several artworks like the frescoes of Ettore De Maria Bergler. The garden, designed by Emilio Kunzmann, covers about seven hectares.

## Gala Dinner



### Castello a mare

*Via Filippo Patti, 90133 Palermo (PA)*

21:00 – 23:30, Thursday, June 22

Transport has been arranged by bus:

- ✓ 19:00 from Palazzo Steri to Piazza Borsa
- ✓ 20:00 from Piazza Borsa to Castello a mare

The Social Dinner will take place at Castello a mare, an ancient fortress that guarded the entrance to the port at Palermo in La Cala. Extensive remains are visible, there is an Arab-Norman keep, a fortified gate or entrance, and remains of a sophisticated Renaissance star-shaped defence.

## Social Tour



### Palazzo Abatellis

*Via Alloro, 4 - 90133 Palermo (PA)*

16:00 – 18:00, Friday, June 23

Meeting point for the walking tour  
at Palazzo Steri



*St. Augustine by  
Antonello da Messina*

Palazzo Abatellis, also known as Palazzo Patella, is located in the Kalsa quarter. Home to the Gallery of Art for the Sicilian region, it is an example of Gothic-Catalan architecture. It was designed in the 15th century by Matteo Carnelivari and the residence of Francesco Abatellis (or Patella), port master of the Kingdom of Sicily.



# Conference Venue



The SIE2017 Annual Meeting is hosted at

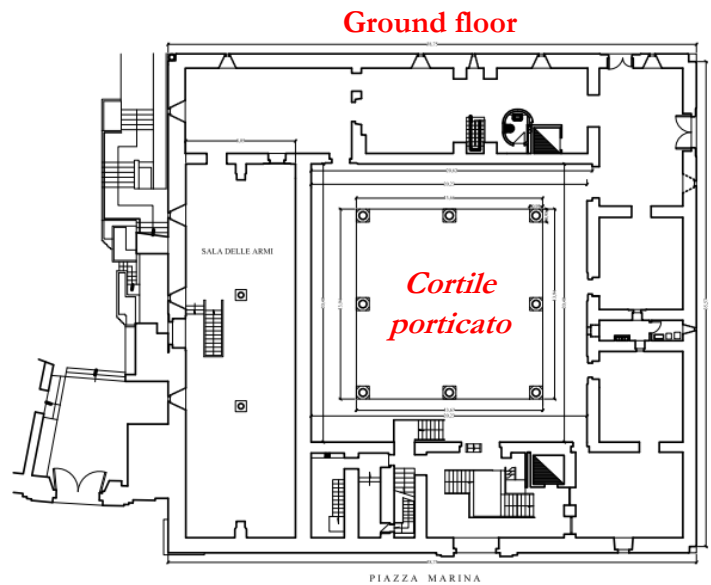
## Palazzo Chiamonte-Steri

*Piazza Marina, 61 - 90133 Palermo*

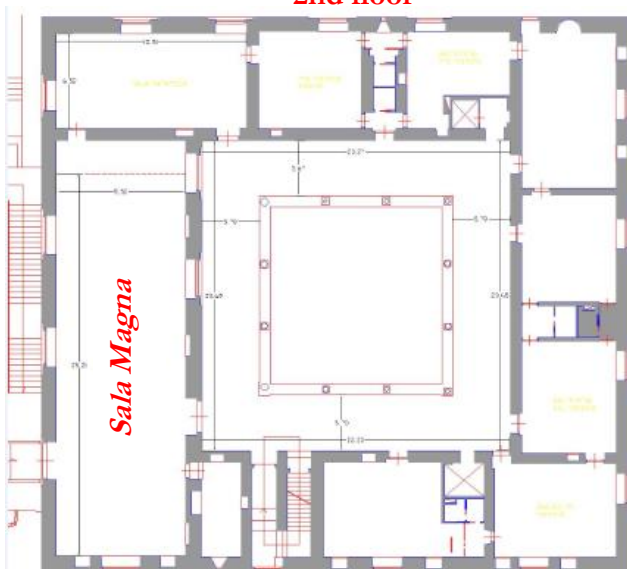
a historical monumental building hosting the Rectorate and Administrative Offices of the University of Palermo. The building was begun in the early 14th century, and was the residence of the powerful Sicilian lord Manfredi III Chiamonte. He commissioned the decoration of the Sala Magna ("Grand Hall"), with a painted wooden ceiling by Cecco di Naro, Simone da Corleone and Pellegrino Darena. From the late 15th century to 1517 it housed the Aragonese-Spanish viceroys of Sicily; later it was home to the Royal Customs and, from 1600 to 1782, the tribunal of the Holy Inquisition. The palace was restored in the 20th century, with numerous elements associated with its role as a jail of the Inquisition. During the works, the grooves left by iron cages in which had been hung the severed heads of the nobles who had rebelled against emperor Charles V were discovered in the façade. The palace is now a museum; among the artworks, it houses *Renato Guttuso's Vucciria*.

The conference rooms Sala Magna and Sala delle Capriate are located at the second and fourth floor, respectively, of the main building.

The poster session and exhibition stands will take place in Cortile Porticato at the ground floor.



**2nd floor**



**4th floor**

