111th edition

AEIT 2019 International Annual Conference

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AEIT 1897

AEIT 1897 Sezione Toscana e Umbria

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programme

Programme Overview

TUESDAY SEPTEMBER 17		
16,00-19,00	**Tutorials**		

WEDNESDAY SEPTEMBER 18		
10,00-10,30	**Welcome Statements**		
10,30-13,00	**Opening Plenary Session**		
13,00-14,00	*Lunch*		
14,00-14,30	**Commemoration of Prof. Francesco Gagliardi, Former AEIT General President**		
14,30-15,30	**AEIT Young Members Group and Social, AEIT for STEM**		
15,30-16,15	**Keynote Speech 1**		
16,15-16,30	*Break*		
	ROOM A	**ROOM B**	**ROOM C**
16,30-18,30	**Technical Session A1** Distributed Generation, Storage and Distribution Networks	**Technical Session B1** Recent Advances in Coding Theory and its Applications	**Technical Session C1** Power Converters and Motor Drives

THURSDAY SEPTEMBER 19		
	ROOM A	**ROOM B**	**ROOM C**
09,00-10,45	**Technical Session A2** Power Systems: Networks and Interconnection	**Technical Session B2** IoT Industrial Applications and cloud resource management	**Technical Session C2** Power Electronics & Active and Passive Components
10,45-11,00	*Break*		
11,00-11,45	**Keynote Speech 2**		
	ROOM A	**ROOM B**	**ROOM C**
11,45-13,15	**Technical Session A3** Power System: Protection and Stability	**Technical Session B3** Access Radio Technology and Software Control System	**Technical Session C3** Innovative smart components, modules and appliances for a truly connected, efficient and secure smart grid
13,15-14,15	*Lunch*		
14,15-17,45	**Young and Student Contest Poster Session & First AEIT Young Members Meeting**		
15,30-15,45	**Young Award Ceremony**		
15,45-16,00	*Break*		
16,00-18,15	**Case Histories**		
18,15-19,15	**Start UP Plenary Session**		
20,30	*Conference Dinner*		

FRIDAY SEPTEMBER 20		
	ROOM A	**ROOM B**	**ROOM C**
09,00-11,00	**Technical Session A4** Management, Operation and Control in Power Systems	**Technical Session B4** E-mobility & Shipboard Applications	**Technical Session C4** Resilience of Electrical Networks
09,00-11,00	**ROOM D** *Special Session Sustainability - Convergence towards a shared definition*		
11,00-11,15	*Break*		
	ROOM A	**ROOM B**	**ROOM C**
11,15-13,15	**Technical Session A5** Energy storage in support of power grids: from field experience to new projects, steering along regulatory and market evolution	**Technical Session B5** Smart Systems and Emerging Technologies	**Technical Session C5** Resilience of Electrical Networks and Climate Changes
13,15-13,30	**Conference Closure**		

OVERVIEW

*I*n recent years, we are seeing a growing synergy among infrastructures and systems for production, transmission, distribution and conversion of electricity, for telecommunications, and all those computing technologies that provide for the intelligence of the whole system. The ever-increasing dependence on electricity for carrying out daily activities, with the increasing use of smart devices, and the need for an intelligent management of the power grid in presence of distributed generation from renewable sources, are creating a tight interdependent system. Cloud computing, big data, large bandwidth interconnections support modern knowledge-based society paradigms.

AEIT 2019 will be an international forum to point out the challenges and needs to face with, in order to stimulate innovative entrepreneurial initiatives, and increase country's competitiveness.

The conference will host both technical and scientific contributions in the wide area of automation, electricity, information and communication technologies. It will also be the venue for hosting panels and speeches from national and international stakeholders for discussing those strategies useful to increasing competitiveness, and lay the foundations for the creation of new scientific as well as technical initiatives.

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Yijie Wang ■ *China*
Sheldon Williamson ■ *Canada*
Zhen Zhang ■ *China*

Technical Programme

Wednesday, September 18, 2019

8,30 **Registration**

10,00 ▪ 10,30 **Welcome Statements**
Debora Stefani ▪ *Presidente Generale AEIT*
Luigi Dei ▪ *Rettore Università di Firenze*
Eugenio Giani ▪ *Presidente del Consiglio Regionale della Toscana*
Cecilia Del Re ▪ *Assessora all'innovazione tecnologica Comune di Firenze*
Giampiero Giovannetti ▪ *Segretario Nazionale CNPI*
Pietro Antonio Scarpino ▪ *Presidente AEIT Sezione Toscana e Umbria*
Carlo Cecati ▪ *Presidente Comitato Scientifico AEIT 2019*

10,30 ▪ 13,00 **Opening Plenary Session**
Chair: Carlo Cecati ▪ *2019 AEIT Technical Program General Chair*
▪ **The Future is distributed - The key role of *DSOs* to enable the Energy Transition** ▪ Vincenzo Ranieri - *E-Distribuzione, Chief Executive Officer*
▪ **Energy transition and decarbonization: challenges and opportunities for the Italian system** ▪ Luigi Michi - *Terna, Head of Strategy, Development and System Operation*
▪ **Innovation & regulation: a key link towards energy transition** ▪ Maurizio Delfanti - *RSE, Chief Executive Officer*
▪ **Digitalisation and Sustainability: pillars of a new deal for industry** ▪ Filomena D'Arcangelo - *ANIE, Technical and Environment Director*
▪ **From pure cable manufacturer to data provider and cable system integrator** ▪ Roberto Candela - *Prysmian Electronics, Chief Executive Officer*
▪ **The new era of PV industry** ▪ Diego Percopo - *EF Solare Italia, Chief Executive Officer*
▪ **Energy trends: need for new products and new competencies** ▪ Paolo Perani - *ABB, Strategic Business Development Manager*
▪ **Technological Innovation in Railway Infrastructures: RFI experience** ▪ Eugenio Fedeli - *RFI, R&D Director*
▪ **Electric mobility: how to turn a potential threat to a great opportunity for power systems** ▪ Bruno Cova - *CESI, System Planning Director*

13,00 ▪ 14,00 **Lunch**

14,00 ■ 14,30 Commemoration of Prof. Francesco Gagliardi, Former AEIT General President

14,30 ■ 15,00   AEIT Young Members Group and Social ■ Nicolò Ventani - *Presidente Gruppo Giovani AEIT Sezione Toscana e Umbria*

15,00 ■ 15,30 AEIT for STEM
Rosa Anna Mastromauro - *Università di Firenze, Italy*

15,30 ■ 16,15 Keynote Speech 1
■ Multilevel topologies for drives and grid tied applications, with reduced DC link supplies ■ Kumarkutti Gopakumar - *FIEEE, FNAE - Indian Institute of Science Bangalore, India*

16,15 ■ 16,30 Break

16,30 ■ 18,30 ROOM A ■ Technical Session A1
Distributed Generation, Storage and Distribution Networks
Chair: Dario Zaninelli ■ *Politecnico di Milano, Italy*
A1.1 ■ Aggregation of residential Energy Storage Systems ■ Luigi Pellegrino, Carlo Sandroni - *Ricerca sul Sistema Enrgetico - RSE, Italy*
A1.2 ■ Techno-Economic Control of Energy Storage System for Demand Side Management ■ Francesco Grasso - *University of Florence, Italy*; Mostafa Abdollahi - *Technical University of Catalonia, Spain*; Libero Paolucci, Giacomo Talluri - *University of Florence, Italy*
A1.3 ■ Techno-Economic Evaluation of On-Grid Battery Energy Storage System in Jordan using Homer Pro ■ Hussam J. Khasawneh - *The University of Jordan, Jordan*; Motasem Bani Mustafa - *Ulster University, United Kingdom*; Ahmed Said Al-Salaymeh, Motasem Saidan - *The University of Jordan, Jordan*
A1.4 ■ A three-phase Optimal Power Flow formulation for a Low Voltage electric grid: a study case ■ Monica Crosa di Vergagni, Stefano Massucco, Federico Silvestro - *University of Genova, Italy*
A1.5 ■ On the Use of Synchronized LoRaWAN for the Coordination of Distributed Energy Resources in Smart Grids ■ Marco Pasetti, Stefano Rinaldi, Emiliano Sisinni, Paolo Ferrari, Alessandra Flammini - *University of Brescia, Italy*; Enrico Ragaini - *ABB, Italy*; Michela Longo, Dario Zaninelli - *Politecnico di Milano, Italy*
A1.6 ■ Multi-Layer RNN-based Short-term Photovoltaic Power Forecasting using IoT Dataset ■ Neungsoo Park, Hyung Keun Ahn - *Konkuk University, Korea*
A1.7 ■ Information Inconsistencies in Smart Distribution Grids under Different Failure Causes modelled by Stochastic Activity Networks ■ Romina Muka, Fredrik B. Haugli - *Norwegian University of Science and Technology, Norway*; Hanne Vefsnmo - *SINTEF Energy Research, Norway*; Poul E. Heegaard - *Norwegian University of Science and Technology, Norway*

16,30 ▪ 18,30 ROOM B ▪ Technical Session B1

Recent Advances in Coding Theory and its Applications

Chair: Massimo Battaglioni ▪ *Università Politecnica delle Marche, Italy*

B1.1 ▪ Obtaining structured generator matrices for QC-LDPC codes ▪ Massimo Battaglioni, Paolo Santini, Marco Baldi, Giovanni Cancellieri - *Università Politecnica delle Marche, Italy*

B1.2 ▪ Coding Bounds in the Finite-Block-Length Regime: an Application to Spread-Spectrum Systems Design ▪ Tomaso Erseghe, Nicola Laurenti, Matteo Zecchin - *University of Padova, Italy*

B1.3 ▪ Symbol Message Passing Decoding of Nonbinary Spatially-Coupled Low-Density Parity-Check Codes ▪ Emna Ben Yacoub - *Technical University of Munich, Germany*; Francisco Lázaro - *German Aerospace Center - DLR, Germany*; Alexandre Graell i Amat - *Chalmers University of Technology, Sweden*; Gianluigi Liva - *German Aerospace Center - DLR, Germany*

B1.4 ▪ Performance Study of a Class of irregular LDPC Codes through low Complexity Bounds on their Belief-Propagation Decoding Thresholds ▪ Francesca Vatta, Alessandro Soranzo, Massimiliano Comisso, Giulia Buttazzoni, Fulvio Babich - *University of Trieste, Italy*

B1.5 ▪ A Note on Channel Polarization and Mutual Information Transformation Charts of Polar Codes ▪ Marco Chiani, Enrico Paolini - *University of Bologna, Italy*

B1.6 ▪ A Simplified Application of Ordered Statistics Decoding to Single Parity Check Product Codes ▪ Roberto Garello, Giacomo Verardo - *Politecnico di Torino, Italy*

B1.7 ▪ Using Non-Binary LDPC and MDPC Codes in the McEliece Cryptosystem ▪ Marco Baldi, Giovanni Cancellieri, Franco Chiaraluce - *Università Politecnica delle Marche, Italy*; Edoardo Persichetti - *Florida Atlantic University, USA*; Paolo Santini - *Università Politecnica delle Marche, Italy*

16,30 ▪ 18,30 ROOM C ▪ Technical Session C1

Power Converters and Motor Drives

Chairs: Luigi Di Noia ▪ *University of Naples Federico II, Italy* and Rosa Anna Mastromauro ▪ *Università di Firenze, Italy*

C1.1 ▪ Development of Faults Diagnostic method for Automotive Motor Drives ▪ Byong Jo Hyon, Dongmyoung Joo, Joon Sung Park - *Korea Electronics Technology Institute, Korea*

C1.2 ▪ Modeling, control and simulation of a light electric vehicle propulsion system based on EMR ▪ Sorina Maria Ciornei, Mircea Ruba, Raul Octavian Nemes - *Technical University of Cluj-Napoca, Romania*; Calin Husar - *Siemens, Romania*; Claudia Martis - *Technical University of Cluj-Napoca, Romania*

C1.3 ■ **Power Quality Improvement for Chopper-Cell Based Modular Multilevel Converters** ■ Ahmed Majed Saif, Concettina Buccella, Maria Gabriella Cimoroni, Carlo Cecati - *University of L'Aquila, Italy*

C1.4 ■ **Design and Analysis of Outer Rotor Permanent Magnet Assisted Synchronous Reluctance Machine with Concentrated Winding for Small Electric Propulsion** ■ Razvan Alexandru Inte, Florin Nicolae Jurca, Claudia Martis - *Technical University of Cluj-Napoca, Romania*

C1.5 ■ **Combination Super-Twisting Sliding Mode with Finite Control Set Predictive Torque Control for IM Drives** ■ Diego Dias Pinheiro, Fabiano Camargo Rosa, Edson Bim - *University of Campinas, Brazil*

C1.6 ■ **Robust Load-Torque Estimation for DC Motor without Torque Sensor** ■ Stefano Fabbri, Matthias Nienhaus, Emanuele Grasso - *Saarland University, Germany*

C1.7 ■ **Sub-Synchronous Torsional Interactions and Start-Up Issues in Oil&Gas Plants: a Real Case Study** ■ Lorenzo Bongini, Rosa Anna Mastromauro - *University of Florence, Italy*

C1.8 ■ **Theoretical and Experimental modeling and Speed control of a Cereal Milling System** ■ Moustapha Diop, Boubacar Niang - *Cheikh Anta Diop University, Senegal*; Mouhamadou Thiam - *Polytechnic School of Ties, Senegal*; Lamine Thiaw - *Cheikh Anta Diop University, Senegal*, Sileymane Dianka - *University of Rome Tor Vergata, Italy*

C1.9 ■ **Investigation on Cascode Devices for High Frequency Electrical Drives Applications** ■ Vincenzo Castiglia, Antonino Oscar Di Tommaso, Rosario Miceli, Filippo Pellitteri, Giorgio Vassallo - *University of Palermo, Italy*

09,00 ▪ 10,45 ROOM A ▪ Technical Session A2

Power Systems: Networks and Interconnection

Chair: Roberto Caldon ▪ *AEIT and Università di Padova, Italy*

A2.1 ▪ Initiatives of Regional Cooperation for Italy's power system integration ▪ Silvio D'Alberto, Rosario Iannone, Antonio Pascucci, Gianluca Bruno, Silvia Moroni, Enrico Maria Carlini - *Terna Rete Italia, Italy*

A2.2 ▪ HVDC link between Italy and Montenegro: impact of the commissioning on the real-time operation ▪ Gaetano Pecoraro, Matteo Contu, Flavio Allella, Antonio Pascucci, Marco Cortese, Gianluca Bruno, Enrico Maria Carlini, Roberto Gnudi, Luigi Michi - *Terna, Italy*

A2.3 ▪ The DC power planning for network flexibility in the multi-area power system ▪ Luigi Michi, Giacomo Donnini, Benedetto Aluisio, Michela Migliori, Chiara Vergine - *Terna, Italy*; Maria Dicorato - *Politecnico di Bari, Italy*; Giuseppe Forte

A2.4 ▪ A new real-time approach for the load forecasting in the operation of sub-transmission systems ▪ Carmelo Mosca, Enrico Marin, Tao Huang, Ettore Bompard - *Politecnico di Torino, Italy*; Paolo Cuccia, Laura Campisano, Stefano Neri - *Terna Rete Italia, Italy*

A2.5 ▪ On Eigenvalues of the Three-Phase Nodal Admittance Matrix ▪ Giovanni Mercurio Casolino, Arturo Losi - *University of Cassino and Lazio Meridionale, Italy*

A2.6 ▪ IEC 61850-based smart automation system logic to improve reliability indices in distribution networks ▪ Alessandro Bosisio, Alberto Berizzi - *Politecnico di Milano, Italy*; Andrea Morotti, Andrea Pegoiani, Bartolomeo Greco, Gaetano Iannarelli - *UNARETI, Italy*

A2.7 ▪ Automatic recognition system of power quality disturbances detection and classification based on MVN neural estimator ▪ Francesco Grasso, Libero Paolucci, Giacomo Talluri, Tommaso Bacci, Pietro Antonio Scarpino - *University of Florence, Italy*

09,00 ▪ 10,45 ROOM B ▪ Technical Session B2

IoT Industrial Applications and cloud resource management

Chair: Giovanni Cancellieri ▪ *AEIT and Università Politecnica delle Marche, Italy*

B2.1 ▪ Cloud resource management in infrastructure as a service cloud by using workload prediction: a framework based on fuzzy inference engine ▪ Nafiseh Razavi, Ali Rezaee, Sahar Adabi - *Islamic Azad University, Iran*

B2.2 ▪ IIoT-based Motion Control Efficiency in Automated Warehouses ▪ Francesco Benzi, Ezio Bassi - *University of Pavia, Italy*; Filippo Marabelli, Nelson Belloni, Marco Lombardi - *Lenze Italia, Italy*

B2.3 ■ **Multiband Multi-rate Narrowband Software Defined Radio waveform based on CPM** ■ Azka Zaheer, Muhammad Zeeshan - *National University of Sciences and Technology, Pakistan*
Invited ■ **Smart Urban Infrastructure for a concrete and integrated approach to Smart Cities** ■ Vincenzo Cortese - *Sirti, Italy*
Invited ■ **Internet of Goods: a new paradigm for logistic and transport** ■ Veronica Tinucci - *Leghorngroup, Italy*

09,00 ■ 10,45 ROOM C ■ Technical Session C2
Power Electronics & Active and Passive Components
Chairs: Giuseppe Gattavari ■ *AEIT-AMES, Italy* and Salvatore Musumeci - *Politecnico di Torino , Italy*
C2.1 ■ **Power Control and Energy Management of Grid-Scale Energy Storage Systems for Smart Users** ■ Francesco Grasso - *University of Florence, Italy*; Mostafa Abdollahi - *Technical University of Catalonia, Spain*; Libero Paolucci, Giacomo Talluri - *University of Florence, Italy*
C2.2 ■ **IGBT based Three Channel Interleaved PFC Boost Converter for Inverter Front-End Application** ■ Salvatore Musumeci, Radu Bojoi, Stefano Borlo, Eric Armando - *Politecnico di Torino, Italy*
C2.3 - **The key role of the SJ MOSFET with fast diode in high-end SMPS converters for telecom applications** ■ Domenico Nardo, Alfio Scuto, Giuseppe Sorrentino - *STMicroelectronics, Italy*; Angelo Raciti, Santi Agatino Rizzo - *University of Catania, Italy*
C2.4 ■ **Development of Active Gate Driver to Reduce Switching Loss for High Power Inverter** ■ Jun-Hyuk Choi, Yong-Su Noh, Jin-Hong Kim - *Korea Electronics Technology Institute, Korea*
C2.5 - **Effects of parasitic phenomena in half bridge with Super Junction MOSFETs suitable for UAV** ■ Luigi Abbatelli - *STMicroelectronics, Italy*; Angelo Raciti - *University of Catania, Italy*; Rosario Scollo - *STMicroelectronics, Italy*; Giuseppe Mauromicale, Santi Agatino Rizzo - *University of Catania, Italy*; Alfio Scuto, Domenico Nardo - *STMicroelectronics, Italy*; Nunzio Salerno, Giovanni Susinni - *University of Catania, Italy*
C2.6 ■ **A real-time MCU-based wireless system for PV applications** ■ Antonino Laudani, Gabriele Maria Lozito, Martina Radicioni - *Roma Tre University, Italy*
C2.7 ■ **Weight Estimation of the Wiring in a Distributed Propulsion System for Aircraft** ■ Adolfo Dannier, Andrea Del Pizzo, Luigi Pio Di Noia, Santolo Meo - *University of Napoli Federico II, Italy*

10,45 ■ 11,00 Break

11,00 ▪ 11,45
Keynote Speech 2
Operation of hybrid AC/DC power systems ▪ Dirk Van Hertem ▪ *University of Leuven, Belgium*

11,45 ▪ 13,15 ROOM A ▪ Technical Session A3
Power System: Protection and Stability
Chair: Stefano Massucco ▪ *AEIT-AEE* and *Università di Genova, Italy*
A3.1 ▪ Line Ultra High Speed Protection. Principles and field experience ▪ Andrea Di Tomasso, Giuliana Invernizzi, Giorgio Vielmini - *Schweitzer Engineering Laboratories, Italy*
A3.2 ▪ A Robust Travelling-Wave Simultaneous Faults Location Considering Parameters Variations ▪ Hossam A. Abd el-Ghany, Ahmed M. Azmy, Ahmed Magdy Abeid - *Tanta University, Egypt*
A3.3 ▪ A Comprehensive Differential Protection Scheme for Delta Hexagonal Phase Angle Regulating Transformers ▪ Ismail A. Soliman, Hossam A. Abd el-Ghany, Ahmed M. Azmy - *Tanta University, Egypt*
A3.4 ▪ High Resistance Faults in EHV/HV grids: EF protections and detection logics ▪ Fabio Bassi, Leandro Caciolli, Giorgio Maria Giannuzzi - *Terna Rete Italia, Italy*; Alberto Giorgi, Niccolò Nesi - *University of Florence, Italy*; Luciano Vignolini - *Terna Rete Italia, Italy*
A3.5 ▪ Voltage Dips in Power Quality - a Brief Review ▪ Mircea Buzdugan - *Technical University of Cluj-Napoca, Romania*
A3.6 ▪ Robust Fuzzy Power System Stabilizer ▪ Sultan Saleh Alwahaibi - *QU, Saudi Arabia*
A3.7 ▪ Improving dynamic stability in presence of static generation: issues and potential countermeasures ▪ Luigi Michi, Enrico Maria Carlini, Giorgio Giannuzzi, Roberto Zaottini, Cosimo Pisani - *Terna, Italy*
A3.8 ▪ Improving dynamic stability with HVDC systems: Italy-Montenegro interconnector case ▪ Luigi Michi, Enrico Maria Carlini, Giorgio Giannuzzi, Roberto Zaottini, Cosimo Pisani, Roberto Puddu - *Terna Rete Italia, Italy*

11,45 ▪ 13,15 ROOM B ▪ Technical Session B3
Access Radio Technology and Software Control System
Chair: Andrea Penza ▪ *AEIT-AICT, Italy*
B3.1 ▪ Analog ICs for Automotive under EMI Attack ▪ Anna Richelli, Luigi Colalongo, Zsolt Kovacs-Vajna - *University of Brescia, Italy*
B3.2 ▪ Weighted Local Access Point based on Fine Matching k-Nearest Neighbor Algorithm for Indoor Positioning System ▪ Mohd Amiruddin Abd Rahman, Muhammad Khalis Abdul Karim, Caceja Elyca Anak Bundak - *Universiti Putra Malaysia, Malaysia*
B3.3 ▪ Assisting Italian DVB-T users against LTE Signal Impairments: The "HELP Interferenze" Project ▪ Massimo Celidonio, Ermanno Fionda, Federica Mangiatordi, Sergio Pompei - *Fondazione Ugo Bordoni, Italy*

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B3.4 ■ **Coexistence of DVB Television and 5G Services in Adjacent Bands** ■ Claudia Carciofi, Andrea Garzia, Ferdinando Lucidi, Andrea Neri - *Fondazione Ugo Bordoni, Italy*

B3.5 ■ **Data dissemination to vehicles using 5G and VLC for Smart Cities** ■ Francesca Nizzi, Tommaso Pecorella, Stefano Caputo, Lorenzo Mucchi, Romano Fantacci - *University of Florence, Italy*; Mattia Bastianini, Carlo Cerboni, Alessandra Buzzigoli - *Estra, Italy*; Andrea Fratini - *OpenFiber, Italy*; Tassadaq Nawaz, Jacopo Catani - *National Research Council Institute of Optics, Italy*; Marco Seminara - *University of Florence, Italy*

Invited ■ **Electromagnetic Field levels and related issues for 5G radio technology** ■ Francesco Pugliese - *PuglieseProgettazioni, Italy*

11,45 ■ **13,15** ROOM C ■ Technical Session C3
Innovative smart components, modules and appliances for a truly connected, efficient and secure smart grid
Chair: Maria Dicorato ■ *Politecnico di Bari, Italy*

C3.1 ■ **Regaining Insight and Control on SMGW-based Secure Communication in Smart Grids** ■ Jens Hiller, Karsten Komanns, Markus Dahlmanns, Klaus Wehrle - *RWTH Aachen University, Germany*

C3.2 ■ **Reduction of Output Capacitance for DAB DC-DC Converters in DC Microgrids by Shaping the Resistive Output Impedance** ■ Guangyuan Liu, Paolo Mattavelli, Simone Pistollato, Andrea Petucco - *University of Padova, Italy*

C3.3 ■ **Operation schedule of DC microgrid for EVs with reserve under various conditions** ■ Maria Dicorato, Michele Antonio Trovato - *Politecnico di Bari, Italy*; Giuseppe Forte - *Italy*

C3.4 ■ **Triple-Phase Shift Modulation for Dual Active Bridge based on Simplified Switching Loss Model** ■ Simone Pistollato, Tommaso Caldognetto, Paolo Mattavelli, Paolo Magnone - *University of Padova, Italy*

C3.5 ■ **Simulation Results from a Kinetic-Electrochemical Energy Storage Model for Network Frequency Regulation** ■ Sebastian Dambone Sessa, Mauro Andriollo, Andrea Tortella, Roberto Benato - *University of Padova, Italy*

C3.6 ■ **Protection and stabilization of Cogeneration plant by means of Rotary UPS with flywheel** ■ Lanfranco Pedrotti - *Piller Italia, Italy;* Bud Leavell, Riccardo Ghezzi - *Piller USA, USA*

13,15 ■ **14,15** **Lunch**

14,15 ■ **17,45** **Young and Student Contest Poster Session & First AEIT Young Members Meeting**

15,30 ■ **15,45** **Young Award Ceremony**

15,45 ■ **16,00** **Break**

16,00 ▪ 18,15 Case Histories

Chairs: Pietro Antonio Scarpino and Francesco Grasso - *AEIT Sezione Toscana e Umbria*

The DSO 4.0 Project - Innovative solutions of E-Distribuzione ▪ Juan Ortiz Noval - *E-Distribuzione, Head of Network Development*

Critical grid situations storyline ▪ Enrico Maria Carlini - *Terna Rete Italia, Head of Dispatching and Operation*

Higher Achievements in HV/EHV Cable Fire Performances ▪ Stefano Cotugno - *Prysmian, HV BU System Engineering Manager*; Filippo Gabelli - *Prysmian, HV BU System Engineering*

The emergent cybersecurity threats to Industrial Control Systems ▪ Claudia Piccolo - *IMQ B.U. Management Systems, ICT Security Dept, Manager*; Alessandro Solano - *IMQ, B.U. Management Systems, ICT Security Dept, Auditor*

EF Solare: the leading operator in Italian PV industry ▪ Giuseppe Noviello - *EF Solare Italia, Vice President*

Electrical Safety in Ungrounded Systems: Technologies and Application Cases ▪ Danilo Martinucci - *Bender Italia, Business Development Manager*

Technological development and policy scenarios for energy transition, some remarks on ongoing research ▪ Romano Ambrogi - *RSE, Strategy and Communication Officer*

Smart Lab laboratory in Dalmine: evolution and continuous improvements ▪ Paolo Perani - *ABB, Strategic Business Development Manager*

5G Pilot Project for «Smart Diagnostic» of Railway Infrastructure ▪ Mirko Ermini - *RFI, R&D Senior Engineer*

Solution to the grid problems by means of flywheel Rotary UPS ▪ Lanfranco Pedrotti - *Piller Italia, Managing Director*

18,15 ▪ 19,15 Start Up Plenary Session

Chair: Giulia Nerozzi - *AEIT Sezione Toscana e Umbria*

River Cleaner Project ▪ Lorenzo Lubrano - *Blue Eco Line, CEO*, Camilla Cantiani - *Blue Eco Line, Information & Technology Manager*, Michael Mugnai - *Blue Eco Line, Automation & Control Manager*, Alberto Luckenbach - *Blue Eco Line, Rapid Prototyping Manager*

G-move: manage your space in a smart way ▪ Marco Musumeci - *G-Move, CEO*

Technical Cross skills - from the Concept to the Industry ▪ Federico Trippi - *R&D Telecommunication and Energy, CEO*

Digitalization and Key enabling technologies: Open Innovation and the challenges of Advisoring 4.0 ▪ Eugenio Telleschi - *Euro Inn Advisory (EIA), Innovation Advisor®*

Italian Minigrid Solutions for Rural Development ▪ Alice Nencini - *WindKinetic Off-grid Power System, Operations Manager*

20,30 Conference Dinner

09,00 ■ 11,00 ROOM A ■ Technical Session A4
Management, Operation and Control in Power Systems
Chair: Francesco Grasso - *University of Florence, Italy*
A4.1 ■ Real time operators training: Terna experience in implementing the Commission Regulation (EU) 2017/1485 ■ Claudio Coluzzi, Stefano Orlandi, Silvia Moroni, Matteo Contu, Flavio Allella, Gaetano Pecoraro, Antonio Pascucci, Enrico Maria Carlini - *Terna Rete Italia, Italy*
A4.2 ■ The European Electricity Balancing Platforms and the Imbalance Netting Process: Terna's participation in the International Grid Control Cooperation ■ Matteo Contu, Stefano Montone, Gaetano Pecoraro, Flavio Allella, Antonio Pascucci, Enrico Maria Carlini, Luigi Michi - *Terna, Italy*
A4.3 ■ Integration of synchronous compensator in Terna's remote control and remote operation system ■ Enrico Maria Carlini, Aniello Borriello, Stefano Neri, Luca Barison, Alessandro Marietti, Laura Campisano - *Terna Rete Italia, Italy*
A4.4 ■ Optimal Bidding Zone Configuration: Investigation on Model-based Algorithms and their Application to the Italian Power System ■ Luigi Michi - *Terna, Italy*; Enrico Maria Carlini, Mauro Caprabianca, Federico Quaglia, Luca Luzi, Giuseppina Nuzzo - *Terna Rete Italia, Italy*; Ettore Bompard, Gianfranco Chicco, Pietro Colella, Andrea Griffone, Andrea Mazza, Angela Russo - *Politecnico di Torino, Italy*; Cristian Bovo, Valentin Ilea - *Politecnico di Milano, Italy*
A4.5 ■ Compliance of GAUDÌ Unique Plants Data Management system to the Commission Regulation (EC) No 714/2009 ■ Rosa Cataldi, Stefano Neri, Claudio Liuni - *Terna, Italy*
A4.6 ■ Algorithms for proper power rating of electrochemical storage systems integrated into generation plants ■ Rosa Cataldi, Stefano Neri, Claudio Liuni - *Terna, Italy*
A4.7 ■ Benefit assessment of installing innovative conductors in overhead lines ■ Roberto Benato, Roberto Caldon, Antonio Chiarelli, Massimiliano Coppo, Sebastian Dambone Sessa - *University of Padova, Italy*; Debora Mimo - *Deangeli Prodotti, Italy*; Michele Modesti, Francesca Piovesan - *University of Padova, Italy*

09,00 ■ 11,00 ROOM B ■ Technical Session B4
E-mobility & Shipboard Applications
Chair: Eugenio Fedeli - *Rete Ferroviaria Italiana, Italy*
B4.1 ■ Emergency supply to safety systems of long railway tunnels ■ Regina Lamedica, Fabio Massimo Gatta, Samuel Mikhael, Alessandro Ruvio - *Sapienza University of Rome, Italy*; Guido Guidi Buffarini, Massimo Castellani - *Italfer, Italy*

B4.2 ■ **Train braking impact on energy recovery: the case of the 3 kV d.c. railway line Roma-Napoli via Formia** ■ Claudio Spalvieri, Irene Rossetta - *Rete Ferroviaria Italiana, Italy*; Regina Lamedica, Alessandro Ruvio, Andrea Papalini - *Sapienza University of Rome, Italy*

B4.3 ■ **Electro-mechanical modelling and simulation of railroad systems** ■ Jiajing Li, Giovanni Lutzemberger, Davide Poli - *University of Pisa, Italy*

B4.4 ■ **Modeling and Simulation of Railway Network in Compliance with Technical Specifications for Interoperability** ■ Morris Brenna, Federica Foiadelli, Carola Leone - *Politecnico di Milano, Italy*; Federico Mauro Casiraghi - *Ferrovienord, Italy*

B4.5 ■ **Running Capability Assessment for Rolling Stock According to EU Regulations** ■ Dario Genovese, Carmine Zappacosta, Giampaolo Mancini, Giuseppe Pancari, Alessio Papeschi, Laura Foconi - *Italcertifer, Italy*

B4.6 ■ **Overview of measurement chain and instrumentation setup for running dynamics on-track tests - normal method - according to EN-14363 standard** ■ Carmine Zappacosta, Luca Bocciolini, Fabio Piccioli, Mattia Macherelli - *Italcertifer, Italy*; Daniele Massini - *University of Florence, Italy*; Niccolò Vanni - *Italcertifer, Italy*

B4.7 ■ **High Frequency Modeling of Foil Type Transformers for Shipboard Power Electronic Power Distribution Systems** ■ Nicola Barbini, Alfredo Contin, Andrea Colavitto, Giorgio Sulligoi, Andrea Vicenzutti - *University of Trieste, Italy*

B4.8 ■ **Coherent Radar System compliant with Safety Integrity Level 4 for railway applications under High Risk of Landslides** ■ Eugenio Fedeli, Vincenzo Calà, Mirco Gonnelli, Mirko Ermini, Antonio Rossetti - *Rete Ferroviaria Italiana, Italy*

09,00 ■ **11,00 ROOM C** - **Technical Session C4**
Resilience of Electrical Networks
Chair: Massimo Pompili - *Sapienza University of Rome, Italy*
C4.1 ■ **A new approach for sending dispatching orders using protocol IEC 60870-5-104** ■ Enrico Maria Carlini, Edmondo Coppoli, Marco Fazion, Patrizio Ferretti, Stefano Neri, Laura Campisano, Luciano Zaretti, Giandomenico Lattuada - *Terna Rete Italia, Italy*
C4.2 ■ **Assessment and possible solution to increase resilience: heat waves in Terni distribution grid** ■ Tommaso Bragatto, Fabrizio Cortesi - *Sapienza University of Rome, Italy*; Massimo Cresta - *TDE, ASM Terni, Italy*; Fabio Massimo Gatta, Alberto Geri, Marco Maccioni - *Sapienza University of Rome, Italy*; Marco Paulucci - *TDE, ASM Terni, Italy*

C4.3 ■ **The contribution of the revitalization of submarine cables 110 kV to resilience of the southern part of the Croatian power system** ■ Igor Mladinic - *HOPS, Croatia*; Miro Mesic - *Energy Consultant, Croatia*; Srecko Aljinovic - *HOPS, Croatia*

C4.4 ■ **Faults Evaluation of MV Underground Cable Joints** ■ Luigi Calcara - *Sapienza University of Rome, Italy*; Luigi D'Orazio, Maurizio Della Corte, Guglielmo Di Filippo, Alessio Pastore, Davide Ricci - *E-distribuzione, Italy*; Massimo Pompili - *Sapienza University of Rome, Italy*

C4.5 ■ **A Experimental Validation of Frequency Model for Studying a Real Black Start Restoration** ■ Roberto Benato - *University of Padova, Italy*; Gianluca Bruno - *Terna, Italy*; Sebastian Dambone Sessa - *University of Padova, Italy*; Giorgio Giannuzzi, Luca Ortolano - *Terna, Italy*; Gianni Pedrazzoli - *University of Padova, Italy*; Michele Poli - *Terna, Italy*; Francesco Sanniti - *University of Padova, Italy*; Roberto Zaottini - *Terna, Italy*

C4.6 ■ **A Decision Support System for Mitigating the Seismic Risk of Electric Distribution Networks: learnings from the Central Italy earthquake sequence 2016-2017** ■ Sonia Giovinazzi, Antonio Di Pietro, Maurizio Pollino, Luigi La Porta, Alberto Tofani, Vittorio Rosato - *ENEA, Casaccia Research Centre, Italy*

C4.7 ■ **New Concepts on Microgrid-Prosumer Interaction** ■ Francesco Muzi, Mario Gimenez De Lorenzo, Marco Consolidani - *University of L'Aquila, Italy*

C4.8 ■ **Impact of snow storms on distribution grids: e-distribuzione and RSE experimental stations** ■ Elvira Amicarelli, Mauro De Masi, Giovanni Valtorta - *E-Distribuzione, Italy*; Pietro Marcacci, Matteo Lacavalla - *RSE, Italy*

09,00-11,00 ROOM D ■ **Special Session**

Sustainability - Convergence towards a shared definition

Chair: Vittorio Cecconi - *Università di Palermo, Presidente ASTRI*

Introduction ■ Vittorio Cecconi - *Università di Palermo, Presidente ASTRI*

Sustainability of a pervasive telecommunication system ■ Giovanni Cancellieri - *Università Politecnica delle Marche, Italy*

Virtual Society of IoT Robosats and Emancipation of Electrical Utilization ■ Giuseppe Parise - *Sapienza Università di Roma;* Luigi Parise - *Bambino Gesù Pediatric Hospital IRCCS;* Francesco Di Paolo - *Professional Engineer*

Infrastructure Design Shared with Territory Inhabitants ■ Adel Motawi, Giampaolo Felli - *Terna*

Sustainability of a Transportation System ■ Luigi Schirone - *Sapienza Università di Roma*

Sustainability in the relationship distributor-provider-user ■ Francesco Cangialosi, Giacomo Trupia - *AEIT*

11,00 ■ **11,15 Break**

11,15 ▪ 13,15 ROOM A ▪ Technical Session A5

Energy storage in support of power grids: from field experience to new projects, steering along regulatory and market evolution
Chairs: Silvia Canevese - *Ricerca sul Sistema Energetico - RSE, Italy* and Giovanni Lutzemberger - *University of Pisa, Italy*

A5.1 ▪ Optimal Sizing Tool for Batteries Providing Multiple Services to the System ▪ Dario Siface, Silvia Canevese - *RSE, Italy*

A5.2 ▪ The evolution of the Italian power system in 2030 to support more than 55% of renewables on electricity consumption ▪ Fabio Lanati, Alberto Gelmini, Giacomo Viganò - *RSE, Italy*

A5.3 ▪ Aging test protocol for Lithium-ion cells ▪ Luigi Pellegrino, Enrica Micolano - *RSE, Italy*

A5.4 ▪ EV Flexibility Supply via Participation in Balancing Services: Possible Profitability for Italian End Users ▪ Silvia Canevese, Diego Cirio, Massimo Gallanti, Antonio Gatti - *RSE, Italy*

A5.5 ▪ A Probabilistic Approach to Assess the Requirements of an Ultra-Fast PEV Charging Station in Extra-Urban Contexts ▪ Elio Chiodo, Diego Iannuzzi, Fabio Mottola, Mario Pagano, Daniela Proto - *University of Naples Federico II, Italy*

A5.6 ▪ Preliminary Economic Assessment for Electric Buses Adoption in the Italian Framework ▪ Claudio Carlini, Diana Moneta - *RSE, Italy*

11,15 ▪ 13,15 ROOM B ▪ Technical Session B5

Smart Systems and Emerging Technologies
Chairs: Livio Baldi and Antonio Imbruglia - *AEIT-AMES, Italy*

B5.1 ▪ Nonlinear optimal control for the fire-truck robotic vehicle ▪ Gerasimos Rigatos - *Industrial Systems Institute, Greece*; Krishna Busawon - *Northumbria University, United Kingdom*, Pierluigi Siano - *University of Salerno, Italy*; Masoud Abbaszadeh - *General Electric, USA*

B5.2 ▪ Nonlinear optimal control of the vertically take-off and landing aircraft ▪ Gerasimos Rigatos - *Industrial Systems Institute, Greece*; Krishna Busawon - *Northumbria University, United Kingdom*; Masoud Abbaszadeh - *General Electric, USA*

B5.3 ▪ Gait Learning Using Reinforcement Learning ▪ Bharath Raj Mahadeva Rao, Sharmila Chidaravalli - *Global Academy of Technology, India*

B5.4 ▪ Reducing Electromagnetic Interferences on Power Planes of High-Speed Circuits by means of a High-Impedance Electromagnetic Surface ▪ Giovanni Aiello, Salvatore Alfonzetti, Emanuele Dilettoso, Angelo Raciti, Santi Agatino Rizzo, Nunzio Salerno - *University of Catania, Italy*

B5.5 ■ **Feasibility analysis of reliability analysis methods applying in air traffic control system** ■ Zhuojia Wang, Xin Jiang, Jian Tang - *Commercial Aircraft Corporation of China, P.R. China*

B5.6 ■ **A new IR Laser Sag Meter prototype for remote on line monitoring of high voltage overhead line: a special application** ■ Elena Golinelli, Daniele Bartalesi, Gian Mario Ogliari - *RSE, Italy*; Umberto Perini - *Consultant, Italy*

B5.7 ■ **Conductive Concrete for Smart Cities Applications** ■ Bassam Swaked, Nasser Qaddoumi, Sherif Yehia, Shereen Farhana - *American University of Sharjah, United Arab Emirates*, Lim Nguyen - *University of Nebraska-Lincoln, USA*

B5.8 ■ **Accurate Single-End and Double-End Fault Location by Traveling Waves: a review with some real applications** ■ Andrea Di Tomasso, Giuliana Invernizzi, Giorgio Vielmini - *Schweitzer Engineering Laboratories, Italy*

B5.9 ■ **An interoperable tool-chain for energy monitoring applications** ■ Davide Brunelli - *University of Trento, Italy*, Tullio Salmon Cinotti, Hugo Woehr, Cristiano Aguzzi, Federico Montori - *University of Bologna, Italy*, Luca Benini - *University of Bologna, Italy and ETH Zurich, Switzerland*

11,15 ■ **13,15** **ROOM C** ■ **Technical Session C5 - Resilience of Electrical Networks and Climate Changes**
Chair: Massimo Pompili - *Sapienza University of Rome, Italy*

C5.1 ■ **An updated investigation about climate-change hazards that might impact electric infrastructures** ■ Paola Faggian, Goffredo Decimi - *RSE, Italy*

C5.2 ■ **An harmonized approach to model weather uncertainty and its growing impact on power systems** ■ Enrico Maria Carlini, Simone Biondi, Federico Quaglia, Mauro Bonanni, Pietro Capurso - *Terna Rete Italia, Italy*; Nicholas Bonfanti, Stefano Lorenzo, Manuele Aufiero - *Milano Multiphysics, Italy*

C5.3 ■ **Flexibility sources for enhancing the resilience of a power grid in presence of severe weather conditions** ■ Fabrizio De Caro - *University of Sannio, Italy*; Enrico Maria Carlini - *Terna Rete Italia, Italy*; Domenico Villacci - *EnSiEl, Italy*

C5.4 ■ **Terna's experience in avoiding snow and ice sleeves formation on High Voltage overhead line conductors** ■ Michele Poli, Giacomo Buora, Antonio Pascucci, Enrico Maria Carlini, Luigi Michi - *Terna, Italy*

C5.5 ■ **Forest fire or other dangerous situations: safety procedure for overhead lines** ■ Enrico Maria Carlini, Luigi Michi - *Terna, Italy*; Luciano Minto - *Terna Rete Italia, Italy*, Cesarino Genovese, Roberto Foppa, Adriano Fedrizzi - *Terna, Italy*

Friday, September 20, 2019

C5.6 ▪ **Analytical modeling of overhead line vulnerability to wet snow events for resilience assessment** ▪ Andrea Pitto, Diego Cirio, Emanuele Ciapessoni, Giovanni Pirovano - *RSE, Italy*

C5. 7 ▪ **Ballast loads for improving the resilience of the Italian sub-transmission grid against ice and snow events** ▪ Luigi Michi, Enrico Maria Carlini, Luciano Minto, Alberto Pesce - *Terna*; Luca Buono, Francesco Palone, Francesco Maria Pepe - *Terna Rete Italia, Italy*

C5.8 ▪ **Dispatching measures for improving the resilience of the Italian sub-transmission grid against ice and snow events** ▪ Enrico Maria Carlini, Luigi Michi - *Terna, Italy*; Davide Rampazzo, Alessio Marchesin, Cristiano Quaciari, Elena Geremia - *Terna Rete Italia, Italy*; Stefano Quaia - *University of Trieste, Italy*

13,15 ▪ **13,30 Conference Closure**

Tuesday, September 17, 2019

16,00 ▪ **19,00**
ROOM C ▪ **Tutorial 1**
A Power Electronics Control Perspective in AC and Hybrid AC&DC Low-Voltage Smart Microgrids ▪ Paolo Mattavelli, Tommaso Caldognetto - *University of Padova, Italy*

ROOM D ▪ **Tutorial 2**
Advances in Protection and Monitoring of HV networks: Time-Domain Protection and Traveling Wave Fault location ▪ Giorgio Vielmini - *SEL, Italy*

Venue

University of Florence
Complesso Sant'Apollonia ▪ Via San Gallo 25 ▪ Florence, Italy

On Site Secretariat

The Conference Secretariat will be open on site as follows
Tuesday, September 17   16,00 - 19,00
Wednesday, September 18   9,00 - 18,30
Thursday, September 19   8,30 - 19,15
Friday, September 20   8,30 - 19,15

All data contained in this program are processed in accordance with

- **STUDENT CONTEST** Poster Session

SC.1 ■ **Modeling Technique of Large Signal Dynamics for Electromagnetic Levitation Melting System** ■ Moria Elkayam, Idan Sassonker, Alon Kuperman - *Ben-Gurion University, Israel*

SC.2 ■ **IoT Network for Industrial Machine Energy Monitoring** ■ Lorenzo Incipini, Tommaso Mancia, Mohamad El Mehtedi, Paola Pierleoni - *Università Politecnica delle Marche, Italy*

SC.3 ■ **Predictive Current Control for a Neutral Point Clamped Inverter Considering SiC-MOSFET as Switches and Using a Photovoltaic Power Source** ■ Luis Morinigo, Thalia Morel - *Universidad del Cono Sur de las Americas, Paraguay*; Jorge Rodas, Raúl Gregor - *Universidad Nacional de Asunción, Paraguay*

SC.4 ■ **Energy Storage Placement in the Transmission Network: A Robust Optimization Approach** ■ Nayeem Chowdhury, Giuditta Pisano, Fabrizio Pilo - *University of Cagliari, Italy*

SC. 5 ■ **Performance Analysis of Power Converters for Standalone Hybrid Renewable Energy System for Residential Load** ■ Habib Ur Rahman Habib - *Huazhong University of Science and Technology, Wuhan, P.R. China & University of Engineering and Technology, Taxila, Pakistan*

- **YOUNG AND STUDENT** Poster Session
  & First AEIT Young Members Meeting

1 ■ **Novel Antennas for 5G Applications** ■ Enrico Massoni - *Università di Pavia, Italy*

2 ■ **Microgrids, energy storage, EVs and evolution of electricity markets: the future of the energy world according to Power System Research Group in Politecnico di Milano** ■ Giuliano Rancilio, Filippo Bovera, Ramin Komaie - *Politecnico di Milano, Italy*

3 ■ **Idrogeno e Smart Energy** ■ Mattia Monte - *AEIT Sezione Friuli- Venezia Giulia*

4 ■ **Il rocchetto di Ruhmkorff** ■ Giacomo Giannetti - *AEIT Sezione Toscana e Umbria*

Conference Dinner

The conference dinner will be held **Thursday, September 19 - 20,30** Konnubio Restaurant ■ Via dei Conti 8r ■ Florence
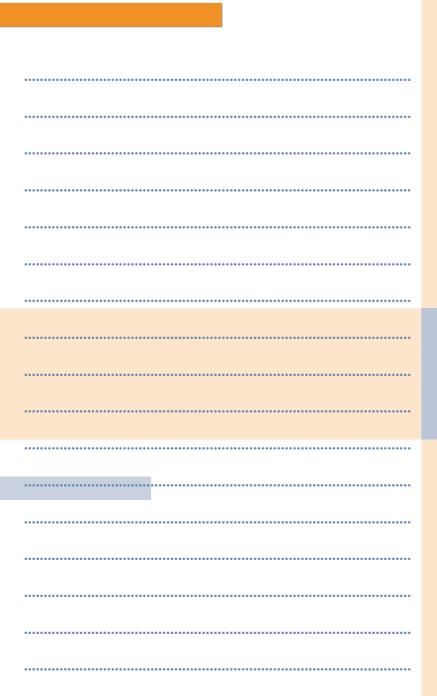
Conference Secretariat

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