5th International Symposium On Environment-Friendly Energies And Applications (EFEA 2018)

CONFERENCE PROGRAM

SAPIENZA UNIVERSITÀ DI ROMA

Faculty of Civil and Industrial Engineering
University of Rome "Sapienza"
Rome, Italy
Sept. 24-26, 2018

UNIVERSITÀ DEGLI STUDI DE L'AQUILA

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Chairs' Message

In response to the ever-increasing interests and technological developments in environmentally friendly energy systems, the Organizing Committee is pleased to welcome you to the 5th International Symposium on Environment-Friendly Energies and Applications (EFEA 2018) in Rome, Italy, on September 24th-26th, 2018.

With Our greatest pleasure and proud, this year's hosting institution is the University of Rome “Sapienza”, Faculty of Civil and Industrial Engineering, which organized the EFEA 2018 Symposium in close collaboration with the University of L'Aquila (IT) and with the University of Valenciennes (Fr) and the University of Northumbria (UK).

EFEA 2018 continues the tradition from previous conferences held in Newcastle, UK in 2012, Paris, France in 2014, and Belgrado, Serbia in 2016, covering all the main topics such as renewable and sustainable energy systems, electric and hybrid transportation systems, advanced power systems and smart grids, as well as energy policy and security, biofuel, geothermal energy, lifelong learning and professional development in renewable energy. EFEA 2018 is a forum for bringing academics, scientists, engineers and industrial partners together to discuss the recent developments in the areas of environment friendly energies and their applications.

We hope that this year's edition may catch the greatest interest of researchers, experts from industry and guests all devoted to environmental friendly applications for providing clean energy and sustainable systems.

On behalf of the Local Organizing Committee, We wish you a fruitful work and a nice time during your stay in Rome.

With best wishes,

Ezio Santini, IT

Claudio Bruzzese, IT

Stefano Di Gennaro, IT

The General Chairs of EFEA 2018 Symposium

Prof. Ezio Santini, Dr. Claudio Bruzzese

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Conference Topics

EFEA 2018 conference topics include but are not limited to

•Policy: Renewable Energy Technology Roadmap; R & D; Finance; Supply Chain; Marketing

•Low Energy Building and Architecture: Green Building; Bioclimatic Architecture; Comfort and Indoor Climates; New Materials; Smart HVAC systems

•Advanced Power Systems: Distributed Energy Resources; Smart Grid; Micro-grid; Power Electronic Convertors

•Electric and Hybrid Vehicles: Electric Cars; Hybrid Engines; Regenerative Brake Systems; Power/Electric Transmission Systems; Battery, Energy Management

•Control: Smart Electrical Energy Metering; Fault Tolerated Control Systems; Demand/Power Control; Fault Detection and Management

•Wind Energy: Wind Turbine Aerodynamics and Structure; Wind Turbine Load and Power Control; Condition Monitoring of Wind Apparatus

•Hybrid Renewable Energy Systems: On-grid and standalone Hybrid System; Power/Demand Management Systems; Resource Modelling

•Solar Thermal and Geothermal: Solar thermal collectors; Solar Heat Pump; Combined Heat/ Power; Geothermal Heat Pump; Geothermal Direct Use

•Hydrogen & Fuel Cell: Fuel Cell Power Plants; Hydrogen Production

•Hydropower and Marine Energy: Micro & Pico Hydro System; Ocean Thermal Energy; Wave Energy

•Energy Storage: High voltage batteries; Battery charge balancing and cooling; Charge/energy management; Ultra-batteries; Thermal, unconventional and Hybrid energy storage systems; Flywheel systems

•Biomass: Biofuel; Biomaterials; Biomass Gasification; Biomass heating systems

•Materials in Renewable Energy Technologies: Composite materials; Smart materials; Shape memory alloys

•Education and Career: Higher education; Life-long learning; Prospects in green job opportunities

Invited Speakers and Plenary Talks

Prof. Carlo Cecati

Full professor of Converters, Electrical Machines and Drives
University of L'Aquila, Department of Engineering, Information Science and Mathematics

Prof. Carlo Cecati (IEEE Fellow, class 2006) was graduated in Electrical Engineering from the University of L'Aquila, L'Aquila, Italy in 1983. From 1983 to 1987 he was a consultant and a research fellow. In 1987, he joined the University of L'Aquila, L'Aquila, Italy, where, since 2006, he has been a Full Professor of Converters, Electrical Machines and Drives. He served his university in various capacities, including as a rector's delegate. Since September 2015, he has been appointed distinguished professor (1000 Talents Plan for High Level Foreign Experts) at Harbin Institute of Technology (HIT), Harbin, P.R. China. From August 2014 to August 2015, he was Chief International Academic Adviser of the same university. His research and technical interests fall in the area of renewable energies and energy saving, in particular the application of power electronics to renewable energy systems, distributed generation, smart grids, electrical drives, electric vehicles. Prof. Carlo Cecati received three best paper awards from IEEE journals. From 2013 to 2015 he has been the Editor in Chief of the IEEE Transactions on Industrial Electronics; previously, from 2009-2012, he has been a Co-Editor-in-Chief. He has been the General Chairman of the conference IEEE IECON 2016, October 2016, Florence, Italy.

“Cascaded H-bridge multilevel converters and their modulation: novel solutions for improving energy efficiency in high and in low power applications”

During the last two decades, power electronics has gained applications in many important areas: energy, transportation, industry, consumer electronics, just to cite the most important, becoming a key enabling technology. Whatever the power level, present and upcoming power electronic converters are complex systems that combine many distinct hardware and software subsystems, which are becoming more and more intelligent and interconnected to meet the announced Internet of Things world, which, without massive use of power electronics devices, only remains a paradigm. There are many demanding tasks to be fulfilled in power electronics converters, but all of them share three basic requirements: optimization of energy conversion, high flexibility and low costs. Multilevel Converters (MLC) early proposed for high power, high voltage applications, are gaining popularity at all power levels and in a significant number of applications, including Renewable Energy Systems, Distributed Generation, Electrical Drives for industry and for transportation and others. Their power level is growing up or going down due to specific application, demonstrating unusual flexibility even at low power. One key point in multilevel converters, is their capability to reduce harmonic content from currents and voltages which is dependent on adopted modulation algorithm. Current literature shows that the latter often consists of a preliminary off-line computation and a subsequent real-time application of the obtained patterns through look-up tables. These approaches need large amount of memory, can deteriorate the precision of commutation angles and are not very flexible with closed loop operations. Analytical methods, instead, offer significant advances: exact problem formulation, easy and effective real-time implementation, selective harmonic elimination or mitigation, possibility to cascade modulator and outer control loops. During the speech, some analitycal methods for modulation of MLC and their fundamental equations will be introduced and examples of practical implementation will be reported.

Dr. Alberto Tessarolo

Professor of Electrical Machines and Drives
University of Trieste, Department of Engineering and Architecture

Alberto Tessarolo received his Laurea and Ph.D. degrees in Electrical Engineering from the University of Trieste, Italy, and Padova, Italy, in 2000 and 2011, respectively. Before joining the University, he worked in the design and development of large innovative motors, generators and drives with NIDEC-ASI (formerly Ansaldo Sistemi Industriali). Since 2006, he has been with the Engineering and Architecture Department of the University of Trieste, Italy, where he teaches the course of Electric Machine Design. He holds the scientific responsibility for several funded research projects in cooperation with leading companies and institutions. Dr. Tessarolo has authored over 150 international technical papers in the area of electrical machine and drive modeling and design. He serves as an Editor for the IEEE TRANS. ON ENERGY CONVERSION and Associate Editor for the IEEE TRANS. ON INDUSTRY APPLICATIONS and the IET ELECTRIC POWER APPLICATIONS. He was the recipient of the Electric Machinery Committee 2012 Prize Paper Award of the IEEE Power and Energy Society and of various best paper awards for contributions presented at IEEE-sponsored or co-sponsored conferences. He is Senior Member of the IEEE and a member of the Industry Applications, Power and Energy, Power Electronics, Industrial Electronics, Magnetics and Reliability Societies of the IEEE.

"Stator Winding Technologies for Renewable-Energy Alternators and for High-Efficiency Electric Motors"

Energy production from renewable energy and energy saving through improved-efficiency motors are topics of paramount importance today and call for new electric machine technologies and design strategies. The speech will focus on some interesting state-of-the art stator winding technology solutions particularly suitable for use in large electric alternators for renewable energy production and in high-efficiency industrial electric motors. Specific attention will be placed on fractional-slot concentrated windings and on the recent developments intended to mitigate their drawbacks in terms of rotor losses and pulsating torques; special optimization techniques will be presented to extend their usage in machines with unconventional slot/pole combinations, as well as in multiphase and modular stator designs for improved fault tolerance. Industrial experiences will be reported from the industrial environment on full-scale realizations of the presented technology solutions and test results collected on small-scale laboratory prototypes will be presented to illustrate and validate some of the most cutting-edge and innovative features in the field.

Prof. Gérard-André Capolino

Chair Professor in Electrical Engineering
University of Picardie "Jules Verne", Amiens, France
IES Distinguished Lecturer

Gérard-André Capolino (A'77–M'82–SM'89–F'02) was born in Marseille, France. He received the B.Sc. degree in electrical engineering from the Ecole Centrale de Marseille (ECM), Marseille in 1974, the M.Sc. degree from the Ecole Supérieure d'Electricité (Supelec), Paris, France, in 1975, the Ph.D. degree from the Aix-Marseille University (AUM), Marseille, in 1978, and the D.Sc. degree from the Institut Polytechnique de Grenoble (Grenoble INP), Grenoble, France, in 1987. He had several faculty positions in Yaoundé, Cameroun, Le Creusot, France and Marseille, France. In 1994, he joined the University of Picardie "Jules Verne," Amiens, France, as a Full Professor and was appointed Chair Professor in 2013. Since 1975, he has published more than 450 papers in scientific journals and conference Proceedings. He has been the principal investigator for more than 50 research contracts. Dr. Capolino is an Associate Editor of the IEEE TRANSACTIONS ON POWER ELECTRONICS, of the IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS and of the IEEE ACCESS. He is also the acting Chair for the Steering Committee of the International Conference on Electrical Machines (ICEM). During 2012–2013, he was the President of the IEEE Industrial Electronics Society (IES). He has been also the IEEE France Section Chair (2005-2007).

"Energy efficiency improvement for electrical machines: a challenge"

The principle of electrical machines has been known for at least 500 years with the first electrostatic machines invented around 1600. The first electromagnetic machines have been imagined later in the 17th century after the discovery of the electromagnetism principle. However, it has been necessary to wait up to the end of the 19th century to have rotating electrical machines structures close to what they are nowadays. Basically, the presentation starts from the classical definition of units for power and energy. Then, the definition of energy efficiency is discussed and developed before giving the current status of efficiency in modern electrical machines. The last part of the presentation is dedicated to trends for improving the efficiency by both design and manufacturing processes. A short highlight of fault tolerance, even if not fully related to energy efficiency, is also presented since it is an actual need for systems using electrical machines for both motoring and generating.

Professor Ghanim Putrus

Professor in Electrical Power Engineering
Department of Mathematics, Physics and Electrical Engineering
Northumbria University, Newcastle upon Tyne, UK

Ghanim leads the Power and Wind Energy Research group at the Faculty of Engineering and Environment, Northumbria University. He has over 25 years of research experience with over 150 publications, including one patent, and has given several invited talks at national and international events. He has led several research projects and has often provided consultancy for industry. Prof Putrus is Associate Editor for Elsevier Renewable Energy journal and serves on the technical/steering committees for several conferences. He is involved in the Institution of Engineering Technology (IET) professional activities and served on the executive committee of the IET Power Trading and Control Professional Network (2001-2009). His main research interests are the application of power electronics in power systems, power quality, integration of renewable energy resources and electric vehicles into power distribution networks (smart grids).

“Sustainable Energy and Transport at Affordable Cost”

Energy and transport sectors are undergoing significant changes. With the increased concern about climate change, the interest in electric transport and renewable energy generation is continually gaining momentum. This talk will give an overview of recent developments that present challenges to electricity supply and urban transport. It will also cover opportunities and emerging technologies available to maintain reliable and affordable electricity supply whilst improving efficiency and lowering environmental impacts of urban transport.

Notes to All Delegates

Registration desk

- Faculty Cloister, above the Cloister Main Room
- University map is also available on the website: http://www.ing.uniroma1.it/en/node/5537

Notes to Chairmen and Oral Presenters

- Chairmen must be in their respective rooms 10 minutes before the start of their session.
- Presenters must meet with chairmen of their session 10 minutes before the start of their session, carrying a written short bio and the presentation file (PDF, Impress, Power Point). 20 minutes (15 minutes presentation and 5 minutes question and answer) is allocated for each paper. Presenters must keep to the allocated time to ensure the smooth running of the program.
- The program is subject to the last minute alternation. Please refer to the conference noticeboard for the most up-to-date information.

Notes to Poster Presenters

- Poster presenters must print and bring their posters with them. Facilities for displaying the posters will be available from the registration desk.
- All posters will be displayed in the Cloister. Delegates have the opportunity of viewing posters and discuss them with the presenters during the designated sessions and the coffee breaks.

Symposium Schedule – DAY 1 – Monday Sept. 24th, 2018 - Morning

8:30-9:00	**Registration**	**Cloister Desk**
9:00-9:30	**Opening Ceremony**	**Cloister Main Room** **EFEA 2018 Committee**
9:30-10:20	**PLENARY KEYNOTE SPEECH 1** ***Cascaded H-bridge multilevel converters and their modulation: novel solutions for improving energy efficiency in high and in low power applications***	**Cloister Main Room** **Speaker: Prof. Carlo Cecati**
10:20-10:50	**Coffe Break + Poster**	**Cloister**
10:50-12:50	**ORAL SESSION 1** ***Wind and Hybrid Renewable Energy Systems***	**Cloister Main Room** **Chairs: Carlo Cecati, Cristian Lazaroiu**
ID44	Variable Stator Frequency Control of Stand-Alone DFIG with Diode Rectified Output	Manish Niraula; Lizon Maharjan; Babak Fahimi; Morgan Kiani
ID46	Integrating renewable energy technologies into distributed energy systems maintaining system flexibility	A.T.D. D Perera; P.U. Wickramasinghe; Vahid Nik; Jean-Louis Scartezzini
ID57	Multi stage integration of renewable energy technologies into standalone energy systems	A.T.D. D Perera; N.A. Iliadis; Jean-Louis Scartezzini
ID66	Plannable demand load in size optimisation of hybrid renewable energy systems	Abdihakim Bokah
ID67	Control of a Grid Connected DFIG Based Wind Turbine Emulator	Lotfi Baghli; Dekali Zouheyr; Abdelmadjid Boumediene; Mohamed Djemai
ID92	Sensitivity analysis of WRF model for wind modelling over a complex topography under extreme weather conditions	Tyagaraja S.M Cunden; Roddy Lollchund
10.50-12:50	**ORAL SESSION 2** ***Education and Career - Energy Storage - Eco design - Wind and Hybrid Renewable Energy Systems - Energy System Sustainability and Integration***	**Affreschi Room** **Chairs: Gojko Joksimovic, Leposava Ristic**
ID68	The Doubly-Fed Induction Generator as Part of The Electrical Machines Curriculum	Gojko Joksimovic; Claudio Bruzzese
ID40	Optimal Sizing and Location of Energy Storage System in a Power System	Maximiliano Martinez; Marcelo Molina; Pedro Mercado
ID50	A methodology for achieving effective market surveillance of power transformers – INTAS project	Francisco R Zuloaga; Angelo Baggini; Franco Bua; Ingrid Weiss; Nerea Ruiz Fuente; Tomas Jezdinsky
ID25	Economic Feasibility Analysis of On-Grid PV System without Battery Storage for a Commercial Building in Karachi, Pakistan	Muhammad Farooq Siddiqui; Talha Javed Soleja; Muhammad Kashan; Areeb Waseem
ID96	The role of CHP in ensuring flexibility and security of the future transmission network	Benedetto Aluisio; Federico Falorni; Alessandro Lazzarini
ID98	Transmission system and offshore wind farms: challenges and chances	M. Dicorato, G. Forte, M. Trovato, E.M. Carlini, B. Aluisio, C. Gadaleta, M. Migliori
12:50-14:00	**Lunch**	**Cloister**

Symposium Schedule – DAY 1 – Monday Sept. 24th, 2018 - Afternoon

14:00-14:50	**PLENARY KEYNOTE SPEECH 2** ***Stator Winding Technologies for Renewable-Energy Alternators and for High-Efficiency Electric Motors***	**Cloister Main Room** **Speaker: Dr. Alberto Tessarolo**
14:50-15:20	**Coffe Break + Poster**	**Cloister**
15:20-17:20	**ORAL SESSION 3** ***Hydropower and Marine Energy – Biomass - Solar Thermal and Geothermal - Education and Career***	**Cloister Main Room** **Chairs: Rositsa Velichkova, Ezio Santini**
ID27	Utilization of wave energy by hybrid system	Rositsa Velichkova
ID51	Evaluation of theoretical and accessible wave power resources along the Bulgarian littoral (Western Black Sea)	Rositsa Velichkova
ID82	Investigation of a full scale, mechanical pretreatment for enhaced biomethane production from giant reed (Arundo donax)	Pier Paolo Dell'Omo; Vincenzo Spena; Sabatino La Froscia
ID83	Assessment of a mechanical pretreatment to enhance biogas production from the noxious weed Eichhornia Crassipes on industrial scale	Pier Paolo Dell'Omo; Vincenzo Spena; Sabatino La Froscia
ID90	Dynamic Coupled Electrical and Thermal Model for PV-T Solar Energy Collectors	Nacer K M'Sirdi; Mohamed Benabdellatif; Giuseppe M. Tina; Aziz Naamane
ID64	Coach-ing, an integrated system of skills: experimentation and guided validation	Ezio Santini; Viviana Callea; Roberta Tempone
15:20-17:20	**ORAL SESSION 4** ***2_Special Session : Microgrids and VPPs for Smart Energy Communities***	**Affreschi Room** **Chairs: S. K. Khadem, Babak Fahimi**
ID39	Distributed double auction for peer to peer energy trade using blockchains	Subhasis Thakur; Barry P. Hayes; John Breslin
ID49	Role of Virtual Power Plants in Capacity Markets	Ankur Majumdar; Shafiuzzaman K. Khadem
ID54	Citizen Engagement as a Business Model for Smart Energy Communities	Beth M Massey; Piyush Verma; Shafiuzzaman K Khadem
ID28	A Holistic Approach for Increasing the Electric Energy Efficiency of a Nearly Zero Energy Building	Christos Mademlis
ID29	Energy management of a single grid-connected home Microgrid for determining optimal supply/demand bids	Mohammad Hossein Fouladfar; Mohammed Seddik Fenik; Mousa Marzband; Ameena Al Sumaiti; Jorma Kyyrä; Edris Pouresmaeil
ID48	Climate impact and energy sustainability of future European neighborhoods	Delannoy Bruno; Puri Salil; A.T.D. D Perera; Silvia Coccolo; Dasaraden Mauree; Jean-Louis Scartezzini
15:20-17:20	**POSTER SESSION 1** ***Advanced Power Systems - Control***	**Cloister** **Chairs: Pierluigi Siano, Claudio Bruzzese**
ID2	H-infinity Kalman Filter for condition monitoring of steam-turbine power generation units	Gerasimos Rigatos; Nikolaos Zervos; Dimitrios Serpanos; Vasilios Siadimas; Pierluigi Siano; Masoud Abbaszadeh
ID3	Nonlinear optimal control for steam-turbine power generation	Gerasimos Rigatos; Nikolaos Zervos; Pierluigi Siano; Wira Patrice; Masoud Abbaszadeh
ID6	Flatness-based adaptive control of Synchronous Reluctance Machines with output feedback	Gerasimos Rigatos; Pierluigi Siano; Wira Patrice; Antonio Moreno-Munoz
ID7	Control of synchronous reluctance machines using differential flatness theory	Gerasimos Rigatos; Pierluigi Siano; Wira Patrice; Milutin Jovanovic
ID14	Flatness-based control of gas-turbine electric power generation units	Gerasimos Rigatos; Nikolaos Zervos; Krishna Busawon; Pierluigi Siano; Masoud Abbaszadeh
ID15	Nonlinear optimal control for gas-turbine power generation units	Gerasimos Rigatos; Krishna Busawon; Pierluigi Siano; Masoud Abbaszadeh
ID16	A nonlinear optimal control approach for DFIG wind power generators	Gerasimos Rigatos; Pierluigi Siano; Masoud Abbaszadeh; Wira Patrice
17:20-17:30	**Break**	
17:30-19:00	**WORKSHOP 1** ***Multi-criteria design optimization of hybrid renewable energy systems under uncertainties-case studies using mohres***	**Cloister Main Room** **Alireza Maheri**
17:30-19:00	**WORKSHOP 2** ***Frequency regulation support by loads and renewable energy sources***	**Affreschi Room** **Francesco Conte**

Symposium Schedule – DAY 2 – Tuesday Sept. 25th, 2018 - Morning

8:30-9:00	**Registration**	**Cloister Desk**
9:00-9:50	**PLENARY KEYNOTE SPEECH 3** ***Energy Efficiency Improvement for Electrical Machines: a Challenge***	**Cloister Main Room** **Speaker: Prof. Gerard Andre Capolino**
9:50-10:00	**Break**	
10:00-11:20	**ORAL SESSION 5** ***3_Special Session: Advanced Techniques for Condition Monitoring of Energy Converters and Systems in Renewable Applications***	**Cloister Main Room** **Chairs: Claudio Bruzzese, Mohamed Djemai**
ID91	Sequence Circuit-Based Modeling of a Doubly Fed Induction Wind Generator For Eccentricity Diagnosis By Split-Phase Current Signature Analysis	Claudio Bruzzese; Francesco Trentini; Ezio Santini; Gojko Joksimovic
ID19	Sensorless Flux Observer-Based Fault Detection of Induction Machines	Jean-Pierre M Masala; Krishna Busawon; Milutin Jovanovic; Richard Binns
ID93	Robust Output observer for fault detection	Lamine Mohamadi
ID78	Comparison between six-phase and three-phase high-speed drag-cup induction motor in terms of cup losses	Mladen V Terzic; Bogdan Brkovic
10:00-11:20	**ORAL SESSION 6** ***Advanced Power Systems***	**Affreschi Room** **Chairs: Krishna Busawon, Gojko Joksimovic**
ID38	Mid-Term Load Power Forecasting Considering Environment Emission using A Hybrid Intelligent Approach	Azim Heydari
ID47	Cloud Induced PV Impact on Voltage Profiles for Real Microgrids	Mustafa Cagatay Kocer
ID32	Selective Harmonic Elimination Procedure for Uniform Step Asymmetrical 7-Level CHB Inverter	Fayçal Chabni , Rachid Taleb , M. Gabriella Cimoroni , C. Buccella
ID33	Selective Harmonic Elimination for a 5-level single phase converters with FPGA based controller	V. Castiglia, R. Miceli, G. Schettino, M.G. Cimoroni, C. Buccella, C. Cecati
11:20-11:30	**Coffe Break + Poster**	**Cloister**
11:30-13:30	**PLENARY PANEL SESSION** ***Colloquium on Euro-Med Energy System Integration***	**Cloister Main Room** **Ing. Michelangelo Celozzi**
13:30-14:30	**Lunch**	**Cloister**

Symposium Schedule – DAY 2 – Tuesday Sept. 25th, 2018 - Afternoon

14:30-15:20	**PLENARY KEYNOTE SPEECH 4** ***Sustainable Energy and Transport atAffordable Cost***	**Cloister Main Room** **Speaker: Prof. Ghanim Putrus**
15:20:15:50	**Coffe Break + Poster**	**Cloister**
15:50-17:50	**ORAL SESSION 7** ***Control - Eco design***	**Cloister Main Room** **Chairs: Concettina Buccella, Stefano Di Gennaro**
ID56	Model predictive-based direct battery control in PV fed Quasi Z-source inverters	Abderezak Lashab; Dezso Sera; Joao Martins; Josep M. Guerrero
ID77	Design of a Water Pressure Boosting System for Pressure Driven Demand in a Distribution Network	Lekhramsingh Mr Latchoomun; Tannegessen Sockalingum; Kavinen Virasamy Poulle
ID69	Vertical displacement sliding mode control of a half-vehicle active suspension	Lotfi Baghli; Abdelmadjid Boumediene; Hassan Benariba
ID94	An overview of wave energy technologies in the Mauritian context	Krishna Busawon; Deoduth DM Mawooa; Lekhramsingh Mr Latchoomun; Govinda Kaully
ID53	Voltage collapse assessment in developing countries EHV cross-boundary interconnection: a case study	Riccardo u Vignoli; Aaron Nyirenda; Stefano Galantino; Ilaria Colucci
ID59	Impacts of the Driverless Car on Urban Architecture	Rory J Gilchrist; Russell J Gilchrist
15:50-17:50	**ORAL SESSION 8** ***4_Special_Session: Design, Control and Applications of Efficient Energy Technologies or Systems***	**Affreschi Room** **Chairs: Leposava Ristić, Krishna Busawon**
ID60	An innovative Design Support System for Industry 4.0 Based on Machine Learning Approaches	Luca Romeo; Marina Paolanti; Gianluca Bocchini; Jelena Loncarski; Emanuele Frontoni
ID71	Efficient Technology for Combustion of Low Calorific Gaseous Fuels	Mirjana Stamenic; Tomislav Simonovic; Nikola Tanasic
ID72	Some Remarks on Bottom-Up Methodology for Energy Efficiency Action Plans	Mirjana Stamenic; Djordje S Cantrak; Novica Jankovic; Milan Lecic
ID73	Application of the microprocessor-based MV protective equipment for energy management purposes	Radoslav Antić, Dragana Naumović Vuković, Milan Bebić, Leposava Ristić
ID74	Electrical Drives with Active Rectifiers Connected to Distorted Utility Grid	Leposava Ristić, Bogdan Brković, Milovan Majstorović, Uroš Milović, Tufik Taluo and Milan Bebić
ID75	Housing of the Future: Housing design of fourth industrial revolution	Vesna-Mila Z. Colic-Damjanovic; Vladimir Lojanica; Novica Jankovic
15:50-17:50	**POSTER SESSION 2** ***Topic Miscellaneous***	**Cloister** **Chairs: Mark A Kirk, Riccardo Vignoli**
ID55	HV line supports alternatives comparison in remote african areas: a specific example in Zambia for the Lufubu cascade link to the national grid	Riccardo Vignoli; Stefano Galantino; Henrik Skobue; Mette Hauge Mikkelsen; Ilaria Colucci
ID35	Use of Photovoltaic Roof Tiling Systems in Listed Buildings. An Overview of the Current Opinion of England's Conservation Officers.	Gemma Davies; Mark A Kirk; Giovanni L. Pesce
ID76	Barriers to the use of low GWP Refrigerants in the Refrigeration and Air Conditioning sector in Mauritius	Raj Kumar Dreepaul
ID86	The Orientation Effect of the Tunnel Greenhouse on Aerodynamic and Energy Properties	Aissa Mohamed; bezari salah
ID61	Comparative Analysis of Radial and Looped Distribution Network Against Voltage Stability and Loadability with Distributed Generation	Saqlain Ahmad
ID62	Land Cover Mapping Analysis Using Sentinal-1 Satellite: A Case Study of Hyderabad in INDIA	Vijaykumar Devi
ID42	Thermal utilization of wet organic waste	Olesya Buryakovskaya; Mikhail Vlaskin; Valentin Kovbasyuk
18:00-20:00	**Coliseum Tour**	
20:00-23:00	**Gala Dinner**	

Symposium Schedule – DAY 3 – Wednesday Sept. 26th, 2018 - Morning

8:30-9:00	**Registration**	**Cloister Desk**
9:00-11:00	**ORAL SESSION 9** ***Energy Storage - Hydrogen & Fuel Cell - Advanced Power Systems***	**Cloister Main Room** **Chairs: Stefano Di Gennaro, Claudio Bruzzese**
ID31	Performance Analysis of a Hybrid Energy Storage System based on Dynamic Simulations	Stamatia Dimopoulou; Ekkehard Boggasch; Andreas Rausch
ID36	Prediction of the Heat Transfer Coefficient in Direct Oil Cooling of Lithium-Ion Batteries	Robert Camilleri; Mahmoud Sawani
ID80	Impact of forecasting errors on day-ahead scheduling of price-responsive customers	Guido Carpinelli; Pasquale De Falco; Fabio Mottola
ID30	Utilization of hydrogen sulfide from biogas installation	Rositsa Velichkova
ID43	Hydrogen generation at low-temperatures by oxidation of aluminum and magnesium	Olesya Buryakovskaya; Alexander Dudoladov; Mikhail Vlaskin; Evgeniy Shkolnikov
ID37	Time Synchronization of Pulse-Coupled Oscillators for Smart Grids	Yan Zong; Xuewu Dai; Krishna Busawon; Zhiwei Gao; Richard Binns
9:00-11:00	**ORAL SESSION 10** ***Energy System Sustainability and Integration***	**Affreschi Room** **Chairs: Stefano Lauria, Cristian Lazaroiu**
ID9	Investigating wind generation investment indices in multi-stage planning	Jaber Valinejad; Mousa Marzband; Krishna Busawon; Jorma Kyyrä; Edris Pouresmaeil
ID10	Dynamic stochastic EPEC model for competition of strategic producers in generation expansion planning	Jaber Valinejad; Mousa Marzband; Taghi Barforoshi; Jorma Kyyrä; Edris Pouresmaeil
ID17	Modular Two-level Voltage Source Converter for Direct Current Transmission Systems	Grain P. Adam
ID23	Deterministic Approach for Generation and Transmission Expansion Planning	Catalina A Sima; George Cristian Lazaroiu; Virgil Dumbrava; Cornel Panait; Mariacristina Roscia
ID52	Multilevel DC-link converter-based photovoltaic system with integrated energy storage	Abderezak Lashab; Dezso Sera; Joao Martins; Josep M. Guerrero
ID81	Comparing univariate and multivariate methods for probabilistic industrial load forecasting	Antonio Bracale; Guido Carpinelli; Pasquale De Falco
ID99	Sustainability in the Network Development Plan, Systemic sustainability and stakeholder engagement	Chiara Vergine, Francesca Scavo
11:00-11:30	**Coffe Break**	**Cloister**
11:30-13:00	**WORKSHOP 3** ***The Next Generation Grid: Apparent Intersection of Electrical and Communication System***	**Cloister Main Room** **Subrahmanyam Pulipaka and Rajneesh Kumar**
13:00-13:30	**Closing Ceremony**	**Cloister Main Room** **EFEA 2018 Committee**
13:30-14:30	**Lunch**	**Cloister**

Workshops

Workshop 1

Monday Sept. 24th, 2018, 17:30-19:00, Cloister Main Room

Multi-criteria design optimization of hybrid renewable energy systems under uncertainties-case studies using mohres

by Dr. Alireza Maheri, University of Aberdeen, UK

This workshop is designed to be beneficial for energy consultancy and system provider firms as well as research community interested in HRES.

Workshop 2

Monday Sept. 24th, 2018, 17:30-19:00, Affreschi Room

Frequency regulation support by loads and renewable energy sources

by Dr. Francesco Conte, Dr. Giorgio Maria Giannuzzi, Diego Cirio, University of Genova, Italy

During last years, a wide installation of renewable energy sources (RESs) into the power system has been promoted. In this scenario, the control of the grid frequency is becoming highly complex. Indeed, RESs are distributed, extremely variable, not programmable, and they do not contribute to the frequency regulation.

Workshop 3

Wednesday Sept. 26th, 2018, 11:30-13:00, Cloister Main Room

The Next Generation Grid: Apparent Intersection of Electrical and Communication System

by Dr. Subrahmanyam Pulipaka and Dr. Rajneesh Kumar, Birla Institute of Technology and Science, Pilani, India

With the growing demand of off-grid systems for solving energy access issue across the globe, the grid architecture is slowly evolving. The future grid will be a conglomeration of forward compatible hardware and software technologies to address evolving energy access patterns. Additionally, the next generation grids, with the proliferation of digital infrastructure to improve financial and operational self-reliance, are slowly transitioning into the ones where the intertwining of communication and electrical infrastructure is a requirement.

Panel Session: Colloquium on the Euro Mediterranean Energy Systems Integration

Tuesday Sept. 25th, 2018, 11:30a.m. - 13:30a.m., Cloister Main Room

The EFEA 2018 Symposium will host the Plenary Panel Session entitled “Colloquium on the Euro Mediterranean Energy Systems Integration”. The event follows ideally the Egyptian-Italian dialogue on the maritime economy, hosted on Tuesday 18 September 2018, with a similar approach of integration and cooperation, by the Campus of the Arab Academy for Science, Technology and Maritime Transport of Alexandria, Egypt, organized by Egyptian Ministry of Transport and the Italian Embassy in Egypt and chaired by the Egyptian Minister of Transport, with a view to developing a real strategic partnership.

The Rome event will be introduced by the Prof. Livio de Santoli and will take place over Video Conference with Cairo - Energy Department of the League of Arab Countries.

The main theme of the session will be the integration of energy systems with regional infrastructural systems (Transport, Telecommunications, Regional Port Infrastructures) functionally connected to energy systems, which greatly increases the range of economic operators interested in infrastructure project financing, turning synergies and opportunities in economic factors of international development and financing plans. An issue on which System Engineering can make a concrete contribution to stability, security and regional development, linked to the migration governance issues by opening new exchange corridors, such as the OBOR Chinese Project, which presents itself like the new "silk road".

The discussion will be based on an International Round Table, with the participation of the Secretary General of the Ministry of Energy of Jordan, Mrs. Amani Al-Azzam, the President of Confindustria Assafrica and Mediterraneo, Giovanni Ottati and of the Director of the Energy Department of the League of Arab Countries, Mrs. Jamila Youssef Ibrahim Matar, the latter over video conference with Cairo. Prof. Sergio Garribba, Senior Advisor for Energy to the Italian Ministry for Foreign Affairs, will moderate the round table.

An opportunity to launch new constructive dialogues and collaborations in the Mediterranean by conveying, with your support, a message of availability to the regional cooperation of the Mediterranean Scientific Community, for the occasion gathered in Rome.

Program ***(starting 11:30 A.M.)***

Introduction **(10 min)**

- Prof. **Livio De Santoli**, University of Rome “La Sapienza”

Colloquium **(60 min.)**

Moderator: Prof. **Sergio Garribba**, Senior Energy Advisor to the Italian Ministry of Foreign Affairs

Participants:

- Mrs. **Jamila Matar**, Director of the Energy Department, League of Arab States
- Mrs. **Amani Al-Azzam**, General Secretary of the Ministry of Energy of Jordan
- Mr. **Giovanni Ottati**, Chairman of Confindustria Assafrica & Mediterraneo

Discussion **(30 min)**

Participants: international **journalists and experts** through **interventions form the floor** (the participants will be kindly request to ask the questions in writing).

Closing and Acknowledgments **(20 min)**

- **Sen. Armando Siri**, State Secretary for Infrastructure (**Invited, TBC**)
- **Prof. Ezio Santini,** University of Rome “La Sapienza”

A Special Session in Memory of Aleksandar Nikolic

The Special Session SS-4 "*Design, Control and Applications of Efficient Energy Technologies or Systems*" by Dr. Leposava Ristic and Dr. Mirjana Stamenic (Tuesday Sept. 25th, 2018) is dedicated to the memory of Dr. Aleksandar Nikolic, Associate Research Professor and Principal Technical Associate at the Electrical Engineering Institute Nikola Tesla, University of Belgrade, Belgrado, Serbia, who suddenly and prematurely passed away on January 8th, 2018. Dr. Aleksandar Nikolic has been General Chairman of the 4th edition of the Symposium on Environment-Friendly Energy and Applications, held in Belgrado, Serbia, on Sept. 14th-16th, 2016. His friends and collegues remember his entusiastic and supportive participation to the EFEA Symposia, besides his professional committement and his passion for engineering work and research. Prof. Krishna Busawon will give a speech for Aleksandar on SS-4 opening.

The General Chairmen of EFEA 2018 Symposium

Ezio Santini

Claudio Bruzzese

Stefano Di Gennaro

Conference Venue

The Faculty of Civil and Industrial Engineering, University “Sapienza”

The Symposium will be held at the University of Rome “Sapienza”, Faculty of Civil and Industrial Engineering, which has a long tradition of teaching and researching. The Faculty is located in the historic centre of Rome directly overlooking the Coliseum and next to the ancient Basilica of San Pietro in Vincoli, home to Michelangelo’s statue of Moses. The Faculty has an international reputation for excellence and strong relations with industrial partners.

Venue Address: Via Eudossiana 18, 00184 Rome, Italy

The Faculty is also present on modern campuses in Latina and Rieti. Today the Faculty continues its long academic tradition of providing students with a strong scientific grounding in core subjects. It also offers an innovative syllabus with solid foundations in a wide variety of sub-disciplines and focus on the sustainability of both the natural and built environments. Its undergraduates gain vital professional skills that can be employed in both the domestic and increasingly globalized job markets. Some of the courses on offer include: Civil and Environmental Engineering, Aerospace and Mechanical Engineering, Conservation and Restoration Engineering, Chemical and Materials Engineering, Management and Security Engineering, Building Engineering and Architecture and other innovative programmer that provide students with the opportunity to explore new topics in the field of renewable energy sources and power plants, nanotechnology, transportation and bioengineering.

1 Faculty Main Entrance Hall

2 Faculty Cloister

3 Cloister's Main Room

4 Cloister's “Affreschi” Room

5 Church of San Pietro in Vincoli: Ciborium

6 Church of San Pietro in Vincoli:Michelangelo's Moses

How to Get There

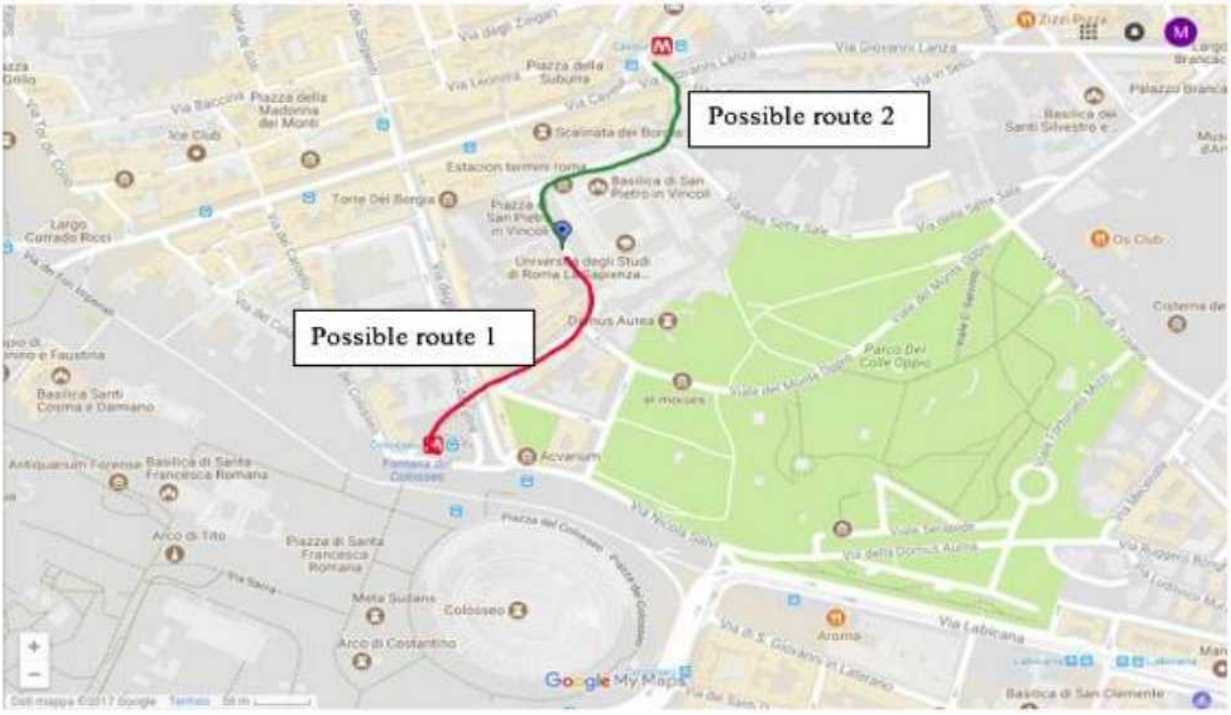
From Termini Station: You can reach the university by foot (15 minutes) or by Metro Line B/B1 going down to Cavour stop.

From Tiburtina Station: You can reach the university city by Metro Line B/B1 going down at Cavour stop.

By Subway: The university city is reached by Metro Line B/B1 going down to Cavour stop.

By the Taxy: University can be reached at via Eudossiano 18 by taking one of the white taxi or calling the number 3570 or 060609.

By the plane: To get from Rome Fiumicino airport to the university you have to take a taxi or the train to Termini station. To get from Rome Ciampino airport to the university you must to take a taxi.



Faculty's Map

Social Events

Welcome Cocktail

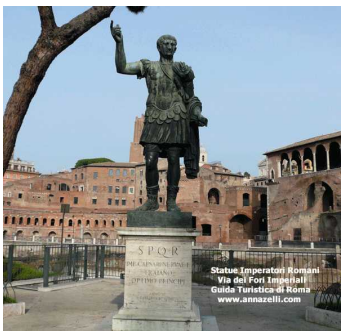
Sept. 23th, 2018, 7:00p.m.-9:00p.m.

A welcome cocktail will be served in the Faculty's Cloister, on Sunday Sept. 23th, 2018, from 7:00p.m. to 9:00p.m. We wait You to join us in the charming Rome's evening!

Coliseum Tour

Sept. 25th, 2018, 6:00p.m.-8:00p.m.

A city walk will start on Monday Sept. 25th, 2018, 6:00p.m. from the Faculty's Cloister and will comprise a 1 hour tour inside the Coliseum, continuing through Via dei Fori Imperiali, and ending at 8:00p.m. at the Gala Dinner venue.

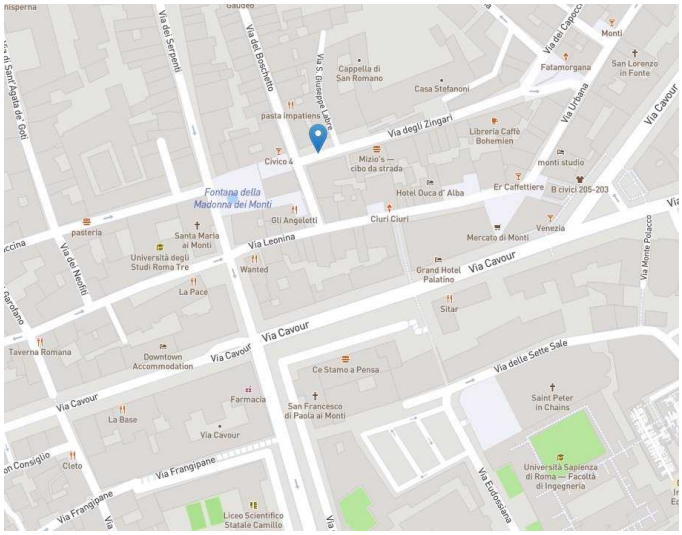


Conference Dinner

Sept. 25th, 2018, 8:00p.m.-11:00p.m.

The Conference Gala Dinner takes place at the Restaurant “Chicco di Grano”, in the heart of the ancient Rome and in the beautiful surroundings of the Coliseum and the Imperial Fora. In this context of immense cultural and artistic value, of breathtaking beauty, the Chicco di Grano is a place where gastronomy and tradition blend togheter, giving life to delicious dishes, succulent food and homemade desserts.

The restaurant “Chicco di Grano” is 10 min walk away from the Converence Venue, in Rione Monti, Via degli Zingari 6/7/8, near Piazza della Madonna dei Monti. The Metro B Station “Cavour” is located in the close nearby.



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We hope that you have enjoyed EFEA 2018 and look forward to seeing you at EFEA 2020

Have a safe journey back home!