



4th AIGE/IIETA International Conference and 13th AIGE 2019 Conference

Energy Conversion, Management, Recovery, Saving, Storage and Renewable Systems

Matera, Italy, June 13-14, 2019

FINAL PROGRAM

www.aige2019materita.it



THE CONFERENCE

The **4th AIGE/IETA International Conference** and **13th AIGE 2019 Conference** on **"Energy Conversion, Management, Recovery, Saving, Storage and Renewable Systems"**

is organized under the joint auspices of the AIGE and IETA with the aim of providing technical information to their members and to the scientific and industrial community at large.

The joint Conferences shall foster a binding platform for researchers from universities, research institutions and industries as well as students to network, learn more and share their knowledge. They will pursue the goal of providing a forum for the exposure and the exchange of technical/scientific information.

The joint Conferences will give the opportunity to discuss the state of the art and to present experimental, analytical and numerical results in Energy Conversion Systems, in Energy Management, in Energy Recovery Systems, in Energy Saving Techniques, Energy Storage Systems and Renewable Systems, with a particular attention to the engineering, environmental and economic aspects.

TOPICS

1 - Energy Conversion and Management:

Analysis and optimization of energy processes - Cogeneration and combined heat, power and refrigeration - Combustion improvements and combustion of new fuels - Industrial and domestic use of energy - Energy conversion and storage – Energy Efficiency in Buildings – Improvement of Indoor Air Quality – Energy Saving in Transportations – Power Plants and Equipment – Refrigeration and Air-Conditioning – Low Enthalpy Energy Sources – Energy Harvesting

2 - Energy Planning and Policy:

Economic and Policy Issues - Energy Analysis - Energy Planning and Energy Management - Energy supply security - Environmental, Social and Economic Impacts of Energy Policies and Usage - Overview of the Global and Regional Energy Scene - Problems of Modeling and Forecasting - Integrated Energy Systems - Optimal Use of Energy Resources - Energy and Environmental Regulation

3 - Power Systems and Networks:

Electricity Supply and Demand – Transmission – Distribution – Network Operation – Data Monitoring and Control Systems – Power Grids – District Heating and Cooling – Natural Gas Supply – Power Plants Automation and Control - Power System Metering - Smart Transmission Grids



4 - Thermodynamics and Heat Transfer:

Heat Exchangers – Conduction, Convection and Radiation Heat Transfer - Heat Transfer in Fission and Fusion Nuclear Facilities – Exergy Analysis - Entropy Generation Minimization – Heat and Mass Transfer Processes – Thermodynamic Modelling and Optimization – Computational Fluid Dynamics

5 - Renewable and Nuclear Energy Sources:

Biomass and Bioenergy - Geothermal Energy Systems - Sustainable Energy Systems - Wind Energy - Solar Thermal and Photovoltaic – Concentrating Solar Power – Waves Energy - Nuclear Power Plants – Hydro Power – Hydrogen Production Technology - Fuel Cells – Tide and Ocean Energy

CONFERENCE CHAIRS

Nicola Cardinale, University of Basilicata, Italy (Organizer)

Pietro Stefanizzi, Polytechnic University of Bari, Italy (Organizer)

Enrico Lorenzini, University of Bologna, Italy, AIGE President, IETA Directive Board Component.

Andrew Zhang, International Information and Engineering Technology Association, IETA, Canada.

ORGANIZING COMMITTEE

(University of Basilicata, Matera – Polytechnic University of Bari, Bari)

Nicola Cardinale, Pietro Stefanizzi, Ubaldo Ayr, Michele Dassisti, Francesco Martellotta, Francesco Piccininni, Francesco Ruggiero, Tiziana Cardinale, Francesca Intini, Stefania Liuzzi, Elisabetta Negro, Chiara Rubino, Valeria Selicati

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VENUE

Department of European and Mediterranean Cultures, Environment, and Cultural Heritage (DiCEM), University of Basilicata, Matera, Italy

AWARDS

3 Certificates of Merit will be assigned during the Conference, to be devoted to graduates (Master's Degree), PhD and post PhD students and young researchers, who have carried out significant research work on the Conference issues and present their results with a paper, in oral or poster sessions: 1 for graduates (Master's Degree) who present the results of their thesis, provided they are under 25 years old; 1 for PhD and post-PhD students provided they are under 32 years old; 1 for the best paper presented by young researchers under 35 years old.

CONTACTS

Conference Scientific Secretary
scientific@auge2019materita.it

Conference website
<http://www.auge2019materita.it/>



Thursday, June 13th, 2019

08:30 – Onwards Registration

Aula Magna Entrance

Campus Università degli Studi della Basilicata-Via Lanera 20 - Via Castello - MATERA

Opening

Aula Magna

09:30 – 10:15	Conference Chairs: Nicola Cardinale – President of Organizing Committee Aurelia Sole – Rector of University of Basilicata Ferdinando Mirizzi – Director of DICEM Piero Marrese – President of the Province of Matera
10:15-10:45	Enrico Lorenzini – President of AIGE - Associazione Italiana Gestione Energia Video messaggio del Sottosegretario allo Sviluppo Economico On. Davide Crippa PROF. FEDERICO TESTA's participation – President of ENEA "Strategia Energetica Italiana e Attività Trainante del' ENEA"

10:45-11:00 Coffee break

11:00- 13:00 Tavola rotonda (Panel discussion): SCELTE POLITICHE e TECNICHE su ENERGIA, AMBIENTE, LAVORO (POLITICAL AND TECHNICAL CHOICES on ENERGY, ENVIRONMENT, WORK)

Coordinator: Enrico Lorenzini

Participants: Adriana Greco, Oronzio Manca, Stefano Piva, Fabio Polonara, Piergiulio Avanzini, Maria Grazia De Angelis

13:00-14:00 Buffet lunch



14:15 – 16:30	Oral Session 1- A Aula Magna Energy Conversion and Management - Chair: Prof. Paolo Tartarini
14:15 – 14:30	02 - Analysis of energy saving potential of combined thermal solar power and micro scale gasification systems - A. Rizzo, M. Puglia, N. Morselli, P. Tartarini
14:30 – 14:45	06 - Energy and Mechanical Characterization of Composite Materials for Building with Recycled PVC- T. Cardinale, C. Sposato, M.B. Alba, A. Feo, F. Grandizio, G.F. Lista, G. Montesano, P. De Fazio
14:45 – 15:00	11 - Control Heating Exchange Through Natural Material in Building Construction – S. Colajanni, B. Megna, M. Gennusa, C. Sanfilippo, M. Bellomo, A. Valenza
15:00 – 15:15	13 - Potential Energy Benchmark for Lecture Timetable Problem - Bettoni L., Zavanella L.E.
15:15 – 15:30	15 - Design and Analysis of the Speed and Torque Control of IM with DTC Based ANN – R. Araria, K. Negadi, F. Marignetti
15:30 – 15:45	21 - Application of Energetic Life Cycle Assessment of Retrofit Interventions on The Historical Heritage: The Case of “Palazzo Del Sedile” – V. Selicati, N. Cardinale, G. Rospi, M. Dassisti
15:45 – 16:00	38 - Dynamic analysis of the role of thermal inertia in the system regulation of historical and monumental buildings – V. Malaguti, C. Lodi, P. Tartarini
16:00 – 16:15	43 - Computer fluid dynamics assessment of an active ventilated façade – M. Ferraro, G. Airò Farulla, G. Tumminia, F. Guarino, D. Aloisio, G. Brunaccini, F. Sergi, F. Giusa, A. E. Colino, M. Cellura, V. Antonucci
16:15 – 16:30	44 - From separated laws and directives to a unique regulatory issue in Europe about the synergic and conflicting use of subsurface to produce low carbon energy – F. Quattrocchi

14:15 – 16:15	Oral Session 1- B Room A203 Energy Conversion and Management Chair: Prof. Romano Borchiellini
14:15 – 14:30	01 - Effective thermal conductivity and the impact of aging effects on foam insulations: an analysis using microstructure and chemical methods – U.



	Berardi
14:30 – 14:45	32 - Strategies for demand-side management in an office building integrated with rooftop façade PV installations – D. Papurello, V. Vitulli, F. Minuto, L. Bottaccioli, A. Lanzini, R. Borchiellini
14:45 – 15:00	41 - Development of regression models to predict energy consumption in industrial sites: the case study of a manufacturing company in the central Italy– E. Moretti, L. Nassuato, G. P. Bordoni
15:00 – 15:15	46 - Towards 4th generation district heating by demand side management: a real application – E. Guelpa, V. Verda
15:15 – 15:30	47 - Experimental validation of a CFD-3D model for analyzing Dual Fuel (CNG/Diesel) – G. Cantore, E. Mattarelli, C.A. Rinaldini, T. Savioli, F. Scignoli
15:30 – 15:45	55 - Modelling approaches for fast simulation and optimization of large district heating networks – E. Guelpa, V. Verda
15:45 – 16:00	61 - Bottoming Organic Rankine Cycles for Passenger Cars – A. Mariani, B. Morrone, A. Unich
16:00 – 16:15	62 - EGR strategy for NOx Emission Reduction in a CAI engine fuelled with Innovative Biogas – A. Mariani, A. Unich, M. Minale

14:00 – 16:00

**Poster Session (with chair's presentation: 14.00 – 14.15 Aula Magna)
Atrium in front of the Aula Magna**

Chair: Prof.ssa Fedora Quattrocchi

05 - Thermal Control and Heat Accounting: Economics Related to Service Time and Building Insulation – C. Marafioti, S. Bergero, P. Cavalletti, A. Marchitto

23 - Nanofluids as Heat Transfer Fluids for High-Efficiency Caloric Heat Pumps – A. Greco, C. Aprea, A. Maiorino, C. Masselli

39 - Experimental Investigation of the Daily Thermal Performance of a CPC - G. Casano, S. Piva

40 - Heat transfer via unconditioned environments: the influence of the adjustment – S. Bergero, A. Chiari

42 - Bottom-up lumped-parameters thermodynamic modelling of the Italian - F. Lombardi, M.V. Rocco, S. Locatelli, C. Magni, E. Colombo, L. Belussi, L. Danza

50 - Effect of lignin on the mechanical properties of a composite material based on date palm and expanded polystyrene wastes – T. Masri, H. Ounis , A. Benchabane, L. Sedira

59 - Numerical investigation on a solar chimney in a building façade under different climatic



condition – L. Capasso, A. Diana, O. Manca, S. Nardini, S. Vigna

64 - A machine learning approach to predict energy consumptions in office and industrial buildings as a function of weather data – F. Martellotta, A. Cannavale, U. Ayr

70 - Energy savings in greenhouses through the use of heat recovery systems – V. Ferraro, P. Bevilacqua, R. Bruno, N. Arcuri

16:30-16:45 Coffee Break

16:45 -17:45 AIGE General Meeting

19:30 Bus for Social Dinner

20.30 Social Dinner - Masseria San Francesco - Matera



Friday, June 14th, 2019

08:30 – Onwards Registration

Aula Magna Entrance

Opening

Aula Magna

09.20 :09:40	<p>Invited paper: Prof. Yoghesh Yaluria – <i>Board of Governors Professor and Distinguished Professor, Mechanical and Aerospace Engineering Department Rutgers University, Piscataway, New Jersey, USA</i> -</p> <p>Optimization of Thermal Systems to Reduce Energy Consumption and Environmental Effect</p>
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09:40 - 11:30

Tavola rotonda (Panel discussion): INDIPENDENZA ENERGETICA e RICERCA per la SOSTENIBILITA' ECONOMICA ed AMBIENTALE (ENERGY INDEPENDENCE and RESEARCH for ECONOMIC and ENVIRONMENTAL SUSTAINABILITY)

Coordinator: Romano Borchiellini

Participants:, Piero de Fazio, Matilde Pietrafesa, Domenico Pietrocola, Fedora Quattrocchi, Paolo Tartarini

11:30-11:45 Coffee Break

11:45 – 13:00	<p>Oral Session 2- A Aula Magna - Thermodynamics and Heat Transfer - Power Systems and Networks Chair: Prof . Stefano Piva</p>
11:45 – 12:00	07 - The effectiveness of cool and green roofs as urban heat island mitigation strategies: a case study - M. Detommaso, A. Gagliano, F. Nocera
12:00 – 12:15	12 - CFD modelling of regenerative pre-heating systems for recycled glass raw material- C. Cravero, P. Leutcha, D. Marsano
12:15 – 12:30	26 - Entropy Generation Minimization for the Design of Plate Heat Exchangers – R. Bruno, P. Bevilacqua, V. Ferraro, N. Arcuri
12:30 – 12:45	27 - Thermal characterization of innovative sustainable building materials from wool textile fibers waste– C. Rubino, M. Bonet-Aracil, S. Liuzzi, F. Martellotta and P. Stefanizzi
12:45 – 13:00	28 - A Porous Media Numerical Approach for the Simulation of Stirling



	Engine Regenerators – M. Faruoli, A. Viggiano, V. Magi
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11:45 – 13:15	Oral Session 2-B Room A203 - Thermodynamics and Heat Transfer - Power Systems and Networks Chair: Prof.Fabio Polonara
11:45 – 12:00	16 - Modelling Of Radiative Heat Transfer In A Gray Semi-transparent Medium With internal Fluid Cavity limited By Black Boundary surfaces- J. S. Djeumegni, M. Lazard, V. Le Dez, H. T. Tagne Kamdem
12:00 – 12:15	20 - Mitigation of a Loss of Coolant Accident In ITER Vacuum Vessel By Means Steam Pressure Suppression – A. Pesetti, G. Giambartolomei, R. Lofrano, R. Lazzeri, Barkar, M. Olcese, D. Aquaro
12:15 – 12:30	36 - Analysis of heat transfer in the case of non linear hyperbolic conduction equation coupled with radiation or with thermoelectricity – M. Lazard, G. Ymeli, H. T. Tagne Kamdem, R. Tchinda
12:30 – 12:45	63 - Bio-compatible core-shell nanostructured PCMs for thermal comfort in lightweight constructions – A. Cannavale, F. Martellotta, V. De Matteis, U. Ayr
12:45 – 13:00	66 - A Preliminary Exergy Analysis of the EU DEMO Fusion Reactor – P. Palazzo, F. Giannetti, G. Caruso
13:00 - 13:15	67 - Characterization and optimization of heat recovery in a Combined Heat and Power generation unit – M. Costa, D. Cirillo, V. Rocco, R. Tuccillo, M. La Villetta, C. Caputo, G. Martoriello

13:30-14:30 Buffet lunch

14:30 – 16:30	Poster Session (with chair's presentation : 14.30 -14.45 Aula Magna) Atrium in front of the Aula Magna Chair: Dott. Enrico Catizzone
	08 - Solar Tracking System for a Linear Fresnel Plant with Two Degrees of Freedom Reflectors – M. Cucumo, V. Ferraro, D. Kaliakatsos, F. Nicoletti
	09 - Thermal Fluid Dynamics Analysis of Crude Oil Fouling in a Heat Exchanger with Internal Mechanical Inserts – M. Cucumo, A. Galloro, N. Greco, M. Mele, F. Nicoletti, D. Perrone
	10 - Computational Fluid Dynamics simulations to evaluate the performance improvement for



Air-cooler equipped with a water spray system - M. Cucumo, V. Ferraro, A. Galloro, D. Gullo, D. Kaliakatsos, F. Nicoletti

17 - Considerations on the thermo-hygrometric and luminous microclimate of a museum building. A case study Messina museum – M. Cannistraro, C. Guglielmino

18 - Verify between the provided by forecast models acoustical data, and those experimental detected at Messina – G. Cannistraro, , M. Cannistraro, C. Guglielmino

37 - Numerical Study on Thermal and Fluid Dynamic Behavior of a Compact Heat Exchanger Partially Filled with Metal Foam – B. Buonomo, A. di Pasqua, O. Manca, S. Nardini

57 - Reduction of greenhouse gas emissions consequent to the introduction of ecological vehicles into the car fleet - C. Marino, C. Monterosso, A. Nucara, M.F. Panzera, M. Pietrafesa

65 - Energetic and economic comparison of lighting systems in historical building. A case study – S. Liuzzi, P. Di Chio, C. Rubino, P. Stefanizzi

14:45 – 16:00	Oral Session 3 - Aula Magna - Renewable and Nuclear Energy Sources - Energy Planning and Policy Chair: Prof. Adriana Greco
14:45 – 15:00	03 - A View On Economy Through Thermodynamic Glasses (The Thermodynamic Currency) – P. Avanzini
15:00 – 15:15	04 - Aeroacoustic Investigation of Aerodynamic Appendages for Wind Turbine Blades: Fluid-Dynamic Tests - G. Cappanera, V. D'Alessandro, L. Giammichele, R. Ricci
15:15 – 15:30	14 - End Users' Acceptance of New Technologies in Building Heating: an Experience on Solar Assisted Heat Pumps - L.A. Tagliafico, A. Cavalletti, C. Marafioti, A. Marchitto
15:30 – 15:45	22 - Sliding Mode Control of Wind Energy Conversion System Using Dual Star Synchronous Machine and Three Level Converter– A. Berkani, K. Negadi, T. Allaoui
15:45 – 16:00	24 - The effect of zeolite features on catalytic performances of CuZnZr/zeolite hybrid catalysts in one-pot CO ₂ -to-DME hydrogenation – E. Catizzone, G. Bonura, M. Migliori, G. Braccio, F. Frusteri, G. Giordano

14:45 – 15:45	Oral Session 3 Room A203 - Renewable and Nuclear Energy Sources - Energy Planning and Policy Chair: Prof. Oronzio Manca
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14:45 – 15:00	25 - Techno-environmental assessment for a bio-methanol integrated plant using anaerobic digestion of OFMSW and biomass gasification – A. Giuliano, E. Catizzone, D. Barisano, F. Nanna, A. Villone, I. De Bari, G. Cornacchia, G. Braccio
15:00 – 15:15	30 - Energy Management of Hybrid Power System PV Wind and Battery Based Three Level Converter – M. Koulali, M. Mankour, K. Negadi, A. Mezouar
15:15 – 15:30	31 - Biomass Availability Based Novel Approach For Lignocellulosic Biorefineries And Power Plants – A. Giuliano, D. Barletta, I. De Bari, V. Motola, N. Pierro, A. Giocoli
15:30 – 15:45	58-Planning of Energy Savings in Public Buildings: Retrofit Actions and Economic Analysis- A. Fichera, R. Volpe
15:45 – 16:00	69 - Smart Ancient Cities: towards PAES compilation. The case history of Magliano-Tuscany Region and Canary Islands – F. Giannuzzi , E. Mesini, F. Quattrocchi

16:30 - 16:45
Aula Magna

Awards ceremony

16:45 - 17:00

Closing of the conference