

# Programma 78° Congresso ATI 2023

14 settembre

Auditorium San Rocco		Aula 1		Aula 2		Aula 3				
9.00-9.30	Registrazione partecipanti									
9.30-10.30	Saluti Istituzionali									
	Delegato del Rettore per le Problematiche Energetiche e l'Edilizia - UniMORE	Prof. Paolo Tartarini								
	Presidente Fondazione Cassa di Risparmio di Carpi	Ing. Mario Ascari								
	Direttore del Dipartimento di Ingegneria "Enzo Ferrari" - UniMORE	Prof. Massimo Borghi								
	Assessore all'Urbanistica della Città di Carpi	Arch. Riccardo Righi								
	Presidente ATI Nazionale - Sapienza-Università di Roma	Prof. Livio De Santoli								
	Presidente ATI Sezione Emilia-Romagna - UniMORE	Prof. Giuseppe Cantore								
10.30-12.30	Keynote Lectures									
	Green carbon and renewable fuels production from biomass and waste: technologies and applications (Libera Università Bolzano)	Prof. Marco Baratieri								
	Impianto Power to Methane come sistema di accumulo di energia elettrica da fonti rinnovabili (Gruppo HERA SpA)	Ing. Nicola Troiano								
	Pump as Turbine (PaT): le soluzioni KSB (KSB Italia)	Dott. Ing. Davide Coduri								
	Transizione energetica: l'esperienza di CPL Concordia (CPL Concordia)	Ing. Bruno Grispino								
	La normazione tecnica tra stato dell'arte e innovazione a supporto delle sfide della transizione energetica (CTI - Comitato Termotecnico Italiano)	Dott. Antonio Panvini								
12.30-13.00	Spostamento bus verso Tecnopolo: 2 viaggi									
13.00-14.30	Pranzo		Pranzo		Pranzo		Pranzo			
14.30-16.00			Internal combustion engines and sustainable mobility Chairman: Davide Moro		Clean, sustainable and renewable energy production and storage systems Chairman: Francesco Melino		Efficient energy use and conversion in systems and processes Chairman: Andrea De Pascale			
14.30-14.45			A phenomenological model for predicting the early development of the flame kernel in spark-ignition engines Marco Pretto		A simplified approach for energy system design in buildings and its application to a case study Luca Migliari		Green hydrogen production in a south of Italy region using excess electricity only: real scenario and alternatives Giovanni Caramia			
14.45-15.00			Experimental analysis of boost limits in a hydrogen fueled PFI internal combustion engine Stefano Frigo		Fluid dynamic design of a pilot tidal turbine for the Mar Piccolo basin in Taranto Giacomo Lo Zupone		Supercritical carbon dioxide recovery system applied to cement industries Gianluca Cevolani			
15.00-15.15	Riunione Fisica Tecnica Italiana con trasporto bus da e per Tecnopolo		Characterization of Hydrotreated Vegetable Oil (HVO) in a Euro 6 Diesel Engine as a Drop-In Fuel and with a dedicated calibration Alessandro Mancarella		Wave Energy Converters and Hydraulic Power Take-off: analysis of a possible control strategy Piofrancesco Barone		Multi-objective sensitive analysis of the performance a wind power plant equipped with a PAT system Lorenzo Dambrosio			
15.15-15.30			Non linear model predictive control strategy for the energy management of a P4 parallel hybrid electric vehicle Luigi Teodosio		Theoretical and experimental analysis of the impact of a recuperative stage on the performance of an ORC-based solar microcogeneration unit Fabio Fatigati		Experimental investigation on the performance of a micro-ORC system for different operating conditions Luigi Falbo			
15.30-15.45			Analysis of the Vibrational Behavior of dual-fuel RCCI combustion in a Heavy-Duty Compression Ignited Engine fueled with Diesel-NG at Low Load Davide Moro		Ammonia as a Fuel for Gas Turbines: Perspectives and Challenges Giuseppe Langella		A Numerical Investigation on Laminar Flame Speed of Syngas in Air with Ozone Addition Marco D'Amato			
15.45-16.00					Renewable energy community design and evaluation according to the Italian regulation Giovanni Brumana		A new meta-model based on artificial neural network to predict the collection efficiency of cyclones for industrial processes involving dust-laden air flow Edoardo Bregolin			
16.00-16.30					Coffee Break		Coffee Break		Coffee Break	
16.30-18.15					Hydraulics, pneumatics and drive systems Chairman: Barbara Zardin		Turbomachines Chairman: Michele Pinelli		Energy efficiency in buildings Measurement and monitoring in energy systems Thermal control in electric and hybrid vehicles Chairman: Massimo Rundo	
16.30-16.45			Tribological investigation of friction coefficient in pneumatic seals with a special pin-on-disc setup Edoardo Goti		A re-design process of an industrial centrifugal fan through CFD and rapid prototyping Michele Pinelli		A model-based approach to long-term energy planning: the case-study of the Turin Airport Matteo Prussi			
16.45-17.00			Modelling of a Gerotor pump including the evaluation of the micro-movements of the external gear Giuseppe Totaro		On the influence of twist and taper of HAWT blades on the rotational augmentation phenomenon: the NREL Phase VI – Phase II comparison Stefano Mauro		Development of diagnostic instrumentations for fuel cells based on consumer electronics Dalberto Thomas			
17.00-17.15			Application of a hydraulic gas bladder suppressor for pressure ripple reduction in gear pumps Carlo Maria Vescovini		Assessment of the derating methods for centrifugal pump performance handling non-Newtonian fluids Nicola Zanini		Instantaneous flowrate measurements in high-pressure liquid flows Oscar Vento			
17.15-17.30			Energy analysis of a hybrid electro-hydraulic system for efficient mobile hydraulics Damiano Padovani				Thermal mapping analysis of a 48V prismatic lithium-ion battery pack with active and passive cooling Hossein Darvish			
17.30-17.45			Analysis of Flow Rate Distribution in Progressive Divider for Reciprocating Compressor Lubrication Luigi Tundo		ASSEMBLEA ATI		Acoustic tomography for velocity estimation in high temperature flows Lorenzo Ferrari			
17.45-18.00			Digital Hydraulic Technology: Applications, Challenges, and Future Direction Francesco Sciatti							
18.00-18.15			Design considerations about the hydromechanical transmission IC2OC Alarico Macor							
Ristorante L'Anatra										
19.00	Trasporto bus da Tecnopolo a ristorante: 1° viaggio									
19.30	Trasporto bus da Tecnopolo a ristorante: 2° viaggio									
22.30	Trasporto bus da ristorante a Tecnopolo: 1° viaggio									
23.00	Trasporto bus da ristorante a Tecnopolo: 2° viaggio									

15 settembre

Auditorium San Rocco		Aula 1		Aula 2		Aula 3	
9.15-11.00	Riunione AIMSEA con trasporto bus da e per Tecnopolo	The role of biomass for sustainable energy transition Chairman: Marco Baratieri		Numerical simulation and optimization in thermal systems Chairman: Marco Cavazzuti			
9.15-9.30		Carbonaceous materials derived from biowastes pyrolysis as efficient and green biogas desulfurization system	Stefano Trotta	DOE optimization of a liquid cold plate used in a thermal management system for power converters in the railway sector through 3D CFD analysis	Luca Romagnuolo		
9.30-9.45		Experimental investigation of chestnut shells gasification	Marco Puglia	Numerical Modeling and Simulation of a Small-Scale Locomotive Powered by Solid Oxide Fuel Cells	Ahmet Fatih KAYA		
9.45-10.00		Continuous Hydrothermal Liquefaction of microalgae for biocrude oil production	Vittoria Benedetti	Numerical modelling of stepped helical cooling channels	Danila Trane		
10.00-10.15		Exergy and Renewability Analysis of Regional-Scale Cogeneration Based on Giant Reed Gasification: The Case of Marginal Lands Exploitation in Sicily	Mauro Prestipino	Numerical study on the mixed convection with nanofluids in vertical channel asymmetrically heated	Gianluca Sarli		
10.15-10.30		Analysis of combined cycle plants integrating biomass and natural gas	Luigi Falbo	Numerical verification of condenser finite volume model	Marco Lorenzini		
10.30-10.45		Exploring the feasibility of grapevine pruning gasification for electricity production and EV charging in non-urban areas: a preliminary technical-economic assessment	Nicolò Morselli	Numerical modelling and process simulation of a post-combustion CO2 capture pilot plant based on a membrane contactor unit	Riccardo Cremona		
10.45-11.00		Decentralized waste to energy & biochar: the circular approach for negative-CO2 farmers	Lorenzo Pezzola				
11.00-11.30		Coffee Break		Coffee Break		Coffee Break	
11.30-13.00		Numerical and experimental results for energy storage and sustainable heating and cooling systems Chairman: Paolo Tartarini		Advancing sustainable energy communities: case studies and innovations for the energy transition Chairman: Simone Pedrazzi			
11.30-11.45	Experimental analysis of a graphene oxide-enhanced paraffin PCM	Giuseppe Emmi	Development of an Energy Community through semi-dynamic simulation of a urban social housing area	Francesco Muzi			
11.45-12.00	Ammonia heat pumps for district heating: thermo-economic optimization analysis based on evaporator geometry for either direct expansion or chilled water configurations	Adelso Flaviano Passarelli	A battery-to-electrolyzer pathway for energy management in a hybrid battery/hydrogen microgrid	Athar Ahmad			
12.00-12.15	Cooling Potential Evaluation of a Ground Heat Exchanger in a Tropical Climate: A Case Study of an Office Building	Miguel Chen Austin	The maximization of shared energy in RECS in disadvantaged areas in terms of population density: the case study of Osidda in Sardinia	Carlo Costantino Mastino			
12.15-12.30	Assessment of the energy consumption of indoor farming for different climates and lighting system intensity	Alice Arcasi	Sustainable practices in energy, air quality, and environmental impact assessments				
12.30-12.45	Thermo-economic optimization of a 100 kW air-to-water heat pump for heating purposes in residential units	Ilaria Viscardi	Monitoring and analysis of environmental and IAQ conditions in classrooms with controlled mechanical ventilation	Giada Remia			
12.45-13.00	Modelling validation for a natural gas pressure reduction station with energy recovery	Francesco Devia	Climatic change mitigation: analysis of electrical fans usage impact on dwellers heat stress	Ramezani Atlas			
13.00-14.30	Pranzo		Pranzo		Pranzo		
14.30-16.00	Energy efficiency in buildings Chairman: Alberto Muscio		Internal combustion engines and sustainable mobility Chairman: Carlo Alberto Rinaldini		Energy storage systems Smart Energy Systems, Smart Grid and distributed power production Policies to aid the energy transition Chairman: Mauro Venturini		
14.30-14.45	A Lumped-Parameter Model of a Smart Ventilation unit for nearly Zero Energy Buildings	Roberto Sedoni	CFD-3D and 1D modeling of fuel cell powertrain for a hydrogen vehicle	Carmine Marra	Preliminary analysis of refilling cold-adsorbed hydrogen tanks	Daniele Melideo	
14.45-15.00	A preliminary analysis of the potential reduction of CO2 emissions by using high temperature heat pumps in residential buildings in Italy	Michele De Carli	Turbocompound energy recovery option on a turbocharged diesel engine	Davide Di Battista	Environmental and Economic Assessment of the Italian Energy Transition Scenarios	Alessandro Sorce	
15.00-15.15	Assessment of the Capabilities of a Simplification Algorithm for Building Energy Modelling for the Evaluation of Control Strategies: a Case Study in Bolzano, Italy	Angelica El Hokayem	Theoretical and experimental evaluation of electric coolant pump benefits in real driving cycles	Marco Di Bartolomeo	Numerical modeling and exergetic analysis of efficiency improving solutions for a micro-CAES system	Dario Tumminello	
15.15-15.30	Deep energy retrofit of an existing two-family building: theoretical and experimental analysis on envelope and HVAC performance improvements.	Paolo Visentin	Hybrid-electric power unit for an ultralight aircraft	Alfredo Maria Pisapia	Pumps as turbines for pumped hydro energy storage systems - A small-size case study	Ing. Fabio Licheri	
15.30-15.45			Can lubricant oil promote undesired self-ignition of the charge in hydrogen engines?	Elia Distaso	Hybrid diagnostic approach for the diagnosis of district heating networks	Lucrezia Manservigi	
15.45-16.00					Analysis of the electrical and thermal behaviour of Li-ion batteries using OD and 3D-CFD approaches with validation on experimental data	Luca Reina	
16.00-16.30	Coffee Break		Coffee Break		Coffee Break		
16.30-17.45	Internal combustion engines and sustainable mobility Chairman: Enrico Mattarelli		Hydrogen production, transport, storage and utilization Chairman: Tommaso Savioli		Clean, sustainable and renewable energy production and storage systems Chairman: Giuseppe Cantore		
16.30-16.45	Influence of E85 on performance and efficiency of a motorcycle engine	Claudio Di Gaetano	Thermal Energy Storage technologies for the optimal management of metal hydride hydrogen storage systems	Alessandro Sorce	The potential of energy planning at Municipality scale: Sustainable Energy and Climate Action Plans (SECAP) and local Energy Communities to meet the energy demand variability	Davide Di Battista	
16.45-17.00	Effect of low-grade gas composition on performance and emission levels in a spark ignition internal combustion engine.	Antonio Caricato	Energy analysis of a hydrogen integrated system in the residential sector	Francesca Mennilli	The role of biomass in energy transition to net zero carbon emissions due to climate change: the Apulia case	Lazzaro Zagaria	
17.00-17.15	Hydrogen, methane and one of their fuel blends combustion: CFD analysis and numerical-experimental comparisons of fixed and mobile applications	Manuel Madia	Metal hydrides in hydrogen storage: optimization of dynamic control strategies	Lingkang Jin	Detailed performance analysis of a novel small-scale biomethane liquefaction plant	Vincenzo Di Domenico	
17.15-17.30	Analysis of oil-gallery for piston cooling using different CFD approaches and comparison with experimental data	Antonio Bottazzo	Fuel Cell Hybrid Electric Vehicles: Fuel Cell experimental characterization and modeling towards the development of a Hardware-in-the-Loop platform for advanced powertrain design	Edoardo Cennamo	Bell-Metha Power Augmented Savonius turbine as Take-off in OWC Systems	Sebastian Brusca	
17.30-17.45			Techno-economic analysis of hydrogen production via photovoltaic, battery and electrolysis: plant sizing and hydrogen cost	Enrico Bocci	Power-to-liquid versus biomass-derived kerosene: a comparative study	Giovanni Manente	
17.45-18.00			Hydrogen production by water foto-sonolysis: a modal approach to enhance the ultrasonic acoustic field in the solution	Piergiovanni Domenighini			

Poster

Poster Area (allestita al Tecnopolo a partire da giovedì 14 ore 10:00)			
ID	Titolo	Topic	Autori

PF1	Effects of a high-reflective mulching membrane on environmental parameters and food crops cultivation: results from a summer season campaign	Measurement and monitoring in energy	Alessia Di Giuseppe, Aron Pazzaglia, Giacomo Fabbrizi , Beatrice Castellani, Andrea Nicolini, Federico Rossi
PF2	Potential Role of green hydrogen as an energy carrier in smart energy system communities	Smart Energy Systems, Smart Grid and	Ali Mojtahed, Alessandro Ciancio, Antonio Sgaramella
PF3	A potential coupling of reforming and electrolysis for producing renewable hydrogen from landfill gas	Hydrogen production, transport, storage and	Ali Mojtahed, Axel Riccardo Massulli
PF4	A numerical study on thermal control of batteries by phase change materials with liquid cooling	Energy storage systems	Aanandsundar Arumugam, Oronzio Manca, Bernardo Buonomo, Carmine D'Arienzo, Pasquale Romano
PF5	Decarbonization of methanol production - Techno-economic analysis of Power-to-Fuel process in a Hydrogen Valley	Hydrogen production, transport, storage and	Alessandro Ciancio, Ali Mojtahed, Antonio Sgaramella
PF6	Formation and dissociation of carbon dioxide hydrate in presence of (NH4)2SO4: experimental characterization of the inhibition produced on the process.	Carbon sequestration and carbon negative applications	Alberto Maria Gambelli, Giovanni Gigliotti, Piergiorgio Domenighini, Federico Rossi
PF7	Improving the energy performance of healthcare buildings: a case study	Energy efficiency in buildings	Stefano Grignaffini, Andrea Vallati, Luca Grignaffini, Marco Romagna
PF8	Biomass as a carbon neutral fuel for the energy transition: a case study on the gasification potential related to a REC planned for a mountain city	Clean, sustainable and renewable energy	Daniela Cirone, Jessica Settino, Roberto Bruno
PF9	Assessing the environmental impact of Kosovo's biggest air pollutants: Monitoring the air quality in urban and industrial areas in Kosovo – Study case of Pristina and Drenas	Climate change mitigation in the built environment	Shqiprim Ahmeti, Luca Rubini, Besa Veseli, Kliton Bylykbashi
PF10	Hydrogen volumetric fraction effects on HCNG refuelling station CAPEX	Hydrogen production, transport, storage and	Antonio Sgaramella, Alessandro Ciancio, Ali Mojtahed
PF11	Monitoring of public buildings via energy-efficient Z-Wave wireless sensors	Energy and IAQ	Alessandro Franco, Emanuele Crisostomi, Matilde Hammoud
PF12	Performance evaluation of transcritical CO2 desiccant heat pumps for electric vehicles	Energy and IAQ	Haidan Wang, Paolo Valdiserri, Yulong Song, Feng Cao, Eugenia Rossi di Schio, Paolo Valdiserri
PF13	Experimental investigation on the borefield thermal response with a Distributed Temperature Sensing (DTS) system	Refrigeration and heat pumps	Christian Natale, Matteo Dongellini, Claudia, Gian Luca Morini
PM1	A phenomenological model for predicting the early development of the flame kernel in spark-ignition engines	Internal combustion engines and sustainable	Pietro Giannattasio, Marco Pretto, Enrico De Betta
PM2	Metal hydrides in hydrogen storage: optimization of dynamic control strategies	Hydrogen production, transport, storage and utilization	Lingkang Jin, Mosé Rossi, Flavio Caresana, Leonardo Pelagalli, Gabriele Comodi
PM3	Utilisation of Ethyl Levulinate as Diesel Fuel Additive	Internal combustion engines and sustainable	Stefano Frigo, Marco Antonelli, Marco Francesconi, Anna Raspolli
PM4	Energy analysis of a hydrogen integrated system in the residential sector	Hydrogen production, transport, storage and utilization	Francesca Mennilli, Lingkang Jin, Mosé Rossi, Alice Mugnini, Gabriele Comodi
PM5	Battery-integrated combined cooling, heating and power plant (CCHP) through NH3 - H2O absorption system in a hospital facility	Efficient energy use and conversion in systems and processes	Simone Braccio, Alfredo Gimelli, Raffaele Iossa, Ali Karimi, Massimiliano Muccillo, Hai Trieu Phan
PM6	Comparison of Desalination Technologies and Assessment of Their Sustainability	Efficient energy use and conversion in systems	Hiba Chebli, Francesco Fornarelli, Nicola Bellantuono
PM7	Comparison among optimal refueling infrastructures for zero emission waste transportation vehicles in Valle Camonica	Hydrogen production, transport, storage and utilization	Ferdinando Vincenti, Gianluca Valenti, Bruno Poetini, Manuel Bontempi, Dario Furlanetto
PM8	Techno-economic analysis of I-CAES systems to increase dispatchability of wind power	Clean, sustainable and renewable energy production and storage systems	Stefano Cioni, Claudio Papini, Francesco Superchi, Adriano Milazzo, Alessandro Bianchini
PM9	Preliminary experimental data analysis for Digital Twin development of a large bore Dual-Fuel engine	Internal combustion engines and sustainable	Federico Del Mondo, Davide Pivetta, Simone Fratti, Lucia Parussini, Elio Padoano, Paolo Gallina, Rodolfo Taccani
PM10	To What Extent Is Aeroelasticity Impacting Multi-Megawatt Wind Turbine Upscaling? A Critical Assessment	Clean, sustainable and renewable energy production and storage systems	Leonardo Pagamonci, Francesco Papi, Francesco Balduzzi, Shengbai Xie, Jasim Sadique, Pietro Scienza, Alessandro Bianchini
PM11	Energetic analysis of a magnetic gearbox for small wind turbine	Efficient energy use and conversion in systems	Amedeo Amoresano, Silvia Roscioli, Renato Rizzo, Luigi Pio Di Noia
PM12	Multi-physics model development and application to real-case alkaline electrolyzer	Hydrogen production, transport, storage and utilization	Marco Dreoni, Francesco Balduzzi, Francesco Maria Ferro , Giorgio Fagioli, Kevin Panichi, Giovanni Ferrara, Alessandro Bianchini
PM13	Behaviour of a tidal turbine system using a diffuser in waters characterized by low speeds and the presence of surface waves typical of the Mediterranean Sea	Clean, sustainable and renewable energy	Micol Pucci, Valerio Maiorino Conte, Alessandro Saccardi, Stefania Zanforlin
PM14	Theoretical and experimental analysis of the impact of a recuperative stage on the performance of an ORC-based solar microcogeneration unit	Clean, sustainable and renewable energy	Fabio Fatigati, Arianna Coletta, Roberto Carapellucci, Roberto Cipollone
PM15	Experimental methodology for the characterization of a hydrogen-fuelled Pressure Gain Combustor	Hydrogen production, transport, storage and	Claretta Tempesti, Luca Romani, Marco Ciampolini, Otso Hakuri, Fabio Ciccateri, Giovanni Ferrara
PM16	Evaluation of the efficiency of a hybrid ICE vehicle fuelled with hydrogen compared with a fuel cell vehicle, based on a simulation model	Internal combustion engines and sustainable mobility	Fernando Ortenzi, Dario Aliberti, Vincenzo La Battaglia , Stefano Marini , Francesco Vellucci
PM17	A new meta-model based on artificial neural network to predict the collection efficiency of cyclones for industrial processes involving dust-laden air flow	Efficient energy use and conversion in systems	Edoardo Bregolin, Piero Danieli, Massimo Masi

## Altri lavori

ID	Titolo	Topic	Autori
1	Numerical analysis of new PCM thermal storage systems	Energy storage systems	Matteo Greppi, Giampietro Fabbri, Federico Amati
2	Building a Renewable Energy Community for the Tor Sapienza district in Rome	Energy efficiency in buildings	Giada Romano, Priscilla Margani, Francesco Mancini, Alessandra Battisti
3	Improving energy efficiency and Indoor Environmental Quality in the School of Mathematics at the Sapienza University campus in Rome	Energy efficiency in buildings	Giada Romano, Maria Rosso, Francesco Mancini, Simona Salvo
4	Performance assessment of electro-osmotic flow of rectangular microchannels with smoothed corners	Innovation in heat transfer problems	Nicola Suzzi, Marco Lorenzini