SAE NAPLES
An SAE International Section

ICE2021

15th International Conference on Engines & Vehicles

Final Program

September 12th - 15th, 2021 @ Capri, Naples

MONDAY

13TH

SEPTEMBER

Monday 13 September

9:00	***Registration*** ***Opening Ceremony*** ***Ezio Mancaruso*** *SAENA President &* ***Riccardo Chirone*** *STEMS Director* ***Michael Bargende*** *&* ***Bianca M. Vaglieco*** *Conference Chairs*
9:15	**Opening Speech from SAE** **Murli Iyer** President - Global Advisory Group & Advisor - SAE International & FISITA
09:20	**eFuels: a further step towards sustainable mobility** **André Casal Kulzer** Porsche AG **Chairperson: Federico Millo**
10:00	**Key Technology Thermal Management** **Jumana Al-Sibai** Member of the Management Board Mahle GmbH **Chairperson: Michael Beargende**
10:40	**Coffee break**
	Room Teatro
	ICE101 - 0-D and 1-D Modeling and Numerics **Chairperson: Luciano Rolando**
11:10	1D Modeling of the outwardly opening direct injection for internal combustion engines operating with gaseous and liquid fuels **(2021-24-0006)** **Paolo Sementa, Michele Todino and Luigi Sequino,** STEMS CNR
11:30	Friction Calculations and Validation Measures on an External Component Test Bench of the Piston Pin Bearing under the Influence of Greater Elastic Deformation Caused by a Hydrostatic Bearin **(2021-24-0001)** **Dennis Liebmann and Volker Lagemann,** Mercedes-Benz AG**; Michael Bargende,** Universitat Stuttgart
11:50	Methane Conversion and Ammonia Formation Model over a Pd-Rh Three-Way Catalyst for CNG Heavy-Duty Engines **(2021-24-0002)** **Dario Di Maio, Carlo Beatrice, Chiara Guido, Valentina Fraioli and Pierpaolo Napolitano,** STEMS CNR**; Sivaram Kannepalli, Stefano Golini and Dimitrios Tsinoglou,** FPT Industrial SpA
12:10	Simulation Study of a Scaled Up Turbocharged Two-Stroke Direct Injected SI -engine **(2021-24-0003)** **Lennarth Zander**, Scania CV AB
12:30	Development of a Fully Physical Vehicle Model for Off-Line Powertrain Optimization: A Virtual Approach to Engine Calibration **(2021-24-0004)** **Federico Millo and Andrea Piano,** Politecnico di Torino**; Alessandro Zanelli and Giulio Boccardo,** POWERTECH Engineering S.r.l.; **Marcello Rimondi and Rocco Fuso,** Punch Torino SpA (former GM)
	ICE502 - Engine NVH **Chairperson: Felix Leach**
12:50	An Enevelope Analysis for Gear fault detection - on line monitoring **(Oral Only)** **Daniela Siano,** STEMS CNR
13:10	Assessment of Flow Noise Mitigation Potential of a Complex Aftertreatment System through a Hybrid Computational Aeroacoustics Methodology **(2021-24-0091)** **Federico Millo, Benedetta Peiretti Paradisi, Francesco Sapio and Renzo Arina**, Politecnico di Torino; **Andrea Bianco**, Powertech Engineering; **Antonio Benetti and Monica Moratti**, CNH Industrial – IVECO – Medium Trucks; **Annalisa Reviglio**, Cornaglia SpA
13:30	**Lunch break**

Monday 13 September

	Room Capri	*Room Rotonda*
	ICE402 - Emission Control Modeling **Chairpersons: Gianluca Montenegro, Panayotis Dimopoulos Eggenschwiler**	**ICE303 - Alternative and Advanced Fuels** **Chairpersons: Vincenzo Mulone, Barbara Apicella, André Kulzer**
11:10	A Simplified CO_2 and Fuel Consumption Model for Buses Derived from VECTO Simulations **(2021-24-0075)** **Stijn Broekaert, Evangelos Bitsanis and Georgios Fontaras,** European Commission Joint Research	Experimental and Numerical Investigation on Hydrogen Internal Combustion Engine **(2021-24-0060)** **Loic Rouleau and Florence Duffour, Bruno Walter, Rajesh Kumar, Ludovic Nowak,** IFP Energies nouvelles
11:30	Reaction analysis and modeling of Fast SCR in a Cu-chabazite SCR catalyst considering generation and decomposition of ammonium nitrate **(2021-24-0073)** **Keiichiro Seki, Rikuto Ueyama, Yoshihisa Tsukamoto, Kenya Ogawa, Kohei Oka, Ratnak Sok and Jin Kusaka**, Waseda University	CO_2 Neutral Fuels in Series Engines - Demonstration of the Potential of OME with Regard to Efficiency and Ultra-Low Emissions **(2021-24-0061)** **Philipp Demel and Christian Beidl,** Technical University of Darmstadt
11:50	Modeling the kinetic and thermal interaction of UWS droplets impinging on a flat plate at different exhaust gas conditions **(2021-24-0079)** **Antonello Nappi, Gianluca Montenegro, Angelo Onorati and Augusto Della Torre**, Politecnico di Milano; **Panayotis Dimopoulos Eggenschwiler**, Empa	Characterization of Internal Diesel Injector Deposits (IDID´s) from heavy-duty vehicles **(2021-24-0062)** **Mayte Pach and Henrik Hittig,** Scania CV AB; **Andreas Cronhjort and Hanna Bernemyr**, KTH Royal Institute of Technology
12:10	Modeling of Three Way Catalyst Behavior Under Steady and Transient Operations in a Stoichiometric Natural Gas Fueled Engine **(2021-24-0074)** **Moyu Wang and Panayotis Dimopoulos Eggenschwiler**, Empa	Fuel Influence on Single-Piston Common Rail Pump Performance **(2021-24-0063)** **Mario Cavallo, Edoardo Frattini and Fulvio Palmieri,** Università degli Studi Roma Tre
12:30	Conversion Performance Prediction of Thermal-Deteriorated Three-Way Catalyst: Surface Reaction Model Development Considering Platinum Group Metals and co-Catalyst **(2021-24-0077)** **Yukihiro Yamakawa, Ryoya Inoue, Yunosuke Kubo, Kyohei Yamaguchi and Jin Kusaka,** Waseda University	Comparison of Fuel Filters and Adsorption Filters for Metal Carboxylate Separation **(2021-24-0064)** **Botond Csontos, Saurabh Shinkhede and Hanna Bernemyr,** KTH Royal Institute of Technology; **Mayte Pach and Henrik Hittig**, Scania CV AB
12:50	An Optimization-Based Framework for Dynamic Model Development for a Three-Way Catalytic Converter Suitable for Urban Driving Condition **(2021-24-0078)** **Deepak Mandloi,** TVS Motor Co., Ltd.; **Samraj dhinagar,** M/S TVS Motor Company Limited; **Himadri Das**, TVS Motor Co Ltd	DME as an Alternative Fuel for Compression Ignition Engines in Long-Haul Heavy-Duty Transport **(2021-24-0065)** **Gilles Hardy and Daniel Klein**, FPT Motorenforschung AG; **Patrik Soltic and Thomas Hilfiker**, Empa; **Tommaso Lucchini and Andrea Schirru**, Politecnico di Milano
13:10	A Random Forest Algorithmic Approach to Predicting Particulate Emissions from a Highly Boosted GDI Engine **(2021-24-0076)** **Nick Papaioannou, Xiaohang Fang and Felix Leach**, University of Oxford; **Andrew Lewis and Sam Akehurst**, University of Bath; **James Turner**, KAUST	Real Driving Emissions of Diesel and LNG Euro VI Heavy-Duty Vehicles Measured with FTIR-PEMS **(2021-24-0066)** **Danilo Engelmann and Yan Zimmerli,** Berne University of Applied Sciences; **Fabian Ruoss and Elimar Frank**, OST Eastern Switzerland University of Applied Sciences
13:30		Hydrogen in testing environments: the migration challenge **(Oral Only)** **Giulio Marmorato,** AVL Italia SRL
13:50	**Lunch break**	

Monday 13 September

14:30	**H_2 ICE: a sustainable powertrain for reaching net zero carbon emissions** **Massimo Ferrera** Landi Group**, Roberto Golisano, Francesco Pesce, Alberto Vassallo** PUNCH Torino **Chairperson: Fabio Bozza**
15:10	**Coffee break**
	Room Teatro
	ICE102 - Multi-Dimensional Engine Modeling **Chairperson: Marco Chiodi**
15:40	Experimental and Numerical Investigation of a Passive Pre-Chamber Jet Ignition Single-Cylinder Engine **(2021-24-0010)** **Federico Millo, Luciano Rolando and Andrea Piano,** Politecnico di Torino**; Paolo Sementa, Francesco Catapano and Silvana Di Iorio,** STEMS CNR**; Andrea Bianco,** Powertech Engineering SRL
16:00	Numerical Simulation of the Early Flame Development Produced by a Barrier Discharge Igniter in an Optical Access Engine **(2021-24-0011)** **Jacopo Zembi, Federico Ricci, Carlo Grimaldi and Michele Battistoni**, Università degli Studi di Perugia
16:20	System simulation combustion modelling of H_2 ICE **(Oral Only)** **Alessio Dulbecco, Guillaume Alix, Gregory Font**, IFP Energies nouvelles
16:40	An Engine Parameters Sensitivity Analysis on Ducted Fuel Injection in Constant-Volume Vessel Using Numerical Modeling **(2021-24-0015)** **Federico Millo, Cristiano Segatori, Andrea Piano and Benedetta Peiretti Paradisi**, Politecnico di Torino; **Andrea Bianco**, Powertech Engineering SRL
17:00	Development of a PN Surrogate Model Based on Mixture Quality in a GDI Engine **(2021-24-0013)** **Davide Domenico Sciortino, Mark Cary, Sunny Verma, Federico Biagiotti and Edward Hopkins**, Oxford Brookes University; **Changzhao Jiang**, Loughborough Univ; **Dennis Witt,** Ford Motor Company; **Fabrizio Bonatesta**, Oxford Brookes University
17:20	Modeling of Reactivity Controlled Compression Ignition Combustion Using a Stochastic Reactor Model Coupled with Detailed Chemistry **(2021-24-0014)** **Tim Franken,** Brandenburg University of Technology; **Andrea Matrisciano**, LOGE AB - Chalmers University; **Rafael Sari, Álvaro Fogué Robles and Javier Monsalve-Serrano**, Universitat Politecnica de Valencia; **Dario Lopez Pintor**, Sandia National Laboratories; **Michal Pasternak**, LOGE Polska Sp.z.o.o.; **Antonio Garcia**, Universitat Politecnica de Valencia; **Fabian Mauss**, Brandenburg University of Technology
18:00	**SAE-NA Naples Section meeting**
20:00	**Informal dinner**

Monday 13 September

	Room Capri	*Room Rotonda*
	ICE601 - Advanced Hybrid and Electric Vehicle Powertrains **Chairpersons: Ivan Arsie, Marco Sorrentino**	**ICE204 - Combustion in Gaseous-Fueled Engines** **Chairperson: Massimo Ferrera**
15:40	Cooling Performance of a Modified R744 Air Conditioning System with Vortex Tube and Internal Heat Exchanger for an Electric Vehicle **(2021-24-0098)** **Barbara Malgorzata Mendecka,** University of Tuscia**; Daniele Chiappini,** Università degli Studi Niccolò Cusano**; Gino Bella,** University of Rome	Characterization of Cycle-by-Cycle Variations of an Optically Accessible Heavy-Duty Diesel Engine Retrofitted to Natural Gas Spark Ignition **(2021-24-0045)** **Jinlong Liu, Christopher Ulishney and Cosmin Dumitrescu**, West Virginia University
16:00	Sizing and Optimization of a Vortex Tube for Electric Vehicle HVAC Purposes **(2021-24-0099)** **Daniele Chiappini,** Università degli Studi Niccolò Cusano**; Barbara Mendecka,** University of Tuscia**; Gino Bella,** University of Rome	High Load Lean SI-Combustion Analysis of DI Methane and Gasoline Using Optical Diagnostics with Endoscope **(2021-24-0046)** **Kristoffer Clasen, Mindaugas Melaika, Lucien Koopmans and Petter Dahlander**, Chalmers University of Technology
16:20	Calibrating BEV and HEV Powertrains for Dynamic Performance Targets **(2021-24-00100)** **Ernst Winklhofer, Harald Philipp, Anna Poms, Thomas Platzer and Mario Propst,** AVL LIST GmbH**; Jakob Moder,** Piezocryst GmbH	Laminar flame speed-based optimization of efficiency and emissions for methane-hydrogen fueled SI micro-generators **(2021-24-0047)** **Adrian Irimescu and Silvana Di Iorio, Paolo Sementa,** STEMS CNR
16:40	Investigation by modelling of a Hybrid Electric Vehicle (HEV) with diesel engine on WLTC **(Oral Only)** **Roberta De Robbio, Ezio Mancaruso,** STEMS CNR**; Maria Cristina Cameretti, Fortunato D'Acunzo,** University of Naples "Federico II"	Effects of EGR, Variable Valve Timing, High Turbulence and Water Injection on Efficiency and Emissions of a HD Stoichiometric Natural Gas Engine **(2021-24-0048)** **Marius Betz, Nico Höweling, Ulf Kühne and Peter Eilts,** Technische Universität Braunschweig
17:00	Lifetime modeling for silicon carbide based power module **(2021-24-00102)** **Michele Calabretta, Angelo Messina and Alessandro Sitta,** STMicroelectronics	A Study on Prediction of Unburned Hydrocarbons in Active Pre-chamber Gas Engine: Combustion Analysis Using 3D-CFD by Considering Wall Quenching Effects **(2021-24-0049)** **Taki Shota, Takuro Kato, Zenta Sudo, Beini ZHOU and Jin Kusaka**, Waseda University; **Hikaru Yamazaki**, MHI Engine & Turbocharger Ltd; **Tomohiro Koga and Yusuke Imamori**, Mitsubishi Heavy Industries Ltd
17:20	Optimal Energy Management Strategy for Energy Efficiency Improvement and Pollutant Emissions Mitigation in a Range-Extender Electric Vehicle **(2021-24-00103)** **Manfredi Villani, Ankur Shiledar and Tong Zhao**, Ohio State University; **Carlos Lana and Dat Le**, Cummins Inc; **Qadeer Ahmed and Giorgio Rizzoni**, Ohio State University	Effect of Injection Strategy on Hydrogen Direct-Injection Spark-Ignition Engine **(2021-24-0050)** **Sanguk Lee, Gyeonggon Kim and Choongsik Bae**, Korea Advanced Inst of Science & Tech
17:40	Test procedure proposal for EV power measurement on dynamometers **(2021-24-00104)** **Benedikt Reick and André Kaufmann**, Ravensburg-Weingarten University of Appl; **Danilo Engelmann**, Bern University of Applied Sciences	
18:00	**SAE-NA Naples Section meeting**	
20:00	**Informal dinner**	

TUESDAY

14TH

SEPTEMBER

Tuesday 14 September

9:00	**Registration**
9:00	**CO_2 social and environmental impact: towards a multi-technology portfolio** **Domenico Brancale, AVL Italia S.R.L.** **Chairperson: Marco Chiodi**
9:40	**Coffee break**
	Room Teatro
	ICE101 - 0-D and 1-D Modeling and Numerics **Chairperson: Angelo Onorati**
10:10	Experimental and numerical investigation of a lean SI engine to be operated as range extender for hybrid powertrains **(2021-24-0005)** **Emmanuele Frasci,** University of Naples "Parthenope"**; Paolo Sementa,** STEMS CNR**; Ivan Arsie and Elio Jannelli,** University of Naples "Parthenope"**; Bianca Maria Vaglieco,** STEMS CNR
10:30	Development and Validation of a Multi-Zone Predictive Combustion Model for Large Bore Dual Fuel Engines **(Oral only)** **Federico Millo, Francesco Accurso, Andrea Piano,** Politecnico di Torino**; Gennaro Caputo,** Wartsila Italia Spa**; Alberto Cafari, Jari Hyvonen,** Wartsila Finland Oy**; Navin Fogla,** Gamma Technologies LLC
10:50	Potentials of the Oversizing and H_2-supported Lean Combustion of a VVA SI Gasoline Engine towards Efficiency Improvement **(2021-24-0007)** **Fabio Bozza,** University of Naples Federico II**; Fabio Berni, Francesco Cicci and Alessandro D'Adamo,** Università di Modena e Reggio Emilia**; Vincenzo De Bellis,** University of Naples Federico II**; Stefano Fontanesi,** Università di Modena e Reggio Emilia**; Enrica Malfi,** University of Naples Federico II**; Valentina Pessina,** Università degli Studi di Modena**; Luigi Teodosio,** University of Naples Federico II
11:10	Development of Phenomenological Models for Engine-Out Hydrocarbon Emissions from an SI DI Engine within a 0D Two-Zone Combustion Chamber Description **(2021-24-0008)** **Stefania Esposito, Lutz Diekhoff, Heinz Pitsch and Stefan Pischinger,** RWTH Aachen University
11:30	Thermal Efficiency Enhancement for Future Rightsized Boosted GDI Engines – Effectiveness of the Operation Point Strategies Depending on the Engine Type **(2021-24-0009)** **Stefania Falfari, Gian Marco Bianchi and Giulio Cazzoli,** University of Bologna**; Claudio Forte,** NAIS SRL
	ICE103 - Combustion and Flow Diagnostics **Chairperson: Ezio Mancaruso**
11:50	Experimental and Numerical Investigation of the Flow Field Effect on Arc Stretching for a J-type Spark Plug **(2021-24-0020)** **Jacopo Zembi, Francesco Mariani, Carlo Grimaldi and Michele Battistoni,** Università degli Studi di Perugia**; Adrian Irimescu and Simona Merola,** STEMS CNR
12:10	Comparison of Velocity Field in a Single-Cylinder Transparent Internal Combustion Engine under Cold Flow Conditions Using Particle Image Velocimetry and Computational Fluid Dynamics **(2021-24-0021)** **Vasileios D. Tsiogkas, Ioannis Bouras PhD, Kyriakos Dimitriadis and Nikolaos Theodorou,** UNIVERSITY OF WESTERN MACEDONIA**; Dimitrios Kolokotronis,** ARISTOTLE UNIVERSITY OF THESSALONIKI**; Antonios Tourlidakis,** UNIVERSITY OF WESTERN MACEDONIA
12:30	Effects of Fuel Composition on Auto-Ignition and Detonation Development in Boosted Spark-Ignited Engines **(2021-24-0022)** **Inna Gorbatenko, Eshan Singh and Mani Sarathy,** King Abdullah Univ of Science & Tech**; Andre Nicolle,** Aramco Fuel Research Center, KAUST
12:50	Computational Investigation of the Effects of Injection Strategy and Rail Pressure on Isobaric Combustion in an Optical Compression Ignition Engine **(2021-24-0023)** **Hammam Aljabri and Xinlei Liu,** King Abdullah Univ of Science & Tech**; Moaz Allehaibi,** King Abdullah & Umm Al-Qura Universities**; Abdullah S. AlRamadan and Jihad Badra,** Saudi Aramco**; Moez Ben Houidi,** King Abdullah Univ of Science & Tech**; Bengt Johansson,** Chalmers University of Technology**; Hong G. Im,** King Abdullah Univ of Science & Tech
13:30	**Lunch break**

Tuesday 14 September

	Room Capri	*Room Rotonda*
	ICE404: Particle Emissions from Combustion Sources **Chairpersons: Imad Khalek, Silvana Di Iorio**	**ICE104: Engine Management and Control** **Chairperson: Christian Beidl**
10:10	Oxidative Reactivity of Soot Particles Generated from the Combustion of Conventional Diesel, HVO and OME Collected in Particle Filter Structures **(2021-24-0085)** **Panayotis Dimopoulos Eggenschwiler, Daniel Schreiber and Karin Schröter,** EMPA**; Christophe Barro,** Vir2sense	FPGA Implementation of In-Cycle Closed-Loop Combustion Control Methods **(2021-24-0024)** **Carlos Jorques Moreno and Ola Stenlaas,** Scania CV AB**; Per Tunestal,** Lund University
10:30	Polycyclic Aromatic Hydrocarbons Evolution and Interactions with Soot Particles During Fuel Surrogate Combustion: A Rate Rule-Based Kinetic Model **(2021-24-0086)** **Luna Pratali Maffei, Matteo Pelucchi and Tiziano Faravelli,** Politecnico di Milano**; Heinz Pitsch and Qian Mao,** RWTH Aachen Univ**; Andrea Nobili,** Politecnico di Milano	Avoidance Algorithm Development to Control Unrealistic Operating Conditions of Diesel Engine Systems under Transient Conditions **(2021-24-0025)** **Rio Asakawa, Iku Tanabe, Kyohei Yamaguchi, Ratnak Sok and Jin Kusaka,** Waseda University**; Masatoshi Ogawa,** Fujitsu Limited**; Takuma Degawa and Shigeaki Kurita,** Transtron Inc.**; Arravind Jeyamoorthy and Zhou Beini,** Waseda University
10:50	Sub-23 nm particle measurement and assessment of their volatile fraction at exhaust of a four-cylinder GDI engine fueled with E10 and E85 under transient conditions **(2021-24-0087)** **Francesco Catapano, Silvana Di Iorio, Agnese Magno and Bianca Maria Vaglieco,** STEMS CNR	Development and validation of a virtual sensor for estimating the maximum in-cylinder pressure of SI and GCI engines **(021-24-0026)** **Guido Federico Scocozza, Giacomo Silvagni, Alessandro Brusa, Nicolo Cavina, Fabrizio Ponti and Vittorio Ravaglioli,** University of Bologna**; Matteo De Cesare, Marco Panciroli and Cristian Benedetti,** Marelli Europe SpA - Powertrain BU
11:10	**ICE403: Emissions Measurement and Testing** **Chairpersons: Imad Khalek, Danilo Engelmann** An Analysis of Modern Vehicle Road Loads for Fleetwide Energy Consumption Modelling **(2021-24-0080)** **Dimitrios Komnos,** FINCONS group**; Stefanos Tsiakmakis,** Ideas Forward PC**; Jelica Pavlovic,** European Commission Joint Research**; Andrés Laverde Marín Ing,** FINCONS group**; Anatoli Chatzipanagi; Georgios Fontaras,** European Commission Joint Research	Development of a Fast-Running Injector Model with Artificial Neural Network (ANN) for the Prediction of Injection Rate with Multiple Injections **(2021-24-0027)** **Dominik Golc, Stefania Esposito, Heinz Pitsch and Joachim Beeckmann,** RWTH Aachen University
11:30	The increasing importance of particles, volatile organic compounds and ammonia in future air quality policy **(Oral only)** **Nick Molden,** Emissions Analytics	**ICE304 - Automotive Lubricants** **Chairperson: Ezio Mancarso** Fuel Economy Engine Oils: Scientific Rationale and Controversies **(2021-24-0067)** **Boris Zhmud,** BIZOL Germany GmbH**; Arthur Coen and Karima Zitouni,** OLEON France
11:50	Estimation of Speciation Data for Hydrocarbons using Data Science **(2021-24-0081)** **Kiran Yalamanchi, Kaust; Bingjie chen; Rooppesh Sarankapani; Mani Sarathy,** King Abudllah University of Science & Tech.	Vibrations and torque losses of synchronizers in transmissions **(2021-24-0068)** **Axel Baumann,** AVL Deutschland GmbH**; Bernd Bertsche,** Universitat Stuttgart

Tuesday 14 September

	Room Capri	*Room Rotonda*
	ICE403: Emissions Measurement and Testing **Chairpersons: Imad Khalek, Danilo Engelmann**	**ICE605 - Energy storage** **Chairperson: Manfredi Villani**
12:10	Prediction of NOx Emissions from Compression Ignition Engines Using Ensemble Learning-Based Models with Physical Interpretability **(2021-24-0082)** **Harish Panneer Selvam, Shashi Shekhar and William F. Northrop,** Univ. of Minnesota-Twin Cities	Eco-friendly Aluminum-air batteries as a possible alternative to Lithium systems **(2021-24-0111)** **Maria F. Gaele, Fortunato Migliardini and Tonia M. Di Palma,** STEMS CNR
12:30	Oxygen storage capacity (OSC) measurement of 3-way automotive catalysts using the CATAGEN OMEGA test reactor **(2021-24-0083)** **Liam Mc Grane,** Catagen Limited**; Roy Douglas,** Queen's University Belfast**; Kurtis Irwin, Andrew Woods, Jonathan Stewart, Andrew Pedlow and Matthew Elliott,** Catagen Limited	Effects of High Conductivity Coatings on the Thermal Behavior of a Li-polymer Battery via Infrared Measurements **(Oral Only)** **Luigi Sequino, Renato Marialto, Bianca Maria Vaglieco,** STEMS CNR**;** **Gaetano Sebastianelli,** University of Naples "Federico II"
12:50	Fast Emissions Analyzers for In-Vehicle and Roadside Measurements **(2021-24-0084)** **Jamie Parnell,** Cambustion Ltd	Modeling Study of the Battery Pack Sizing for the Electric Conversion of a Commercial Vehicle **(2021-24-0112)** **Luigi Sequino, Ezio Mancaruso and Bianca Maria Vaglieco,** STEMS CNR
13:10	DEkati EPNC: A novel technology for regulatory exhaust particle number measurements **(Oral only)** **Erkki Lamminen, Peter Lambaerts,** Dekati Technologies	**ICE606: Energy efficient Automated Vehicles** **Chairperson: Manfredi Villani** At the Convergence of the Mobility Trends: Eco-Friendly Connected Automated Vehicles (CAV) and the Energy Efficiency of their Perception System **(2021-24-0113)** **Mircea Gradu, David Heeren,** Velodyne LiDAR
13:30	**Lunch break**	

Tuesday 14 September

14:30	**Ammonia as zero-carbon fuel for Internal Combustion Engine: where are we today?** **Christine Mounaïm-Rousselle** University of Orléans Polytech Orléans / Laboratoire PRISME **Chairperson: Viktoria Kelich**
15:10	**Coffee break**
	Room Teatro
	ICE102-Multi-Dimensional Engine Modeling **Chairperson: Giuseppe Cantore**
15:40	Combined CFD - Experimental Analysis of the In-Cylinder Combustion Phenomena in a Dual Fuel Optical Compression Ignition Engine **(2021-24-0012)** **Roberta De Robbio,** STEMS CNR**; Maria Cristina Cameretti,** University of Napoli Federico II**; Ezio Mancaruso,** STEMS CNR**; Raffaele Tuccillo,** University of Napoli Federico II**; Bianca Maria Vaglieco,** STEMS CNR
16:00	3D-CFD Full Engine Simulation Application for Post-Oxidation Description **(2021-24-0016)** **Rodolfo Tromellini,** University of Stuttgart**; MADAN KUMAR and Salaar Moeeni,** Chiba Univ**; Marco Chiodi,** FKFS**; Michael Bargende,** University of Stuttgart**; Tatsuya Kuboyama and Yasuo Moriyoshi,** Chiba Univ
16:20	In-Cylinder Heat Transfer Determination Using Impulse Response Method with a Two-Dimensional Characterization of the Eroding Surface Thermocouple **(2021-24-0018)** **Carl Caruana, Mario Farrugia and Pierluigi Mollicone,** Univ of Malta**; Emiliano Pipitone,** Univ of Palermo**; Gilbert Sammut,** Dolphin N2 Ltd
16:40	Methods to Investigate the Importance of eFuel Properties for Enhanced Emission and Mixture Formation **(2021-24-0017)** **Jonas Villforth, Andre Casal Kulzer and Hans-Peter Deeg,** Dr. Ing. h.c. F. Porsche AG**; Antonino Vacca, Edoardo Rossi, Francesco Cupo, Marco Chiodi and Michael Bargende,** FKFS
17:00	Experimental and Numerical Investigation for Improved Mixture Formation of an eFuel Compared to Standard Gasoline **(2021-24-0019)** **Edoardo Rossi, Simon Hummel, Francesco Cupo, Antonino Vacca, Marco Chiodi and Michael Bargende,** FKFS**; Jonas Villforth, Andre Casal Kulzer and Hans-Peter Deeg,** Dr. Ing. h.c. F. Porsche AG
17:20	Synergetic application of 0/1/3D-CFD approaches for hydrogen-fuelled spark ignition engine simulation **(Oral only)** **Federico Millo, Luciano Rolando, Andrea Piano, Francesco Accurso, Fabrizio Gullino, Salvatore Roggio,** Politecnico di Torino**; Francesco Pesce, Alberto Vassallo, Punch Torino; Andrea Bianco,** Powertech Engineering SRL

Tuesday 14 September

	Room Capri	*Room Rotonda*
	ICE202 - Combustion in CI Engines **Chairpersons: Benjamin Lawler, Marius Betz, Erich Wenz**	**ICE504 - Engine Boosting Systems** **Chairperson: Silvia Marelli**
15:40	Ethanol in a Light-Duty Dual Fuel Compression Ignition Engine: 3-D Analysis of the Combustion Process **(2021-24-0036)** **Davide Lanni, Enzo Galloni and Gustavo Fontana,** University of Cassino**; Roberto Ianniello, Carlo Beatrice and Gabriele Di Blasio,** STEMS CNR	Supercharged expander to enhance waste heat recovery through ORC unit in vehicle applications **(2021-24-0092)** **Davide Di Battista,** Università degli Studi dell'Aquila**; Fabio Fatigati,** Università degli Studi dell'Aquila**; Marco Di Bartolomeo and Roberto Cipollone,** Università degli Studi dell'Aquila
16:00	Vortex Development and Heat Release Enhancement in Diesel Spray Flame by Inversed-Delta Injection Rate Shaping Using TAIZAC Injector **(2021-24-0037)** **Tetsuya Aizawa, Tomoki Kinoshita, Yohei Tanaka, Tatsuki Takahashi, Yuusei Miyagawa and Taizo Shimada,** Meiji University**; Lingzhe Rao and Sanghoon Kook,** The University of New South Wales	Time to boost analysis of an advanced boosting system for automotive applications **(2021-24-0093)** **Vittorio Usai and Silvia Marelli,** Università Degli Studi di Genova
16:20	Combustion Behaviour of Blends of Synthetic Fuels in an Optical Single Cylinder Engine **(2021-24-0038)** **Jose V. Pastor, Jose M. Garcia-Oliver, Carlos Micó and Francisco J. Tejada,** Universitat Politecnica de Valencia	A Numerical Study on Turbocharging System for Hydrogen Combustion Engine **(2021-24-0094)** **Jeyoung Kim and Srithar Rajoo,** Universiti Teknologi Malaysia
16:40	What Are the Barriers Against Brake Thermal Efficiency beyond 55% for HD Diesel Engines? **(2021-24-0039)** **Kazumasa Watanabe, Noboru Uchida, Kazuhiro Yokogawa and Fumihiro Kawaharazuka,** New Ace Inst Co Ltd	**ICE603 - Advanced Fuel Cell Vehicle Applications** **Chairperson: Sven Eberts** Assessment of a Hydrogen-Fueled Heavy-Duty Yard Truck for Roll-On and Roll-Off Port Operations **(2021-24-0109)** **Giovanni Di Ilio and Paolo Di Giorgio,** University of Naples Parthenope**; Laura Tribioli,** University of Rome Niccolò Cusano**; Viviana Cigolotti,** ENEA; **Gino Bella,** University of Rome Niccolò Cusano**; Elio Jannelli,** University of Naples Parthenope
17:00	Performance Analysis and In-Cylinder Visualization of Conventional Diesel and Isobaric Combustion in an Optical Diesel Engine **(2021-24-0040)** **Harsh Goyal, Niraj Panthi and Moez Ben Houidi,** King Abdullah Univ. of Science & Tech.**; Abdullah S. AlRamadan and Jihad Badra,** Saudi Aramco**; Gaetano Magnotti,** King Abdullah Univ. of Science & Tech.	Parametric and Sensitivity Analyses to Support Decision Making Tasks in Fuel Cell Hybrid Vehicle Design **(2021-24-0110)** **Antonio Monetti, Simone Sorgente and Marco Sorrentino,** University of Salerno
17:20	Conditional Moment Closure Approaches for Simulating Soot and NOx in a Heavy-Duty Diesel Engine **(2021-24-0041)** **Shrey Trivedi, University of Cambridge;** CARES Singapore**; Savvas Gkantonas,** University of Cambridge**; Yuri M. Wright,** ETH Zurich/Combustion+FlowSolutions Gmbh**; Matteo Parravicini,** ETH Zürich**; Christophe Barro,** Vir2sense**; Epaminondas Mastorakos,** Univ. of Cambridge	

17:40	Flow-Field Analysis of Isobaric Combustion Using Multiple Injectors in an Optical Accessible Diesel Engine **(2021-24-0042)** **Niraj Panthi, Harsh Goyal and Moez Ben Houidi,** King Abdullah Univ. of Science & Tech**.; Abdullah AlRamadan and Jihad Badra,** Saudi Aramco**; Gaetano Magnotti,** King Abdullah Univ. of Science & Tech.	

WEDNESDAY

15TH

SEPTEMBER

Wednesday 15 September

9:00	**Registration**
9:00	**Internal Combustion Engine Tailpipe Emissions CLEANER than Air?** **Imad A. Khalek** Southwest Research (USA) **Chairperson: Panayotis Dimopoulos Eggenschwiler**
9:40	**Coffee break**
	ICE201 - Combustion in Spark Ignition Engines **Chairpersons: Christine Mounaime Rousselle, Simona Silvia Merola**
10:10	A Deterministic Method for Real Time Detection of Misfire for Smaller Capacity Spark Ignition Engine **(2021-24-0031)** **Monika Jayprakash Bagade, Himadri Das and S Jabez Dhinagar,** TVS Motor Co Ltd
10:30	LPG and Prechamber as Enabler for Highly Performant and Efficient Combustion Processes Under Stoichiometric Conditions **(2021-24-0032)** **Hans Schmid; Hans-Peter Kollmeier, Ivica Kraljevic, Theo Gottwald and Florian Sobek,** Fraunhofer ICT; **Michael Bargende**, Universitat Stuttgart; **Marco Chiodi, Andreas Kaechele and Francesco Cupo**, FKFS
10:50	On Turbulent Jet Ignition: a detailed numerical analysis and comparison with a standard ignition system **(2021-24-0033)** **Elia Distaso, Egidio Cassone, Riccardo Amirante and Pietro De Palma,** Politecnico di Bari; **Paolo Sementa**, STEMS CNR; **Paolo Tamburrano,** Politecnico di Bari; **Bianca Maria Vaglieco**, STEMS CNR
11:10	Exploiting SI Engine Efficiency Through Lean Burn Operation in Combination with Stroke Extension, Miller Timings and High Compression Ratios **(2021-24-0034)** **Erich Wenz, Alexander Pauls, Marvin Thielen, Arne Todt and Peter Eilts**, Technische Universität Braunschweig
11:30	Experimental and Numerical Analyses of Direct and Port Water Injection in a Turbocharged Spark-Ignition Engine **(2021-24-0035)** **Davide Lanni, Enzo Galloni, Gustavo Fontana and Giovanni Erme**, University of Cassino
	ICE205 - Abnormal Combustion Knock, Preignition SPI and LSPI **Chairperson: Fabio Bozza**
11:50	A Simple CFD Model for Knocking Cylinder Pressure Data Interpretation: Part 1 **(2021-24-0051)** **Dáire James Corrigan**, Ferrari SpA; **Sebastiano Breda**, R&D CFD; **Stefano Fontanesi**, Università di Modena e Reggio Emilia
12:10	Lubricant-oil-induced pre-ignition phenomena in modern gasoline engines: using experimental data and numerical chemistry to develop a practical correlation **(2021-24-0052)** **Elia Distaso, Riccardo Amirante, Giuseppe Calò, Pietro De Palma and Paolo Tamburrano**, Politecnico di Bari; **Rolf Reitz**, Univ. of Wisconsin
12.30	Experimental Investigation of a Coolant Flow Rate Variation on Knock Tendency in a Small S.I Engine **(2021-24-0053)** **Luigi Falbo and Diego Perrone,** Università della Calabria; **Teresa Castiglione**, Università del Salento; **Angelo Algieri and Sergio Bova**, Università della Calabria
12.50	On the Relevance of Octane Sensitivity in Heavily Downsized Spark-Ignited Engines **(2021-24-0054)** **Eshan Singh, Abdulrahman Mohammed**, **Inna Gorbatenko and Mani Sarathy**, King Abdullah Univ. of Science & Tech.
13:30	**Lunch break**

Wednesday 15 September

	Room Capri	*Room Rotonda*
	ICE405 - Low Temperature Catalysis **Chairperson: Panayotis Dimopoulos Eggenschwiler**	**ICE104 - Engine Management and Contro** **Chairperson: Christian Beidl**
10:10	Catalytic Oxidation of Soot and Volatile Organic Compounds over Cu and Fe Doped Manganese Oxides Prepared via Sol-Gel Synthesis **(2021-24-0088)** **Miguel Jose Marin Figueredo, Marco Piumetti, Debora Fino, Nunzio Russo, Clarissa Cocuzza and Samir Bensaid,** Politecnico di Torino	Towards a Complete Engine Calibration Methodology, Dynamic Design of Experiments (DDoE), Application to Catalyst warm-up phase **(2021-24-0028)** **Djamel Eddine Hambarek**, CRITTM2A; J**ean-François Petiot and Pascal Chesse**, Ecole Centrale De Nantes; **Eric Watel**, CRITTM2A
10:30	Numerical Assessment of an After-Treatment System Equipped with a Burner to Speed-Up the Light-Off during Engine Cold Start **(2021-24-0089)** **Augusto Della Torre, Loris Barillari, Gianluca Montenegro and Angelo Onorati**, Politecnico di Milano; **Federico Rulli, Stefano Paltrinieri, Vincenzo Rossi and Francesco Pulvirenti**, Ferrari S.p.A.	Machine Learning Application to Predict Turbocharger Performance under Steady-State and Transient Conditions **(2021-24-0029)** **Kanto Kobayashi, Arravind Jeyamoorthy, Iku Tanabe, Rio Asakawa, Kyohei Yamaguchi and Jin Kusaka**, Waseda University
	ICE401 - Exhaust Emission Control Systems **Chairperson: Cary Henry**	Neural Network Design of Control-Oriented Autoignition Model for Spark Assisted Compression Ignition Engines **(2021-24-0030)** **Dennis Robertson and Robert Prucka**, Clemson University
10:50	Reversible Sulfur Poisoning of 3-way Catalyst linked with Oxygen Storage Mechanisms **(2021-24-0069)** **Grigorios C. Koltsakis,** Aristotle University Thessaloniki**; Panagiota Alexiadou and Christos Avgerinos,** Exothermia SA**; Nikos Symeonidis, Shota Nagano and Francois-Alexandre Lafossas,** Toyota Motor Europe NV/SA	
11:10	Ultra-low Emissions of a 48V Mild-Hybrid Gasoline Vehicle with Advanced Emission Control Technologies and System Control **(2021-24-0070)** **Joachim Demuynck, Pablo Mendoza Villafuerte and Dirk Bosteels**, AECC; **Gabriele Randlshofer**, IPA	Towards a powerful Hardware-in-the-loop System for virtual calibration of an off-road diesel engine **(Oral Only)** **Antonio Riccio, Filippo Monzani, Maurizio Landi**, Kohler Engines
11:30	Combination of Mixed Metal Oxides with Cu-zeolite for Enhanced Soot Oxidation on an SCRoF **(2021-24-0071)** **Cary Henry, Grant Seuser, Nicholas Kaylor and Robert Henderson**, Southwest Research Institute	**ICE602 - Controls for Hybrids and Electric Powertrains** **Chairpersons: Nicolo Cavina, Michele Caggiano**
		Development of Adaptive-ECMS and predictive functions for Plug-in HEVs to handle Zero-Emission Zones using navigation data **(2021-24-0105)** **Alessandro Capancioni, Lorenzo Brunelli and Nicolò Cavina**, University of Bologna; **Alessandro Perazzo**, FEV Italia s.r.l.
11:50	Exhaust Aftertreatment Technologies for Hybrid Electrical Vehicles **(2021-24-0072)** **Lorenzo Pace and Rolf Brueck**, Vitesco Technologies Emitec; **Paul Rodatz and Peter Senft**, Vitesco Technologies	Integrated, emission optimized hybrid operating strategy development through a novel testing methodology **(2021-24-0106)** **Tim Steinhaus, Maximilian Stumpp and Christian Beidl**, Technical University of Darmstadt
12:10	Experimental and Numerical Analysis of an innovative mixer geometry for Urea injection in SCR applications **(Oral Only)** **Federico Millo, Francesco Sapio, Benedetta Peiretti Paradisi**, Politecnico di Torino; **Andrea Bianco**, Powertech Engineering SRL; **Lucio Postrioti**, Università degli Studi di Perugia; **Giacomo Buitoni, Marco Tabarrini**, STSE s r l; **Cristina Robino**, Cornaglia SPA	Optimization of Energy Management and Control for a Hybridized Through-the-Road Car **(2021-24-0107)** **Francesco Antonio Tiano, Gianfranco Rizzo and Matteo Marino**, Università degli Studi di Salerno

		Analysis of the Optimal Operating Strategy of a P24-Hybrid for Different Electric Power Distributions in Charge-Depleting and Charge-Sustaining Operation **(2021-24-0108)** **Mario Jungen, Nikolai Kimmig, Morris Langwiesner, Daniel Goerke and Stefan Schmiedler**, Mercedes-Benz AG; **Peter Hofmann**, Technische Universität Wien
		Rule-based control of hybrid-electric powertrain for torque assist and tailpipe NOx reduction **(Oral Only)** **Ivan Arsie**, Università di Napoli Parthenope; **Cesare Pianese, Pierpaolo Polverino, Bruno Rossomando**, Università di Salerno
13:10	**Lunch break**	

Wednesday 15 September

14:30	**Battery electric powered products: Addition, or Competition to the ICE? An example of the lawn and garden industry** **Wolfgang Zahn** Chairman of the Board of Trustees FKFS **Chairperson: Christian Beidl**
15:10	**Coffee break**
	Room Teatro
	ICE203 - HCCI/PCCI/RCCI/DF **Chairperson: Carlo Beatrice**
15:40	OMEx fuel and RCCI combustion to reach engine-out emissions beyond the current EURO VI legislation **(2021-24-0043)** **Antonio Garcia, Javier Monsalve-Serrano, David Villalta and María Guzmán Mendoza,** Universitat Politecnica de Valencia
16:00	Autoignition characterization of wet isopropanol-n-butanol-ethanol blends for ACI **(2021-24-0044)** **Brian Gainey, Sean Moser and Benjamin Lawler**, Clemson University
	ICE505: Alternative Engine Architectures **Chairperson: Carlo Beatrice**
16:20	Testing of a Modern Wankel Rotary Engine - Part II: Motoring Analysis **(2021-24-0095)** **Giovanni Vorraro and James Turner**, KAUST; **Chris Brace**, University of Bath
16:40	Thermodynamic Analysis of Novel 4-2 Stroke Opposed Piston Engine **(2021-24-0096)** **Sean Moser, Brian Gainey, Benjamin Lawler and Zoran Filipi,** Clemson University
17:00	**Investigations into Steady-State and Stop-Start Emissions in a Wankel Rotary Engine with a Novel Rotor Cooling Arrangement** **(2021-24-0097)** **James Turner**, KAUST; **Reza Islam**, University of Bath; **Giovanni Vorraro**, KAUST; **Matthew Turner and Sam Akehurst**, University of Bath; **Nathan Bailey and Shaun Addy**, Advanced Innovative Engineering UK Ltd
17:20	SAE and the post pandemic challenges and opportunities in the mobility engineering ***David Schutt,*** *SAE Chief Executive Officer*
17:40	*Closing Remarks* ***Michael Bargende*** & ***Bianca M. Vaglieco*** *Conference Chairs*
20:30	***Gala Dinner***

Wednesday 15 September

	Room Capri	*Room Rotonda*
	ICE501 - CI & SI Engines Technology **Chairperson: Teresa Castiglione**	**ICE301 - Fuel Injection and Sprays: Modeling** **Chairperson: Michele Battistoni**
15:40	Model development of a CNG active pre-chamber fuel injection system **(2021-24-0090)** **Gessica Onofrio,** STEMS CNR, Univ. "Parthenope"**; Pierpaolo Napolitano, Carmelina Abagnale, Chiara Guido and Carlo Beatrice,** STEMS CNR	Numerical Simulation of Multi Injector Cylinder Head Engine Concept enhancing fuel atomization **(2021-24-0055)** **Marcos Gutierrez, Diana Taco,** Tablet School**; Svyatoslav Cheranev,** NAMI Russian State Scientific Res. Center
16:00	Racing Toward Zero: The Untold Story of Driving Green **(Oral Only)** **Kelly Senecal,** Convergent Science Inc**; Felix Leach,** University of Oxford	Investigation of the Engine Combustion Network Spray C Characteristics at High Temperature and High-Pressure Conditions Using Eulerian Model **(2021-24-0056)** **Moaz Allehaibi**, Umm Al-Qura Univ & KAUST; **Xinlei Liu, Hammam Aljabri and Moez Ben Houidi,** King Abdullah Univ of Science & Tech; **Balaji Mohan**, Saudi Arabian Oil Co; **Hong Im**, King Abdullah Univ of Science & Tech
16:20	Numerical investigation of an innovative piston bowl design in a light-duty diesel engine achieving ultra-low engine-out soot emissions **(Oral Only)** **Federico Millo, Andrea Piano, Salvatore Roggio,** Politecnico di Torino**; Andrea Bianco,** Powertech Engineering SRL	**ICE302 - Fuel Injection and Sprays: Experiments** **Chairperson: Alessandro Montanaro** Under-expanded jets characterization by means of CFD numerical simulation using an Open FOAM density-based solver **(2021-24-0057)** **Francesco Duronio**, Università degli Studi dell'Aquila; **Alessandro Montanaro**, STEMS CNR; **Stefano Ranieri**, Università degli Studi dell'Aquila; **Luigi Allocca,** STEMS CNR; **Angelo De Vita**, Università degli Studi dell'Aquila
16:40	Numerical Assessment of Port Water Injection capabilities to reduce CO2 emissions of a Lambda 1 Turbocharged Spark Ignition engine **(Oral Only)** **Fabrizio Gullino, Federico Millo, Luciano Rolando, Oliviero Agnelli**, Politecnico di Torino	Behaviors of Spray Droplets with and without Flat Wall Impingement **(2021-24-0058)** **Feixiang Chang and Hongliang Luo**, Univ of Hiroshima; **Cheng Zhan**, Xi'an Jiaotong Univ; **Keiya Nishida and Youichi Ogata**, Univ. of Hiroshima
17:00		Experimental and numerical characterization of the Hydrotreated Vegetable Oil (HVO) spray in comparison with Diesel EN590 **(Oral Only)** **Andrea Piano**, **Mohammadjavad Jafari, Federico Millo**, Politecnico di Torino; **Lucio Postrioti, Andrea Cavicchi**, Università degli Studi di Perugia; **Gabriele Brizi**, STSE s r l
17:20	SAE and the post pandemic challenges and opportunities in the mobility engineering ***David Schutt,*** *SAE Chief Executive Officer*	
17:40	*Closing Remarks* ***Michael Bargende*** *&* ***Bianca M. Vaglieco*** *ICE2021 Conference Chairs*	
20:30	***Gala Dinner***	


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