

Joint Meeting of the Belgian and Italian sections of the Combustion Institute

45th Meeting of the Italian Section of the Combustion Institute

Combustion for Energy Transition and Sustainable Mobility

Firenze, May 28-31, 2023



WELCOME

Technical Program & Social Events



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Welcome

The organizing committee wishes to thank you all for attending the first Joint Meeting of the Belgian and Italian Sections of The Combustion Institute including the 45th Annual Meeting of the Italian Section (ASICI).

The meeting is aimed at giving the opportunity for an exchange of expertise and to promote discussion between scientists and technologists working in the field of combustion, in all its fundamental and applied aspects, as well as in neighboring fields (pyrolysis, gasification, fuel processing, and upgrading) with specific emphasis on low-emission and sustainable technologies.

A prize will be given to the best oral presentations delivered by students or young (non-permanent position) researchers during the meeting.

We wish you all a productive and excellent meeting!





Organizing and Scientific Committee

Dr. Mario Commodo (CNR-STEMS)

Prof. Alessandro Parente (UNIVERSITÉ LIBRE DE BRUXELLES)

Prof. Antonio Andreini (UNIVERSITÀ DEGLI STUDI DI FIRENZE)

Dr. Giancarlo Sorrentino (CNR-STEMS)

Prof. Ward De Paepe (UNIVERSITÉ DE MONS)

Dr. Gianluigi De Falco (UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II)

Dr. Antonio Tregrossi (CNR-STEMS)

Secretariat

Ilaria Giorgi (Università degli Studi di Firenze)



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Acknowledgments



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BELGIAN SECTION OF THE
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Technical program



Proceedings





Topics

Low-Emission Combustion Technologies: including low-carbon and hydrogen-based fuels, MILD combustion, oxy-fuel combustion, chemical looping, NO_x and SO_x reduction, and CO₂ capture strategies.

Gas Turbine Combustion: including device-specific aspects of fuels, emissions, injection, stability, combustion dynamics, internal combustion engines, gas turbines, and rocket engines.

Reaction Kinetics: including the kinetics of hydrocarbons, oxygenated fuels, and alternative energy carriers, formation of pollutants, elementary reactions, and mechanism generation and reduction.

Turbulent Combustion: including experiments, theory, and numerical modeling applied to ignition, propagation, extinction, stabilization, dynamics, and instabilities.

Fuel synthesis, upgrading, and CCUS processes: including methane and drop-I fuels synthesis, non conventional hydrogen production, CO₂ capture and methanation

Propulsion and engines, Detonation, Explosion, and Supersonic Combustion: including device-specific aspects of fuels, emissions, injection, stability, combustion dynamics, internal combustion engines, gas turbines, and rocket engines fundamental aspects of ignition and flame acceleration, fire safety aspects, rotating- and pulse-detonation engines, constant volume combustion engines, and scramjet engines.

Biomass and waste thermochemical processing, recycling, and valorization: including fundamental aspects related to pyrolysis, oxidation, gasification, liquefaction and kinetic modelling

Soot, Nanomaterials, and Large Molecules: including the formation, growth, and destruction of soot, PAHs, carbon nanostructures, and other nanoscale materials.

Novel Concepts including Multiphysics Phenomena: including assisted combustion (plasmas, electric and magnetic fields), catalysis, coupled heat transfer, micro-channel reactors, fuel cells, fuel synthesis and transformation, and electrolysis.





Venue

Auditorium di Sant'Apollonia

Via S. Gallo, 25 - Firenze



Social Events



Sunday, May 28

Welcome Reception

FOODY FARM

Lungarno Corsini, 2A



Monday, May 29

Early Career Mixer

THE STELLAR

Lungarno Soderini, 21



Tuesday, May 30

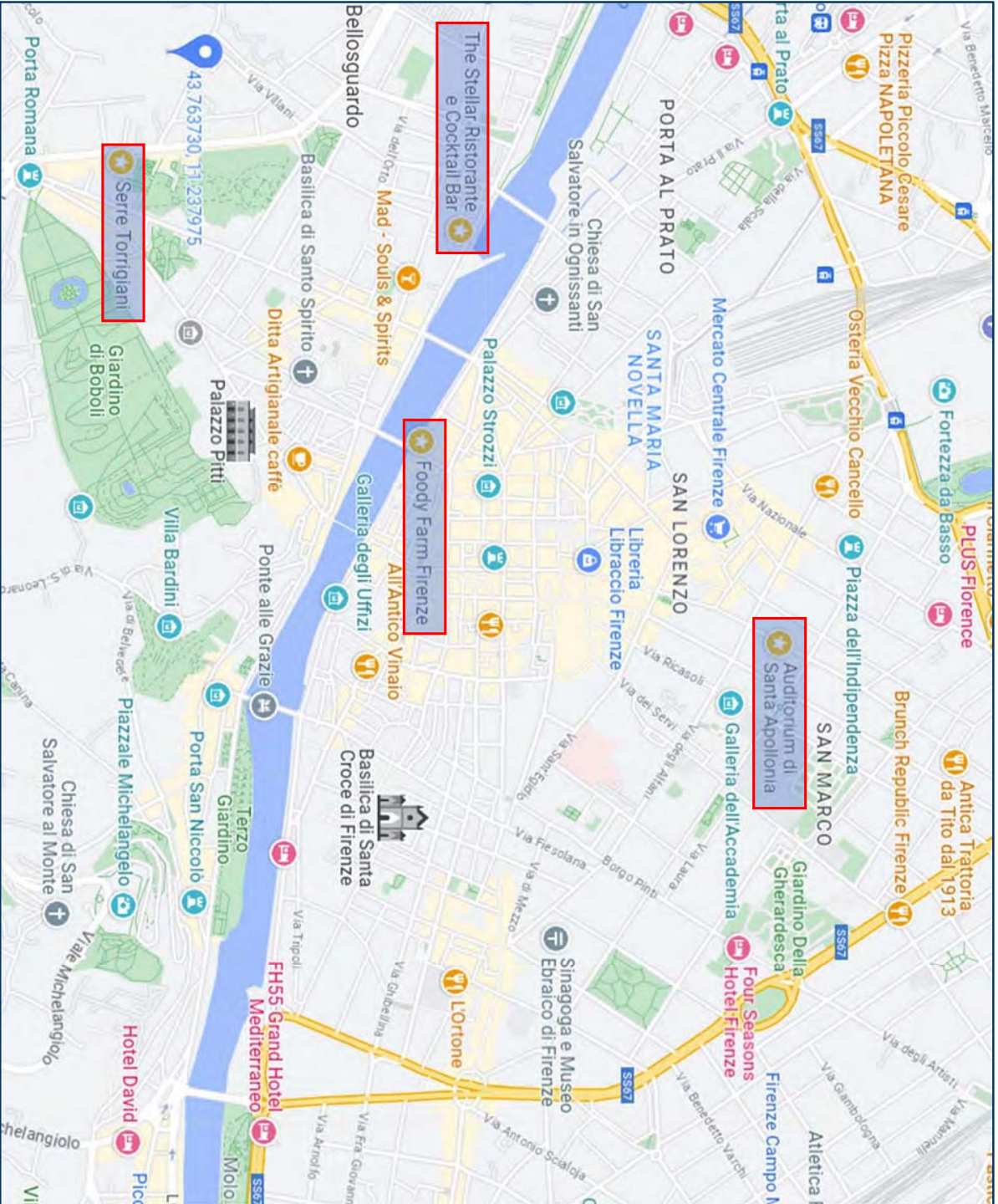
Gala Dinner

LE SERRE TORRIGIANI

Via Gusciana, 27



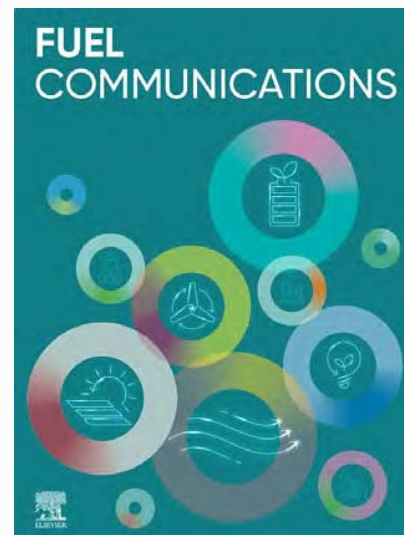
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SPECIAL ISSUES PUBLICATION

Selected papers from the conference proceedings will be published in Special Issues of the following Elsevier Journals: **Applied Thermal Engineering** or **Fuel Communications**



Papers will be selected after the conference and the authors will be invited separately



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Joint Meeting of the Belgian and Italian Sections of The Combustion Institute

45th Meeting of the Italian Section of the Combustion Institute

Combustion for Energy Transition and Sustainable Mobility

PROGRAM



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Plenary Sessions

Monday, May 29	9:30 - 10:15	Auditorium
	EFFICIENT USE OF E-FUELS IN INTERNAL COMBUSTION ENGINES Prof. Hervé Jeanmart	
	14:30 – 15:15	Auditorium
	ELECTROMAGNETIC INTERACTIONS IN ENGINEERED FUEL COMBUSTION Prof. Andrea Giusti	
Tuesday, May 30	9:15 – 10:00	Auditorium
	CCUS PROCESSES USING FLUIDIZED BED REACTORS Prof. Fabrizio Scala	
	14:30 – 15:45	Auditorium
	RECENT DEVELOPMENTS AND REMAINING CHALLENGES FOR PLASMA-ASSISTED COMBUSTION Prof. Aureliè Belleman	



Sunday, 28 May 2023



JOINT MEETING OF THE BELGIAN AND ITALIAN SECTIONS OF THE COMBUSTION INSTITUTE

Combustion for Energy Transition and Sustainable Mobility

18:30-20:15

Welcome Reception (Foody Farm Firenze)

Monday, 29 May 2023

JOINT MEETING OF THE BELGIAN AND ITALIAN SECTIONS OF THE COMBUSTION INSTITUTE

Combustion for Energy Transition and Sustainable Mobility

8:30 - 9:15

REGISTRATION

9:15 - 9:30

CONFERENCE OPENING - INSTITUTIONAL SALUTATIONS

9:30 - 10:15

PLENARY LECTURE

EFFICIENT USE OF E-FUELS IN INTERNAL COMBUSTION ENGINES

Hervé Jeanmart

Chair: Julien Blondeau

10:15 - 10:30

Break/Transfer

PARALLEL SESSIONS (ORAL PRESENTATIONS)

10:30 - 11:30

“AUDITORIUM”

“SALA POCSETTI”

SESSION I: Propulsion and Engines including Detonation and Supersonic Combustion

SESSION II: Novel concepts including multi-physics phenomena

Chair: Sofia Galeotti

Chair: Marco Lubrano Lavadera

10:30 - 10:45

I1

EXPANDING THE LIMITS OF DETONABILITY IN A SMALL-SCALE ROTATING DETONATION ENGINE WITH PARTIAL PRE-MIXING
N. T. Fiorino, N. J. Snow, F. R. Schauer, M. D. Polanka

II1

A NOVEL MACHINE LEARNING BASED LUMPING APPROACH FOR THE REDUCTION OF LARGE KINETIC MECHANISMS FOR PLASMA-ASSISTED COMBUSTION APPLICATIONS
G. Rekkas-Ventiris, A. Duarte Gomez, N. Deak, N. Kincaid, P. Pepiot, F. Bisetti, A. Bellemans

10:45 - 11:00

I2

SENSITIVITY ANALYSIS OF THE PARTIALLY STIRRED REACTOR IN A SCRAMJET COMBUSTION CHAMBER
A. Piscopo, M. Savarese, S. Iavarone, M. Riis, W. De Paepe, A. Parente

II2

ACTIVATION OF HIGHLY STABLE MOLECULES IN ATMOSPHERIC PRESSURE PLASMAS FOR POWER-TO-CHEMICAL CONVERSION
L.M. Martini, F. Spadoni, P. Tosi

11:00 - 11:15

I3

PREDICTION OF KNOCK IN HEAVY-DUTY METHANOL ENGINES WITH NEURAL NETWORK DRIVEN IGNITION DELAY CALCULATIONS
W. Suijs, J. Dierickx, Y. Pu, S. Verhelst

II3

SOLAR FUELS FROM CHEMICAL LOOPING CYCLES WITH PEROVSKITE CATALYST IN AN INNOVATIVE FLUIDIZED BED REACTOR
S. Padula, C. Tregambi, M. Troiano, A. Di Benedetto, P. Salatino, G. Landi, R. Solimene

11:15 - 11:30

I4

HEAVY DUTY OPPOSED PISTON FREE PISTON ENGINE SIMULATION USING OD/1D MODELING
A. Maiello, R. Saviano, C. Beatrice

II4

ELECTRIC FIELD-ASSISTED FLAME SYNTHESIS OF CARBON NANOPARTICLE FILMS
A. Parisi, G. De Falco, M. Commodo, M. Sirignano, P. Darvehi, B. Apicella, C. Russo, R. Griffio, C. Carotenuto, P. Minutolo, F. Di Natale

11:30 - 12:00

Coffee Break



		PARALLEL SESSIONS (ORAL PRESENTATIONS)	
		"AUDITORIUM"	"SALA POCETTI"
12:00 - 13:15		SESSION III: Reaction kinetics including pollutant emission predictions – Part 1 <i>Chair: Francesca Picca</i>	SESSION IV: Biomass and waste thermochemical processing, recycling, and valorization <i>Chair: Corinna Maria Grottola</i>
12:00-12:15	III1	EXPERIMENTAL AND MODELING STUDY OF NH ₃ -NO INTERACTION AT LOW-INTERMEDIATE TEMPERATURE <i>M. V. Manna, K. P. Shrestha, F. Mauß, R. Ragucci, M. de Joannon, P. Sabia</i>	IV1 PYROLYSIS OF LARGE WOOD PARTICLES: KINETIC MODELING AND EXPERIMENTAL VALIDATION <i>M. M. Afessa, A.V. Ramayya, A. Locaspi, P. Debiagi, A. Frassoldati, T. Faravelli, A. Szepannek, A. Hofmann, C. Pfeifer</i>
12:15-12:30	III2	AUTOMATIC VALIDATION AND OPTIMIZATION OF A KINETIC MODEL FOR ALCOHOLS COMBUSTION <i>T. Dinelli, A. Pegurri, H. Tej, A. Stagni, M. Pelucchi</i>	IV2 THERMOCHEMICAL RECYCLING OF POLYETHYLENE TEREPHTHALATE: EXPERIMENTAL AND KINETIC INVESTIGATION <i>A. Locaspi, O. Akin, M. Havaei, M. Mehl, M. Pelucchi, R.J. Varghese, K.M. Van Geem, T. Faravelli</i>
12:30-12:45	III3	LAMINAR BURNING VELOCITY AND KINETIC MODELS EVALUATION OF SYNGAS CO/H ₂ , CO/H ₂ /CH ₄ , CO/H ₂ /CO ₂ AT NORMAL AND ELEVATED TEMPERATURE <i>M. Z. Qureshi, C. Caligiuri, M. Renzi, M. Baratieri</i>	IV3 PREDICTING TORREFACTION AND PYROLYSIS OF BIOMASS USING A MACHINE LEARNING APPROACH <i>P. Brachi, A. Coppola, V. Del Duca, P. Salatino, F. Scala</i>
12:45-13:00	III4	BENZENE FLAMMABILITY LIMITS: KINETIC MODELING AND EXPERIMENTAL VALIDATION <i>A. Frassoldati, A. Stagni, A. Nobili, A. Cuoci, T. Faravelli</i>	IV4 COMPARISON OF BIO-CRUDE YIELD AND QUALITY FROM HYDROTHERMAL LIQUEFACTION OF SEWAGE SLUDGE UNDER DIFFERENT HEATING RATES <i>F. Di Lauro, A. Amadei, M. Balsamo, M. Damizia, B. De Caprariis, P. De Filippis, F. Montagnaro, P. Salatino, R. Solimene</i>
13:00-13:15	III5	EXPERIMENTAL AND NUMERICAL KINETICS STUDY OF OME1 AND OME2 COMBUSTION IN STOICHIOMETRIC LOW-PRESSURE LAMINAR FLAME <i>Y. Huo, V. Dias, H. Jeanmart</i>	IV5 METHANATION OF SYNGAS FROM BIOMASS GASIFICATION: SMALL-SCALE PLANT DESIGN IN ASPEN PLUS™ <i>B. Ciccone, F. Murena, G. Ruoppolo, M. Urciuolo, P. Brachi</i>
13:15-14:30	Lunch Break		
14:30-15:15	PLENARY LECTURE ELECTROMAGNETIC INTERACTIONS IN ENGINEERED FUEL COMBUSTION – TOWARDS NOVEL TECHNOLOGIES FOR SUSTAINABLE TRANSPORTATION – Andrea Giusti <i>Chair: Antonio Andreini</i>		
15:15-15:30	Break/Transfer		
		PARALLEL SESSIONS (ORAL PRESENTATIONS)	
		AUDITORIUM	SALA POCETTI
15:30-16:45		SESSION V: Turbulent Combustion – Part 1 <i>Chair: Davide Laera</i>	SESSION VI: Fuel synthesis, upgrading, and CCUS processes <i>Chair: Lorenzo Giuntini</i>



15:30-15:45	V1	DYNAMIC MODELLING OF SUBGRID SCALAR DISSIPATION RATE IN PREMIXED AND PARTIALLY PREMIXED FLAMES WITH DIFFERENTIAL FILTER <i>G.Ferrante, I.Langella</i>	VI1	DEVELOPMENT OF A SECOND-GENERATION NAPHTHENIC DROP-IN FUEL FOR SPARK IGNITION APPLICATIONS <i>T. Robeyn, T. Larsson, S. Verhelst</i>
15:45-16:00	V2	HIGH-FIDELITY INVESTIGATION OF FGM AND TFM APPROACH ON A LEAN HYDROGEN FLAME <i>M. Amerighi, P.C. Nassini, A. Andreini, C. O. Paschereit</i>	VI2	SULFUR TOLERANT DUAL FUNCTION MATERIALS FOR THE INTEGRATED CO ₂ CAPTURE AND METHANATION <i>S. Cimino, E.M. Cepollaro, L. Lisi</i>
16:00-16:15	V3	COMPUTED TOMOGRAPHY OF CHEMILUMINESCENCE USING A SPARSE SENSING FRAMEWORK <i>A. Procacci, R. Amaduzzi, A. Coussement, A. Parente</i>	VI3	STEAM-ASSISTED MILD-POX: A FLEXIBLE PROCESS FOR THE PRODUCTION OF HYDROGEN <i>M. Lubrano Lavadera, A. Coussement, A. Parente</i>
16:15-16:30	V4	FLASHBACK IN HYDROGEN-FUELED PERFORATED BURNERS: QUANTIFICATION OF UNCERTAINTIES AND SENSITIVITY TO PARAMETERS <i>F. Fruzza, R. Lamioni, A. Mariotti, M.V. Salvetti, and C. Galletti</i>	VI4	METHANE PRODUCTION FROM BIOMASS-DERIVED SYNGAS: ISSUES AND BENEFITS <i>A. Coppola, R. Ruggiero, F. Scala, M. Urciuolo</i>
16:30-16:45	V5	LES MODELS FOR TURBULENT HYDROGEN FLAMES WITH CONVOLUTIONAL NEURAL NETWORKS <i>A. Attili, M.G.D. Jansen, N. Sorace, M. Bruce, T. Grenga, L. Nista, L. Berger, H. Pitsch</i>	VI5	DESIGN AND MODELING OF AN AUTOTHERMAL CO-FLOW REACTOR FOR TURQUOISE HYDROGEN PRODUCTION <i>F. Cevinzo, E. A. Scelzo, G. Sorrentino, M. Commodo, A. D'Anna</i>
16:45-17:00	Coffee Break			
17:00-18:00	ASICI Annual Meeting ("AUDITORIUM")			
18:15-20:15	Early Career Researcher Mixer (<i>The Stellar Firenze</i>)			

Tuesday, 30 May 2023



JOINT MEETING OF THE BELGIAN AND ITALIAN SECTIONS OF THE COMBUSTION INSTITUTE

Combustion for Energy Transition and Sustainable Mobility

8:30 - 9:15	Registration		
9:15 - 10:00	PLENARY LECTURE CCUS PROCESSES USING FLUIDIZED BED REACTORS Fabrizio Scala <i>Chair: Mario Commodo</i>		
10:00 - 10:15	Break/Transfer		
	PARALLEL SESSIONS (ORAL PRESENTATIONS)		
	AUDITORIUM		SALA POCCETTI
10:15-11:30	SESSION VII: Numerical Combustion <i>Chair: Matteo Amerighi</i>		SESSION III: Reaction kinetics including pollutant emission predictions – Part 2 <i>Chair: Tom Robeyn</i>
10:15-10:30	VII1	ON THE USE OF PROJECTION TO LATENT STRUCTURES AND GAUSSIAN PROCESS REGRESSION FOR CHEMISTRY REDUCTION <i>H. Dave, M.R. Malik, K. Zdybat, H. G. Im, A. Parente</i>	III6 DERIVATION AND VALIDATION OF AN ARRHENIUS-BASED REDUCED GLOBAL MECHANISM FOR HYDROGEN-AIR FLAMES <i>F. G. Schiavone, M. Torresi, S. M. Camporeale, D. Laera</i>
10:30-10:45	VII2	TABULATION-BASED SAMPLE-PARTITIONING ADAPTIVE REDUCED CHEMISTRY AND CELL AGGLOMERATION <i>A. Cuoci, A. Nobili, A. Parente, T. Grenga</i>	III7 SYSTEMATIC REACTION CLASS-BASED ANALYSIS OF PAH FORMATION IN BENZENE FLAMES WITH AUTOMATED TOOLS <i>L. Pratali Maffei, A. Nobili, T. Dinelli, T. Faravelli</i>
10:45-11:00	VII3	TIME-LAG AUTO-ENCODERS FOR CHEMISTRY DIMENSIONALITY REDUCTION <i>L. Castellanos, R.S.M. Freitas, A. Parente, F. Contino</i>	III8 MODEL-TO-MODEL BAYESIAN CALIBRATION OF A CHEMICAL REACTOR NETWORK FOR POLLUTANT EMISSION PREDICTIONS OF AN AMMONIA-FUELLED MULTISTAGE COMBUSTOR <i>M. Savarese, L. Giuntini, R. Malpica Galassi, S. Iavarone, W. De Paepe, C. Galletti, A. Parente</i>
11:00-11:15	VII4	EFFECT OF SELECTION PROCEDURES OF HIGH-FIDELITY DATA IN MULTI-FIDELITY SURROGATE MODELING <i>A. Özden, A. Procacci, R. Malpica Galassi, F. Contino, A. Parente</i>	III9 DEVELOPING PREDICTIVE TOOLS TO LIMIT THE IMPACT OF WILDFIRES AND URBAN FIRES: A STUDY OF COMBUSTION AND EMISSIONS USING SEMI-DETAILED KINETIC MODELS <i>M. Mehl, C. Saggese, A. Cuoci, A. Locaspi, W. Sun</i>
11:15-11:30	VII5	SELF-LEARNING DIGITAL TWIN OF A COMBUSTION FURNACE THROUGH THE KALMAN FILTER METHOD <i>L. Donato, A. Procacci, C. Galletti, A. Coussement and A. Parente</i>	III10 AN AUTOMATIC MERGING PYTHON CODE FOR LARGE MECHANISM: EXAMPLE OF A TRF-IB MECHANISM <i>T. Fages, R. Veillet, R. Fournet, B. Sirjean, P.A. Glaude</i>



11:30-12:00		Coffee Break	
PARALLEL SESSIONS (ORAL PRESENTATIONS)			
AUDITORIUM		SALA POCCETTI	
12:00-13:15		SESSION V: Turbulent Combustion – Part 2 <i>Chair: Mustafa Kamal</i>	SESSION VIII: Pollutants formation, monitoring and control including nanomaterials and large molecules <i>Chair: Francesca Di Lauro</i>
12:00-12:15	V6	INVESTIGATIONS ON LEAN TURBULENT PREMIXED HYDROGENATED FLAMES <i>D. Gülerüz, C. Allouis, İ. Gökalp</i>	VIII1 SOOTING TENDENCY OF OIL EXTRACTED FROM SPENT COFFEE GROUNDS <i>V. Esposito, R. Colucci Cante, A. Nigro, I. Garella, S. Cimino, C. Allouis, M.M. Oliano, B. Apicella, C. Russo, R. Nigro, M. Sirignano</i>
12:15-12:30	V7	A DATA-DRIVEN APPROACH FOR HYDROGEN PREMIXED COMBUSTION MODELING <i>A. Remiddi, G. Indelicato, D. Cavalieri, P.E. Lapenna, A. Attili, L. Berger, H. Pitsch, F. Creta</i>	VIII2 FLAME SYNTHESIS AND CHARACTERIZATION OF SELF-ASSEMBLED NANOSTRUCTURED FILMS OF TiO ₂ -CARBON NANOPARTICLES <i>G. De Falco, M. Commodo, P. Minutolo, A. D'Anna</i>
12:30-12:45	V8	ON THE EFFECT OF MANIFOLD TOPOLOGY IN REDUCED-ORDER MODELING OF TURBULENT COMBUSTION <i>K. Zdybat, J. C. Sutherland, A. Parente</i>	VIII3 SECONDARY AEROSOL FORMATION IN AN OXIDATION FLOW REACTOR – MASS SPECTROMETRY AND PARTICLE SIZE MEASUREMENTS <i>F. Sasso, F. Picca, A. Pignatelli, M. Commodo, P. Minutolo, A. D'Anna</i>
12:45-13:00	V9	EXPERIMENTAL INVESTIGATION OF FLAME DYNAMICS OF SWIRLED METHANE-AIR FLAME WITH H ₂ ADDITION <i>S. Bonuso, P. Di Gloria, G. Mehdi, M.G. De Giorgi</i>	VIII4 EFFECTS OF ETHANOL ADDITION IN AN ETHYLENE/AIR FLAME ON THE PRIMARY AND SECONDARY PARTICLE SIZE DISTRIBUTION <i>A. Pignatelli, F. Sasso, F. Picca, M. Commodo, P. Minutolo, A. D'Anna</i>
13:00-13:15	V10	ANALYSIS OF A PARTIALLY PREMIXED H ₂ -NATURAL GAS-AIR FLAMES STABILIZED BY A SWIRL BURNER USING EXPERIMENTAL AND NUMERICAL METHODS <i>E. Böncü, D. Gülerüz, M. Karaca, C. Allouis, İ. Gökalp</i>	VIII5 A THEORETICAL INVESTIGATION OF ACETYLENE ADDITION ON GRAPHENE ARMCHAIR AND ZIGZAG EDGES <i>C. Giudici, M. Ferri, G. Contaldo, M. Maestri, M. Pelucchi</i>
13:15-14:30		Lunch Break	



14:30-15:15		PLENARY LECTURE RECENT DEVELOPMENTS AND REMAINING CHALLENGES FOR PLASMA-ASSISTED COMBUSTION Aureliè Bellemans <i>Chair: Alessandro Parente</i>	
15:15-15:30		Break/Transfer	
PARALLEL SESSION (ORAL PRESENTATIONS)			
15:30-17:15		AUDITORIUM	SALA POCSETTI
		SESSION IX: Low-carbon fuels and low-emission stationary combustion concepts <i>Chair: Luna Pratali Maffei, Luca Matteo Martini</i>	SESSION X: Gas Turbine Combustion <i>Chair: Arianna Remiddi, Iavarone Salvatore</i>
15:30-15:45	IX1	DIRECT NUMERICAL SIMULATION OF THERMODIFFUSIVELY UNSTABLE LEAN NH ₃ /H ₂ -AIR FLAME <i>F. D'Alessio, P.E. Lapenna, F. Creta</i>	X1 OPTIMIZATION OF INTERCOOLED REGENERATIVE REHEAT GAS TURBINE SYSTEM FOR MULTI-FUEL COMBUSTION <i>G.B. Ariemma, G. Langella, G. Sorrentino, R. Ragucci, P. Sabia</i>
15:45-16:00	IX2	THE DECARBONIZATION OF STEEL HEATING PROCESSES – TENOVA SIMULATION/EXPERIMENTATION MODEL FOR THE NET-ZERO CHALLENGE <i>A. Della Rocca, D. Astesiano</i>	X2 NUMERICAL MODELLING OF SWIRL STABILISED LEAN-PREMIXED H ₂ -CH ₄ FLAMES WITH THE ARTIFICIALLY THICKENED FLAME MODEL <i>S. Castellani, P.C. Nassini, A. Andreini, R. Meloni, E. Pucci, A. Valera Medina, S. Morris, B. Goktepe, S. Mashruk</i>
16:00-16:15	IX3	LES STUDY OF A H ₂ /AIR CYCLONIC COMBUSTOR OPERATING IN MILD REGIME <i>S. Carpenella, D. Cecere, I. Quaranta, E. Giacomazzi, G. Sorrentino, P. Sabia, G. Battista Ariemma</i>	X3 FGM VS ATFM: A COMPARATIVE ANALYSIS IN PREDICTING THE FLAME CHARACTERISTICS OF AN INDUSTRIAL SWIRLER <i>G. Lemmi, P.C. Nassini, S. Castellani, A. Picchi, S. Galeotti, R. Becchi, A. Andreini, G. Babazzi, R. Meloni</i>
16:15-16:30	IX4	MILD COMBUSTION OF AMMONIA/HYDROGEN MIXTURES <i>G.B. Ariemma, G. Sorrentino, P. Sabia, R. Ragucci, M. de Joannon</i>	X4 IMPACT OF HYDROGEN ADDITION ON THE THERMO-ACOUSTIC STABILITY OF A METHANE FUELLED MICRO GAS TURBINE <i>V. Ceglie, J. Bompas, M. Stefanizzi, F. Fornarelli, W. De Paepe, S. M. Camporeale, D. Laera</i>
16:30-16:45	IX5	NUMERICAL DESIGN OF A RICH-LEAN MICRO-GAS TURBINE COMBUSTOR FOR AMMONIA FUELING <i>L. Giuntini, C. Galletti, A. Parente</i>	X5 EXPERIMENTAL CHARACTERIZATION OF AN INDUSTRIAL BURNER OPERATED WITH SIMULATED EGR <i>S. Galeotti, A. Picchi, R. Becchi, R. Meloni, G. Babazzi, C. Romano, A. Andreini</i>
16:45-17:00	IX6	TENOVA ULTRA LOW NOX REGENERATIVE BURNERS WORKING WITH HYDROGEN AND OXYGEN ENRICHMENT <i>D. Astesiano, A. Della Rocca, C. Leoncini</i>	X6 AMMONIA/HYDROGEN COMBUSTION IN A GAS TURBINE: UNCERTAINTY QUANTIFICATION TO CALIBRATE THE CRN MODELING <i>R. Lamioni, A. Mariotti, M.V. Salvetti, C. Galletti</i>
17:00-17:15	IX7	A (PRELIMINARY) ANALYSIS OF AMMONIA COMBUSTION RESEARCH FEVER <i>Iskender Gökalp</i>	X7 LES VALIDATION OF AN INDUSTRIAL BURNER FLAME EXTINCTION OPERATED WITH HIGHLY VITIATED OXIDIZER <i>R. Meloni, G. Babazzi, S. Galeotti, A. Picchi, R. Becchi, S. Castellani, A. Andreini</i>
17:15-17:30		Coffee Break	
18:00-19:45		Guided Tour: EXPLORE FLORENCE	
19:45-22:30		Social Dinner (Le Serre Torrigiani Firenze)	

Wednesday, 31 May 2023



JOINT MEETING OF THE BELGIAN AND ITALIAN SECTIONS OF THE COMBUSTION INSTITUTE

Combustion for Energy Transition and Sustainable Mobility

08:30-09:00	Registration
09:00-10:45	ROUND TABLE NON-CO2-EMISSIONS AND ENVIRONMENTAL IMPACT OF SUSTAINABLE FUELS <i>Chairs: Andrea D'Anna – Antonio Andreini</i>
09:00-09:10	Introduction <i>Andrea D'Anna (UNINA)</i>
09:10-09:30	HYDROGEN COMBUSTION – ENVIRONMENTAL IMPACT <i>Epaminondas Mastorakos (Cambridge)/Antonio Peschiulli (AvioAero)</i>
09:30-09:50	AMMONIA (NH ₃) - IMPACT ON AIR QUALITY AND CLIMATE <i>Matteo Cerutti (Baker Hughes)/Hervé Jeanmart (Louvain)</i>
09:50-10:10	SUSTAINABLE AVIATION FUELS – SAF – NON-CO2 EMISSIONS <i>David Chiamonti (POLITO)/Raffaele Ragucci (STEMS/CNR)</i>
10:10-10:30	BIOFUELS/BIO MASS COMBUSTION <i>Iskender Gokalp (CNRS)/Julien Blondeau (Vrije)</i>
10:30-10:45	Discussion
10:45-11:00	Break/Transfer
11:00-12:30	WORK-IN-PROGRESS (POSTER PRESENTATIONS)
11:30-12:00	Coffee Break
12:00-12:30	WORK-IN-PROGRESS (POSTER PRESENTATIONS)
12:30-13:00	Closure and Awards
13:00-14:30	Lunch Break

WORK-IN-PROGRESS POSTER SESSION



P1	NUMERICAL BASELINE ANALYSIS OF THE T100 MICRO GAS-TURBINE (MGT) COMBUSTOR <i>G. Generini, A. Andreini, E. Bianchi</i>
P2	QUANTIFICATION OF HEAT LOADS FOR ROTATING DETONATION COMBUSTOR WITH GT CONDITIONS <i>S. Ramanagar Sridhara, P. Nassini, M. D. Bohon, A. Andreini</i>
P3	TOWARDS A DATA-DRIVEN MODEL FOR THERMAL CHARACTERIZATION IN ROCKET COMBUSTION CHAMBERS FIRING PLATES <i>A. Remiddi, P.E. Lapenna, G. Indelicato, R.C. Pellegrini, E. Cavallini, M. Pizzarelli, M. Valorani, F. Creta</i>
P4	A TABULATED LARGE EDDY SIMULATIONS FRAMEWORK FOR COMPLEX FLOWS IN REALISTIC GEOMETRIES <i>C. Matteucci, D. Schintu, D. Molinaro, D. Cavalieri, A. Remiddi, F. Creta</i>
P5	LARGE EDDY SIMULATIONS OF HYDROGEN COMBUSTION IN A REVERSE FLOW MICRO GAS TURBINE BURNER <i>E. Stendardo, M. Muhammad Kamal, A. Coussement, A. Parente, J. Blondeau, L. Bricteux, K. Bioche</i>
P6	BIMETALLIC FE-CU CATALYSTS SUPPORTED ON CERIA FOR CO ₂ VALORIZATION BY REVERSE WATER GAS SHIFT REACTION <i>G. Sorbino, S. Scognamiglio, G. Ruoppolo, A. Di Benedetto, G. Landi</i>
P7	AUTOMATED ADAPTIVE CHEMISTRY FOR LES OF TURBULENT FLAMES <i>R. Amaduzzi, G. D'Alessio, P. Pagani, A. Cuoci, R. Malpica Galassi, A. Parente</i>
P8	A COMBINED EXPERIMENTAL AND NUMERICAL APPROACH FOR THE CHARACTERIZATION OF TEMPERATURE DISTRIBUTION IN A MILD COMBUSTION FURNACE <i>M. Lubrano Lavadera, M.M. Kamal, S. Sharma, L. Donato, G. Bellacima, A. Coussement, C. Galletti, A. Parente</i>
P9	CHARACTERIZATION OF THE CARBON PRODUCED BY METHANE CRACKING IN A MOLTEN TIN REACTOR <i>E. Busillo, M.P. Bracciale, P. De Filippis, B. de Caprariis</i>
P10	ASSESSMENT OF FLAMELET-TABULATED APPROACHES FOR LES ANALYSIS OF SWIRL NON-PREMIXED FLAMES <i>G. Indelicato, C. Matteucci, P. E. Lapenna, D. Mira, F. Creta</i>
P11	WETTABILITY OF CNP NANOFILM OBTAINED WITH DIFFERENT HARVESTING PROCESS <i>R. Griffò, F. Di Natale, A. Parisi, G. De Falco, M. Sirignano, R. Dondè, F. Migliorini, S. De Iulii, C. Carotenuto</i>
P12	NUMERICAL MODELLING OF COMBUSTION STABILITY PREDICTION IN A DUAL MODE RAMJET WITH A CAVITY FLAMEHOLDER <i>M. Riis, A. Piscopo, A. Coussement</i>
P13	VALORIZATION OF PLASTIC ELEMENT OF DECOMMISSIONED PHOTOVOLTAIC PANELS <i>R. Migliaccio, M. Urciuolo, Andrea Mieli, G. Ruoppolo</i>
P14	INFLUENCE OF GAS CARRIER AND TEMPERATURE ON THE PYROLYSIS OF CONTAMINATED BIOMASS <i>C. M. Grottola, P. Giudicianni, D. Amato, R. Ragucci</i>
P15	FATE OF LEAD DURING PYROLYSIS OF LIGNOCELLULOSIC BIOMASS <i>D. Amato, P. Giudicianni, C. M. Grottola, F. Stanzione, R. Migliaccio, R. Ragucci</i>
P16	A REDUCED KINETIC MECHANISM FOR JET-A1 COMBUSTION IN VITIATED AIR <i>M. V. Manna, R. Ragucci, M. de Joannon, P. Sabia</i>
P17	PERFORMANCE OF BIOMASS PYROLYSIS PRODUCTS MILD COMBUSTION IN A CYCLONIC BURNER <i>G.B. Ariemma, G. Sorrentino, P. Sabia, P. Giudicianni, M. de Joannon, R. Ragucci</i>
P18	INVESTIGATION ON THE EFFECT OF NITROGEN COMPOUNDS ON THE OXIDATION OF SURROGATE GASEOUS FRACTION OF BIOMASS PYROLYSIS COMPOUNDS <i>M. V. Manna, K. P. Shrestha, F. Mauss, R. Ragucci, M. de Joannon, P. Sabia</i>
P19	INVESTIGATION OF PREMIXED LAMINAR SOOTING FLAME BY INFRARED PYROMETRY <i>L. Basta, M. Commodo, C. Allouis, A. D'Anna</i>
P20	ENVIRONMENTAL IMPACT OF FIREWORKS ON AEROSOL CHEMICAL CHARACTERISTICS DUE TO CHAMPIONSHIP-WINNING CELEBRATION <i>F. Picca, F. Sasso, A. Pignatelli, M. Commodo, P. Minutolo and A. D'Anna</i>
P21	BAYESIAN INFERENCE FOR THE DEVELOPMENT OF CONVENTIONAL AND ALTERNATIVE JET FUEL SURROGATES <i>J. Liberatori, D. Cavalieri, R. Malpica Galassi, M. Valorani, P.P. Ciottoli</i>

FIRST ITALIAN WORKSHOP ON AMMONIA ENERGY



31 May, 2023 (14:30 – 18:00)

Auditorium di Santa Apollonia – Via S. Gallo 25, Firenze



The event provides for a first Italian forum, where academics, SMEs and Industrial companies can profitably discuss “ammonia economy” open issues. The forum represents a tangible opportunity to share actors’ needs and expertise, towards the definition of common strategies to solve open issues of Ammonia Energy.

Invited-speech contributions will catalyse round-table discussions, where panelists and workshop participants will have the opportunity to proactively analyse ammonia energy open issues and define possible concrete roadmaps.

The event will be a half-day Workshop that will start on 31 May, after lunch time.

Organizing and Scientific Committee:

Dr. Mara de Joannon (Chair), CNR-STEMS

Prof. Umberto Desideri, Università di Pisa

Prof. Antonio Andreini, Università di Firenze

Dr. Cinzia Tornatore, CNR-STEMS

Dr. Giancarlo Sorrentino, CNR-STEMS / ASICI

Dr. Giovanni Cinti, Università di Perugia

Dr. Mario Commodo, CNR-STEMS / ASICI



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