1st International Conference on Impact Loading of Structures and Materials

ICILSM 2016

22/26 May 2016
Turin, Italy

POLITECNICO DI TORINO
DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

WWW.ICILSM2016.ORG

WELCOME ADDRESS

The Department of Mechanical and Aerospace Engineering (DIMEAS) of Politecnico di Torino is pleased to host the 1st International Conference on Impact Loading of Structures and Materials which follows the previous four editions of the International Conference on Impact Loading of Lightweight Structures. This series of conferences, initiated by Prof. Norman Jones (University of Liverpool) and Prof. Tom Wierzbicki (MIT) in the 1980s, continued in Florianópolis (Brazil, 2005), Trondheim (Norway, 2008), Valenciennes (France, 2011) and Cape Town (South Africa, 2014). The conference is planned to be a forum for scientists, researchers and engineers, from all over the world, to exchange ideas and experience on the behavior and modelling of materials, safety and design of structures with respect to high strain-rate, impact and blast loading in particular. The list of topics includes but is not limited to:

- Material characterization including failure (lightweight alloys, composites, polymers, high-strength steels, foams, ceramics, biological materials)
- Structural failure, energy absorbing systems and crashworthiness
- Vehicle safety (automotive, railways, aerospace, motorcycles and bicycles, naval)
- Impact biomechanics
- Ballistic impact
- Experimental techniques
- Theoretical models
- Numerical analysis

Each providing information on the design of modern, lightweight structures and contributing to a safer world. A major objective is to strengthen the link between research and development, which is carried out at universities and research organizations, and the needs of industry and society. Thus, scientists from both academia and industry are encouraged to contribute at the conference. Any kind of structure or material is to be included in the conference topics as well as any kind of application, from road vehicles to aircraft, trains, spacecrafts, ships, offshore structures, strategic buildings and infrastructure.

Prof. Giovanni Belingardi

Chair of ICILSM 2016

Department of Mechanical and Aerospace Engineering

Politecnico di Torino

Prof. Massimiliano Avalle

Co-Chair of ICILSM 2016

Department of Mechanical and Aerospace Engineering

Politecnico di Torino

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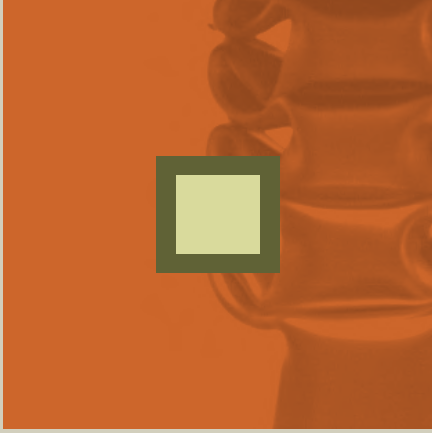
CONGRESS VENUE



The conference will take place at Politecnico di Torino (www.polito.it). Politecnico di Torino is one of the leading institutions to study engineering and architecture in Italy. Among the various campuses of Politecnico di Torino in the Piedmont region, the conference will take place at the Main Campus – Corso Duca degli Abruzzi. The main campus is made of two parts that are divided by corso Castelfidardo. The Sede centrale is located between corso Duca degli Abruzzi and corso Castelfidardo, while the Cittadella Politecnica is located between corso Castelfidardo and via Paolo Borsellino. There are many entrances to the Campus. The main entrance is located in Corso Duca degli Abruzzi 24 and it is the preferable entrance for reaching the Auditorium (Aula Magna) for plenary sessions. Other entrances of the Campus are located in Corso Castelfidardo, via Borsellino and Corso Einaudi. The entrance to Cittadella Politecnica located in corso Castelfidardo 37 is preferable for reaching the rooms of parallel sessions (rooms I). The welcome cocktail will take place in the historical building of Castello del Valentino (first site of Politecnico di Torino) near the Po river (Viale Pier Andrea Mattioli, 39, 10126 Torino; by tram lines 9 stop 629, or bus 299).

HOW TO REACH THE CONFERENCE VENUE:

BY PLANE

Airport "Sandro Pertini" - Torino Caselle (TRN) is 40 minutes by car. Please consider that during rush hours it may take 1 hour. The taxi fee from the airport to Politecnico di Torino – Corso Duca degli Abruzzi is about 35 euros during the day. There are regular shuttle buses of various companies from the Airport to the city centre and vice versa every half an hour. Tickets are about 7 euros. The preferable bus stop in the city centre is Torino Porta Susa (train station). Then, follow the by train instructions.

BY TRAIN

From the Porta Susa station you can either walk (15 minutes) or take the tramway 10 (direction Settembrini) at the bus stop named "XVIII Dicembre place" and get out at the fourth bus stop (Corso Duca degli Abruzzi-Politecnico). The ticket costs 1,50 euros.

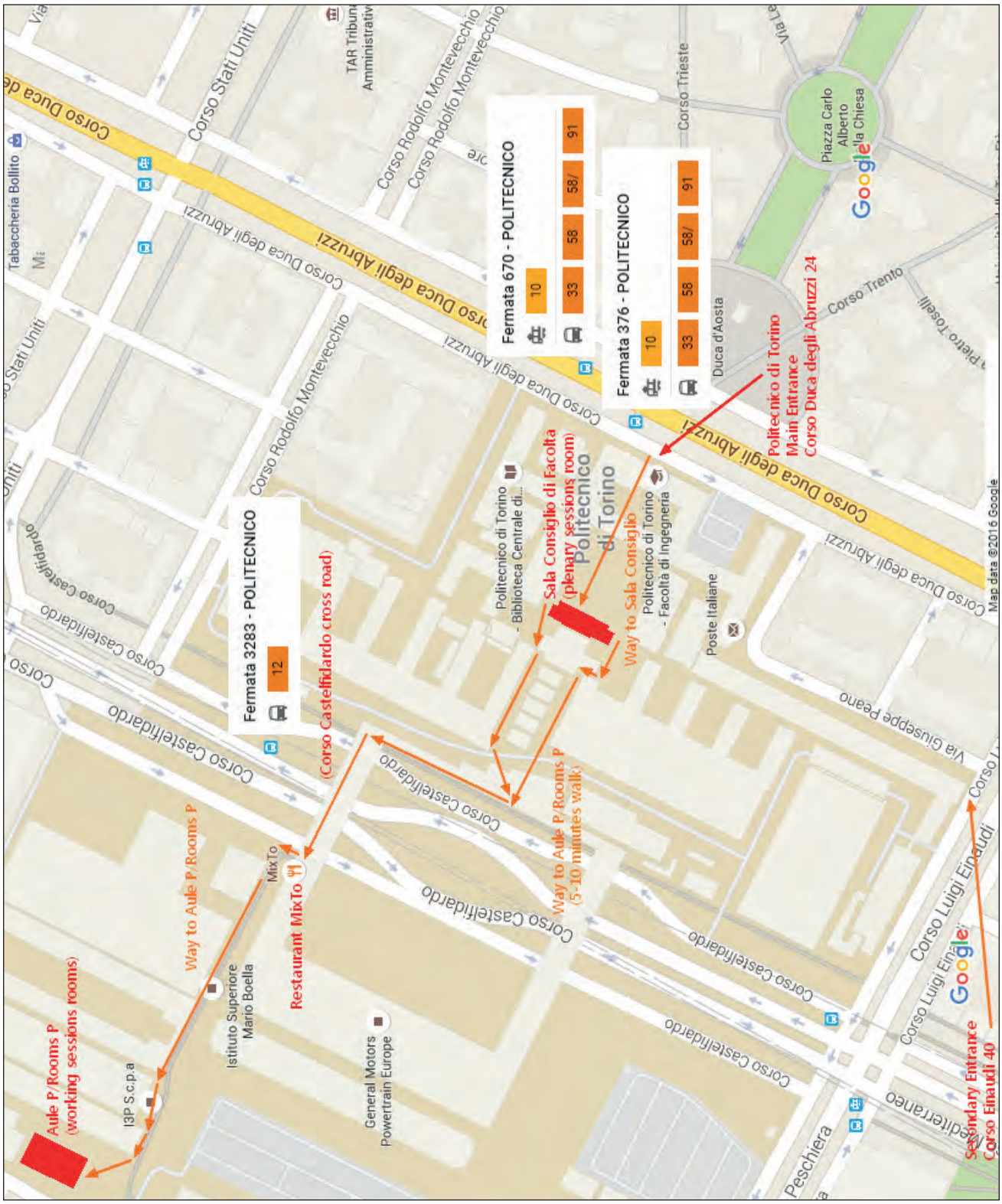
BY METRO

There is only one metro line in Torino. The metro station nearest to Politecnico is the Vinzaglio station, which is 5 minutes walk from Politecnico. Once you get out of the metro go along corso Duca degli Abruzzi in the south direction (opposite to the city centre).

BY BUS

Buses 58, 58/, 33 and tramway 16 have a bus stop at the campus.

HOW TO COME


Politecnico di Torino
Main Entrance
Corso Duca degli Abruzzi 24
Sala Consiglio di Facolta
(plenary sessions room)
Way to Sala Consiglio
Way to Aule P/Rooms P
(5-10 minutes walk)
Restaurant MixTo
(Corso Castelfidardo cross road)
Way to Aule P/Rooms P
Aule P/Rooms P
(working sessions rooms)
Secondary Entrance
Corso Einaudi 40
Fermata 670 - POLITECNICO
Fermata 376 - POLITECNICO
Fermata 3283 - POLITECNICO
Corso Duca degli Abruzzi
Corso Castelfidardo
Corso Rodolfo Montevecchio
Corso Stati Uniti
Corso Trieste
Corso Trento
Corso Luigi Einaudi
Via Giuseppe Peano
Politecnico di Torino
Politecnico di Torino - Biblioteca Centrale di...
Politecnico di Torino - Facoltà di Ingegneria
Poste Italiane
Istituto Superiore Mario Boella
I3P S.c.p.a
General Motors Powertrain Europe
Piazza Carlo Alberto
Duca d'Aosta
Tabaccheria Bollito
Peschiera
Mediterraneo
Google
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Aule P/Rooms P
(working sessions rooms)
Via Pier Carlo Boggio
Plottergrafica Centro
Stampa Plottaggi Tesi...
Copy Break -
Bringme
I3P S.c.p.a
Rooms I
Rooms N
Rooms M
Mensa Universitaria
Castelfidardo
Aule Ingegneria del
Cinema e dei Mezzi di...
Rooms T
Istituto Superiore
Mario Boella
NEXA Center for
Internet & Society
Corso Castelfidardo
Fermata 3283 - POLITECNICO
12
Restaurant MixTo
Dipartimento di
Automatica e...
General Motors
Powertrain Europe
From PoliTO main building
(area of the plenary sessions)


Corso Duca degli Abruzzi
Politecnico di Torino
- Biblioteca Centrale di...
Buses/trams to "Porta Nuova"
"Porta Susa" train stations, and
to the city center
Fermata 670 - POLITECNICO
10
33
58
58/
91
Rooms 2-4-6
Sala Consiglio di Facoltà
(plenary sessions room)
Aula Magna "G. Agnelli"
J.E.To.P
Politecnico
di Torino
Dipartimento di Scienze
Matematiche (DISMA)
main ward
Fermata 376 - POLITECNICO
10
33
58
58/
91
Rooms 1-3-5
Politecnico di Torino
- Facoltà di Ingegneria
Buses/trams from "Porta Nuova"
"Porta Susa" train stations, and
from the city center

GENERAL PROGRAM

		SUNDAY, 2016-05-22	MONDAY, 2016-05-23	TUESDAY, 2016-05-24	WEDNESDAY, 2016-05-25	THURSDAY, 2016-05-26
8:30	9:00		Registration	Keynote 3 (Mohr)	Keynote 5 (Olivares)	Keynote 8 (Nurick)
9:00	9:30			Keynote 4 (Arnoux)	Keynote 6 (Yu)	Keynote 9 (Bouvet)
9:30	10:00		Opening	SIE Presentation (Alves)	Keynote 7 (Duddeck)	Keynote 10 (Petrinic)
10:00	10:30			Coffee-break	Coffee-break	Coffee-break
10:30	11:00		Coffee-break	Blast l. Nurick / Vehicle safety Duddeck / Materials Verley-sen	Imp. bio. Marulo / 75th Yu Karagio-zova / Crash Altenhof	Ballistic impact Haq / 75th Yu Lu / Crash Castanié
11:00	11:30		Keynote 1 (Abrate)			
11:30	12:00		Keynote 2 (Cornacchia)			
12:00	13:00		Lunch	Lunch	Lunch	
13:00	13:30		Structur. failure Alves / Compo-sites Lopresto / Material charact. Aymerich	Structur. failure Worswi-ck / Compo-sites Mas-sabò / HSF + Theor M. Zhao	Impact biomec. Arnoux / 75th Yu Lang-seth / Num. analysis Cronin	
13:30	14:00					
14:00	14:30					
14:30	15:00					
15:00	15:30		Coffee-break	Coffee-break	Coffee-break	
15:30	16:00		Structur. failure Yu / Compo-sites Vaziri / Material charact. Shim	Blast loading Børvik / Compo-sites Abrate / Expe-rim. Techn. Cadoni	75th Yu Langdon / Num. analysis Mar-kiewicz	
16:30	17:00					
17:00	17:30	Welcome cocktail at Castello del Valentino				
17:30	18:00					
18:00	18:30					
18:30	19:00					
19:00	19:30					
19:30	23:30				Conference Dinner at Circolo Unione Industriale di Torino	

S01	Ballistic impact
S02	Blast loading
S03	Experimental techniques
S04	High-speed forming (HSF)
S05	Impact biomechanics

S06	Material characterization
S07	Numerical analysis
S08	SS: Crashworthiness
S09	SS: Composites
S10	SS: 75th Prof. Yu

S11	Structural failure
S12	Theoretical models
S13	Vehicle safety

Keynotes (other)
Organization and other
Resting/recreational

MONDAY Program

08:30 - 09:30	**Registration** Faculty Council Hall
09:30 - 10:30	**Welcome ceremony: conference opening** Faculty Council Hall
10:30 - 11:00	**Coffee break** Faculty Council Hall
11:00 - 11:30	**Keynote 1: Serge Abrate** "Underwater Blasts, Impacts, and Shock Waves in Medical Applications" Faculty Council Hall
11:30 - 12:00	**Keynote 2: Giorgio Cornacchia** Faculty Council Hall
12:00 - 13:00	**Lunch break** Restaurant Mixto

MONDAY, MAY 23, 2016 - WORKING SESSION 1.1			
	Session 1.1A - Room 1P	**Session 1.1B - Room 2P**	**Session 1.1C - Room 4P**
	Structural failure 1/3 Chair: Marcílio AlvesStructural failure 1/3 Chair: Marcílio Alves	**Special session: composites 1/4 Chair: Valentina LoprestoSpecial session: composites 1/4 Chair: Valentina Lopresto**	**Material characterization 1/3 Chair: Francesco AymerichMaterial characterization 1/3 Chair: Francesco Aymerich**
13:00 13:20	3 - Grimsmo Erik L., Clausen Arild H., Aalberg Arne, Langseth Magnus; 'Dynamic response of beam-to-column joints of steel'	4 - Al-Dodoee Omar Hashim Hassoon, Mostapha Tarfaoui, Mahrez AIT Mohammed; 'Damages Modeling in Composite Materials: Effect of Laminate Stacking Sequences'	10 - Shim Victor P.W., Guo Yangbo, Chen Jianhong, Gao Guangfa, Li Pei; 'Dynamic Crushing of Anisotropic Polymeric Foam – Effects of Loading Direction and Strain Rate'
13:20 13:40	8 - Qi Chang, Yang Shu, Yang Li-Jun, Shu Jian, Han Shou-Hong, Pei Lian-Zheng; 'Blast resistance and multi-objective optimization of metallic sandwich panels with graded aluminum foam cores'	41 - Belingardi Giovanni, Mehdipour Hadi, Mangino Enrico, Martorana Brunetto; 'Experimental and numerical analysis of low to medium velocity impact of a woven fabric composite beam with injection moulded short fibre composite ribs'	14 - Nasim Mohammad, Brasca Michele; 'Impact Properties of Polymeric Materials Used for Motorcyclists' Personal Protective Equipment'
13:40 14:00	19 - Kara Emre, Crupi Vincenzo, Epasto Gabriella, Guglielmino Eugenio, Aykul Halil; 'Low Velocity Impact Response of Sandwiches with Micro Lattice Cores Manufactured via Selective Laser Sintering'	44 - D'Andrea Alessio, Paolino Davide Salvatore, Belingardi Giovanni; 'A methodology for the assessment of residual elastic properties in damaged components made of composite materials'	29 - Li Jianguo, Suo Tao, Li Yulong; 'Mechanical responses and dynamic failure of Nanostructure Cu-Al alloys under uniaxial compression'
14:00 14:20	23 - Wilhelm Arnaud, Ferrero Jean-François, Rivallant Samuel; 'Parametric study of a sandwich structure under soft impact.'	47 - Carello Massimiliana, Airale Andrea Giancarlo, Ferraris Alessandro, Virgillito Enrico; 'Different methods to evaluate SEA in GFRP laminated plates'	31 - Miao Ying-Gang, Li Yu-Long, Suo Tao, Tang Zhong-Bin; 'On the Mechanical Response and damage-based Constitutive Model of Epoxy under Wide Strain Rate loading'

MONDAY, MAY 23, 2016 - WORKING SESSION 1.1 (CONTINUES)			
	Session 1.1A - Room 1P	**Session 1.1B - Room 2P**	**Session 1.1C - Room 4P**
	Structural failure 1/3 Chair: Marcílio AlvesStructural failure 1/3 Chair: Marcílio Alves	**Special session: composites 1/4 Chair: Valentina LoprestoSpecial session: composites 1/4 Chair: Valentina Lopresto**	**Material characterization 1/3 Chair: Francesco AymerichMaterial characterization 1/3 Chair: Francesco Aymerich**
14:20 14:40	18 - Belingardi Giovanni, Castiglione Giovanni; 'Relevance of forming processes on crash performance of body-in-white structural parts'	54 - De Marco Muscat-Fenech Claire, Mizzi Karl; 'Analysis of the impact on composite sandwich structures'	63 - Lafilé Vincent, Grolleau Vincent, Mahéo Laurent, Penin Arnaud, Galpin Bertrand; 'Strain rate effect under various stress states on two metals'
14:40 15:00		60 - Tostain Floran, Guillén Ulecia Pilar, Fúster Alfonso Luis, Rivallant Samuel, Espinosa Christine; 'Crushing of composite plates: an experimental comparison between laminate and interlock behaviour under static and dynamic loads'	72 - Pandya Kedar, McShane Graham; 'Prediction of damage initiation in epoxy over a wide range of stress states, strain rates and temperatures'
15:00 15:30	Coffee break	P classrooms court	

MONDAY, MAY 23, 2016 - WORKING SESSION 1.2			
	Session 1.2A - Room 1P	**Session 1.2B - Room 2P**	**Session 1.2C - Room 4P**
	Structural failure 2/3 Chair: Tongxi Yu	**Special session: composites 2/4 Chair: Reza Vaziri**	**Material characterization 2/3 Chair: Victor Shim**
15:30 15:50	32 - Costas Miguel, Díaz Jacobo, Romera Luis, Morin David, Langseth Magnus; 'Experimental characterization and numerical multi-objective optimization of the crashworthiness of aluminum extrusions filled with PET foam and GFRP.'	134 - S. Aadithya, M. Nallamohamed, B. Vinoth, A. Praveen kumar; 'Numerical and experimental study of the effect of orientation and stacking sequence on petalling of composite cylindrical tubes under axial compression'	86 - Govender Reuben, Curry Richard; 'The Open Hopkinson Pressure Bar – Addressing force equilibrium in specimens with non-uniform deformation'
15:50 16:10	34 - Wouts Jeremy, Coutellier Daniel, Oudjene Marc, Haugou Gregory, Morvan Hervé; 'Energy absorption capability of spruce and beech under axial compression with rigid confinement.'	82 - Boria Simonetta, Raponi Elena, Belingardi Giovanni, Giannoni Fabio; 'Searching the energy absorption capability of composite impact attenuators with the particle swarm optimization'	87 - Donnard Adrien, Guérard Sandra, Maheo Laurent, Rio Gérard, Viot Philippe; 'Investigation of foam multiaxial behavior by numerical and experimental methods'
16:10 16:30	45 - Duan Libin, Cheng Aiguo, Xiao NingCong, Li Guangyao, Chen Tao; 'GSA-based Multi-objective Optimization for Light-weight Design of Full Parametric Concept Car Body'	90 - McShane Graham, Harris Jonathan, Schenk Mark, Guest Simon; 'Origami-inspired energy absorbing cellular materials'	100 - Eller T.K., Greve L., Andres M., Medricky M., Geijselaers H.J.M., Meinders V.T., van den Boogaard A.H.; 'The softened heat-affected zone in resistance spot welded tailor hardened boron steel: a material model for crash simulation'
16:30 16:50	52 - Harris Jonathan, McShane Graham; 'Effects of material alignment in additively manufactured structures for blast and impact protection'	105 - Beyene Alem Tekalign, Belingardi Giovanni, Martorana Brunetto, Innocente Franco; 'Low velocity impact investigation: an experimental and numerical study on automotive bumper made of Semi Impregnated Micro-sandwich composite'	101 - Cui Hao, Kalwak Gordon, Yasaee Mehdi, Hallett Stephen, Pellegrino Antonio, Petrinic Nik; 'High loading rate tension and shear response of Z-pins in multidirectional laminates'
16:50 17:10	61 - Sturm Ralf; 'Crashworthiness of the twin-walled fuselage design'	91 - Treutenaere Sylvain, Lauro Franck, Bennani Bruno, Xu Weijiang, Mottola Ernesto, Matsumoto Tsukatada; 'Numerical and experimental evaluation of the damage induced by a low-speed impact on a composite plate in an industrial context'	131 - Peroni Lorenzo, Scapin Martina, Tridello Andrea, "Analysis of the dynamic behaviour of tungsten in post-necking regime"
17:10 17:30	104 - Borazjani Soroosh, Belingardi Giovanni; 'Light-Weight-Design: Detailed Comparison of Roof Panel Solutions at Crash and Stiffness Analyses'	111 - Sbarufatti Claudio, Gilioli Andrea, Dziendzikowski Michal, Dragan Krzysztof, Manes Andrea, Frovel Malte, Giglio Marco; 'Compression after impact (CAI) test on CFRP panels with embedded FBG sensors'	193 - J.Y. Yang, Q.M.Li; 'Dynamic mode transformation of an elastic-plastic ring subjected to internal impulsive load'

TUESDAY Program

08:30 - 09:00 **Keynote 3: Prof. Dirk Mohr**
"Ductile fracture under extreme conditions: Experiments and Modeling"
Faculty Council Hall

09:00 - 09:30 **Keynote 4: Pierre Jean Arnoux**
"Human models to understand, prevent and repair injuries"
Faculty Council Hall

09:30 - 10:00 **Society of Impact Engineering (SIE) Presentation: Marcílio Alves**
Faculty Council Hall

10:00 - 10:30 **Coffee break**
P classrooms court

TUESDAY, MAY 24, 2016 - WORKING SESSION 2.1			
	Session 2.1A - Room 1P	**Session 2.1B - Room 2P**	**Session 2.1C - Room 4P**
	Blast loading 1/2 **Chair: Gerald Nurick**	**Vehicle safety** **Chair: Fabian Duddeck**	**Material characterization 3/3** **Chair: Patricia Verleysen**
10:30 **10:50**	11 - Aune Vegard, Valsamos Georgios, Casadei Folco, Larcher Martin, Langseth Magnus, Børvik Tore; 'Inelastic response of thin aluminium plates exposed to blast loading'	25 - Simon Mößner, Tim Rudolph, Fabian Duddeck; 'Simplified modeling of vehicle frontends for pedestrian safety with the FlexPLI'	116 - Peroni Marco, Jung Anne, Larcher Martin, Solomos George; 'High strain-rate properties of hybrid aluminium and polyurethane foams'
10:50 **11:10**	30 - Kristoffersen Martin, Osnes Karoline, Rydtun Haug Sondre, Aune Vegard, Børvik Tore; 'Shock tube testing and numerical simulations of concrete slabs'	35 - Vidjannagni Kodjo, Michel Massenzio, Sylvie Ronel, Denis Brizard, Clement Goubel; 'Design and assessing of Motorcyclist Vehicle Restraint Systems: numerical simulation and parametric study'	130 - Scapin Martina, Peroni Lorenzo, Tridello Andrea, "Mechanical behaviour of pure iridium in high strain-rate and high temperature loading conditions"
11:10 **11:30**	57 - Chung Kim Yuen Steeve, Balden Victor, Lucas Adrian, Mone Aurelie; 'Response of V-shaped sandwich panels filled with tubular cores subjected to a blast load'	64 - Dlugosch Michael, Lukaszewicz Dirk, Fritsch Jens, Hiermaier Stefan; 'Experimental investigation of automotive components consisting of hybrid FRP-metal-material systems under dynamic loading'	166 - Chen Y. Chen, Xue P. Xue, Liu H.F. Liu, Li Y.L. Li; 'Behaviour of Composite Single-bolted Joint under Dynamic Tensile and Compressive Loading'
11:30 **11:50**	73 - Cadoni Ezio, Dotta Matteo, Forni Daniele; 'Effect of the high temperature on the high strain rate behaviour of an austenitic stainless steel'	84 - Duan Libin, Li Guangyao, Xiao NingCong, Sun Guangyong, Zhang Huile, Pang Tong; 'Parametric analysis for variable-thickness rolled blank (VRB) top-hat thin-walled structures under bending impact loading'	197 - Elmarakbi Ahmed, Azoti Wiyao; 'Crashworthiness modelling of hierarchical short glass fibres reinforced graphene polymer composites materials'
11:50 **13:00**	Lunch break	Restaurant Mixto	

TUESDAY, MAY 24, 2016 - WORKING SESSION 2.2			
	Session 2.2A - Room 1P	**Session 2.2B - Room 2P**	**Session 2.2C - Room 4P**
	Structural failure 3/3 **Chair: Michael Worswick**	**Special session: composites 3/4** **Chair: Roberta Massabò**	**High-speed forming and theoretical models** **Chair: Han Zhao**
13:00 **13:20**	118 - Abd Kadir Nurdina, Wan Abd Hamid Wan Luqman Hakim, Aminanda Yulfian, Shaik Dawood Mohd Sultan Ibrahim, Mokhtar Hanan; 'ID 118_ Experimental and Simulation Study of Specific Energy Absorption of Foam-Filled Honeycomb Structure Subjected to Quasi-Static Compression Loading'	112 - Gilioli Andrea, Sbarufatti Claudio, Dziendzikowski Michal, Dragan Krzysztof, Manes Andrea, Giglio Marco; 'Impact on CFRP panel with embedded FBG sensors'	79 - Liu Jun, Yang Liming, Zhou Fenghua; 'Coupling Mechanism in MetalPowder Impact Compaction'
13:20 **13:40**	129 - M. Nalla Mohamed, S. Aadithya, B. Vinoth, A. Praveen Kumar; 'New insight to improve energy absorption characteristics of long circular tubes with stiffeners as controllable energy-dissipating devices'	120 - Koricho Ermias, Haq Mahmoodul, Belingardi Giovanni; 'Evaluation of Progressive Damage of Micro-Glass Bubble modified Composite Laminates under Repeated Impacts'	97 - Kakogiannis Dimitrios, Coghe Frederik, Verleysen Patricia, Rabet Luc; 'Multiscale modelling of Ti6Al4V sheets under explosive loading'
13:40 **14:00**	132 - Zhumagulov Amir, Butcher Clifford, Imbert Jose, Worswick Michael, Mishra Raja; 'Energy absorption characterization of multicellular AA6063-T6 extrusions'	122 - Lopresto Valentina, Langella Antonio; 'CFRP and GFRP laminates in vinylester resin impacted at low temperature'	106 - Adziman Fauzan, Reed Roger, Petrinic Nik; 'Local onset prediction of deformation twinning at subsurface for metals at high strain-rates'
14:00 **14:20**	163 - Morin David, Hopperstad Odd Sture, Langseth Magnus; 'Impact against aluminium stiffened panels'	125 - Abrate Serge; 'Advances in composite sandwich structures and their behaviour under impact'	180 - Charles Francart, Yaël Demarty, Nadia Bahlouli; 'Constitutive modelling of high thermal softening phenomenon in metallic materials'
14:20 **14:40**	184 - Susainathan John, Eyma Florent, De Luycker Emmanuel, Arthur Cantarel, Castanie Bruno; 'Experimental investigation on impact behaviour of wood-based sandwich structures'	126 - Abrate Serge; 'Collisions with marine structures'	181 - Galán-López Jesús, Verleysen Patricia, Kestens Leo A.I.; 'Critical assessment of the Johnson-Cook and VPSC models to describe the quasi-static and dynamic behaviour of Ti-6Al-4V in an implicit finite element scheme'
14:40 **15:00**	53 - Sun Guangyong, Jiang Hao, Fang Jianguang, Li Guangyao, Li Qing; 'Energy absorption of hierarchical honeycombs'	21 - Nciri Mariem, Notta-Cuvier Delphine, Lauro Franck, Chaari Fahmi, Maalej Yamen, Zouari Bassem; 'Modeling non-linear strain rate dependent behaviour of short-fibre reinforced composites'	
15:00 **15:30**	Coffee break	P classrooms court	

TUESDAY, MAY 24, 2016 - WORKING SESSION 2.3			
	Session 2.3A - Room 1P	**Session 2.3B - Room 2P**	**Session 2.3C - Room 4P**
	Blast loading 2/2 **Chair: Tore Børvik**	**Special session: composites 4/4** **Chair: Serge Abrate**	**Experimental techniques** **Chair: Ezio Cadoni**
15:30 **15:50**	70 - Codina Ramón, Ambrosini Daniel, de Borbón Fernanda; 'Alternatives to improve the dynamic response of reinforced concrete columns subjected to blast loading'	78 - De Luca Alessandro, Sepe Raffaele, Lamanna Giuseppe, Lopresto Valentina, Caputo Francesco; 'Parametric simulation of LVI test onto CFRP plates'	6 - Pradel Pierre, Malaise Frédéric, Cadilhon Baptiste, de Resseguier Thibaut, Delhomme Catherine; 'Investigation of polyurethane foam shock mitigation by using high energy charged particle beams'
15:50 **16:10**	76 - Gerasimov Alexander; 'Protection of lightweight structural elements against explosive and impact loading'	138 - Russo Pietro, Langella Antonio, Papa Ilaria, Lopresto Valentina; 'Impact behaviour of thermoplastic polyurethane based composite laminates under severe conditions'	15 - Gilat Amos, Kuokkala Veli-Tapani, Seidt Jeremy, Smith Jarrod; 'Full-Field Temperature Measurement in High Strain Rate Tensile Experiment'
16:10 **16:30**	98 - Malachowski Jerzy, Baranowski Pawel, Mazzurkiewicz Lukasz, Sielicki Piotr, Sumelka Wojciech; 'Crashworthiness analysis of various configurations of protective panels'	170 - Carosena Meola, Boccardi Simone, Carlomagno Giovanni Maria, Boffa Natalino Daniele, Petrone Giuseppe, Monaco Ernesto, Ricci Fabrizio; 'Learning more on impact damaging of composites with infrared thermography'	51 - Zeng Huabin, Bailly Patrice; 'Use of the digital image correlation to process a non equilibrium dynamic compressive test on a very low impedance material'
16:30 **16:50**	109 - Yuan Ye, Tan PJ; 'On momentum and energy transfer to clamped elasto-plastic beam in intense air blasts'	173 - Petrolo Marco, Carrera Erasmo, Kaleel Ibrahim; 'Efficient Component-Wise Finite Elements for the Dynamic Response Analysis of Metallic and Composite Structures'	67 - Calle Miguel, Oshiro Roberto, Alves Marcílio; 'Recent advances in experimental scale modelling of ship collision and grounding scenarios'
16:50 **17:10**	167 - Ding Yuanyuan, Wang Shillong, Zheng Zhijun, Yang Liming, Yu Jilin; 'Blast attenuation in cellular sacrificial claddings: a rigid-plastic hardening shock model'	186 - Francesconi Luca, Aymerich Francesco; 'FE simulation of the effect of stitching on the delamination resistance of composite laminates under low velocity impact'	99 - Lißner Maria, Cui Hao, Petrinic Nik; 'Experimental Investigation of the Rate-Dependent Performance of Bonded Interfaces – Mode I'
17:10 **17:30**	185 - Langdon Genevieve, von Klemperer Christopher, Sinclair Gregory, Ghoor Ismail; 'The influence of curvature on the response of sandwich panels subjected to air-blast loading'	128 - Massabo Roberta; 'Wave propagation in sandwich beams';	107 - Vincent Julien, Venunye Avevor Yao, Faure Laurent, Philippon Sylvain, Moufki Abdelhadi; 'Use of an experimental device developed for investigating severe interactions in aircraft engines to study High-Speed Milling of aluminium alloys'

WEDNESDAY Program

08:30 - 09:00	**Keynote 5: Gerardo Olivares**
	"Aerospace Structural Crashworthiness: from conceptual design to certification"
	Faculty Council Hall
09:00 - 09:30	**Keynote 6: Tongxi Yu**
	"Effects of Lightweight on the Dynamic Behavior of Structures under Impact Loading"
	Faculty Council Hall
09:30 - 10:00	**Keynote 7: Fabian Duddeck**
	"Topology optimization for crash - a review"
	Faculty Council Hall
10:00 - 10:30	**Coffee break**
	P classrooms court

WEDNESDAY, MAY 25, 2016 - WORKING SESSION 3.1			
	Session 3.1A - Room 1P	**Session 3.1B - Room 2P**	**Session 3.1C - Room 4P**
	Impact biomechanics 1/2 Chair: Francesco Marulo	**Special session: 75th birthday prof. Yu 1/4 Chair: Dora Karagiozova**	**Special session: crashworthiness 1/2 Chair: William Altenhof**
10:30 10:50	143 - Bailly Nicolas, Llari Maxime, Donnadieu Thierry, Masson Catherine, Arnoux Pierre-Jean; 'Ski helmet: from accident investigation to helmet evaluation'	46 - Zhao Han; 'NI-TI sma alloy under impact shear loading'	58 - Ledford Noah, Paul Hanna, Sauer Martin, May Michael; 'Investigation of the Dynamic Behaviour of a PU Based Adhesive using Split-Hopkinson Tensile and Compression Bars'
10:50 11:10	144 - Avalle Massimiliano, Arnoux Pierre Jean, Ferrari Diana, Scattina Alessandro; 'Development of airbag device for pedestrian safety by means of finite element simulations'	59 - Alves Marcílio, Oshiro Roberto; 'A numerical general technique for scaling impacted structures'	62 - Omer Kaab, ten Kortenaar Lukas, Butcher Clifford, Woswcik Michael, Malcolm Skye, Detwiler Duane, Adam Nick; 'Evaluation of a Stress State Dependent Fracture Model for Hot Stamped Boron Steel: Experiments and Simulations'
11:10 11:30	177 - Maxime Llari, Yves Godio-Raboutet, Pierre-Jean Arnoux; 'Analyse of a powered two-wheeler (PTW) passenger kinematics and impact conditions'	83 - Karagiozova Dora; 'Combining cellular materials with structural softening/hardening for improved impact energy absorption'	69 - Kim Samuel; 'Crashworthiness Evaluation of Warm Formed Aluminum Side Impact Beams'
11:30 11:50		89 - Xi Feng, Li Yueqiang; 'Numerical Study on the Response of Restrained Steel Beams under Fire and Explosion Loads'	93 - Bondy Matthew, Altenhof William; 'Quasi-Static and Low Velocity Dynamic Characterization of D-LFT Compression Moulded Carbon Fibre Reinforced Polyamide-6'
11:50 13:00	Lunch break	Restaurant Mixto	

WEDNESDAY, MAY 25, 2016 - WORKING SESSION 3.2			
	Session 3.2A - Room 1P	**Session 3.2B - Room 2P**	**Session 3.2C - Room 4P**
	Impact biomechanics 2/2 **Chair: Pierre-Jean Arnoux**	**Special session: 75th birthday prof. Yu 2/4** **Chair: Magnus Lanseth**	**Numerical analysis 1/2** **Chair: Duane Cronin**
13:00 **13:20**	28 - Farajzadeh Khosroshahi Siamak, Ghajari Mazdak, Galvanetto Ugo; 'Finite Element Simulation of Neck Brace Protective Equipment for Motorcycle Riders'	102 - Watson Brock, Worswick Michael, Cronin Duane; 'A Comparison of Linear Shell Element, Selectively Reduced Integration Solid Element and Cubic Solid Element Formulations Using a Crush Tube Model'	38 - Omar Ahmad, Marin Philippe, Forquin Pascal, Daudeville Laurent; '3D Discrete Element Modelling of spalling behaviour of concrete at high strain rates'
13:20 **13:40**	96 - Senatore Flavio, Vitolo Bonaventura, Guida Michele, Marulo Francesco, Caputo Francesco; 'Numerical-experimental investigation on the biomechanical performances of an aeronautical seat'	103 - Watson Brock, Nandwani Yogesh, Trimiño Luis, Caruso Dailey Mary M., Nielson Kent, Cronin Duane; 'Technique for Simulating Interfacial or Cohesive Failure in Adhesive Joints'	39 - Chtourou Rim, Haugou Gregory, Leconte Nicolas, Chaari Fahmi, Markiewicz Eric, Zouari Bassem; 'Tensile strength and failure simulation of resistance spot weld of multi- layers of steel sheets'
13:40 **14:00**	123 - Chen Tao-Hsing, Fang Te-Hua, Lin Shin-You; 'Dynamic mechanical properties of Ti-Mo biomedical material'	136 - Vaziri Reza, Shor Ofir; 'Impact and Crush Simulation of Composite Structures using the Local Cohesive Zone Method'	42 - Montanari Mattia, Pellegrino Antonio, Siegkas Petros, Barbieri Ettore, Petrinic Nik; 'Systematic study of p-refined (higher order) isogeometric analysis patches with application in ballistic test of titanium plates'
14:00 **14:20**		145 - Zhiqiang Li, Zhihua Wang, Shengjie Li, Longmao Zhao; 'Experimental investigation of laminated tempered glass subject to blast load'	66 - Falco Simone, De Cola Francesco, Siegkas Petros, Petrinic Nik; 'Modelling and failure of granular reinforced composite materials under dynamic loading conditions'
14:20 **14:40**		149 - Li Peifeng, Wang Zhiyong; 'Characterisation and prediction of the failure process of ceramics under dynamic compression'	108 - Cousins Benjamin, Adziman Fauzan, Reed Julian, Thomas Matthew, Pellegrino Antonio, Siegkas Petros, Petrinic Nik; 'Constitutive modelling of plastic anisotropy with kinematic and isotropic hardening at high strain rates using a multi-scale calibration'
14:40 **15:00**		151 - Tan P.J., Christodoulou I.; 'Edge effects in periodic lattices'	182 - Wojciech Mocko, Radziejewska Joanna, Marczak Jan, Sarzynski Antoni, Strzelec Marek; 'Numerical calculation of plastic deformations caused by wave induced by ns laser pulse'
15:00 **15:30**	Coffee break	P classrooms court	

WEDNESDAY, MAY 25, 2016 - WORKING SESSION 3.3			
	Session 3.3A - Room 1P	**Session 3.3B - Room 2P**	**Session 3.3C - Room 4P**
		Special session: 75th birthday prof. Yu 3/4 Chair: Genevieve Langdon	**Numerical analysis 2/2 Chair: Eric Markiewicz**
15:30 15:50		152 - Qiu XinMing, YU XiaoHuan, YU T.X.; 'Deformation Mechanism of A Metal Tube under Inversion over Circular Dies'	113 - Cheng Pengcheng, Rachik Mohamed, Laksimi Abdelouahed; 'Ballast impact effect on composite based carbodyshell in railway'
15:50 16:10		169 - Hussein Rafea, Ruan Dong, Lu Guoxing; 'Crushing behaviour of aluminium sheet wrapped square carbon fibre reinforced plastic (CFRP) tubes'	117 - Ruggiero Andrew, Iannitti Gianluca, Di Stefano Roberto, Bonora Nicola; 'A multi-physics modelling for simulating the expanding ring test'
16:10 16:30		154 - Xu Jun, Liu Bnghe; 'Simulative analysis of the acupuncture of 18650 cell jellyroll: coupling of the mechanical, electrical and thermal behavior'	135 - Moayeri Kashani Hamed, Kiani Kaymand, Sarkarhosseini Mehrdad; 'Optimization of Car Baler's Structure'
16:30 16:50		156 - Yang Jinglei, Zhang Xin, Wang Pengfei; 'A convenient drop-weight device for characterizing the dynamic tensile behaviour of individual fibres'	187 - Usta Fatih, Eren Zana, Türkmen Halit S., Kazanci Zafer, Mecitoglu Zahit; 'Numerical Investigation of Foam Filled Axially Loaded Multitubular Structures'
16:50 17:10		158 - Yu Jilin, Yang Jie, Wang Xiaokai, Zheng Zhijun; 'Wave propagation in density-graded cellular metals under impact loading'	198 - Christian Witzgall, Sandro Wartzack; 'A simplified simulation method for adhesively bonded hybrid structures'
17:10 17:30		159 - Zhang Xiong, Zhang Hui, Wang Zong; 'Bending collapse of square tubes with variable thickness in the cross-section'	

THURSDAY Program

08:30 - 09:00	**Keynote 8: Christophe Bouvet** **"Impact damage tolerance of aeronautical composite structures"** Faculty Council Hall
09:00 - 09:30	**Keynote 9: Gerald Nurick** **"The Effect of Boundary Conditions on the Response of Plates Subjected to a Blast Load: an Overview Covering the Past Quarter Century"** Faculty Council Hall
09:30 - 10:00	**Keynote 10: Nik Petrinic** **"A multi-scale design framework for hybrid lightweight systems subjected to impact loading"** Faculty Council Hall
10:00 - 10:30	**Coffee break** P classrooms court

THURSDAY, MAY 26, 2016 - WORKING SESSION 4.1			
	Session 4.1A - Room 1P	**Session 4.1B - Room 2P**	**Session 4.1C - Room 4P**
	Ballistic impact **Chair: Mahmoodul Haq**	**Special session: 75th birthday prof. Yu 4/4** **Chair: Guoxing Lu**	**Special session: crashworthiness 2/2** **Chair: Bruno Castanié**
10:30 **10:50**	20 - Holmen Jens Kristian, Solberg Jan Ketil, Hopperstad Odd Sture, Børvik Tore; 'Ballistic perforation of layered and surface-hardened steel plates'	172 - Lu Guoxing, Xiang Xinmei, Shu Dongwei; 'Energy absorption of short tubes under oblique compression'	94 - Bondy Matthew, Altenhof William, Jensen Morten, Mindle Wayne; 'Finite Element Modelling of a Novel Cutting Deformation Mode of AA6061-T6 Tubes Employing Higher Order Element Formulations and GPU Computing Technology'
10:50 **11:10**	85 - Ren Jie, Xu Yuxin, Wang Shushan, Li Shuo; 'Experimental Investigation on the penetration performance of UHSLA steel projectiles to HSLA steel plate'	174 - Li Bing, Wang Shaohua, Wu Xiao, Wang Bin; 'Response of Continuous Beam Bridges with Friction Pendulum Bearing to Earthquake Loading'	137 - Feser Thomas, Waimer Matthias; 'Numerical simulation of progressive bearing failure of bolted joints in CFRP aircraft structures'
11:10 **11:30**	110 - Kechagiadakis Georgios, Pirlot Marc; 'Effect of Impact Rate in Multiple Impacts on Aramid Fabrics'	176 - Xiao Jing, Shu Dong Wei, Lu Guo Xing; 'High strain rate response of magnesium nanocomposite'	191 - Zimmermann Michael, Grünheid Thomas, Zhou Ping, Beeh Elmar, Friedrich Horst E.; 'Crash Absorbing Structures for Different Vehicle Concepts'
11:30 **11:50**	114 - Manes Andrea, Ruggiero Andrew, Iannitti G., Giglio Marco; 'Ballistic impact on ceramic-composite tiles: experimental and numerical investigation'	179 - Li Qing; 'Crashworthiness of Vertex Based Hierarchical Honeycombs under Out-of-Plane Impact'	194 - L. Di Palma, F. Di Caprio, A. Chiariello, D. Lucarello, D. Cristillo, F. Caputo, F. Senatore, L.Gramiccia, N. Gentile, S. Russo; 'Safer and less expensive design strategies in the composite A/C certification process: numerical-experimental crashworthiness evaluation for composite regional aircraft fuselage'
11:50 **12:10**	139 - Yu Long, Mohagheghian Iman, Wang Yi, Dear John; 'Impact performance of composite sandwich structure under low and high velocity impact'	189 - Ling ZHU; 'Saturated Impulse for Pulse-loaded Elastic-plastic Rectangular plates'	196 - Mariano Livio, Cantarutti Giorgio, Bruno Alessandro; 'Optimization of the elasto-plasticity on the legs of a spacecraft lander'
12:10 **12:30**		190 - Zhang Xin, Wang Pengfei, Sun Dawei, Yang En-Hua, Yang Jinglei; 'Rate effect on compressive properties of metal microspheres with liquid core'	

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EVENTS & GENERAL INFORMATION

BOOK OF ABSTRACT

The congress bags contain a USB pen drive with the final conference abstracts.

CERTIFICATE AND ATTENDANCE

Certificates of Attendance can be requested at the Registration Desk during Congress.

REGISTRATION DESK

Congress Secretariat Operating Hours

Monday May, 23: 08.00 - 18.00 at Faculty Council Hall

Tuesday May, 24: 08.00 - 18.00 at P classrooms court

Wednesday May,25: 08.00 - 18.00 at P classrooms court

Thursday May, 26: 08.00 - 14.00 at P classrooms court

LIABILITY

The organizers cannot accept liability for any personal accidents, loss of belongings or damage to private property of participants and accompanying persons that may occur during the Congress.

OFFICIAL LANGUAGE

The official language of the Congress is English.

PUBBLIC TRANSPORT TORINO

Public transport in the city is well organized.

Here below details of prices:

Valid for Regular Rate

1 day	€ 5,00
2 days	€ 7,50
3 days	€ 10,00
4 days	€ 15,00

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Ask the reception of your hotel or dial numbers:

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STAFF

Should you have any questions, congress staff will be pleased to help you. Please contact the Registration Desk.

WELCOME COCKTAIL

The Welcome Cocktail will be held on May, 22 at Castello del Valentino, on the River Po. The Castle, in addition of being a Savoy House of the 17thCentury, is the historical and representative base of the Politecnico in town.

GALA DINNER

The Conference Dinner will be held on May, 25 at Circolo Unione Industriale di Torino. Dress Code: informal. To participate you can buy the Gala Dinner coupon before the Congress opening and the first day at the Registration Desk (upon availability). The cost is € 70.00 (vat included) per person.

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