

Program of the XXIII Conference of the Italian Association of
Aeronautics and Astronautics - AIDAA 2015

PROVISIONAL VERSION

Politecnico di Torino and Oval Lingotto, Torino, Italy

16-19 November 2015

Chairman: Erasmo Carrera

Executive Committee:

Maria Cinefra
Alfonso Pagani
Marco Petrolo
Enrico Zappino

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Giuseppe Davi, Università di Palermo, President of AIDAA Palermo
Stefano Debei, Università di Padova, President of AIDAA Veneto
Aldo Frediani, Università di Pisa, Editor in Chief, Aerotecnica Missili e Spazio
Mario Marchetti, La Sapienza - Università di Roma, President of AIDAA Roma
Leonardo Lecce, Università di Napoli, President of AIDAA and AIDAA Napoli
Franco Persiani, Università di Bologna, President of AIDAA Emilia-Romagna
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Diana Giorgini, Piemonte Agency
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Massimo Sorli, Politecnico di Torino
Franco Tortarolo, Avio Aero

Thursday Morning, 19 November 2015, Oval Lingotto

Thursday Morning / 19 November / Oval Lingotto	
0800 - 0830	Registration

Thursday Morning / 19 November / Oval Lingotto	
0830 - 1045	Plenary Talks
0830 - 0900	<u>Wenbin Yu</u> Purdue University <i>Mechanics of Structure Genome: A Unified Theory for Constitutive Modeling of Composite Structures</i>
0900 - 0930	<u>Paul Weaver</u> University of Bristol <i>TBA</i>
0930 - 1000	<u>Adrian Mouritz</u> RMIT University <i>Multi-Functional Three-Dimensional Fibre Composites</i>
1000 - 1045	<u>Eric Dautriat</u> Clean-Sky Executive Director <i>TBA</i>

Thursday Morning / 19 November / Oval Lingotto	
1045 - 1110	Coffee-Break

Thursday Morning / 19 November / Oval Lingotto

1110 - 1250**Parallel Sessions**

Thursday Morning / 19 November / Oval Lingotto

Session S8**Composites**

1110	1135	1200	1225
Higher-order solutions for buckling and vibration analysis of variable stiffness plates	Static and dynamic analysis of laminated box beam using advanced theories	Analysis of laminated structures by combined ESL-LW variable kinematics plate elements	Free vibration analysis of laminated structures with viscoelastic layers
Riccardo Vescovini, Lorenzo Dozio	Erasmus Carrera, Matteo Filippi, Prashanta Kr Mahato, Alfonso Pagani	Alfonso Pagani, Stefano Valvano, Erasmus Carrera	M. Filippi, E. Carrera

Thursday Morning / 19 November / Oval Lingotto

Session MS9**Innovative Training Networks and Manufacturing Technologies
for Composite Structures for the Aerospace Sector:
ADMACOM, COACH and FULLCOMP European projects
Coordinated by Politecnico di Torino**

1110	1135	1200	1225
Advanced manufacturing routes for metal/composite components	Joining of Al-6016 to Al-foam using Zn-based alloys to obtain aluminium foam sandwich (AFS) for aerospace applications	Joining of C/SiC ceramic composite to itself and Ti6Al4V for aerospace applications	Review of different test methods on shear strengths of aerospace glues
M. Ferraris & ADMACOM team	Muhammad Kashif Bangash, Pardeep Kumar Gianchandani, Graziano Ubertalli, Valentina Casalegno, Monica Ferraris	Pardeep Kumar Gianchandani, Muhammad Kashif Bangash, Valentina Casalegno, Monica Ferraris	G. Mata-Osoro, G. Blugan, J. Kuebler

Thursday Morning / 19 November / Oval Lingotto

Session S3**Fluid Dynamics**

1110	1135	1200	1225
Velocity-pressure coupling deriving from the interaction of a low speed jet with a tangential flat plate	Analysis on aerodynamic characteristics of a paraglider airfoil	Investigation of a novel VTOL aircraft concept for operations in urban areas	Exact solutions of non-classical nozzle flows of van der Waals fluids
Alessandro Di Marco, Matteo Mancinelli, Tiziano Pagliaroli, Roberto Camussi	Maurizio Boffadossi, Federico Savorgnan	Salvatore Sedda, Costantino Sardu, Gaetano Iuso	Alberto Guardone, Davide Vimercati

Thursday Morning / 19 November / Oval Lingotto

Session MS1**European Project CRYSTAL**

1110	1130	1150	1210	1230
Industrial implementation of the systems engineering and impact upon product innovation according to INCOSE	Alenia Aermacchi needs and experience on MBSE: the Crystal user scenario	Heterogeneous simulation based on standards: deepening interoperability in trade-off analysis approach for aeronautical application	Architecture framework in Space industry: adopting DODAF viewpoints through the ARCADIA methodology	Cross-domain fertilization in systems engineering applied to transportation systems
Lucio Tirone	Bruno Di Giandomenico, Claudio Pessa, Elena Valfrè, Ivo Viglietti	Andreas Mitschke, Eugenio Brusa, Ambra Calà, Davide Ferretto, Claudio Pessa, Gray Bachelor	Enrico Vezzetti, Marco Alemanni, Ana Cristina Diaz Del Castillo Zambrano, Paolo Maggiore, Lorenzo Pace	Marco Ferrogali

Thursday Morning / 19 November / Oval Lingotto

Session S6**Systems, Air Traffic Management and Navigation**

1110	1135	1200	1225
Performance based navigation (PBN): from technology to operations	Feasibility study for a voice relay supporting ATC operator communications to the RPAS ground pilot	Air multi mission surveillance solutions in the current situational awareness domain	Project FIREFLY - An innovative solution for the Italian aerial firefighting system
Filippo Tomasello, Maria Grazia Cristofaro	Francesco Fusco, Mario Raffa, Michele Inverno	Antonietta Guarracino, Mario Fassero Gamba, Michele Genisio	Alessandro Ramazzotti, Lorenzo Trainelli

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Session S7**Helicopters**

1110	1135	1200	1225
Design and manufacturing of a pitch-oscillating system for helicopter rotor blade dynamic stall testing	Electro-mechanical actuator for helicopter landing gear extension/retraction: experimental study and dynamic model validation	Modelling and identification of the nonlinear dynamics of a small-scale unmanned rotorcraft	The use of GIS for locating helicopter emergency medical service (HEMS) operating sites
A. Marino, A. Visingardi, N. Paletta, G. Esposito, V. Quaranta, L. Flamini, D. Sagaria, R. Pasta	Gianpietro Di Rito, Roberto Galatolo, Eugenio Denti, Francesco Schettini, Viviana Bruno, Riccardo Grassetti	Francesco Schettini, Gianpietro Di Rito, Eugenio Denti, Roberto Galatolo	Maurizio Bruglieri, Cesare Cardani, Matteo Putzu

Thursday Afternoon / 19 November / Oval Lingotto

1250 - 1400**Lunch**

Thursday Afternoon / 19 November / Oval Lingotto

1400 - 1605**Parallel Sessions**

Thursday Afternoon / 19 November / Oval Lingotto

Session S11**Space**

1400	1425	1450	1515	1540
Technical working group on know-how improvement on space launch vehicles: the "TETHIS" initiative	Elastic deformation analysis of the VS-40 sounding rocket carrying SARA payload	Design, testing and experimental data assessment of a heat sink combustion chamber	Preliminary analysis of the high-speed experimental flight test vehicle HEXAFly-international	Transferring an Earth-based adaptive optics technology to space telescopes
Alessandro Chiesa, Erika Manis, Emanuele Pensavalle	Élcio Jeronimo de Oliveira, Paolo Gasbarri, Ijar Milagre da Fonseca, Giovanni B. Palmerini	Francesco Battista, Daniele Cardillo, Pasquale Natale, Daniele Ricci, Mario Panelli, Manrico Fragiaco, Michele Ferraiuolo	Nunzia Favalaro, Maria Pia Di Donato, Attilio Rispoli, L. Vecchione, Johan Steelant	Marco Bevilacqua, Lorenzo Dozio, Paolo Mantegazza

Thursday Afternoon / 19 November / Oval Lingotto

Session MS9**Innovative Training Networks and Manufacturing Technologies
for Composite Structures for the Aerospace Sector:
ADMACOM, COACH and FULLCOMP European projects
Coordinated by Politecnico di Torino**

1400	1425	1450	1515	1540
Joining of SiC composites by TA alloys: wetting studies and physical-chemical characterization of interfaces	Joining of SiC-based composites with Ti_3SiC_2 using spark plasma sintering	Quantifying the physical and chemical degradation of composite materials	Development and integration of glass fibre sensors into polymer composites for applications in harsh environments	A thermal stress finite element analysis of beam structures by hierarchical modelling
Fabrizio Valenza, Sofia Gambaro, Maria L. Muolo, Alberto Passerone, Michael J. Reece, Theo Saunders, Peter Tatarko, Andreas Schmidt, Thomas Schubert, Thomas Weissgaerber	Peter Tatarko, Valentina Casalegno, Theo Saunders, Milena Salvo, Monica Ferraris, Michael J. Reece	Stefanos Giannis, Milena Salvo	Milena Salvo, Daniel Milanese, Monica Ferraris, Massimo Olivero, Guido Perrone, Stefanos Giannis, Roderick H. Martin, Ben Milsom	Gaetano Giunta, Salim Belouettar

Thursday Afternoon / 19 November / Oval Lingotto

Session S3**Fluid Dynamics**

1400	1425	1450	1515	
Stability analysis of three-dimensional laminar compressible boundary layers based on ray-tracing theory and multiple scale technique	Transition prediction in unsteady flow on a rotor blade in forward flight condition	Geometric data reduction in aero-shape optimization	Using a high velocity oxy-fuel torch for aerothermodynamic applications	
Raffaele S. Donelli, Donato de Rosa	Donato de Rosa, Raffaele S. Donelli	Davide Cinquegrana, Emiliano Iuliano	Antonio Esposito, Antonio Grieco, Michele Nugnes	

Thursday Afternoon / 19 November / Oval Lingotto

Session MS6**STEPS 2 - Sistemi e Tecnologie per l'esplorazione spaziale**

1400	1425	1450	1515	1540
STEPS2 Project - Precision landing for future space exploration missions	STEPS2: rover surface navigation "Enabling new robotic exploration capabilities"	Regenerative fuel cells	Virtual reality applications for re-entry vehicle aerothermal and mission analysis	New inflatable habitats generation
Carlo Maria Paccagnini, Marcello Chiaberge, Paolo Prinetto, Carlos Perez, Paolo Navone, Luigi Pantani, Daniele Camatti, Costantino Scozzafava	Andrea Biggio, Carmine Ianni, Sandro Torelli, Alessandro Sperindé, Enrico Simetti, Basilio Bona, Francesco Lamberti, Federico Salvio	Giorgio Ferrari, Stewart Pelle, Massimiliano Antonini, Paolo Maggiore, Sabina Fiorot	Manuela Marelo, Agata Marta Soccini, Lorenzo Rocci	Marco Nebiolo, Antonia Simone, Andrea Messidoro, Monica Ferraris, Erasmus Carrera, Paolo Maggiore, Donata Valletti

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Session S6**Systems, Air Traffic Management and Navigation**

1400	1425	1450	1515	1540
New algorithm for horizon detection and attitude estimation	Frequency modulated continuous wave synthetic aperture radar focusing techniques: a review in the framework of indoor autonomous operations by small unmanned aerial systems	DR-ONE: A formation flight dedicated unmanned aerial vehicle	A preliminary design study of maintenance and logistic infrastructure for male UAS*	A method intended to prevent users interaction problems in aircraft hydraulic systems*
Ignazio F. Finazzi, Vito M. Fico, Maria A. Martin Prats	Antonio F. Scannapieco, Alfredo Renga, Antonio Moccia	Alberto Rolando, Andrea Mottin, Valentina Onorato	Marco Fioriti, Luca Boggero, Sabrina Corpino, Nicole Viola	Lorenzo Borello, Matteo D.L. Dalla Vedova, Paolo Maggiore

Thursday Afternoon / 19 November / Oval Lingotto

Session S7**Helicopters**

1400	1425	1450		
Unsteady aerodynamic optimization of the camber of a morphing airfoil for rotorcraft blades	Conceptual design of a very light rotorcraft for environmental monitoring using a twin piston engine	Boundary element method for aerodynamic analysis of bluff bodies		
Andrea F. Cortesi, Francesca Fusi, Giuseppe Quaranta	Alessio Barbato, Andrea Carbonara, Giorgio Riva, Luigi Grimaldi, Salvatore Costagliola, Smaranda Chifu, Tommaso Guffanti, Giuseppe Quaranta, Roberto Papetti	Giovanni Bernardini, Giorgio Pierfederici, Jacopo Serafini, Massimo Gennaretti, Corrado Ficuciello		

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Session S14

Satellites

			1515	1540
			Satellite system cyber security, specific security needs for an uncommon environment	A simple method for accurate center of gravity determination of small satellite platforms
			Daniele Frasca, Gianluca Scialanga, Giorgio Sciascia	Dario Modenini, Lorenzo Iannascoli, Paolo Tortora

Thursday Afternoon / 19 November / Oval Lingotto	
1605 - 1630	Coffee-Break

Thursday Afternoon / 19 November / Oval Lingotto	
1630 - 1835	Parallel Sessions

Thursday Afternoon / 19 November / Oval Lingotto				
Session S11		Space		
1630	1655	1720	1745	1810
Additive manufacturing towards space applications: Qualification guidelines for a new market approach	Equatorial Italian observatory for space debris monitoring at the Broglio space center*	Development of a flexible lead-free piezoelectric transducer for health monitoring in the space environment*	The future of crew training: on ground vs. on orbit training*	Airbus Defence and Space additive manufacturing strategy implementation and development for space applications*
Ciro Borriello, Emilio Ferrari, Erika Manis, Emanuele Pensavalle	Fabio Santoni, Fabrizio Piergentili, Lorenzo Arena, Tommaso Cardona, Francesco Diprima, Giacchino Scirè, Andrea Spinetti, Armando Grossi, Federico Curianò, Claudio Canu, Claudio Portelli	Marco Laurenti, Denis Perrone, Alessio Verna, Candido F. Pirri, Alessandro Chiolerio	Serena Bertone, Rudiger Seine	Michaud Pierre, Desagulier Christian, Larnac Guy, Beyer Steffen

Thursday Afternoon / 19 November / Oval Lingotto				
Session MS9	Innovative Training Networks and Manufacturing Technologies for Composite Structures for the Aerospace Sector: ADMACOM, COACH and FULLCOMP European projects Coordinated by Politecnico di Torino			
1630	1655	1720		
Multi-mode reduced order approach for dynamic post-buckling analysis of composite panels	Dynamic response analysis of structures through component-wise models	Evaluation of damage effects on metallic and composite aerospace structures via refined models		
Eelco Jansen, Tanvir Rahman, Raimund Rolfes	Marco Petrolo, Erasmus Carrera, Gabriele De Pietro	Marco Petrolo, Erasmus Carrera, Gabriele De Pietro, Alessandro Rosati		

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Session MS6 STEPS 2 - Sistemi e Tecnologie per l'esplorazione spaziale

1630	1655	1720		
Development and manufacturing of high performance ribbons structures for the inflatable habitat module technology	STEPS 2 contributions to exploration	Smart skin developments in the STEPS2 pad project		
Andrea Messidoro, Donata Valletti, Antonia Simone, Marco Nebiolo, Carol Monticelli, Valter Carvelli, Zhengyu Fan	Maria Antonietta Perino, Piero Messidoro, Dario Boggiatto	Gaetano Poidomani, Eleonora Zeminiani, Luigi Pantani, Giampiero Benettin, Alessandro Chiolerio, Giovanni Benefazio		

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Session S6 Systems, Air Traffic Management and Navigation

1630	1655	1720	1745	
Onboard electromechanical actuators affected by short circuit of stator coils: a new prognostic method based on spectral analysis* techniques	Proposals for the regulation of unmanned air vehicle use in common airspace*	Hazard and risk assessment in ATR42/72 FQI maintenance*	The role of new production technologies and CAE in the evolution of Aerospace industry*	
Dario Belmonte, Matteo D. L. Dalla Vedova, Paolo Maggiore	Anna Masutti	Rosario A. Marretta	Raffaele Acierno, Fabio Rossetti, Marco Perillo	

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Session S14 Satellites

1630	1655	1720	1745	1810
Scheduling satellite observations to monitor illegal immigration in the Mediterranean sea	Use of LARES satellite data for Earth science	Design of a reusable space TUG*	Orbital data analysis on LARES satellite	Model reference adaptive method for microsatellite active magnetic control
Riccardo Lombardi, Mauro Massari, Francesco Topputo	Erricos C. Pavlis, Antonio Paolozzi, Ignazio Ciufolini, Claudio Paris, Giampiero Sindoni, Alessandro Gabrielli	Sara Cresto Aleina, Nicole Viola, Simona Ferraris, Maria A. Viscio	Giampiero Sindoni, Erricos C. Pavlis, Ignazio Ciufolini	Fabio Curti, Maurizio Parisse, Alessandro Salvati