

ICSS-14

14th International Conference on Sandwich Structures



Genova, Italy, 16-18 June 2025

University of Genova, Polytechnic School

<https://icss14.unige.it/>

BOOK OF ABSTRACTS



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**Università
di Genova**

PROGRAM OVERVIEW

<u>Monday 16 June</u>	<u>Tuesday 17 June</u>	<u>Wednesday 18 June</u>
8:00 - 17:30 Conference Registration	8:30 - 17:30 Conference Registration	8:30 - 13:00 Conference Registration
8:30 - 9:00 Opening session		
9:00 - 9:45 <u>General lecture</u> Prof. Leif Carlsson	9:00 - 9:45 <u>General lecture</u> Prof. Jian Xiong	9:00 - 9:45 <u>General lecture</u> Dr. Matteo Pasi
9:45 - 10:45 Session: <u>Extreme Loadings</u> Chair: Prof. D. Penumadu	9:45 - 10:45 Session: <u>Mechanics</u> Chair: Prof. M.S. Hoo Fatt	9:45 - 11:05 Session: <u>Core Material Design and Characterization</u> Chair: Dr. A. Di Renzo
10:45 - 11:15 Coffee Break	10:45 - 11:15 Coffee Break	11:05 - 11:35 Coffee Break
11:15 - 12:55 Session: <u>Design and Manufacturing</u> Chair: Prof. D. Wowk	11:15 - 12:55 Session: <u>Delamination/Disbond</u> Chair: Dr. J. Hohe	11:35 - 12:55 Session: <u>Design</u> Chair: Dr. A. Gomez
12:55 - 14:00 Lunch	12:55 - 14:00 Lunch	12:55 - 13:25 Closing Session
14:00 - 14:45 <u>General lecture</u> Dr. F. Hähnel and Dr. R. Schäuble	14:00 - 14:45 <u>General lecture</u> Prof. Laura Galuppi	
14:45 - 16:05 Session: <u>Thermoplastic Sandwich Structures</u> Chair: Prof. P. Casari	14:45 - 16:05 Session: <u>Applications</u> Chair: Prof. C. Berggreen	
16:05 - 16:35 Coffee Break	16:05 - 16:35 Coffee Break	
16:35 - 17:55 Session: <u>Delamination/Debond</u> Chair: Dr. R. Schäuble	16:35 - 17:15 Session: <u>Thermal and Environmental Effects</u> Chair: Prof. I. Monetto	
19:30 Welcome Cocktail at the Blu Marlin Passeggiata Anita Garibaldi 12r, Genova Nervi Outbound trip (bus transfer): Pick-Up Time: 18.45; Meeting Point Piazza De Ferrari. Return trip (by train)	17:30 ICSS International Scientific Committee Meeting 20:00 Banquet at Palazzo Pallavicino Piazza delle Fontane Marose 2	

Monday 16 June

8:00 - 17:30	Conference Registration
8:30 - 9:00	Opening Session
9:00 - 9:45	General lecture In Search of Good Sandwich <i>Prof. Leif Carlsson, Florida Atlantic University</i>
Session Extreme Loadings <i>Chair: Prof. D. Penumadu</i>	
9:45 - 10:05	RESPONSE OF FLAT AND CURVED SANDWICH COMPOSITE PANELS SUBJECTED TO A NEAR-FIELD UNDERWATER EXPLOSION <i>A. Shukla, S. Jain, A. Pandey</i>
10:05 - 10:25	BEHAVIOR OF PVC FOAMS UNDER A WIDE ENVIRONMENTAL TEMPERATURE RANGE <i>M.S. Hoo Fatt, A.R. Vedire</i>
10:25 - 10:45	INVESTIGATING STATIC COMPRESSION PRELOADS ON THE IMPACT BEHAVIOUR OF HONEYCOMB SANDWICH STRUCTURES <i>C. Fischer, F. Hähnel, K. Wolf, J. Markmiller</i>
10:45 - 11:15	Coffee Break
Session Design and Manufacturing <i>Chair: Prof. D. Wowk</i>	
11:15 - 11:35	PEI HONEYCOMB CORES WITH WAVY CELL WALL GEOMETRY <i>J. Pflug, F. Zerling, G. Kravchenko, W. Winant</i>
11:35 - 11:55	METHODS FOR THE DESIGN AND MANUFACTURING OF TAILORED HONEYCOMB CORES (THC) <i>P. Engel, C. Fischer, F. Hähnel, J. Markmiller</i>
11:55 - 12:15	DESIGN AND SIMULATION OF A FOLDED SANDWICH CORE STRUCTURE FOR NEAR-SURFACE FLUID TRANSPORT IN AIRCRAFT SKIN HEAT EXCHANGERS <i>S. Thissen, P. Middendorf</i>
12:15 - 12:35	SURFACE MATCHING DESIGN AND SHAPE-FORMING DAMAGE ANALYSIS OF CARBON FIBER COMPOSITE HONEYCOMB <i>X. Wei, J. Xiong</i>
12:35 - 12:55	INNOVATIVE DESIGN STRATEGIES FOR RECYCLING OF SANDWICH STRUCTURES <i>H. Eggenschwiler, S. Laffranchini, J. Vitoria</i>
12:55 - 14:00	Lunch

14:00 - 14:45	General lecture Sandwich Disbond - Fracture Mechanics Model and Micromechanics of Damage <i>Dr. F. Hähnel, TU Dresden, Dr. R. Schäuble, Fraunhofer IMWS</i>
	Session Thermoplastic Sandwich Structures <i>Chair: Prof. P. Casari</i>
14:45 - 15:05	SANDWICH STRUCTURES CONSIDERING INFUSIBLE THERMOPLASTICS <i>D. Penumadu, Z. Arwood</i>
15:05 - 15:25	THERMOFORMING OF NOVEL HONEYCOMB CORE SANDWICH STRUCTURES BASED ON HIGH PERFORMANCE THERMOPLASTICS <i>B. Borowitz, R. Schäuble, R. Schlimper, F. Zerling, J. Pflug, M. Feldmann</i>
15:25 - 15:45	TEMPERATURE-DEPENDENT FAILURE MECHANISM OF THERMOPLASTIC HONEYCOMB SANDWICHES UNDER SHEAR DOMINATED 4-POINT BENDING LOAD <i>A. Horn, C. Berggreen, A. Gomez, B. Legarth</i>
15:45 - 16:05	MECHANICAL PROPERTIES AND FABRICATION OF RECOVERABLE THERMOPLASTIC SANDWICH STRUCTURES WITH CIRCULAR HONEYCOMB CORES USING A CONTINUOUS APPROACH <i>Q. Fu, J. Xiong</i>
16:05 - 16:35	Coffee Break
	Session Delamination/Debond <i>Chair: Dr. R. Schäuble</i>
16:35 - 16:55	COMPUTATIONAL INVESTIGATION OF DISBOND PROPAGATION IN HONEYCOMB-CORE SANDWICH PANELS UNDER GROUND-AIR-GROUND PRESSURIZATION AND COMPLEX IN-PLANE LOADING <i>A. Gomez, C. Berggreen</i>
16:55 - 17:15	EXPERIMENTAL ANALYSIS OF DISBOND GROWTH IN SANDWICH PANELS SUBJECTED TO GROUND-AIR-GROUND PRESSURIZATION <i>S. Chava, A. Gomez, C. Berggreen</i>
17:15 - 17:35	A FATIGUE FRACTURE TEST METHODOLOGY USING THE SANDWICH DCB-UBM TEST SPECIMEN <i>M. Manouchehr, C. Berggreen, E.A.G. Meisel</i>
17:35 - 17:55	FRACTURE BEHAVIOR AND DAMAGE PROPAGATION IN IMPACTED AEROSPACE SANDWICH PANELS: A NUMERICAL AND EXPERIMENTAL INVESTIGATION <i>C. Berggreen, A. Gomez</i>
19:30	Welcome Cocktail Blu Marlin - Passeggiata Anita Garibaldi 12r, Genova Nervi Outbound trip (bus transfer): Pick-Up Time: 18.45; Meeting Point Piazza De Ferrari Return trip (by train)

Tuesday 17 June

8:30 - 17:30	Conference Registration
9:00 - 9:45	General Lecture Mechanics of Carbon Fiber Composite Sandwich Materials and Structures <i>Prof. Jian Xiong, Harbin Institute of Technology</i>
	Session Mechanics <i>Chair: Prof. M.S. Hoo Fatt</i>
9:45 - 10:05	UNCERTAINTY IN THE RESPONSE OF ALL-ALUMINUM SANDWICH BEAMS LOADED IN BENDING AND SHEAR MODES – AN EXPERIMENTAL INVESTIGATION <i>J. Hohe, C. Beckmann</i>
10:05 - 10:25	FAILURE ANALYSIS IN BENDING OF SINGLE-FACE HONEYCOMB CORE SANDWICH BEAMS <i>L.A. Carlsson, M.O. Ayanoglu</i>
10:25 - 10:45	T-STRESSES IN END-LOADED BIMATERIAL ISOTROPIC STRIPS <i>I. Monetto, K. Ustinov, R. Massabò</i>
10:45 - 11:15	Coffee Break
	Session Delamination/Disbond <i>Chair: Dr. J. Hohe</i>
11:15 - 11:35	FATIGUE DISBOND GROWTH RATE OF SANDWICH MATERIAL WITH VERY THIN FACESHEETS – COMPARISON OF EXPERIMENTAL APPROACHES <i>R. Schäuble, N. Falke, M. John</i>
11:35 - 11:55	CRACK KINKING PREDICTION IN CARBON FIBER/PMI FOAM SANDWICH STRUCTURES <i>C. Contaldi, C. Berggreen, B.N. Legarth, R. Massabò</i>
11:55 - 12:15	NUMERICAL MODELLING OF INTERFACE DELAMINATION IN SANDWICH COMPOSITE STRUCTURES <i>M. Schiera, C. Bisagni</i>
12:15 - 12:35	ASSESSMENT OF ONE-DIMENSIONAL MODELS FOR THE EVALUATION OF BOUNDARY EFFECTS IN SANDWICH FRACTURE SPECIMENS <i>S. Scelza, R. Massabò</i>
12:35 - 12:55	MODELING DELAMINATION AND KINKING IN SANDWICH SPECIMENS <i>R. Massabò</i>
12:55 - 14:00	Lunch
14:00 - 14:45	General Lecture Structural Analysis and Design of Composite Glass Elements: Analytical Methods and Engineering Applications <i>Prof. Laura Galuppi, University of Parma</i>

Session Applications <i>Chair: Prof. C. Berggreen</i>	
14:45 - 15:05	TESTING FOR EFFECTS OF EDGE PROXIMITY IN DENTED HONEYCOMB SANDWICH PANELS D. Wowk, P. Wheeler
15:05 - 15:25	DESIGN AND ANALYSIS OF PULL-OUT TESTS FOR INSERTS IN THERMOPLASTIC COMPOSITE SANDWICH PANELS M. Hojjati, S. Mandegarian, A. Yeganeh, H. Moghaddar
15:25 - 15:45	A SANDWICH STRUCTURE APPROACH TO STABILITY ANALYSIS OF ORTHODONTIC BRACKETS B. Azarov, O. Rabinovitch
15:45 - 16:05	DETERMINATION OF THE TORSIONAL AND WARPING STIFFNESS OF SANDWICH STRUCTURES BASED ON EQUIVALENT CROSS-SECTIONS E.M. Pradhan, F. Rädcl, J. Lange
16:05 - 16:35	Coffee Break
Session Thermal and Environmental Effects <i>Chair: Prof. I. Monetto</i>	
16:35 - 16:55	CHARACTERIZATION OF CYCLIC HYGROTHERMAL SWELLING AND SHRINKAGE BEHAVIOR OF Balsa WOOD AND GFRP-Balsa SANDWICH STRUCTURES P. Casari, Y. Wu, J. Fajoui, S. Fréour, M. Bouziane
16:55 - 17:15	FACE DELAMINATIONS AND BLISTERING IN PIR-CORE SANDWICH PANELS: INFLUENCE OF TIME, TEMPERATURE AND PRODUCTION PARAMETERS A. Schardt, F. Rädcl, J. Lange
17:30	ICSS International Scientific Committee Meeting
20:00	Banquet at Palazzo Pallavicino Piazza delle Fontane Marose 2

Wednesday 18 June

8:30 - 13:00	Conference Registration
9:00 - 9:45	General Lecture Sandwich panels in LHD structures <i>Dr. Matteo Pasi, Leonardo Helicopter Division</i>
Session Core Material Design and Characterization <i>Chair: Dr. A. Di Renzo</i>	
9:45 - 10:05	EFFECT OF SANDWICH CONFIGURATION ON THE LATERAL STABILITY OF SANDWICH BEAMS WITH INNER SUPPORTS <i>A. Wurf, Y. Frostig, O. Rabinovitch</i>
10:05 - 10:25	FATIGUE PROPERTIES OF NOMEX® HONEYCOMB CELL WALL MATERIAL <i>F. Hähnel, S. Gebhardt, C. Fischer, J. Markmiller</i>
10:25 - 10:45	LOCAL AND GLOBAL BUCKLING OF SANDWICH CELL WALLS IN HIERARCHICAL SANDWICH HONEYCOMB CORES <i>N. Michel, F. Zerling, G. Kravchenko, J. Pflug, H. Georges, C. Mittelstedt</i>
10:45 - 11:05	THERMOPLASTIC HONEYCOMB CORES WITH COEXTRUDED SANDWICH CELL WALLS <i>R. Zarnekow, F. Zerling, G. Kravchenko, J. Pflug</i>
11:05 - 11:35	Coffee Break
Session Design <i>Chair: Dr. A. Gomez</i>	
11:35 - 11:55	DEVELOPMENT OF SUSTAINABLE AIRCRAFT FLOOR PANELS MADE OF FOAM/CORK CORE AND rCF-NON-CRIMP-FABRICS <i>A. Dimassi, R. Emmerich, C. Klemm, D. May</i>
11:55 - 12:15	BONE-INSPIRED DESIGN FOR DAMAGE MITIGATION <i>N. Bahrami Novin, A. Stagni, L. Musenich, F. Caronna, F. Libonati</i>
12:15 - 12:35	MULTI-MATERIAL FUSED FILAMENT FABRICATION PRINTING FOR LIGHTWEIGHT SANDWICH STRUCTURES <i>P.R. Barnett, I. Mellinger, M. Vranes, V. Chawla</i>
12:35 - 12:55	NUMERICAL EVALUATION OF SANDWICH MECHANICAL METAMATERIALS STRUCTURES <i>E.E. Theotokoglou, P.N. Lympieropoulos</i>
12:55 - 13:25	Closing Session