

# NEW MATERIALS FOR APPLICATIONS IN AEROACOUSTICS

## 23<sup>rd</sup> Workshop of the Aeroacoustics Specialists Committee of the CEAS

26-27 September 2019 – Roma Tre University, Department of Engineering

Day 1 - Thursday, 26 September 2019			Day 2 – Friday, 27 September 2019		
08:30	Welcome and registration				
09:15	Workshop opening				
09:30	<b>Keynote 1</b>	<b>Wim Desmet</b> "Locally resonant vibro-acoustic metamaterials for compact lightweight noise control engineering solutions"	9:30	<b>Keynote 3</b>	<b>Estelle Piot</b> "Example of advanced identification techniques and design tools applied to innovative aeroacoustic liners"
	<b>Session 1: Theoretical and Numerical Modeling 1</b> <b>Chair: Lorenzo Burghignoli, Roma Tre University</b>			<b>Session 4: Manufacturing and Experimental Assessment</b> <b>Chair: Mahdi Azarpeyvand, University of Bristol</b>	
10:15	S. Palleja-Cabre, B. J. Tester, R. Jeremy Astley, H. Bériot "Fan noise suppression with Over-Tip-Rotor liners: impedance modelling of acoustically treated circumferential grooves"		10:15	D. Radulescu, M. Deaconu "Experimental validation of an ultra open metamaterial which uses the acoustic black hole principle"	
10:35	A. Coutant, Y. Auregan, V. Pagneux "Slow-sound laser in lined flow ducts"		10:35	H. Bodén, S. Sack, and S. Jacob "A Study on 3D-printed and Segmented Liners"	
10:55	H. Bodén, Z. Zhang and M. Åbom "Application of Slow Sound in Ducts"		10:55	L. Dowling, D. Heaphy, D. Trimble, J. Kennedy "Repeatability in additive manufacturing for metamaterials"	
11:15	BREAK		11:15	BREAK	
11:45	A. Celik, A. Gautam and M. Azarpeyvand "Wavefront Manipulation by Fractal Space-Coiling Acoustic Metamaterials"		11:45	K. Knobloch, F. Bake, and L. Enghardt "Flexible Walls for Acoustic Liners"	
12:05	L. Burghignoli and G. Palma "On the integration of acoustic phase-gradient metasurfaces in aeronautics"		12:05	G. J. Bennett, R. Hossain and A. McKay "Squeeze Film Dynamic Resonator acting as an Acoustic Diode Metamaterial"	
12:25	L. Flanagan, H. Rice, J. Kennedy "Modelling approaches of acoustic absorptive meta-structures using viscothermal and reduced order models"		12:25	T. Humbert, M.E. d'Elia, R. Delalande, G. Gabard, J. Golliard and Y. Aurégan "Performance of Kumaresan-Tufts and Matrix Pencil algorithms for direct impedance education of liners: some numerical experiments and Laser Doppler Velocimetry measurements"	
12:45	LUNCH		12:45	LUNCH	
14:00	<b>Keynote 2</b>	<b>Wonju Jeon</b> "Acoustic metamaterials and metasurfaces: effects of flow and visco-thermal losses"	14:00	<b>Keynote 4</b>	<b>Francesco Asdrubali</b> "Sustainable materials and metamaterials for acoustic applications"
	<b>Session 2: Theoretical and Numerical Modeling 2</b> <b>Chair: John Kennedy, Trinity College Dublin</b>			<b>Session 5: Active and Tunable Concepts</b> <b>Chair: Hervé Lissek, EPFL</b>	
14:45	H. Mao, P. Göransson "An Inverse Method for Characterization and Design of Acoustic Metamaterials"		14:45	H. Lissek, R. Boulandet, S. Karkar, M. Collet, G. Matten, M. Ouisse and M. Versaavel "Active SDOF Electroacoustic Metamaterial for use as an Adjustable Acoustic Liner for Engine Noise Reduction"	
15:05	U. Iemma, M. Carley, P. Göransson, "An Integrated Approach to the Theoretical and Numerical Modelling of Metamaterials for Aeroacoustics"		15:05	G. J. Bennett, A. Fossorier "Tunable Acoustic Absorption of a Spherical Elastomeric Monopole with Negative Bulk Modulus."	
15:25	I. Bashir, C. Courtney, M. Carley "Development of Novel, Light-weight and Multifunctional Acoustic Metamaterials/Metasurfaces for Aeronautical Applications using 3D BEM"		15:25	Y. Auregan, M. Farooqui and M.E. D'Elia "Ultra-Thin and In-Parallel perfect sound absorbers"	
15:45	C. Sandu, M. Deaconu "Advanced Considerations on Using the Vacuum as a Material in Aeroacoustics"		15:15	Y. Auregan, M. E. D'Elia, and T. Humbert "Effect of flow on the acoustic behavior of a vibrating cantilever beam liner"	
16:05	A. McKay, I. Davis, G. J. Bennett "An optimized sub-wavelength segmented membrane sound absorber"		15:45	END OF THE WORKSHOP	
16:25	BREAK				
16:55	<b>Session 3: T.E. noise mitigation. Chair: Lars Enghardt, DLR</b>				
17:15	L. Rossian, R. Ewert, J.W. Delfs "Numerical Investigation of Porous Materials for Trailing Edge Noise Reduction"				
17:35	K.S. Rossignol, A. Suryadi, M. Herr, J. Schmidt "Experimental Investigation of Porous Materials for Trailing Edge Noise Reduction"				
18:00	C. Teruna, F. Avallone, D. Ragni, D. Casalino, A. Rubio-Carpio "Trailing Edge Noise Reduction with Permeable Materials: Description of Noise Scattering Mechanism"				
18:20	A. Rubio Carpio, S. Luesutthiviboon, R. Hedayati, F. Avallone, D. Ragni, M. Snellen, S. van der Zwaag "Broadband Trailing Edge Noise Reduction with Porous Media: 3D-printed Permeable Trailing Edges"				
	END OF DAY 1				
20:00	WORKSHOP DINNER				