

CURRICULUM VITAE

Personal information

Name and Lastname	Fabio Auriemma
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E-mail	...
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Nationality	...
Date of birth	...
Residence	...

Education

Ph.D. (2012)	Ph.D. in “Engineering of Mechanical systems”, University Federico II di Napoli, Faculty of Mechanical Engineering. Thesis: “The acoustics of automotive mufflers: 1D-3D BEM analyses, experimental validation and optimization”.
University degree (2007)	<i>Cum laude</i> degree in Mechanical Engineering, University Federico II di Napoli, Faculty of Mechanical Engineering. Thesis: “Use of numerical methods for combustion noise characterization of a 2-stroke diesel engine for aeronautic applications”.

Professional experiences

15 <sup>th</sup> May 2024-present	Full-time research scientist (contractual denomination Ricercatore di livello III) in CNR-SPIN, Italy, with research focus on detection of quantum state of light. The research project is framed within the National Quantum Science and Technology Institute – Spoke 4 – and funded by the National Recovery and Resilience Plan (PNRR).
2019-Feb. 2024	Full-time senior researcher at Tallinn University of Technology, Department of Mechanical and Industrial Engineering, School of Engineering, Tallinn, Estonia. The research activity has been focussed on the study of sound wave propagation in porous media, waveguides, and acoustic metamaterials.. Thermoacoustics has been proposed as both a pathway to wave manipulation by breaking reciprocity of acoustic waveguides, and as a mean for acoustic-based green heat engines and refrigerators. The teaching activity involves delivering lectures in two study courses, i.e. “Modelling and Testing of Products and Processes”, and “Hydraulics and Pneumatics”.
2014-2019	Full-time research scientist at Tallinn University of Technology, Department of Mechanical and Industrial Engineering, School of Engineering. The research activity included investigating new solutions for sound control in duct-acoustics applications, studying the interaction of acoustic waves with a turbulent gaseous flow, and creating an optimization procedure to improve the vibro-acoustic behaviour of glass windows by maximizing the sound transmission loss. Teaching activities consisted of lecturing and tutoring students for the course of Modelling and Testing of Products and Processes.

2012-2014	Post-doctoral fellow at Tallinn University of Technology, Department of Mechanical and Industrial Engineering, School of Engineering. The research project, titled "Micro-grooved panels: a novel technology for effective noise cancellation", was financed by Estonian Research MObility Scheme (with a support of FP7 Marie Curie COFUND). The project aimed at developing a new typology of multi-layered non-fibrous sound absorptive panel, which was based on surface resistance and realized by means of a cost-effective technological process.
2007-2009 (prior to doctoral studies)	External Technical consultant for Fiat Powertrain Technologies (FPT), Technical Services, Mirafiori, Turin and Elasis-Fiat Powertrain Technologies (FPT), Gasoline Engineering, Pomigliano d'Arco, Naples. In Turin, the main tasks included drafting technical specifications for experimental facilities used to develop new internal combustion engines, e.g. engine-bench components. In Pomigliano, the main goals were data collection and testing in Emission Laboratory, support in dyno test bench activities and in calibration of Electronic Central Units.
<b>Competitive Grants</b>	
2012-2014	Estonian Research Mobility Scheme grant co-financed by Marie-Curie FP7 Actions. Total amount granted: 51200 EUR. See professional experiences.
2014-2017	Estonian Development Fund. The research scheme supported my activity as a Researcher in Tallinn University of Technology with a project titled "Micro-perforated locally resonant acoustic materials: a combined approach for noise control". Total amount granted: 208834 EUR. See professional experiences. The fund allowed to employ a post-doctoral student to support laboratory activities.
<b>Participation in research projects</b>	
2015-2022	"Zero energy and resource efficient smart buildings and districts" (Principal investigator: prof. J. Kurninski).
2021-2023	"Additive manufacturing of bio-material for food waste" (Principal investigator: prof. P. Konda Gokuldoss).
2020	"Smart micro-perforated silencer for heat, ventilation and air conditioning systems" (Principal investigator: prof. J. Lavrentjev).
2016-2019	"Numerical methods and algorithms for design of advanced composite and nanostructures" (Principal investigator: prof. J. Majak).
2015-2019	"Smart manufacturing and materials technologies competence centre" (Principal investigator: prof. K. Karjust).
<b>Teaching activities</b>	
Date	2015-present
Activities	Lecturing and tutoring - Course of Modelling and Testing of Products and Processes (Department of Mechanical and Industrial Engineering, School of Engineering).
Date	2023-present
Activities	Lecturing and tutoring - Course of Hydraulic and Pneumatics (same institution as above).
Activities	Supervision of 1 post-doctoral student, 1 visiting doctoral student and 1 master student.
<b>Reviewing activities</b>	
	Reviewer for several journals: Scientific reports (Nature), The Journal of Acoustical Society of America, Sustainability (MDPI), Journal of Zhejiang university - Science A, Building Acoustics (SAGE), Acoustics Australia, Proceedings of the Estonian Academy of Sciences.
<b>Major collaborations</b>	
2019-present	R. Dragonetti (prof.), R. Romano (prof.), Department of Industrial Engineering, Universita' degli Studi di Napoli Federico II, Italy. Research collaboration. Characterization of porous materials for both noise control and thermoacoustic applications, novel experimental techniques in acoustics.

2021-2022	M. Di Sciuva (prof.), M. Sorrenti (PhD), Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Italy. Research collaboration. Numerical models for structural mechanics.
2018-2019	M. Antonov (PhD), D. Gomov, Tallinn University of Technology, Estonia and ABB, Estonia. Research collaboration. Impact-abrasive wear of polycrystalline diamond (vibrational test and signal processing).
2017-2018	R. Aiello (PhD), Department of Industrial Engineering, Università degli Studi di Napoli Federico II, Italy. Research collaboration/Supervision. Vibro-acoustic optimization of hanged glass panels.
2016	M. Åbom (prof.), R. Kabral (PhD), KTH, School of Industrial Engineering and Management (ITM), Centres, Competence Center for Gas Exchange (CCGEx), Stockholm, Sweden. Research collaboration: / Development of a compact silencer for automotive applications.

## Peer-reviewed papers

- Auriemma, F. (2024). Low-frequency non-reciprocal propagation features in thermoacoustic waveguide. *The Journal of the Acoustical Society of America*, 156(1), 314-325, doi: 10.1121/10.0026453.
- Napolitano, M.; Di Giulio, E.; Auriemma, F.; Romano R. A.; Dragonetti, R. (2022). Low frequency acoustic method to measure the bulk modulus of porous materials. *The Journal of the Acoustical Society of America*, 151(3), 1545-1556, doi: 10.1121/10.0009767.
- Di Giulio, E.; Auriemma, F.; Napolitano, M.; Dragonetti, R. (2021). Acoustic and thermoacoustic properties of an additive manufactured lattice structure. *The Journal of the Acoustical Society of America*, 149 (6), 3878-3888, doi: 10.1121/10.0005085.
- Sorrenti, M.; Di Sciuva M.; Majak J.; Auriemma, F. (2021). Static response and buckling loads of multi-layered composite beams using the refined Zig-Zag theory and Higher Order Haar Wavelet Method, *Mechanics of Composite Materials*, 57 (1), doi: 0191-5665/21/5701-0001.
- Auriemma, F.; Giulio, E. Di; Napolitano, M.; Dragonetti, R. (2020). Porous Cores in Small Thermoacoustic Devices for Building Applications. *Energies*, 13 (11), 2941. doi: 10.3390/en13112941.
- Auriemma, F.; Holovenko, Y. (2019). Performance of Additive Manufactured Stacks in a Small Scale Thermoacoustic Heat Engine. *SAE Technical Paper Series*, Technical paper 2019-01-1534, doi: 10.4271/2019-01-1534.
- Gomon, D.; Auriemma, F.; Antonov, M. (2019). Assessment of abrasive powder behaviour during impact-abrasive wear of PCD elements. *Wear*, 426-427 Part A, 151-161, doi: 10.1016/j.wear.2019.03.024
- Auriemma, F.; Holovenko, Y. (2019). Use of Selective Laser Melting for Manufacturing the Porous Stack of a Thermoacoustic Engine. In: *Modern Materials and Manufacturing 2019* (246-251). Trans Tech Publications, doi:10.4028/www.scientific.net/KEM.799.246.
- Aiello, R.; Auriemma, F. (2018). Optimized vibro-acoustic design of suspended glass panels. *Structural and Multidisciplinary Optimization*, 58 (5), 2253-2268, doi: 10.1007/s00158-018-2014-3.
- Auriemma, F. (2017). Acoustic performance of micro-grooved elements. *Applied Acoustics*, 122 (6), 128-137, doi: 10.1016/j.apacoust.2017.02.019.
- Auriemma, F. (2017). Study of a new highly absorptive acoustic element. *Acoustics Australia*, 45 (2), 411-419, doi: 10.1007/s40857-017-0087-6.
- Auriemma, F. (2017). A double-layer acoustic absorber as potential substitute for traditional micro-perforated elements. *Proceedings of meetings on acoustics Acoustical Society of America*, 141 (5), 3872-3883, doi: 10.1121/1.4988656.
- Tiikoja, H.; Auriemma, F.; Lavrentjev, J.; (2016). Damping of Acoustic Waves in Straight Ducts and Turbulent Flow Conditions. *SAE Technical Paper Series*, Technical paper 2016-01-1816, doi: 10.4271/2016-01-1816.
- Auriemma, F.; Tiikoja, H. (2015). On the Acoustic Impedance of a Fibreless Sound Absorptive Element. *SAE International Journal of Engines*, 8 (5), 2268-2275, doi: 10.4271/2015-24-2462.
- Auriemma, F.; Rämmal, H.; Lavrentiev, J. (2014). Extended Investigations on Micro-Grooved Elements - A Novel Solution for Noise Control. *SAE International Journal of Materials and Manufacturing*, 7 (1), 184-194, doi: 10.4271/2013-24-0068.
- Siano, D.; Bozza, F.; Auriemma, F. (2013). Acoustic and fluid-dynamic optimization of an automotive muffler. *Proceedings of the Institution of Mechanical Engineers Part D. Journal of Automobile Engineering*, 227 (5), 735-747, doi: 10.1177/0954407012465689.
- Auriemma, F.; Rämmal, H.; Lavrentiev, J. (2013). Application of Novel Micro-Grooved Elements to Small Engine Silencer. *SAE Technical Paper Series*, Technical paper 2013-32-900, doi: 10.4271/2013-32-9001.

Auriemma, F.; Rämmal, H.; Lavrentjev, J. (2013). Micro-Grooved Elements - A Novel Solution for Noise Control. *SAE International Journal of Materials and Manufacturing*, 6 (3), 599-610, doi: 10.4271/2013-01-1941.

Kabral, R.; Rämmal, H.; Auriemma, F.; Luppini, J.; Koiv, R.; Tiikoja, H.; Lavrentjev, J. (2012). A Novel Design for Cruiser Type Motorcycle Silencer Based on Micro-Perforated Elements. *SAE Technical Paper Series*, Technical paper 2012-32-0109, doi: 10.4271/2012-32-0109.

Kabral, R.; Rämmal, H.; Lavrentjev, J.; Auriemma, F. (2011). Acoustic Studies on Small Engine Silencer Elements. *SAE Technical Paper Series*, Technical paper 2011-32-0514, doi: 10.4271/2011-32-0514.

Siano, D.; Auriemma, F.; Bozza, F.; Rämmal, H. (2011). Validation of 1D and 3D Analyses for Performance Prediction of an Automotive Silencer. *SAE Technical Paper Series*, Technical paper 2011-24-0217, doi: 10.4271/2011-24-0217.

Siano, D.; Bozza, F.; Auriemma, F. (2010). Pros and Cons of Using Different Numerical Techniques for Transmission Loss Evaluation of a Small Engine Muffler. *SAE Technical Paper Series*, Technical paper 2010-32-0028, doi: 10.4271/2010-32-0028.

## Conference papers

Auriemma, F. (2023). Non-reciprocal propagation in an acoustic waveguide with a thermally graded porous core. AIP Publishing, Modern Materials and Manufacturing 2023, Tallinn, Estonia

Di Giulio, E.; Napolitano, M.; Auriemma, F.; Romano, R.A.; Dragonetti, R. (2021). Low frequency acoustic method to measure static thermal permeability. SAPEM 2020+1, 6<sup>th</sup> Triennial Symposium on the Acoustics of Poro-Elastic Materials, online event.

Auriemma, F.; Liu, L. (2021). Acoustic performance of an additive manufactured lattice structure. 1140. IOP Conference Series: Materials Science and Engineering, 1-6. Modern Materials and Manufacturing Conference (MMM 2021), 27th-29th April 2021, Tallinn, Estonia.

Auriemma, F.; Napolitano, M.; Elio, Di G.; Dragonetti, R. (2020). Criteria for the selection of porous cores for thermoacoustic applications. Proceedings of 2020 International Congress on Noise Control Engineering, INTER-NOISE 2020, online event.

Auriemma, F. (2019). Genetic Algorithm vs Finite Differences in an Optimization Procedure Including FEM with Fixed Mesh. 16th International Conference of Numerical Analysis and Applied Mathematics, 13-18 September, Rhodes, Greece.

Majak, J.; Anton, J.; Õunapuu, E.; Auriemma, F.; Pohlak, M.; Eerme, M.; Klauson, A. (2019). Experimental Evaluation and Numerical Modelling Residual Stresses in Glass Panel. 2018 International Conference on Materials Science and Manufacturing Engineering (MSME 2018), Paris, France.

Auriemma, F.; Aiello, R. (2018). Optimal holder configurations for suspended glass panels. 25th International Congress on Sound and Vibration, 8-12 July 2018: 25th International Congress on Sound and Vibration, 8-12 July 2018, Hiroshima, Japan.

Moezzi, R. Auriemma, F. (2018). Observation of Nonlinear Vibro-Acoustic phenomena in the Presence of Elastic Membrane with Different Boundary Conditions. The Euronoise2018 Proceedings. FORTH-IACM, 2645-2652, Crete, Greece.

Majak, J.; Pohlak, M.; Õunapuu, E.; Auriemma, F.; Rämmal, H.; Saarts, S. (2016). Analysis and design of multifunctional laminated glass composite structures. ICCE proceedings: 24th Annual International Conference on Composites and Nano Engineering, Shanghai, China.

Luppini, J.; Auriemma, F. (2014). Acoustic studies on porous sintered powder metals. Proceedings of the 9th International Conference of DAAAM Baltic Industrial Engineering : 24-26st April 2014, Tallinn, Estonia.

Kabral, R.; Auriemma, F.; Knutsson, M.; Åbom, M. (2014). A new type of compact silencer for high frequency noise. Proceedings of the 9th International Conference of DAAAM Baltic Industrial Engineering : 24-26st April 2014, Tallinn, Estonia.

Kabral, R.; Rämmal, H.; Lavrentjev, J.; Auriemma, F. (2011). A complete acoustic analysis on the passive effect of small engine silencer elements 1: 18th International Congress on Sound and Vibration 2011, ICSV 2011; Rio de Janeiro; Brazil.

Siano, D.; Auriemma, F.; Bozza, F. (2009). A correlation study of computational techniques of a three-pass perforated tube muffler including FEM and 1D methods. Sustainable Energy Beyond 2020: Proceedings of the 3rd International Conference on Sustainable Energy Environmental Protection; Dublin, Ireland.

**Bibliometric data**

- Google Scholar: <https://scholar.google.it/citations?user=EEmP3rYAAAAJ&hl=it>
- Scopus: Author ID: 55535430300.
- ORCID ID: [orcid.org/0000-0002-8305-0884](https://orcid.org/0000-0002-8305-0884).
- Researchgate: [https://www.researchgate.net/profile/Fabio\\_Auriemma](https://www.researchgate.net/profile/Fabio_Auriemma)

**Patent application**

F. Auriemma, "Elemento fonoassorbente costituito da strati con scavi passanti e solchi dissipativi superficiali", Patent number NA2012A000012.

**Spoken languages**

Mother tongue Italian

Other language English (fluent), Estonian (intermediate)