

 **Diplomas & Degrees**

- 03/2022 – **Ph.D. Acoustics**, Université Polytechnique Hauts-de-France, Valenciennes, France
Ultrasonic imaging of contact defects under low frequency loading: application for SHM of elastic plates
Advisors: Pr. Emmanuel Moulin, Dr. Hab. Vladislav Aleshin, Dr. Lynda Chehami
- 06/2018 — **M.Sc. Physics (with honors, GPA = 4.9/5)**, Lomonosov Moscow State University, Moscow, Russia
Specialization: Physical and Applied Acoustics
Formation of a vortex ultrasonic beam in liquids by passing an acoustic wave through a phase plate of variable thickness
Advisor: Pr. Oleg A. Sapozhnikov

 **Research Experience**

- 01/04/2026–now – **Postdoc, Laboratory of Mechanics and Acoustics (LMA), Aix Marseille University**
(Supervisors: Dr. Hab. Sandrine Rakotonarivo, Dr. Renaud Cote, Frederic Michel (CEA))
 - Passive imaging of cylinder vibrating in water for nondestructive testing application
- 01/05/2025–02/03/2026 – **Postdoctoral Researcher, IEMN, University of Lille**
(Supervisor: Dr. Marco Miniaci)
 - Dynamical characterization of diatoms for bio-inspired acoustic metamaterials design: numerical (transient FEM simulation) and experimental (laser vibrometry, laser picoacoustics)
 - Experimental validation of elastic metamaterial design for mitigation of earthquakes (design of lab-scale experiment to test Surface Acoustic Waves suppression, laser vibrometry)
- 09/2022 – 02/2025 – **Postdoctoral Researcher, Laboratory of Acoustics of Le Mans University (LAUM)**
(Supervisors: Dr. Hab. Vladislav Aleshin, Dr. Mathieu Chekroun, Dr. Hab. Vincent Tournat)
 - Experiments on wave propagation in plastic kirigami strip for acoustic blackhole design (kirigami fabrication with laser cutting, laser vibrometry)
 - Experiments on moving objects on a vibrating beam with Lamb waves
 - Semi-analytical modeling of deformable sphere dynamics on a substrate excited with Rayleigh wave: friction-driven object manipulation with acoustic waves
 - FEM modeling of guided waves propagation along boreholes with for carbon sequestration
- 11/2018 – 03/2022 – **Ph.D. Student, Institute of Electronics, Microelectronics and Nanotechnologies**
 - Pump-probe experiments on nonlinear contact defect detection in a thin plate with piezoceramic transducers array and a shaker
 - Original signal processing for baseline-free defect detection: delay-and-sum beamforming with dispersion compensation for slowly modulated defect in pump-probe experiment where probe is 1) series of ultrasonic pulses of 2) diffuse field
 - Semi-analytical modeling for frictional contact response to flexural wave incorporated into FEM-model
- 09/2014 – 06/2018 – **Research Assistant, Laboratory of Industrial and Medical Ultrasound**
 - Original experiment for generation of a vortex ultrasound beam in water using a specific phase plate and acoustic holography
 - FEM modeling for vortex ultrasound beam formation in liquid

 **Teaching experience**

Year	Subject	Level	Type	Number of hours
2017-2018	Introduction to experimental techniques (DC electrical circuits)	L1	TP	18h
2019-2020, 2020-2021	Modeling and simulation of mecatronic systems	4th year engineers	TP	36h
2023-2024	Vibrations	L3	TP	24h
2023-2024	Acoustics	L2	TP	12h
Total				90h

Skills

- **Acoustic experiment:** multi-channel acoustic emission and reception, Laser Doppler Vibrometry, acoustic holography, laser cutting
- **Signal processing:** dispersion analysis, spectral analysis, ultrasonic imaging, correlation analysis, digital image correlation and tracking, noise whitening, singular value decomposition
- **Modeling:** FEM, BEM (COMSOL Multiphysics) and finite differences modeling of acoustic wave propagation in solids and liquids, mechanical response of contacts with friction to acoustic waves
- **Programming:** MATLAB, Python, Fortran
- **Languages:** English (fluent), French (working proficiency), Russian (native speaker)

Supervision

- 11/2024 – 02/2025 – 1st year master student internship: experiments on laser vibrometry in kirigami strips

Journal papers (*h-index* = 3, 46 citations)

1. M. E. Terzi, V. V. Aleshin, J. Ghesquiere, V. Tournat. Vibrational transportation of deformable axisymmetric particles. (submitted to *Phys. Rev. E*, Q2, preprint: <http://arxiv.org/abs/2511.21528>)
2. J. Ghesquiere, M. Terzi, O. Bou Matar, S. Cleve, V. Aleshin, M. Baudoin. Hertz-Mindlin contact law governs the reverse drift of particles driven by surface acoustic waves (submitted to *PRL*, Q1)
3. M. Terzi, L. Chehami, M. Farin, E. Moulin, V. Aleshin, N. Smagin, J. de Rosny, and F. Benmeddour. Pump-probe localization technique of varying solid contacts. *J. Ac. Soc. Am.*, **149**, 2943 (2021) <https://doi.org/10.1121/10.0004820> (Q1)
4. M.E. Terzi, S.A. Tsysar, P.V. Yuldashev, M.M. Karzova, O.A. Sapozhnikov. Generation of a vortex ultrasonic beam with a phase plate with an angular dependence of the thickness. *Mosc. Univ. Phys. Bull.*, **72**, 61–67 (2017) <https://doi.org/10.3103/S0027134916050180> (Q3)
5. M.E. Terzi, S. A. Tsysar, P. V. Yuldashev, O. A. Sapozhnikov. Theoretical analysis of a torque exerted by the vortex ultrasonic beam on the absorber located in liquid. *Memoirs of the Faculty of Physics*, **5**, 1751313-1—1751313-4 (2017) <http://uzmu.phys.msu.ru/abstract/2017/5/1751313/>

Journal papers in preparation (*with expected submission dates specified*)

1. R. A. Galvan, M. E. Terzi, V. Fonseca Dal Poggetto, F. Alberti, G. Sarris, C. Croënne, R. V. Craster, M. Miniaci. Metamaterials damping surface acoustic waves for seismic applications. *Nat. Commun.* (May 2026).

Conference Proceedings

1. **M. Terzi**, V. Aleshin, J. Ghesquière. Hopping motion of a particle along a substrate driven by a surface acoustic wave. *Congrès Français d'Acoustique 2025*, Paris, France, 179—185. <https://cfa2025.fr/pdfs/livret-resumes.pdf>
2. **V.V. Aleshin**, **M. Terzi**, J. Ghesquière. Contact Forces Move a Particle along an Acoustically Excited Surface: Case of Permanent Contact. *Advanced Mechanics: Structure, Materials, Tribology 2024*, Samarkand, Uzbekistan, *AIP Conf. Proc.* 3177, 020001-1—020001-12 (2025) <https://doi.org/10.1063/5.0295665>
3. **M. Terzi**, V. Aleshin, M. Chekroun, V. Tournat. Particle manipulation with acoustic waves based on Hertz-Mindlin mechanics. *Proceedings of Forum Acusticum 2023*, Torino, Italy, 543—546. <https://dael.euracoustics.org/confs/fa2023/data/vol1.pdf>
4. **L. Chehami**, **M. Terzi**, E. Moulin, E. Chatelet, F. Massi, J. de Rosny. One step forward passive baseline-free imaging using nonlinear secondary noise sources. *International congress on Ultrasonics (ICU) 2023*, Pekin, China. https://hal.science/hal-04447843v1/file/LyndaChehami_JPCSLaTeXGuidelines.pdf
5. **L. Chehami**, E. Moulin, **M.E. Terzi**. Non Destructive Auscultation and Imaging of Damages by Distributed Sensor Array: Step Towards Passive SHM Under Real Conditions. *European Workshop on Structural Health Monitoring 2022*, Palermo, Italy. <https://hal.science/hal-03362255/document>
6. **M. Terzi**, V. Aleshin, L. Chehami, E. Moulin. Modeling for acoustic wave propagation in a thin plate with localized contact acoustic nonlinearity. *Congrès Français d'Acoustique 2022*, Marseille, France. <https://hal.science/hal-03653419v2/document>
7. **L. Chehami**, E. Moulin, **M. Terzi**, M. Farin, F. Benmeddour. Détection ultrasonore et localisation de défaut de contact sous sollicitations basses fréquences. *Congrès Français d'Acoustique 2022*, Marseille, France. <https://hal.science/hal-03663819/document>
8. **M.E. Terzi**, L. Chehami, E. Moulin, N. Smagin, V. Aleshin. Reference-free damage localization based on pump-probe measurements. *e-Forum Acousticum 2020*, Lyon, France, 67—72. <https://hal.science/FA2020/hal-03240303v1>

9. **M. Terzi**, L. Chehami, E. Moulin, V. Aleshin, N. Smagin. Baseline-free repetitive pump-probe experiment for Structural Health Monitoring. *International Congress on Acoustics (ICA) 2019*, Aachen, Germany, 8193—8200. <https://uphf.hal.science/hal-03592383v1>
10. **M. Terzi**, S. A. Tsysar, P. V. Yuldashev, O. A. Sapozhnikov. Experimental study of the ability of vortex ultrasound beams to rotate absorbers of large wave dimensions. *2nd All-Russian Acoustic Conference, Russian Acoustical Society*, 2017, Nizhniy Novgorod, Russia, 70—71 (*in Russian*)
11. **M. Terzi**, S.A. Tsysar, P.V. Yuldashev, M.M. Karzova, O.A. Sapozhnikov. Experimental study of a vortex ultrasonic beam. *23rd International Conference “Lomonosov-2016”*, Moscow, Russia, 101-102 (*in Russian*)
12. **M. Terzi**, P.V. Yuldashev, O.A. Sapozhnikov. Vortex acoustic beams. *International Conference “Lomonosov-2015”*, Moscow, Russia, 190-191 (*in Russian*)
13. **M. Terzi**, S.A. Tsysar, P.V. Yuldashev, M.M. Karzova, O.A. Sapozhnikov. Generation of a vortex ultrasonic beam emitted by a single element piezoelectric source using a non-uniform in thickness phase plate. *All Russian Conference “Waves-2016”*. Acoustics of Heterogeneous Media, Moscow, Russia, 13—16 (*in Russian*)
14. **M. Terzi**, P.V. Yuldashev, O.A. Sapozhnikov. Vortex ultrasonic beams. *All-Russian Conference “Waves 2015”*. Acoustics and Acoustooptics, Moscow, Russia, 40—41 (*in Russian*)

Funding

09/2023 – 02/2025 – **Postdoctoral grant for 18 months (ranked 2nd), 80 kEur**

Project "Friction-driven vibrational transport via surface acoustic waves", Institut d'Acoustique Graduate School, Le Mans, France

Peer Review

- 05/2023 – Reviewer of a conference paper on ultrasonic nondestructive testing for Forum Acusticum 2023, Torino, Italy;
- 05/2025 and 08/2025 - Reviewer of a journal paper on ultrasonic nondestructive testing in *J. Acoust. Soc. Am.*;