Henri Leroy

Postdoctoral researcher

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Education

ESPCI Paris - PSL *Paris, France*

PhD in Acoustics *Sep. 2022 - Nov. 2025*

- Dissertation: "Towards clinical volumetric Doppler & super-resolution vascular ultrasound imaging" - Advisors: Dr. Mathieu Pernot & Dr. Guillaume Goudot

Mines Paris - PSL *Paris, France*

Master of Science & Executive Engineering - Diplôme d'ingénieur *Sep. 2021 - Sep. 2022*

- Major in biotechnology

Ecole polytechnique *Palaiseau, France*

Master of Science - Cycle ingénieur polytechnicien *Sep. 2018 - Sep. 2021*

- Major in biophysics & biomechanics
- Dissertation: "Modelling blood flow and LDL transport across endothelium in relation to atherosclerosis". Advisor : Pr. Peter Weinberg

Lycée Sainte Geneviève *Versailles, France*

Bachelor of Science - Classes préparatoires aux grandes écoles *Sep. 2016 - Sep. 2018*

- Major in Math, Physics & Chemistry

Professional Experience

Postdoctoral researcher *Lausanne, Switzerland*

Ecole polytechnique fédérale de Lausanne *Jul. 2026 - Present*

Wavefront shaping for ultrasound micromanipulation in scattering media

Postoctoral researcher *Paris, France*

ESPCI Paris - PSL *Jan. 2026 - Mar. 2026*

Volumetric vascular ultrasound : Doppler, super-resolution, and contrast imaging

Research & Development Intern *Alpnach, Obwald, Switzerland*

Centre Suisse d'Electronique et de Microtechnique *Apr. 2022 - Aug. 2022*

"Sample Handling and Sensing" team :

- Proof of concept of a microfluidic sorting method for organoids as part of european project OrganTrans
- Development of an organoid sorter robot for future spinoff Visienco

Graduate Research Assistant *London, United Kingdom*

Department of Bioengineering, Imperial College London *Mar. 2021 - Jul. 2021*

Weinberg lab :

- CFD modelling of blood flow : wall shear stress calculations and correlations with early atherosclerosis
- Modelling of LDL transcytosis through endothelial cells of the arterial wall

Research & Development Intern *Paris, France*

DNA Script *Jun. 2020 - Aug. 2020*

"Advanced Research" team :

- Automation of hardware and software systems on an inkjet DNA printer prototype

Project manager & Mentor *Corbeil-Essonnes, France*

Une Grand Ecole, Pourquoi Pas Moi? *Sep. 2018 - Apr. 2019*

Tutoring & organization of scientific seminars for high school students in underprivileged neighbourhoods

Publications

Journal articles

Leroy, H., Wang, L. Z., Jimenez, A., ... & Pernot, M. (2025). Assessment of microvascular flow in human atherosclerotic carotid plaques using ultrasound localization microscopy. *EBioMedicine*, 111, 105528. doi : 10.1016/j.ebiom.2024.105528

Leroy, H., Bertolo, A., Deffieux, T., Goudot, G., Tanter, M. & Pernot, M. (2026). Revisiting XDoppler estimator for high spatiotemporal resolution volumetric axial velocity measurement using row-column arrays. *Ultrasonics*, 108126. doi : 10.1016/j.ultras.2026.108126

Zhang G., **Leroy, H.**, ..., Shapiro M., Pernot M., & Tanter M. (2026). Exploiting Harmonic Signature of Gas Vesicles in Amplitude-Modulated Singular Value Decomposition for Ultrafast Ultrasound Molecular Imaging. *Physics in Medicine & Biology*, 71 (3), 035013. doi : 10.1088/1361-6560/ae35c7

Plath, H., Haidour, N., Bolliet, L., Houdouin, A., **Leroy, H.**, ..., & Papadacci, C (2026). 4D Wide-field ultrafast ultrasound of the human carotid using a multi-lens probe. *Ultrasound in Medicine & Biology*, 52 (6). doi : 10.1016/j.ultrasmedbio.2026.02.025

Buffle, E., Ait Ouaret, R., **Leroy, H.**, … & Pernot, M. (2026) Evaluation of mitral regurgitation: comparison of ultrafast and focused ultrasound in an in-vitro pulsatile flow phantom. Accepted in *Ultrasound in Medicine & Biology*.

Conference proceedings

Leroy, H., Le Fustec, B., ... & Pernot, M. Assessment of Carotid Plaque neovascularization in Patients Using 3D Ultrasound Localization Microscopy with a Row-Column Array. *IEEE International Ultrasonics Symposium*, 2025. doi : 10.1109/IUS62464.2025.11201635

Buffle E., Ait Ouaret, R., **Leroy, H.**, ... & Pernot, M. Evaluation of mitral regurgitation using ultrafast ultrasound: in-vitro validation in a pulsatile flow phantom. *IEEE International Ultrasonics Symposium*, 2025. doi : 10.1109/IUS62464.2025.11201610

Under Review

Leroy, H.. Angle-domain null subtraction imaging from beamformed plane-wave data. Under review in *Physics in Medicine & Biology*. Preprint doi: 10.48550/arXiv.2608.18252

Leroy, H., Le Fustec, B., … & Pernot, M. Feasibility of volumetric ultrasound localization microscopy for carotid plaque neovascularization assessment. Under review in *Ultrasound in Medicine & Biology*.

Zhang, G., **Leroy, H.**, … & Tanter, M. Multi‐stage singular value decomposition for ultrafast ultrasound imaging of microbubbles. Under review in *Ultrasonics*. Preprint doi: 10.64898/2026.05.04.722634

Awards, Fellowships & Grants

2026	**Poster award - "Ultrasound & Optoacoustic applications"**, European Molecular Imaging Meeting
2026	**Young investigator competition finalist**, European Symposium on Ultrasound Contrast Imaging
2025	**Student travel grant**, IEEE International Ultrasonics Symposium
2025	**Best oral presentation**, PhD day - Ecole doctorale SMAER
2022	**Allocation Moniteur Polytechnicien - Full PhD funding**, Ministère de l'Enseignement Supérieur et de la Recherche, France
2018	**Cycle Ingénieur Polytechnicien - 4-year education funding**, Ecole polytechnique, France

Presentations

** presenting author*

Invited Talks

February 2026. *Volumetric vascular ultrasound imaging at various scales*. Guest Lecture, EPFL, Switzerland

January 2026. *Improving the clinical diagnosis abilities of volumetric vascular ultrasound at various scales*. Guest Lecture, TU Delft, Netherlands

Oral Presentations

Leroy H.*, et al. 2026. Volumetric AM-SVD biomolecular contrast ultrafast ultrasound imaging. European Symposium on Ultrasound Contrast Imaging, Rotterdam, Netherlands

Leroy H.*, et al. 2025. Assessment of Carotid Plaque neovascularization in Patients Using 3D Ultrasound Localization Microscopy with a Row-Column Array. IEEE Intenrational Ultrasonics Symposium, Utrecht, Netherlands

Leroy H.*, et al. 2025. XDoppler Velocity Estimation Using row-Column Arrays. IEEE Intenational Ultrasonics Symposium, Utrecht, Netherlands

Leroy H.*, et al. 2025. Super-resolved 3D ultrasound imaging applied to the characterization of carotid atherosclerotic plaque microflows in humans. PhD day, Ecole doctorale SMAER, Paris, France

Leroy H.*, et al. 2025. Assessment of human carotid plaque neovascularization using 2&3D ultrasound localization microscopy. European Biomolecular Ultrasound Workshop, Cély, France

Posters

Leroy H.*, et al. 2026. Assessment of carotid plaque neovascularization using 3D Ultrasound Localization Microscopy on patients. European Molecular Imaging Meeting, Ljubljana, Slovenia

Plath H.*, Haidour N., Bolliet L., Goudot G., Magna A., **Leroy H.**, et al. 2025. Wide field of view 3D ultrafast Doppler imaging using a large aperture multi-lens probe. IEEE International Ultrasonics Symposium, Utrecht, Netherlands

Buffle E.*, Ait Ouaret, R., **Leroy, H.**, et al. 2025. Evaluation of mitral regurgitation using ultrafast ultrasound: in-vitro validation in a pulsatile flow phantom. IEEE International Ultrasonics Symposium, Utrecht, Netherlands

Leroy H.*, et al. 2024. Assessment of Carotid Plaque Neovascularization In Vivo in Humans Using Ultrasound Localization Microscopy. IEEE Ultrasonics, Ferroelectrics & Frequency Control - Joint Symposium, Taipei, Taiwan

Leroy H.*, et al. 2024. Assessment of neovascularization inside atherosclerotic carotid plaques in vivo using Ultrasound Localization Microscopy. European Molecular Imaging Meeting, Porto, Portugal

Leroy H.*, et al. 2023. Super-resolved 3D ultrasound imaging applied to the characterization of carotid atherosclerotic plaque microflows in humans. PhD day, Ecole doctorale SMAER, Paris, France

Teaching Experience

2023-2024	**Experimental physics - Bachelor 3rd year - 48 hours**, Université Paris Cité, Teaching Assistant	*Paris*
2022-2023	**Experimental physics - Bachelor 1st year - 48 hours**, Université Paris Cité, Teaching Assistant	*Paris*
2019-2020	**Physics - Bachelor 1st year**, Lycée Sainte Geneviève, Oral Examiner	*Versailles*

Mentoring

2025	**Benjamin Le Fustec**, Graduate Student, Mines Paris - PSL	*Paris*
2024	**Yinshuang Zhou**, Graduate Student, PSL University	*Paris*

Activities & Leadership

First aid team leader & instructor *Paris, France*

Protection Civile Paris Seine *2021 - present*

- Management of teams of 3 to 15 first aid rescuers for emergency rescue (car accidents, cardiac arrests, childbirth, etc.)
- Management of the skatepark emergency system for the Paris 2024 Olympic Games
- First aid training for the general public and professionals
- Responsible for the training & progression of 30 first aid rescuers

Competition swimming *Paris, France*

Ecole polytechnique & Mines Paris - PSL *2019-2022*

Member of the university swimming team in university-level competitions