

Clément GAULTIER, PhD

Research Fellow, Center for Research and Innovation in Human Audiology, Hearing Institute, Institut Pasteur, Paris, FRANCE

✉ clement.gaultier@pasteur.fr

🌐 gaultier.io

in clement-gaultier

📧 cgaultier

📧 cgaultier

🆔 0000-0002-4552-9659

🎓 scholar: Clément Gaultier

SCIENTIFIC BACKGROUND & INTERESTS

Hearing Research	Speech & Sound Perception. <ul style="list-style-type: none">○ Cochlear implants, behavioural study design○ Speech intelligibility, auditory awareness○ Adaptation to noise, stimuli calibration	🎧	Artificial Intelligence	Speech Processing. <ul style="list-style-type: none">○ Deep learning models for speech enhancement, noise and reverberation reduction, EEG decoding○ Binaural sound source localization, HRTF○ Virtually supervised learning	📺
Signal Processing	Acoustic and Audio. <ul style="list-style-type: none">○ Multichannel audio reconstruction, acoustic echo cancellation○ Time-frequency real-time algorithm design○ Sound propagation modeling, acoustic sensing○ Distributed audio systems	🔊	Others	Teaching and Committees. <ul style="list-style-type: none">○ Student supervision, PhD examiner, jury○ Scientific outreach○ Teaching wave propagation physics (optics, acoustics, electromagnetics)	👤

RESEARCH POSITIONS

- 2024 – current **Research Fellow**, *Center for Research and Innovation in Human Audiology*, Paris, FRANCE, *Research*.
 - Center for Research and Innovation in Human Audiology: Prof. Paul Avan
 - Project: Measuring and Restoring Auditory Awareness for Cochlear Implants Listeners in Noise, Pasteur-Roux-Cantarini Research Fellowship
 - cochlear implant research,
 - auditory science, perception of the acoustic environment,
 - study design, participant recruitment,
 - objective & subjective measures of sound perception,
 - deep learning speech enhancement, virtual acoustics,
 - protocol and ethics validation
 - Holding also a honorary visiting researcher position at the MRC Cognition and Brain Sciences Unit, University of Cambridge, UK.
- 2021 – 2023 **Research Fellow**, *MRC Cognition and Brain Sciences Unit*, Cambridge, UK, *Research*.
 - Deep Hearing Lab: Dr. Tobias Goehring
 - Project: Speech Enhancement for people with cochlear implants, Fondation Pour l'Audition Fellowship
 - cochlear implant research,
 - auditory science, speech perception,
 - study design, participant recruitment,
 - multi-microphone signal processing,
 - deep learning models, virtual acoustics,
 - student supervision.
 - Holding also a honorary researcher position at the Cambridge University Hospital, National Health Service (NHS) Addenbrookes Hospital.
- 2019 – 2021 **Postdoctoral researcher**, *Orange, Orange Labs*, Cesson-Sévigné, FRANCE, *Research & Development*.
 - Project: Multichannel acoustic echo cancellation for ad-hoc distributed audio systems
 - low-latency Acoustic Echo Cancellation (AEC),
 - Room Impulse Responses measurements,
 - speaker localization through multilateration,
 - patent filed on real-time acoustic echo cancellation robust to acoustic path change and double-talk scenario.
- 2019 **Postdoctoral Researcher / Engineer**, *Inria Rennes research center*, Rennes, FRANCE, *Research & Development*.
 - Projects: audio restoration transfer of technology
 - pop noise removal,
 - multichannel declipping,
 - DSP algorithms code conversion,
 - listening tests.
- Nov. 2015 – Jan. 2019 **Ph.D. candidate specialized in acoustic & audio signal processing**, *Inria Rennes research center*, Rennes, FRANCE, *Research*.
 - Early stage researcher
 - Projects: acoustic & audio signal processing inverse problems
 - digital sound processing,
 - non-convex optimization algorithms,
 - machine learning for binaural sound source localization,
 - science popularization.
 - Teaching, mentoring & evaluation
 - Teaching wave propagation physics tutorials - acoustics, electromagnetics, optics - for second year students (INSA Rennes public school of engineering delivering a postgraduate degree in engineering),
 - Mentoring undergrads students on a room acoustics project,
 - Jury member for final year students graduating as sound engineers from ESRA Bretagne school.

March 2015 – Sept. 2015 **Postgraduate visiting student**, *Institute of Sound and Vibration Research*, Southampton, UK, University of Southampton.

Measuring the adaptation to noise for enhanced speech perception in individuals with normal hearing

- Under the supervision of Dr. Jessica J. M. Monaghan and Prof. Stefan Bleeck
- Research work on the auditory system, hearing in noise, speech intelligibility, signal processing
- Setting up listening experiments for people with normal hearing
 - noisy speech stimuli calibration,
 - statistical analysis,
 - ethical study / noise exposure validation,
 - participants recruitment.

EDUCATION



June 2022 **Training course on hearing**, *Institut de l'Audition & Institut Pasteur*, Paris, France.

- A 3-week intensive training course on auditory science
- "Hearing: From mechanisms to restoration technologies"
- In depth lectures with topics ranging from basic auditory science to gene therapy to hearing impairments,
- Practical sessions including psychoacoustic testing, confocal microscopy...

Nov. 2015 – Jan. 2019 **Ph.D. specialized in acoustic & audio signal processing**, *Université de Rennes 1*, Rennes, FRANCE, *Research*.

Design and evaluation of sparse models and algorithms for audio inverse problems

- Under the supervision of Dr. Nancy Bertin & Prof. Rémi Gribonval
- Graduated in: January 2019
- Projects: acoustic & audio signal processing inverse problems
 - denoising, declipping, dereverberation,
 - structured (co)sparsity for time-frequency modeling,
 - non-convex optimization algorithms,
 - virtually supervised learning for binaural sound source localization,
 - multichannel real-time audio reconstruction.

2014 – 2015 **Master 2 Acoustics**, *Le Mans Université*, Le Mans, FRANCE, *Research, with Honours*.

- A University Master of Science under the authority of the French Ministry of Education and Research
- Graduated in: October 2015
- Specialized in: acoustics
- Project: Characterization of inhomogeneous membranes vibrations (psychoacoustic descriptors, spectrum analysis, vibration behaviour)

2012 – 2015 **Acoustics and vibrations graduate engineer**, *ENSIM - École Nationale d'Ingénieurs du Mans*, Le Mans, *Spécialité Acoustique - Vibration - Capteurs*.

- A selective Engineering School in three years under the authority of the French Ministry of Education and Research delivering a postgraduate degree in engineering
- Graduated in: October 2015
- Specialized in: vibration, acoustics, sensors
- Projects: With ONERA the French Aerospace Lab (acoustic measurements, signal processing, BEM modeling, correlation techniques)

GRANTS & AWARDS



Feb. 27th, **RNID Innovation Seed Fund**, *RNID*, UK.

- 2025 ○ "Toward Accelerated and More Accurate Objective Fitting: Integrating Multi-Latency Measures of Auditory Processing in Cochlear Implant Patients"
- Innovation fund to develop new measures describing the activity of the auditory system for listeners using cochlear implants
 - Award amount: £10 000
- Collaborator with Dr. Charlotte Garcia (Co-I) & Dr. Dorothee Arzounian (Co-I) from the University of Cambridge, UK.

July 23rd, **2024 FPA – WCA Travel Award**, *Fondation Pour l'Audition*, France.

- 2024 ○ Travel grant awarded to support attendance at the World Congress of Audiology,
○ Award amount: € 500

Nov. 21st, **Pasteur-Roux-Cantarini Research Fellowship**, *Pasteur Institute*, 25-28, rue du Docteur Roux, Paris.

- 2023 ○ "MiRACLE: MeasurIng and Restoring Auditory awareness for Cochlear implant Listeners in Noise"
- (Current funding)
- Individual research fellowship starting 02-04-2024 (24 months, Center for Research and Innovation in Human Audiology, Hearing Institute, Paris, France),
 - Award amount: € 144 626

June 09th, **GoB Travel Grant**, *Guarantors of Brain*, UK.

- 2023 ○ Early Career Researcher Travel Grant,
○ Award amount: £1000

May 15th, **2023 GFF Travel Grant**, *Graham Fraser Foundation*, UK.

- 2023 ○ Travel grant awarded to non-clinical cochlear implant researchers to support attendance at scientific meetings,
○ Award amount: £500

March 18th, **FPA Research Fellowship**, *Fondation pour L'Audition*, 13, rue Moreau, Paris.

- 2021 ○ "RECOVER-CI: REverberation COmpensation using Virtual acoustics and multichannel speech Enhancement to Restore speech perception in noise with Cochlear Implants"
- Individual research fellowship starting 08-12-2021 (24 months, University of Cambridge, UK),
 - Award amount: € 118 126

- June 28th, **Best flash presentation and poster**, *JJCAAS, Journées Jeunes Chercheurs en Audition, Acoustique musicale et Signal Audio*, Le Mans, Laboratoire d'Acoustique de l'Université du Mans.
- “Désaturation audio multicanale : une approche par coparcimonie structurée”
 - Multichannel Audio Declipping : a structured cosparsé approach,
 - French Young Researcher Days on Hearing, Musical Acoustics and Audio Signal Processing

March 2015 **Erasmus+ Grant.**

- European Union Mobility Grant accorded for a postgraduate visiting student stay at Institute of Sound and Vibration Research, Southampton, UK

March 2015 **Envoleo Grant**, *Région Pays de la Loire*, France.

- Regional Council Mobility Grant accorded for a postgraduate visiting student stay at Institute of Sound and Vibration Research, Southampton, UK


OTHER SCIENTIFIC ACTIVITIES



2017 – **Occasional Reviewer.**

- present ○ International Journals
- Nature Portfolio Scientific Reports,
 - IEEE Journal of Selected Topics in Signal Processing,
 - IEEE Transactions on Audio, Speech, and Language Processing, IEEE Transactions on Biomedical Engineering
 - Elsevier Signal Processing, Hearing Research,
 - AIP Journal of the Acoustical Society of America,
 - AAS Ear and Hearing.
- International Conferences
- IEEE International Conference on Acoustics, Speech, and Signal Processing, ISCA Interspeech,
 - International Conference on Latent Variable Analysis and Signal Separation.

2016 – **Scientific Outreach.**

- present ○ PasteurDon (Institut Pasteur, Paris, Oct. 2025)
- Science popularization day with demo and lay talks about cochlear implant research
- Semaine du Cerveau (NeuroPSI, Saclay, Feb. 2025)
- Science popularization day with demo and lay talks about cochlear implant research and brain adaptation to electrical stimulation
- Cochlear Implant Volunteer Appreciation Day (Oct. 2023)
- Science popularization open day for cochlear implant volunteers and their relatives to learn about the research projects they took part in,
 - Talks and demos about cochlear implants and auditory research,
 - MRC Cognition and Brain Sciences Unit, University of Cambridge,
 - More than 50 attendees
- Ci-Fi  experience (2022)
- Science popularization web page/app and demo about cochlear implants,
 - Cambridge Science Festival,
 - <https://deephearinglab.mrc-cbu.cam.ac.uk/ci-fi/>
- Journée Science et Musique (2016 – 2019)
- Member of the organizing committee (2016 – 2019),
 - Financial manager, communication manager,
 - JSM (Journée Science et Musique) is a science popularization open day about science and music organized every year by the PANAMA team (IRISA research center, Rennes (France)),
 - More than 650 attendees.

TEACHING & COMMITTEES



2024 **Student supervision**, *Institut Pasteur*, Paris, France.

- Project: Project: “COMPRESSED: Studying lasting effects of listening to dynamically compressed sounds on the human auditory system”
- M.Sc Student research project supervision, (Ms. Thinhinane Arris) with Dr. Marta Campi, Dr. Grégory Gérenton and Prof. Paul Avan

2023 **Student supervision**, *University of Cambridge*, Cambridge, UK.

- Project: “RADAR: Representative Acoustic Database for Auditory Research”
- Student research project supervision, (Ms. Elise Sutherland and Ms. Liesl Claridge)
- Cambridge Social Sciences and Humanities Access to Research Experience, SHARE placement program. (with Dr. Tobias Goehring, Dr. Alexis Deighton MacIntyre, Dr. Lidea Shahidi)

2022 **PhD reviewer**, *University of Cambridge*, Cambridge, UK.

- Internal reviewer/examiner along with Prof. Olivier Macherey (external reviewer),
- PhD thesis: “The Panoramic ECAP Method: estimating patient-specific patterns of current spread and neural health in cochlear-implant users”
- Dr. Charlotte Garcia’s work on characterization of the electrode-nerve interface with cochlear implants.

2022 **Student supervision**, *University of Cambridge*, Cambridge, UK.

- Project: “Speech enhancement for hearing devices: learned sound representations versus deterministic transforms”
- Student research project supervision, (Mr. Zephyr Verwimp)
- Cambridge Centre For Mathematical Sciences, math placement program.

Oct. 2018 – **Teaching wave propagation physics**, *INSA Rennes*, Rennes, France.

- June 2020 ○ Teaching wave propagation physics tutorials - acoustics, electromagnetics, optics - for second year students (INSA Rennes public school of engineering delivering a postgraduate degree in engineering)

June 2019 **Jury Member**, *ESRA Bretagne*, Rennes, France.

- Jury member for final year students graduating as sound engineers from ESRA Bretagne school,
- Report reviewer and defence jury.

Jan. 2016 – **Mentoring undergraduate students**, *Lycée Joliot-Curie*, Rennes, France.

- Room acoustics project, modal theory modeling, reverberation, practical validation and measurements,
- Undergraduate students in preparatory class studying intensive math, physics and engineering before French schools of Engineering competitive exams

PUBLICATIONS & SCIENTIFIC COMMUNICATIONS



Submissions under review

A. Bradshaw, C. Gaultier, S. Black, and M. Davis, “Perceptual learning and sensorimotor adaptation with cochlear-implant simulated speech feedback,” *Under review*, 2025.

M. Campi, E. Partouche, G. Gérenton, P. Avan, and C. Gaultier, “Mechanism-specific speech encoding failures in auditory neuropathy: A computational phenotyping framework,” *Under review*, 2026.

International Peer Reviewed Articles

A. D. MacIntyre, C. Gaultier, and T. Goehring, “Robust decoding of speech acoustics from eeg: Going beyond the amplitude envelope,” *Journal of Neural Engineering*, vol. 23, no. 1, p. 016014, 2025.

C. Gaultier and T. Goehring, “Recovering speech intelligibility with deep learning and multiple microphones in noisy-reverberant situations for people using cochlear implants,” *The Journal of the Acoustical Society of America*, vol. 155, no. 6, pp. 3833–3847, 2024.

C. Gaultier and T. Goehring, “Joint compensation of multi-talker noise and reverberation for speech enhancement with cochlear implants using one or more microphones,” in *INTERSPEECH 2023, ISCA*, 2023, pp. 3497–3501.

I. Thoidis, C. Gaultier, and T. Goehring, “Perceptual analysis of speaker embeddings for voice discrimination between machine and human listening,” in *2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2023, pp. 1–5.

C. Gaultier, A. Guérin, G. Pallone, and M. Emerit, “Double-talk robust acoustic echo cancellation using partition block frequency-domain adaptive filtering,” in *29th European Signal Processing Conference (EUSIPCO)*. IEEE, 2021, pp. 171–175.

C. Gaultier, S. Kitić, R. Gribonval, and N. Bertin, “Sparsity-based audio declipping methods: selected overview, new algorithms, and large-scale evaluation,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 29, pp. 1174–1187, 2021.

S. Kitić, C. Gaultier, and G. Pallone, “A comparative study of multilateration methods for single-source localization in distributed audio,” in *Conference of Open Innovations Association, FRUCT*, no. 27. FRUCT Oy, 2020, pp. 328–336.

R. Lebarbenchon, E. Camberlein, D. Di Carlo, C. Gaultier, A. Deleforge, and N. Bertin, “Evaluation of an open-source implementation of the SRP-PHAT algorithm within the 2018 locata challenge,” in *2018 16th International Workshop on Acoustic Signal Enhancement (IWAENC), LOCATA Challenge*. IEEE, 2018.

C. Gaultier, N. Bertin, and R. Gribonval, “CASCADE: Channel-Aware Structured CosparsE Audio DEclipper,” in *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2018, pp. 571–575.

C. Gaultier, S. Kitić, N. Bertin, and R. Gribonval, “AUDASCITY: AUdio Denoising by Adaptive Social CosparsITY,” in *2017 25th European Signal Processing Conference (EUSIPCO)*. IEEE, 2017, pp. 1265–1269.

C. Gaultier, S. Kataria, and A. Deleforge, “VAST: The Virtual Acoustic Space Traveler dataset,” in *International Conference on Latent Variable Analysis and Signal Separation*. Springer, 2017, pp. 68–79.

S. Kataria, C. Gaultier, and A. Deleforge, “Hearing in a shoe-box: binaural source position and wall absorption estimation using virtually supervised learning,” in *2017 IEEE International Conference on Acoustics, Speech and Signal Processing*. IEEE, 2017, pp. 226–230.

Workshops with Selecting Committee

C. Gaultier, P. Avan, and T. Goehring, “Measuring auditory awareness by cochlear implant listeners,” in *International Symposium on Auditory and Audiological Research, Nyborg, Denmark*, August 2025.

C. Gaultier, P. Avan, and T. Goehring, “Measuring auditory awareness by cochlear implant listeners,” in *Conference on Implantable Auditory Prostheses, Tahoe City, California, United States*, July 2025.

C. Gaultier and T. Goehring, “Recovering speech intelligibility for cochlear implants in noisy and reverberant situations using multi-microphone deep learning algorithms,” in *4th Virtual Conference on Computational Audiology*, 2023.

C. Gaultier and T. Goehring, “Deep learning for speech enhancement with cochlear implants: joint compensation of noise and reverberation with one or more microphones,” in *British Cochlear Implant Group Annual Meeting*, April, 13 2023.

C. Gaultier and T. Goehring, “Deep learning strategies for compensation of noise and reverberation: single- vs multi-microphone approaches and applications to cochlear implants,” in *Hearing, Audio and Audiology Sciences Meeting*, Spetember, 12 2022.

C. Gaultier, N. Bertin, and R. Gribonval, “Désaturation audio multicanale : une approche par coparcimonie structurée,” in *JJCAAS, Journées Jeunes Chercheurs en Audition, Acoustique musicale et Signal audio*, 2019.

C. Gaultier, N. Bertin, and R. Gribonval, “Multichannel cosparsE declipping: Structure helps,” in *GDR MIA, Journée Thématique “Parcimonie et Applications”*, 2018.

C. Gaultier, S. Kitić, N. Bertin, and R. Gribonval, “CosparsE denoising: The importance of being social,” in *The Signal Processing with Adaptive Sparse Structured Representations (SPARS) workshop*, 2017.

R. Gokula, C. Gaultier, J. J. M. Monaghan, and S. Bleack, “Acclimatization to different english accents for enhanced speech intelligibility in noise in individuals with normal hearing,” in *Basic Auditory Science Meeting*. British Society of Audiology, 2015.

Research Reports

C. Gaultier, N. Bertin, S. Kitić, and R. Gribonval, “A modeling and algorithmic framework for (non) social (co) sparse audio restoration,” 2017.

Thesis

C. Gaultier, “Design and evaluation of sparse models and algorithms for audio inverse problems,” Ph.D. dissertation, Université de Rennes 1, Jan. 2019.

Patents

C. Gaultier, A. Guérin, M. Emerit, and G. Pallone, “Method and device for variable pitch echo cancellation,” in *US Patent GRANTED*, 2021.

Softwares

C. Gaultier, S. Kitić, E. Camberlein, R. Gribonval, and N. Bertin, “Spade toolbox,” in *Agency for the Protection of Programs deposit, Paris, France*, 2019.

Talks

C. Gaultier, “Mesure de la perception de l’environnement sonore chez les utilisateurs d’implants cochléaires,” in *17e Congrès Français d’Acoustique*, 2025.

C. Gaultier, “Recovering speech intelligibility with deep learning and multiple microphones in noisy-reverberant situations for people using cochlear implants,” in *36th World Congress of Audiology, Paris, France*, September, 22 2024.

C. Gaultier, “Amélioration de la perception de la parole dans les environnements bruyants et réverbérants : vers une approche multi-microphone basée sur l’apprentissage profond,” in *Journées GEORRIC, Groupe d’Etude sur l’Optimisation de la Rééducation et des Réglages de l’Implant Cochléaire, Marseille, France*, May, 31 2024.

C. Gaultier, “Recovering speech intelligibility for cochlear implants with deep-learning strategies in noisy reverberant situations using one or more microphones,” in *Ear Institute Seminars, UCL, London, UK*, November, 17 2023.

C. Gaultier, “Recovering speech intelligibility for cochlear implants with deep-learning strategies in noisy reverberant situations using one or more microphones,” in *Institute of Sound and Vibration Research Seminars, University of Southampton, UK*, November, 16 2023.

C. Gaultier, “Deep learning for speech enhancement with cochlear implants: Joint compensation of noise and reverberation with one or more microphones,” in *Conference on Implantable Auditory Prostheses, Tahoe City, California, United States*, July, 10 2023.

C. Gaultier, “Recovering speech intelligibility for cochlear implants in noisy and reverberant situations using multi-microphone deep learning algorithms,” in *4th Virtual Conference on Computational Audiology*, June, 28 2023.

C. Gaultier, “Deep learning for speech enhancement with cochlear implants: joint compensation of noise and reverberation with one or more microphones,” in *Cambridge Hearing Group Seminars*, February, 17 2023.

C. Gaultier, “Introduction to git and git hosting platforms - useful tools for any researcher,” in *MRC CBU, Method Seminar*, January, 09 2023.

C. Gaultier, “Double-talk robust acoustic echo cancellation using partition block frequency-domain adaptive filtering,” in *29th European Signal Processing Conference (EUSIPCO)*, August, 26 2021.

C. Gaultier, “A double-talk robust frequency-domain acoustic echo cancellation algorithm,” in *Orange Labs Seminar, Rennes*, February, 9 2021.

C. Gaultier, “Design and evaluation of sparse models and algorithms for audio inverse problems,” in *Orange Labs Seminar, Rennes*, October, 10 2019.

C. Gaultier, “Désaturation audio multicanale : une approche par coparcimonie structurée,” in *JfCAAS, Journées Jeunes Chercheurs en Audition, Acoustique musicale et Signal audio*, June, 27 2019.

C. Gaultier, “Multichannel cosparsely de-clipping: Structure helps,” in *GDR MIA, Journée Thématique “Parcimonie et Applications”*, May, 03 2018.

C. Gaultier, “Cosparsely denoising: The importance of being social,” in *The Signal Processing with Adaptive Sparse Structured Representations (SPARS) workshop*, June, 05 2017.

C. Gaultier, “VAST: The Virtual Acoustic Space Traveler dataset,” in *International Conference on Latent Variable Analysis and Signal Separation*, February, 21 2017.