Emerging Bioacousticians Days

Listening to nature

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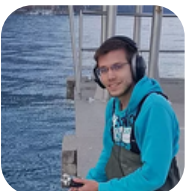# Organizing committee

Clément Cornec
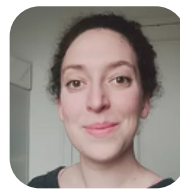
Léo Papet

Léo Perrier

Anna Terrade

Théophile Turco

Julie Thévenet

Nicolas Boyer

Siloé Corvin

Floriane Fournier

Lény Lego

Naïs Caron Delbosc

Romane Philippe

Virgile Daunay

Welcome

Welcome to this first edition of the Emerging Bioacousticians Days !

The creation of this event aims to promote bioacoustics and to facilitate networking between students and young researchers in the field, encouraging interdisciplinary dialogue. We are honored to welcome you.

Three plenary presentations will be given by experienced bioacousticians. These presentations will provide a unique opportunity for students and young researchers to learn about current research in their field and to discuss with established researchers.

The congress will also offer various scientific workshops enabling us to work together on the integration of technologies and recent tools. Led by specialists in the field, these interactive workshops will offer participants a close look at current and novel research approaches.

Please note that this is a provisional schedule that may be subject to change in case of cancellations, and that some workshops may not be able to take place if we have a lack of participants.
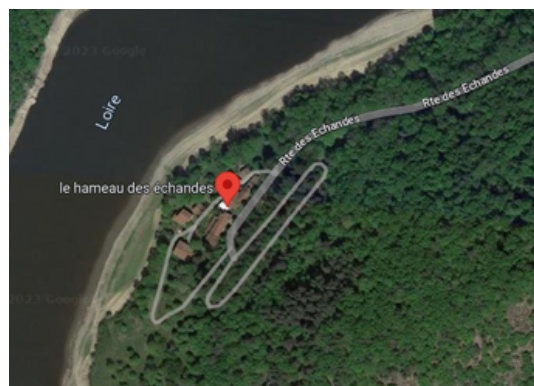
Practical information

The conference will be held at Hameau des Echandes.

📍 Rte des Echandes, 42240 Unieux

You can arrive by train at the Saint-Etienne Châteaucreux station where carpools will be organized to get to the congress.

If you have a problem, don't hesitate to contact either Naïs Caron Delbosc (+33 6 26 07 35 61) or Floriane Fournier (+33 7 50 28 96 46).
You can also contact us via email jjbioacoustique@gmail.com.

General program

Wednesday, June 28

9:00 Welcome

10:00 Production and perception of sound n°1

12:40 Lunch break

14:00 Plenary n°1

15:10 Underwater acoustics n°1

16:40 Eco-acoustics n°1

Thursday, June 29

9:00 Production and perception of sound n°2

10:50 Professional applications

12:10 Lunch break

13:40 Plenary n°2

14:50 Eco-acoustics n°2

16:00 Workshops

17:30 General assembly

Friday, June 30

9:00 Underwater acoustics n°2

11:00 Plenary n°3

12:00 Lunch break

13:30 Production and perception of sound n°3

15:00 Eco-acoustics n°3

16:00 Closing

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Plenary

Julie Elie, Wednesday, June 28

Julie Elie (University of California, Berkeley, USA) is a computational neuroethologist with a passion for vocal communication. She is interested in how and why animals and humans make communicative sounds. For the past 15 years, she has been studying the vocal and social behavior of a bird: the zebra finch. She has focused her research on the perception of social vocalizations and their role in social bonding in that species. More recently she started to explore vocal communication in the Egyptian Fruit-bat, investigating the neural pathways of vocal production and the level of vocal plasticity in that species. Her work combines behavioral and neurophysiological experiments with advanced analysis in bioacoustic and neural modeling.

Plenary

His research lies at the interface between ecology, acoustics and computer science. He has devoted more and more time to the development of innovative and efficient software and algorithms to overcome the constraints of analyzing bioacoustic passive data (long-term acoustic recordings). Today, the tools he has developed are used systematically in the monitoring of many species, in particular bats. Bioacoustics is a multidisciplinary science and the research carried out by Yves Bas will make it possible to understand how, by harmonizing these different skills, high-performance systems can be developed. He is currently a researcher at the Natural History Museum in Paris.

Plenary

Katarzyna Pisanski, Friday, June 30

Her research focuses on understanding the origins, development, mechanisms and social functions of acoustic communication in mammals, including our own species. At the frontiers of biology, ethology, psychology, acoustics and linguistics, her work highlights the role of voice control in the evolutionary history that led to speech. This ranges from how we humans modulate our voices in social contexts including to exaggerate fitness-related traits (such as body size or strength), to why we laugh or cry. She will do us the great honor of being present at this event and will be a source of inspiration for many students who will be delighted to talk with her. She is now a permanent researcher at the CNRS, works at the Laboratoire de Dynamique du Langage at the University of Lyon and in close collabora-tion with the Bioacoustics Research Laboratory of ENES.

Workshops

Lorène Jeantet
Deep learning and bioacoustics

Tremendous progress has been made in bioacoustics research via deep learning algorithms. Recent scientific articles focusing on the use and development of bioacoustic classification models all use convolutional neural networks. This skills showcase will provide participants with fundamental knowledge in convolutional neural networks to better understand how they are implemented to create an acoustic classifier model.Participants will be introduced to theoretical basics of 2D convolutional neural networks. This will be followed by an introduction to audio processing in Python and finally, participants will build a convolutional neural network to classify vocalisation events of the critically endangered Hainan gibbons. The same approach could be applied to species. Programming will be done in Python 3 and Tensorflow using Google Colab. No software installation is required other than an Internet browser with a working Internet connection and a Google account.

Julie Lossent, Jonas Guignet, Clément Cornec, Léo Papet, Manon Ducrettet, Maxime Bru
Applied bioacoustics

Bioacoustics, ecoacoustics and passive acoustic monitoring have been identified as really efficient methods to monitor biodiversity underwater and in terrestrial environments. This workshop aims to identify the hot topics in a professional application of bioacoustics, and exchange with different structures conducting bioacoustics projects outside of an academic environment.

Workshops

Floriane Fournier, Mathilde Massenet, Anna Terrade

Soundgen R-package, a robust tool for synthesising nonlinear vocal phenomena in animal vocalisations

A key challenge of research in vocal communication is to map the acoustic form of vocal signals onto their functions to uncover the origins and evolution of diversity in mammal vocalisations. One such ubiquitous form-function correspondence involves the presence of harsh-sounding elements called nonlinear phenomena (NLP) in vertebrate vocalisations. Perhaps because they also characterize pathological voices, these acoustic irregularities have long been considered as nonadaptive vocal features or by-products of sound production. Yet, there is now growing evidence that NLP may also have evolved to attract listeners' attention or to signal high arousal in calls communicating aggression, size, dominance, or distress. While interest in the prevalence and function of nonlinear phenomena in vocal signals has recently surged in multiple research disciplines, this topic has long been hindered by a lack of methods for their analysis and synthesis. The very recent breakthrough technology of Soundgen (Anikin 2019) now enable parametric sound synthesis of nonlinear phenomena to directly test their signalling function in animal and human communication by systematically examining their effects on behavioural or physiological responses in listeners. In this workshop, we propose a basic introduction to learn how to synthetise realistic animal vocalisations and to add nonlinear phenomena with the R-package Soundgen. Before attending the workshop, we ask you to install PRAAT and Soundgen (© R package) on your computer. The workshop will last for approximatively 1h.

Common thread

Romane Philippe
Nonverbal vocal imitation

During all the congress, you are invited to participate in a vocal imitation task, carried out by Romane Philippe, PhD student at the ENES bioacoustics laboratory, in the context of her PhD research on the origin and development of non-verbal vocal modulation and imitation abilities in humans.

Background: Humans produce various types of nonverbal vocalizations from an early age, such as laughing, screaming, whining, roaring or grunting, and in various contexts. However, unlike the animals with whom we share this vocal repertoire, humans have a remarkable ability to voluntarily modulate our vocalizations to communicate a range of social, emotional, motivational and physical nuances. While the function of these vocal abilities is well described in adults, many questions remain unanswered about their developmental trajectory, especially in children. To answer these questions, we conduct a comparative study of the modulation and vocal imitation abilities of children and adults.

Protocol: You will be asked to reproduce affective non-verbal vocalizations (e.g., laughter, screams) as well as common animal (e.g., dog, horse, cow, sheep). This task lasts about 5 minutes. Before audio recordings, you will complete a consent form and a short questionnaire to indicate your age, gender, ect.

Benefits: This is an opportunity for you to discover your secret mimicry talents and contribute to our scientific understanding of non-verbal sound imitation skills in humans. You will also receive a small gift as compensation for your participation (e.g., chocolate, candy). We hope to see many of you!

Production and perception of sound n°1
Wednesday, June 28

10:00 **Javier Onate-Casado - Department of Ecology, Charles University**

Guess who? Evaluating individual acoustic monitoring for males and females of the Tawny Pipit, a migratory passerine bird with a simple song

10:20 **Siloé Corvin - CRNL, ENES Bioacoustics Research Lab**

Brain changes that accompany infant care: decoding pain in babies' cries

10:40 **Floriane Fournier - ENES Bioacoustics Research Lab**

Nonlinear Acoustic Phenomena are Age Dependent in Mandrills

11:00 **Morgane Millot - ENES Bioacoustics Research Lab**

Do conspecific vocalisations modulate feeding performance in the eyeless cavefish Astyanax mexicanus?

Production and perception of sound n°1
Wednesday, June 28

11:20 **Francesca Terranova - Department of Life Sciences and Systems Biology, University of Turin**

Investigating pitch-size cross-modal correspondence in African penguins (Spheniscus demersus)

11:40 **Léo Perrier - ENES Bioacoustics Research Lab**

African striped-mice use ultrasonic vocalizations as a social cue

12:00 **Anna N Osiecka - Department of Vertebrate Ecology and Zoology, University of Gdansk, Behavioural Ecology Group, University of Copenhagen**

Calling in the crowd: Information coding in the vocalisations of a highly colonial seabird, the little auk (Alle alle)

12:20 **Blanche Colonna - Organism Biology and Ecology, University of Paris-Saclay,**

Comparison of the calls of two Pinniped subspecies, the Cape fur seal (A.pusillus pusillus) and the Australian fur seal (A.pusillus doriferus)

Underwater acoustics n°1
Wednesday, June 28

15:10 **Juliana Lopez Marulanda - Institute of Neurosciences Paris-Saclay, Universitey Paris-Sud**

Bottlenose dolphins (Tursiops truncatus) under human care use acoustic cues to synchronize their aerial jumps

15:30 **Naïs Caron Delbosc - Laboratory LEMAR , Institut Universitaire Européen de la Mer, CRNL, ENES Bioacoustics Research Lab**

Performance estimation of a bearded seal detector on a large dataset

15:50 **Sandra Treussard - Laboratory LEMAR , Institut Universitaire Européen de la Mer**

Effect of vessel noise on the masking of bearded seal vocalisations in a Svalbard fjord

16:10 **Théophile Turco - ENES Bioacoustics Research Lab**

Behavioral and ecological responses of an invasive freshwater mussel to noise pollution

Eco-acoustics n°1
Wednesday, June 28

16:40 **Camille Bourhis - Laboratory Biogéosciences, team BioME, University of Bourgogne**

Impact of Interspecific Competition and of Urbanization in Communication of Great and Blue tits

17:00 **Felix Michaud - Institut Systématique, Évolution, Biodiversité (ISYEB), Muséum national d'Histoire naturelle, CNRS, Sorbonne Université, EPHE, Université des Antilles**

Data-centric AI for Ecoacoustics

17:20 **David Funosas - Laboratory Écologie Fonctionnelle et Environnement**

Potential and current limitations of BirdNET as a tool to assess bird diversity through the automated analysis of environmental soundscapes

Production and perception of sound n°2
Thursday, June 29

09:00 **Julie Bosca - Laboratory Ethologie Cognition Développement, Paris Nanterre University**

Do female songbirds modify their vocal performance in the context of territorial intrusion?

09:20 **Mathilde Martin - Institut des Neurosciences Paris-Saclay (NeuroPSI), Paris-Saclay University**

Early onset of postnatal individual vocal recognition in a highly colonial mammal species

09:40 **Tifany Volle - Laboratory Ethologie Cognition Développement, Paris Nanterre University**

Song learning in the black redstart, Phoenicurus ochruros, a longitudinal field study

10:00 **Virgile Daunay - ENES Bioacoustics Research Lab, CRNL, DENDY, Laboratory DDL**

What does your laugh mean? Production and perception analysis of volitional context-specific human laughter

Professional application
Thursday, June 29

10:30   **Maxime Bru - BioPhonia**

Structural connectivity of soundscapes in wildlife corridors of two alpine valleys

10:50   **Valentin Monnoy - Bureau d'étude Ecosphère**

Can bioacoustics tools be used by field surveyors? How, when, and where?

11:10   **Jonas Guignet - Self-employed bioacoustician**

Acoustic monitoring of rock ptarmigan (Lagopus muta) population in french alps, Global change and large scale study

11:30   **Manon Ducrettet - BioPhonia, ENES Bioacoustics Research Lab, Natural History Museum**

Spatio-temporal detectability of acoustic signals

11:50   **Marine Magnin - Research Institut CHORUS – SENSEA FR**

Soundscape ecology applied to environmental monitoring of marine ecosystems: insight into a company dedicated to the environment and sustainable development

Eco-acoustics n°2
Thursday, June 29

14:50   **Sixue Li - Behavioural ecology group, University of Copenhagen**

Investigate the relationship between the main vocalization and social network in the Ring Dove (Streptopelia risoria)

15:10   **Anaïs Pessato - CESCO, Natural History Museum**

Nocturnal bird and bat migration : a case study at an offshore windfarm

15:30   **Arthur Guibard - Ecole Centrale de Lyon, LMFA**

Acoustic propagation in heterogeneous environments and variability of active and detection spaces in rock ptarmigan

Underwater acoustics n°2
Friday, June 30

09:00 **Loïc Prosnier - ENES Bioacoustics Research Lab**

Anthropogenic noise surprisingly increases fitness of a freshwater zooplankton

09:20 **Wenjing Wang - ENES Bioacoustics Research Lab**

Chronic anthropogenic noise impacts on growth and foraging across early life stages of the African cichlid Maylandia zebra

09:40 **Mathilde Michel - ENSTA Bretagne, Lab STICC**

Less is more? How the choice of a recording duty cycle could affect monitoring results of passive acoustic studies on cetaceans

10:00 **Anatole Gros-Martial - Centre d'Etudes Biologiques de Chizé, IUEM, University of Western Britany**

Analyzing variations in surface geophonic sources from continuous underwater acoustic recordings obtained via tagged elephant seals

10:20 **Quentin Hamard - France Energies Marines**

Deep Learning for marine mammal monitoring from underwater acoustic data at offshore windfarm scale

10:40 **Gabriel Dubus - Institut d'Alembert, Sorbonne University, ENSTA Bretagne, Lab STICC**

Citizen science involved in detection and classification of cetaceans for passive acoustic Monitoring

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Production and perception of sound n°3
Friday, June 30

13:30 **Camille Le Gal - Laboratory Ethologie Cognition Développement, Paris Nanterre University**

Assessing variation of females signals during courtship: a playback experiment in the domestic canary (Serinus canaria)

13:50 **Emmalie Alvarado - ENES Bioacoustics Research Lab**

"Seeing Sound" project

14:10 **Thibaut Marin-Cudraz - Laboratory of Vibration and Acoustics, INSA Lyon**

Acoustic space of tyre noise

14:30 **Aglaé Thieffry - ENES Bioacoustics Research Lab**

Do nonlinear phenomena in puppies' whines signal their need to their mother?

Eco-acoustics n°3
Friday, June 30

15:00 **Pablo Bolanos - Centre d'Écologie et des Sciences de la Conservation, Natural History Museum**

Quantifying pollinator activity using acoustic monitoring and deep learning

15:20 **Lény Lego - ENES Bioacoustics Research Lab**

Ecoacoustic methods allow to map of the communication network of the African Striped mice

15:40 **Camille Monnet - BioPhonia**

Efficacy of acoustic deterrence method based on alarm and distress calls broadcast for Northern Ravens Corvus Corax
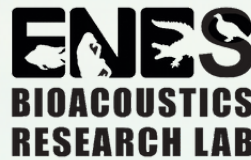
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