The Doctoral Network SEASOUNDS is recruiting 10 highly motivated PhD students

The MSCA Doctoral Network SEASOUNDS (Innovative marine soundscape characterization to effectively mitigate ocean and sea noise pollution, Grant agreement no. 101119769), coordinated by CNRS (France), aims to **better characterize and predict marine soundscapes, in order to provide recommendations for appropriate and proportionate underwater noise mitigation solutions**, for improved know-how, decision-making and standards setting for a sustainable Blue Growth limiting the impact on marine wildlife.

SEASOUNDS addresses important knowledge gaps related to understanding, characterization and modeling of the entire noise transfer chain, from the noise source (e.g. offshore foundation installation, UXO disposal, shipping) to the receiver (whether a technological tool or an animal). SEASOUNDS' methodological approach incorporates concepts, models, and tools from a variety of disciplines including **underwater acoustics, seismology, mechanics, bioacoustics, and marine biology**. Thus, SEASOUNDS will train 10 PhD students with high multidisciplinary, inter-sectoral, and transverse skills, who will comprehend noise pollution issues in a holistic way.

The Network gathers 15 partners from France, Spain, Italy, The Netherlands, Denmark, Norway, Monaco and USA (see https://cordis.europa.eu/project/id/101119769), and will run for 4 years from January 2024.

SEASOUNDS will soon be recruiting 10 highly motivated PhD students. The PhD positions will have staggered <u>starting dates between September-December 2024</u> for a duration of 3 or 4 years, depending on the host institution's rule. The 10 individual projects are briefly described below.

Selection process will start soon. Check https://euraxess.ec.europa.eu/ in the coming days. Your application will receive fair consideration.

For information about SEASOUNDS, you can contact the Coordinator Dr. Nathalie Favretto-Cristini (favretto@lma.cnrs-mrs.fr). Please do not contact her for unsolicited services.

Please pay attention to the eligibility and mobility criteria

Each successful candidate will be enrolled in a doctoral program during the project and will receive an attractive salary, in accordance with MSCA regulations for Doctoral Candidates. The salary will include living and mobility allowances, plus family allowance and special needs allowance (for candidates with disabilities), if applicable. In SEASOUNDS we embrace diversity as one of our core values.

To be eligible for the positions, applicants:

- **must not yet have been awarded a doctoral degree** at the date of their recruitment in the project,
- can be of any nationality. However, if applicable, they may have to comply with any security restrictions imposed by the host or secondment institution,
- are required to undertake transnational mobility (i.e., move from one country to another) when taking up their appointment. **Candidates must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting institution for more than 12 months in the 3 years immediately before the recruitment date.** Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status are not taken into account.

The 10 PhD positions

Each position includes secondment opportunities.

PhD position 1 at TU Delft (The Netherlands) - Environmental vibrations and acoustic emissions from offshore foundation installation

The aim of the project is to develop a semi-analytical model for underwater noise emissions applicable to XXL piles for vibratory and impact piling installations. The model will be amended with noise mitigation elements at-the-path to the receiver, to assess the noise mitigation performance of various systems and optimize the overall mitigation strategy. The outputs of this model shall provide input to the bio-acousticians and policymakers to assess the noise impact on the fish, mammals and invertebrates.

For information about this vacancy, you can contact Dr. Apostolos Tsouvalas (a.tsouvalas@tudelft.nl).

PhD position 2 at CNRS-Géoazur (France) - Imagery of seabed sediments and sub-surface properties by Distributed acoustic sensing (DAS) measurement

The aim of the project is to develop an improved near-surface tomography procedure based on DAS technology by (i) studying the impact of the acquisition design, (ii) considering the variations of the cable-seafloor coupling conditions, (iii) considering a variety of noise sources to increase the usable frequency band, (iv) optimizing the data processing by merging different techniques, (v) optimizing the inversion process for inferring seabed properties. The methodology will be tested against numerical simulations and active seismic imaging.

For information about this vacancy, you can contact Dr. Anthony Sladen (sladen@geoazur.unice.fr).

PhD position 3 at CNRS-LMA (France) - Noise pollution generated by historical Unexploded Ordnance (UXO) disposal in shallow waters

The aim of the project is to study the explosion-induced noise propagation according to the UXO disposal location and to define optimal UXO disposal conditions limiting the impact on marine life. The work will rely mainly on 3D High-Performance Computing simulations of full-wave propagation in a variable marine environment, and on real shock pressure, acoustic and seismic data.

For information about this vacancy, you can contact Dr. Nathalie Favretto-Cristini (favretto@lma.cnrs-mrs.fr).

PhD position 4 at NTNU Trondheim (Norway) - Modeling of shipping noise in arctic fjords

The aim of the project is to estimate the acoustic noise field in arctic fjords relying on 3D HPC simulations of the full-wave propagation. The simulations will be calibrated with shipping noise already collected from a DAS system and also compared to simulations performed for the same environment using approximate methods relying on Gaussian beams and/or Parabolic Equation. The goal of the work is also to investigate the influence of the selected numerical method on noise predictions.

For information about this vacancy, you can contact Pr. Børge Arntsen (borge.arntsen@ntnu.no).

PhD position 5 at CNRS-LMA (France) - Uncertainties in the source and environment description: influence on noise impact assessment

The aim of the project is to investigate the influence of the input data (e.g. bathymetry, sound speed profile in water, seabed properties, etc.) and their variability on the numerical noise predictions. The work will mainly rely on HPC simulations of full-wave propagation and adjoint-based sensitivity analysis, and comparison with real data.

For information about this vacancy, you can contact Dr. Paul Cristini (cristini@lma.cnrs-mrs.fr).

PhD position 6 at Università degli studi di Padova (Italy) - Impact of anthropogenic activities on underwater noise pollution in the Venetian Lagoon

The aim of the project is to characterize quantitatively the soundscape within the Venetian Lagoon by (i) collecting continuous acoustic data at multiple locations and analyzing their characteristics, (ii) understanding how different anthropogenic sources (taxi boats, the transit of large ships, etc.) contribute to underwater noise pollution in the Venetian Lagoon; (iii) identifying in a preliminary manner the marine species living in the Lagoon that might be affected by noise. The results of this work will help to guide new regulations for marine life protection with a reasonable impact on human activities.

For information about this vacancy, you can contact Pr. Lapo Boschi (lapo.boschi@unipd.it).

PhD position 7 at Università degli studi di Padova (Italy) - Natural and Anthropogenic Dynamics of Marine Soundscapes

The aim of the project is to study both very quiet and very noisy areas to understand more about the noise level dynamics animals have to face in their real life. This approach also includes the identification and temporal distribution mapping of detected vocalizing species (mainly fish and mammals).

For information about this vacancy, you can contact Pr. Lapo Boschi (lapo.boschi@unipd.it).

PhD position 8 at NTNU Trondheim (Norway) - Marine mammal monitoring using Distributed Acoustic Sensing (DAS)

The aim of the project is to (i) detect as much marine mammal vocalizations as possible in an enormous dataset using dedicated AI-based algorithms; (ii) investigate the migration patterns, numbers, type of species through analysis of the DAS whale soundings; (iii) identify eventual behavioral changes of whales in response to ship traffic; (iv) propose a methodology for avoiding whale-ship strikes.

For information about this vacancy, you can contact Pr. Martin Landrø (martin.landro@ntnu.no).

PhD position 9 at Aarhus University (Denmark) - Moving animals in a variable soundscape

The aim of the project is to link the noise exposure experienced by individual animals in the wild to the noise levels modeled by hindcasting soundscape models. The work will rely on (i) analysis of recordings from tagged marine mammals to define metrics that characterize the degree of impact from anthropogenic noise; (ii) comparison of these metrics to metrics derived from soundscape modeling of ship noise. The work will provide useful recommendations for EU member states in their reporting on the MSFD criterion D11C2.

For information about this vacancy, you can contact Pr. Jakob Tougaard (jat@ecos.au.dk).

PhD position 10 at Universitat Politècnica de Catalunya – BarcelonaTech (Spain) – Impact of underwater noise pollution on marine invertebrates and plants

The aim of the project is to investigate the comparative effects of sound particle motion and acoustic pressure on animals' response to noise exposure using a dedicated laboratory setup, and to identify and quantify the impact of impulsive noise (e.g. UXO disposal, pile driving) on marine invertebrates and plants, in terms of essential behavioral, survival and physiological aspects of species' response to sound.

For information about this vacancy, you can contact Dr. Marta Solé (marta.sole@upc.edu).