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Pozzuoli, February 16th, 2024

New generation of optical fiber based hydrophones

Keywords : Optical Fibers, Optical Sensors, FBG, Hydrophones, Acoustics, Optics

We are seeking candidates for a **Post-Doc position** funded by the Italian Ministry for Universities and Research (MUR) in the framework **PRIN 2022** project **SEAmPhonia** ("**An innovative enlightening approach to enable the modelling of marine ecosystems by the acoustic 3D field**"), founded by **European Union– Next Generation EU**, that involves 5 Italian partners, CNR-ISMAR, CNR-INO, CNR, Università la Sapienza Roma, ICEA Università di Padova. The **SEAmPhonia** project is finalized to the study of the submarine noise on a new perspective. Its target is the investigation of the physical processes that generated the noise starting from the study of the submarine acoustical field. This approach is based on the installation of a system of submarine sensors. The position will start approximately by **April 2024 and lasts 1 years**. The research will focus on the development of a new generation of **optical fiber based hydrophone** for measurements in sea environment. **Fiber Bragg Gratings (FBG)** are the key element for the sensing of the acoustical signal in this approach. The first task of the candidate will be the study and the modeling of the mechanical setup for the acoustic pickup of the new sensor. This activity will start from existing models of vibrating transducers, searching for tailored solutions for the specific aim. This investigation will be supported by **Finite State Element Methods**. As second task, the candidate will be involved in assembling, develop and test of the fiber based optical device equipped with FBGs. As last step, the candidate could be involved in dedicated test in controlled environment, at the CNR facilities, or in final marine environment. Tests in open see are also planned within the **SEAmPhonia Project**: the development of the new sensor is finalized to the installation and data acquisition from real World signals at oceanographic platform "Acqua Alta Oceanographic Tower" AAOT, located in the Northern Adriatic Sea, managed by CNR-ISMAR.



Candidate's profile:

The candidate must possess a PhD degree in Physics or Engineering. A background in Finite State Elements analysis, a general laboratory-oriented attitude, a knowledge in acoustics, are preferred skills. Additional expertise in optics and/or fiber-optic sensing are desirable but not mandatory. Software knowledge: MatLab, LabView, Comsol.

The research activity will be carried out in the Optical Sensors Group of CNR-INO Naples unit, in Pozzuoli (Italy). Open field tests and measurements are planned at other CNR Italian facilities. A side-by-side collaboration with project partners is planned.

<https://opticalsensorslab.ino.it/>
[SEAmPhonia project](#)

Salary: 22.000 eur/year after taxes

Important dates:

Application deadline: March 11th, 2024 (Rome time)

Interview: 3pm March 22th, 2024 , Rome Time (in person or on-line upon request)

[See details in the official call](#)

Official call

<https://www.urp.cnr.it/node/1487>

https://www.urp.cnr.it/system/files/2024-02/ASS%20INO%20005%202024%20NA.docx_signed.pdf

Formal offer soon available on EURAXESS website.

Quick reference tab:

Position	Post Doc
Kind of position	On-site, Full-time
Degree	Physics, Engineering
Place of work	INO-CNR Labs., Pozzuoli, Napoli
Salary	22.000 eur/year after taxes
Travelling prospect	Yes
Last	1 year

For information, please contact antonio.giorgini@ino.cnr.it

References

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- Gagliardi, G., et al. "Interrogation of FBG-based strain sensors by means of laser radio-frequency modulation techniques." *Journal of Optics A: Pure and Applied Optics* 8.7 (2006): S507.
- Gagliardi, G., et al. "Design and test of a laser-based optical-fiber Bragg-grating accelerometer for seismic applications." *Measurement Science and Technology* 19.8 (2008): 085306.
- Gagliardi, G., Salza, M., Avino, S., Ferraro, P., & De Natale, P. (2010). Probing the ultimate limit of fiber-optic strain sensing. *Science*, 330(6007), 1081-1084.
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