

## AIDAA Educational Series and Academy

# Acoustics in aerospace – numerical methods and materials characterization

*15 and 16 April 2024*

### **Overview and General Information:**

The aim of this webinar is to deal with the main criticisms related to acoustic simulation and noise suppression in the aerospace sector. This objective is achieved by initially introducing and discussing the state-of-the-art methods and technologies that are relevant to this field. Subsequently, the fundamentals of analytical (Transfer Matrix Method) and numerical (Wave Finite Element Method) approaches are illustrated, which constitute powerful and efficient techniques to estimate the absorption and transmission properties of a sound package. Lastly, some innovative acoustic meta-material configurations are presented, based on a periodic pattern of porous unit cells, whose main homogenization models are defined and discussed too. These topics address different applications not only in the aerospace industry, but more generally in transportation (automotive, railway), energy and civil engineering sectors, where both weight and space, as well as vibroacoustic comfort, still remain as critical issues.

### **Learning Objectives:**

- Aircraft noise: methods and technologies
- Transfer Matrix and Wave Finite Element Methods in acoustics
- Acoustic characterization of porous meta-materials

### **Target audience**

Master students, doctoral students, non-academic professionals

### **Dates and times:**

April 15, 2024. Time: 10:00 – 13:00 (CEST)

April 16, 2024. Time: 10:00 – 13:00 (CEST)

## Speaker

### Dario Magliacano

Dario Magliacano is an assistant professor at the Politecnico di Torino. He received a double PhD in Industrial engineering in the context of the Marie-Curie H2020 project “VIPER”, granted by the Université of Franche-Comté and the University of Napoli Federico II in 2020, and an MSc in Aerospace engineering at the University of Napoli Federico II in 2016. His research activities are mainly in aerospace and industrial engineering, and are focused on vibrations and acoustics; in details, he investigates the evaluation of acoustic performances through wave methods of innovative materials (such as meta-materials), as well as their design optimization to match specific applications. Dr. Magliacano is the main author of several publications in international peer-reviewed journals, and serves as a referee for several scientific boards, including: Journal of Sound and Vibration (JSV), Mechanical Systems and Signal Processing (MSSP), Journal of Mechanical Engineering Science (JMES), International Journal of Mechanical Sciences (IJMS), Heliyon, Fractal and Fractional.

### Giuseppe Petrone

Giuseppe Petrone is an assistant professor at the University of Napoli Federico II. He received a PhD in Aerospace, Naval and Quality engineering at the University of Napoli Federico II in 2014 and an MSc in Aerospace engineering at the University of Napoli Federico II in 2010. His research activities are mainly in the area of mechanical and aerospace engineering and are related to vibrations, acoustics, structural health monitoring, and dynamic and control of homogeneous and composite materials (in particular natural fibres) and sandwich structures. Dr. Petrone advises more than 70 undergraduate and graduate students, participated in several European and national projects and published more than 66 articles in international peer-reviewed journals.

## Registration and Contacts

**Course Code:** 20240415-16

This course is part of the 2024 institutional activity for AIDAA members. The **registration** requires the purchase of one of the packages described here [www.aidaa.it/package-list/](http://www.aidaa.it/package-list/), and the completion of the online form available here [LINK](#).

**Course platform:** Webex, a link will be sent via email as the registration is complete.

At the end of each course, **attendance certificates** will be sent to participants via email.

For further info, please, contact [academy@aidaa.it](mailto:academy@aidaa.it)

## Figures

