

Marta Cianferra, Born in Rome, July 8, 1988.
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Education and Training

2008 - 2012	Bachelor degree in Mathematics, University of Rome – La Sapienza
2012 - 2014	Master's degree in applied mathematics, University of Rome – La Sapienza
2014 - 2017	PhD in Earth Science and Fluid Mechanics, University of Trieste
2017 - 2021	Post-Doctoral Researcher, Department of Engineering and Architecture, University of Trieste
2021 – 2025	RTDa (Assistant Professor), Department of Engineering and Architecture, University of Trieste
2025 – Now	RTT – Tenure Track position (Assistant Professor), Department of Engineering and Architecture, University of Trieste

Research

The current research activity builds upon topics addressed in previous projects (PRELICA, OPENCAVIFOAM) concerning the numerical modeling of fluid dynamic noise and multiphase flows. In particular, the following main topics can be identified:

- Calculation of noise generated by fluid dynamic sources in the near field, with a focus on engineering applications of interest (e.g., ship propellers, hydraulic turbines, wind turbines).
- Fluid dynamic and acoustic modeling of a flow under cavitation conditions.
- Modeling for noise propagation in complex environments (e.g., ocean waveguides, port areas, measurement tanks).

Participation in the research group for the "IDROACU - advanced project aimed at the development of numerical methods for predicting cavitation and noise emitted by ship propellers". Partners: Fincantieri S.p.A (Trieste), Cetena S.p.A (Genoa), University of Trieste.

I'm currently directly involved in three projects:

- 1) PRIN2022: "ACDC-P - Acoustic Characterization for Diagnostic of Cavitation in Pumps";
- 2) JPI Oceans: "SONORA - Filling the gap: Thresholds assessment and impact beyond acoustic pressure level linked to emerging blue-growth activities";
- 3) SBEP: "BluEcho - From science to policy: assessing impacts and developing solutions for ship traffic and offshore wind farms through detailed soundmaps".

Scientific collaborations:

Collaboration with the Institute of Marine Engineering of the National Research Council (INM-CNR). The collaboration involved co-supervising a doctoral student from the University of Trieste, resulting in publications No. 1 and 2 in the "ISI/SCOPUS Journal Publications" list.

Collaboration with the Department of Civil, Building, and Environmental Engineering of the University of Naples-Federico II" (specifically with the research group coordinated by Prof. A. Carravetta) on numerical modeling for flows under cavitation conditions. The collaboration includes co-supervision of a doctoral student from the University of Naples (Dr. Renato Montillo) and participation in the PRIN2022 project "Acoustic Characterization for Diagnostic of Cavitation in Pumps ACDC-P". Coordinated by Prof. Vincenzo Armenio of the University of Trieste. Start date: 30/09/2023.

Collaboration with international research groups being partners of ongoing EU projects.

Grants:

Scientific Manager of the "Microgrants UNITS 2021" project - "Numerical Model for the Acoustics of a Cavitating Flow". This project extends aspects addressed in the OPENCAVIFOAM project regarding cavitation modeling. Project funding: €3000. Duration: 12 months. From 01-06-2021 to 01-06-2022.

Scientific Manager of the FRA2021 project, UNITS: "Numerical Investigation on Sound-Absorbing Properties of a Two-Phase Flow". The project allowed for a theoretical and preliminary numerical study on techniques for reducing underwater noise using layers of air, known as bubble air curtains. Project funding: €10,000. Duration: 12 months. From 01-07-2021 to 01-07-2022.

Scientific Manager (Italian Principal Investigator) in the European project JPI Oceans: "SONORA - Filling the Gap: Thresholds Assessment and Impact Beyond Acoustic Pressure Level Linked to Emerging Blue-Growth Activities". Coordinator: Prof. Jaime Ramis Soriano, University of Alicante (Spain). Project national funding: €135,000. Start date: 01-11-2022. Duration: 36 months.

Scientific Manager (Italian representative) in the H2020-MSCA-2019 project: "ARIA - Accurate Roms for Industrial Applications". Coordinator: INRIA INSTITUT NATIONAL DE RECHERCHE ENINFORMATIQUE ET AUTOMATIQUE. Project national funding: €41,920. From 01-09-2023 to 30-11-2024.

Scientific Manager and Coordinator of the European project SBEP: "BluEcho - From Science to Policy: Assessing Impacts and Developing Solutions for Ship Traffic and Offshore Wind Farms through Detailed Soundmaps". Project national funding: €250,00. Start date: 15-04-2024. Duration: 36 months.

International Coordination Activities:

As Coordinator of Special Interest Group 5 (SIG5) at Ercoftac - Environmental Fluid Mechanics, in collaboration with Dr. A. Bomers from the University of Twente (Enschede, Netherlands), my responsibilities include overseeing the group's activities and fostering collaboration among members. This role, initiated on January 1, 2016, continues to date, emphasizing the importance of international cooperation in advancing research in environmental fluid mechanics.

ISI/SCOPUS Journal Publications:

- 1) Cianferra M. and Armenio V., (2024). Rayleigh-Plesset based eulerian mixture model for cavitating flows. *Physics of Fluids*, being published
- 2) Petris G., Cianferra M. and Armenio V., (2024). Full Acoustic Analogy of the fluid-dynamics noise of an immersed cube. *Ocean Engineering*, 300, p.117433
- 3) Lamonaca F., Petris G., Cianferra M. and Armenio V., (2024). Non-reflective hard source method for multiple physically extended sources and scattering bodies. *Physics of Fluids*, 36(3)
- 4) Rocca A., Cianferra M., Broglia R., and Armenio V., (2022). Computational hydroacoustic analysis of the BB2 submarine using the advective Ffowcs Williams and Hawkings equation with Wall-Modeled LES. *Applied Ocean Research*, 129, 103360
- 5) Posa A., Broglia R., Felli M., Cianferra M. and Armenio V., (2022). Hydroacoustic analysis of a marine propeller using large-eddy simulation and acoustic analogy. *Journal of Fluid Mechanics*, 947, A46
- 6) Petris G., Cianferra M. and Armenio V., (2022). Marine propeller noise propagation within bounded domains. *Ocean Engineering*, vol. 265, ISSN: 0029-8018, doi: 10.1016/j.oceaneng.2022.112618
- 7) Rismondo G., Cianferra M. and Armenio V., (2022). Acoustic Response of a Vibrating Elongated Cylinder in a Hydrodynamic Turbulent Flow. *Journal of Marine Science And Engineering*, vol. 10, ISSN: 2077-1312, doi: 10.3390/jmse10121918
- 8) Petris G., Cianferra M. and Armenio V., (2022). A numerical method for the solution of the three-dimensional acoustic wave equation in a marine environment considering complex sources. *Ocean Engineering*, vol. 256, ISSN: 0029-8018, doi: 10.1016/j.oceaneng.2022.111459

- 9) Cianferra M. and Armenio V., (2021). Scaling properties of the Ffowcs-Williams and Hawkings equation for complex acoustic source close to a free surface. *Journal of Fluid Mechanics*, vol. 927, p. 1-32, ISSN: 0022-1120, doi: 10.1017/jfm.2021.723
- 10) Savio A., Cianferra M. and Armenio V., (2021). Analysis of performance of cavitation models with analytically calculated coefficients. *Energies*, vol. 14, p. 1-22, ISSN: 1996-1073, doi: 10.3390/en14196425
- 11) Gadalla M., Cianferra M., Tezzele M., Stabile G., Mola A. and Rozza G., (2021). On the comparison of LES data-driven reduced order approaches for hydroacoustic analysis. *Computers & Fluids*, vol. 216, ISSN: 0045-7930, doi: 10.1016/j.compuid.2020.104819
- 12) Cianferra M., Armenio V. and Petronio A., (2019). Numerical prediction of the far field noise generated by a ship propeller. *Proceeding of Inter Noise: 48th International Congress and Exhibition on Noise Control Engineering*
- 13) Cianferra M., Ianniello S. and Armenio V., (2019). Assessment of methodologies for the solution of the Ffowcs Williams and Hawkings equation using large-eddy simulations of incompressible single-phase flow around a finite-size square cylinder. *Journal of Sound and Vibration*, 453, 1-24
- 14) Cianferra M., Petronio A., and Armenio V., (2019). Non-linear noise from a ship propeller in open sea condition. *Ocean Engineering*, 191, 106474
- 15) Cianferra M., Armenio V. and Ianniello S., (2018). Hydroacoustic noise from different geometries. *International Journal Heat Fluid Flow*, 70, 348-362
- 16) Cianferra M., Petronio A. and Armenio V., (2018). Hydrodynamic noise from a propeller in open sea condition. *Proceeding of NAV 2018: 19th International Conference on Ship & Maritime Research*, IOS Press, pp. 149-156

Reviewer for the following journals: *Journal of Sound and Vibration*, *Ocean Engineering*, *Physics of Fluids*, *The Journal of Marine Science and Engineering*, *Journal of Marine Science and Technology*, *Energies*, *Journal of Hydraulic Research*.

Teaching

Courses:

- Hydraulics (6 CFU) master's degree in Civil Engineering
- Water waves and shore protection - water waves and shore protection (3 CFU) master's degree in Civil Engineering
- Wave and tidal power plants - wave and tidal power plants (3 CFU) master's degree in Engineering for the Energy Transition
- Computational Fluid Dynamics (6 CFU) master's degree in Data Science & Scientific Computing, Geophysics and Geodata

Other Lectures:

Physics and Modelling of Turbulence - Course Exercises - Civil Engineering master's degree

Hydroacoustics Seminars within the Environmental Hydraulics Course - Civil Engineering bachelor's degree

Invited Minicourse at the University of Turin (conducted remotely). The course focused on fundamental concepts of numerical analysis and the use of OpenFOAM software. It lasted for 4 hours and was aimed at students of the second-level master's program "Mathematical and Physical Methods for Aviation Sciences". (November, 2021)

Supervision of thesis:

Co-supervision of the following bachelor's Theses:

- Bachelor's thesis, Civil and Environmental Engineering program, student Leonardo Serafini, titled: "Localized pressure losses in a convergent duct under laminar flow conditions - CFD".
- Master's thesis, Civil and Environmental Engineering program, student Giacomo Rismondo, titled: "Numerical analysis of fluid-structure-sound interaction in turbulent flow".
- Master's thesis, Mathematics program, student Frida Lamonaca, titled: "Assessment of new methodologies for acoustic sources in bounded domains and in the presence of scattering objects".

Supervision of the following master's Thesis:

- Master's thesis, Mathematics program, student Ines Addeo, titled: "Subgrid scale contribution of cavitation to fluid dynamic noise".

Co-supervision of the following Ph.D. Candidates:

- Giovanni Petris, XXXV Cycle. Thesis title: "Physics and modelling of generation and propagation of noise by complex sources in realistic basins". Supervisors: V. Armenio, M. Cianferra, A. Camerlenghi.
- Andrea Savio, XXXV Cycle. Thesis title: "Cavitation models for ship propellers". Supervisors: V. Armenio, M. Cianferra, R. Bensow.
- Naira Hamid, XXXVI Cycle. Thesis title – "Acoustic characterization of air-bubble films in a turbulent Boundary layer". Supervisors: V. Armenio, M. Cianferra.
- Ines Addeo, XXXVII Cycle. Thesis title – to be defined. Supervisors: V. Armenio, P. Klin, M. Cianferra.

Engagement activities

Visiting period at Chalmers University of Technology (Gothenburg, Sweden), facilitating collaboration with the research group led by Prof. R. Bensow (Department of Maritime Sciences, Division of Marine Technology). From December 5, 2021, to December 12, 2021, and from February 1, 2022, to February 4, 2022.

Kick-off meeting of the SONORA Project at the University of Alicante. From November 3, 2022, to November 6, 2022.
Kick-off meeting (organization) of the BluEcho project. April 29-30, 2024.

Workshop on underwater noise propagation and impacts on marine life (organization), October 15-16, 2024.

Invited Seminars:

- Seminar during the Ercoftac Autumn Festival, at Roma Tre University. Rome 2021. Title: "Recent Progress in Computational Hydroacoustics".
- Seminar within the framework of the Department of Excellence project, at Roma Tre University. Rome 2022. Title: "Recent Developments in Hydroacoustics".
- Seminar as Visiting Assistant Professor, at Chalmers University of Technology. Gothenburg 2021.
- Seminar during the PhD Presentation Days, at the University of Trieste, Trieste 2022. Title: "Numerical Characterization of Underwater Noise Sources".
- Seminar during the PhD Presentation Days, at the University of Udine, Udine 2022. Title: "Numerical Reproduction of Cavitating Flows and the Evaluation of Hydroacoustic Noise".
- Seminar during the Waves Master Erasmus Mundus 2023 Summer School, at Universitat Politècnica de València, Gandia 2023. Title: "Noise from Ship Propellers: Numerical Modelling".
- Seminar-lecture during the Advanced Master in Sustainable Blue Economy, Trieste 2023. Title: "Noise Propagation in the Ocean".
- Seminar-lecture during the Advanced Master in Sustainable Blue Economy, Trieste 2024. Title: "Noise Propagation in the Ocean".
- Presentation at the SNAME event, Trieste 2024. Title: "Underwater Acoustics in Offshore Wind".
- Presentation at Aventa conference, Genova 2024, Title: "Evaluating wind turbine noise: a numerical prospective".

- Presentation of the BluEcho project at Sustainable Blue Economy Partnership Workshop - Baltic Sea - Sopot, Poland, April 2025.

Participation in conferences, both national (AIMETA, IDRA) and international (e.g. InterNoise, Euromech, SMP, ONR, APS DFD, ETMM Ercoftac, Ecomas Marine, UACE).

Trieste 18/09/2025

Marta Cianferra

A handwritten signature in black ink, reading "Marta Cianferra". The signature is written in a cursive style with a large, stylized initial 'M'.