Stefano Meloni

stefano.meloni@unitus.it

RESEARCH AND WORK EXPERIENCE

October 2022–present **Assistant Professor (RtD.A)**, University of Tuscia, Department of Economics, Engineering, Society and Business Organization.

Officially involved in DTT(Divertor Tokamak Test Facility) consortium: for the design of the cooling system of the tokamak trasmission line.
Officially involed in "BANDO RICERCA PNRR – Partenariati Estesi alle Università, ai centri di ricerca, alle aziende per il finanziamento di progetti di ricerca di base e Piano Nazionale Complementare Salute" PE2 Spoke 2 Offshoring Wind Turbines

November 2020–September 2022 **Research fellow**, University of Roma Tre, Department of Engineering. *Topic*: Experiments and time-frequency data analyses on the noise emitted by a propeller in distributed propulsion. Activities supported by ENODISE H2020. He has been also involved other European and Italian research projects: GARTEUR and DAVYD.

April 2022 **Visiting Researcher**, University of Bristol (UK).*Topic*: To follow experiments on a boundary layer ingesting propeller. Activity supported by ENODISE H2020.

Jun 2019 - oct 2019 **Visiting PhD Student**, ISVR, University of Southampton (UK). *Topic*: The main task of such visit, performed in the Rolls-Royce University Technology Centre in Gas Turbine Noise located at the ISVR, University of Southampton UK, was the study of the acoustic field and wall pressure field induced by a compressible jet installed under the wing in static and flight case.

Nov 2017 - Nov 2021 **PhD Student**, *Topic*: University of RomaTre. The PhD regarded a parametric analysis of jets in the installed configuration in terms of flow statistics and noise emitted, including the wall pressure field, with increasing complexity. The work included different experimental studies performed using different test setups, various facilities and different data processing techniques, including Fourier-based and wavelet-based, single and multivariate statistics.

dec 2016 - set 2017 **Researcher Internship** Technische Universiteit Delft (NL). *Topic*: This work aimed to develop a new post-processing technique for Particle Image Velocimetry(PIV) based on the vorticity equation and an optimization algorithm. During these months, I joined the large-scale PIV team. As a result, I have maturated experiences on Tomo, Stereo and Planar PIV.

dec 2014 - set 2017 **Master degree in Aeronautical Engineering** University of RomaTre. Department of Engineering

dec 2010 - set 2014 **Bachelor degree in Mechanical Engineering** University of RomaTre. Department of Engineering

TEACHING EXPERIENCE

2023-2024 **Main Lecturer of**:
Mechanics of Fluids, Industrial Engineering L9, University of Tuscia

Applied Termo-fluid-dynamics, Science and techniques of aircraft maintenance L9, University of Tuscia

Complements of aircraft engines: Pistone Engines, Science and techniques of aircraft maintenance L9, University of Tuscia

2022-2023 **Main Lecturer of**:
Fluid dynamic of Machine (Mod1), Industrial Engineering University of Tuscia

2021-Currently **Instructor**, CST Leonardo/Guardia di Finanza, Accredited instructor for the Military Aircraft Maintenance License (MAML), Pratica di Mare Airport, allowed at teaching to all the EASA modules (from M1 up to M17).

2020-2021 **Teaching assistant**, University of Roma Tre, Department of Engineering.
Termofluid-dynamic of propulsion systems course: Lectures and exercises about propulsion systems design, Master degree Aeronautical engineering

2018-2020 **Teaching assistant**, University of Roma Tre, Department of Engineering. Lectures about wind tunnel design and qualification. Performed in the Aerodynamic course, master degree in Aeronautical engineering.

2018-Currently **Supervisor and Co-supervisor** of more than 10 thesis (Masters and Bachelor degree).

2018-2020 **Tutor** in aerodynamic and aeroacoustic laboratory activities.

OTHER ACTIVITIES

Referee (Journals): Journal of Sound and Vibration, AIAA Journal, Aerospace Science and Technology, Experiments in Fluids, Flow turbulence and Combustion, Scientific Reports, Applied Acoustics, Sensors and Actuators A: Physical, International Journal of Aeroacoustics, Acta Acustica, International journal of Thermofluids, Advances in Mechanical Engineering, Fluids, Aerospace, Energies, Processes, Materials, Machines, Fractal and Fract, Int. J. of Global Energy Issues, Aerotecnica Missili e Spazio, Journal of Marine Engineering.
Referee (Projects): Project Referee for the Linz Institute of Technology
Guest Editor:

- Journal: Fluids. Special Issue on Recent Advances in Aerodynamics and Aeroacoustics: Towards Greener Aviation
- Journal: Applied Science. Special Issue on Advancements in Aerodynamics and Aeroacoustics: Addressing Installation Effects

Co-Organizer 1st Bristol Aeroacoustic Summer Event 19-20 September 2022;
Local Committee Aeroacoustics 2024 AIAA/CEAS
Chairman International Conference of Hydrodynamics, ICHD Rome 2024 (session of Vortex Dynamics and Turbulence Models)
Committee External examiner member of the final defence PhD committee at University of RomaTre for the 35th Cycle of Doctoral Degree in Mechanical and Industrial engineering, 28 May 2023
External examiner member of the final defence PhD committee at CUSANO University for the 34th Cycle of Doctoral Degree in Mechanical and Industrial engineering, 12 December 2023

License to practice as Engineer I am allowed to practice has engineer from September 2020.
Visiting Lecturer(Under Erasmus+ Program) University of Crna Gora, Podgorica, Montenegro, July 2023.
Visiting Lecturer University of Bristol, Bristol, UK, July 2024.
External Collaborations

- Collaboration contract with University of RomaTre to apply and develop advanced post-processing techniques in the EU project ENODISE (March/August 2023).
- Collaboration contract with University of RomaTre to apply and develop advanced post-processing techniques over a VEGA dataset in cooperation with AVIO (September 2023/February 2024).
- Collaboration contract with University of RomaTre to apply and develop advanced post-processing techniques over a hydrogen combustion dataset in cooperation with ENEA (April 2024/ November 2024).
- Collaboration with CNR (Italian National Research Council) on the project "Vortices" (February 2024 / Present).

PUBLICATIONS

Journals

Romanelli F. et al. Divertor Tokamak Test facility Project: status of design and implementation. Nuclear Fusion. 2024;0(0).

Kamliya Jawahar H, Hanson L, Meloni S, Azarpeyvand M. A multivariate and wavelet-based analysis on the wall pressure fluctuations for propellers in ground effect. (2024)International Journal of Aeroacoustics. 2024;0(0).

G, Palma, S. Meloni, R. Camussi, U.Iemma and C. Bogey (2024) Subsonic Jet Noise Prediction in Near and Far Field with Optimized Wave-Packet Approach. AIAA journal

I Zaman, M Falsi, B Zang, M Azarpeyvand, S Meloni (2024)On the Aeroacoustics of Turbulent Boundary Layer Ingesting Propellers. Physics of Fluids

A Celik, NS Jamaluddin, K Baskaran, S Meloni, D Rezgui, M Azarpeyvand (2024) Experimental characterisation of rotor noise in tandem configuration, Applied Acoustics 222, 110053

Moro A., Bruschi A., Fanale F., Fanelli P., Gajetti E., Garavaglia S., Granucci G., Meloni S., Pepato A., Platania P., Romano A., Salvitti A., Savoldi L., Schmuck S., Scungio M., Simonetto A., Turcato M., Vassallo E. (2024) Progress and challenges of the ECH transmission line design for DTT. Fusion Engineering and Design.

A. Salvitti, A. Bruschi, G. Calabrò, F. Fanale, P. Fanelli, S. Garavaglia, G. Granucci, S. Meloni, A. Moro, P. Platania, A. Romano, M. Scungio, Thermal and structural analyses on different mirrors of the Multi-Beam Transmission Line of DTT ECH system, (2024) Fusion Engineering and Design.

F. Petricelli, P. Chaitanya, S. Palleja-Cabre, S. Meloni, P. F Joseph, A. Karimian, S. Palani, R. Camussi An experimental investigation on the effect of in-flow distortions of propeller noise (2023) Applied Acoustics.

Stefano Meloni, Francesco Centracchio, Elisa de Paola, Roberto Camussi, Umberto Iemma (2023) Experimental characterisation and data–driven modelling of unsteady wall pressure fields induced by a supersonic jet over a tangential flat plate. Journal of Fluid Mechanics

G. Palma, S. Meloni, R.Camussi, U. Iemma and C. Bogey(2023) A data-driven multi-objective optimization of wave–packets for near–field subsonic jet noise. AIAA Journal

S. Meloni, E. de Paola, E. Grande, D. Ragni, L. G. Stoica, A. Di Marco and R. Camussi (2023) A wavelet-based separation method for tonal and broadband components of low Reynolds-number propeller noise. Measurement Science and Technology, Volume 34, Number 4

R. Camussi, S. Meloni, and C. Bogey. (2022) On the influence of the nozzle exhaust initial conditions on the near field acoustic pressure. Acta Acustica 6 : 57.

HK Jawahar, S Meloni, R Camussi, (2022) Jet noise sources for chevron nozzles in under-expanded condition, International Journal of Aeroacoustics

AR Proença, S Meloni, (2022) Evaluation of Turbulent Jet Characteristic Scales Using Joint Statistical Moments and an Adaptive Time-Frequency Analysis, Fluids, 7,(4),125

S Meloni, HK Jawahar, (2022) A Wavelet-Based Time-Frequency Analysis on the Supersonic Jet Noise Features with Chevrons, Fluids 7(,3),108

Micci G,. Camussi,R., Meloni S., Bogey C., (2022) Intermittency and stochastic modelling of low and high Reynolds number compressible jets. AIAAJournal

R. Camussi, M. Ahmad, S. Meloni, E. de Paola, A. Di Marco (2022). Experimental analysis of an under-expanded jet interacting with a tangential flat plate: flow visualizations and wall pressure statistics. Experimental Thermal and Fluid Science

Camussi, R., Meloni, S. (2021). On the Application of Wavelet Transform in Jet Aeroacoustics. Fluids, 6(8), 299.

S. Meloni, A. Proença, J. Lawerence, R. Camussi (2021). An experimental investigation into model-scale installed jet-pylon-wing noise. Journal of Fluid Mechanics

H. K. Jawahar, S. Meloni, R. Camussi, M. Azarpeyvand (2021) Intermittency and stochastic analysis of slat tones. Physics of Fluids, 33 (2), 025120.

S. Meloni, R. Camussi, A. Di Marco, M. Mancinelli (2020) Single and Multivariate Statistics of Jet-Induced Pressure Fluctuations over an Infinite Plate. Applied Science 10 (13), 4605.

S. Meloni, J. Lawerence, A. Proença, R. Self, R. Camussi. (2020) Wall pressure fluctuations induced by a single stream jet over a semi-finite plate. International Journal of Aeroacoustics 19 (3-5), 240-253.

S. Meloni, A. Di Marco, M. Mancinelli, R. Camussi. (2020) Experimental investigation of jet-induced wall pressure fluctuations over a tangential flat plate at two Reynolds numbers. Sci. Rep., Nature 10 (1), 1-11.

S. Meloni, M. Mancinelli, R. Camussi, J. Huber. (2020) Wall pressure fluctuations induced by a compressible jet in installed configuration. AIAA Journal, 58 (7), 2991-3000.

S. Meloni, A. DiMarco, M. Mancinelli, R. Camussi. (2019) Wall-pressure fluctuations induced by a compressible jet flow over a flat plate at different Mach numbers, Exp Fluids 60: 48.

Conference Proceedings

Meloni, S., Centracchio, F., Palma, G., Burghignoli, L., Mancinelli, M., Camussi, R., Bogey, C. (2024). An extensive near-field noise prediction of a subsonic jet using data-driven surrogate model based on neural networks. In 30th AIAA/CEAS Aeroacoustics Conference 2024.

Mancinelli, M., Meloni, S., Camussi, R. (2024). Jet-Plate Interaction in a Supersonic Screeching Jet. In 30th AIAA/CEAS Aeroacoustics Conference 2024.

Zaman, I., Meloni, S., Falsi, M., Zang, B., Azarpeyvand, M. (2024). On the Unsteady Fuselage Loading Induced by a Proximal Propeller. In 30th AIAA/CEAS Aeroacoustics Conference 2024.

S. Meloni, M. Mancinelli, R. Camussi, C. Bogey. (2023) The effects of inner boundary layer thickness on the near pressure field of a subsonic jet, Forum Acusticum 2023 Turin

Meloni S., Centracchio F., Falsi M., Zaman I., Zang B., Azarpeyvand M., Iemma U., Camussi R. DATA-DRIVEN MODEL FOR THE PREDICTION OF THE NOISE EMITTED BY A BOUNDARY LAYER INGESTING PROPELLER (2023) Proceedings of the International Congress on Sound and Vibration

Mancinelli M., Meloni S., Camussi R. AN EXPERIMENTAL INVESTIGATION OF THE INTERACTION BETWEEN A SUPERSONIC JET AND A FLAT PLATE (2023) Proceedings of the International Congress on Sound and Vibration

M. Falsi, I. Zaman, S. Meloni, R. Camussi, B. Zang and M. Azarpeyvand A multivariate statistical analysis of the noise emitted by an installed propeller Journal of Physics: Conference Series, Volume 2590, AIVELA XXX National Meeting 15/12/2022 –16/12/2022 Rome, Italy

M. Falsi, I. Zaman, M. Mancinelli, S. Meloni, R. Camussi, B. Zang, M. Azarpeyvand, Experimental investigation of the noise emitted by two different propellers ingesting a planar boundary layer, Materials Research Proceedings, Vol. 37, pp 17-20, 2023

G. Palma, S. Meloni, R. Camussi, U. Iemma ,C. Bogey (2023). Subsonic installed Jet noise scattering prediction using BEM and near-field-data-optimized Wave-Packet model. AIAA AVIATION FORUM 2023

S. Meloni, R. Camussi, M. Mancinelli,C. Bogey (2023).A parametric analysis of the effect of the jet initial conditions on the wavelet-decomposed near-field acoustic pressure. AIAA AVIATION FORUM 2023

R. Camussi, S. Meloni, C. Bogey (2022). The Statistics of the Near Field-Pressure of Compressible Subsonic Jets under Different Initial Conditions. ERCOFTAC Bulletin 132, AIMETA Palermo 2022

Edoardo Carbini, Jack Lawrence, Anderson Proenca, Stefano Meloni, Roberto Camussi(2022). An experimental investigation into the influence of installed chevron jet flows on wall-pressure fluctuations. Internoise, Glasgow

Umberto Iemma, Francesco Centracchio, Stefano Meloni, Roberto Camussi(2022)ARTIFICIAL NEURAL NETWORKS METAMODELS TAILORED TO JET INDUCED WALL PRESSURE FLUCTUATIONS International Conference of Sound and Vibration (ICSV) Singapore

S. Meloni, E. de Paola, E. Grande, D. Ragni, L. G. Stoica, A. Di Marco and R. Camussi. (2022) Wavelet-based decomposition of the tonal-broadband components of propeller noise, AIAA 2022-2876. 28th AIAA/CEAS Aeroacoustics 2022 Conference. June 2022

G. Palma, S. Meloni, R.Camussi, U. Iemma and C. Bogey.(2022) A Multi-Objective Optimization of a Wave-Packet Model Using Near-Field Subsonic Jet Data, AIAA 2022-2934. 28th AIAA/CEAS Aeroacoustics 2022 Conference. June 2022.

F. Petricelli, S. Palleja-Cabre, C. C. Paruchuri, P. Joseph, A. Karimian, S. Meloni and R. Camussi. (2022) On the effect of inflow distortions of propeller noise, AIAA 2022-2938. 28th AIAA/CEAS Aeroacoustics 2022 Conference. June 2022.

F. Centracchio, S. Meloni, H. K. Jawahar, M. Azarpeyvand, R. Camussi and U. Iemma.(2022) Under-expanded jet noise prediction using surrogate models based on artificial neural networks, AIAA 2022-3025. 28th AIAA/CEAS Aeroacoustics 2022 Conference. June 2022.

S. Meloni, E. de Paola, L. Curcio and R. Camussi (2022) On the Wall Pressure Fluctuations induced by a Supersonic Jet over the Wing pressure side, June 2022 Journal of Physics Conference Series 2293(1):012004

S. Meloni , R. Camussi , M. Prestianni , E. de Paola , F. Biondo (2021) An experimental investigation on the unsteady pressure field induced by an installed jet in supersonic flow conditions. AIAA AVIATION 2021 FORUM.

H. Kamliya Jawahar, S. Meloni, R. Camussi, M. Azarpeyvand, (2021). Experimental Investigation on the Jet Noise Sources for Chevron Nozzles in Under-expanded Condition. AIAA AVIATION 2021 FORUM.

R. Camussi, G. L. Micci, S. Meloni, C. Bogey (2021). Intermittent statistics and stochastic modelling of low and high Re compressible jets. AIAA AVIATION 2021 FORUM.

S. Meloni, J. Lawerence, A. Proença, R. Self , R. Camussi. (2020) Analysis of experimental unsteady wall pressure data from a jet installed above a semi-finite plate, FA2020.

H. Kamliya Jawahar, S. Meloni, M. Azarpeyvand, R. Camussi, C. I. Da Silva. (2020) Intermittency analysis of high-lift airfoil with slat cove fillers. AIAA AVIATION 2020 FORUM

S.Meloni, R. Camussi, A. Di Marco, G. Fava. (2019) Jet-Flat Plate Interaction: Wall Pressure Coherence Modeling AIMETA, Roma

R. Camussi, S.Meloni, E. de Paola, M. Khalil, A.Di Marco, A. Fagotto. (2019) Experimental Investigation of an Under-expanded Single Stream Jet Interacting with a Tangential Flat Plate: Flow Visualizations and Wall Pressure Statistics, Internoise, Madrid

S.Meloni, M Mancinelli, R.Camussi, J Huber (2019) Wall pressure fluctuations induced by a compressible coaxial jet in installed configuration. AIAA /CEAS Delft

S.Meloni, A. DiMarco, R. Camussi M. Mancinelli (2019) Parametric characterization of wall pressure fluctuations induced by a compressible jet flow interacting with a flat plate. AIAA/CEAS Delft.

S.Meloni, E. de Paola, A. Di Marco, A. Fagotto, R.Camussi. (2019) Wall pressure analysis and Background Oriented Schlieren visualization on jet-flat plate interaction Journal of Physics: Conference Series

S.Meloni, A.DiMarco, M Mancinelli, R.Camussi (2018) Reynolds number effect on wall pressure fluctuations induced by a subsonic jet on a tangential flat plate FIV,Toronto

S.Meloni, A.DiMarco, E.dePaola, G.Fava, R.Camussi. (2018)Pressure and Velocity Measurements of a Compressible Jet Interacting with a Flat Plate. ITI Bertinoro

E.dePaola , A.DiMarco, S.Meloni, R.Camussi (2018) Density Measurements of a Compressible Jet Flow Interacting with a Tangential Flat Plate Using Background-Oriented Schlieren. ITI Bertinoro