

**CURRICULUM OF THE RESEARCH AND TEACHING ACTIVITIES  
OF  
MASSIMO MASI**

**1. Personal Data**

Place and date of birth:      Padova - Italy, September 22th, 1969  
Work affiliation:              Department of Engineering and Management – DTG,  
University of Padova

**2. Present position**

From March, 31<sup>th</sup> 2022, associate professor at the University of Padova in Fluid Machines and Energy Systems.

**3. Past positions and Education**

2011/22      Assistant professor at the University of Padova in Fluid machines and energy systems.  
2000/10      Post-doc and research fellowships at the University of Padova  
1999          Fellowship winner at the Italian National Institute of Nuclear Physics (INFN).  
1996/99      PhD in Energetics (Design of Turbomachines) in 2000 at the University of Padova.  
1997          Licensed for the profession of engineer (regularly enrolled in the Association of Engineers of Padova).  
1996/97      Military service at Brigata Alpina “Cadore” (rank: corporal squad-commander).  
1996          MSc in Mechanical Engineering.

**4. Teaching Activity**

Involved in teaching activity since 1999: seminar lessons up to 2004; course responsibility since 2003-04; member of examination boards since 2003-04; supervisor or co-supervisor of BSc, MSc, PhD theses, and institutional research grants since 1997-1998. A summary of this activity is listed in the following.

***Institutional courses and classes***

*University of Padova – Department of Management and Engineering*

Since 2018/19 “Design of Engines for Sustainable Transition” (formerly “Internal Combustion Engine Design” - course for the second-cycle degree in Product Innovation Engineering (48 hours).

Since 2011/12 “Turbomachines and energy systems” (formerly “Turbomachines”) - course for the first-cycle degree in Engineering and Management (48 hours).

*University of Padova – Department of Industrial Engineering*

Since 2023/24

Course of “*Design and Analysis of Axial-Flow Industrial Fans*”, (course for the doctoral program in Industrial engineering, 24 hours).

*University of Padova – Department of Industrial Engineering*

From 2011/12 to 2015/16

Course of “*Internal Combustion Engines*” (course for the second-cycle degree in Mechanical Engineering, 48 hours).

*University of Padova – Department of Mechanical Engineering*

From 2005/06 to 2010/11

Course of “*Internal Combustion Engines*” (course for the first- or second-cycle degree in Mechanical Engineering, 50-to-54 hours).

From 2004/05 to 2007/08

“*Technical-scientific issues in the design of the Internal Combustion Engines*” (class of the course “*Fluid machines design*” for the second-cycle degree in Mechanical Engineering, 12 hours, 6 hours after 2005/06).

2003/04 “*CFD for turbomachines design*” (class of the course “*Fluid machines design*” for the second-cycle degree in Mechanical Engineering, 12 hours).

### **Supervision of PhD Theses**

*University of Padova – School of Industrial Engineering*

*Mechanical Engineering*

- PhD5 “Aeraulic systems and processes for the sustainability of the steel industry”, dr. Edoardo Bregolin, XXXVII cycle, 2022-present (Supervisor).

*Energetics*

- PhD4 “Micro to small scale energy harvesting from gas networks”, dr. Piero Danieli, XXXIV cycle, 2018-21 (Co-supervisor).
- PhD3 “*Development of a general procedure for the optimum design of ORC plants and their components*”, dr. Luca Da Lio, XXXI cycle, 2016-19. (Co-supervisor).
- PhD2 “*Design and analysis of multistage rotodynamic pumps featuring a compact design*”, dr. Federico Fontana, XXX cycle, 2015-18. (Supervisor).
- PhD1 “*A new design method for axial flow fans with constrained rotor speed and diameter*”, dr. Stefano Castegnaro, XXX cycle, 2015-18. (Supervisor).

### **External reviewer of PhD Theses**

“*Sapienza*” *University of Rome – Doctoral school of Science and Technology for the Industrial Innovation – Energy and Environment – Faculty of Civil and Industrial Engineering*

- RPh9 “*Analysis of brake system emissions and evaluation of possible mitigation strategies*”, dr. Marco Torre, Supervisors prof. A. Corsini and dr. Ettore Guerriero, 2021-2024.

*Budapest University of Technology and Economics – Mechanical Engineering, Faculty of Mechanical Engineering*

- RPh8 “*A passive loss reduction method of square sudden expansion*”, dr. Eszter Lukacs, Supervisor prof. J. Vad, 2020-2023.

*Stellenbosch University – Mechanical Engineering, Faculty of Engineering*

- RPh7 “*Augmentation of the actuator-disk method for low-pressure axial flow fan simulation*”, dr. Adam John Venter, Supervisor prof. M.T.F Owen, co-Supervisor dr. J. Muiyser, 2020-23.

*Politecnico di Milano – School of Energy and Nuclear Science and Technology*

- RPh6 “*Numerical and experimental characterization of small-scale ORC turbines*”, dr. Marco Manfredi, Advisors prof. A. Spinelli and prof. M. Astolfi, 2020-23.

*University of Modena and Reggio Emilia – School of Industrial and Environmental Engineering*

- RPh5 “*Validation of chemistry-based methodologies to infer knock occurrence in a GDI engine. Fuel model design and comparison between synthetic and statistical approaches*”, dr. Francesco Cicci, Advisors prof. A. d’Adamo and prof. S. Fontanesi, 2020-23.

*Stellenbosch University – Mechanical Engineering, Faculty of Engineering*

- RPh4 “Design of a Tip Appendage for the Control of Tip Leakage Vortices in Axial Flow Fans”, dr. Thomas Oliver Meyer, Supervisor prof. S. J. van der Spuy, co-Supervisors prof. C. J. Meyer and prof. A. Corsini, 2018-21.

*“Sapienza” University of Rome – School of Industrial and Management Engineering*

- RPh3 “Machine learning in industrial turbomachinery: development of new framework for design, analysis and optimization”, dr. Gino Angelini, Supervisor prof. A. Corsini, 2016-19.

*University of Oviedo – Department of Energy, School of Energy and Process Control*

- RPh2 “Optimized Design of Aerodynamic Airfoils for Vertical Axis Wind Turbines”, dr. Andrés Meana-Fernández, Supervisors Sandra Velarde-Suárez and Jesús Manuel Fernández-Oro, 2015-19.

*“Sapienza” University of Rome – School of Industrial and Management Engineering*

- RPh1 “Complex network analysis in industrial process monitoring and Control”, dr. Fabrizio Bonacina, Supervisor prof. A. Corsini, 2015-18.

### **External examiner of PhD Theses**

*Budapest University of Technology and Economics – Mechanical Engineering, Faculty of Mechanical Engineering*

- Eph5 “A passive loss reduction method of square sudden expansion”, dr. Eszter Lukacs, Supervisor prof. J. Vad, 2020-2023.

*Stellenbosch University – Mechanical Engineering, Faculty of Engineering*

- Eph4 “Augmentation of the actuator-disk method for low-pressure axial flow fan simulation”, dr. Adam John Venter, Supervisor prof. M.T.F Owen, co-Supervisor dr. J. Muiyser, 2020-23.

*Politecnico di Milano – School of Energy and Nuclear Science and Technology*

- Eph3 “Numerical and experimental characterization of small-scale ORC turbines”, dr. Marco Manfredi, Advisors prof. A. Spinelli and prof. M. Astolfi, 2020-23.

*Stellenbosch University – Mechanical Engineering, Faculty of Engineering*

- Eph2 “Design of a Tip Appendage for the Control of Tip Leakage Vortices in Axial Flow Fans”, dr. Thomas Oliver Meyer, Supervisor prof. S. J. van der Spuy, co-Supervisors prof. C. J. Meyer and prof. A. Corsini, 2018-21.

*University of Padova – Mechanical Engineering, School of Industrial Engineering*

- Eph1 “Numerical study of bicycle racing wheels aerodynamics performance”, dr. Matteo Pogni, Supervisor prof. N. Petrone, XXIX cycle, 2014-18.

### **Institutional research grants supported by University of Padova**

*Tutor of senior research grants*

- IRG4 “Hydraulic design and experimental validation of partial emission pumps for the propulsion of logistic lunar landers”, researcher P. Danieli, 2023-24.
- IRG3 “Alternative energy systems to support the transition to 100% renewable scenarios”, researcher P. Danieli, 2021-2023.
- IRG1 “An Approach to a Multidisciplinary Design for a Small-Scale Vertical Axis Wind Turbine for the Urban Environment”, researcher M. Raciti Castelli, 2014-16.

*Participant at research grant projects*

- IRG2 “Integration of turbine design in the thermodynamic analysis and optimization of Organic Rankine Cycle engines”, researcher G. Manente, Tutor prof. A. Lazzaretto, 2012.

### **MSc and BSc Theses**

Supervisor or co-supervisor of 69 theses (54 second-cycle theses, 15 first-cycle theses);  
Examiner of 3 MSc theses.

## 5. Other institutional positions

### **Doctoral school in Industrial Engineering**

University of Padova – Department of Industrial Engineering  
since 2014      Member of the teaching staff of the *Energetics* program.

### **Cluster Trasporti Italia 2020**

Working Group (WG) “trasporto sulle vie d'acqua”  
2014-2022      Expert for the University of Padova (association participant) in the Working Group (WG) “trasporto sulle vie d'acqua”.

### **Teaching boards**

University of Padova – Department of Management and Engineering  
since 2018/19      Member of the Product Innovation Engineering board.  
University of Padova – Department of Management and Engineering  
since 2011/12      Member of the Management Engineering board.  
University of Padova – Department of Industrial Engineering  
from 2011/12 to 2015/16      Member of the Mechanical Engineering board.

## 6. Projects and research contracts

Leader or participant to several national projects and research contracts since 1998 on theoretical, numerical and experimental issues of turbomachinery, industrial combustors, and alternative fuels in internal combustion engines. In the following, a selection of the recent and most representative ones is reported.

Since 2022 PI of the research contract with Thales Alenia Space Italia S.p.A. (Turin), as contractor of Nammo-UK for the main-contract between the latter and the European Space Agency (ESA) for RELIANCE, engine of the logistic lander EL3 conceived in the framework of the Argonaut-ESA mission. The work packages include the pre-development, co-design support, and hydraulic design of the electric high-speed pumps for the propellants, and the design of the electric-pumps cooling system. (Euro 300.000).  
2020-2022: Co-responsible of the contract with Area Impianti S.p.A. – Air Cleaning – Heat Recovery – Power Generation, (Padova), funded by Uni-Impresa 2019, for the “Study and design of an innovative sCO<sub>2</sub> power-plant for the recovery of medium-to-low temperature waste heat – GLASSCO<sub>2</sub>”. (Euro 200.000).

## 7. Voluntary tasks devoted to the scientific community

### **Editorial Board of International Journals**

Since 2025 Associate Editor of the ASME Journal of Energy Resource Technology, Part A: Sustainable and Renewable Energy.  
2025      Guest Editor for the *International Journal of Turbomachinery, Propulsion and Power* of the special issue “*Advances in Industrial Fan Technologies*”.  
2022-25      Guest Editor for *Energies* journal of the special issue “*Experimental and Numerical Methods for the Design of Internal Combustion Engines and Turbomachines*”.

### **Scientific and Technical Committees**

Since 2024 Member of the “Technical Committees” Committee of the Extended Leadership Team of the ASME division International Gas Turbine Institute  
Since 2024 Vice-chair of the “Fans & Blowers” Technical Committee (ASME-International Gas Turbine Institute).

- 2021-2024 Vanguard chair of the “Fans & Blowers” Technical Committee (ASME-International Gas Turbine Institute).
- 2018 Member of the Turbo Expo Student Poster Awards, ASME 2018 TurboExpo. Oslo, NOR, June 10-15.  
Member of the Scientific Advisory Committee of Fan 2018 International conference on Fan noise, Aerodynamics Applications and Systems. Darmstadt, DE, April 18-20.
- Since 2015 Member of the “Fans & Blowers” Technical Committee (ASME-International Gas Turbine Institute).

### **Organising Committees**

- Since 2025 Organising committee member of “*FAN 2028 – IX International conference on Fan noise, Aerodynamics Applications and Systems*”.
- 2022-25 Organising committee member of “*FAN 2025 – VIII International conference on Fan noise, Aerodynamics Applications and Systems*”. Antibes, FR, April 9-11.

### **Track Organiser and co-organiser in international conference**

- 2024/25 “Fans & Blowers” (as Vice-chair of the homonymous technical committee) of the ASME 2024 TurboExpo. London, UK, June 24-28, 2024.
- 2022-25 “Fan Aerodynamics” Track co-Chair for “*FAN 2025 – International conference on Fan noise, Aerodynamics Applications and Systems*”. Antibes, FR, April 9-11.
- 2023/24 “Fans & Blowers” (as Vanguard chair of the homonymous technical committee) of the ASME 2024 TurboExpo. London, UK, June 24-28, 2024.
- 2022/23 “Fans & Blowers” (as Vanguard chair of the homonymous technical committee) of the ASME 2023 TurboExpo. Boston-MA, USA, June 26-30, 2023.
- 2021/22 “Fans & Blowers” (as Vanguard Chair of the homonymous technical committee) of the ASME 2022 TurboExpo. Rotterdam, NL, June 13-17, 2022.

### **Session Organiser, Chairman and co-Chair in international conference**

- 2025 Co-chair of the session: Artificial intelligence and optimization techniques, VIII International conference on Fan noise, Aerodynamics Applications and Systems - Fan 2025. Antibes Juan les Pins, FRA, 9-11 April, 2025.
- 2024 Chair of the session: Turbomachinery Aerodynamic Design and Analysis Methods, GPPS Chania 2024, Chania, Greece, September 4-6, 2024.
- 2024 Chair of the session: Pumps, GPPS Chania 2024, Chania, Greece, September 4-6, 2024.
- 2023/24 Session Organiser and Chair of the session Fans&Blowers: Numerical simulations and fan noise, ASME 2024 TurboExpo. London, UK, June 24-28, 2024.
- 2022/23 Session Organiser and Chair of the session Fans&Blowers: Acoustic studies of fans, ASME 2023 TurboExpo. Boston-MA, USA, June 26-30, 2023.
- 2021/22 Session Organiser and Chair of the session Fans&Blowers: Design and optimization, ASME 2022 TurboExpo. Rotterdam, NL, June 13-17, 2022.
- 2020/21 Session Organiser and Chair of the session Fans&Blowers: Optimization for Fans and Blowers, ASME 2021 TurboExpo. Virtual event, June 7-11, 2021.
- 2019/20 Session Organiser and Chair of the session Fans&Blowers: Fan component design, ASME 2020 TurboExpo. Virtual event, September 21-25, 2020.
- 2018/19 Session Co-organiser and Co-chair of the session Fans&Blowers: Machine Learning and Optimization, ASME 2019 TurboExpo. Phoenix-AZ, USA, June 17-21, 2019.
- 2017/18 Session Organiser and Chair of the session Fans&Blowers: Optimization, ASME 2018 TurboExpo. Oslo, NOR, June 10-15, 2018.  
Chair of the sessions: Application of Analytical, Computational and Experimental Methods I and II - Fan 2018 International conference on Fan

- noise, Aerodynamics Applications and Systems. Darmstadt, DE, April, 18-20.
- 2016/17 Session Organiser and Co-chair of the session Fans&Blowers: Design Method 2, ASME 2017 TurboExpo. Charlotte-NC, USA, June 26-30, 2017.
- 2016 Co-chair of the session Fans&Blowers: Fan Design and optimization, ASME 2016 TurboExpo. Seoul, South-Korea, June 15-19, 2016.
- 2015 Chair of the session Flow Control and Measurements 1, 12<sup>o</sup> International Symposium on Experimental and Computational Aerodynamics of Internal Flows – ISAIF. Lerici, Italy, July, 13-16.

***Reviewer of scientific papers***

- 2025 Reviewer for the international conference 16<sup>o</sup> European Turbomachinery Conference ETC 16 - Turbomachinery Fluid-Dynamics and Thermodynamics, Hannover, NL, EU, March 24-28, 2025.
- 2024 Reviewer for the international conference Fan 2025 – VII International Conference on Fan Noise, Aerodynamics, Applications and Systems, Antibes Juan les Pins, FRA, EU, April, 9-11, 2024.
- 2024 Reviewer for the international conference GPPS 24 – Global Power & Propulsion Society Conference, Chania, GR, September, 4-6 2024.
- Since 2024 Reviewer for the international journal Energy Sources, Part A: Recovery Utilization and Environmental Effects (UESO).
- Since 2023 Reviewer for the international journal Periodica Polytechnica Mechanical Engineering.
- Since 2022 Reviewer for Frontiers in Mechanical Engineering (FMECH), Journal of Particulate Science and Technology (UPST), international Journal of the Chinese Institute of Engineers (JCIE).
- Since 2021 Reviewer for the international journals ASME Journal of Turbomachinery (JTURBO), Journal of Mechanical Engineering Science (JMES, PIME - part C), and International Journal of Precision Engineering and Manufacturing-Green Technology (JPGT)
- 2020 Reviewer for the international conference ECOS2020, (Conference not held, proceedings only), Jul, 2020.
- Since 2020 Reviewer for the ASME journal of Fluids Engineering (JFE).
- Since 2019 Reviewer for the international journal of Numerical Methods for heat and Fluid Flow (HFF).
- 2018 Reviewer for the international conference GPPS 19 – Global Power & Propulsion Society Conference, Zurich, SUI, January, 15-16 2019.
- Since 2018 Reviewer for the international journals ASME Journal of Engineering for Gas Turbines and Power (JEGTP), Advances in Mechanical Engineering (AME).
- 2017 Reviewer for the international conference Fan 2018 – International Conference on Fan Noise, Aerodynamics, Applications and Systems, Darmstadt, GER, EU, April, 18-20.
- Since 2017 Reviewer for the international journals SAE International Journal of Engines (JENG), International Journal of Turbomachinery, and Propulsion and Power (IJTPP).
- 2017 Reviewer for the international conference 12<sup>o</sup> European Turbomachinery Conference ETC 12 - Turbomachinery Fluid-Dynamics and Thermodynamics, Stockholm, SWE, EU, April, 3-7.
- Since 2016 Reviewer for the international journal Energies.
- 2016 Reviewer for the international conference ASME International design engineering technical conferences & computers and information in Engineering Conference – ASME-IDETC/CIE Charlotte, NC, USA, August, 21-24.
- Since 2015 Reviewer for the international conference ASME-TurboExpo.
- 2015 Reviewer for the international conferences: Fan 2015 – International Conference on Fan Noise, Aerodynamics, Applications and Systems, Lyon, FR, April, 15-17; ECOS2015, Pau, FR, June 30 – July 3.

Since 2014 Reviewer for the international journals Proceedings of the Institution of Mechanical Engineers – part A (PIME part A) and Journal of Agricultural Science and Technology (JAST).

2014 Reviewer for the international conference SAE 2014 International Powertrain, Fuels & Lubricants Meeting, Birmingham, October 20-23.

Since 2013 Reviewer for the international journal Environmental Engineering and Management Journal (EEMJ).

Since 2012 Reviewer for the international journals Fuel (JFUE) and Noise Control Engineering Journal (NCEJ).

2012 Reviewer for the international conference ECOS2012, Perugia, June, 26-29.

Since 2011 Reviewer for the international journals Energy, International Journal of Energy and Environmental Engineering (IJEEE), Energy Conversion and Management (ECM), International Journal of Thermodynamics (IJoT) and Journal of Applied Mechanical Engineering (JAME).

Since 2010 Reviewer for the international journals Applied Energy (APEN) Mathematical and Computer Modelling of Dynamical Systems (MCMDS) and Aircraft Engineering and Aerospace Technology (AEAT).

Since 2008 Reviewer for the international conference ASME IMECE.

Since 2007 Reviewer for the international Journal of Energy Resources Technology (JERT).

2007 Reviewer for the international conference ECOS2007, Padova, June, 24-27.

### **Membership**

Since 2012 Member of the American Society of Mechanical Engineers (ASME).

Since 2016 Member of the Italian Association of Fluid Machines and Energy Systems - AIMSEA.

Since 2019 Member of the Italian Thermo-technique Association – ATI.

## **8. Foreign Collaborations**

Since 2021 City University of London, Department of Mechanical Engineering and Aeronautics, prof. JafarAl-Zaili and Abdulnaser Sayma, use of the gas network as hydrogen carrier and storage system.

2022-23 Harbin Engineering University (China), College of Power Energy Engineering, prof. Longbin Yang, Zhenyu Shen, marine diesel engines fault diagnostics.

2018-19 Universitas Muhammadiyah Magelang (Indonesia), Department of Automotive Engineering, Dr. Muji Setiyo (Head of Research Division), LPG fuelled engines.

2011-17 Lulea University of Technology (SWE), prof. Andrea Toffolo, gas turbine combustors.

## **9. Cooperation with public or private research institutions**

*Association to inter-university research consortia:*

Since 2014 member of the “Consorzio Interuniversitario Nazionale per la Scienza e Tecnologia dei Materiali – INSTM”.

*Cooperation with STEMS-CNR (former Istituto Motori IM-CNR) of Naples:*

Since 2014 Scientific Coordinator of the cooperation agreement between Istituto Motori and the Department of Engineering and Management of the University of Padova.

*Cooperation with the National Institute of Nuclear Physics INFN-LNL:*

2006 Fluid dynamic study of a microdosimetry probe for mixed radiations.

1999 Fluid Dynamic sizing of the cooling circuit for resonators RFQ in superconductive operation.

## 10. International and national awards or recognitions

- 2024 Presenter of the Tutorial of Basics “Basic Design and Analysis of Axial-Flow Industrial Fans” proposed by the Fans & Blowers ASME IGTI Technical Committee at the TurboExpo 2024 Conference, London, UK, June 24-28, 2024.
- 2023 Editor's Choice Articles based on recommendations by the scientific editors of MDPI journals from around the world, for the paper: Fontana, F., Masi, M., “A Hybrid Experimental-Numerical Method to Support the Design of Multistage Pumps”. *Energies*, Vol. 16 (12), (2023), 4637. Editors select a small number of articles recently published in the journal that they believe will be particularly interesting to readers, or important in the respective research area. The aim is to provide a snapshot of some of the most exciting work published in the various research areas of the journal. [https://www.mdpi.com/journal/energies/editors\\_choice](https://www.mdpi.com/journal/energies/editors_choice) , June, 11, 2023.
- 2023 Nomination for the best paper of the “ASME-IGTI Fans & Blowers Technical Committee”, (Masi M., Danieli P., Lazzaretto A., “Effect of Solidity and Aspect Ratio on the Aerodynamic Performance of Axial-Flow Fans with 0.2 Hub-to-Tip Ratio”. *Proc. ASME TurboExpo 2022*, Rotterdam, The Netherlands, June 13-17).
- 2023 Most referenced author (5 papers) in: Singh, V., Baraiya, N.A., A Review on Design and Optimisation of Axial Fan. In: *Recent Advances in Fluid Dynamics. Lecture Notes in Mechanical Engineering*, (2023), Banerjee, J., Shah, R.D., Agarwal, R.K., Mitra, S. (eds). Springer.
- 2022 Nomination for the best paper of the “ASME-IGTI Fans & Blowers Technical Committee”, (Masi M., Danieli P., Lazzaretto A., “Overview of the Best 2020 Axial-Flow Fan Data and Inclusion in Similarity Charts for the Search of the Best Design”. *Proc. ASME TurboExpo 2021*, Virtual event, United States, 2021, June 7-11).
- 2022 Presenter of the Tutorial of Basics “Introduction to the Aerodynamic Design of Axial-Flow Industrial Fans” proposed by the Fans & Blowers ASME IGTI Technical Committee at the TurboExpo 2022 Conference, Rotterdam, the Netherlands, June 13-17, 2022.
- 2021 Nomination for the best paper of the “ASME-IGTI Fans & Blowers Technical Committee” (Danieli P., Masi M., Delibra G., Corsini A., Lazzaretto A., “Assessment of MULTALL As CFD Code for the Analysis of Tube-Axial Fans”. *Proc. ASME TurboExpo 2020*, Virtual event, 2020).
- 2020 Presenter of the Tutorial of Basics “A Basic Introduction to the Aerodynamic Design of Industrial Axial Flow Fans” proposed by the Fans & Blowers ASME IGTI Technical Committee at the TurboExpo 2020 Conference, Virtual event, 16<sup>th</sup> Dec., 2020.
- 2020 Two nominations for the best paper of the “ASME-IGTI Fans & Blowers Technical Committee” (Masi M., Lazzaretto A., “A New Practical Approach to the Design of Industrial Axial Fans: Part I — Tube-Axial Fans with Very Low Hub-to-Tip Ratio”, and Masi M., Lazzaretto A., “A New Practical Approach to the Design of Industrial Axial Fans: Part II — Forward-Swept Blades with Low Hub-to-Tip Ratio”. *Proc. ASME-TurboExpo 2019*, Phoenix-AZ, USA, 2019).
- 2018 Nomination for the best paper of the “ASME-IGTI Fans & Blowers Technical Committee” (Masi M., Lazzaretto A., “Preliminary investigation on the effect of the modification of the sweep angle at the blade tip of forward swept axial fans”. *Proc. ASME-TurboExpo 2017*, Charlotte-NC, USA, 2017).
- 2018 Invited speech “Efficiency in the pump Industry” at the event “Innovation, Design Efficiency Application Sustainability - IDEAs Shape the Future”, Villa Reale di Monza, March 14<sup>th</sup>, 2018, (<http://ideas.sea-land.it/>).
- 2017 Nomination for the best paper of the “ASME-IGTI Fans & Blowers Technical Committee” (Masi M., Castegnaro S., Lazzaretto A., “A Criterion for the

- preliminary design of high-efficiency tube-axial fans". Proc. ASME-TurboExpo 2016, Seoul, South Korea, 2016).
- 2006 "inTESI" Award of the Padova's scientific-technologic park "Galileo", as supervisor of MSc thesis on innovation in cooperation with ZF Padova S.r.l. *"Analisi Fluidodinamica della Scia e Scelta dell'Elica per una Nave Cisterna"*, candidate Bernardo Valier [T33].
- 2000 Certificate of Appreciation of the American Society of Mechanical Engineers (ASME) Petroleum Division for the contribution to the international congress ESDA 2000.

## 11. Brief summary of the research activity

The research activity aimed at the study and fluid dynamic characterisation of the fluid machines began in 1997.

Based on the studies on applied fluid dynamics for the preliminary design of turbomachines in the framework of the MSc thesis and PhD course, the research has been focused on several topics related to fluid machines and fluid dynamics: analysis of turbomachine internal flows, external aerodynamics problems, study of industrial processes, numerical modelling of combustion instability, numerical simulation and experimental testing of internal combustion engines. In the last years, the activity has been also focused on the energy systems and the issues related to the decarbonisation of the national energy system.

The scientific activity has been always combined with the applied research, as proven by the cooperation with several industrial partners.

The entire activity produced 122 works organised as follows:

- 91 publications, 34 on peer reviewed international journals (29 with impact factor), 46 peer reviewed international conference papers (32 original and 14 published on international journal), 1 book chapter, 4 national journal papers and 6 peer reviewed national conference papers (5 originals e 1 published on international journal);
- 30 technical reports on the research activity performed in the framework of projects and contracts with national industries;
- PhD thesis.

The complete list of the publications is reported in item 2 of the curriculum appendix.

Padova, June 8<sup>th</sup> 2025

Massimo Masi



## APPENDIX TO MASSIMO MASI'S CURRICULUM VITAE

### 1. Publications list

#### ***Peer reviewed international journal papers***

- [A34] Masi M., Danieli P., Dal Cin E., Bregolin E., "Effects of Different Blade Loading Strategies Applied to Low Specific Speed Tube-Axial Fans". Journal of the Global Power and Propulsion Society, Accepted for publication May 8<sup>th</sup>, 2025.
- [A33] Bregolin, E., Danieli, P., Masi M., Collection Efficiency of Cyclone Separators: Comparison between New Machine Learning-Based Models and Semi-Empirical Approaches. Waste Vol. 2, (2024), 240-257. Doi: 10.3390/waste2030014.
- [A32] Lazzaretto, A., Masi, M., Rech, S., Carraro, G., Danieli, P., Volpato, G., Dal Cin, E., "From exergoeconomics to Thermo-X Optimization in the transition to sustainable energy systems". Energy Vol. 304, (2024), 132038. Doi: 10.1016/j.energy.2024.132038
- [A31] Danieli P., Carraro G., Volpato G., Dal Cin E., Lazzaretto A., Masi, M., "Guidelines for minimum cost transition planning to a 100% renewable multi-regional energy system", Applied Energy Vol. 357, (2024), 122497. Doi:10.1016/j.apenergy.2023.122497.
- [A30] Danieli P., Masi M., Lazzaretto L., Carraro G., Dal Cin E., Volpato G., "Is banning fossil-fueled internal combustion engines the first step in a realistic transition to a 100% RES share?". Energies, Vol. 16, (2023), 5690. <https://doi.org/10.3390/en16155690>.
- [A29] Fontana, F., Masi, M., "A Hybrid Experimental-Numerical Method to Support the Design of Multistage Pumps". Energies, Vol. 16 (12), (2023), 4637. Doi: 10.3390/en16124637.
- [A28] Xu N., Yang L., Lazzaretto A., Masi M., Shen Z., Fu Y.P, Wang J.M., "Fault location in a marine low speed two stroke diesel engine using the characteristic curves method", AIMS Electronic research Archive, Vol. 31 (7): 3915-3942, (2023). Doi: 10.3934/era.2023199.
- [A27] Masi M., Danieli P., Lazzaretto A., "Effect of Solidity and Aspect Ratio on the Aerodynamic Performance of Axial-Flow Fans with 0.2 Hub-to-Tip Ratio", ASME Journal of Turbomachinery, Vol. 145 (8): 081008, (2023). Doi: 10.1115/1.4057063.
- [A26] De Simio, L., Iannaccone, S., Masi, M., Gobbato P., "Experimental Study and Optimisation of a Non-Conventional Ignition System for Reciprocating Engines Operation with Hydrogen-Methane Blends, Syngas, and Biogas". Energies, Vol. 15, (2022), 8270. Doi: 10.3390/en15218270
- [A25] Masi M., Danieli P., Lazzaretto A., "Overview of the Best 2020 Axial-Flow Fan Data and Inclusion in Similarity Charts for the Search of the Best Design", ASME Journal of Turbomachinery, Vol. 144: 0901012, (2022). Doi: 10.1115/1.4053535.
- [A24] Danieli, P., Lazzaretto, A., Al-Zaili, J., Sayma, A., Masi, M., Carraro, G., "The potential of the natural gas grid to accommodate hydrogen as an energy vector in transition towards a fully renewable energy system". Applied Energy, Vol. 313, (2022), 118843.
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- [G3] 2002, Masi, M., Antonello, M., Navarro, G., “Analisi Fluidodinamica di un Modello di Girante Bipolare per Pompa Centrifuga ST 4”. (Studio sulla fluidodinamica delle giranti per pompe autoadescanti), Report for VARISCO POMPE S.p.A. in Padova.
- [G2] 2002, Antonello, M., Masi, M., Navarro, G., “Ricerca delle funzionalità delle fasi di lavaggio, sterilizzazione e tappatura nella macchina prototipale per l’imbottigliamento”. (Studio sulla fluidodinamica del processo di imbottigliamento di vini), Report for MBF S.p.A in Verona.
- [G1] 2000, Masi, M., “Analisi fluidodinamica di testate rotonde per l’estrusione di prodotti alimentari tipo pasta”. (Studio teorico sulla reologia di fluidi non newtoniani e sul progetto fluidodinamico di testate per l’estrusione di pasta alimentare). Report for PAVAN S.p.A. in Padova.

### **PhD Thesis (in Italian)**

- [H1] “Metodo per il Progetto Preliminare di Turbomacchine Assiali Basato sulla Teoria del Potenziale”, coordinator prof. M. Rea, supervisor prof. G. Navarro. PhD course in Energetics – XII cycle. December, 31th 1999.

### **Legend:**

- |                                                        |                                                           |
|--------------------------------------------------------|-----------------------------------------------------------|
| [A]: <i>Peer reviewed international journal Papers</i> | [B]: <i>Other international publications</i>              |
| [C]: <i>Book chapters</i>                              | [D]: <i>Peer reviewed international conference papers</i> |
| [E]: <i>National journal papers</i>                    | [F]: <i>National conference papers</i>                    |
| [G]: <i>Technical reports</i>                          | [H]: <i>PhD Thesis</i>                                    |

## 2. MSc and BSc theses list

### Supervisor of second-cycle theses (in Italian):

- T69 "Studio aeraulico preliminare del trasporto e deposito di lanugine all'interno della cassa di asciugabiancheria domestiche", candidate Stefano Rota, a.a. 2022-23.
- T68 "Caratterizzazione di sensori ottici per il controllo della combustione di miscele metano-idrogeno in caldaie domestiche", candidate Antonio Soffini, a.a. 2022-23.
- T67 "La carbon footprint: uno strumento per quantificare e ridurre le emissioni di gas serra e i costi operativi di un'azienda di trasporti", candidate Alberto Dalla Valle, a.a. 2017-18.
- T66 "Analisi sperimentale e numerica del ricambio della carica in un motore 2 tempi da competizione", candidate Matteo Pregrasso, a.a. 2017-18.
- T65 "Misura delle emissioni allo scarico di un motore automobilistico configurato per il minimo consumo nell'uso urbano.", candidate Giacomo Folador, a.a. 2015-16.
- T64 "Analisi numerica dell'aerodinamica di differenti piani velici per un'imbarcazione da regata", candidate Andrea Carradori, a.a. 2015-16.
- T63 "Studio sperimentale e modellazione numerica quasi dimensionale del battito nei motori ad accensione comandata", candidate Nicola Saccon, a.a. 2015-16.
- T62 "Analisi numerica di effetti secondari in palettature a vortice arbitrario", candidate Giacomo Garbin, a.a. 2014-15.
- T61 "Modellazione della fase di scarico di un motore a combustione interna mediante il metodo delle caratteristiche", candidate Mattia Milan, a.a. 2014-15.
- T60 "Fluidodinamica dei condotti di aspirazione di un motore veloce a quattro tempi: coefficienti di efflusso, moto di tumble e campo di pressione sulle pareti", candidate Lorenzo Artico, tesi ritenuta "eccezionale" dal examiner prof. G. Cantore), a.a. 2013-14.
- T59 "Progetto, realizzazione e collaudo di una strumentazione per la misura delle perdite meccaniche di un motore motociclistico", candidate Marco Masciolini, a.a. 2013-14.
- T58 "Sistema innovativo per la sicurezza attiva nel settore automobilistico. Studio concettuale e prime verifiche", candidate Alberto Terzo, a.a. 2013-14.
- T57 "Analisi teorica e simulazione del motore a accensione comandata usato come ausilio alla decelerazione del veicolo", candidate Alessandro Spagnolo, a.a. 2013-14.
- T56 "Incremento delle prestazioni di pale a vortice arbitrario per ventilatori assiali a sola girante: verifica sperimentale e numerica", candidate Stefano Castegnaro, (tesi ritenuta "eccezionale" dal examiner prof. A. Corsini) a.a. 2013-14.
- T55 "Studio numerico e sperimentale dell'effetto delle perdite meccaniche e volumetriche su prestazione e rendimento di una turbopompa radiale multistadio", candidate Federico Fontana, a.a. 2012-13.
- T54 "Computational analysis of the flow field in a laboratory gas turbine combustor", candidate Dario Piccoli, a.a. 2012-2013.
- T53 "Studio di pale a vortice arbitrario per ventilatori assiali a sola girante", candidate Manuel Piva, a.a. 2012-2013.
- T52 "Studio numerico sperimentale delle perdite meccaniche di un motore motociclistico", candidate Matteo Pogni, a.a. 2012-2013.
- T51 "Misura delle prestazioni ottenibili da un motore di serie alimentato a iniezione indiretta di gas", candidate Christian Gobbi, a.a. 2012-2013.
- T50 "Studio Sperimentale della Fluidodinamica Stazionaria nei Condotti di Aspirazione e nel Cilindro di un Motore Motociclistico", candidate Marco Baccichetto, a.a. 2011-2012.
- T49 "Elaborazione e Validazione di un Software per la Simulazione Termofluidodinamica di un Motore a Combustione Interna", candidate Pierfrancesco Poniz, a.a. 2011-2012.
- T48 "Analisi e Riprogettazione di un Ventilatore Assiale", candidate Michele Tamiozzo, a.a. 2010-2011.
- T47 "Studio Sperimentale e Numerico della Distribuzione di un Motore Motociclistico da Competizione", candidate Filippo Roman, a.a. 2010-2011.

- T46 *“Analisi Sperimentale e Numerico del Moto di Tumble in un Motore Motociclistico 4T”*, candidate Andrea Dai Zotti, a.a. 2010-2011.
- T45 *“Studio fluidodinamico sperimentale e numerico dei condotti valvola di scarico di un motore 4 tempi con il supporto di tecniche di ingegneria inversa”*, candidate Fabio Zanotto, a.a. 2010-2011.
- T44 *“Analisi Sperimentale e Modellazione Numerica di un Motore Motociclistico da Competizione”*, candidate Giovanni Scapin, a.a. 2009-2010.
- T43 *“Analisi Sperimentale di un Sistema di Alimentazione a GPL per Motori a Combustione Interna ad Accensione Comandata”*, candidate Salvatore Torcivia, a.a. 2009-2010.
- T42 *“Sviluppo di un Modello di Rendimento Meccanico per la Trasformazione a Carter Secco di un Motore Motociclistico per Vetture Formula SAE”*, candidate Matteo Menegon, a.a. 2008-2009.
- T41 *“Caratterizzazione Fluidodinamica della Testa di un Motore Monocilindro da Competizione”*, candidate Fabio Dola, a.a. 2007-2008.
- T40 *“Analisi Numerica e Sperimentale di un Motore Motociclistico da Competizione”*, candidate Andrea Mozzo, a.a. 2006-2007.
- T39 *“Analisi Sperimentale delle Prestazioni di un Motore Monocilindrico da Competizione”*, candidate Davide Gazzola, a.a. 2006-2007.
- T38 *“Analisi Fluidodinamica della Scia e Scelta dell'Elica per una Nave Cisterna”*, candidate Bernardo Valier, a.a. 2005-2006. Vincitrice nel 2006 del premio per l'innovazione industriale inTESI del Parco Scientifico Galileo.
- T37 *“Progetto di un Giunto Elastico per l'Allestimento di un Banco Prova Motori”*, candidate Sandro Franzoso, a.a. 2005-2006.
- T36 *“Simulazione Numerica di un Propulsore Automobilistico e Verifica al Banco Prova”*, candidate Carlo Roncari, a.a. 2005-2006.

Supervisor of first-cycle theses (in Italian):

- T35 *“Pompe volumetriche monovite per il trattamento di fanghi di depurazione”*, candidate Nicola Tamburin, a.a. 2022-2023.
- T34 *“Effetti della solidità e del rapporto d'aspetto sulle prestazioni aerauliche di ventilatori assiali intubati”*, candidate Giovanni Morettin, a.a. 2021-2022.
- T33 *“Panoramica delle prestazioni dei ventilatori assiali in commercio nel 2020”*, candidate Davide Vaccaro, a.a. 2019-2020.
- T32 *“Progetto di un banco di flussaggio in accordo con la normativa UNI 10531”*, candidate Giovanni Strazzabosco, a.a. 2012-2013.
- T31 *“Aerodinamica di un veicolo da corsa: componenti rilevanti per la prestazione”*, candidate Mauro Comunello, a.a. 2012-2013.
- T30 *“Sistemi di distribuzione per motori a quattro tempi”*, candidate Giacomo Ghelli, a.a. 2011-2012.
- T29 *“Allestimento di un banco prova per la misura delle perdite meccaniche di un motore motociclistico”*, candidate Fabio Bozzola, a.a. 2011-2012.
- T28 *“Messa al Banco e Strumentazione di un motore motociclistico, rilievo delle prestazioni”*, candidate Michele Sorgato, a.a. 2009-2010.
- T27 *“Studio Sperimentale del Condotti di aspirazione di un Motore Motociclistico 4T ad Accensione Comandata”*, candidate Davide Furlani, a.a. 2009-2010.
- T26 *“Allestimento di un Banco Prova per il Rilievo Sperimentale delle Curve di Coppia, Potenza e Consumo Specifico in un Motore Kawasaki”*, candidate Massimo Spoladore, a.a. 2008-2009.

Co-supervisor of second-cycle theses (in Italian):

- T25 *“Studio Fluidodinamico di una Pompa a Emissione Parziale per Motori a Razzo Ibridi”*, supervisor prof. F. Barato, candidate Paolo Bertosin, a.a. 2021-22.
- T24 *“Analisi Numerica e Sperimentale di una Galleria del Vento Subsonica”*, supervisor eng. M. Antonello, candidate Stefano Cancian, a.a. 2010-11.
- T23 *“Numerical and Experimental Analysis of a Low-Speed Open Circuit Wind Tunnel”*, supervisor eng. M. Antonello, candidate Marco Pavan, a.a. 2008-09.

- T22 *“Simulazione Numerica della Termofluidodinamica di un Motore a Combustione Interna Monocilindro ad Accensione Comandata”*, supervisor eng. A. Toffolo, candidate Alberto Boscato, a.a. 2007-08.
- T21 *“Analisi Numerica per la Determinazione di Coefficienti di Efflusso di Condotti a Sezione Variabile”*, supervisor eng. M. Antonello, candidate Emiliano Agnoletto, a.a. 2007-08.
- T20 *“Modello Numerico per l’Ottimizzazione del Sistema di Scarico da un Motore Monocilindrico da Competizione”* supervisor eng. M. Antonello, candidate Simon Bobbo, a.a. 2006-07.
- T19 *“Simulazione ed Ottimizzazione Fluidodinamica di Cerchi di Formula 1 con Metodi Numerici”*, supervisor eng. M. Antonello, candidate Fabio Pertile, a.a. 2006-07.
- T18 *“Alimentazione ad Alcool di Motori a Combustione Interna”*, supervisor eng. A. Toffolo, candidate Tomas Baraldo, a.a. 2005-06.
- T17 *“Tecnologie Innovative per l’Abbattimento delle Emissioni Inquinanti dei Motori a Combustione Interna”*, supervisor eng. A. Toffolo, candidate Fabio Strada, a.a. 2005-06.
- T16 *“Evoluzione del Propulsore ad Accensione per Compressione e Studio delle Potenzialità della multiniezione”*, supervisor prof. A.D. Martegani, candidate Francesco Dell’Aica, a.a. 2004-05.
- T15 *“Modello Numerico di un Motore a Combustione Interna e sua Validazione al Banco Prova”*, supervisor prof. A.D. Martegani, candidate Nicola Cappellato, a.a. 2004-05.
- T14 *“Sviluppo di un Modello per la Simulazione Numerica di un Gassificatore di Biomassa”*, supervisor prof. L. Rosa, candidate Daniela D’Onofrio, a.a. 2004-05.
- T13 *“Sviluppo di un Modello per la Simulazione Numerica di un Gassificatore di Biomassa”*, supervisor prof. L. Rosa, candidate Marco Xotta, a.a. 2003-04.
- T12 *“Sviluppo di un Modello per la Simulazione Numerica di un Gassificatore di Biomassa”*, supervisor prof. L. Rosa, candidate Michele Fratucello, a.a. 2003-04.
- T11 *“Modellazione Matematica e Simulazione Numerica di un Gassificatore di Biomassa”*, supervisor prof. L. Rosa, candidate Andrea Magarotto, a.a. 2002-03.
- T10 *“Modellazione Matematica e Simulazione Numerica di un Gassificatore di Biomassa”*, supervisor prof. L. Rosa, candidate Marco Carraro, a.a. 2002-03.
- T9 *“Simulazione Numerica di uno Stadio di Pompa Centrifuga”*, supervisor prof. G. Navarro, candidate Piero Vazzoler, a.a. 2002-03.
- T8 *“Previsione di un Flusso Interpolare mediante Modelli di Turbolenza Algebrici”*, supervisor prof. G. Navarro, candidate Alessandro Falcone, a.a. 2000-01.
- T7 *“Utilizzo del Metodo dei Pannelli per la Generazione Semiautomatica di Griglie Bidimensionali”*, supervisor prof. G. Navarro, candidate Alessandro Lotto, a.a. 1999-2000.
- T6 *“Studio Teorico dei Modelli Matematici di Turbolenza: Applicazioni nella Fluidodinamica Esterna e nelle Turbomacchine”*, supervisor prof. G. Navarro, candidate Antonio Bernardi, a.a. 1997-98.

Co-supervisor of first-class theses (in Italian):

- T5 *“Motore ad aria compressa: alternativa al motore elettrico nei sistemi ibridi?”*, supervisor prof. G. Berti, candidate Mattia Bedin, a.a. 2015-2016.
- T4 *“Studio dei condotti valvola di un motore monocilindro da competizione”*, supervisor eng. R. Meneghello, candidate Andrea Bernardi, a.a. 2008-2009.
- T3 *“Studio dei condotti valvola di un motore monocilindro da competizione”*, supervisor eng. R. Meneghello, candidate Niccolò Colombo, a.a. 2008-2009.
- T2 *“Studio delle Soluzioni per la Sovralimentazione di un Motore ad Accensione Comandata di Grossa Cilindrata”*, supervisor eng. A. Toffolo, candidate Alberto Costaganna, a.a. 2007-08.
- T1 *“Allestimento di un Banco Prova e Rilievi Sperimentali delle Prestazioni di un Motore Monocilindrico da Competizione”*, supervisor eng. G. Meneghetti, candidate Matteo Artusi, a.a. 2006-07.

Examiner of MSc theses:

- C03 *“The effect of varying blade lengths on axial fan performance”*, Faculty of Engineering at Stellenbosch University (South Africa), candidate Tristan le Roux, 2022.
- C02 *“Blade surface pressure measurements of an axial flow fan”*, Faculty of Engineering at Stellenbosch University (South Africa), candidate Johannes Nils Rohwer, 2019.
- C01 *“Off-design performance model of Organic Rankine Cycle systems”*, Università degli Studi di Padova, candidate Nicolò Mazzi, a.a. 2013-14.