



Federico Mazzelli, Ph.D.

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🔗 [Academia](#), [Researchgate](#), [scholar](#)

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Sex Male | Date of birth 15/01/1986 | Nationality Italian

WORK EXPERIENCE

Since Dec. 2018

Researcher

University of Florence, Italy

Main activities

Research on thermodynamics, heat transfer and refrigeration cycles

Since Sept. 2017

Lecturer of Thermal Engineering (Fisica Tecnica Industriale)

University of Florence, Italy

Main subjects

Principles and applications of Thermodynamics, Pscyrometrics and Heat Transfer

Dec. 2015 – Dec. 2018

Post-doc

University of Florence, Italy

Main activities

Research on Single- and Two-Phase Supersonic Ejectors for refrigeration applications

INTERNATIONAL EXPERIENCE

June. – Sept. 2018

Visiting Researcher

Georgia Institute of Technology, USA

Main activities

Invited by **Prof. S. Garimella** to work on experimental analysis of CO₂ Microchannel heat exchangers

Sept. – Dec. 2013

Visiting student

Université Catholique de Louvain, Belgium

Main activities

Invited by **Prof. Y. Bartosiewicz** to work on experimental and CFD analysis of supersonic air ejectors

Sept. – Dec. 2011

Visiting student

Duke University, USA

Main activities

Invited by **Prof. A. Bejan** to work on Constructal Theory applications to urban design

EDUCATION

Dec. 2012– Apr. 2016

Ph.D. in Industrial Engineering

University of Florence, Italy

Advisor: **Prof. G. Grazzini**

Sept. 2009– Apr. 2012

MS in Energy Engineering

University of Florence, Italy

Advisor: **Prof. G. Grazzini**

Final grade: 110/110 with honors

Sept. 2005– Apr. 2012

BS in Mechanical Engineering

University of Florence, Italy

Advisor: **Prof. B. Facchini**

Final grade: 107/110

ACHIEVEMENTS

- March 2018 **Awarded the grant “Giovani@Ricerca Scientifica”** from Fondazione Cassa di Risparmio di Pistoia e Pescia with the project “ECO₂ – Railways” (2017/18)
- March 2018 **Awarded the “Seal of Excellence”** for the Marie Sklodowska Curie Individual Fellowship project “THERMICO” (H2020-MSCA-IF-2017)
- August 2017 **Member of the Ph.D. review commission** for the University of Southern Queensland (Australia). Ph.D. candidate Mr. Mohamed Alsafi
- Apr. 2017 **Awarded the “Seal of Excellence”** for the Marie Sklodowska Curie Individual Fellowship project “CoolCube” (H2020-MSCA-IF-2016)
- Since Jan. 2017 **Lecturer and Member of the organization committee** of the Summer School ART (Advanced Research in Turbomachinery), editions 2017, 2018, 2019, 2020
- Apr. 2016 **Awarded the “Doctor Europaeus”** title (European Doctorate)

ACADEMIC ACTIVITIES

- Industrial Projects* **Hitachi Rail Italy** – “ECO₂-Railways, development of a compact CO₂ heat pump for train coaches with microchannels and flashing ejectors” (2018)
GEA Wiegand GmbH – “Computational simulation of supersonic steam ejectors” (2017)
Frigel S.p.a. – “Ottimizzazione Di Impianto Frigorifero Ad Eiezione Per Uso Industriale” (2014)
- Technology Transfer* Awarded the acceleration program (pre-incubazione) of the "Incubatore Universitario Fiorentino" (IUF) with the project "ReCreo" (2016/17)
- Teaching* Lecturer of “Thermal Engineering” (since 2017)
 Seminar lectures in “Refrigeration Technology” and “Engineering Thermodynamics” (since 2012)
 Mentoring of numerous Ph.D., Bachelor’s and Master’s students (since 2012)
- Journal Reviews* Outstanding Reviewer for “Applied Thermal Engineering”, Elsevier (2017)
 Outstanding Reviewer for “International Journal of Refrigeration”, Elsevier (2017)
 Reviewer for “Energy”, Elsevier (2018)
- Oral Presentations* *Advanced Research on Turbomachinery* 2017, July 10th – 14th, Firenze, Italy
Heat Powered Cycle Conference, June 26th – 29th, 2016, Nottingham, UK
9th International Conference on Multiphase Flow, May 22nd - 27th, 2016, Firenze, Italy
Constructal Law & Second Law Conference, May 18th – 19th, 2015, Parma, Italy

SKILLS

Foreign languages	Listening	Reading	Spoken interaction	Spoken production	writing
English	C2	C2	C2	C2	C2
Toefl – 107/120 IBT					
French	A2	A2	A2	A2	A1
Institut des Langues Vivantes, Louvain-La-Neuve, Belgium					
German	A1	A1	A1	A1	A1
Zertifikat Deutsch Zeugnis, Goethe Institute in Florence, Italy					

Digital Competences

- Operating Systems* Linux, Windows
- Computational Fluid Dynamics* ANSYS Fluid Dynamics (Fluent, CFX, ICEM, CFD-Post, Workbench)
- Programming language* Visual Basic, Matlab
- Engineering Tools* EES, Solid Works, Microsoft Office

SELECTED PUBLICATIONS
International Journals

- J. Mahmoudian, F. Mazzelli, A. Milazzo, R. Malpress, D.R. Buttsworth, *Experimental visualization of water vapour condensation within supersonic nozzle flow generated by an impulse tunnel*, International Journal of Multiphase Flow, 134 (2021), 103473
- S. Garimella, K. Keniar, F. Mazzelli, *Experimental Investigation of Carbon Dioxide Flow Boiling in a Single Microchannel*, Int. J. Heat and Mass Transfer, 159 (2020), 120100
- F. Giacomelli, F. Mazzelli, K. Banasiak, A. Hafner, A. Milazzo, *Experimental and computational analysis of a R744 flashing ejector*, International Journal of Refrigeration 107 (2019) 326-343
- F. Giacomelli, F. Mazzelli, A. Milazzo, *A novel CFD approach for the computation of R744 flashing nozzles in compressible and metastable conditions*, Energy 162 (2018), 1092-1105
- F. Mazzelli, F. Giacomelli, A. Milazzo, *CFD modeling of condensing steam ejectors: Comparison with an experimental test-case*, International Journal of Thermal Sciences 127C (2018), 7-18
- A. Milazzo, F. Mazzelli, *Future perspectives in ejector refrigeration*, Applied Thermal Engineering, 121 (2017), 344–50
- D.V. Brezgin, K.E. Aronson, F. Mazzelli, A. Milazzo, *The surface roughness effect on the performance of supersonic ejectors*. Thermophysics and Aeromechanics, 24 (2017), 553-561
- G. Grazzini, F. Mazzelli, A. Milazzo, *Constructal design of the mixing zone inside a supersonic ejector*, Int. J. of Heat and Technology, Volume 34 (2016), 109-118
- F. Mazzelli, A. B. Little, S. Garimella, Y. Bartosiewicz, *Computational and experimental analysis of supersonic air ejector: Turbulence modeling and assessment of 3D effects*, international Journal of Heat and Fluid Flow, 56 (2015), 305–316
- F. Mazzelli, A. Milazzo, *Performance analysis of a supersonic ejector cycle working with R245fa*, International Journal of Refrigeration, 49 (2015), 79-92

Books and dissertations

- G. Grazzini, A. Milazzo, F. Mazzelli, *Ejectors for Efficient Refrigeration - Design, Applications and Computational Fluid Dynamics*, Springer, 2018
- F. Mazzelli, *Single & Two-Phase Supersonic Ejector for Refrigeration Applications*, Ph.D. dissertation, University of Florence, 2016