



Dipartimento di Ingegneria Meccanica e Aerospaziale, Sapienza Università di Roma, Via Eudossiana 18, 00184, Rome, Italy

WORK EXPERIENCE

2019 – CURRENT – Rome, Italy

POSTDOCTORAL RESEARCHER – SAPIENZA UNIVERSITY OF ROME

Research activities: hybrid rocket engines, liquid rocket engines, hypersonics

Lecturer: "Chemical Equilibrium with Applications" module in the Master Course in Space Transportation Systems - 8 hours

Teaching assistant: "Rocket Propulsion" and "Space Propulsion Lab"

Rome, Italy

2015 – 2018 – West Lafayette, United States

RESEARCH ASSISTANT – PURDUE UNIVERSITY

Research activities: CFD simulations for fundamental research on thermoacoustics in supercritical fluids; Design of a transcritical thermoacoustic prototype in the thermal management team at the Rolls-Royce University Technology Center

West Lafayette, Indiana, United States

EDUCATION AND TRAINING

2015 – 2018 – West Lafayette, Indiana, United States

PH.D. IN MECHANICAL ENGINEERING – Purdue University

GPA: 4.0/4.0

Thesis: "Numerical and Theoretical Modeling of Thermoacoustic Instabilities in Transcritical Fluids"

2013 – 2015 – Rome, Italy

M.SC. IN SPACE ENGINEERING – Sapienza University of Rome

110/110 *cum laude*

Thesis: "Transient Response of Homogeneous Isotropic Turbulence to Heat Sources"

2010 – 2013 – Rome, Italy

B.SC. IN AEROSPACE ENGINEERING – Sapienza University of Rome

110/110 *cum laude*

Thesis: "Effect of Friction and Cooling on the Performance of Supersonic Nozzles"

● LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● DIGITAL SKILLS

Tecplot 360 | Microsoft Office | Inkscape | Python | Fortran | Matlab | vim | LaTeX | bash scripting | Git | C++ | CFD | RANS

● HONOURS AND AWARDS

Awards

2017 Rolls-Royce Doctoral Fellowship, Purdue University, IN, USA
2015 F. N. Andrews Fellowship, Purdue University, IN, USA
2015 Antonio Ventura Scholarship, Fondazione Roma Sapienza, Rome, Italy
2015 Excellence Path in Space Engineering, Sapienza University of Rome, Italy
2011–2013 Excellence Path in Aerospace Engineering, Sapienza University of Rome, Italy
2010–2013 Sapienza Deserving Student, Sapienza University of Rome, Italy
2010 Italian Ministry of Education Award for High School Excellence, Nomentano, Rome, Italy

● OTHER RELEVANT EXPERIENCE

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2021-present: Faculty Advisor of the Rocket Team of the Sapienza Aerospace Student Association (SASA)

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Thesis Co-Advisor

Co-advisor of more than 10 M.Sc. and B.Sc. theses with advisors Professors F. Nasuti, D. Bianchi, S. Heister

Contracts

SPIV (Sistema Propulsivo Ibrido VEGA, AVIO-ASI): 2020 - present

RIPAS (Rilancio dei Programmi di Accesso allo Spazio dalla Base di Malindi Luigi Broglio Space Centre (BSC) ASI): 2019 - 2020

RECOMMENDATIONS

Prof. Francesco Nasuti (PostDoc Mentor and B.Sc. Advisor, Sapienza University)

Prof. Daniele Bianchi (PostDoc Mentor, Sapienza University)

Prof. Carlo Scalo (Ph.D. Advisor and Mentor, Purdue University)

Prof. Stephen D. Heister (Ph.D. Mentor, Purdue University)

Prof. Bernardo Favini (M.Sc. Advisor, Sapienza University)

PUBLICATIONS

2021

[25] "Student firing tests and launches with commercial and self-made solid rocket motors", Migliorino, M.T., Aiello, M., Berti, M., Rotondi, M., D'Alessandro, S., Bianchi, D., Jahjah, M., Pizzarelli, M., *International Astronautical Congress*, 2021

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[22] "A Computational Tool for the Design of Hybrid Rockets", Zolla, P. M., Migliorino, M.T., Bianchi, D., Nasuti, F., Pellegrini, R. C., Cavallini, E., *Aerotecnica Missili & Spazio*, 2021, 100 (3), pp. 253-262

[21] "Numerical Approach for the Estimation of Throat Heat Flux in Liquid Rocket Engines", Concio, P., Migliorino, M. T., Nasuti, F., *Aerotecnica Missili & Spazio*, 2021, 100 (1), pp. 33-38

[20] "Gas-Phase Reaction Effects on Nozzle Erosion in Paraffin/Oxygen Hybrid Rockets", Migliorino, M.T., Bianchi, D., Nasuti, F., *AIAA Propulsion and Energy Forum*, 2021

[19] "Machine Learning Techniques for Flight Performance Prediction of Hybrid Rocket Engines", Zavoli, A., Zolla, P. M., Federici, L., Migliorino, M.T., Bianchi, D., *AIAA Propulsion and Energy Forum*, 2021

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[16] "Numerical simulations of the internal ballistics of paraffin–oxygen hybrid rockets at different scales", Migliorino, M.T., Bianchi, D., Nasuti, F., *Aerospace*, 2021, 8(8), 213

[15] "Onset Criteria for Bulk-Mode Thermoacoustic Instabilities in Supercritical Hydrocarbon Fuels", Hunt, S.A., Migliorino, M.T., Scalo, C., Heister, S.D., *Journal of Fluids Engineering, Transactions of the ASME*, 2021, 143(4), 040901

[14] "System and Method for Stabilizing Transcritical Air-to-Fuel Heat Exchange", P. C. Sweeney, S. D. Heister, S. A. Hunt, C. Scalo, M. T. Migliorino, *US Patent* No. US 10,890,114 B2

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- [7] "Heat-induced planar shock waves in supercritical fluids", Migliorino, M.T., Scalo, C., *Shock Waves*, 2020, 30(2), pp. 153–167

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Mario Tindaro Migliorino

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