europass Curriculum vitae

PERSONAL INFORMATION

Jacopo Liberatori

Via Eudossiana, 18, 00184, Rome, Italy

jacopo.liberatori@uniroma1.it

WORK EXPERIENCE

February 2024 – Present

Postdoctoral Researcher

Sapienza University of Rome
Department of Mechanical and Aerospace Engineering

Multi-fidelity and Robust Optimization for Aerospace Propulsion Systems

EDUCATION AND TRAINING

2020–2023

Ph.D. in Aeronautics and Space Engineering

Sapienza University of Rome

Thesis Title: *Toward Climate-Neutral Aviation: Uncertainty Quantification, Bayesian Inference, and Optimization supporting Multi-Fidelity CFD*

Supervisors: Prof. Pietro Paolo Ciottoli, Prof. Mauro Valorani

November 2020 – December 2020

Training Course - "Fundamentals of Turbulent Combustion"

Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique (CERFACS)

2018–2020

Master's Degree in Mechanical Engineering

Sapienza University of Rome

Final Grade: 110/110 cum Laude

Thesis Title: *Numerical Analysis of a Double Swirl Burner under Isothermal Conditions*

Supervisor: Prof. Pietro Paolo Ciottoli

2015–2018

Bachelor's Degree in Mechanical Engineering

Sapienza University of Rome

Final Grade: 110/110

Thesis Title: *Metodi di Raccolta e Analisi di Dati per la Gestione degli Impianti a Fonti Rinnovabili*

Supervisor: Prof. Alessandro Corsini

2010–2015

High School Diploma (scientific studies)

Collegio San Giuseppe - Istituto De Merode

Final Grade: 100/100 cum Laude

PERSONAL SKILLS

Mother tongue: Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
Spanish	B2	B2	B1	B1	B1
Romanian	B2	B2	B1	B1	B1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Digital skills
- Working knowledge with the following OS: MAC, Windows, Unix-based
- Programming skills in: Python, C++, MATLAB, Fortran, Wolfram Mathematica, Julia
- Working knowledge with the following CFD softwares: OpenFOAM, Ansys FLUENT
- Working knowledge with the following CFD post-processing softwares: Paraview, Tecplot
- Working knowledge with the chemical kinetics software Cantera
- Working knowledge with the multi-disciplinary design optimization platform ModeFRONTIER
- Working knowledge with the following CAD softwares: SolidEdge, SolidWorks, Autodesk Fusion360.

Other skills Former swimmer at a competitive level.

Driving licence B

PUBLICATIONS

[1] **J. Liberatori**, R. Malpica Galassi, D. Bianchi, F. Nasuti, M. Valorani, and P.P. Ciottoli. “Family of Skeletal Reaction Mechanisms for Methane-Oxygen Combustion in Rocket Propulsion”. In: *Journal of Propulsion and Power* 40.2 (2024), pp. 303–319.

[2] **J. Liberatori**, F. Battista, F. Dalla Barba, and P.P. Ciottoli. “Direct numerical simulation of Vortex Breakdown in Evaporating Dilute Sprays”. In: *Flow, Turbulence and Combustion* 112 (2024), pp. 643–667.

[3] L. Lucchese, **J. Liberatori**, D. Cavalieri, D. Simone, D. Liuzzi, M. Valorani, and P.P. Ciottoli. “Impact of Chemical Modeling on the Numerical Analysis of a LOx/GCH4 Rocket Engine Pintle Injector”. In: *Acta Astronautica* 218 (2024), pp. 240–250.

[4] **J. Liberatori**, M. Valorani, and P.P Ciottoli. “Anisotropy Analysis of Vortex Breakdown States via Direct Numerical Simulation”. In: *International Journal of Heat and Fluid Flow (accepted for publication)* (2024).

[5] D. Cavalieri, **J. Liberatori**, P.E. Lapenna, M. Valorani, and P.P Ciottoli. “Impact of non-ideal fluid modeling on droplet evaporation for aerospace applications”. In: *Flow, Turbulence and Combustion (accepted for publication)* (2024).

[6] M. Blandino, **J. Liberatori**, D. Cavalieri, M. Valorani, and P.P. Ciottoli. “Turbulence Closure Assessment in URANS of a Cold-Flow Lab-Scale Swirled Burner”. In: *AIAA SciTech 2024 Forum*. 2024.

[7] L. Lucchese, **J. Liberatori**, D. Cavalieri, D. Simone, D. Liuzzi, M. Valorani, and P.P. Ciottoli. “Pintle Injector Performance Sensitivity to the Radial Injection Arrangement”. In: *AIAA SciTech 2024 Forum*. 2024.

[8] **J. Liberatori**, R. Malpica Galassi, M. Valorani, and P.P Ciottoli. “Uncertainty quantification analysis of Reynolds-averaged Navier–Stokes simulation of spray swirling jets undergoing vortex breakdown”. In: *International Journal of Spray and Combustion Dynamics* 15.4 (2023), pp. 218–236.

[9] L. Angelilli, **J. Liberatori**, P.P. Ciottoli, F.E. Hernández Pérez, R. Malpica Galassi, M. Valorani, and H.G Im. “A Stokes number-based improvement for stochastic dispersion model for large eddy simulation”. In: *"Atomization and Sprays* 33.9 (2023), "35–55.

[10] **J. Liberatori**, R. Malpica Galassi, M. Valorani, and P.P. Ciottoli. “CSP-Driven Optimization of a 16-Species Skeletal Mechanism for Methane Ignition at High Pressure”. In: *AIAA SciTech 2023 Forum*. 2023.

[11] D. Cavalieri, **J. Liberatori**, R. Malpica Galassi, P.E. Lapenna, M. Valorani, and P.P. Ciottoli. “Unsteady RANS Simulations with Uncertainty Quantification of Spray Combustor Under Liquid Rocket Engine Relevant Conditions”. In: *AIAA SciTech 2023 Forum*. 2023.

[12] **J. Liberatori**, R. Malpica Galassi, D. Liuzzi, A. Filosa, M. Valorani, and P.P. Ciottoli. “Uncertainty quantification in RANS prediction of LOX cross-flow injection in Methane”. In: *AIAA Propulsion and Energy 2021 Forum*. 2021.

Il sottoscritto dichiara di essere consapevole che il presente curriculum vitae sarà pubblicato sul sito istituzionale dell’Ateneo, nella Sezione “Amministrazione trasparente”, nelle modalità e per la durata prevista dal d.lgs. n. 33/2013, art. 15.