

# PAOLO MARIA ZOLLA

## EDUCATION AND RESEARCH

### Ph.D. in Space Engineering – Sapienza University of Rome

2021 – Present

#### Topics

- Combustion instability prediction using low-order numerical simulations for liquid rocket engines
- Hybrid rocket engines low-order modeling and multidisciplinary optimization exploiting feedforward neural networks
- Design of high altitude test facility using CFD
- Design and testing of a water based noise suppression system for small-scale supersonic hot jets

### Post-Graduate fellowship – CRAS (Center of Aerospace Research of Sapienza)

2020 – 2021

#### Topics

- Design of a water based noise suppression system for supersonic hot jets
- Combustion instability numerical simulations using reduced order models, accounting for the real gas behavior of supercritical fluids
- Hybrid rocket engine multidisciplinary optimization exploiting feedforward neural networks and reduced order models

### M.Sc. in Space and Astronautical Engineering – Sapienza University of Rome

2018 – 2020

Final grade: 110/110 cum laude

Weighted average: 29.5/30.0

Thesis: "Low-order modeling and performance analysis of hybrid rocket propulsion"

Advisor: Prof. Daniele Bianchi

### Bachelor's Degree in Aerospace Engineering – Sapienza University of Rome

2015 – 2018

Final grade: 110/110 cum laude

Weighted average: 30.0/30.0

Thesis: "Combustion instability in liquid rocket engines and solid rocket motors"

Advisor: Prof. Diego Lentini

**Path of excellence successfully completed**

## SPACE ENGINEER

### ABOUT ME

I'm a 26 years old strongly motivated space engineer, graduated in 2020 at La Sapienza, University of Rome.

My major interests lie within the propulsion systems research field, in particular hybrid rockets and combustion instability analysis via CFD numerical simulations and reduced models development.

My objective and dream is to be recruited by a famous space company where I could exploit at best my engineering skills, remaining within the boundaries of my field of research.

I believe myself to be a fast learner and hard worker, resilient and adaptable.

### CONTACTS

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## LANGUAGES

- ✓ ITALIAN: Native
  - ✓ ENGLISH: Excellent
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## SKILLS

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### IT Skills

Programming and software knowledge: Fortran, Matlab, Python, Mathematica, LaTeX, Tecplot, MS Office  
Operative systems: Linux, Mac OS, Windows

### Other Skills

- Adaptability and critical thinking in the workplace, aimed at problem solving
- Presentation and organization of scientific results, drafting of technical reports
- Capability of working individually and in a team, stress tolerance
- Collaborative, resourceful and flexible in teamwork
- Highly motivated, determined, perseverant, fast learner

## AWARDS

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**BEST PAPER: 2021 Propulsion & Energy Forum  
Hybrid rockets session**

2021

**WINNER: 17<sup>th</sup> Pegasus Student Conference**

2021

## PUBLICATIONS

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**P.M. Zolla**, R. Rosa, M.T. Migliorino, D. Bianchi: "Multi-disciplinary Optimization of Single-stage Hybrid Rocket with Swirl Injection for Lunar Ascent". *AIAA SciTech Forum*. 2023

**P.M. Zolla**, M. Fiore, P.E. Lapenna, D. Bianchi, F. Nasuti: "A Design Strategy for Water-based Noise Suppression Systems in Liquid Rocket Engines Firing Tests". *CEAS Space Journal*. 2022

A. Zavoli, **P.M. Zolla**, L. Federici, M.T. Migliorino, D. Bianchi: "Surogate Neural Network for Rapid Flight Performance Evaluation of Hybrid Rocket Engines". *Journal of Spacecraft and Rockets*. 2022

**P.M. Zolla**, A. Montanari, S. D'Alessandro, M. Pizzarelli, F. Nasuti: "Low Order Modeling of Combustion Instability Using a Hybrid Real/Ideal Gas Mixture Model". *EUCASS*. 2022

**P.M. Zolla**, M.T. Migliorino, D. Bianchi, F. Nasuti, R.C. Pellegrini, E. Cavallini: "A Computational Tool for the Design of Hybrid Rockets". *Aerotecnica Missili & Spazio*. 2021

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

S. D'Alessandro, **P.M. Zolla**, M. Pizzarelli, B. Favini, F. Nasuti: "A Hybrid Real/Ideal Gas Mixture Model in the Framework of Low Order Modeling of Combustion Instability". *Propulsion & Energy Forum*. 2021

*\*Autorizzo al trattamento dei dati personali ai sensi del Decreto Legislativo 30 Giugno 2003, n. 196 e del GDPR (Regolamento UE 2016/679)*

*\*Autorizzo alla pubblicazione del presente CV ai sensi del Decreto Legislativo n. 33/2013*