

PERSONAL INFORMATION

Marta Colella✉ marta.colella@uniroma1.it

Nationality Italy

CURRENT POSITION

1 November 2020 – Current

**Ph.D Student in Aeronautics and Space Engineering
at Sapienza University of Rome**

Main research interests:

- Multi-Disciplinary and Multi-Objective Design Optimization. The integrated structural and control design optimization with the approach called Co-design.
- Integrated Reduced Order Models (ROMs) of aeroelasticity, flight dynamics and control systems.
- Control laws for aircraft maneuverability and stability. Control laws for aeroelastic instabilities, Active Flutter Suppression (AFS).
- Sloshing effects on aeroelastic stability and response.

WORK EXPERIENCE

6 March 2023 – 1 September 2023

Internship at AIRBUS OPERATIONS SAS

Loads and Aeroelasticity department in Toulouse, FR

Activities performed:

- Study of Integrated Reduced Order Models (ROMs) of aeroelasticity, flight dynamics and control systems, usable in industrial field
- Use of simulation and optimization programs available in the company
- Presentations and technical reports for the work team

TEACHING ASSISTANCE

October 2022 – Current

**Tutoring activity for students for Aerospace Structures first level degree
course**

Sapienza University of Rome, Rome, IT

March 2022 – September 2022

**Tutoring activity for students for Aeronautical Structures second level
degree course**

Sapienza University of Rome, Rome, IT

Tutoring activities involve assisting students with course materials and exercises, following them through the course's activities.

EDUCATION

27 May 2020

Master Degree in Aeronautical Engineering

Sapienza University of Rome, Rome, IT

Graduation note: 110/110

Thesis: Linearized sloshing modelling with membrane-containment system for FSI applications. (Supervisor Prof. Franco Mastroddi)

My thesis proposes Reduced-Order Models (ROMs) based on data provided by a CFD code for the study of sloshing-integrated systems including the possibility of a fluid-movement control, implemented by a containment system. The proposed study of fluid-structure interaction has been built for applying it in aeronautical and space applications for integrated (stability and response) analysis and design. Two integration cases were proposed for two tank geometries (a simple parallelepiped and an unconventional cylindrical), in both the parallel with and without containment system is maintained. The first is aimed at reducing the coupling between the rigid modes associated to the sloshing fluid. The second is aimed at describing how the sloshing fluid changes the aeroelastic response of a flexible aircraft. The ultimate goal is to show how one can benefit from using a flexible membrane in contact with sloshing fluid in the two considered cases in integrated aeroelastic similarity.

This thesis has been supported by SLOWD project.

2018-2019 **Sapienza Flight Team project**

Sapienza University of Rome, Rome, IT

Participation in Student Unmanned Aerial Systems (SUAS) Competition

(<https://suas-competition.org>)

St. Mary's County Regional Airport (2W6) in St. Mary's County, Maryland.

Role: Aircraft design group member

After detailed preliminary mission analysis, my team and I worked on the aircraft aerodynamic and dynamic design. Due to previous experience, we set the goal of achieving the best manoeuvrability at low flight speeds to minimize the turn radius, thus respecting the flight field boundaries and improving object detection. A genetic optimization procedure was used to determine the optimal configuration. A careful analysis of the different phases of flight enabled us to determine the best choice of engine, batteries and propeller.

10 November 2017 **Bachelor Degree in Aerospace Engineering**

Sapienza University of Rome, Rome, IT

Graduation note: 110/110 cum laude

Thesis: An analysis of the performance of ducted propellers for vertical take-off aircraft. (Supervisor Prof. Luca Marino)

2014 **High School Diploma**

PNI scientific high school R. Mattioli, Vasto, IT

Graduation note: 97/100

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C1	B2	B2	C1
French	A2	A2	A1	A1	A2

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

- Communication skills**
- I have worked in the Sapienza Flight Team as a member of the design group. As a result of the experience, I have been able to interact with the challenges of the project and work with the various working groups.
 - I presented at the IFASD conference the results obtained regarding the optimization of a simplified aeroservoelastic aircraft model. As a result of the experience I refined my abilities to analyze, synthesize, and present the obtained results.

Digital competences

SELF-ASSESSMENT				
Information Processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Independent user	Independent user	Proficient user

[Digital competences - Self-assessment grid](#)

- Computer skills**
- Competent with most Microsoft Office programs
 - Programming competence: Matlab, Mathematica
 - Simulators: ModeFrontier, MSC Nastran, MSC Patran, Simulink, Ansa, Fluent, CFD++, AVL, Gemseo, OpenMDAO

- Volunteering**
- Recovery of food and clothing for poor reference centers
 - Lessons for foreign children to learn Italian

Other skills Enjoy all arts particularly dance. Love to travel and experience different cultures.

CONFERENCE ATTENDANCE

13-17 June 2022 **International Forum on Aeroelasticity and Structural Dynamics IFASD**
 Madrid, Spain
 Article presented: M. Colella, F. Saltari, F. Mastroddi, F. Vetrano, "Multi-Disciplinary Optimization for an Aeroservoelastic simplified model"

PUBLICATIONS

- [1] M. Colella, F. Saltari, M. Pizzoli, F. Mastroddi. "Sloshing reduced-order models for aeroelastic analyses of innovative aircraft configurations." In: *Aerospace Science and Technology* 118 (2021).
- [2] M. Colella, F. Saltari, F. Mastroddi, F. Vetrano. "Multi-disciplinary optimization for an aeroservoelastic simplified model". In: *International Forum on Aeroelasticity and Structural Dynamics, IFASD* (2022).