

Luigi Mascolo

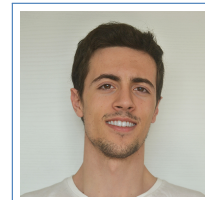
Curriculum Vitae

Citizenship: IT (EU)

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Education

- March 2015– (Exp. 2018) **MSc in Aerospace and Astronautical Engineering**, *Politecnico di Torino*, Turin, Italy.
Space and Astronautics branch specialization.
MSc Thesis “Electro-Magnetic Launchers - a Feasibility Study”
Supervisors Dr. Adrian Stoica, NASA Jet Propulsion Laboratory
Prof. Lorenzo Casalino, Politecnico di Torino
Company NASA Jet Propulsion Laboratory (JPL), Pasadena, CA, USA
Description Feasibility study for a small celestial body based EML in extreme environment conditions. Scientific analysis, magneto-mechanic and electro-thermal models validation, GUI development, identification of missing technologies, estimate of resources. Orbits for E-ML2 and interplanetary payload delivery
- Sept. 2011– **BSc in Aerospace Engineering**, *Politecnico di Torino*, Turin, Italy.
March 2015 (A/A) Specialized in atmospheric Entry, Descent and Landing Systems.
BSc Thesis “Atmospheric Re-entry Systems with Flexible and Inflatable Technologies”
Supervisors Prof. M. Battipede & Prof. D. D’Ambrosio, Politecnico di Torino
Company Eng. A. Messidoro, Aerosekur S.p.A., Caselle T.se, (TO), Italy
Description Implementation of the inflatable technologies (IADs, LIEDs, etc) in the EDL phases, two scenarios: low-mass return from the ISS; high-mass manned mission to Mars.

Experience

Vocational

- Oct. 2017– **Jet Propulsion Laboratory Visiting Student Researcher**, *JVSRP*, NASA Jet Propulsion Laboratory.
- Sept. 2016– **Teaching Assistant and Student Tutor**, *ASTRODYNAMICS*, Politecnico di Torino.
Feb. 2017 Tutoring for students of the last year in the Space and Astronautics branch in MSc Aerospace Engineering. Main focus on: astrodynamics, Matlab® /NASA GMAT® implementation, rendez-vous problems.
Matlab exercises editor, *GASDYNAMICS*, Politecnico di Torino.
Assistance for students of the fourth year in the MSc Aerospace Engineering. Production of a MATLAB software to analyze a variety of compressible flow phenomena interactively.
- 2015–2017 **UNISON Italy student representative**, *UNISEC Student Organisation*, www.unisonitaly.eu.
Italian (2016) and Politecnico di Torino (2015–2017) student representative for Aerospace and Astronautics projects.
- Sept. 2014– **Teaching Assistant and Student Tutor**, *TECHNICAL DRAWING*, Polytechnic of Turin.
Feb. 2017 Teaching in BSc Aerospace course in technical drawing, both for manual and CAD. Teaching aid in classes and exercises, mid-term and final grading, SOLIDWORKS teaching and evaluation for 3D models and 2D drawings.
- Jan. 2014– **CAD designer, CAE analyst**, *TEAM D.I.A.N.A.*, Politecnico di Torino.
Oct. 2016 Space robotics team. Mechanical model and production of a turret with 3D cameras payload; production of a central joint with circular damper; model of an arm-wrist-hand system with a novel linear clutch configuration.

Courses

- Jan. 2018 – **California Institute of Technology**, *Caltech*, Control & Dynamical Systems CDS 270-1, Astrodynamics.
Mar. 2018 Applied mathematics, mathematical modeling, and optimization of interplanetary spacecraft trajectories; optimal control theory; direct/indirect methods; differential dynamic programming; SDDP, Q-Law.

Conferences

- June 2017 **10th International Academy of Astronautics**, *IAA SYMPOSIUM*, Turin, Italy.
Sept. 2016 **67th International Astronautical Conference**, *IAC 2016*, Guadalajara, Mexico.
19th Annual International Mars Society Convention, *Catholic University of America*, Washington.
October 2015 **66th International Astronautical Conference**, *IAC 2015*, Jerusalem, Israel.
June 2015 **International Planetary Probe Workshop**, *IPPW 15*, Köln, Germany.

Publications

Book Chapters

- 2018 **Springer** [👉](#), *Outer Solar System: Prospective Energy and Material Resources*, Chapter 12, WindBots: A Concept for Persistent In Situ Science Explorers for Gas Giants (978-3-319-73844-4).

Peer-reviewed journal articles

- 2017 **Acta Astronautica** [👉](#), *Interplanetary CubeSats for Asteroid Exploration: Mission Analysis and Design*.

Conference Proceedings

- 2018 **Sub. AHS**, *Electro-Magnetic Launchers on the Moon*.
IAC18.x42813 [👉](#), *Electro-Magnetic Launchers at the Lunar South Pole: a Feasibility Study for Future Exploration*.
IAC18.x42101 [👉](#), *Human Mission Concept Evaluation and Selection through the Figures-of-Merit Approach*.
- 2017 **IAA17**, *Interplanetary CubeSats for Asteroid Exploration: Mission Analysis and Design*.
IAC16.x37488 [👉](#), *CubeSats for Asteroid Exploration: Asteroid Impact Mission (AIM) Case Study*.
- 2016 **IAC16.x32247** [👉](#), *Preliminary Analysis and Design for an End-to-End Mars Flyby Manned Mission*.
IAC16.x34320 [👉](#), *An Innovative Multi-Spectral and Multi-Angle Based CubeSat for Earth Observation*.
- 2015 **IAC15.x30698** [👉](#), *Atmospheric Re-Entry Systems with Flexible and Inflatable Technologies*.
IPPW15, *Planetary Atmospheric EDL with Flexible and Inflatable Technologies*.

Projects

- 2015–2017 **FATO Mars Team**, *International Gemini Mars Design Competition*, Mars Society, www.marsociety.org. FATO Mars Team (First human Approach TO Mars Team) designed a feasible end-to-end two-person Mars flyby mission with a re-entry by 2024. Main focus on: trajectory design and optimisation, concept of operations, concept design, architecture trade-off, and mission simulation.
- 2015–2017 **Italian student representative**, *UNISON Italy*.
Spokesman and student national point of contact for UNISEC Europe.
- March 2016 – April 2016 **International Space Apps Challenge 2016**, NASA.
Development of a method and a novel drill to characterize the composition of an asteroid for mining potential.
- 2015–2016 **STRATONAV**, *BEXUS 22*, (STRATOspheric NAVigation).
Test of a VOR navigation system and evaluation of its accuracy above its estimated Standard Service Volume. Main focus on: Manufactory Drafting, Drawing Set, CAD and CAE structural analysis.
- 2014–2016 **Mechanical group representative**, TEAM D.I.A.N.A., Politecnico di Torino.
Lunar Rover – Turret Production and Testing; Mars Rover – Robotic 3-DOF wrist project.

Miscellaneous

- 2013–Present **Civil aircraft private pilot**, *Private Pilot License*, IT.FCL.18153, replacing JAR-FCL # I-PPL-A-037048.
Airworthiness status check (PIC responsibility for private flights), including propeller and engine. An efficient communication (both in Italian and English) and a significant problem-solving skill of sudden events are necessary.

Awards

- Sep. 2016 Podium - FATO Mars Team - International Gemini Mars Design Competition

Computer skills

- Languages C, MATLAB[®], JAVA, python[™], L^AT_EX
- Space Mission AGI System ToolKit STK[®], NASA GMAT[®], SPICE[®] NASA Toolkit
- CAD/FEM/3D VCarve[®], DS SolidWorks[®], DS Catia[®] V5, MSC Patran[®]/Nastran[®], MSC Adams[®]
- Graphics Adobe[®] After Effect/Dreamviewer/Fireworks/Photoshop, Blender, Cryengine, Pinnacle Studio
- Certifications AICA ECDL core full (7/7) IT 1822339 [👉](#), Certified DS SolidWorks Associate CSWA [👉](#)/ Professional CSWP [👉](#) R4

Languages

- Italian **Mothertongue**
English **Advanced**

C1 Trinity ISE III "Proficient User"

Interests

- Space and Defense
- Flight Path/Orbital Optimal Control
- Space Propulsion
- Space Robotics
- Piano/guitar
- Mission Analysis and Design
- Military Air Systems
- Inner and Outer Planets Navigation
- Teaching and Student Assistance
- Fence (foil/épée/sabre)