

Sabrina Corpino

Address: Department of Mechanical and Aerospace Engineering
Politecnico di Torino
Corso Einaudi 40
10129 Torino – Italy
Phone: +39 011 090 6867 E-mail: sabrina.corpino@polito.it

Professional History

2014: Massachusetts Institute of Technology, EAPS Dept.

Visiting Scientist

2006-present: Politecnico di Torino, Torino, Italy

Professore aggregato (from 2012)

Confirmed Assistant professor of Aerospace Systems (ING-IND/05)

2003-2005: Politecnico di Torino, Torino, Italy

Assistant professor of Aerospace Systems (ING-IND/05)

Educational History

1999-2003 Ph.D. "*Definition of a 3D-CAD based conceptual design methodology for aircraft*"
Department of Aerospace Engineering, Politecnico di Torino, Italy

2000-2001 Visiting student at Imperial College, Department of Aeronautics, London, UK

1992-1999 MSc in Aerospace Engineering, Politecnico di Torino, Italy

Research Activity and Projects

Since 2000, I take part in the AeroSpace Systems Engineering Team (ASSET) of Politecnico di Torino. We work in the area of aerospace system engineering, and in particular we are focused on methods for the design of systems and missions taking into account all design variables and their interactions in the global architecture. The methods are used for concepts exploration and mission analysis, for requirements definition and systems development on a functional basis. Some interesting tools have been developed to define and evaluate mission architecture on the basis of multi-objective robust optimization in multi-disciplinary environments, to design and simulate systems using advanced techniques (MBSE, software-in-the-loop, hardware-in-the-loop), to study characteristics such as safety and reliability of systems via zonal analysis, and others.

For some applications, such as small platforms and CubeSats, we also develop and verify our systems by means of simulation and test. In these cases, the detailed design of systems and sub-systems is carried out and verified in our Systems and Technologies for Aerospace Research Lab (STARlab) at the Department of Mechanical and Aerospace Engineering.

Period	Research title	Funding	Role
2015-present	Aircraft 3rd Generation MDO for Innovative Collaboration of Heterogeneous Teams of Experts (AGILE)	EU-H2020	PoliTo Coordinator
2015-present	Youth for Space Challenge (ODYSSEUS)	EU-H2020	PoliTo Co-Coordinator
2014-present	Tecnologie Innovative per Velivoli di Aviazione Generale di Nuova GeneraziOne (TIVANO)	MIUR-Cluster	PoliTo Coordinator
2013-present	CubeSat for Space Exploration: a new paradigm for Planetary Science Missions	Compagnia di San Paolo Foundation	Coordinator
2013-present	Fly Your Satellite (FYS): verification of a CubeSat Design with ESA and preparation for orbit launch (CubeSat e-st@r-II)	ESA – PoliTo	Program Manager
2013-present	Capture and Deorbiting Technologies (CADET): design and demonstration of a system for orbit debris removal	Piedmont Regional Government	WP leader (Development of chaser guidance strategies)
2012-present	Future Launcher Avionic Program (FLAP)	Piedmont Regional Government	WP leader (design of the GNC system)
2010-present	GEOID (GENSO Experimental Orbital Initial Demonstration): A CubeSat Constellation for the Validation of the Global Educational Network for Satellite Operations (GENSO)	ESA – PoliTo	Program Manager
2008-12	Educational Payload on the Vega Maiden Flight – CubeSat e-st@r-I	ESA – PoliTo	Program Manager
2009-11	SMAT F1 - Land Monitoring Advanced System, Phase 1	Piedmont Regional Government	Participant
2008-11	STEPS - Systems and Technologies for Space Exploration	Piedmont Regional Government	Participant
2007-10	TWIn Satellites To Observe the Solar Corona - Twistosc	INAF OATo	Participant
2000-08	Several projects of nanosatellites design and applied technologies	MIUR-PRIN	Participant
2004-05	Human Space Transportation Systems (HSTS) and Atmospheric Re- entry Experimental Vehicle (AREV)	Thales Alenia Space – Italia S.p.A.	Participant
2002	Nanotechnology for University Nanosatellites Flying in Formation: Prototype Design and Test	ASI	Participant

Teaching and education activity

The education activity has been and is being carried out mainly within the undergraduate, graduate and postgraduate Courses in Aerospace Engineering at Politecnico di Torino, in the area ING-IND/05 (Aerospace Systems). In the following, some details about the most relevant education assignments are given.

- a. Since 2011 I teach the classes of “Space Missions and Systems Design” and “Aerospace Systems” in the Master of Science Course in Aerospace Engineering.
- b. Since 2004, teaching assignments in the area of Aerospace Systems Engineering and RAMST Engineering
- c. Since 2004, supervision of more than 80 theses and participation in the final Graduation Examination Board.
- d. Mentoring of PhD candidates and participation in Doctoral Examination Committees. PhD Candidates under my supervision are listed below:
 - Guido Ridolfi, Space Systems Conceptual Design. Analysis methods and engineering team support, 2009-2012
 - Giovanni Medici, Thrust vectoring on an UCAV airplane (Thrust Vectoring Engine Model): advanced control system, 2010-2012
 - Fabrizio Stesina, Guidance, Navigation and Control Systems for space applications, 2011-2013
 - Fabio Nichele, Design Methods for the functional definition of System of Systems, 2012-2014
 - Gerard Obiols Rabasa, Methods for dependability analysis of small satellite missions, 2012-2014
 - Raffaele Mozzillo, Technologies and methodologies for CubeSats performances improvement, 2013-2015
 - Lorenzo Feruglio, Technologies and Methodologies for Space Missions Automation, 2014-2016
 - Luca Boggero, Study of hybrid propulsion systems for UAS and general aviation aircraft, 2015-2017
- e. Since 2010, Academic Advisor of the CubeSat Student Team of Politecnico di Torino.

Other activities

- Reviewer for several international journals:
 - IEEE Transactions on Aerospace and Electronic Systems
 - IEEE International Systems Journal
 - Acta Astronautica, Elsevier Publications, sponsored by the International Academy of Astronautics
 - Proceedings IMechE, Part G: Journal of Aerospace Engineering, SAGE Publications Ltd;
- Member of the Space University Administrative Committee (SUAC) of the International Astronautical Federation as representative of Politecnico di Torino.
- Activity in the NATO Science and Technology Organization - STO:
 - Technical Team Member in the Exploratory Team ET-110 on Risk and Reliability Assessment and Validation for Small Spacecraft (2011);
 - Technical Team Member in the panel Applied Vehicle Technology AVT-210 “Risk and Reliability Assessment and Validation for Small Spacecraft” since 03.01.2012 to present.

Public and Invited Talks

- 2014 “CubeSat for Space Exploration: challenges & opportunities” Seminar at Jet Propulsion Laboratory, Pasadena, CA, USA
- 2013 “La Donna e lo Spazio” Round Table on the role of women in the Aerospace Field, 50th anniversary of the first woman in Space, Lingotto Campus, Torino, Italy
- 2013 “CubeSat: from University to Space”, Conferenza *L'Italia nello Spazio* a cura di AESA, Politecnico di Torino, Italy
- 2009 “Satellites at PoliTo: programs overview”, International Workshop on Aerospace Technology Access to Space for Europe and USA, Politecnico di Torino, Italy

Selected Scientific Publications

- Corpino S., Stesina F. (2014). *Verification of a CubeSat via Hardware-in-the-loop Simulation*, IEEE Transactions on Aerospace and Electronic Systems, 50(4), pp.2807- 2818
- Viscio, M. A., Viola, N., Corpino, S., Stesina, F., Fineschi, S., Fumenti, F., and Circi, C. (2014). *Interplanetary CubeSats system for space weather evaluations and technology demonstration*. Acta Astronautica, Elsevier Ltd, 104(2), pp.516–525
- Corpino S., Mooij E., Ridolfi G. (2013). *Post-Optimality Pareto-Robustness Analysis of an Earth-Observation Satellite Mission*, Journal of Spacecraft and Rockets. AIAA - American Institute of Aeronautics and Astronautics, 50(4), pp.884-895
- Ridolfi G., Mooij E., Cardile D., Corpino S., Ferrari G. (2012). *A methodology for system-of-systems design in support of the engineering team*. Acta Astronautica, Elsevier Ltd, 73, pp.88-99
- Medici G., Viola N., Corpino S., Fioriti M. (2012). *Development and Validation of on-board systems control laws*. Aircraft Engineering and Aerospace Technology, Emerald, 84(3), pp.151-161
- Chiesa S., Corpino S., Fioriti M., Rougier A., Viola N. (2012). *Zonal safety analysis in aircraft conceptual design: application to SAVÉ aircraft*. Proceedings of the Institution of Mechanical Engineers. Part G, Journal of Aerospace Engineering, SAGE, 227(4), pp. 714-733

Torino, March 25th, 2015

