HISTORY OF THE DEPARTMENT

The University "Politecnico di Milano" was founded in 1863. Its mission is to teach technologies and educate students to become researchers. The University is continuously updating its tradition as a school that focuses on quality and innovation in teaching and research. Scientific research at Politecnico di Milano has always been oriented toward innovation and quality, always seeking a strong relationship with the industrial world through technology transfer. Attuning to the needs of the industrial sector helps research to continuously explore new areas and stay at the leading edge of science and technology.

The scientific community of Politecnico di Milano is made of more than 1,300 professors and research fellows, with 38,200 students (2013 update). According to QS World University Rankings 2012/2013, Politecnico di Milano ranked 28th worldwide in the area of Engineering and Technology. On a worldwide scale, it is the first Italian university entering the QS ranking among the top 30 technical universities. Furthermore, Politecnico di Milano participates in the coveted "club" of universities ranked in the top 100 in the world in the most prominent international rankings, along with only 15 other European universities.

Politecnico di Milano is currently articulated in 12 departments, where research is co-ordinated and carried out, and 6 schools, where education is co-ordinated and implemented. Several service Centres provide support for technical and administrative purposes.

DIPARTIMENTO DI SCIENZE E TECNOLOGIE AEROSPAZIALI

The Dipartimento di Scienze e Tecnologie Aerospaziali (Department of Aerospace Science and Technology, DAER-PoliMi) was established within Politecnico di Milano as an autonomous institute in the 1950s. The personnel of DAER-PoliMi currently consists of 43 faculty, 27 technical and administration staff, 70 research assistants and Ph.D. students. The main activity within the Department is scientific research.

The Department itself is the main reference body for the B.Sc. (Laurea) course in Aerospace Engineering, the M.Sc. (Laurea Magistrale) course in Aeronautical Engineering and Space Engineering, and the Ph.D. (Dottorato di Ricerca) course in Aerospace Engineering. M.Sc. and Ph.D. courses are offered in English. Each year, about 250 students complete the B.Sc., 180 the M.Sc., and 15 the Ph.D. In parallel, DAER-PoliMi staff is strongly involved in several research activities with academia, industries and research bodies worldwide.

Politecnico di Milano
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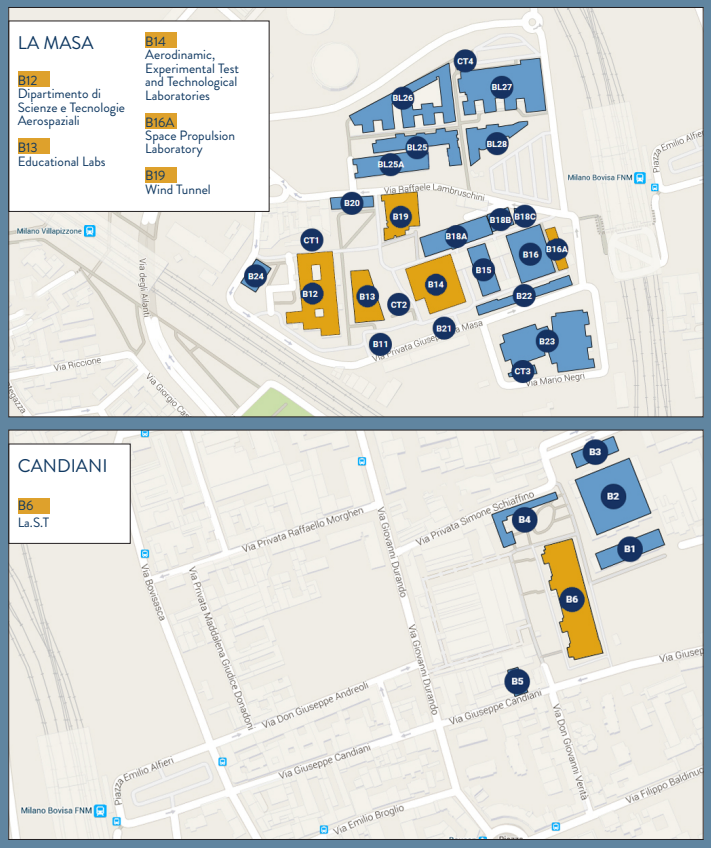
DOVE SIAMO
CAMPUS BOVISA - La Masa e Candiani



DAER 015/2016 - Rev.0

POLITECNICO
MILANO 1863

DIPARTIMENTO DI SCIENZE
E TECNOLOGIE AEROSPAZIALI

SCIENTIFIC LAB

AVLab - Aeroelasticity and Vibroacoustics Lab

SCIENTIFIC LABS

DEPARTMENT OF AEROSPACE SCIENCE AND TECHNOLOGY (DAER)

Research activities within the Aerospace Science and Technology Department (DAER) of Politecnico di Milano are organized in scientific laboratories. These laboratories represent the core of the research competences developed at DAER over the years. They are highly specialized, agile and vital competence centers.

SCIENTIFIC LABS

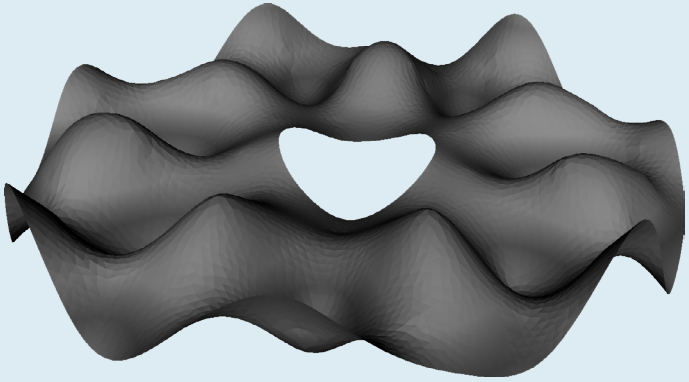
The Department has formed 14 research laboratories, which contribute to the majority of research activities.

- AMATECH - Aerospace MAterials and TECHnologies
- ASCL - Aerospace Systems and Control Lab
- ASDL - AeroStructures Design Lab
- AVLab - Aeroelasticity and Vibroacoustics Lab
- CrashLab
- FlowCon - Instability and Flow Control Lab
- FMSlab - Flight Mechanics & Flight Systems Lab
- FRAME - Fixed and Rotary-wing Aircraft Multidisciplinary Eng.
- PFDLab - Physical Fluid Dynamics Lab
- POLI-Wind - Wind Energy Lab
- RAL - Rotorcraft Aerodynamics Lab
- SIAMS - Structural Integrity of Advanced Materials and Structures
- SME - Space Missions Engineering
- SPLab - Space Propulsion Laboratory and Nanoenergetics

AVLAB

AEROELASTICITY AND VIBROACOUSTICS LAB

The Aeroelasticity and Vibroacoustics Laboratory deals with the simulation and control of the response of light aerospace structures. It studies the aeroelastic response, vibrations and noise emission of aircraft and helicopters. It develops nonlinear active control systems for flutter suppression and load alleviation, as well as real time vibration and noise control systems. It also develops high fidelity models and designs innovative control systems for large telescope adaptive mirrors.



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ONGOING ACTIVITIES

- Vibration and acoustic analysis of finite-size multilayered composite panels, based on accurate and efficient sublaminate Ritz models with variable-kinematics capabilities. Classical laminated to more advanced sandwich configurations involving frequency-dependent viscoelastic materials and piezoelectric materials can be studied.
- Advanced transfer matrix method (TMM) to predict the transmission loss of helicopter trim panels with anisotropic and heterogeneous layers. The proposed combination of TMM and FE modeling represents a versatile and efficient acoustic tool, overcoming the limitations of homogeneous equivalent models.
- Design and implementation of active devices and systems on glass windows with noise reduction capabilities.
- Multidisciplinary modeling and control of telescope adaptive mirrors. AVLab pioneered, together with Osservatorio Astrofisico di Arcetri, Microgate and ADS International, the secondary mirror contactless solution. It is now actively working on the development of advanced simulation models and new control schemes. It is also involved in the simulation of the E-ELT M4 adaptive unit and of the GMT Adaptive Secondary Unit.
- AVLab participates to the PoliMi Sound and Vibration Laboratory (PSVL), the reference Politecnico research structure in vibroacoustics noise and vibration control.

FUTURE PLANS

- Multidisciplinary optimizations of complex structures, accounting for acoustic, low frequency vibrations and for nonlinear structural constraints.
- Topology optimization techniques are being used to design tailored band-gap meta-materials.
- The existing adaptive mirror technology for the control of large space structures and of flexible structures with negligible damping.

ERC KEYWORDS

PE7_3 Simulation engineering and modelling
PE7_1 Control Engineering
PE9_15 Space Sciences
PE8_1 Aerospace Engineering

FREE KEYWORDS

- Active and adaptive optics.
- Massive structural control.