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.

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DOVE SIAMO
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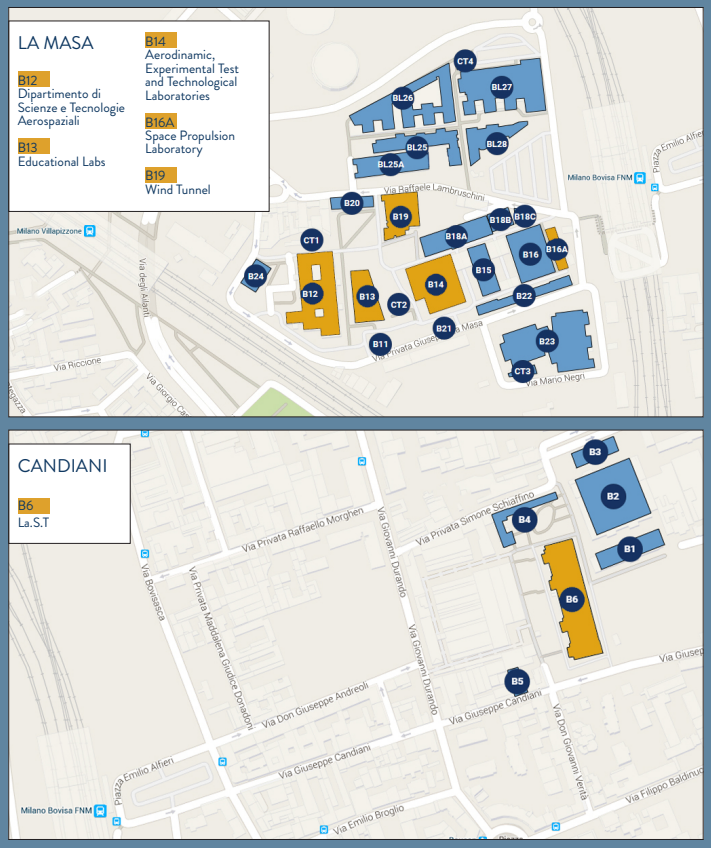

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POLITECNICO
MILANO 1863

DIPARTIMENTO DI SCIENZE
E TECNOLOGIE AEROSPAZIALI

SCIENTIFIC LAB

RAL
Rotorcraft Aerodynamics 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

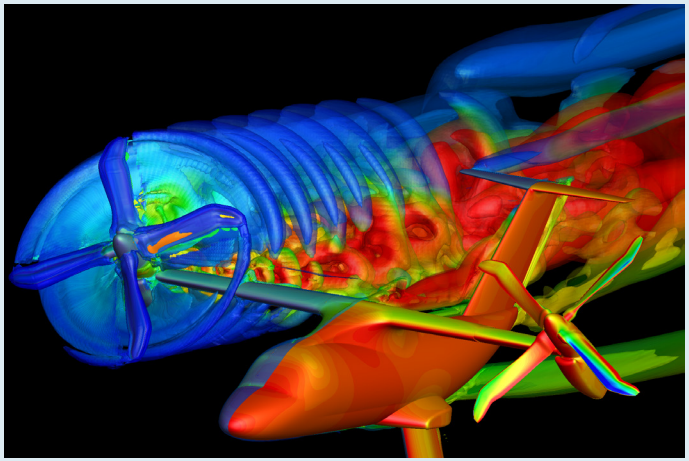
The Department has formed 14 research laboratories, which contribute to the majority of research activities.

- 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

RAL

ROTORCRAFT AERODYNAMICS LAB

The goal of RAL is to perform numerical and experimental studies of complete helicopter and tiltrotor configurations. Its expertise includes: coupled CFD/CSD methods for helicopters with elastic blades; unstructured moving grids; investigation of rotor-fuselage mutual interference. Large and medium subsonic Wind Tunnels with a rotor driving system; dynamic stall experiments on blade sections.



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TOOLS

- Wind tunnels, force and pressure measurements, flow surveys (3D-HW and 3D-PIV).
- Navier-Stokes solvers: structured, multi-block, Chimera (ROSITA), coupled with MbDyn for CFD/CSD simulations; unstructured with ALE formulation (Flowmesh).

MAIN RESEARCH SUBJECTS

- Tilt-rotor aerodynamics: a research about the interaction between rotor and wing in a tilt-rotor aircraft is in progress. The subject is investigated by means of both numerical simulation (with ROSITA) and experimental tests (with the test rig developed in our lab).
- CFD for rotorcraft aerodynamics: high-order, multi-dimensional WENO schemes for multi-block grids are presently being developed to be implemented in ROSITA, while the technique of the residual distribution scheme will be adopted in Flowmesh.
- Experimental techniques: an innovative technique, allowing obtaining the pressure distribution from the velocity field measured with the PIV, has been refined and applied to a series of tests of a rotor equipped with Active Gurney Flaps within the GUM CleanSky project.
- Dynamic stall control: the dynamic stall and more in general the oscillating airfoil aerodynamics has been subject of several studies, both numerical and experimental, including the feasibility study of an innovative L-shaped flap.
- Blade Vortex Interaction: the oscillating airfoil test rig was also used for experiments of perpendicular blade-vortex interaction where the complex flow produced by the vortex impact over the target oscillating airfoil was in details investigated by means of PIV. Full rotor experiments are planned as a support for the aeroelastic/aeroacoustic design of quit blades in BVI conditions.
- Helicopter-obstacle interference effects: the investigation is carried out by means of both wind tunnel testing (in the large test chamber of the large wind tunnel) and numerical simulation (with the ROSITA code). This research is be part of a GARTEUR program.