

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
Department of Aerospace Science and
Technology (DAER)

Campus Bovisa
Via La Masa, 34 - 20156 Milano - Italy
Edificio B12 "Enrico Forlanini" - 2nd floor

tel. +39.02.2399.8323-24
fax +39.02.2399.8334

<http://www.aero.polimi.it/>



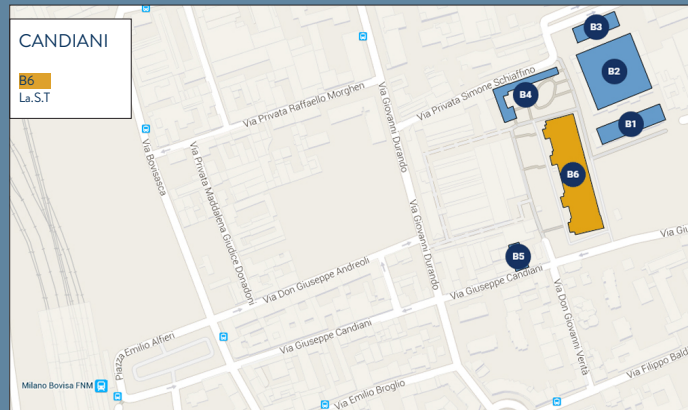
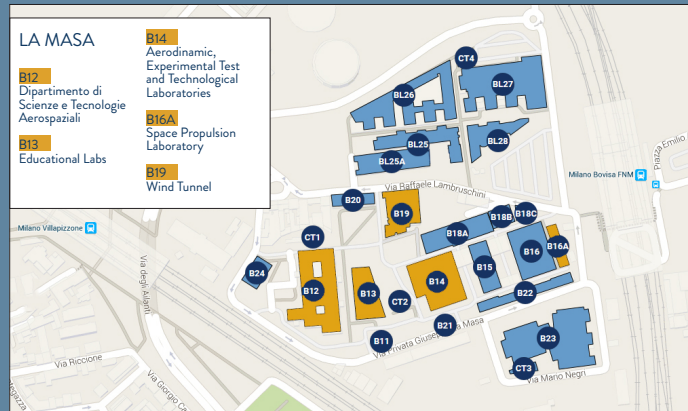
POLITECNICO
MILANO 1863

DIPARTIMENTO DI SCIENZE
E TECNOLOGIE AEROSPAZIALI

SCIENTIFIC LAB

CrashLab

DOVE SIAMO
CAMPUS BOVISA - La Masa e Candiani



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.

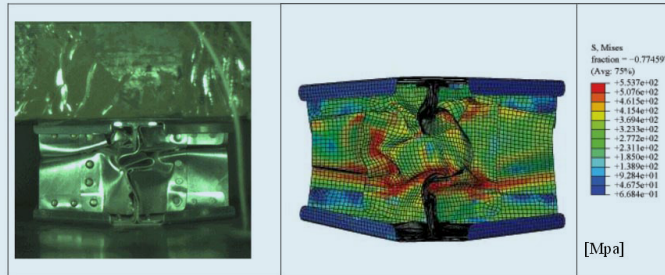
SCIENTIFIC LABS

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

CRASHLAB

Experimental analysis and numerical modeling of metal and composite structures under crash and impact conditions, including: definition of constitutive laws of materials, fluid-structure interaction, occupant's biomechanics, injury criteria, cabin safety, fuel system integrity, bird and hail impact.



CONTACT PERSON

Prof. Paolo Astori

PHONE NUMBER

+39 02 2399 8337

MAIL ADDRESS

paolo.astori@polimi.it

WEB SITE

<http://www.aero.polimi.it/en/research/research-laboratories/>

ONGOING ACTIVITIES

- Refinement of cabin safety numerical models based on drop test campaign on specimens including subfloor, seta and anthropomorphic dummy.
- Design of structures minimising the bird impact damage, based on FE analysis and gas gun shots; characterisation of suitable ballistic gel for future use in experimental testing in place of bird cadavers.
- Use of hybrid models, based on mixed finite element and lumped mass parts, for the analysis of large rotorcraft sections including cabin, subfloor, seats and anthropomorphic devices; optimisation of energy absorption mechanical parameters, aimed at injury risk minimisation, by fast analysis techniques.
- Use of human total body models for the study of injury criteria and comparison with anthropomorphic test dummy based criteria.

FUTURE PLANS

- Improvement of bird strike modelling technique.
- Co-operation with industrial partner for the refinement of an innovative helicopter crashworthy seat, finalised to EASA certification.
- Study of new constitutive laws for Al alloys for a better finite element analysis of fracture propagation.
- Experimental testing and finite element modelling of riveted junctions in static and dynamic conditions.
- Experimental testing and finite element modelling of chiral structures in static and dynamic conditions, aimed at crash energy absorption.
- Application of optimisation strategies to numerical models (hybrid and lumped masses) of more extended rotorcraft sections, including the three main energy absorbing stages of seat, subfloor and landing gear.

ERC KEYWORDS

PE8_13 Lightweight construction, textile technology
PE8_8 Mechanical and manufacturing engineering
(shaping, mounting, joining, separation)
PE8_4 Computational Engineering
PE8_1 Aerospace Engineering

FREE KEYWORDS

- Crashworthiness.
- Structural impact.