MASTER'S PROGRAM

AERONAUTICS & SPACE
MAJOR TURBULENCE

This two years master's program aims at training engineers, physicists and mathematicians to be able to deal with any industrial or research environment thanks to their skills in computational, experimental and theoretical turbulence.

Three of the top French Technical Universities **(Centrale Lille, ISAE-ENSMA and ENSIP)** have teamed up to offer a unique programme. You will deal with both the science and the engineering of turbulent flow : the fundamental concepts of turbulence theory together with advanced, state-of-the-art computational and experimental methodologies.

Length of studies:
2 years

Language of instruction:
English

Course Directors:
Pr. JM. FOUCAUT
Centrale Lille
F. MARGNAT, PhD
ENSI Poitiers

An International Advisory Board ensures the master program is at the international state of the art in Turbulence

Chairman: Prof J.C. Vassilicos (CNRS, France)

Members:
Prof B. Frohnapfel (KIT, Germany) | Prof W.K. George (Imperial, UK) | Dr M. Hultmark (Princeton, USA) | Dr A. Lozano-Duran (MIT, USA) | Dr P. Spalart (retired from NASA and Boeing) | Prof M. Stanislas (Centrale Lille, France) | M. Wosnik (University of New Hampshire).

Semester 1

Centrale Lille
30 credits | Core courses - 310 h

Dynamics of viscous incompressible flows - Dynamics of compressible flows and similarity - Mathematics - Turbulence - Project - Experimental methods - Experimental practice - Numerical methods - Numerical methods practice - Fortran - Language - Culture

Semester 2

Centrale Lille
30 credits | Core courses - 140 h
+ 2,5 months research project

Turbulence - Lagrangian - Numerical methods practices - LES & DNS - Turbulence & turbomachinery - Aerodynamics - Research project - Artificial Intelligence

Semester 3

ISAE-ENSMA & ENSIP
30 credits | Core courses - 322 h

Advanced Signal processing - Introduction to hydrodynamics stability - Flow control - Compressible turbulence - Numerical simulation of turbulence - Aeroacoustics - Turbulent heat transfer - French culture - Project

Semester 4

Master Thesis | 6 months

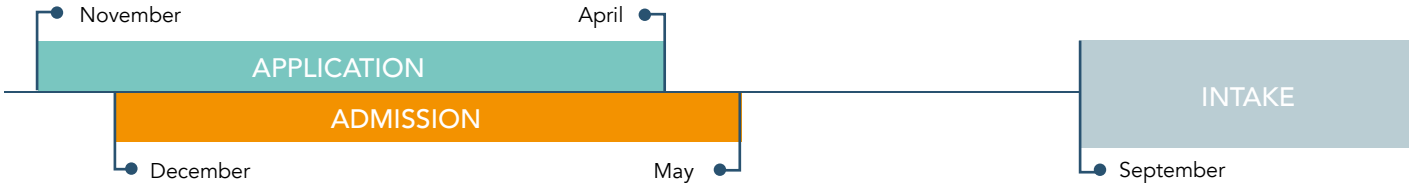
The thesis takes place in a company or a laboratory, in France or abroad, cosupervised by one of the three universties involved (possibility to get a paid internship).

The program is tightly linked to ongoing research on turbulence and related topics in the two research laboratories: Institut P' and Laboratory of Fluid Mechanics of Lille - Kampé de Fériet (LMFL). These two laboratories have strong connections with CNRS, the French National Centre for Scientific Research.

Admission

Minimum requirements :
Bachelor's degree, or equivalent, in Science or Engineering disciplines which lends itself to the study of Turbulence, e.g. Mechanical, Aerospace, Engineering Physics, Physics or Applied Mathematics.
Applicants must be fluent in English - written and spoken.

Tution fees : 14 000€ for the two-years program



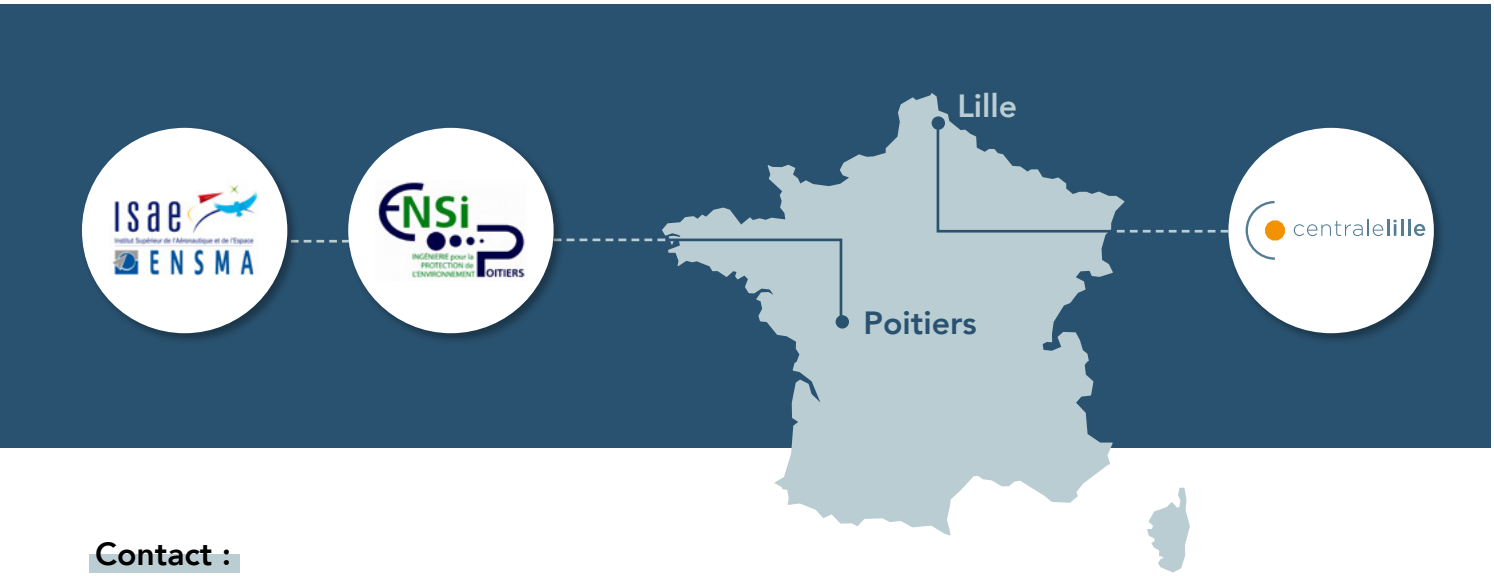
Apply online : **https://centralelille.fr/en/aeronautic-space-major-turbulence/**

Job prospects and further PhD studies

Sector :
Aerospace, aeronautics, automotive, chemicals, electricity, oil & gas, renewable energy, transports.

Carreer :
About 50% of graduated students choose to carry out a PhD in prestigious research laboratories. The other 50% go to the corporate world in Europe and outside Europe.

More than 100 graduates are now well established and successful professionals in both industry and reasearch structures. The TIMP-ALUMNI association (Turbulence International Master Programme Alumni) is a registered nonprofit organization in France founded in 2013. You will be able to benefit from this rich professional network and keep links with former, contemporary and future students.



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