Numerical methods for compressible flows

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **Code:** N9EM05B
- **Open to exchange students:** No

Presentation

Objectives

The aim of this course is to introduce the main numerical methods used to solve the equations governing hyperbolic conservation laws. Particular attention will be paid to gas dynamics and free-surface flows, and more generally to nonlinear hyperbolic problems generating discontinuities such as shock waves.

Description

After underlining the specificities of these flows from the point of view of numerical modeling, modern numerical techniques for capturing discontinuities (Riemann solvers, flow decomposition schemes, etc.) will be presented. We'll take a closer look at methods for increasing order (MUSCL method). We will also look at the discretization of boundary conditions for hyperbolic problems.

Pre-requisites

1st year course on numerical methods