PPSC
Programmation et Calcul Scientifique Parallèle
Programming & Parallel Scientific Computing

8, 13, 14, 15pm,18, 20, 22 & 25 November

Team

- **Aurélien Larcher**
- **Jonathan Viquerat**
- **Elie Hachem**

Lab assistant

- **Ramy Nemer**

30 h
Courses & Exercises

Objectives

The course provides an introduction to C++ programming and algorithms with a focus on scientific computing using Cimlib_CFD.

An overview of the C++ language is provided: specification, arithmetics, memory management, object-oriented design for component-based software, and advanced topics using templates.

Distributed and shared-memory parallel computing are then approached with exercises related to numerical methods for PDEs.

Program

I. C++ Programming

- Environment and standards
- Integer and Floating-point arithmetics
- Object-Oriented concepts
- Template and meta-programming
- Advanced STL

II. Parallel scientific computing

- Parallel computing architectures
- Distributed programming models (MPI)
- Shared memory models (OpenMP)
- Applications to numerical linear algebra and finite element/finite difference methods.

Evaluation

Project & Participation in classes