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## Introduction to ICFD

**Instructor: Inaki Caldichoury**

**1 Day - \$400, Students \$200** w/student ID

Includes on-site continental breakfast, lunch, breaks and class notes

Includes 30-day demonstration license to practice

**Prerequisite:** Basic keyword knowledge of LS-DYNA. CFD knowledge is appreciated but not mandatory.

**Description:** This 1 day class provides an introduction to the ICFD solver in LS-DYNA. The ICFD solver can run as a stand alone for pure CFD applications (the study of drag lift around bluff body and vehicles for example), or be coupled to the thermal and structural mechanical problems for linear and non-linear complex FSI and conjugate heat transfer applications. It also makes use of an automatic mesh generator for the fluid volume thus greatly reducing the cost of setting up the model. In the first part, key concepts as well as the philosophy behind the solver will be discussed before moving on practice examples and keywords in the second part.

**Content:**

- **Features and applications**
  - Background
  - Characteristics
  - Applications
- Principles of fluid mechanics and CFD
  - Main concepts of fluid mechanics
  - Main concepts of CFD
- **General CFD**
  - Main keywords
  - Mesh control tools
  - Free surface problems (dam breaks and wave generation)
  - Thermal flows
  - User defined meshes
- Steady state solver
- Post treatment tools
- **Multiphysics and coupling**
  - Weak and strong FSI coupling
  - Handling dynamic remeshing
  - Linear coupling with structure
  - Thermal coupling
  - DEM coupling
- **Advanced CFD**
  - Non Newtonian materials
  - Porous media flows
  - Turbulence models and boundary layer meshes
  - Non inertial reference frame
  - Periodic and sliding mesh boundary conditions