Stanford

Lluis Jofre Cruanyes

Postdoctoral Research Fellow, Mechanical Engineering

Bio

PROFESSIONAL EDUCATION

- Mechanical Engineering, Polytechnic University of Catalonia - BarcelonaTech (2008)
- Masther's Thesis, KTH - Royal Institute of Technology (2008)
- Doctor of Philosophy, Polytechnic University of Catalonia - BarcelonaTech (2014)

STANFORD ADVISORS

- Gianluca Iaccarino, Postdoctoral Research Mentor
- Parviz Moin, Postdoctoral Faculty Sponsor

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Interested in numerical methods for computational fluid dynamics and multiphysics. The research is mainly focused on multiphase turbulent flows, and includes raids into compressible and low-mach number flows, combustion processes, adaptive mesh refinement and high performance computing.

The objective is to develop discrete numerical models for the simulation of flow phenomena such that mimic the properties of the continuous conservation equations. The mathematical formulations are principally based on finite-volume approaches, the models developed are suitable for 3-D unstructured meshes, and the implementations are properly parallelized in order to be resolved on supercomputers.

Publications

PUBLICATIONS

- **A scalable geometric multigrid solver for nonsymmetric elliptic systems with application to variable-density flows** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Esmaily, M., Jofre, L., Mani, A., Iaccarino, G.
  2018; 357: 142–58
- **A Framework for Characterizing Structural Uncertainty in Large-Eddy Simulation Closures** *FLOW TURBULENCE AND COMBUSTION*
  Jofre, L., Domino, S. P., Iaccarino, G.
  2018; 100 (2): 341–63
- **A low-dissipation convection scheme for the stable discretization of turbulent interfacial flow** *COMPUTERS & FLUIDS*
  Schillaci, E., Jofre, L., Balcazar, N., Antepara, O., Oliva, A.
  2017; 153: 102–17

- **A level-set aided single-phase model for the numerical simulation of free-surface flow on unstructured meshes** *COMPUTERS & FLUIDS*
  Schillaci, E., Jofre, L., Balcazar, N., Lehmkuhl, O., Oliva, A.
  2016; 140: 97-110
- **A coupled volume-of-fluid/level-set method for simulation of two-phase flows on unstructured meshes** *COMPUTERS & FLUIDS*
  Balcazar, N., Lehmkuhl, O., Jofre, L., Rigola, J., Oliva, A.
  2016; 124: 12-29
- **Parallel load balancing strategy for Volume-of-Fluid methods on 3-D unstructured meshes** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Jofre, L., Borrell, R., Lehmkuhl, O., Olivaa, A.
  2015; 282: 269-288
- **Level-set simulations of buoyancy-driven motion of single and multiple bubbles** *INTERNATIONAL JOURNAL OF HEAT AND FLUID FLOW*
  Balcazar, N., Lehmkuhl, O., Jofre, L., Oliva, A.
  2015; 56: 91-107
- **A finite-volume/level-set method for simulating two-phase flows on unstructured grids** *INTERNATIONAL JOURNAL OF MULTIPHASE FLOW*
  Balcazar, N., Jofre, L., Lehmkuhl, O., Castro, J., Rigola, J.
  2014; 64: 55-72
- **A 3-D Volume-of-Fluid advection method based on cell-vertex velocities for unstructured meshes** *COMPUTERS & FLUIDS*
  Jofre, L., Lehmkuhl, O., Castro, J., Oliva, A.
  2014; 94: 14-29
- **CONSERVATION PROPERTIES OF UNSTRUCTURED FINITE-VOLUME MESH SCHEMES FOR THE NAVIER-STOKES EQUATIONS** *NUMERICAL HEAT TRANSFER PART B-FUNDAMENTALS*
  Jofre, L., Lehmkuhl, O., Ventosa, J., Trias, F. X., Oliva, A.
  2014; 65 (1): 53-79