TEP-235 Fluid Mechanics Group Jaén

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The “Fluid Mechanics Group Jaén” comprises a multidisciplinary team of engineers and doctors with extensive experience in different Fluid Mechanics techniques, including theoretical aspects, experimental techniques and numerical simulations. The group also works with collaborators of recognized prestige from other universities, both Spanish and foreign. The research lines undertaken are focused primarily on multiphase flows, such as the processes of bubble generation and dynamic or the stability of fluid jets and the formation of drops. We also work on the stability and control of wakes of blunt bodies with application to the aerodynamic of terrestrial vehicles and civil aerodynamics, fluid-structure interaction and vibrations induced by vortices, the study of biological flows and the dynamic of fires in large-size chambers. In performing our work, we have advanced experimental and supercomputer facilities in place.

In performing its work, the group has a wide variety of research facilities and equipment in place. Of note among them are two wind tunnels for conducting studies on scale models, a water tunnel and a towing tank. It also has laser velocimetry (LDV, PIV) systems, a hot wire anemometry (HWA) system, portable anemometers and two high-speed cameras (PHOTRON FASTCAM APX-RS and PHOTRON FASTCAM SA-1.1) for acquiring images at acquisition speeds of 650,000 IPS. To conduct plastics injection studies, we have a BabyPlast machine, a Discovery DHR-2 Hybrid Rheometer and a system for measuring surface tension in fluids. As for its computational capabilities, the research group has two high-performance supercomputers (HPCs), with the RedHat and Centos operative systems. Both units provide a total of 500 cores for conducting parallel simulations. A brief description of the mentioned facilities and equipment can be found on the following website: http://www.fluidsujaen.es/facilities/.

Website for the group

Website for the Fluid Mechanics Group Jaén Research Group

Research lines

- Study of the mechanisms of drop and bubble formation, and devices for generating microdrops and microbubbles
- Study of the stability and control mechanisms of fluid jets and wakes
- Aerodynamic improvement of heavy vehicles
- Fluid-structure interaction and vibrations induced by vortices
- Biological flows
- Dynamic of fires in large compartments
- Two-phase turbulent flows
- Characterization of plastics injection
- Irrigation, olive grove, water quality, rationalization studies

Related services and products

- Device for reducing aerodynamic drag in vehicles
- System and procedure for generating monodisperse microbubbles in co-flow configuration

- Aerodynamic studies, both experimental and by means of numerical simulation
- Simulation of flows in plastics injection systems
- Optimized design of fluid thermal systems by means of attached optimization tools
- Study of solar panel refrigeration
- Characterization of climate control systems
- Design of air injection systems in liquids
- Analysis and design of water-saving systems
- Fire propagation simulations
- Characterization of ducts and networks
- Technical consultancy and advisory service
- Manufacture of parts and prototypes
- Specialization courses in Fluid Mechanics

Spanish website: http://bit.ly/2Cr5deP