UNIVERSIDAD POLITÉCNICA DE MADRID

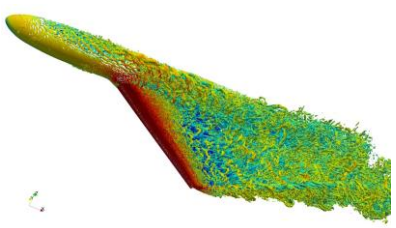
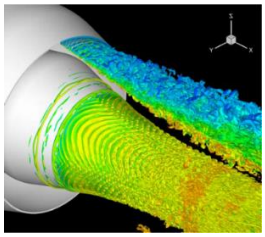
Expression of Interest – UPM Supervisor

Marie Skłodowska Curie Action –Postdoctoral Fellowship 2022 (MSCA-PF-2022)

Contact Person/Scientist in charge	**Name**	Eusebio
	Surname	Valero
	Email	Eusebio.valero@upm.es
Department /Institute /Centre	**Name**	Center for Computational Simulation, Universidad Politécnica de Madrid
	Address	School of Aerospace, Plaza Cardenal Cisneros 3, 28040 Madrid
	Province	Madrid
Research Area		Information Science and Engineering (ENG) Mathematics (MAT)
Brief description of the Centre/Research Group		The research Center for Computational Simulation (CCS) aggregates much of the computational sciences and engineering activities in the UPM. It incorporates over 100 members, 60 of them permanent researchers from four Universities in Madrid, grouped in five areas covering a broad corpus of knowledge: numerical simulation, data analytics, visualization and data interaction, fundamentals and new computational models and ICT energy efficiency. Annually, its members produce well over 200 communications and papers in international journals and coordinate around 20 projects, many with international partners and in the framework of H2020. CCS is not only committed to produce excellent science, but also to transfer knowledge to the productive sector and in educational activities. It collaborates with many companies, both SMEs and large ones either directly in research and development contracts or as partners in joint projects. Its members participate in specialized courses, masters, PhD programs and international training networks. Within CCS, the Numerical Mathematics Group (NUMATH) of the School of Aeronautics, has over 20 years of experience in computational fluid dynamics. The group has developed during the last years its own simulations solvers based on a probable stable implementation of a high-order discontinuous galerkin discretization of the Navier-Stokes equations. Current investigations are concerned with implicit methods, h/p adaptation with immerse grids, under resolved turbulence problems for industrial problems and the development of numerical algorithms for data management and feature detection of large unsteady databases.

UNIVERSIDAD POLITÉCNICA DE MADRID

Expression of Interest – UPM Supervisor

Project description	**Project Title: New Numerical Simulation tools for aerodynamic and aeroelastic data prediction**. We propose a **collaborative project with Airbus & Defense and Space**. To improve its simulation capabilities Airbus is embarked in a new generation of aerodynamic solvers and new methodologies for data prediction and modelling. This kind of tools will mark the different in simulation capabilities necessary for the future electric or hydrogen propulsion aircraft. The project requires a **deep knowledge of numerical simulation, language programming and software development for the solution of the Navier-Stokes equations**. Key objectives are the development of algorithms for numerical efficiency, algorithms for data management and the efficiency implementation of those algorithms in the most advanced HPC platforms (MareNostrum).   Long Range Aircraft in Low Speed Flight Conditions with deployed High Lift and the Engine jet, two of the proposed test cases to validate the advances in simulation. The candidate will join an international team led by Airbus that will be the new reference for aeronautical design. Additionally, the application to a series of industrial aerodynamic configurations will be presented at the most meaningful international conferences and workshops and will be disseminated in the most relevant archival journals in the field of fluid mechanics and scientific computing.
Applications: documents to be submitted and deadlines	Technical skills and experience: ● PhD in engineering, applied mathematics, physics, or equivalent. ● Excellent computational skills and language programming expertise in C++. ● Deep knowledge of numerical methods is mandatory. Experience in high-order schemes, spectral element and discontinuous Galerkin methods is recommended. Applicants should submit his/her CV, two letter of references, a letter of motivation and an example of his/her work before the 10th of July 2022.