This autumn the Severo Ochoa Research Seminar Series are opening on **Friday, 27th September at 10:00 in AULARI A4**, Campus Nord. The welcome address will be given by Eduard Ayguade and Josep Casanovas. The first lecture will be given by our colleague Mariano Vazquez, CASE Department at BSC-CNS.

**Title**: Understanding Cerebral Aneurysms through HPC-based Computational Modeling

**Abstract**: This talk addresses the use of HPC-based simulation tools in understanding cerebral aneurysms. In particular, coupled CFD and Solid Mechanics simulations could help to assess the risk of rupture. The tools are FeFlo for CFD and Alya for the solid mechanics problem. The work flow starts with acquiring images for several patients, which are used nexto to create a CFD simulation scenario. Then, the mean values of pressure and strains are transferred to Alya solver as boundary conditions for a 3D solid mesh created by extrusion of the surface fluid mesh. Mechanical and material properties are modulated according to some criteria and the inner stress analyzed.

**Biography**: Since 2005, Mariano Vázquez is research group leader at the Computer Applications in Science and Engineering (CASE) Department of the Barcelona Supercomputing Center – Centro Nacional de Supercomputación (BSC-CNS). He leads the High Performance Computational Mechanics Group. His group’s main task is to develop Computational Mechanics tools adapted to run efficiently in large-scale parallel computers. This involves Physical modelling, Mathematical algorithms and code development and optimization, all with the strong constraint of efficient use of parallel resources. This multidisciplinary group is composed by 10-15 researchers including post-docs, PhD students and programming engineers. Mariano Vázquez is one of the three main architects of the Alya System, the in-house HPCM tool. His main lines of research are on Computational Mechanics and HPC, with a strong focus in Biomechanics. In particular, all the computational aspects of Cardiac Computational Modelling (partially financed by the Severo Ochoa Program), Respiratory System or Hemodynamics (aneurisms).

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