**Title** : *Quasi-Newton methods for partitioned simulation of fluid-structure interaction*

**Abstract**

Fluid-structure interaction and other coupled problems can be simulated in a partitioned way, meaning that two existing solvers are coupled. However, in strongly coupled cases simply exchanging data at the shared boundary of both subproblems is numerically unstable. If this instability is limited to a small number of modes in the interface degrees of freedom, then quasi-Newton methods like IQN-ILS can typically stabilize the coupling iterations. These techniques treat the solvers as black boxes, meaning that only data at the shared interface is required. In addition, simplified or analytical models of the subproblems are sometimes available and they can be included in the quasi-Newton coupling using the recently developed IQN-ILSM method to further accelerate the convergence.

**Short CV:**

**Prof Joris Degroote** obtained his PhD in Mechanical Engineering in 2010. He became Associate Professor at Gent University, Belgium in 2013, after research stays at the MIT in the USA and Technical University of Munich (TUM) in Germany. He became full Professor in 2020. Prof Degroote’s research focuses on the numerical simulation of fluid-structure interaction (FSI), in particular on quasi-Newton techniques. His team does both algorithm development and advanced applications, often in a multi-disciplinary collaboration.

**Date:** 22 September 2022

**Time:** 14:00-15:00

**Room:** Robert Record Room, *Computational Foundry, Room 102*, Bay Campus