PhD position at IFP Energies nouvelles (IFPEN)
Mechanics

Modelling of aero-elasticity in large transformations
by a partitioned coupling: application to large wind
turbines

IFP Energies nouvelles is recruiting a student for a PhD in the field of wind energy. The thesis work will mainly take place at the IFPEN site in Rueil-Malmaison within the Department of Mechanics of Solids, interacting with the Department of Mechanics of Fluids; and collaborating with the MEMPHIS team from INRIA Bordeaux.

The development of wind power generation is strongly growing in France and around the world. IFPEN, as a public player in the energy transition, invests in this field and in the R&D on the characterization of wind resource, control and command of turbines, coupled mechanical modelling of wind power systems and technological development of offshore floating wind systems.

Increasing the size of wind turbines improves their profitability. This increase in size induces ever greater constraints on the lightness of the blades and makes aero-(servo)-elastic phenomena more significant because of more severe levels of blade deformation. The ambition of this thesis is to set up an innovating fluid-structure coupling methodology that makes it possible to perform simulations describing (very) large wind turbines in a relevant way and in industrial contexts. This PhD thesis is an opportunity for the student to build skills in various domain such as in solid mechanics, fluid mechanics, numerical methods and in the field of wind energy.

Keywords: Wind turbine, fluid-structure coupling, aero-elasticity, numerical modelling

Academic supervisor
Pr., BERGMANN Michel, Inria centre Bordeaux - Sud-Ouest

Doctoral School

IFPEN supervisor
Dr, GUY Nicolas, Dpt. Mécanique des solides, nicolas.guy@ifpen.fr

PhD location
IFPEN, Rueil-Malmaison, France

Duration and start date
3 years, starting in december 2021

Employer
IFPEN, Ruel-Malmaison, France

Academic requirements
University Master degree in solid mechanics, fluid mechanics or applied mathematics

Language requirements
Fluency in French or English, willingness to learn French

To apply, please send your cover letter and CV to the IFPEN supervisor indicated here above.

About IFP Energies nouvelles
IFP Energies nouvelles is a French public-sector research, innovation and training center. Its mission is to develop efficient, economical, clean and sustainable technologies in the fields of energy, transport and the environment. For more information, see our WEB site.
IFPEN offers a stimulating research environment, with access to first in class laboratory infrastructures and computing facilities. IFPEN offers competitive salary and benefits packages. All PhD students have access to dedicated seminars and training sessions. For more information, please see our dedicated WEB pages.