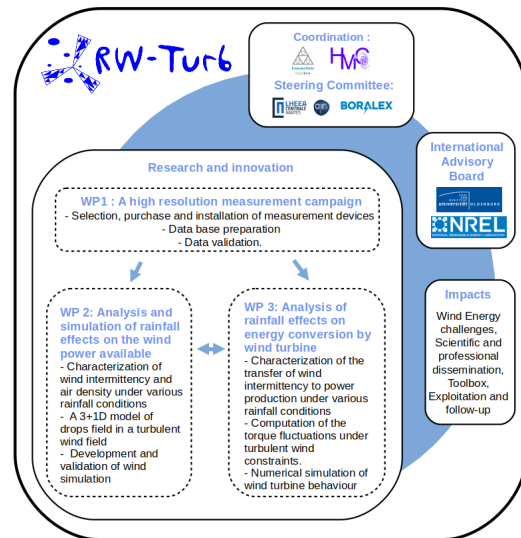


If interested by this internship opportunity : please contact [auguste.gires@enpc.fr](mailto:auguste.gires@enpc.fr) with CV and motivation letter.

### Brief Overview of the RW-Turb project :

The RW-Turb (Rainfall, Wind and Turbulence) is a project was recently funded by the French National Research Agency. RW-Turb will rely on the expertise of HM&Co ( the Hydrology, Meteorology and Complexity laboratory) in measurement and modelling across wide range of spatio-temporal scales of atmospheric turbulence and rainfall to quantify the impact of the latter on wind power production. This project will benefit from an industrial partnership with Boralex, a wind power producer. RW-Turb will open new paths to improve nowcasts of power production, a major challenge in a framework of increasing use of renewable energies in France and Europe.

More details are available on the projects website <https://hmco.enpc.fr/portfolio-archive/rw-turb/>



### Internship topic :

The internship is related to the work of WP3 on the analysis of rainfall effects on energy conversion by wind turbine. More precisely it will aim at :

- (i) Getting familiar and implementing the FAST – TurbSim modelling chain developed by the NREL – US (<https://nwtc.nrel.gov/FAST>). These tools enable simulating the behaviour of wind turbines under varying wind conditions. More precisely the FAST model uses wind-inflow data, and accounts for blade behaviour (Blade Element Momentum theory) as well as potential wind turbine controllers. This model already accepts fluctuating wind input generated by TurbSim thanks to the AeroDyn module (<https://nwtc.nrel.gov/AeroDyn>).
- (ii) Identifying the relevant output of the modelling chain for the purpose of the project.
- (iii) Analysing the sensitivity of these outputs to variations of inputs. Multifractal tools will be used for this characterization. Such tools have been widely used to characterize and simulate geophysical fields extremely variable over wide range of scales such as wind and rainfall.
- (iv) Depending on how efficient the intern is, implementation of a provided Multifractal wind simulator will be envisaged.

The intern will be involved in the RW-Turb project and benefit from exchange with the International Advisory Board (notably a NREL experts) and steering committee. If the internship is successful, there is a possibility to continue as a PhD student.

Supervisors : Auguste Gires (HM&Co-ENPC)