

# CFD Studies about Marine propeller (JESSUP Type)



**NICOLAS BAUDIN**  
INTERNSHIPS IN FRANCE INITIATIVE

Name of the hosting institution in France	ENSTA Bretagne
Name of the host laboratory / research team	IRDL (Institut de Recherche Dupuy de Lôme)
Address	IRDL – antenne ENSTA-Bretagne 2 rue François Verny 29806 BREST cedex 9
Web site	<a href="https://irdl.fr">https://irdl.fr</a>
Name of the supervisor	Pierre-Michel GUILCHER
Function	Associate Professor
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## Internship offer

Topic of the internship (title) CFD Studies about Marine propeller (JESSUP Type)

Proposed dates of the internship\* **Start** 2020-10-05 **End** 2021-03-31

\* The supervisors have indicated the dates proposed are flexible and are able to be postponed subject to COVID-19 border closures.

**Scientific and academic objectives of the internship (detailed description of the internship content, work expected from the intern and expected outcomes):**

Dassault Systèmes, within its Marine and Offshore Industry Department, offers you to design the boats of the future. In the context of electrifying a speedboat, you will be asked to determine the characteristics of a JESSUP type propeller (Kt, Kq, J, n) using CFD (Computational Fluid Dynamic) tools based on fluid flow simulation models using the Lattice Boltzman method (XFlow type solution). This work will be carried out with a view to optimizing shape and additive manufacturing (3DPRINTING) on parameterized geometry (topological optimization).

A profile of general mechanical engineers with a specialization in CFD is required. The work will be done jointly with a student engineer in charge of the design of the parametric digital model (CATIA). Knowledge of this type of application will be a plus. The work in progress on the propeller modelling (CATIA 3DEXPERIENCE) and the availability of simulation tools (CFD XFlow) exclusively at Dassault Systèmes means that the internship will be done on the Vélizy (78) France site. Minimum period of 5 months.

Name of industrial partner	Dassault Systèmes
Role of the industrial partner in the internship project	Dassault Systèmes has been working for several years on the subject of marine propellers and their modelling and optimization through the parametric construction of a digital representation and simulation tools. This was done in large part in collaboration with an ENSTA B teacher making reference in the field: Jean-Marc Laurens. Dassault Systèmes and the UoA are also in close contact for the implementation of 3DEXPERIENCE in the Mechanical Engineering department of this school (February 2019). The objective, on the Australian side, is to deploy a teaching based on the concepts of the industry of the future (Industry 4.0) with in particular an RFLP approach, which is native in 3DEXPERIENCE.
Main contact at the French industrial partner	Alain MARIANNE
Email of contact at French industrial partner	Alain.MARIANNE@3ds.com
Main contact at the French industrial partner's branch in Australia	Noemie Neves (Adelaide DS Office)
Email	noemie.neves@3ds.com
Name of the Australian partner institution	University of Adelaide
Name of lab/department/team involved in the collaboration at the Australian partner institution	Faculty of Engineering, Computer & Mathematical Sciences
Main contact in the Australian partner institution	Eric FUSIL
Function of the main contact in the Australian partner institution	Ass. Professor – Director of the Shipbuilding Hub for Integrated Engineering and Local Design
Email address of the main contact in the Australian partner institution	eric.fusil@adelaide.edu.au

Outside of this ongoing collaboration, will applications coming from students of other eligible Australian universities be considered by the hosting institution in France? Yes

## Expected profile of applicant

Level of study	Master, Bachelor with Honours
Discipline	Maritime Engineering, naval architecture
Required qualities, knowledge and skills	Required: Fluid Mechanics, Propeller and Propulsion, Computational Fluid Dynamics (CFD) Desirable: CAD, High Performance Computing (HPC)