NTNU-CSC PhD Scholarship:

Hydrodynamic response of slender structures close to seabed in shallow waters

Type of scholarship: PhD scholarship

Period of the scholarship: 01 October 2022 – 30 September 2026 (up to 4 years)

Short description of the scholarship:

The Dynamic Response of Offshore Pipelines on Seabed (DROPS) project is a Joint Industrial Project driven by Sintef Ocean, where a range of companies both from Norway, Europe and China participate; also the Department of Marine Technology, represented by Prof. Lars Erik Holmedal and Prof. Svein Sævik participate in this project. A topic of particular interest which needs to be further addressed, is hydrodynamic forces and the resulting stability of thin cables through the coastal zone. This is particularly important with respect to transfer of energy from offshore wind turbines through the coastal zone on to land. Since the hydrodynamic forces acting on the cables are induced mainly by the surface waves, a good description of wave propagation over shallow waters over an uneven bottom is required. This will be obtained by using Boussinesq models and, whenever feasible, Higher Order Stokes (HOS) solvers. The resulting forces on the cables will be obtained by numerical simulations using Large Eddy Scale (LES) simulations in conjunction with wall models in order to incorporate the effect of the sand roughness. The successful candidate will be working on both on wave modelling and LES simulations and will profit from the joint knowledge from the Department of Marine Technology and Sintef Ocean within these fields.

The research project will mainly focus on following topics:

- Modelling of wave propagation over shallow waters with uneven bottom
- LES simulations of flow over thin cables near the seabed with focus on hydrodynamic wave-induced forces
- Fluid-structure interaction between flexible cables and the hydrodynamic forcing
Qualification and requirement:

- The PhD-position's main objective is to qualify for work in research positions. The qualification requirement is completion of a master’s degree or second degree (equivalent to 120 credits) with a strong academic background in, e.g. hydrodynamics, computational fluid dynamics or equivalent education with a grade of B or better in terms of NTNU’s grading scale.

- Preferred selection criteria
  - The candidate should have a background, and practical experience, with at least two of following fields:
    - Hydrodynamics
    - Computational fluid dynamics
    - Programming and development of software

In addition, for all applicants the following applies:

- Fluent English language, both written and spoken with certificates of TOEFL minimum 95 or IELTS minimum 6.5
- Chinese citizenship documents (copy of his/her passport or national ID of P.R. China
- CV
- A motivation letter

Deadline for submission of application: 15th Feb 2022

Scholarship: 17000 NOK/month for a period of up to 48 months

According to the NTNU-CSC agreement
CSC will provide a living stipend, currently 12,500 NOK per month for a period of up to forty-eight (48) months, and a round-trip international airfare between China and Norway. NTNU will provide a monthly additional funding for a period of up to forty-eight (48) months, which combined with the CSC living stipend ensures the sufficient income (currently minimum 17,000 NOK per month) required by NTNU. No tuition fees will be charged for PhD candidates at NTNU.
Supervisor info:
Lars Erik Holmedal, Professor
Department of Marine Technology, NTNU
lars.erik.holmedal@ntnu.no
Mobil: +47 92891855

Naiquan Ye, Senior research scientist
Energy and Transport, SINTEF Ocean AS
Naiquan.Ye@sintef.no

Email and contact information for where to send the application:
lars.erik.holmedal@ntnu.no, Lars Erik Holmedal, Professor
Naiquan.Ye@sintef.no, Naiquan Ye, Senior research scientist