3 PhDs in Versatile Hydrodynamics Project

**Faculty/department** Civil Engineering and Geosciences  
**Level** Master degree  
**Maximum employment** 38 hours per week (1 FTE)  
**Duration of contract** 4 years  
**Salary scale** €2222 to €2840 per month gross

**Civil Engineering and Geosciences**  
The Faculty of Civil Engineering and Geosciences of Delft University of Technology (TU Delft) provides leading international research and education, with innovation and sustainability as central themes. Research and education are closely interwoven and address societal challenges. The Faculty consists of the departments of Transport and Planning, Structural Engineering, Geoscience and Engineering, Water Management, Hydraulic Engineering, and Geoscience and Remote Sensing.

The Versatile Hydrodynamics project is a joint project of three faculties of TU Delft, the German Federal Agency for Cartography and Geodesy (BKG, Frankfurt), and Deltares. It aims at the development of tomorrow's marine navigation products. The development of a hydrodynamic model which resolves all relevant 3D physical processes is a key element of the project. This model will be linked to a strong and extended observational network that allows accurate, seamless forecasting of total water depths in the Dutch North Sea. Please check [http://versatile-hydrodynamics.nl](http://versatile-hydrodynamics.nl) for more information.

**Job description**  
The project is organized along three interrelated sub-projects. For each subproject, a PhD candidate is looked for. In subproject P1, we will develop a new technique to transfer heights over large water bodies in order to realise a height system that covers the whole model domain and meets the required accuracy. This realisation serves as the unified height datum to which both observed and modelled water levels will refer. In subproject P2, we will develop a model that resolves the fronts, freshwater lenses, and baroclinic effects, that are characteristic features in the Dutch coastal waters, at high resolution. To validate/calibrate this model, we will use salinity/temperature profiles derived from multibeam echosounding data. In subproject P3, we will develop new and operational techniques to 1) assimilate full water levels (in particular those provided by satellite radar altimeters), and 2) describe the accuracy of the model forecasts. Together with the contributions from P1 and P2, this enables us to build a prototype of the seamless forecasting system for total water depths in the Dutch North Sea. Building and validating this prototype is also part of P3. For more information about the project as a whole and the three subprojects, we refer to [http://versatile-hydrodynamics.nl/](http://versatile-hydrodynamics.nl/).

**Requirements**  
Applicants should have the following qualifications:  
- Ability to cooperate with both scientific and industrial partners;  
- Proven programming skills;  
- Keen interest in data analytics;  
- Good proficiency in spoken and written English.
Specific requirements P1:
- MSc degree in geodesy (preferably);
- Solid background in physical geodesy and probability and estimation theory;
- Knowledge of physical oceanography/experience in numerical flow modelling is beneficial.

Specific requirements P2:
- MSc degree in environmental fluid mechanics/physical oceanography/mathematics;
- Solid background in environmental flows physics;
- Proven experience with numerical modelling.

Specific requirements P3:
- MSc degree in mathematics;
- Knowledge of data assimilation, stochastic processes, probability theory, statistics, and system and control;
- Strong affinity with numerical modelling.

Conditions of employment
The TU Delft offers an attractive, customisable compensation and benefits package, including a discount for health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. An International Children’s Centre offers day care, before- and after-school care and an international primary school. Dual Career Services offers support to accompanying partners. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities.
As a PhD candidate you will be enrolled in the TU Delft Graduate School. The TU Delft Graduate School provides an inspiring research environment; an excellent team of supervisors, academic staff and a mentor; and a Doctoral Education Programme aimed at developing your transferable, discipline-related and research skills. Please visit www.tudelft.nl/phd for more information.

Information and application
For more information about position P1, please contact D. C. Slobbe (D.C.Slobbe@tudelft.nl). For P2, please contact J. D. Pietrzak (J.D.Pietrzak@tudelft.nl) / M. Snellen (M.Snellen@tudelft.nl). For P3, please contact M. Verlaan (M.Verlaan@tudelft.nl). To apply, please e-mail a detailed CV, proof of English language proficiency, the abstract of your MSc thesis (one page), two references, your preferred position, and a letter of motivation in a single PDF file entitled CiTG17.40_Choice Position (P1, P2 or P3)_Lastname.pdf by 26 January 2018 to Recruitment-CiTG@tudelft.nl. When applying for this position, please refer to vacancy number CITG17-40.