Tobias Martin, PhD

Curriculum Vitae

Research interests

Fluid-structure interaction, hydroelasticity, philosophy of nature, ecophilosophy.

Education

01/2021 – 12/2023 **Bachelor of Arts in Philosophy**, *University of Oslo*, Norway, *ECTS-Grade A*
Major in philosophy and minor in environmental humanities.

08/2017 – 07/2021 **Doctoral Research Fellow**, *Department of Civil and Environmental Engineering, Norwegian University of Science and Technology, Trondheim*, Norway
Thesis: A new CFD-based framework for modelling the interaction of open ocean aquaculture structures and complex free surface hydrodynamics (defended 17.06.2021).

10/2014 – 09/2016 **Master of Science in Marine Technology**, *University of Rostock*, Germany, *Grade 1.0 (equals ECTS-Grade A)*
Specialization in numerical hydrodynamics and ocean engineering. Master thesis (30 CP): *Development of a finite volume solver for two-phase incompressible flows using a level set method* (Grade 1.0).

10/2011 – 09/2014 **Bachelor of Science in Mechanical Engineering**, *University of Rostock*, Germany, *Grade 1.4 (equals ECTS-Grade A)*
Specialization in ship technology and ocean engineering. Bachelor thesis (12 CP): *Validation of hybrid turbulence models for free surface flows in ocean engineering* (Grade 1.0).

Academic positions

08/2021 – 02/2022 **Postdoctoral researcher**, *Department of Civil and Environmental Engineering, Norwegian University of Science and Technology, Trondheim*, Norway
KPN project about improving ship emissions in waves. Co-supervision of one PhD student (unofficial).

11/2016 – 04/2017 **Research assistant**, *Chair of Ocean Engineering, University of Rostock, Germany*
Project about the optimisation of the acoustic emission of underwater vehicles.

07/2015 – 09/2016 **Student research assistant**, *Chair of Modelling and Simulation, University of Rostock, Germany*
Implementation of numerical methods for fluid flows in open-source software OpenFOAM.

Academic services

08/2023 **Conference co-organiser**, *University of Oslo, Norway*
Co-organiser of the Lifetimes conference 2023 on time across the socio-natural divide.

01/2023 – 12/2023 **Faculty board member**, *University of Oslo, Norway*
Deputy student representative at the board of the Faculty of Humanities.

06/2019 **Session Co-Chair**, *38th International Conference on Ocean, Offshore & Arctic Engineering (OMAE)*, Glasgow, Scotland, UK
Co-chair in session on fluid-structure interaction within the symposium on CFD & FSI.

2017 – 2022 **Co-supervisor**, *Department of Civil and Environmental Engineering, NTNU, Norway*
Co-supervisor of five Master theses and one project thesis at NTNU.

2017 – 2022 **Lecturer**, *Department of Civil and Environmental Engineering, NTNU, Norway*
Teaching in the courses "Coastal Engineering" (spring semesters) and "Dynamic Response to Irregular Loadings" (fall semesters) for Master students.

12/2016 – 07/2017 **Workshop Organiser**, *University of Rostock, Germany and NTNU, Norway*
Three workshops on the topic of introducing the finite volume methods in OpenFOAM.

Research experience

2018 – 2022 **Proposal Writing**
Contribution to six proposal writings for calls of the NFR, EEA and ERC, at which three were successful (1 KPN, 1 EEA, 1 ERC Consolidator).

2018 – 2022 **Reviewer**
Reviewer for research articles for OMAE conferences, JOMAE, Ocean Engineering, Journal for Marine Science and Engineering, and Journal of Fluids and Structures.

05/2019 – 06/2019 **Visiting researcher**, *Department of Civil Engineering, Aalborg University*, Denmark
Work on high-order Discontinues Galerkin Methods for structural dynamic problems.

Research projects

2023 – 2027 **Particle Resolving Fluid-Sediment Interaction**, *ERC Consolidator*, 2 Mio €
Role: Contribution to proposal writing.

2020 – 2024 **Improving Ship Performance in Real Sea States**, *Research Council of Norway KPN project*, 15 Mio NOK, 1 PhD and 1 PostDoc position. Project partner: SINTEF Ocean
Role: Contribution to proposal writing, 1 year PostDoc position.

2020 – 2023 **Solutions to Current and Future Problems on Natural and Constructed Shorelines, Eastern Baltic Sea**, *Estonia-Norway EEA grant*, 9 Mio NOK, 1 researcher position. Project partner: University of Tallinn
Role: Contribution to proposal writing.

2017 – 2021 **High Resolution Numerical Modelling of Flexible Fish Cage Structures**, *Resarch Council of Norway Havbruk TOPPFORSK project*, 11.9 Mio NOK, 1 PhD, 1 PostDoc and 1 researcher position. Project partners: SINTEF Ocean, IIT Bombay, University of Hannover.
Role: PhD student.

Selected peer-reviewed journal articles

Main author of 11 peer-reviewed journal articles and co-author of 8 peer-reviewed journal articles. In total, 350 citations and h-index 11. A full list can be found on https://www.researchgate.net/profile/Tobias-Martin-5.

2022 **Martin, T. et al.** Modelling Open Ocean Aquaculture Structures using CFD and a Simulation-based Screen Force Model. *Journal of Marine Science and Engineering*, doi: 10.3390/jmse10030332.

2021 **Martin, T. and Bihs, H.** A numerical framework for modelling the dynamics of open ocean aquaculture structures in viscous fluids. *Applied Ocean Research*, doi: 10.1016/j.apor.2020.102410.

2021 **Martin, T. and Bihs, H.** A non-linear implicit approach for modelling the dynamics of porous tensile structures interacting with fluids. *Journal of Fluids and Structures*, Vol. 100, doi: 10.1016/j.jfluidstructs.2020.103168.

2021 **Martin, T. and Bihs, H.** A numerical solution for modelling mooring dynamics, including bending and shearing effects, using a geometrically exact beam model. *Journal of Marine Science and Engineering.* Vol. 9(5), doi:10.3390/jmse9050486.

2020 **Martin, T. et al.** A Lagrangian approach for the coupled simulation of fixed net structures in a Eulerian fluid model. *Journal of Fluids and Structures*, Vol. 94, doi: 10.1016/j.jfluidstructs.2020.102962.

2018 **Martin, T. et al.** Efficient Implementation of a Numerical Model for Flexible Net Systems. *Ocean Engineering*, Vol. 150, p 272-279.

Selected peer-reviewed conference proceedings

Presentation of own research at 9 international conferences on numerical modelling and marine technology including peer-reviewed articles.

2021 **Martin, T. and Bihs, H.** A CFD approach for modelling the fluid-structure interaction of offshore aquaculture cages and waves. *40th International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2021.*

2020 **Martin, T. et al.** Numerical Modelling of the interaction of moving fish nets and fluid. *39th International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2020.*

2019 **Martin, T. et al.** Numerical Modelling of the Interaction between a Fish Net and Fluid using CFD. *8th International Conference on Computational Methods in Marine Engineering, MARINE 2019.*

2018 **Martin, T. et al.** Modelling and Simulation of Moored-floating Structures using the Tension-Element-Method. *37th International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2018.*

Awards and scholarships

11/2016 **"VDI-Studienpreis MV 2016"**, *Mecklenburg-West Pomerania, Germany*
Award granted for high academic record to the best graduate in engineering science 2016.

10/2015 – 09/2016 **"Deutschlandstipendium"**, *University of Rostock, Germany*
Scholarship awarded for high academic record and special personal achievements.

Computer skills

Operating systems: Debian GNU/Linux, MacOS, Windows.

Software: Microsoft Office, Matlab, Latex, Git, Vim, ParaView, REEF3D, OpenFOAM.

Programming: C/C++, Python, HTML, MPI.

Languages

German: Mother-tongue.

English: Very good written and oral skills (PTE Academic 86/90).

Norwegian: Very good written and oral skills (Trinn 3: Grade A).