

Asim Önder, Ph.D.

PERSONAL	Assistant Professor, Department of Marine Environment and Engineering, National Sun Yat-sen University, 70 Lienhai Rd., Kaohsiung 80424, Taiwan, R.O.C. E-mail: asim.onder@mail.nsysu.edu.tw ORCID: https://orcid.org/0000-0003-3367-4119 Google Scholar: https://scholar.google.com/citations?&user=gXIWyU8AAAAJ	
RESEARCH INTERESTS	Coastal and Marine Processes ▷ oceanic boundary layers ◦ air-sea interactions ◦ breaking waves ◦ wave-current interactions ◦ tsunamis Offshore Renewable Energy ▷ offshore wind energy ◦ tidal stream energy ◦ metocean characterization ◦ wind-farm design and control Computational Science ▷ volume of fluid method ◦ data assimilation ◦ machine learning ◦ adaptive methods ◦ high-order methods	
EDUCATION	Ph.D., Mechanical Engineering KU Leuven M.Sc., Computational Science and Engineering Technical University of Munich B.Sc., Mechanical Engineering Istanbul Technical University	Dec 2014 Leuven, Belgium May 2009 Munich, Germany Jun 2006 Istanbul, Turkey
PROFESSIONAL EXPERIENCE	Assistant Professor National Sun Yat-sen University Department of Marine Environment and Engineering Senior Research Fellow National University of Singapore Department of Civil and Environmental Engineering Research Fellow National University of Singapore Department of Civil and Environmental Engineering Postdoctoral Researcher KU Leuven Department of Mechanical Engineering	Aug 2022 – Present Kaohsiung, Taiwan Jan 2022 – July 2022 Singapore Oct 2015 – Dec 2021 Singapore Jan 2015 – Oct 2015 Leuven, Belgium
RESEARCH GRANTS	(Currencies ▷ NT\$: New Taiwan Dollar) <ol style="list-style-type: none">Air-sea interactions in marine surface layers: a fully-coupled approach, NSTC, Taiwan <i>Role:</i> PI <i>Period:</i> 01.03.2023–29.02.2024 <i>Resources:</i> 800.000 NT\$Simulation of Air-Sea Interactions with AI-Accelerated Computational Fluid Dynamics, NSCC, Singapore & Riken, Japan <i>Role:</i> Project representative	

Period: 01.04.2022–31.03.2023

Resources: 315,634 node hours on Fugaku supercomputer (Japan)

PUBLICATIONS **Peer-Reviewed Journal Articles** (Corresponding author*)

1. **Önder, A.***, & Liu, P. L.-F. (2023). Deep learning of interfacial normal and curvature: a symmetry-preserving approach for the volume of fluid method. *Journal of Computational Physics*. 485, 112110. doi: <http://dx.doi.org/10.1016/j.jcp.2023.112110> ([pdf](#))
2. Goit, J. P., & **Önder, A.** (2022). The effect of coastal terrain on nearshore offshore wind farms: a large-eddy simulation study. *Journal of Renewable and Sustainable Energy*. 14(4):043304. doi: <http://dx.doi.org/10.1063/5.0094476> ([pdf](#))
3. **Önder, A.***, & Liu, P. L.-F. (2021). Receptivity and transition in a solitary wave boundary layer over rough bottom topography. *Journal of Fluid Mechanics*. 912, A21. doi: <http://dx.doi.org/10.1017/jfm.2020.1141> ([pdf](#))
4. **Önder, A.***, & Liu, P. L.-F. (2020). Stability of the solitary wave boundary layer subject to finite-amplitude disturbances. *Journal of Fluid Mechanics*. 896, A20. doi: <http://dx.doi.org/10.1017/jfm.2020.351> ([pdf](#))
5. **Önder, A.***, & Yuan J. (2019). Turbulent dynamics of sinusoidal oscillatory flow over a wavy bottom. *Journal of Fluid Mechanics*. 858, 264-314. doi: <http://dx.doi.org/10.1017/jfm.2018.754> ([pdf](#))
6. **Önder, A.***, & Meyers, J. (2018). On the interaction of very-large-scale motions in a neutral atmospheric boundary layer with a row of wind turbines. *Journal of Fluid Mechanics*. 841, 1040-1072. doi: <http://dx.doi.org/10.1017/jfm.2018.86> ([pdf](#))
7. **Önder, A.**, & Meyers, J. (2016). Optimal control of a transitional jet using a continuous adjoint method. *Computers and Fluids*. 126, 12–24. doi: <http://dx.doi.org/10.1016/j.compfluid.2015.11.012> ([pdf](#))
8. **Önder, A.**, & Meyers, J. (2014). Modification of vortex dynamics and transport properties of transitional axisymmetric jets using zero-net-mass-flux actuation. *Physics of Fluids* 26 (7), 075103. doi: <http://dx.doi.org/10.1063/1.4890242> ([pdf](#))

Theses

1. **A. Önder** (2014). Active control of turbulent axisymmetric jets using zero-net-mass-flux actuation. *Ph.D. Dissertation*. ([pdf](#))
2. **A. Önder** (2009). Projection methods using finite elements in fluid mechanics. *Master Thesis*. ([pdf](#))

Newsletter

1. **A. Önder** (2016). Direct numerical Simulation of oscillatory flow over rippled bed using Fourier-spectral/hp element discretization, HPC@NUS Newsletter. ([url](#))

Conferences

1. **Önder, A.** & Liu, P. L.-F. (2023) Turbulence-resolving simulations of bottom boundary layers under tsunamis, *AOGS2023: 20th Annual Meeting of Asia Oceania Geosciences Society*, Singapore
2. **Önder, A.**, & Liu, P. L.-F. (2021). A machine learning approach for the simulation of water waves using volume of fluid method, *43rd Ocean Engineering Conference*, Taoyuan City, Taiwan. ([pdf](#))
3. **Önder, A.**, Liu, P. L.-F., & Tsai W. T. (2020) Generation and breakdown of surface streaks in wind-driven aqueous flow, *22nd Australasian Fluid Mechanics Conference*, Brisbane, Australia (Accepted but withdrawn due to Covid-19). ([pdf](#))
4. Goit J. P., & **Önder A.** (2020) Large-eddy simulation of nearshore offshore wind farms, *22nd Australasian Fluid Mechanics Conference*, Brisbane, Australia. ([pdf](#))
5. **Önder, A.**, & Liu, P. L.-F. (2019). Emergence of streaks and turbulent spots in an unsteady boundary layer beneath a solitary wave, *72nd Annual Meeting of the APS Division of Fluid Dynamics*, Seattle, WA, USA
6. Goit, J.P., **A. Önder** (2019). A simulation framework for upscaling of wind turbine designs, *41st Wind Energy Symposium by Japan Wind Energy Association*, Tokyo, Japan
7. **Önder, A.**, & Meyers, J. (2017). On very-large-scale motions (VLSMs) and long-wavelength patterns in turbine wakes, *70th Annual Meeting of the APS Division of Fluid Dynamics*, Denver, CO, USA
8. **Önder, A.**, & Meyers, J. (2014). Optimal control of turbulent jets using an unsteady adjoint solver, *6th European Conference on Computational Fluid Dynamics (ECFD VI)*. Barcelona, Spain.
9. **Önder, A.**, & Meyers, J. (2013). HPC realization of a controlled turbulent jet using OpenFOAM, *Open Source CFD International Conference 2013*. Hamburg, Germany. ([pdf](#))
10. **Önder, A.**, Wu, P., & Meyers, J. (2012) Improving speed-up and efficiency in simulation of stationary turbulent flows by parallelization of statistical averaging, *9th International ERCOFTAC Symposium on Engineering Turbulence Modeling and Measurements*. Thessaloniki, Greece. ([pdf](#))
11. **Önder, A.**, & Meyers, J. (2012). DNS study of the active control of an axisymmetric jet with zero-net mass-flux (ZNMF) actuators, *the 9th European Fluid Mechanics Conference (EFMC9)*. Rome, Italy.

Invited Talks

1. On bottom drag and turbulence under tsunami-like long waves. *National Cheng Kung University*, Tainan, Taiwan, Jan 2023.
2. Can tsunamis generate turbulence in deep waters? *44th Ocean Engineering Conference*, Kaohsiung, Taiwan, Nov 2022.
3. Turbulent boundary layers beneath tsunami-scale long waves. *The 1st Taiwan Society of Fluid Dynamics Conference*, Hsinchu, Taiwan, Oct 2022.

4. Towards fully resolving the turbulence around wave-induced bedforms using petascale supercomputing, *Supercomputing Frontiers 2017*, Singapore, Mar 2017

TEACHING EXPERIENCE	<p>MAEV240: Engineering Mechanics NSYSU, Dept. Marine Environment and Engineering <i>Level:</i> Undergraduate <i>Type:</i> Required <i>Description:</i> Fundamentals of statics</p> <p>MAEV204: Engineering Mathematics II NSYSU, Dept. Marine Environment and Engineering <i>Level:</i> Undergraduate <i>Type:</i> Required <i>Description:</i> Vector calculus, Fourier analysis</p> <p>MAEV522: Marine System Modelling I NSYSU, Dept. Marine Environment and Engineering <i>Level:</i> Graduate <i>Type:</i> Elective <i>Description:</i> Introductory course to computational modelling of flows in the marine environment</p> <p>MAEV525: Applied Engineering Hydraulics NSYSU, Dept. Marine Environment and Engineering <i>Level:</i> Graduate <i>Type:</i> Elective <i>Description:</i> Fundamental principles of hydraulics, and the design of some basic flow systems</p>
AFFILIATIONS AND SERVICES	<p>Reviewer Journal of Fluid Mechanics, Journal of Computational Physics, Journal of Geophysical Research: Solid Earth, Energies</p> <p>Member American Physical Society, American Geophysical Union, European Geophysical Union</p>
AWARDS	<p>New Faculty Award Aug 2022 National Sun Yat-sen University</p>