

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 ▷ air–sea exchange ◦ wave–current interactions ◦ tsunamis ◦ surf-zone turbulence Offshore Wind Energy ▷ floating offshore wind turbines ◦ metocean engineering ◦ wind–farm design and control Computational Science ▷ machine learning ◦ data assimilation ◦ volume of fluid method ◦ immersed boundary method
EDUCATION	Ph.D., Mechanical Engineering Dec 2014 KU Leuven Leuven, Belgium M.Sc., Computational Science and Engineering May 2009 Technical University of Munich Munich, Germany B.Sc., Mechanical Engineering Jun 2006 Istanbul Technical University Istanbul, Turkey
PROFESSIONAL EXPERIENCE	Assistant Professor Aug 2022 – Present National Sun Yat-sen University (NSYSU) Kaohsiung, Taiwan Department of Marine Environment and Engineering Senior Research Fellow Jan 2022 – July 2022 National University of Singapore Singapore Department of Civil and Environmental Engineering Research Fellow Oct 2015 – Dec 2021 National University of Singapore Singapore Department of Civil and Environmental Engineering Postdoctoral Researcher Jan 2015 – Oct 2015 KU Leuven Leuven, Belgium Department of Mechanical Engineering
RESEARCH GRANTS	(Currencies ▷ NT\$: New Taiwan Dollar) <ol style="list-style-type: none">Exchange Processes in Marine Surface Layers: A Fully-Coupled Approach (II) <i>Agency:</i> NSTC, Taiwan <i>Role:</i> PI <i>Period:</i> 01.08.2024 – 31.07.2027 <i>Grant:</i> 3.322.000 NT\$Air-Sea Interactions in Marine Surface Layers: A Fully-Coupled Approach <i>Agency:</i> NSTC, Taiwan

Role: PI
Period: 01.03.2023 – 29.07.2024
Grant: 800.000 NT\$

3. **Simulation of Air-Sea Interactions with AI-Accelerated Computational Fluid Dynamics**

Agencies: NSCC Singapore & Riken Japan
Role: Project representative
Period: 01.04.2022–31.03.2023
Grant: 315,634 node hours on Fugaku supercomputer (Japan)

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

1. Goit, J. P., & **Önder, A.** (2023). The effect of wind turbine sitting on the power output and flow fields of offshore wind farms. *Journal of Wind Energy, JWEA*. 47:2, 29-35. doi: https://doi.org/10.11333/jwearonbun.47.2_29 ([pdf](#))
2. **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](#))
3. 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>
4. **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>
5. **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](#))
6. **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>
7. **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>
8. **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>
9. **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>

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](#))

TALKS AND SEMINARS

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. “Neural–Network Models for Curvature Estimation in Two-Phase Interfacial Flows”, *2024 TWSIAM Annual Meeting*, Taichung, Taiwan, May 2024
2. “Resolving tsunami turbulence: scientific and computational challenges”, *2023 State Grid HPC/AI User Achievements Exchange Conference*, Tainan, Taiwan, Dec 2023.
3. “On bottom drag and turbulence under tsunami-like long waves”, *National Cheng Kung University*, Tainan, Taiwan, Jan 2023.
4. “Can tsunamis generate turbulence in deep waters?”, *44th Ocean Engineering Conference*, Kaohsiung, Taiwan, Nov 2022.
5. “Turbulent boundary layers beneath tsunami-scale long waves”, *The 1st Taiwan Society of Fluid Dynamics Conference*, Hsinchu, Taiwan, Oct 2022.
6. “Towards fully resolving the turbulence around wave-induced bedforms using petascale supercomputing.” *Supercomputing Frontiers 2017*, Singapore, Mar 2017

TEACHING
EXPERIENCE

MAEV628: Turbulence

NSYSU, Dept. Marine Environment and Engineering

Level: Graduate

Type: Elective

Description: Fundamentals of fluid turbulence

Spring 2024

MAEV204: Engineering Mathematics II

NSYSU, Dept. Marine Environment and Engineering

Level: Undergraduate

Type: Required

Description: Vector calculus, Fourier analysis

Spring 2023, 2024

MAEV522: Marine System Modelling I

NSYSU, Dept. Marine Environment and Engineering

Level: Graduate

Type: Elective

Description: Introductory course to ocean modelling

Fall 2022, 2023

MAEV525: Applied Engineering Hydraulics

NSYSU, Dept. Marine Environment and Engineering

Level: Graduate

Type: Elective

Description: Fundamental principles of hydraulics, and the design of some basic flow systems

Fall 2022, 2023

MAEV240: Engineering Mechanics

NSYSU, Dept. Marine Environment and Engineering

Level: Undergraduate

Type: Required

Description: Fundamentals of statics

Spring 2023

AFFILIATIONS AND SERVICES
Reviewer
Journal of Fluid Mechanics
Journal of Computational Physics
Journal of Geophysical Research: Solid Earth
International Journal of Multiphase Flow

Member
American Physical Society
American Geophysical Union
European Geophysical Union

AWARDS
Excellent Teaching Courses: “Engineering Mechanics” Dec 2023
National Sun Yat-sen University
New Faculty Award Aug 2022
National Sun Yat-sen University