David R. Fuhrman
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Fluid Mechanics, Coastal and Maritime Engineering
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Profile

David R. Fuhrman is Professor of Coastal Dynamics at the Technical University of Denmark (DTU), Department of Mechanical Engineering. His research focuses on many aspects of coastal engineering, including: surf zone and coastal dynamics, sediment transport, coastal morphology, scour, turbulence modelling, wave boundary layers, and nonlinear wave hydrodynamics. He has published approximately 50 peer-reviewed articles in leading international journals on such topics. He presently serves on the Editorial Boards for three leading international journals: (1) ASCE J. Waterways, Port, Coastal and Ocean Engineering; (2) Coastal Engineering; and (3) Applied Ocean Research. His research on turbulence modelling is featured in the latest v1912 release of the popular CFD software OpenFOAM. He is co-author of the textbook: Turbulence in Coastal and Civil Engineering.

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Qualifications

PhD, Mechanical Engineering, Technical University of Denmark, Kgs. Lyngby, Denmark
2001 → 2004

PhD, Mechanical Engineering, Technical University of Denmark
2001 → 2004

MSc, Hydroinformatics, with Distinction, UNESCO-IHE, Delft, The Netherlands
1999 → 2001

MSc, Hydroinformatics, with Distinction, UNESCO-IHE, Delft, The Netherlands
1999 → 2001

BSc, Civil Engineering, Magna Cum Laude, University of Idaho, Moscow, Idaho, USA
1994 → 1999

BSc, Civil Engineering, Magna Cum Laude, University of Idaho, Moscow, Idaho, USA
1994 → 1999

BSc, MSc, PhD

PhD, MSc, BSc

Employment

Professor
Department of Civil and Mechanical Engineering
Technical University of Denmark
Kgs. Lyngby, Denmark
4 Jul 2003 → present

Fluid Mechanics, Coastal and Maritime Engineering
Technical University of Denmark
Kgs. Lyngby, Denmark
25 Aug 2022 → present

1 Jan 2010 → present

Assistant Professor, Technical University of Denmark

1 Jan 2006 → 1 Jan 2010

Postdoc, Technical University of Denmark
1 Jan 2004 → 1 Jan 2006

PhD Student, Technical Univeristy of Denmark
1 Jan 2002 → 1 Jan 2004

Researcher, DHI Water &Environment, Hørsholm, Denmark
1 Jan 2001 → 1 Jan 2001

PhD Student, Technical University of Denmark
1 Jan 2001 → 1 Jan 2002

Research outputs

Microplastic retention in marine vegetation canopies under breaking irregular waves
Kerpen, N. B., Larsen, B. E., Schlurmann, T., Paul, M., Guler, H. G., Goral, K. D., Carstensen, S., Christensen, E. D. & Fuhrman, D. R., 2024, In: Science of the Total Environment. 912, 14 p., 169280.

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Experimental investigation on the nearshore transport of buoyant microplastic particles
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Experimental Study on the Incipient Motion of Microplastic Particles with Different Shapes, Sizes, and Densities on a Live Sediment Bed
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Simulating Breaking Waves with the Reynolds Stress Turbulence Model
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Stabilized RANS simulation of surf zone kinematics and boundary layer processes beneath large-scale plunging waves over a breaker bar
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Computation of nonlinear water waves with a high-order Boussinesq model
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Nonlinear wave-structure interactions with a high-order Boussinesq model
Fuhrman, D. R., Bingham, H. & Madsen, P. A., 2005, In: Coastal Engineering. 52, 8, p. 655-672

Oblique wave interaction with reflective structures by a high-order velocity potential Boussinesq-type model
Jamois, E., Fuhrman, D. R., Bingham, H. & Molin, B., 2005, *20th International Workshop on Water Waves and Floating Bodies.* p. 105-108

Potential dominance of oscillating crescent waves in finite width tanks
Fuhrman, D. R. & Madsen, P. A., 2005, In: Physics of Fluids. 17, 3, p. 038102

Third-order theory for bichromatic bi-directional waves in arbitrary depth
Madsen, P. A. & Fuhrman, D. R., 2005, *In Proc. Inter. Symp. for Topical Problems of Nonlinear Wave Physics, Nonlinear Phenomena in Environmental Research (NWP-3).*

Third-order theory for bi-directional bi-chromatic water waves
Madsen, P. A. & Fuhrman, D. R., 2005, *Proceedings of the International Symposium on Topical Problems of Nonlinear Wave Physics: Nonlinear Phenomena in Environmental Research.* Mareev, E. & Troitskaya, Y. (eds.). Nizhny Novgorod: Russian Academy of Sciences Institute of Applied Physics, p. 73-74

Numerical Solutions of Boussinesq Equations for Fully Nonlinear and Extremely Dispersive Water Waves
Fuhrman, D. R., Oct 2004, Kgs. Lyngby: Technical University of Denmark. 221 p.

A numerical study of crescent waves
Fuhrman, D. R., Madsen, P. A. & Bingham, H., 2004, In: Journal of Fluid Mechanics. 513, p. 309-341

Linear and non-linear stability analysis for finite difference discretizations of high-order Boussinesq equations
Fuhrman, D. R., Bingham, H. B., Madsen, P. A. & Thomsen, P. G., 2004, In: International Journal for Numerical Methods in Fluids. 45, 7, p. 751-773

Nonlinear wave interaction with bottom-mounted structures by a high-order Boussinesq method.
Bingham, H. B., Fuhrman, D. R., Jamois, E. & Kimmoun, O., 2004, *19th International Workshop on Water Waves and Floating Bodies.* p. 9-12

Numerical modeling of nonlinear water waves
Fuhrman, D. R., Madsen, P. A. & Bingham, H., 2004.

Numerical modeling of three-dimensional nonlinear water wave surface patterns
Fuhrman, D. R., Madsen, P. A. & Bingham, H., 2004.

Numerical solutions of fully nonlinear and highly dispersive Boussinesq equations in two horizontal dimensions
Fuhrman, D. R. & Bingham, H., 2004, In: International Journal for Numerical Methods in Fluids. 44, 3, p. 231-256

Preconditioning methods for a high-order Boussinesq water wave model
Fuhrman, D. R. & Bingham, H., 2003.

Data assimilation of local model error forecasts in a deterministic model
Babovic, V. & Fuhrman, D. R., 2002, In: International Journal for Numerical Methods in Fluids. 39, 10, p. 887-918

Data assimilation using local models
Babovic, V. & Fuhrman, D. R., 2002, *Proceedings of the Fifth International Conference on Hydroinformatics.* Cardiff, Whales

Data assimilation and error prediction using local models
Babovic, V. & Fuhrman, D. R., 2001.

Selection of input parameters for a hydrologic runoff model using a neural network
Fuhrman, D. R. & Minns, A. W., 2000, *Proceedings of the Fourth International Conference on Hydroinformatics.*

Activities

Keynote Lecture: Computational fluid dynamics simulation of breaking waves, sediment transport, and coastal morphology utilizing stabilized turbulence closure models
David R. Fuhrman (Guest lecturer)
4 Sept 2020

OpenFOAM Journal (Journal)
David R. Fuhrman (Reviewer)
2020 → 2021

Ocean Dynamics (Journal)
David R. Fuhrman (Reviewer)
2018 → 2020

Coastal Dynamics 2017
David R. Fuhrman (Organizer)
12 Jun 2017 → 16 Jun 2017

Coastal Engineering (Journal)
David R. Fuhrman (Reviewer)
2017 → 2021

Journal of Waterway, Port, Coastal, and Ocean Engineering (Journal)
David R. Fuhrman (Reviewer)
2017 → 2021

Applied Ocean Research (Journal)
David R. Fuhrman (Reviewer)
2015 → 2021

Journal of Offshore Mechanics and Arctic Engineering (Journal)
David R. Fuhrman (Reviewer)

2015 → 2018

Prizes

ASCE Outstanding Reviewer Award - Journal of Waterway, Port, Coastal, and Ocean Engineering
Fuhrman, David R. (Recipient), 2015

Coastal Engineering Journal Citation Award 2021
Larsen, Bjarke Eltard (Recipient), Fuhrman, David R. (Recipient) & Roenby, Johan (Recipient), 2021

Co-author of Web of Science designated Highly Cited Paper
Fuhrman, David R. (Recipient), 2016

DTU Prize for Teaching and Learning
Fuhrman, David R. (Recipient), 2018

Elsevier Outstanding Reviewer Award - Applied Ocean Research
Fuhrman, David R. (Recipient), 2016

Elsevier Outstanding Reviewer Award - Coastal Engineering
Fuhrman, David R. (Recipient), 2016

Elsevier Outstanding Reviewer Award - Ocean Engineering
Fuhrman, David R. (Recipient), 2017

Myhrwold Foundation Special Achievement Award, for outstanding PhD research completed at DTU
Fuhrman, David R. (Recipient), 2006

Nominee, 2018 Teacher of the Year, DTU Student Association
Fuhrman, David R. (Recipient), 2018

Publons Top Reviewer in Engineering
Fuhrman, David R. (Recipient), Sept 2018

Research featured in "Focus on Fluids" article by Journal of Fluid Mechanics
Madsen, Per A. (Recipient) & Fuhrman, David R. (Recipient), 10 Jul 2020

Research featured in official release of DHI's Mike model
Larsen, Bjarke Eltard (Recipient) & Fuhrman, David R. (Recipient), 2022

Research featured in official release of open source CFD toolbox OpenFOAM
Larsen, Bjarke Eltard (Recipient) & Fuhrman, David R. (Recipient), 2019

U.S. Fulbright / Netherland-America Foundation Scholar
Fuhrman, David R. (Recipient), 1999

Press/Media

David Roger Fuhrman explains his Research Project: MPCOAST | The Independent Research Fund Denmark
David R. Fuhrman
17/12/2020
1 Media contribution

New model for turbulence beneath waves can improve coastal protection (article in Danish)
Bjarke Eltard Larsen & David R. Fuhrman
05/02/2020
1 Media contribution

New multiphase turbulence stabilization models in OpenFOAM
Bjarke Eltard Larsen & David R. Fuhrman
23/12/2019
1 Media contribution

Study aims to find out where microplastics accumulate along the Danish coast (article in Danish)
David R. Fuhrman
24/07/2020
1 item of Media coverage

Projects

Advanced CFD computation of breaking wave loads on offshore wind turbine structures
Ghadirian, A., Bredmose, H., Fuhrman, D. R., Haver, S. K. & Ferrant, P.
Samfinansieret - Andet
01/11/2015 → 14/02/2019

ASTARTE: Assessment, STrategy And Risk Reduction for Tsunamis in Europe
Fuhrman, D. R., Sumer, B. M. & Larsen, B. E.
01/11/2013 → 01/11/2016

CFD analyses of flow and scour around a mono-pile with and without scour protection
Mandviwalla, X., Christensen, E. D., Carstensen, S., Fuhrman, D. R., Deigaard, R. & Troch, P.
Samfinansieret - Andet
01/10/2014 → 08/11/2018

Coastal Transport of Microplastic Particles
Göral, K. D., Fuhrman, D. R., Carstensen, S., Christensen, E. D., Larsen, B. E., Faraci, C. L. & KÃ¦rgaard, K.
01/12/2020 → 11/03/2024

Density-driven currents and deposition of fine materials
Saremi, S., Hjelmager Jensen, J., Christensen, E. D., Fuhrman, D. R., Mulder, T. D., Rhee, C. V. & Petersen, O. S.
Institut, samfinansiering
01/05/2011 → 25/08/2014

Detailed analyses of breaking wave dynamics interaction with nearshore and offshore structures
Tomaselli, P., Christensen, E. D., Fuhrman, D. R., Bihs, H. & Troch, P.
Institut, samfinansiering
01/12/2012 → 19/01/2017

Detailed analyses of breaking waves and their interaction with offshore structures in intermediate depth
Qwist, J. R. K., Bihs, H., Christensen, E. D., Carstensen, S., Fuhrman, D. R. & Jacobsen, N. G.
Fonde
01/06/2018 → 14/12/2022

Detailed analyses of flow in large porous structures in the marine environment
Zhai, Y., Christensen, E. D., Carstensen, S., Fuhrman, D. R., Shao, Y., Troch, P. & Zang, J.
15/02/2019 → 31/03/2022

Development of natural seabed forms and their interaction with OWF
Margalit, J., Fuhrman, D. R., Christensen, E. D., Roulund, A. & Holmedal, L. E.
Samfinansieret - Andet
01/07/2014 → 16/04/2018

Dynamics and kinematics of extreme irregular waves
Klahn, M., Onorato, M., Trulsen, K., Bingham, H., Fuhrman, D. R. & Madsen, P. A.
Fonde
15/04/2018 → 08/06/2021

En komplet hydro- og morfodynamisk beskrivelse af revleudvikling
Jacobsen, N. G., Deigaard, R., Fuhrman, D. R., Hjelmager Jensen, J., Sumer, B. M., Christensen, E. D., Foster, D., Roelvink, J. A. & Fredsøe, J.
DTU stipendium
01/10/2007 → 29/06/2011

MPCOAST: MicroPlastic transport processes in the COASTal environment
Fuhrman, D. R., Larsen, B. E., Carstensen, S. & Christensen, E. D.
01/07/2020 → 01/07/2023

Numerical techniques for solving Boussinesq equations for fully nonlinear and extremely dispersive water waves
Fuhrman, D. R., Bingham, H. B., Madsen, P. A., Thomsen, P. G., Nielsen, H. B., Hesthaven, J. & Rasmussen, J. J.
Forskningsrådsfinansiering
01/06/2001 → 27/10/2004

Scour Protection of Offshore Wind Farms
Nielsen, A. W., Sumer, B. M., Christensen, E. D., Fuhrman, D. R., Myrhaug, D., Whitehouse, R. J. S. & Fredsøe, J.
Technical University of Denmark
01/09/2008 → 21/12/2011

SUBSEA: SimUlating Breaking waves and SEdiment trAnsport with stabilized turbulence models
Li, Y. & Fuhrman, D. R.
01/09/2019 → 31/08/2021

SWASH: Simulating WAve Surf-zone Hydrodynamics and sea bed morphology
Fuhrman, D. R. & Larsen, B. E.
01/06/2018 → 30/11/2021

Topology Optimization and Lattice Bolzmann Methods
Nørgaard, S. A., Sigmund, O., Engelbrecht, K., Lazarov, B. S., Fuhrman, D. R., Evgrafov, A. & Stingl, M. W.
Samfinansieret - Andet
01/09/2014 → 01/02/2018

Tsunami-Seabed Interaction
Larsen, B. E., Fuhrman, D. R., Christensen, E. D., Hjelmager Jensen, J., Sumer, B. M., Madsen, P. A., Drønen, N. K. & Rodríguez, M. G.
Samfinansieret - Andet
01/11/2014 → 06/09/2018

Using hydrodynamics to improve the selectivity of towed fishing gears
Burgaard, K. B., Kofoed, J. P., Ong, M. C., O'Neill, B., Carstensen, S. & Fuhrman, D. R.
01/04/2020 → 31/08/2023

Wave interaction with porpous coastal structures
Jensen, B., Christensen, E. D., Sumer, B. M., Fuhrman, D. R., Troch, P. & Allsop, W.
1/3 FUU, 1/3 inst 1/3 Andet

01/12/2010 → 25/08/2014