

Mahdi Abkar

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Research Interests

Computational Fluid Dynamics. Turbulence. Boundary-Layer Meteorology. Large Eddy Simulation. Wind Energy. Uncertainty Quantification. Wind-Farm Modeling, Optimization and Control, Data-driven Modeling.

Employment

Aarhus University, Aarhus, Denmark, December 2020 - Present

Associate Professor, Department of Mechanical and Production Engineering.

Aarhus University, Aarhus, Denmark, July 2017 - November 2020

Tenure-track Assistant Professor in Mechanical Engineering - Department of Engineering.

Center for Turbulence Research (CTR), Stanford University, Stanford, USA, 2015 - 2017

Postdoctoral Fellow in Mechanical Engineering. PI: Profs. Parviz Moin and John Dabiri.

École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, 2014 - 2015

Postdoctoral Fellow in Mechanical Engineering. PI: Prof. Fernando Porté-Agel.

Education

École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, 2010 - 2014

Ph.D. in Mechanical Engineering

Dissertation: Interaction of the atmospheric boundary layer with land-surface heterogeneity and wind turbines: numerical and analytical studies.

Advisor: Prof. Fernando Porté-Agel.

Amirkabir University of Technology (AUT), Tehran, Iran, 2007 - 2010

M.Sc. in Mechanical Engineering

Dissertation: Thermal modeling of turbulent gas-particle flows using statistical models for particle-particle and particle-wall collisions.

Advisor: Prof. Majid Saffar Avval.

Amirkabir University of Technology (AUT), Tehran, Iran, 2003 - 2007

B.Sc. in Mechanical Engineering

Publications

The full list of my publications is available at my Google Scholar page:

<https://scholar.google.dk/citations?user=x5kiBfYAAAAJ&hl=en>

Membership

American Physical Society (APS): Division of Fluid Dynamics (DFD).

American Meteorological Society (AMS).

European Geosciences Union (EGU).

Peer Review

Journal of Fluid Mechanics. Boundary-Layer Meteorology. Wind Energy. Journal of Turbulence. AIAA Journal. Journal of Renewable and Sustainable Energy. Geoscientific Model Development. Journal of Wind Engineering and Industrial Aerodynamics. Journal of Advances in Modeling Earth Systems.

Teaching Experiences and Professional Activities

Aarhus University, Aarhus, Denmark

Lecture: Fluid dynamics and turbulence (M.Sc. and Ph.D.), Fall 2017&2018.

Lecture: Atmospheric boundary layer and wind energy (M.Sc. and Ph.D.), Spring 2018.

Stanford University, Stanford, USA

Guest Lecture: The Atmospheric boundary layer: Fundamental physics and modeling (M.Sc. and Ph.D.), 2016.

Session Chair, APS Division of Fluid Dynamics, Portland OR, US, 2016.

Invited Speaker, "Interaction between thermally stratified atmospheric boundary layers and wind turbines". University of California, Berkeley, 2016.

École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

Guest Lecture: Turbulence closure techniques - Boundary layer meteorology (M.Sc. and Ph.D.), 2013.

Teaching Assistant: Fluid mechanics & Hydrology for engineers (B.Sc.), 2011-2015.

Fellowships, Honors and Awards

Postdoctoral fellowship, Center for Turbulence Research (CTR), Stanford University, 2015.

Early postdoc mobility fellowship, Swiss National Science Foundation (SNSF), 2015.

Best EPFL EDME (Doctoral Program in Mechanics) Thesis Award, 2015.

Awarded member of National Elites Foundation (Society of prominent students of the country), Iran, 2009.

Media Coverage

Distinguished research paper highlighted at "Physics Today" home page, 2015

My research topic on modeling wind farms' influence on weather and climate models is highlighted "Physics Today" home page.

<https://physicstoday.scitation.org/doi/10.1063/PT.3.2740>

Distinguished PhD research highlighted at EPFL home page, 2015

My research topic concerning the effect of atmospheric thermal stability on the performance of wind farms is highlighted at EPFL home page.

<http://actu.epfl.ch/news/wind-farms-perform-best-when-the-sun-is-out/>