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Personal details

Birth year: 1976

Nationality: Dutch

Family status: Married, two children

Track record

Maarten is a Senior Lecturer in Environmental Fluid Mechanics in the Department of Civil and Environmental Engineering at Imperial College London. His interests are in turbulent boundary layers and buoyancy driven flows. Application areas of his work are transport processes in urban areas (urban heat island, dispersion, microclimate), atmospheric convection, building ventilation (stratified environments, plumes/jets, exchange flows), water quality in distribution systems (mass transfer), groundwater flows and oceanography. His approach generally involves using the simulation data to develop conceptual models that capture the dominant flow physics, which often lead to (approximate) analytical solutions. Maarten is part of the multi-institutional EIT funded Blue Green Dream project, leading the urban microclimate modelling. He is a PI on a Royal Society International Exchange project (IE131557) with National Taiwan University to integrate microclimate models with Building Information Models (BIM), the latter rapidly becoming an industry standard due to UK legislation. Maarten is an active member of the EPSRC-sponsored UK turbulence consortium (EP/L000261/1) and is part of the Management Committee of the EPSRC Centre for Doctoral Training in Fluid Dynamics Across Scales at Imperial College London (EP/L016230/1). He was part of the team that was awarded the first Wim Nieuwpoort award for High Performance Computing in 2008 in the Netherlands.

Employment record and education

- 2013 – Senior Lecturer in Environmental Fluid Mechanics
Department of Civil and Environmental Engineering, Imperial College London
- 2007 – 2013: Lecturer in Fluid Mechanics
Department of Civil and Environmental Engineering, Imperial College London
- 2002 – 2007: PhD, Faculty of Applied Physics, Delft University of Technology
Direct simulation and regularization modelling of turbulent thermal convection
- 1999 – 2002: Freely chosen MSc programme in Fluid Mechanics, Faculty of Civil and Environmental Engineering, Delft University of Technology
- 1995 – 1999: BSc in Civil and Environmental Engineering, Faculty of Civil and Environmental Engineering, Delft University of Technology

Awards

1. President's Award for Excellence in Teaching, Imperial College London, 2014
2. Wim Nieuwpoort Award for super-computing for our project "High resolution simulation of turbulent atmospheric boundary layers", December 2010.
3. Bill Morton Prize for Computational Fluid Dynamics, Runner-up 2010
4. PhD student John Craske was awarded several prizes for his PhD work on unsteady turbulent jets and plumes. He was awarded the Lighthill-Thwaites Prize in Applied Mathematics by the Institute of Mathematics and its Applications (IMA), and was runner-up for the prestigious UK Osborne Reynolds Prize in Fluid Mechanics.

Professional activities

1. Keynote Lecture at the ERCOFTaC symposium on Direct and Large-Eddy Simulation in Paphos, Cyprus, May 2015
2. Management and Teaching committee, EPSRC Centre for Doctoral Training in Fluid Dynamics across Scales, Imperial College London
3. Member of the EPSRC UK Turbulence Consortium
4. Session Chair at THMT conference, September 2012
5. Visiting scientist Delft Faculty of Geoscience September 2007-; Tel Aviv University, 2012-; ETH Zurich 2013-, Ecole Normale Lyon 2014-
6. Keynote lecture by co-author (Jonker) on our work on turbulent entrainment across density interfaces, Turbulence Heat and Mass transfer symposium, October 2012
7. Invited lecture at the PRACE supercomputing conference, June 2012
8. Referee for Boundary-Layer Meteorology, Journal of Fluid Mechanics; Flow, Turbulence and Combustion; Computers and Fluids; International Journal of Heat and Fluid Flow.
9. PhD examiner on several occasions. External in Warwick (2013), Southampton (2016).

Publications

25 journal papers and 27 conference contributions to date. Journal papers listed below.

1. SCHMIDT, L. FOUXON, I., KRUG, D., VAN REEUWIJK, M., HOLZNER, M. (2016), Clustering of particles in turbulence due to phoresis, *Phys. Rev. E*. (under review)
2. GUEVARA MOREL, C.R., VAN REEUWIJK, M., GRAF, T. (2015), Systematic investigation of non-Boussinesq effects in variable-density groundwater flow, *J. Contam. Hydr.* (under review)
3. CRASKE, J., VAN REEUWIJK, M. (2015), An energy-based framework for unsteady turbulent plumes, *J. Fluid Mech.* (under review)
4. VAN REEUWIJK, M., CRASKE, J. (2015), Energy-consistent entrainment relations for jets and plumes, *J. Fluid Mech.* **782**, 333-355.
5. CRASKE, J., DEBUGNE, A.L.R., VAN REEUWIJK, M. (2015), Shear-flow dispersion in turbulent jets, *J. Fluid Mech.* **781**, 28-51
6. CRASKE, J., VAN REEUWIJK, M. (2015), Energy dispersion in turbulent jets. Part 1. Direct simulation of steady and unsteady jets, *J. Fluid Mech.* **763**, 500-537
7. CRASKE, J., VAN REEUWIJK, M. (2015). Energy dispersion in turbulent jets. Part 2. A robust model for unsteady jets, *J. Fluid Mech.* **763**, 538-566
8. VAN REEUWIJK, M., HOLZNER, M. (2013) The turbulence boundary of a temporal jet, *J. Fluid Mech.* **739**, 254-275
9. JONKER, H.J.J., VAN REEUWIJK, M., *et al.*, (2013) On the scaling of shear-driven entrainment: a DNS study, *J. Fluid Mech.* **732**, 150-165.
10. SOOKHAK LARI, K., VAN REEUWIJK, M., MAKSIMOVIC, C. (2013) The role of geometry in rough wall turbulent mass transfer, *Heat Mass Tr.* **49**, 1191-1203.
11. CRASKE, J.C. and VAN REEUWIJK, M (2013) Robust and accurate open boundary conditions for incompressible turbulent jets and plumes, *Computers and Fluids* **86**, 284–297.
12. VAN REEUWIJK, M., SOOKHAK LARI, K (2012) Asymptotic solution for turbulent mass transfer augmented by a first order chemical reaction, *Int. J. Heat Mass Tr* **55**, 6485-6490.
13. VAN REEUWIJK, M., SOOKHAK LARI, K. (2012) Asymptotic solutions for turbulent mass transfer at high Schmidt number, *Proc Roy. Soc. A.*, **468**, 1676-1695
14. VAN REEUWIJK, M. (2011), A momentum- and energy-conserving discretisation for shallow water waves, *Comp. Fluids* **46**, 411-416
15. SOOKHAK LARI K., VAN REEUWIJK, M., MAKSIMOVIC, C. (2010), Simplified numerical and analytical approach for solutes in turbulent flow reacting with smooth pipe walls, *J. Hydr. Eng-ASCE* **136**, 626-632
16. SOOKHAK LARI, K., VAN REEUWIJK, M., MAKSIMOVIC, C., SHARIFAN, S. (2010), Combined bulk and wall reactions in turbulent pipe flow: decay coefficients and concentration profiles, *J. Hydroinf.* **13**, 324-333
17. MATHIAS, S.A., TSANG, C-F, VAN REEUWIJK, M. (2010), Investigation of hydromechanical processes during huff-puff testing of a deformable rock fracture, *Int. J. Rock Mech. Mining Sci.* **47**, 517-522

18. VAN REEUWIJK, M., JONKER, H.J.J., HANJALIC, K. (2009) Leray-alpha simulations of turbulent wall-bounded flows, *Int. J. Heat Fluid Flow* **30**, 1044-1053
19. MATHIAS, S.A., VAN REEUWIJK, M (2009), Hydraulic fracture propagation with 3-D leak-off, *Transport Porous Med.* **80**, 499-518
20. VAN REEUWIJK, M, MATHIAS, S.A., SIMMONS, C.T., WARD, J.D. (2009), Insights from a pseudospectral approach to the Elder problem, *Water Resour. Res.* **45**, W04416, 13 pages
21. VAN REEUWIJK, M, JONKER, H.J.J., HANJALIC, K. (2008) Wind and boundary layers in Rayleigh-Bénard convection. II. Boundary layer character and scaling, *Phys. Rev. E* **77**, 036312, 10 pages
22. VAN REEUWIJK, M., JONKER, H.J.J., HANJALIC, K. (2008) Wind and boundary layers in Rayleigh-Bénard convection. I. Analysis and modelling *Phys. Rev. E* **77**, 03611, 15 pages
23. VERDOOLD, J., VAN REEUWIJK, M., TUMMERS, M.J., JONKER, H.J.J., HANJALIC, K. (2008), Spectral analysis of boundary layers in Rayleigh-Bénard convection, *Phys. Rev. E* **77**, 016303, 8 pages
24. VAN REEUWIJK, M, JONKER, H.J.J., HANJALIC, K. (2006), Incompressibility of the Leray-alpha model for wall-bounded flows, *Phys. Fluids* **18**, 018103, 4 pages
25. VAN REEUWIJK, M., JONKER, H.J.J., HANJALIC, K. (2005) Identification of the wind of Rayleigh-Benard convection, *Phys. Fluids* **17**, 051704, 4 pages

PhD supervision

Supervision of seven PhD students, two vacancies. Four completed projects.

Vacancies

1. Vacancy (2016). *Turbulent entrainment in warm clouds*. Co-supervised by Christos Vassilicos;
2. Vacancy (2016). *Particle transport across interfaces*. Primary supervisor Christos Vassilicos;

In progress

3. Owen Jordan (2015). *Turbulent entrainment in stratified fluids*. Co-supervised by Christos Vassilicos;
4. Liliane Bauwerter (2015). *Superhydrophobic surfaces for low-friction water transmission*. Co-supervised by Chris Cheeseman, Michael Templeton;
5. Tom Grylls (2015). *LES of pollution dispersion in urban areas*.
6. Caterina Massidda (2015). *Including the effect of vegetation in urban large-eddy simulation*. Co-supervised by Ana Mijic;
7. Paola Alpresa (2013). *The fluid Mechanics of orbital shakers*. Co-supervised by Peter Weinberg, Spencer Sherwin;
8. Ivo Suter (2013). *Simulating Micro-climates in urban areas with Large-eddy simulation*. Co-supervised by Cedo Maksimovic;
9. Erwan Kasiman (2013). *Nonlinear wave-structure interactions*. Primary supervisor Chris Swan.

Completed

10. John Craske (2011). *Unsteady jets and plumes*.
11. Ajay Shrinivas (2011). *Cooling buildings with underfloor air distribution*. Primary supervisor Gary Hunt (now at Cambridge).
12. Andy Acred (2010). *Design and control of passive ventilation in multi-storey buildings*. Primary supervisor Gary Hunt (now at Cambridge).
13. Kaveh Sookhak Lari (2009). *Mass transfer of solutes in turbulent wall bounded flows reacting with the conduit surface*. Co-supervised by Cedo Maksimovic.

Research Grants since 2012

1. Horizons 2020 project COMPLETE Cloud-MicroPhysics-Turbulence-Telemetry (2015; Co-I). PI: Tordella (Turin). EUR 3.8M total.
2. 2 x PhD project for EPSRC CDT of Sustainable Civil Engineering (2015; PI). £180k
3. PhD project for EPSRC CDT for Fluid Dynamics Across the Scales (2015;PI). £92k
4. EPSRC CDT in Fluid Dynamics across the Scales (2014; Co-I). PI: Vassilicos £4.28M
5. EPSRC UK Turbulence Consortium (2013; CO-I). PI: Sandberg (Southampton) £570k
6. Royal Society International Exchange Grant (2013; PI). £12k
7. PhD project for Climate-KIC (2013; PI). £60k
8. HPC grants. >80M core hours to date on EPRCS/DEISA/PRACE projects, nominal value in excess of £1M.