

Yukie Tanino

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Education

	Massachusetts Institute of Technology	Cambridge, MA
09/2008	Ph.D. in Environmental Fluid Mechanics, Department of Civil and Environmental Engineering.	Cumulative Graduate GPA: 4.9 / 5.0
09/2004	S.M. in Civil and Environmental Engineering, Department of Civil and Environmental Engineering.	
06/2003	B.S. in Environmental Engineering Science, Department of Civil and Environmental Engineering.	Cumulative Undergraduate GPA: 5.0 / 5.0

Professional Experience

08/2018 – present	Senior Lecturer School of Engineering, University of Aberdeen	Scotland, UK
	Leadership and service. Manager, Subsurface Flow and Transport Research Laboratory (01/2015 –). School of Engineering representative, University Research Facilities Working Group (09/2022 –). Member, School of Engineering Research Committee (11/2022 –). Chair, School of Engineering Health & Safety Committee (11/2016 – 04/2026). Senate representative, University Sustainable Development Committee (09/2020 – 09/2022). Elected Member of the Senatus Academicus (10/2018 – 09/2022).	
	Research. Carry out independent research in the area of flow and mass transport under conditions relevant to the subsurface, e.g., soil and petroleum reservoirs. (Co-)supervise postgraduate research students and research staff.	
	Teaching. I currently teach <i>Fluid Mechanics</i> (all 3 rd year undergraduate students except Electrical and Electronics) and <i>Enhanced Oil Recovery</i> (MSc and MEng Petroleum Engineering) and supervise UG and MSc dissertations. Examination of PhD students.	
06/2018 – 06/2021	Adjunct (honorary) Senior Lecturer School of Engineering, Edith Cowan University	West Australia
09/2012 – 07/2018	Lecturer School of Engineering, University of Aberdeen	Scotland, UK
11/2009 – 09/2012	Research associate Qatar Carbonates and Carbon Storage Research Centre (QCCSRC) Imperial College London PI: Martin J Blunt	London, UK
10/2008 – 10/2009	Postdoctoral researcher Laboratoire Fluides, Automatique et Systèmes Thermiques Jean-Pierre Hulin (PI) & Frédéric Moisy	Orsay, France
	Turbulence in stratified shear flows in an inclined tube. Supported by Agence Nationale pour la Recherche grant ANR-07-BLAN-0181.	

Graduate research assistant

MIT

PI: Heidi M. Nepf

- 09/2004 – 08/2008 Turbulence and lateral dispersion of passive solute in arrays of randomly-distributed cylinders. Supported by US National Science Foundation (NSF) grants EAR-0509658, EAR-6895392, and EAR-0309188.
- 06/2003 – 09/2004 Lock-exchange flows through random cylinder arrays. Supported by NSF grant EAR-0309188.

External Memberships, Affiliations, and Service

- Associate Editor, *Water Resources Research*. 1 Jan 2026 – 31 Dec 2029 (2nd term); 06 Sept 2022 – 31 Dec 2025.
- Committee member, [Women in Fluid Dynamics UK Special Interest Group](#) 15 May 2025 – .
- Member, [UK Royal Society International Exchanges Committee](#). 1 Jan 2024 – 31 Dec 2026.
- Mentor, [Women in Fluid Dynamics UK Special Interest Group](#) mentoring scheme, 11 Nov 2025 –
- Member, Local Organizing Committee, [10th International Symposium on Environmental Hydraulics](#), June 2024.
- Topic Editor, [Enabling Energy Transition: CO₂ Geological Storage and Large-Scale Hydrogen Underground Storage](#), *Frontiers in Energy Research*. July 2021 – Aug 2022.
- Lifetime Member, Society of Core Analysts.
- Chapter Affiliate, Society of Petrophysicists and Well Log Analysts (SPWLA).
- Tau Beta Pi Scholar, 2002-03. US national engineering honours society.
- Member, Scottish Carbon Capture & Storage (SCCS).

External Examination

- 2026 to 2030 BEng and MEng Environmental Engineering programme, Department of Engineering, Faculty of Environment, Science and Economy, University of Exeter.
- 2026 PhD, School of Engineering & Physical Sciences, Heriot-Watt University, UK
- 2025 PhD, Imperial College London, UK
- 2024 PhD, Department of Civil Engineering, McMaster University, Canada
- 2024 PhD, School of Engineering & Physical Sciences, Heriot-Watt University, UK
- 2023 PhD, University of New South Wales, Australia
- 2023 PhD, Imperial College London, UK
- 2021 PhD, Robert Gordon University, UK
- 2020 PhD, University of Bergen, Norway
- 2020 PhD, Curtin University, Australia
- 2019 PhD, School of Engineering & Physical Sciences, Heriot-Watt University, UK

External Grants & Funding

- 08/2026 – 01/2030 *Pipeline polymer coating longevity and fate*. Chevron International Exploration and Production Company Ltd. PhD studentship (£64k), Co-I.

01/2026 – 06/2026	<i>Enhancing research culture for women in fluid dynamics at the University of Leeds.</i> University of Leeds Research Culture Targeted Funding 2025/26 (£17224), named in-kind contributor.
11/2024 – 11/2027	<i>Unravelling the formation and impact of the plastisphere in response to environmental stresses in microplastic contaminated soils.</i> UK Natural Environment Research Council (NERC) NE/Z504051/1 (£526150), Co-Lead.
10/2024 - 09/2027	<i>Impact of grain roughness on gas-water-oil flow in hydrophilic porous media.</i> The Higher Committee for Education Development in Iraq. PhD studentship for A Hameed (£90650 excl. monthly stipend paid to student), PI.
10/2022 - 01/2023	<i>Corefloods to test reservoir barrier technology.</i> Aubin Group (£10383), PI.
01/2022 - 03/2022	<i>Complex DNA-based tracers to investigate the transport of microbes in soil.</i> UK Biotechnology and Biological Sciences Research Council (BBSRC) Mitigation Fund (£49.8k), Co-I.
05/2021 – 04/2023	TRAMPAS . European Commission. Individual Fellowship for Nasrollah Sepehrnia (€224.9k), named co-supervisor.
09/2020 – 08/2023	<i>Integrate digital rock physics and big data with AI to optimize oil recovery.</i> China National Offshore Oil Corporation (£160k), Co-I.
03/2019 – 03/2021	<i>Non-planar propagation of hydraulic fracture in transition zone of coal measure strata.</i> Royal Society International Exchanges Cost Share 2018 China (£11.1k), Co-I.
08/2015 – 08/2020	<i>Engineered inversions in reservoir wettability and its impact on oil recovery from fractured reservoirs.</i> COREX (UK) Ltd. PhD studentship (£41.4k), PI.
07/2016 – 09/2019	<i>Oil recovery from fractured reservoirs.</i> Mexican National Council for Science and Technology (CONACyT). PhD studentship for Xanat Zacarias Hernandez (£64.1k).
05/2016 – 04/2018	<i>Dynamic, in-situ imaging of capillary imbibition in rock using simultaneous neutron and X-ray computed tomography.</i> UK Engineering and Physical Sciences Research Council EP/N021665/1 (£20.6k), PI.
12/2016 – 09/2017	<i>Modelling the deep biosphere over deep geological time at the Nankai Trough, Japan.</i> NERC NE/P015182/1 (£35.4k), Co-I.
10/2014 - 03/2016	<i>Dynamic pore-scale imaging of capillary imbibition in mixed-wet porous media using lab-on-a-chip methods.</i> Royal Society Research Grant RG140009 (£15k), PI.
07/2014 – 08/2015	<i>Neutron tomography: a novel approach for investigating the dynamics of oil recovery by capillary imbibition.</i> Carnegie Trust for the Universities of Scotland Research Grant ref. 31813 (£2.5k), PI.

Internal (University of Aberdeen) Grants & Funding

08/2022 – 09/2022	<i>On the factors that determine plastic transport in rivers.</i> EU Brexit Mitigation Fund (£3263). Co-I.
10/2015 – 09/2018	<i>Pore-scale imaging of two-phase flow: Linking in-situ contact angles to bulk properties.</i> 36-month PhD scholarship (est. £48.6k). School of Engineering. Co-I.
10/2015 – 09/2018	<i>Impact of wettability on two-phase flow in geological porous media: linking macroscopic properties to pore-scale fluid distribution.</i> 36-month PhD scholarship (est. £48.6k). School of Geosciences. PI.
09/2015 – 08/2016	<i>Fate and transport of particulate organic matter during waterflood.</i> 36-month PhD scholarship (est. £48.6k). School of Geosciences. Co-I.
2013 – 2016	<i>Impact of wettability on two-phase flow phenomena relevant to enhanced oil recovery and geological CO₂ storage.</i> 36-month PhD studentship (est. £52k). College of Physical Sciences. PI.

Awards & Honours

2006 – 2007	MIT Martin Family Society of Fellows for Sustainability (US\$26844.50)
2003 – 2004	MIT Presidential Graduate Fellowship (US\$48660)
2003	The Richard Lee Russel Award (departmental award for outstanding undergraduate academic achievement)
2002 – 2003	Tau Beta Pi Scholarship (one of 39 awarded by the national engineering honour society for outstanding scholarship, US\$2000)

Other Qualifications

07/2021	National Examination Board in Occupational Safety and Health (NEBOSH) <i>HSE Introduction to Incident Investigation</i> Award
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Postgraduate Research Students Supervised to Completion

2026	Ciprian-Teodor Panaitescu. <i>Combining Digital Rock Technology, Artificial Intelligence, and Core-scale Experiments to Investigate Flow in Fractured Porous Media</i> , PhD in Petroleum Engineering. Conferred 26 March.
2023	Kazeem A Odunlami. <i>Impact of Grain Roughness on Liquid Permeability of Packed Columns of Glass Spheres</i> , MSc by Research in Engineering. Conferred 24 Oct.
2020	Girvani Manoharan. <i>Characterisation of Propagation of Fractures in Rocks using X-ray and Neutron Imaging</i> , PhD in Engineering. Conferred 25 Aug.
2020	Iton Whiteley Iton. <i>Adsorption process of Carbon Dioxide and Nitrogen Gas in Shale</i> , MSc by Research in Engineering. Conferred 30 June.
2020	Anelechi Ibekwe. <i>Impact of Grain Roughness on Porous Media Flow: a Pore-Scale Investigation</i> , PhD in Engineering. Conferred 19 Mar.
2020	Olalekan O. Ajayi. <i>Impact of Grain Roughness and Oil Viscosity on Porous Media Flow: a Microfluidic Study</i> , MSc by Research with Distinction. Conferred 20 Feb.
2018	Magali Christensen. <i>Impact of Wettability on Two-Phase Flow in Oil/Water/Carbonate Rock Systems</i> , PhD in Engineering. Conferred 30 Oct.
2018	Dhelda R Mfanga. <i>Impact of Drilling Fluids on the Geomechanical Stability of Wellbores</i> , PhD in Petroleum Engineering. Conferred 15 Oct.

Invited Seminars, Lectures, and Panels

05/2025	Institute for Multiscale Thermofluids, University of Edinburgh.
09/2024	Korean Institute of Construction Technology, Korea.
09/2024	Department of Civil and Environmental Engineering, Seoul National University.
09/2024	Department of Civil and Environmental Engineering, Yonsei University, Seoul.
03/2024	University of Strathclyde and Japan Society for the Promotion of Science (JSPS) London , invited panel speaker
08/2022	University of Birmingham.
04/2022	Institute for Multiscale Thermofluids, University of Edinburgh.
03/2022	Society of Petroleum Engineers Student Chapter, University of Aberdeen.
10/2021	Department of Civil and Environmental Engineering, Seoul National University.
10/2019	College of Petroleum Engineering, China University of Petroleum - Beijing.

02/2019	Research Centre for Carbon Solutions (RCCS), Heriot Watt University, Edinburgh.
07/2014	Neutron Physics Group, National Institute of Standards and Technology, Gaithersburg MD, USA.
03/2014	The Petroleum Institute, Abu Dhabi.
01/2013	Porous Media-Processes and Mathematics Research Network kick-off meeting, International Centre for Mathematical Sciences, Edinburgh.
01/2013	Department of Petroleum Engineering, University of Stavanger.
04/2012	Division of Civil Engineering, University of Dundee.
10/2010	Petroleum and Process Technology Research Group, Department of Physics and Technology, University of Bergen.
06/2010	School of Engineering, University of Warwick.
02/2010	Hydrodynamics Laboratory, Ecole Polytechnique, France.
01/2008	Department of Civil & Environmental Engineering, Cornell University, USA.

Selected Publications

Invited book chapters

2023	Y. Tanino , D. Pokrajac. Immiscible Fluids . In: <i>Encyclopedia of Soils in the Environment</i> , 2 nd ed. Section Eds: P. Hallett, D. Or. Elsevier.
2012	Y. Tanino . Flow and mass transport in vegetated surface waters. In: <i>Fluid Mechanics of Environmental Interfaces</i> . Eds: C. Gualtieri, D. T. Mihailovic. Taylor & Francis.
2012	Y. Tanino . Water exchange between littoral zone and open lake water. In: <i>Encyclopedia of Lakes and Reservoirs</i> . Eds: L. Bengtsson, R. W. Herschy, R. W. Fairbridge. Springer.

Peer-reviewed journals (* denotes corresponding author; + denotes joint first author)

2026	N. Sepehrnia*, B. Azimzadeh, L. Charlton, H. Barrio-Zhang, P. D. Hallett, C. Gubry-Rangin, Y. Tanino , G. McHale, C. E. Martínez. Soil-plastisphere interfacial properties enable decoding microplastics behaviour in the environment. <i>Communications Earth & Environment</i> , doi: 10.1038/s43247-026-03916-y .
2025	M. Sarlak*, A. J. McCue, Y. Tanino *. Laboratory data on the interfacial tension, viscosity, and density of two naphthenic acids in n-hexadecane at varying temperature and concentrations. <i>Data in Brief</i> , doi: 10.1016/j.dib.2025.111322 .
2025	M. Sarlak*, J. Reed, S. Law, A. J. McCue, Y. Tanino . Water and oil volume measurement using UV-visible spectroscopy. <i>Transport in Porous Media</i> , doi: 10.1007/s11242-024-02140-6 .
2025	F. Zhao*, Y. Tanino , J. Guo, R. He, J. Ren, J. Zeng, W. Chen, L. Huang. Bed strength in sheared beds of mono- and bi-disperse particles: dependence on geometrical and mechanical properties of constituent particles. <i>Powder Technology</i> , doi: 10.1016/j.powtec.2024.120286 .
2024	N. Sepehrnia*, C. Gubry-Rangin, Y. Tanino , P. D. Hallett. Microplastics alter soil structural stability as quantified by high-energy moisture characteristics. <i>Journal of Hazardous Materials</i> , doi: 10.1016/j.jhazmat.2024.134940 .
2024	M. Sarlak*, K. Jarrahan, A. J. McCue, J. A. Anderson, Y. Tanino . Adsorption of organic acids in oil on crushed marble at varying temperatures and ambient pressure. <i>Colloids & Surfaces A</i> , doi: 10.1016/j.colsurfa.2024.133231 .
2021	A. Syed, Y. Tanino , J. M. LaManna, D. L. Jacobson, D. S. Hussey, E. Baltic, G. Burca. A portable triaxial cell for beamline imaging of rocks under triaxial state of stress. <i>Measurement Science & Technology</i> , doi: 10.1088/1361-6501/abeb94 .

- 2020 **Y. Tanino***, A. Ibekwe, D. Pokrajac. Impact of grain roughness on residual non-wetting phase cluster size distribution in packed columns of uniform spheres. *Physical Review E*, doi: [10.1103/PhysRevE.102.013109](https://doi.org/10.1103/PhysRevE.102.013109).
- 2020 A. Ibekwe, D. Pokrajac*, **Y. Tanino**. Automated extraction of in situ contact angles from micro-computed tomography images of porous media. *Computers & Geosciences*, doi: [10.1016/j.cageo.2020.104425](https://doi.org/10.1016/j.cageo.2020.104425).
- 2019 A. Ibekwe, **Y. Tanino***, D. Pokrajac. A low-cost, non-hazardous protocol for surface texturing of glass particles. *Tribology Letters*, doi: [10.1007/s11249-019-1230-3](https://doi.org/10.1007/s11249-019-1230-3).
- 2019 **Y. Tanino***, A. Syed. Enhanced oil recovery by polymer flooding: direct, low-cost visualization of in a Hele-Shaw cells. *Education Sciences*, doi: [10.3390/educsci9030186](https://doi.org/10.3390/educsci9030186)
- 2019 X. Zacarias-Hernandez, M. Christensen, **Y. Tanino***, O. O. Ajayi. Laboratory measurements of viscosity, density, and bulk contact angle on marble and soda lime glass for three naphthenic acid + *n*-decane solutions. *Data in Brief*, doi: [10.1016/j.dib.2019.103988](https://doi.org/10.1016/j.dib.2019.103988).
- 2019 **Y. Tanino***, M. Christensen. Imbibition capillary pressure and relative permeability of mixed-wet limestone and their dependence on contact angle. *Transport in Porous Media*, doi: [10.1007/s11242-019-01280-4](https://doi.org/10.1007/s11242-019-01280-4).
- 2018 **Y. Tanino***, X. Zacarias-Hernandez, M. Christensen. Oil/water displacement in microfluidic packed beds under weakly water-wetting conditions: competition between precursor film flow and piston-like displacement. *Experiments in Fluids* 59(2): 35.
- 2017 M. Christensen, **Y. Tanino***. Enhanced permeability due to apparent oil/brine slippage in limestone and its dependence on wettability. *Geophysical Research Letters* 44: [6116-6123](https://doi.org/10.1029/2016GL071233).
- 2017 M. Christensen, **Y. Tanino***. Waterflood oil recovery from mixed-wet limestone: dependence upon the contact angle. *Energy & Fuels* 31(2): [1529-1535](https://doi.org/10.1021/acs.energyfuels.6b01535).
- 2016 S. A. Bowden, **Y. Tanino***, B. Akamairo, M. Christensen. Recreating mineralogical petrographic heterogeneity within microfluidic chips: assembly, examples, and applications. *Lab-on-a-Chip* 16, doi: [10.1039/C6LC01209D](https://doi.org/10.1039/C6LC01209D).
- 2015 **Y. Tanino***, F. Moisy, J.-P. Hulin. Lock-exchange flows in inclined pipes: the relevance of the Prandtl mixing length model. *Journal of Turbulence* 16(5): [484-502](https://doi.org/10.1080/10717862.2015.1061502).
- 2013 **Y. Tanino***, M. J. Blunt. Laboratory investigation of capillary trapping under mixed-wet conditions. *Water Resources Research* 49(7), doi: [10.1002/wrcr.20344](https://doi.org/10.1002/wrcr.20344).
- 2012 **Y. Tanino***, M. J. Blunt. Capillary trapping in sandstones and carbonates: dependence on pore structure. *Water Resources Research* 48 [W08525](https://doi.org/10.1029/2011WR015255).
- 2012 **Y. Tanino***, F. Moisy, J.-P. Hulin. Laminar-turbulent cycles in inclined lock-exchange flows. *Physical Review E* 85(6), doi: [10.1103/PhysRevE.85.066308](https://doi.org/10.1103/PhysRevE.85.066308).
- 2009 **Y. Tanino***, H. M. Nepf. Closure to “Laboratory investigation of mean drag in a random array of rigid, emergent cylinders.” *Journal of Hydraulic Engineering* 135(8).
- 2009 **Y. Tanino***, H. M. Nepf. Laboratory investigation of lateral dispersion within dense arrays of randomly distributed cylinders at transitional Reynolds number. *Physics of Fluids* 21(4).
- 2008 **Y. Tanino***, H. M. Nepf. Lateral dispersion in random cylinder arrays at high Reynolds number. *Journal of Fluid Mechanics* 600.
- 2008 **Y. Tanino***, H. M. Nepf. Laboratory investigation of mean drag in a random array of rigid, emergent cylinders. *Journal of Hydraulic Engineering* 134(1).
- 2005 **Y. Tanino***, H. M. Nepf, P. S. Kulis. Gravity currents in aquatic canopies. *Water Resources Research* 41(12) W12402.