

Yukie Tanino

School of Engineering
University of Aberdeen
AB24 3UE
Scotland, United Kingdom

Phone: +44 (0)1224 27 4514
ytanino@abdn.ac.uk
<http://www.abdn.ac.uk/engineering/people/profiles/ytanino>
ORCID: [0000-0002-5766-0515](https://orcid.org/0000-0002-5766-0515)

Education

09/2008	Massachusetts Institute of Technology Ph.D. in Environmental Fluid Mechanics, Department of Civil and Environmental Engineering. Cumulative Graduate GPA: 4.9 / 5.0	Cambridge, MA
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
	Admin. 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-). Manager, Subsurface Flow and Transport Research Laboratory (01/2015-). 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 multiphase porous media flows with focus on application to groundwater remediation, microplastics-contaminated soil, and enhanced oil recovery. (Co-)supervise postgraduate research students and research staff.	
	Teaching & learning support. I currently teach <i>Enhanced Oil Recovery</i> (MSc and MEng Petroleum Engineering) and <i>Fluid Mechanics</i> (all undergraduate 3 rd year students except Electrical and Electronics) and supervise UG and MSc projects. Internal and external examiner of PhD students at UK and overseas institutions.	
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 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 Grants & Funding

10/2022 - 01/2023 *Corefloods to test reservoir barrier technology.* Aubin Group (£10383), PI.

01/2022 - 03/2022 *Complex DNA-based tracers to investigate the transport of microbes in soil.* 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 *Integrate digital rock physics and big data with AI to optimize oil recovery.* China National Offshore Oil Corporation (£160k), Co-I.

03/2019 – 03/2021 *Non-planar propagation of hydraulic fracture in transition zone of coal measure strata.* Royal Society International Exchanges Cost Share 2018 China (£11.1k), Co-I.

08/2015 – 08/2020 *Engineered inversions in reservoir wettability and its impact on oil recovery from fractured reservoirs.* COREX (UK) Ltd. PhD studentship (£41.4k), PI.

07/2016 – 09/2019 *Oil recovery from fractured reservoirs.* Mexican National Council for Science and Technology (CONACyT). PhD studentship for Xanat Zacarias Hernandez (£64.1k).

05/2016 – 04/2018 *Dynamic, in-situ imaging of capillary imbibition in rock using simultaneous neutron and X-ray computed tomography.* Engineering and Physical Sciences Research Council EP/N021665/1 (£20.6k), PI.

12/2016 – 09/2017 *Modelling the deep biosphere over deep geological time at the Nankai Trough, Japan.* NERC NE/P015182/1 (£35.4k), Co-I.

10/2014 - 03/2016 *Dynamic pore-scale imaging of capillary imbibition in mixed-wet porous media using lab-on-a-chip methods.* Royal Society Research Grant RG140009 (£15k), PI.

07/2014 – 08/2015 *Neutron tomography: a novel approach for investigating the dynamics of oil recovery by capillary imbibition.* Carnegie Trust for the Universities of Scotland Research Grant ref. 31813 (£2.5k), PI.

Internal Grants & Funding

08/2022 – 09/2022 *On the factors that determine plastic transport in rivers.* EU Brexit Mitigation Fund (£3263). University of Aberdeen. Co-I.

10/2015 – 09/2018 *Pore-scale imaging of two-phase flow: Linking in-situ contact angles to bulk properties.* 36-month PhD scholarship (est. £48.6k). School of Engineering, University of Aberdeen. Co-I.

10/2015 – 09/2018 *Impact of wettability on two-phase flow in geological porous media: linking macroscopic properties to pore-scale fluid distribution.* 36-month PhD scholarship (est. £48.6k). School of Geosciences, University of Aberdeen. PI.

- 09/2015 – 08/2016 *Fate and transport of particulate organic matter during waterflood.* 36-month PhD scholarship (est. £48.6k). School of Geosciences, University of Aberdeen. Co-I.
- 2013 – 2016 *Impact of wettability on two-phase flow phenomena relevant to enhanced oil recovery and geological CO₂ storage.* 36-month PhD studentship (est. £52k). College of Physical Sciences, University of Aberdeen. 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) *HSE Introduction to Incident Investigation Award*

External Examination

- 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

Postgraduate research students supervised to completion

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

External Memberships and Affiliations

- Member, [UK Royal Society International Exchanges Committee](#). 1 Jan 2024 – 31 Dec 2026.
- Associate Editor, *Water Resources Research*. 06 Sept 2022 – 31 Dec 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).

Invited Seminars, Lectures, and Panels

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

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

- 2024 M. Sarlak*, A. J. McCue, Y. Tanino*. Data from laboratory measurements of interfacial tension, viscosity, and density of two naphthenic acids in n-hexadecane at varying temperature and concentrations. *Data in Brief*, under review.

- 2024 M. Sarlak*, J. Reed, S. Law, A. J. McCue, **Y. Tanino**. Water and oil volume measurement using UV-visible spectroscopy. *Transport in Porous Media*, under review.
- 2024 F. Zhao*, **Y. Tanino**, J. Guo, J. Ren. Bed strength in sheared beds of mono- and bi-disperse particles: dependence on geometrical and mechanical properties of constituent particles. *Powder Technology*, under review.
- 2024 N. Sepehrnia*, C. Gubry-Rangin, **Y. Tanino**, P. D. Hallett. Microplastics alter soil structural stability as quantified by high-energy moisture characteristics. *Journal of Hazardous Materials*, doi: [10.1016/j.jhazmat.2024.134940](https://doi.org/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. *Colloids & Surfaces A*, doi: [10.1016/j.colsurfa.2024.133231](https://doi.org/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. *Measurement Science & Technology*, doi: [10.1088/1361-6501/abeb94](https://doi.org/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. 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.
- 2017 M. Christensen, **Y. Tanino***. Waterflood oil recovery from mixed-wet limestone: dependence upon the contact angle. *Energy & Fuels* 31(2): 1529-1535.
- 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: 4677-4681.
- 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.
- 2013 **Y. Tanino***, M. J. Blunt. Laboratory investigation of capillary trapping under mixed-wet conditions. *Water Resources Research* 49(7), doi: [10.1002/wrcr.20344s](https://doi.org/10.1002/wrcr.20344s).
- 2012 **Y. Tanino***, M. J. Blunt. Capillary trapping in sandstones and carbonates: dependence on pore structure. *Water Resources Research* 48 W08525.

- 2012 **Y. Tanino***, F. Moisy, J.-P. Hulin. Laminar-turbulent cycles in inclined lock-exchange flows. *Physical Review E* 85(6).
- 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.

Invited book chapters

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

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