


## Catherine Spurin

Postdoctoral researcher at Stanford University

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British 

## Academic Employment

Stanford University

August 2021 – present

- Postdoctoral researcher as part of the GeoCquest project, a collaboration between Stanford, Cambridge and Melbourne universities
- Exploring reservoir engineering strategies to increase pore scale utilisation and accelerate trapping

Imperial College London

2015 – 2021

- Completed an 8-week research placement modelling tsunami wave inundation (2015).
- Graduate Teaching Assistant

Massachusetts Institute of Technology

June – August 2016

- Undertook an 8-week research placement having received a bursary from Imperial College.
- Research explored the formation of gravity driven fingers in porous, homogeneous, saturated media.

## Education

Imperial College London

2017 – 2021

- PhD researcher. Funding obtained from the President's PhD scholarship award.
- Research focus is the study of intermittent flow pathways during steady-state two-phase flow using laboratory-based X-ray micro-CT imaging and synchrotron imaging.
- Principal investigator for a synchrotron campaign at the Swiss Light Source.

Imperial College London

2013 – 2017

- 1<sup>st</sup> class MSci in Geophysics. Engineering Dean's list for all 4 years.
- MSci thesis– analysing the development of gravity fingers observed in laboratory experiments during vertical infiltration of the wetting phase into a porous medium. Highest MSci mark in my year.

Nonsuch High School for Girls

2006 – 2013

- A-Levels – Mathematics (A\*), Further Mathematics (A\*), Physics (A\*) and Geography (A).
- GCSEs – 8 A\*'s, 4 A's and 1 C including English Language, Spanish and French.

## Teaching & Supervising Experience

- Graduate Teaching Assistant (2017 – 2021) at Imperial College London for the undergraduate modules Maths Methods, Impact Cratering and the BSc dissertation project. Ran example sessions teaching the application of the skills learned during lectures and co-supervised the students as they conducted their research project.
- Hosted a high school student for 2 weeks (2018 and 2019) as part of the In2ScienceUK programme (a programme designed to progress young people from low income backgrounds to degrees and careers in STEM subjects). Organised activities to learn about science and provided support for university applications.
- Undergraduate Teaching Assistant (2016-2017) at Imperial College London for Maths Methods.

## **Additional Employment**

Isometric

June 2023

- Consultant for carbon sequestration

Delonex Energy (UK) Limited

July 2015

- 2-week internship with oil exploration company modelling gravity observations using Oasis Montaj.
- Proposed a model for sediments thick enough to potentially mature oil source rocks which crop out in the area. Delonex subsequently farmed-into this asset and encountered good oil shows.

Everyone Active – Cheam, Westcroft and Acton Leisure Centres

2013 – 2017

- Swim Teacher for government supported swim lessons and schools.
- Built confidence leading large groups, having taught non-swimmer classes with up to 12 children.

Atkins Global

July 2012

- 2-week work experience placement using CAD and STAR-CCM+ to model air flow in the 2012 Olympic ping-pong arena. Coding skills learnt purely from online resources.

## **Scholarships, Awards & Funding Secured**

- Imperial College President's PhD Scholarship - £120,000 (2017-2021).
- Swiss Light Source beam time awarded (principal investigator) – approx. €80,000 for 10 x 8hr beamtime shifts (June 2019).
- Ernest Edward Glorney Scholarship for excellence in 4<sup>th</sup> year undergraduate study - £2,000 (2017).
- Funding from Imperial's Exploration Board for 2 different expeditions - £2,200 (2016 and 2017).
- Centurion's Trust Award for extra-curricular activities at Imperial College London - £750 (2016).
- Imperial's International Research Opportunity Bursary for research at MIT - £4,000 (2016).
- Undergraduate Research Opportunity Bursary for research at Imperial College - £1,600 (2015).
- Award from the British Geophysical Association for being the best performing student in the Morocco geophysics field course - £100 (2015).
- Winner of the Jack Petchey Achievement Award for inspiring participation in sport - £200 (2012).

## **Conference Presentations & Invited Talks**

- Gordon Research Seminar on Flow and Transport in Permeable Media, July 2022, Switzerland – poster presentation
- Interpore, September 2021, online – oral presentation
- Interpore, September 2020, online – oral presentation
- Invited talk for the Geology Research Seminars, February 2020, Ghent University, Ghent, Belgium
- AGU Fall Meeting, December 2019, San Francisco, USA – poster presentation
- UKCCRC early career researcher led webinar, October 2019, recorded in Edinburgh, UK – invited speaker
- Interpore, May 2019, Valencia, Spain – oral presentation and chair of a session
- SPE talk, April 2019, London, UK – invited speaker
- Gordon Research Seminar on Flow and Transport in Permeable Media, July 2018, Newry, USA – poster presentation
- IEAGHG summer school for carbon capture and storage, June 2018, Trondheim, Norway – poster presentation

## Publications

- **Spurin, C.**, Bultreys, T., Bijeljic, B., Blunt, M.J. and Krevor, S., 2019. Mechanisms controlling fluid breakup and reconnection during two-phase flow in porous media. *Physical Review E*, 100(4), p.043115.
- **Spurin, C.**, Bultreys, T., Bijeljic, B., Blunt, M.J. and Krevor, S., 2019. Intermittent fluid connectivity during two-phase flow in a heterogeneous carbonate rock. *Physical Review E*, 100(4), p.043103.
- Rücker, M., Bartels, W.B., Bultreys, T., Boone, M., Singh, K., Garfi, G., Scanziani, A., **Spurin, C.**, Yesufu-Rufai, S., Krevor, S. and Blunt, M.J., 2020. Workflow for Upscaling Wettability from the Nanoscale to Core Scale. *Petrophysics*, 61(02), pp.189-205.
- Scanziani, A., Alhosani, A., Lin, Q., **Spurin, C.**, Garfi, G., Blunt, M.J. and Bijeljic, B., 2020. In Situ Characterization of Three-Phase Flow in Mixed-Wet Porous Media Using Synchrotron Imaging. *Water Resources Research*, 56(9), p.e2020WR027873.
- **Spurin, C.**, Bultreys, T., Rücker, M., Garfi, G., Schlepütz, C.M., Novak, V., Berg, S., Blunt, M.J. and Krevor, S., 2020. Real-time imaging reveals distinct pore scale dynamics during transient and equilibrium subsurface multiphase flow. *Water Resources Research*, 56(12), p.e2020WR028287.
- **Spurin, C.**, Bultreys, T., Rücker, M., Garfi, G., Schlepütz, C.M., Novak, V., Berg, S., Blunt, M.J. and Krevor, S., 2021. The development of intermittent multiphase fluid flow pathways through a porous rock. *Advances in Water Resources*, 150, p.103868.
- Ekanem, E.M., Rücker, M., Yesufu-Rufai, S., **Spurin, C.**, Ooi, N., Georgiadis, A., Berg, S. and Luckham, P.F., 2021. Novel adsorption mechanisms identified for polymer retention in carbonate rocks. *JCIS Open*, p.100026.
- Garfi, G., John, C.M., Rücker, M., Lin, Q., **Spurin, C.**, Berg, S. and Krevor, S., 2022. Determination of the spatial distribution of wetting in the pore networks of rocks. *Journal of Colloid and Interface Science*, 613, pp.786-795.
- **Spurin, C.**, Rücker, M., Moura, M., Bultreys, T., Garfi, G., Berg, S., Blunt, M.J. and Krevor, S., 2022. Red Noise in Steady-State Multiphase Flow in Porous Media. *Water Resources Research*, 58(7), p.e2022WR031947.
- **Spurin, C.**, Berg, S., Armstrong, R. and McClure, J., 2022. Dynamic Mode Decomposition for Analyzing Dynamics in Multi-phase Flow in Porous Media. *Advances in Water Resources*, 175, p.104423.
- Wang, S., **Spurin, C.**, Bultreys, T., 2023. Pore-scale Imaging of Multiphase Flow Fluctuations in Continuum-Scale Samples. *Water Resources Research*, 59(6), p.e2023WR034720.

## Extra-Curricular Activities

- Was the first person to run the length of Estonia. Also represent Imperial College at Cross-Country and am a keen long-distance runner, having completed multiple marathons and ultra-marathons.
- Was the Geophysics Society Vice President for 2 years (2014-2016) and helped arrange talks, social events and the first Geophysics Society Tour, which was to Mt. Etna.
- On the committee for the Porous Media Tea Time Talks, a YouTube channel promoting Early Career Researchers and encouraging collaboration between different institutions for research in porous media.