Thomas G. J. Chandler

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Profile

I am a Van Vleck Visiting Assistant Professor researching Applied Mathematics at the University of Wisconsin–Madison. I specialize in the application of asymptotics to physically-inspired mathematical problems. My research interests cover a wide range of physical mathematics, including fluid dynamics, solid mechanics, and mathematical geophysics. More generally, I am fascinated by the mathematics behind observable phenomena, both small day-to-day principles and large scale challenges in which a mathematical approach is needed.

Academic Positions

2021–24 **Van Vleck Visiting Assistant Professor — Department of Mathematics, University of Wisconsin–Madison, WI, USA**

Postdoctoral research position in the Department of Mathematics, specializing in liquid crystals interacting with soft matter, advised by Prof. Saverio Spagnolie[†].

Teaching: *Math 322 (Spring 2022), Math 320! (Fall 2021).*

Education

2017–21 **DPhil Mathematics — Mathematical Institute, University of Oxford, UK**

Doctor of Philosophy degree specializing in the mechanics of thin elastic materials and the interaction with soft matter, supervised by Prof. Dominic Vella[‡] (OCIAM).

Thesis: *'Mathematical Models of Two-Dimensional Sheets and Foundations'*
Broadening Courses: *Statistical Mechanics, Soft Matter, Scientific Computing for DPhil Students I & II, and Theories of Deep Learning.*

2013–17 **MMath Mathematics — Lincoln College, University of Oxford, UK**

Fourth Year (MMath) — 1st Class Honours (85.3%)

Dissertation: *'Complex singularities near the intersection of a free-surface and a rigid wall'* supervised by Dr Philippe Trinh[§] (90%, Gibbs Dissertation Prize).
Courses: *Applied Complex Variables, Perturbation Methods, Solid Mechanics, Mathematical Geoscience, Elasticity & Plasticity, and Topics in Fluid Mechanics.*

Third Year (BA) — 1st Class Honours (82%)

Extended Essay: *'Jets, waterfalls and splashes from angled slots'* supervised by Dr Philippe Trinh[§] (82%).

2008–13 **Freman College, Buntingford, Hertfordshire, UK**

A-Level (2013): Mathematics (A*), Further Mathematics (A*), Physics (A).
AS-Level (2012): Chemistry (A), STEP I & II.

Academic Awards

2020 **DSOFT Student Travel Award — APS March Meeting 2020**
An APS Division of Soft Matter travel grant, awarded for a high quality of work.

2019 **Teaching Award — Mathematical Institute, University of Oxford**
Awarded in recognition of outstanding feedback received from students.

2017–21 **EPSRC Doctoral Grant — Mathematical Institute, University of Oxford**
A fully funded Doctoral Training Grant for a three and a half year period.

2017 **Gibbs Dissertation Prize — Mathematical Institute, University of Oxford**
Awarded for the best 4th year MMath dissertation (achieved grade: 90%).

[†]Department of Mathematics, University of Wisconsin–Madison. [‡]Mathematical Institute, University of Oxford.
[§]Department of Mathematical Sciences, University of Bath.

2017 **Stansbie Prize — Lincoln College, University of Oxford**
Awarded for the best performance across all science Final Honours Schools.

2016–17 **Lord Crewe Scholarship — Lincoln College, University of Oxford**
Awarded on tutors' and advisers' recommendations for outstanding work.

2015–16 **College Scholarship — Lincoln College, University of Oxford**
Awarded for academic achievement and exceptional promise.

2013–16 **Collection Prize — Lincoln College, University of Oxford**
Awarded on eight occasions for performance in college examinations.

Publications

2021 **Chandler, T. G. J.**, 2021. Mathematical models of two-dimensional sheets and foundations. [PhD thesis]. University of Oxford. ora.ox.ac.uk/objects/uuid:b2368224-dc2d-4240-8b21-db5c9e370198.

2020 **Chandler, T. G. J.** & Vella, D., 2020. Validity of Winkler's mattress model for thin elastomeric layers: Beyond Poisson's ratio. *Proc. R. Soc. A* **476**, 20200551. doi:10.1098/rspa.2020.055.

2020 **Chandler, T. G. J.** & Vella, D., 2020. Indentation of suspended two-dimensional solids: The signatures of geometrical and material nonlinearity. *J. Mech. Phys. Solids* **144**, 104109. doi:10.1016/j.jmps.2020.104109.

2018 **Chandler, T. G. J.** & Trinh, P. H., 2018. Complex singularities near the intersection of a free surface and wall. Part 1. Vertical jets and rising bubbles. *J. Fluid Mech.* **856**, 323–350. doi:10.1017/jfm.2018.708.

In prep. **Chandler, T. G. J.** & Trinh, P. H., 20–. Complex singularities near the intersection of a free surface and wall. Part 2. Angled jets. (*In preparation.*)

Presentations

Mar. 2022 **American Physical Society, March Meeting — Chicago, IL**
Oral presentation: *'Morpho-mechanics of pressurized cellular sheets: From moss leaves to soft robotics.'*

Nov. 2021 **American Physical Society, Division of Fluid Dynamics — Phoenix, AZ**
Oral presentation: *'The interaction of thin elastomeric substrates with viscous flows: From elastohydrodynamic sedimentation to Hele-Shaw flow.'*

Mar. 2020 **American Physical Society, March Meeting — Denver, CO**
Oral presentation: *'The interaction of elastomeric coatings with viscous flows: How incompressible is PDMS?'* (Performed virtually due to COVID-19.)

Apr. 2019 **British Applied Mathematics Colloquium — University of Bath, UK**
Oral presentation: *'Indentation tests of two-dimensional materials: separating non-linear material behaviour from experimental error.'*

May. 2018 **Junior Applied Mathematics Seminar — University of Oxford, UK**
Oral presentation: *'Complex singularities near the intersection of a free-surface and a rigid wall.'*

Apr. 2016 **British Applied Mathematics Colloquium — University of Oxford, UK**
Poster presentation: *'Jet flows from angled nozzles.'*

Teaching Experience

2022 **MATH 322 Instructor — Department of Mathematics, UW–Madison**
A first course in partial differential equations and applied mathematics techniques.

2021 **MATH 320(!) Instructor — Department of Mathematics, UW–Madison**
Honors course introducing differential equations and linear algebra.

2020 **Topics in Fluid Mechanics Class Tutor — Mathematical Institute, Oxford**
MMath Part C course covering current fluid problems in industry and geoscience.

2019–20 **Elasticity and Plasticity Class Tutor — Mathematical Institute, Oxford**
MMath Part C course covering various introductory problems in linear elasticity.

2018 **Solid Mechanics Class T.A. — Mathematical Institute, Oxford**
MMath Part C course covering an introduction to nonlinear solid mechanics.

2018 **Elasticity and Plasticity Class T.A. — Mathematical Institute, Oxford**
MMath Part C course covering various introductory problems in linear elasticity.

2017–19 **Topics in Fluid Mechanics Class T.A. — Mathematical Institute, Oxford**
MMath Part C course covering current fluid problems in industry and geoscience.

2013–15 **Schools Plus Mathematics Tutor — The Oxford Academy, Oxford**
Voluntary A-level and GCSE maths tutor with the Schools Plus program.

Other Experience and Skills

2017–19 **Undergraduate Admissions Interviewer — Lincoln College, Oxford**
For the past three years, I have been interviewing potential Mathematics Undergraduates for Lincoln College, University of Oxford.

Jul.–Sept. 2016 **Summer Project — Mathematical Institute, University of Oxford**
Funded by InFoMM, University of Oxford, I worked with Dr Philippe Trinh[§] to further my 3rd year project on the singularity structure of 'Jet Flows from Angled Nozzles'.

2014–15 & 2017–18 **Treasurer of Oxford University Judo Club**
Along with being a keen participating member, I was twice elected treasurer of OUJC.

Proficient in: Mathematica, MATLAB, LaTeX, Python, Microsoft Office, and Adobe Creative Suite.