

Fenner Stanley Tanswell

Areas of Specialisation: Philosophy of Mathematics & Logic, Epistemology, Logic, Mathematics Education

Areas of Competence: Philosophy of Science, Experimental Philosophy, Environmental Philosophy

EMPLOYMENT

- 2023-present Wissenschaftlicher Mitarbeiter (Habilitation Track, 5 years)
Technische Universität Berlin
- 2021-2023 Researcher
Centre for Logic and Philosophy of Science, Vrije Universiteit Brussel
- 2018-2021 Lecturer in Mathematics Education (tenured)
Mathematics Education Centre, Loughborough University
- 2017-2018 Associate Lecturer
Arché Research Centre, Department of Philosophy, University of St Andrews
- 2016-2017 Postdoctoral Researcher
Department of Computer Science, University of Oxford
Project: The Social Machines of Mathematics, led by Prof. Ursula Martin CBE
Research Member of the Common Room, Wolfson College, University of Oxford

EDUCATION

- 2013-2016 PhD in Philosophy, St Andrews/Stirling Joint Programme
Arché Research Centre, University of St Andrews; University of Stirling
Thesis: "Proofs, Rigour and Informality: A Virtue Account of Mathematical Knowledge"
Supervisors: Dr Aaron Cotnoir & Dr Patrick Greenough
- Autumn 2014 Visiting PhD Student, Philosophy Department & UConn Logic Group
University of Connecticut, CT, USA
Supervisor: Prof Jc Beall
- 2010-2012 Master of Science in Logic
Institute for Logic, Language and Computation, Universiteit van Amsterdam
- 2006-2010 Master of Arts (Hons) First Class in Mathematics and Philosophy
University of St Andrews

PEER-REVIEWED PUBLICATIONS

- Tanswell, F. S. (Forthcoming) *Mathematical Rigour*, Cambridge Elements in Philosophy of Mathematics, Cambridge University Press. <https://www.cambridge.org/core/elements/abs/mathematical-rigour-and-informal-proof/EB935628D089C970D6C49B88BA5AF13D>
- Tanswell, F. S. (Forthcoming) "The Concept of Extinction: Epistemology, Responsibility, and Precaution", *Ethics, Policy & Environment*. <https://www.tandfonline.com/doi/full/10.1080/21550085.2022.2133937>
- Tanswell, F. S., & Inglis, M. (Forthcoming) "The Language of Proofs: A Philosophical Corpus Linguistics Study of Instructions and Imperatives in Mathematical Texts", in Sriraman, B. (ed.) *The Handbook of the History and Philosophy of Mathematical Practice*, Springer. https://link.springer.com/referenceworkentry/10.1007/978-3-030-19071-2_50-1
- Tanswell, F., Davies, B., Jones, I., & Kinnear, G. (2023). Comparative judgement for experimental philosophy: A method for assessing ordinary meaning in vehicles in the park cases. *Philosophical Psychology*, pp. 1-21.
- Sa, R., Alcock, L., Inglis, M., & Tanswell, F. S. (2023). Do mathematicians agree about mathematical beauty? *Review of Philosophy and Psychology*, 1-27. <https://link.springer.com/article/10.1007/s13164-022-00669-3>
- Habgood-Coote, J., & Tanswell, F. S. (2023) "Group Knowledge and Mathematical Collaboration: A Philosophical Examination of the Classification of Finite Simple Groups", *Episteme*. <https://doi.org/10.1017/epi.2021.26>
- Sangwin, C., & Tanswell, F. S. (2023) "Developing new picture proofs that the sums of the first odd integers are squares", *Mathematical Gazette* 107(569), pp. 249-262. <https://doi.org/10.1017/mag.2023.56>
- Weber, K., & Tanswell, F. S. (2022) "Instructions and Recipes in Mathematical Proofs", *Educational Studies in Mathematics* 111, pp. 73-87.
- Tanswell, F. S., & Kidd, I. J. (2021) "Mathematical Practice and Epistemic Virtue and Vice", *Synthese* 199, pp. 407-426. <https://link.springer.com/article/10.1007%2Fs11229-020-02664-6>
- Pease, A.; Martin, U.; Tanswell, F. S.; & Aberdein, A. (2020) "Using Crowd-Sourced Maths to Understand Mathematical Practice", *ZDM Mathematics Education* 52, pp. 1087-1098. <https://link.springer.com/article/10.1007/s11858-020-01181-7>
- Tanswell, F. S., & Rittberg, C. (2020) "Epistemic Injustice in Mathematics Education", *ZDM Mathematics Education* 52, pp. 1199-1210. <https://link.springer.com/article/10.1007/s11858-020-01174-6>
- Rittberg, C.; Tanswell, F. S.; & Van Bendegem, J. P. (2020) "Epistemic Injustice in Mathematics", *Synthese* 197, pp. 3875-3904. <https://link.springer.com/article/10.1007/s11229-018-01981-1>
- Lane, L.; Martin, U.; Murray-Rust, D.; Pease, A.; & Tanswell, F. S. (2019) "Journeys in Mathematical Landscapes: Genius or Craft?", in Gila Hanna, David Reid, and Michael de Villiers (eds.) *Proof technology: Implications for teaching*, Springer, pp. 197-212. https://link.springer.com/chapter/10.1007/978-3-030-28483-1_9
- Tanswell, F. S. (2018) "Conceptual Engineering for Mathematical Concepts", *Inquiry: An Interdisciplinary Journal of Philosophy* 61, pp. 881-913. <https://www.tandfonline.com/doi/abs/10.1080/0020174X.2017.1385526>
- Tanswell, F. S. (2016) "Saving Proof from Paradox: Gödel's Paradox and the Inconsistency of Informal Mathematics" in Andreas, H. & Verdée, P. (eds.) *Logical Studies of Paraconsistent Reasoning in Science and Mathematics*, *Trends in Logic* 45, Springer International Publishing. https://link.springer.com/chapter/10.1007/978-3-319-40220-8_11

Tanswell, F. S. (2015) "A Problem with the Dependence of Informal Proofs on Formal Proofs" *Philosophia Mathematica*, 23 (3), pp. 295-310. <https://academic.oup.com/philmat/article/23/3/295/1450007>

FURTHER WORK

Tanswell, F. S. (Under Review) "Bare statistical evidence and responsible statistics".

Aberdein, A.; Tanswell, F. S.; & Rittberg, C. J. (2021) "Virtue theory of mathematical practices: an introduction". *Synthese* 199, pp. 10167-10180.

Tanswell, F. S. (Under Review) "Go Forth and Multiply! On Actions and Imperatives in Mathematical Proofs", for a volume on the works of Jody Azzouni, edited by Otávio Bueno and Josh Brown.

Tanswell, F. S. (2020) Book Review of *99 Variations on a proof* by Philip Ordning. *British Journal for the History of Mathematics* 35, pp. 173-175.

<https://www.tandfonline.com/doi/full/10.1080/26375451.2020.1735618>

Tanswell, F. S. (2020) Book Review of *A Concise History of Mathematics* by John Stillwell. *Metascience* 29, pp. 519-521. <https://link.springer.com/article/10.1007/s11016-020-00547-7>

Tanswell, F. S. (2017) "Playing with LEGO and Proving Theorems", in Cook, R. T. & Bacharach, S. (eds.) *LEGO and Philosophy: Constructing Reality Brick by Brick*, Oxford: Wiley Blackwell, pp. 217-226.

Tanswell, F. S. (2016) *Proofs, Rigour, and Informality: A Virtue Account of Mathematical Knowledge*. PhD Thesis. University of St Andrews & University of Stirling Joint Programme. <https://research-repository.st-andrews.ac.uk/handle/10023/10249>

TEACHING

TU Berlin

Winter 2023 Logik II (Undergrad/Masters Lecture Course)

Environmental Philosophy (Undergrad/Masters Seminar)

Summer 2023 Logik I (Intro to Logic, Integrated Lecture Course)

Philosophy of Mathematics (Undergrad/Masters Lecture course)

Loughborough University (Lecturer in Mathematics Education)

Autumn 2018, *Core Mathematics 1*. (First year mathematics for electrical engineering students)

2019, & 2020.

Autumn 2019 *Methods, Philosophy and Frontiers of Physical Science*. Guest lecturer. (Philosophy of Science for first year Physics students)

St Andrews (Associate Lecturer)

Spring 2018 *Philosophy of Logic* (Mlitt. Graduate Philosophy course)

Reasoning (First year introduction to logic and argumentation)

Advanced Logic (Final year undergraduate course).

Autumn 2017 *Intermediate Logic* (Second year formal and philosophical logic course)

Oxford (Postdoctoral Researcher)

Summer 2017 *Philosophy of Mathematics*. (Tutorial course, one-on-one)

Spring 2017 *Elements of Deductive Logic*. (First year course on formal logic)

St Andrews (PhD student)

Spring 2016 *Honours Prize Seminar: "Knowing How and Mathematical Proof"*.

2013-16 PhD Tutor for modules on: *Meaning and Knowing; Intermediate Logic; Reasoning and Knowledge; Modern Philosophy from Descartes to Kant; Formal and Philosophical Logic*.

PHD SUPERVISION

2019- present Tuya Sa, "What is Mathematical Beauty? An experimental philosophical investigation into mathematicians' aesthetic judgements.". Submitted Dec 2023.

2020-present Safdar Shah, "Formal and Informal Proving in Mathematics Education".

REVIEWED AND INVITED TALKS

27.11.23 "The Epistemology of Mathematical Proofs", Research Seminar, *Max Planck Institute for the History of Science*, Berlin, November 2023.

"The Philosophical Implications of Using LLMs in Mathematics", Oxford Philosophy of Maths Seminar, *University of Oxford*, Oxford, UK, October 2023.

"Comparative Judgement for Experimental Philosophy: Assessing Ordinary Meaning in 'Vehicles in the Park' Cases", *3rd European Experimental Philosophy Conference*, University of Zurich, Zurich, Switzerland, September 2023.

"Proof Identity, Essential Ideas, and Translations Between Algebra and Diagram", *Maths Education Meets the Philosophy of Mathematical Practice Workshop*, Loughborough University, Loughborough, UK, June 2023.

"Different Conceptual Models of Informal Proofs and Mathematical Rigour", *Logic & Epistemology Seminar*, Ruhr-Universität Bochum, May 2022.

"Interesting and Important Mathematics: A Corpus Study", *Text-Driven Approaches to Philosophy of Mathematics*, online, August 2021.

"The Concept of Extinction", *International Society for Environmental Ethics*, online, June 2021.

"Epistemic Injustice in Mathematics Education", *Cultures and Practices of Mathematics*, online, June 2021.

"Rigour and Formalisation", *Formalise! World Logic Day 2021*, online, January 2021.

"Actions and Imperatives in Mathematical Texts", *Topics in Philosophy of Mathematical Practice*, online, August 2020. Joint work with Matthew Inglis.

"Open Texture, Ambiguity and Underdetermination for Mathematical Concepts", *Indeterminacy and Underdetermination*, University College Dublin, January 2020.

"Proofs as Recipes, Journeys, Craft and Story: Comparing Metaphors for Mathematics", *Narrative Science Workshop*, London School of Economics, September 2019.

"Actions and Imperatives in Mathematical Texts", *Symposium on Text-Based Approaches to Mathematics*, CLMPST, Prague, August 2019. Joint work with Matthew Inglis.

"Group Knowledge and Mathematical Collaboration", *Arché 20th Anniversary Conference*, St Andrews, June 2019. Joint talk with Josh Habgood-Coote.

“Group Knowledge and Mathematical Collaboration”, *Big Proof*, International Centre for Mathematical Science, Edinburgh, May 2019.

“Group Knowledge and Mathematical Collaboration”, *Mathematical Collaboration III*, Bristol, April 2019.

“Group Knowledge and Mathematical Collaboration”, invited talk at the VUB, Brussels, April 2019.

“The Social Dimension of Mathematics”, *London Mathematical Society Good Practice Workshop*, International Centre for Mathematical Science, Edinburgh, April 2019.

“Go Forth and Multiply! Imperatives and Actions in Mathematics”, invited talk at ETH Zurich, December 2018.

“Conceptual Engineering for Mathematical Concepts”, invited talk at the *ConceptLab*, Oslo, April 2018.

“Go Forth and Multiply! Imperatives and Actions in Mathematics”, *Symposium on “Group Knowledge and Mathematical Collaboration”* which I also coordinated, *European Congress of Analytic Philosophy*, LMU Munich, August 2017.

“Proofs Gone Wrong: Epistemic Injustice in Mathematics” (joint with Colin J. Rittberg, VUB), *Symposium on Mathematical Reasoning, European Congress of Analytic Philosophy*, LMU Munich, August 2017.

“Go Forth and Multiply! Imperatives and Actions in Mathematics”, invited talk and participation at the *Big Proof* programme, Isaac Newton Institute, Cambridge, July 2017.

“Imperatives and Action in Mathematical Proving”, *Masterclass in Philosophy of Mathematical Practice*, Brussels, May 2017.

“The Epistemic Significance of Proving”, invited talk at the *North American Meeting of the Association for Symbolic Logic*, Boise State University, Idaho, March 2017.

“Conceptual Engineering for Mathematical Concepts”, *27th Novembertagung on the History of Mathematics*, Sonderborg, Denmark, Nov 2016.

“Mathematical Values and Set Theoretic Pluralism” (joint with Colin J. Rittberg, VUB). A three-part lecture series applying philosophy of mathematical practice and virtue epistemology to set-theoretic pluralism. *Set Theoretic Pluralism Symposium I*, University of Aberdeen, July 2016.

“Mathematical Virtues and the Practice of Proving”, invited talk at the VUB, Brussels, May 2016.

“Proof, Rigour and Mathematical Virtues”, *Third Meeting of the Association of the Philosophy of Mathematical Practice*, Paris, Nov 2015.

“Proof in Mathematics and the Open Texture of Mathematical Concepts”, *Cultures of Mathematics IV*, New Delhi, India, Mar 2015. Awarded a €250 travel award by the International Association for Science and Cultural Diversity.

“Saving Proof from Paradox: Gödel's Paradox and the Inconsistency of Informal Mathematics”, *Cambridge Graduate Conference in Logic and Philosophy of Mathematics 2015*, Cambridge, Jan 2015.

“Informal Proof and Mathematical Know-How”, *Uconn Logic Group*, UConn, CT, USA, Oct 2014.

“A Problem with the Dependence of Informal Proofs on Formal Proofs”, *Uconn Logic Group*, UConn, CT, USA, Sep 2014.

“Saving Proof from Paradox: Gödel's Paradox and the Inconsistency of Informal Mathematics”, *Paraconsistent Reasoning in Science and Mathematics*, LMU München, Munich, Germany, Jun 2014.

“The Troll under the Derivationist Bridge”, *Deductive Mathematical Cognition and Philosophy*, University of Bristol, Apr 2014.

“Eliminating Diagrams and Formalising Proofs”, *Workshop on Beauty and Explanation in Mathematics*, Umeå, Sweden, Mar 2014.

CONFERENCE ORGANISATION

(Currently Organising) *Equity in Peer Review*, at the International Centre for Mathematical Sciences, Edinburgh, May 2022.

Mathematical Collaboration IV (autumn online seminar) 2021, online.
<https://mathscollaboration.wordpress.com/mathematical-collaboration-4-autumn-2021-online-seminar/>

Scientific Committee for *Mathematical Cultures and Practices XI*, re-scheduled for July 2021, University of St Andrews, Scotland. <http://staff.computing.dundee.ac.uk/alisonpease/MathCultPracXI/calls.html>

Mathematics Education Centre Annual Symposium, Loughborough, May 2019.
<https://www.lboro.ac.uk/departments/mec/events/2019/mec-annual-symposium/symposium-2019-details/>

Mathematical Collaboration III, Bristol, April 2019.
<https://mathscollaboration.wordpress.com/mathematical-collaboration-iii/>

Virtue Epistemology of Mathematical Practice, Vrije Universiteit Brussel, July 2018.
<https://clps.research.vub.be/en/virtue-epistemology-of-mathematical-practice-0>

Group Knowledge and Mathematical Collaboration II, a joint St Andrews-Oxford event in April 2018.
<https://www.st-andrews.ac.uk/arche/event/group-knowledge-and-mathematical-collaboration-workshop-ii/>

Enabling Mathematical Cultures, Oxford, December 2017, to celebrate the completion of the *Social Machine of Mathematics* project. <https://enablingmaths.wordpress.com/>

Group Knowledge and Mathematical Collaboration, Oxford, April 2017.
<https://mathscollaboration.wordpress.com/>

8th Annual Arché Graduate Conference, St Andrews, 8 & 9 Nov 2014.
<https://philevents.org/event/show/14629>

SERVICE & OTHER ROLES

Internal examiner for the PhD thesis of Benjamin Davies on “Proof Comprehension and Comparative Judgment”, December 2019.

Editor for the *Synthese* topical collection “Virtue Theory and Mathematical Practice”.
https://link.springer.com/journal/11229/topicalCollection/AC_ba33b34e5f2eb634d7680e778c25ccab/

Referee for: *Philosophia Mathematica*, *Axiomathes*, *Philosophia*, *ZDM*, *Inquiry*, *Erkenntnis*, *Synthese*, *Philosophy and Technology*, *Logique et Analyse*, *Review of Symbolic Logic*, the *Logic Journal of the IGPL*, *International Journal of Mathematical Education in Science and Technology*, the *Australasian Journal of Logic*, *Kriterion*, and *Cognition*.

Member of the *Association for the Philosophy of Mathematical Practice*.

AWARDS & FUNDING

2020	£12,000 for <i>Equity and Peer Review</i> event (ICMS Edinburgh)
2018	£2,500 for <i>Mathematical Collaboration III</i> (University of Edinburgh).
2017	£1,000 grant for <i>Mathematical Collaboration II</i> (Scots Philosophical Association).
2013-16	£30,000 Caroline Elder Scholarship. £8,100 SASP Home/EU scholarship.
2016	£300 Honours Prize Seminar Award (jointly with Joshua Habgood-Coote) Awarded based on a proposal annually by the St Andrews Philosophy Department in order to run a 4 th year undergraduate module on our research topics. The course was entitled “Knowledge How and Mathematical Proof”.
2014	£1,800 Arché Travel Award to visit the University of Connecticut for three months.
2014	£3,500 Funding for Arché graduate conference (Scots Philosophical Association, Mind Association, Aristotelian Society, Analysis, CAPOD innovation Grant).

- 2014 Shortlist for the Students' Association Tutoring Award 2014.
In the top four for a university-wide tutoring prize, nominated by the students.
- 2010 Medal (Mathematics BSc fourth level), University of St Andrews.
Awarded to one graduating student each year for top academic performance in fourth year Mathematics.
- Summer 2009 £1,800 Undergraduate Research Internship Programme, University of St Andrews
Project: "Frege, Dedekind and the Foundations of Arithmetic" (supervised by Prof Peter Clark).
- 2010 & 2008 Deans' List, University of St Andrews.
Awarded to students who average 16.5 (distinction) in all modules across the academic year.