

Silvia De Toffoli

Curriculum Vitae

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Philosophy Department,

Princeton University

208 Marx Hall, Princeton, NJ 08540

Areas of Specialization: Philosophy of Mathematics, Epistemology

Areas of Competence: Philosophy of Science, Logic, Nietzsche, Philosophy and Literature

Employment

2019–22 Princeton University, Philosophy Department, Postdoctoral Research Associate and Lecturer

Education

2019 **PhD in Philosophy, Stanford University**

Dissertation: *Epistemic Roles of Mathematical Diagrams*

Committee: Thomas Ryckman (advisor), Marcus Giaquinto, Michael Friedman, Krista Lawlor

As visiting student: Columbia University (fall 2016), University of Pennsylvania (fall 2017)

Goethe University Frankfurt (spring 2018)

PhD Minor, Philosophy, Literature, and the Arts, Stanford University

Advisor: R. Lanier Anderson

2016 MA, Philosophy, Stanford University

2013 **PhD in Mathematics, Technical University of Berlin**

Advisor: John M. Sullivan

2009 MS, Mathematics, University of Bologna

As visiting student: University of Paris7 (2007-2008)

2006 BS, Mathematics, University of Bologna

As visiting student: University of Calgary (2004-2005)

Publications

Articles

- “Intersubjective Propositional Justification,” *Propositional and Doxastic Justification: New Essays on Their Nature and Significance*, Eds. Paul Silva Jr. & Luis Oliveira, Routledge, forthcoming.
- “Groundwork for a Fallibilist Account of Mathematics,” *The Philosophical Quarterly*, Volume 7, Number 4, 823-844, <https://doi.org/10.1093/pq/pqaa076> (2021).
- “Reconciling Rigor and Intuition,” *Erkenntnis*, Volume 86, 1783-1802, <https://doi.org/10.1007/s10670-020-00280-x> (2021).
- “Leopardi: ‘Everything is Evil,’” in: *Evil—A History*, Ed: A. P. Chignell. OUP, 350-357, (2019).
- “‘Chasing’ The Diagram – The Use of Visualizations in Algebraic Reasoning,” *The Review of Symbolic Logic*, Volume 10, Number 1, 158-186, (2017).
- “Envisioning Transformations – The Practice of Topology” (with Valeria Giardino), in: *Mathematical Cultures*, Ed: B. Larvor. Birkhäuser, 25-50, (2016).
- “An Inquiry into the Practice of Proving in Low-Dimensional Topology” (with Valeria Giardino) In: *From Logic to Practice*, Eds: G. Lolli, M. Panza, G. Venturi. *Boston Studies in the Philosophy and History of Science*, Volume 308, 315-336, (2015).
- “Forms and Roles of Diagrams in Knot Theory” (with V. Giardino), *Erkenntnis*, Volume 79, 829-842, (2014).

Editorial Work

- Special issue of *Endeavour* (with Paula Findlen and Greg Priest) With a co-authored introduction: “Tools of Reason: The Practice of Scientific Diagramming from Antiquity to the Present” *Endeavour*, Volume 42 (2-3), 49–59, (2018).

Conference Proceedings

- “Fruitful Over-Determination in Knot Diagrams,” Proceeding of *Diagrams 2018, Lecture Notes in Computer Science* (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 10871 LNAI, 807–809, (2018).
- “Meta-Vermeer: A Topological Reinterpretation of a Masterpiece,” (with Y. Sakamoto), *Bridges 2012: Mathematics, Music, Art, Architecture, Culture*, 499-502, (2012).

Work in Progress

- “The Epistemological Subject of Mathematics,” in preparation, to appear in: *The Handbook of the History and Philosophy of Mathematical Practice*, Ed: Bharath Sriraman, Springer.
- Entries “Diagrams” and “Fallibilism in Mathematics,” in preparation, to appear in: *The Third Edition of the Blackwell Companion to Epistemology*, Ed: Kurt L. Sylvan.

- “What is a Mathematical Diagram?,” *R&R*.
- “Who’s Afraid of Mathematical Diagrams?,” *R&R*.
- “Recalcitrant Disagreement in Mathematics: An Endless and Depressing Controversy in the History of Italian Algebraic Geometry” (with Claudio Fontanari), *R&R*.
- “Objectivity and Rigor in Classical Italian Algebraic Geometry” (with Claudio Fontanari), submitted.
- “Diagrams, Visualization, and the A Priori,” in preparation.
- “Successful Transmission of Justification Across Fallacious Arguments,” submitted.
- “New Tools for Kant’s Incongruent Counterparts,” in preparation.
- “Nietzsche’s Conception of Logic,” in preparation.

Others

- *Numeri. Divagazioni, calcoli, giochi* (with D. De Toffoli, D. Zaccariotto) (introduction by Stefano Bartezzaghi), First Edition, 2008, Stampa Alternativa, Viterbo. 2nd Edition (preface by Furio Honsell), Edizioni Koala, (2017).

Teaching

As Primary Instructor

- *Mathematical Rigor between Theory and Practice* (with John Burgess), PHI 536, Fall 2021-22, Princeton University
- *Theory of Knowledge*, PHI 313, Fall 2020-21, Princeton University
- *Philosophy of Mathematics* (with John Burgess), PHI 314, Fall 2019-20, Princeton University
- *Philosophy of Mathematics*, PHIL 162, Winter 2017-18, Stanford University
- *Introduction to Philosophy*, PHIL 102, Fall 2016-17, City College New York
- *Algebraic Topology*, MA 512, Spring Semester 2013-14, Montana State University, Bozeman

As Teaching Assistant

- *Philosophy and Literature*, PHIL 81, (R. L. Anderson and J. Landy) Winter 2016-17, Stanford
- *Epistemology*, PHIL 184, (Instructor: Eli Alshanetsky) Spring 2015-16, Stanford
- *Introduction to Philosophy of Science*, PHIL 60, (H. Longino) Winter 2015-16, Stanford
- *Topology* (Instructor: John Sullivan), Master course, Winter 2010-11, TU Berlin

Awards

- 2017-19 Ric Weiland Graduate Fellow in the Humanities & Sciences, Stanford University.
- 2017 France-Stanford Visiting Student Researcher Fellowship (IHPST, Institute for History and Philosophy of Sciences and Technology), spring 2017, sponsor: Marco Panza, CNRS, Paris.
- 2013 Certificate of Distinction from *the Berlin Mathematical School* for the Ph.D. thesis “Degrees of essentiality for secants of knots.”

Events Organization

- [member of the organizing Committee] *6th International Conference of the Association for the Philosophy of Mathematical Practice*, (29 June-3 July 2021)
- *Rigor and Intuition*, group session of the Philosophy of Mathematics Association, Pacific APA, Portland (5-10 April 2021)
- [POSTPONED] With John Burgess: *The ‘End’ of Philosophy of Mathematics?*, Conference at Princeton University (3-5 April 2020)
- [member of the organizing Committee] *5th International Conference of the Association for the Philosophy of Mathematical Practice*, ETH, Zurich (18-21 January 2020)
- *Association for the Philosophy of Mathematical Practice* symposium, 16th Congress of Logic, Methodology and Philosophy of Science and Technology, Prague (5-10 August 2019), <http://clmpst2019.flu.cas.cz>
- *Association for the Philosophy of Mathematical Practice* symposium, XXIV World Congress of Philosophy, Beijing (13-20 August 2018)
- With Rebecca Morris: *Mathematical Reasoning*, Workshop at Stanford University (9-10 February 2018)
- *Varieties of Visualization in Mathematics*, Workshop as part of the 4th International Meeting of the Association for the Philosophy of Mathematical Practice, Salvador, Brazil (23-27 October 2017)
- With Paula Findlen and Greg Priest: *Tools of Reason: The Practice of Scientific Diagramming from Antiquity to the Present*, Workshop at Stanford University (10-11 February 2017)

Service

- 2021 – Assistant Editor for the “Open Problems” section of **APhEx** (Analytical and Philosophical Explanations) – Italian journal for analytic philosophy.
- 2019 – **PhilPapers** Editor of the categories “**Mathematical Practice**,” “**Visualization in Mathematics**,” “**Philosophy of Literature**,” “**Fiction**,” “**The Basing Relation**,” “**Propositional and Doxastic Justification**,” and “**Epistemic Fallibilism**.”
- 2018 – Member of the Steering Committee of the *Association for the Philosophy of Mathematical Practice* (APMP)

Refereeing (Journals and Books)

Philosophical Quarterly, Synthese, Erkenntnis, Philosophia Mathematica, Philosophy of Science, The British Journal for the Philosophy of Science, Journal for General Philosophy of Science, Journal of Humanistic Mathematics, Spatial Cognition and Computation: An Interdisciplinary Journal, Kriterion, Manuscripta, Theoria, Dialectica, Axiomathes, Éditions de la Sorbonne

Refereeing (Grants)

Graduate Women in Science (GWIS) National Fellowship Program, Fondecyt Program National Research and Development Agency (Chile)

Scientific Committee for Conferences

- 2022 *Diagrams 2022, 13th International Conference on the Theory and Application of Diagrams, Philosophy Track, Rome (14-16 September)*
- 2021 *Diagrams 2021, 12th International Conference on the Theory and Application of Diagrams, Philosophy Track, (28-30 September)*
- 2020 *Diagrams 2020, 11th International Conference on the Theory and Application of Diagrams, Philosophy Track, Tallinn (24-28 August)*
- 2018 *Diagrams 2018, 10th International Conference on the Theory and Application of Diagrams, Philosophy Track, Edinburgh (18-22 June)*

Presentations

COMING UP

EEN (European Epistemology Network) conference, Glasgow (15-17 June 2022)

"Mathematical Justification"

Arché's research stream "Epistemology: Current Themes," Department of Philosophy, University of St Andrews (9 June 2022)

TBD

Structuralism and Fictionalism in Mathematical Practice, Workshop at the University of York (27 May 2022)

TBD

Séminaire d'histoire et de philosophie des sciences, Centre de Recherches en Histoire des Idées, Université Côte d'Azur, Nice (March 2022)

"Fallibilisme en mathématiques"

Colloquium Series in the Philosophy Program at the CUNY Graduate Center (16 March 2022)

TBD

Mathematics 19th-21st, History and Philosophy Seminar, SPHERE laboratory, CNRS, Paris (14 March 2022)

TBD

Eastern APA, Session of the Philosophy of Mathematics Association, Baltimore (5-8 January 2022)

"Beliefs, Degrees of Beliefs, and 'Probabilistic Proofs'"

Mathematical Collaborations 4, hosted by Vrije Universiteit Brussel and University of Leeds, online (7 December 2021)

"Higher-Order Evidence in Mathematics"

2021

FPMW13 - 13th French PhilMath Workshop - Treizième rencontre française de Philosophie des Mathématiques, Nice (7-9 October 2021)

"Diagrams and the Apriority of Mathematics"

SIFA 2021 - 14th Conference of the Italian Society for Analytic Philosophy, Noto (22-24 September 2021)

"Diagrams and the Apriority of Mathematics"

Text-Driven Approaches to the Philosophy of Mathematics (TDPhiMa 2), Duisburg-Essen University, online event (1-3 September)

"Algebraic and Graphical Languages: the Case of Monoidal Categories"

Topic in Philosophy of Mathematical Practice 2021, University of Copenhagen, online event (16-18 August)

"Reconciling Rigor and Intuition"

Seminario PLS (Piano Lauree Scientifiche) Online, mathematics department, University of Bologna (July 9)

"Rigore e Intuizione in Matematica"

6th International Conference of the Association for the Philosophy of Mathematical Practice (APMP), Online, Zoom provided by Chapman University (29 June-3 July)

"Mathematical Practice and Analytic Epistemology"

Seminario all'Università di Trento, Centro *PopMat* (June 28)

"Cosa sono I diagrammi matematici?"

Science & More Talks, Center for Logic, Language and Cognition (LLC), University of Turin (June 16)

"Can we form a justified belief in mathematics based on an incorrect argument?"

Carl Friedrich von Weizsäcker-Colloquium, University of Tübingen (June 9)

"What are Mathematical Diagrams?"

Stirling University, Visiting Speaker Seminar, (11 February)

"A Case for the Fundamentality of Doxastic Justification"

Logic & Phil of Math in the evening, organized by D. Kant and D. Sarikaya (14 January)

"Mathematical Justification"

Comments on "Nietzsche... and Possibility of Metaphysics," Eastern APA (4-7 January)

2020

University of Trento, *PopMat* lab, joint talk department of philosophy and mathematics (online, 9 December)

"Philosophy of Mathematical Practice"

Canadian Society for the History and Philosophy of Mathematics Talk, online (20 November)

"The Epistemological Subject of Mathematics"

Texas A&M University, talk for a research group on mathematical reasoning, online (5 May)

"Who's Afraid of Mathematical Diagrams?"

[POSTPONED] *Understanding Mathematical Explanation*, Rutgers University (6 April)

TBD

[POSTPONED] *The 'End' of Philosophy of Mathematics?*, Princeton University (3 April)
"Mathematical Justification Ain't What it Seems"

[CANCELLED] *Dimensions of Epistemic Justification*, University of Cologne (26-27 March)
Commentator at Large

5th *International Conference of the APMP*, ETH, Zurich (18-21 January)
"A Fallibilist Account of Mathematical Justification"

2019

Carnegie Mellon University, philosophy department, colloquium talk (8 November)
"Diagrammatic Notations in Mathematical Proofs"

Rutgers University, Talk at the *Proof Comprehension Research Group* (1 November)
"Mathematical Diagrams"

16th *Congress of Logic, Methodology and Philosophy of Science and Technology*, Prague (5-10 August)
"The Epistemic Basing Relation in Mathematics"

Masterclass in the Philosophy of Mathematical Practice, Vrije Universiteit Brussel (19-21 June)
"Mathematical Justification in Practice"

Explanatory and Heuristic Power of Mathematics (invited), Roma La Sapienza (13-14 June)
"Grasping How a Proof Supports its Conclusion"

Intersem Talk, organized by Mic Detlefsen, Paris 7, Sphere, (6 June)
"Rigorous Diagrammatic Proofs"

Big Proofs Workshop, International Centre for Mathematical Sciences (invited), Edinburgh (26-31 May)
"Diagrammatic Notations in Mathematical Proofs"

Macalester College, department colloquium (April 25)
"Mathematical Justification in Practice"

Pacific APA, Society for Realist-Antirealist Discussion, Vancouver (April 17-20)
"Proof, Simil-Proofs, and Mathematical Justification"

2018

Mathematics in Action (invited paper), Henri Poincaré Archives, Nancy (13-14 December)
"Mathematical Justification in Practice"

APMP session, XXIV World Congress of Philosophy, Beijing (13-20 August)
"What is a Mathematical Diagram"

XXIV World Congress of Philosophy, Beijing (13-20 August)
"Fruitful Over-determination for Mathematical Notations"

Proofs and Representations Workshop (invited), Munich Center for Mathematical Philosophy (6-8 July)
"Heterogenous Notations for Mathematical Proofs"

Diagrams 2018, 10th International Conference on the Theory and Application of Diagrams, Edinburgh (18-22 June)
"Fruitful Over-Determination in Knot Diagrams"

Stanford University, Psychology Department, Jay McClelland Laboratory (6 March)
"Diagrams in Mathematics"

University of British Columbia, Okanagan campus, department colloquium (23 February)
"Diagrams in Mathematical Practice"

Eastern APA, Society for Realist-Antirealist Discussion, Savannah (3-7 January)
"Proofs and Diagrams in Mathematics"

2017

4th *International Conference of the APMP*, Salvador, Brazil (23-27 October)
 “Varieties of Mathematical Diagrams”
Visual Reasoning and Intuition in Mathematics. (invited), Free University of Berlin, (29 June-1 July)
 “Knots and Embeddings: New Tools for Incongruent Counterparts”
Logic in Question 7 conference (invited paper), Paris Sorbonne (13-14 June)
 “Thinking with Diagrams: The Case of Mathematics”
PhilMath seminar series (invited paper), IHPST, Paris (12 June)
 “Varieties of Mathematical Diagrams”
PROOFS workshop (invited paper), IHPST, Paris (1-2 June)
 “The Notion of Proof in the Practice of Mathematics”
Mathématiques en action seminar series, Archives Henri Poincaré, Nancy (24 April)
 “What is a Mathematical Diagram?”
Tools of Reason workshop, Stanford University (10-11 February)
 “Thinking with Diagrams: The Case of Mathematics”

2016

Midwest PhilMath Workshop 17, Notre Dame University (12-13 November)
 “Thinking with Diagrams: The Case of Mathematics”
 City College New York, department colloquium (22 September)
 “Aspects of Diagrammatic Reasoning in Mathematics”
 Vrije Universiteit Brussel, colloquium (08 July)
 “Aspects of Diagrammatic Reasoning in Category Theory” (with I. Goyvaerts)
 University of Udine, mathematics and computer science colloquium (29 June)
 “Pensare con i Diagrammi: il caso dei Nodi”
Five Years MCMP: Quo Vadis, Mathematical Philosophy? conference (invited), MCMP (2-4 June)
 “Varieties of Visualizations in Mathematics”
 43rd *philosophy of science conference in Dubrovnik* (invited paper), Croatia (11-15 April)
 “Diagrams in Algebra”

2009–2015

3rd *International Conference of the APMP* (keynote speaker), Paris (2-4 November 2015)
 “‘Chasing’ The Diagram – The Use of Visualizations in Algebraic Reasoning”
Proofs and Pictures conference, University of South Carolina, Columbia (20 March 2015)
 “‘Diagram Chase’ Techniques – The Use of Space in Algebraic Reasoning”
What is? Seminar, Berlin Mathematical School (8 February 2013)
 “What is a Rational Tangle?”
Filosofia della matematica, Scuola Normale Superiore, Pisa, Italy (24-26 September 2012)
 “La dinamica dei diagrammi in teoria dei nodi” (with V. Giardino)
 Società Italiana di Filosofia Analitica (SIFA) conference, Alghero, Italy (13-15 September 2012)
 “Roles and Forms of Diagrams in Knot Theory” (with V. Giardino)
Mathematical Cultures conference, London (10-13 September 2012)
 “Low-dimensional topology as visual mathematics” (with V. Giardino)
 Free University of Berlin, Sybille Krämer’s colloquium (19 June 2012)
 “Die epistemische Rollen von Diagrammen in der Topologie”
Société de philosophie analytique (SOPHA) conference, École Normale Supérieure, Paris (4-6 May 2012)
 “Diagrammes et Illustrations en Topologie: Le Cas des Nœuds”
Work in Progress Seminar, Munich Center of Mathematical Philosophy, Munich (19 January 2012)

“The Knot Moves: A Case Study on Diagram Dynamics”
University of Sevilla, philosophy colloquium (15 November 2011)
“Use and Epistemic Roles of Diagrams in Knot Theory”
What is? Seminar, Berlin Mathematical School (4 December 2009)
“What is a Seifert Surface?”

Languages

Italian (native), English (excellent), French and German (fluent reading and speaking)

References

Thomas Ryckman, Professor of Philosophy, Stanford University

tryckman@stanford.edu

John Burgess (research and teaching), John N. Woodhull Professor of Philosophy, Princeton University

jburgess@princeton.edu

Thomas Kelly, Professor of Philosophy, Princeton University

tkelly@princeton.edu

Jeremy Avigad, Professor of Philosophy, Carnegie Mellon University

avigad@cmu.edu

Marcus Giaquinto, Honorary Emeritus Professor of Philosophy, University College London

m.giaquinto@ucl.ac.uk

Paolo Mancosu, Willis S. and Marion Slusser Professor of Philosophy, University of California, Berkeley

mancosu@socrates.berkeley.edu

R. Lanier Anderson, Professor of Philosophy, Stanford University

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