3945 Rue St. Andreé
Montreal, Quebec

ACT 2019 School
Oxford, UK

January 13, 2019

To Whom It May Concern,

I'm writing to convey my strong interest in attending the 2019 Applied Category Theory school. I am primarily a logician and philosopher of mathematics, and my investment in category theory begins through foundations, though my definition of foundations exceeds conventional set theory. While I've maintained an interest in category theory since my encounter during an undergraduate course on group theory, I imagine I'm not alone in being largely inspired by the diversity of work in the collection edited by Elaine Landry, *Categories for the Working Philosopher*. My technical background is roughly at the level of Awodey and Leinster's primers, though I am also comfortable with intersections in language, formal metaphysics and quantum physics. I have a strong set-theoretic and group-theoretic background, with most of my category-theoretic familiarity being either pure mathematics, foundations, or related to physics. While I've written recently on category-theoretic and set-theoretic foundations from a metaphysical perspective—where Fong, Myers and Spivak's work on Behavioral Mereology has a familiar flavor—my primary work lies in the comparative complexity and computability under various formal languages. I have interests in formal linguistics and foundations of physics, where I've been interested in expanding a categorical perspective since encountering Dana Scott's work modeling lambda calculus, and James Weatherall's work on field theories, respectively. Moreover, my mathematical work lies in low-dimensional topology, e.g. knots and braids (and their relationship to descriptive set theory and large cardinals), where categorical applications have been essential to understanding braid tangles as morphisms, and properties of other operators like racks, quandles and keis; while these are 'pure' mathematical interests, they are directly tied to my work in topological foundations for visual epistemology of mathematics, wherein I hope to further formalize diagrammatic complexity in relation to perceptual inferences and operations. Since fall 2018, I have been based in Montreal, where I've had the privilege to interact with the Logic & Categories Seminar, Geometry and Topology Centre, and Philosophy of Mathematics Group, and learn about category-theoretic approaches to gauge theory, computability and ergodic systems.

I expect to complete my doctorate sometime between 2022 and 2024, realistically; my prospective research attempts to formalize the 'speeding up' of proof simplicity for key theorems based on higher-powered formal computational systems.

Based on the provided readings, each project has substantial overlap with potential research interests (my work falls in many areas undergoing recent 'categorization'), and all obviously pertain to my broader interest in improving category-theoretic knowledge. By proximity to prospective work, my order is:

1. David Spivak's *Toward a mathematical foundation for autopoiesis*

2. Pieter Hofstra's *Complexity classes, computation, and Turing categories*

3. Mehrnoosh Sadrzadeh's *Formal and experimental methods to reason about dialogue and discourse using categorical models of vector spaces*

4. Miriam Backens' *Simplifying quantum circuits using the ZX-calculus*

5. Bartosz Milewski's *Traversal optics and profunctors*

6. Tobias Fritz's *Partial evaluations, the bar construction, and second-order stochastic dominance*

Luckily (or fatefully!) I plan to be in London at the Institute of Philosophy during the summer of 2019, so I can preemptively commit to attending the workshop and conference at Oxford.

I'm deeply interested in the versatility of category-theoretic tools for formal models in language, computation, and formal sciences. Later this summer, I plan to visit Stanford's Centre for the Study of Language and Information, where I'll carry out work on an ongoing project on bounded rationality and complexity of models for cognitive discrimination tasks; work like Pieter Hofstra's has been invaluable for making headway at formalizing dynamic interrelations of variable decision time, cognitive and task complexity, and I'd hope to use this opportunity to establish working foundations for integration of category theory into the full extent of this project and its environs in my later career, especially as I move to higher-order abstraction and composition tasks. This would also benefit my occasional collaborate with discourse-analysts in social sciences, especially on multi-participant conversation. From a general epistemological standpoint, the entire endeavor of ACT to bring together students and practitioners is great for my understanding contemporary applied mathematical practice, and developing relationships with possible collaborators who can provide complementary technical understanding to my philosophical inquiry. My work in foundations and meta-mathematics concentrates on the feasibility of mathematical nominalism, where fine-grained mathematical applications are vital to understanding how much computational complexity is 'necessary'; while this has been historically isolated to physics and mathematics, there's no reason why other applications should be excluded; I'm keen on using category theory to understand applications, and tracking category-theoretic usage for meta-mathematical concern. Additionally, I have firm interests that would categorize me as both a mathematician and philosopher, though being currently in a philosophy department limits my interaction especially with mathematical fields disparate to my own; looking forwards, category theory would help me maintain a model fluency and interest in a broad swath of pure and applied developments. I suspect the need for category theory in my future work is inevitable, and the chance to develop an intimate fluency of at least one facet of contemporary import is a great catalyst.

Sincerely,

Lawrence S. Wang

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he—him—his

wang.tennessee@gmail.com

January 30, 2019

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Education

2017-2018	**M.A.** University of Essex, UK.
	Dissertation: Inference and Self-Reference: A Modal Logic of Scientific Referentialism
2013-2017	**A.B.** Harvard University, US.
	Joint with Physics and Chemistry

AOS — Philosophical & Mathematical Logic

Paradox, Foundations of Mathematics, Axiomatic Justification, Non-Classical Logic,
Proof Theory, Complexity Theory, Model Theory, Group Theory (esp. Braid/Knots)

AOC — Philosophy of Language (esp. Semantics), Philosophy of Mathematics, Epistemology,
Philosophy of Science (esp. Physics), Hist. Analytic Philosophy

Professional Positions

2018-	Klibanksy Research Fellow, McGill University
	Project: Modelling Modal Possibility and Counterfactual Plenitude
2018-	Assistant Editor, Issue Editor, Hortulus Graduate Journal of Early Modern and Medieval Studies
2018	Hong Summer Scholar, St. Olaf University
	Project: Does Kierkegaard Have a Modal Ontological Argument?
2017-2019	HASTAC Digital Humanities Fellow
2018-	Lecturer, Xi'an Gaoxin #1 Technical High School
2015-2017	Researcher, Quantum Info. Physics Lab, Harvard University

Languages

Russian	Native
Japanese	Native
Chinese	Native
French	Fluent
Spanish	Advanced
German	Advanced
Anc. Greek	Intermediate
Latin	Intermediate

In Preparation

*Titles Tentative

"Two be, or not two (three, four, five...) be?" Paper arguing for non-pluralism and non-platonism about mathematics (5000 W)

"Carnap and Wittgenstein on Gödel's Ontology." Paper on axiomatizing incompleteness and logical nominalism (4000 W, Presentation at ASL-APA 2019*)

"If not, then what?" Paper defending if-thenism against recent critiques (5000 W, Under Review)

"Dirty Details in Mathematical Taxonomy." (Under Review, *Analysis*, 3000W)

"Amodal Completion Is Not Independently Knowledge Grounding." (Under Review, *Analysis*, 3000W)

Paper on Braid Groups and Axiomatization (2500W)

"Two-Dimensional Semantics and Twin-Earthable Regular Concepts" Adaptation of Dissertation Chapter (4000 W)

"What the Tortoise Wrote Down: A Third Inference Problem" Adaptation of Dissertation Chapter (2500 W)

"Nietzsche, Habit and Personal Identity.", paper on personal identity metaphysics grounding epistemology, (Under Review, *The Monist*, 10,000 W)

"Where are Facts?: A Leibnizian Modal Realist-Idealist Puzzle" (8000 W)

"Is All Art Boring?" Paper on Logical Vagueness, Monism about Perceptual Content and Negative Perceptual Features (Under Review, 5000 W)

Selected Publications

2018	"Wittgenstein and Carnap on Gödel's Ontology." (Abs.) *Bulletin of Symbolic Logic*.
2018	"A Cradle of Graves: Understanding Inexpressibles through Percieving Modals." *Bodies in the Streets: Somaesthetics of the City.* Edited by Richard Shusterman. Leiden: Brill. (Forthcoming)
2019*	Paper on Medieval Logic and *Ex Falso Quodlibet* In volume on Negativity for *International Medieval Society*. Routledge (Forthcoming)
2018	"Michel de Montaigne's *Of Cannibals*." Entry in *Race and Ethnicity Encyclopedia*, Edited by Russell Lawson. ABC-Clio. (Forthcoming)

Conference Proceedings (Peer Reviewed)

2018   "Running up Against the Limits of Mathematics: Wittgenstein and Mathematical Construction." *Proceedings of the International Wittgenstein Symposium 41*

2017   "Ethics as Aesthetics: Narrating the Tragic Hero in Hegelian Ethics." *Proceedings of the International Hegel Society.*

Invited Presentations

2019   "Wittgenstein and Carnap on Gödel's Ontology." *Association of Symbolic Logic-APA Central 2019*, February 21, 2019 (Scheduled)

2019   "Two be, or not two (three, four, five...) be?" *George State Graduate Conference 2019*. Atlanta, Georgia (Scheduled)

2019   "Philosophy of Knots and Diagrammatic Reasons" *Knots in Washington*, George Washington University. January 20-21, 2019

2017-2019   "Inference and Self-Reference in Scientific Organization

- "The Adoption Problem for Epistemology." *Indiana University History and Philosophy of Science Graduate Conference.* Bloomington, Indiana. March 21-24 2019.

- "Husserls Crisis Today." Center for Ideology and Discourse Analysis Graduate Seminar Series.

- "Rule-Following, Systematicity and the Social Sciences" Center for Ideology and Discourse Analysis Essex University Departmental Workshop.

2019   "Epistemic Restriction as Legitimate Punishment: Or, Can Prisons Be Without Libraries?" *Ways of Knowing*. Temple University, Philadelphia, PA. (Scheduled)

2019   "Two Theories of Concept: A Defense of Representationalism." 50th North-East Modern Languages Conference, Georgetown University, Washington DC (Scheduled)

2018   "Modality and Substance-Property Relationships"

- "Acosmism, Reality and Consciousness in Romantic Idealist Philosophy." *Institute for the History of Philosophy.* Emory University. 16-26 July 2018.

- "Mereology, World, and Plural Possibilities." Leibniz in Ligerz, University of Lucerne, June 26-July 1 2018.

2018   "Wittgenstein and Mathematical Construction." *41st International Wittgenstein Symposium*, Kirchberg am Wechsel, Austria

2017-2018   "Idealist Value Theory and Epistemology of Mind"

- "Ist Ästhetische Erfahrung selbstbewusst?" *Was ist Geist? Internationales Symposium 2018 der Schweizerischen Philosophischen Gesellschaft/ What is Mind? Intenational Symposium of the Swiss Philosophical Society.* Basel, Switzerland.

- "Perceptual Experience and External Persistence." British Society of Phenomenology, 2018.

- "Ethics as Aesthetics: Narrating the Tragic Hero in Hegel's Ethics." *International Hegel Society Conference.* Tampere, Finland.

2017-2018 "Externalism/Realism in Aesthetic Perception: Argument through Negative Valences."

- "Is All Art Boring?" *Western Michigan University Graduate Conference*, Kalamazoo, Michigan. (Scheduled, 2018.)

- "Is All Art Boring?" *Are We Living in an Age of Distraction?* Birkbeck Graduate Conference, Birkbeck College London, 2018.

- "Static Cinema: Perceiving Imperception in Film." *De-Centered Cinema.* San Francisco State University, 2017.

2018 "Is Truth Higher than God?: Antinomic Ontology in Meister Eckhart and Margeurie Porete." International Medieval Society. Paris, France.

2018 "Joyce, Vitalism and Philosophy of Identity."

- "Quiddity and Haecceity: Aquinian and Romantic Philosophy in Joyce's Vitalism." *International Conference on Romanticism.* Clemson University, 2018. (Scheduled)

- "Whatness before Wholeness: Quiddity in the Aesthetics of *Portrait of the Artist as a Young Man*" *26th International James Joyce Symposium.* University of Antwerp, 2018.

2018 "Theory, Analysand." Paper on Meta-Theory and its Definition. North Eastern Modern Languages Association. 2018.

Publication Reviews

2018 Sinclair, Mark. *The Actual and the Possible: Modality and Metaphysics in Modern Philosophy.* Metapsychology (Forthcoming)

2018 Westfall, Joseph, Ed. *The Continental Philosophy of Film Reader.* ed. Film Philosophy (Forthcoming)

2018 Mei, Todd. *Land and the Given Economy: The Hermeneutics and Phenomenology of Dwelling.* Marx and Philosophy Review.

2018 Thorndike, Oliver. *Kants Transition Project and Late Philosophy.* Open Phenomenology. (Forthcoming)

2018 Farin, Ingo and Jeff Malpas, Eds. *Reading Heideggers Black Notebooks 1931-1941.* Symposium.

2018 Landers, Matthew. *Anatomy, the Brain, and Memory in Tristram Shandy: A Forensic Examination of Sternes Narrative Structure.* Journal of Literature and Science.

Commentary and Conference Organization

2019	Chair, "Coordinating *If*'s", Justin Khoo, APA Central 2019, Denver, Colorado.
2018	Invited Respondent, "Wittgenstein's Reality Soaked Grammar." Daniéle Moyal-Sharrock. *Wittgenstein, Grammar and Nature*, University of Southampton
2018	Organizer, Chair. Panel on Philosophy of Perception and James Joyce, Chair. 26th International James Joyce Symposium. University of Antwerp, Belgium.
2018-2019	Co-organizer, *Logics of Explanation*, University of Essex Conference. Jointly held between philosophy and political science. (Scheduled)
2017-2018	Coorganizer and Grant Writer, *Rediscovering the Demos Inside the space of Academia*. Centre for Theoretical Studies. 200+ attendee conference in philosophy of social science.

Fellowships and Accolades

2018-2019	Klibansky Research Fellowship, McGill University
2019	Travel Award, APA Central
2019	Travel Award, Knots in Washington, George Washington University
2019	Travel Award, Ways of Knowing Conference, Temple University
2018	Courtesy Bursary, *Wittgenstein, Grammar, Nature*, University of Southampton
2018	Travel Bursary, Emory University Institute for the History of Philosophy Workshop
2018	Travel Stipend, Workshop on Einstein's Philosophy of Science, Tübingen University
2018	Travel Stipend, Realism and Idealism Workshop, University of Freiburg
2017-2019	HASTAC Digital Humanities Fellowship
2018	Hong Library Fellowship, St. Olaf University
2018	Western Michigan University Graduate Conference Travel Bursary (Declined)
2018	Graduate Student Bursary, University College Dublin.
2018	Graduate Student Bursary, Great British Hegel Society
2017-2018	University of Essex Postgraduate Merit
2014	Harvard China Fund Fellowship
2013	SIEMENS Scholarship
2013	Cornelius Vanderbilt Scholarship (Declined)
2013	National Merit Scholarship

Professional Service

2018-	David Lewis Letters, University of Manchester	Volunteer Transcriber
2017-2018	MA Module: Political Theory and Analysis	Representative/Assistant
2018	*Introduction to Philosophy*, Christina Hendricks, Ed.	Contributing Editor
2017-	*Journal of Literature and Science*	Reviewer
2017-	*Hortulus Graduate Journal of Medieval Studies*	Reviewer, Assoc. Editor

Professional Memberships

American Philosophical Association, Association of Symbolic Logic, Aristotelian Society, Austrian Ludwig Wittgenstein Society, Modern Language Association, Centre for Theoretical Studies in Humanities and Social Sciences, British Society for the Philosophy of Science, Leibniz Society of North America, Society for Exact Philosophy

Something Completely Different

2018	"Margeurite Duras and Extimité." *S: Journal of the Circle for Lacanian Ideology Critique.*
2017	"Benjamins Voices: Irresolution and Textual Practice in *On the Concept of History.*" *Metacritic Journal for Comparative Studies and Theory.* Vol 3(2).
2017	"Selva Oscura: On Forgetting in the Forest in *Alice in Wonderland*" *Artis Natura* Vol. 1(2)

Extra-Scholastic Activities

Co-Author, Report on Sexual Assault and Policy Recommendation for College Campuses, Massachusetts State House, Harvard Institute of Politics, 2016

Undergraduate Tutor, Neuroscience, Mathematics, Harvard University, 2014-2015

Instructor, PBHA Summer Civics and Science Programs - Designed and implemented curriculum in civics and natural sciences for teaching at-risk and lower-income youth in Boston neighborhoods, 2016-2017

2017-2018 UK University Strike Graduate Student Workshop Organizer, University and College Union, University of Essex, 2018

Staff Writer, Harvard Political Review, 2015-2017

Co-Organizer, Harvard Effective Altruism 2015-2017

References

Sean Kelly
Teresa G. and Ferdinand F. Martignetti Professor of Philosophy, Harvard University
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Dusty Grundmeier
Faculty Preceptor, Department of Mathematics, Harvard University
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January 14, 2019

Dear Admissions Committee,

I am writing this letter to support **Lawrence Wang's** applications to various summer programs. Lawrence took my Math S-101 course at Harvard during the summer 2017 term. Math S-101 is a bridge course designed to help students transition from more computational calculus courses to more theoretical, proof-based courses. Math S-101 is an introduction to writing proofs in the context of abstract algebra and general topology. Students generally find the course to be unlike their previous math courses and quite challenging.

In my four times teaching Math 101, I would say Lawrence is among the best students that have taken the course with me. He easily earned an A in the course. Furthermore he was thoughtful and engaged throughout the summer. He thought deeply about the material, and he is clearly quite mathematically talented. More than most students in the course, he seemed comfortable with abstraction and precise thinking.

In addition to a final exam, Math S-101 had a final group presentation. Lawrence gave one of the best presentations I've seen in Math 101. He presented a clear, self-contained and well-motivated introduction to braid groups. He clearly understood the ideas and he did an excellent job communicating those ideas to the class.

Given Lawrence's ability to digest difficult and abstract mathematics, he will make an excellent addition to a summer program focused on using abstract mathematics. Therefore, I strongly recommend Lawrence Wang for admission to your program. Please feel free to contact me if you have any further questions.

Sincerely,

Dusty Grundmeier, Ph.D.
Dept. of Mathematics
Harvard University