Lu Chen
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Academic Position

Assistant Professor (tenure-track), University of Southern California, Jan 2024-.
Assistant Professor (tenure-track), Koç University, Istanbul, 2020-2023.

Education

Ph.D.	Philosophy, University of Massachusetts Amherst, 2014-2020.
	Committee Members: Phillip Bricker (chair), Alejandro Perez Carballo, Jeffrey Sanford Russell (USC), Alexei Oblomkov (Mathematics)
	Dissertation: *Continua*.
M.A.	Philosophy, University of Wisconsin, Milwaukee, 2012-2014.
M.A.	Philosophy, Fudan University, Shanghai. 2009-2012.
	Calvin College, visiting student, 2011-2012.
B.A.	Philosophy (with the Dean's Award), Fudan University, Shanghai, 2005-2009.

Areas of Specialization

Philosophy of Mathematical Physics, Philosophical Logic, Metaphysics

Areas of Competence

Decision theory, Epistemology, Applied Ethics, Philosophy of Mind

Peer-Reviewed Journal Articles

*Reversely ordered by acceptance date.

12. "Hyperdeterminism? Spacetime 'Analyzed'," with Tobias Fritz (forthcoming) *Erkenntnis*.

    When modelling spacetime and classical physical fields, one typically assumes smoothness. We argue that this assumption is not sufficiently scrutinized, and the rejection of which has significant philosophical consequences.

11. "Symmetries as Isomorphisms", (forthcoming) *British Journal for Philosophy of Science*.

    I offer a rigorous categorical strategy that formulates symmetries as isomorphisms between spacetime models. I also consider algebraic models, in which case we can use the method of natural operators to address the problem of ontological nonperspicuity faced by the categorical strategy.

10. "Algebraicism is not Substantivalism," (2024) *Philosophy of Physics* 2(1): 14.

    Contrary to the common belief, I argue that algebraicism, the framework that does not posit spacetime manifold, is not equivalent to the manifold-theoretic approach to spacetime theories in philosophically significant ways.

9. "Univalence and Ontic Strucuralism," (2024) *Foundation of Physics* 54 (3): pp.1-27.

   I argue that Univalent Foundations (UF), which feature the axiom that all isomorphic structures are identical, offer a foundation for ontic structuralism and are more attractive than other proposed structuralist frameworks.

8. "Is the Metric Signature really Electromagnetic in Origin?" with James Read (2023) *Philosophy of Physics* 1(1): 10.

   The programme of pre-metric electromagnetism developed by Hehl and collaborators seeks to derive metrical signature from empirically informed axioms regarding electromagnetic fields, and should thereby be of profound interest to both empiricist and relationalist philosophers. We aim to be the first ones to evaluate the programme in depth and point out where it fails to deliver its promise.

7. "Why the Weyl Tile Argument is Wrong," (forthcoming) *British Journal for the Philosophy of Science*.

   Weyl famously argued that if space (or spacetime) were discrete, then Euclidean geometry cannot hold even approximately. I identify an importantly flawed assumption in Weyl's argument: physical geometry is determined by fundamental spacetime structures independently from the dynamical laws. I show its falsity through two rigorous examples: random walks in statistical physics and quantum mechanics.

6. "Can we effectivize spacetime?" (2022) *Studies in History and Philosophy of Science* 95: pp.75-83.

   According to *effective realism*, scientific theories give us knowledge about the unobservable world, but not at the fundamental level. This view is motivated by the well-received effective-field-theory (EFT) approach to physics, according to which our best physical theories are only applicable up to a certain energy scale. I challenge this view by raising an interpretative dilemma faced by all EFTs concerning their indispensable references to classical spacetime beyond their scope of validity.

5. "Smooth Infinitesimals in the Metaphysical Foundation of Spacetime Theories" (2022) *Journal of Philosophical Logic* 51: pp.857–877.

   I advance a classically consistent interpretation of Smooth Infinitesimal Analysis which is formulated in intuitionistic logic and is commonly considered to lack a classical interpretation. I advance the resulting theory as a novel approach to spacetime, which has infinitesimal regions playing the role of tangent space.

4. "An algebraic approach to physical fields," with Tobias Fritz (2021), *Studies in History and Philosophy of Science* 89: pp.188-201.

   We propose a novel algebraic approach to physical theories according to which physical fields exist without an underlying manifold. Comparing to the standard formulation, our approach does not posit a ghostly scalar field in lieu of spacetime but treats all and only physical fields as fundamental. We use natural operations in category theory to implement this idea.

3. "Intrinsic Local Distances: a Mixed Solution to Weyl's Tile Argument," (2021) *Synthese* 198: pp.7533–7552.

   Weyl's tile argument is a simple and influential argument against the view that our space is composed of extended indivisible "atoms." I advance a novel response to this argument by

appealing to a new account of distance for atomistic space, and argue that this response is better than the current proposals.

2. "Infinitesimal Gunk," (2020) *Journal of Philosophical Logic* 49: pp.981–1004.

   A natural development of the gunky view, the view that there are no indivisible regions of space, violates standard measure-theoretic principles. I advance *Infinitesimal Gunk* as an alternative gunky view with a hyperreal-valued measure theory and argue that this view has distinctive advantages over the other proposals.

1. "Do Simple Infinitesimal Parts Solve Zeno's Paradox of Measure?" (2021) *Synthese* 198: pp.4441–4456

   It is sometimes suggested that space is composed of infinitesimal-sized points. I develop this view into a rigorous infinitesimal theory of continua. The theory has an attractive measure theory, but it also suffers from various problems, which leave it with no clear advantage over its familiar alternatives.

Shorter Pieces

- "The Possibility of Tiled Space: Why Weyl was wrong about discrete space" (forthcoming) *BJPS Short Reads*.

Research Talks

19. "Is Spacetime induced" (invited), Philosophy of Physics Society, APA Pacific, San Francisco, 2025.

18. "What QFT realism should be" (peer-reviewed), APA Pacific, San Francisco, 2025.

17. "What QFT realism should be" (peer-reviewed), Philosophy of High Energy Physics, Pittsburgh, 2025.

16. 'Algebraicism is not Substantivalism" (invited) UC Irvine, May 2024

15. "Symmetries as Isomorphisms" (invited) Caltech, May 2024

14. "The Algebra of Spacetime Relationalism"(invited) Math department USC, March 2024.

13. "Why Univalence matters" (invited), Zhejiang University, Nov 2023.

12. "Univalence and structural realism" (invited), Fudan University, Oct 2023.

11. "La lumiere fut, donc la pomme a chu" (invited), Chinese Academy of Science, Institute of Philosophy, Sep 2023.

10. "Fields without spacetime" (invited), Peking University, Sep 2023.

9. "Symmetries are isomorphisms"(invited), the Institute Vienna Circle, Jun 2023.

8. "A discrete case for dynamicism"(invited), Oxford Philosophy of Physics seminar, University of Oxford, October 2022.

7. "Why the Weyl Tile Argument is wrong" (invited) the 16th Biennial Homecoming Conference, University of Massachusetts, April 2022.

6. "Regarding the Weyl Tile Argument" (peer-reviewed), American Philosophical Association Pacific Division, April 2022.

5. "A defense of spacetime dynamicism" (invited) Koc University Philosophy Colloquium, 2021.

4. "Intrinsic Local Distances: A Mixed Solution to Weyl's Tile Argument," (peer-reviewed) American Philosophical Association Pacific Division, Online, 2021.

3. "Toward A Metaphysics of Nilpotent Region," (peer-reviewed) Society for the Metaphysics of Science Annual Conference, University of Toronto, November 2019.

2. "Intrinsic Local Distances: A Mixed Solution to Weyl's Tile Argument,"(peer-reviewed) Philosophy of Logic, Mathematics, and Physics Graduate Conference, University of Western Ontario, June 2019.

1. "A Local Solution to Weyl's Tile Argument,"(invited) Metaphysical Mayhem, Rutgers University, 2018.

Services

- Referee for *British Journal for Philosophy of Science, Analysis, Philosophical Studies, Philosophical Quarterly, European Journal for Philosophy of Science, Chinese Philosophical Review, Inquiry, Journal of Symbolic Logic, American Philosophical Quarterly, Philosophy of Science.* Internal review and referee for *Pacific Philosophical Quarterly.*

- Area exam committee (Jin Zeng), USC Fall 2024-Spring 2025

- Graduate placement committee, USC Fall 2024-Spring 2025

- Graduate committee, USC Fall 2024-Spring 2025

- Philosophy colloquium co-organizor, USC, Spring 2024 to current.

- Graduate admission committee, USC, Spring 2024.

- Graduate recruitment committee, USC, Spring 2024.

- Second-year paper review (Jin Zeng). USC, 2024.

- Seminar at CASIP philosophy of physics 2022; Koc Philosophy Club 2021.

- Commentary in APA eastern division 2021 (Symposium), 2022 (Colloquium); Society for the Metaphysics of Science Annual Conference, Toronto 2019.

- Philosophy Colloquium Series organizor (and class coordinator), Koc University. 2020-2023.

- Thesis seminar, Koc University. Spring 2022, Spring 2023.

Fellowships and Grants

- the Institute Vienna Circle fellowship, Vienna University, 2023.
- Seed Research Fund for "Metaphysics of Quantum Gravity", Koc University, 2022-2023.
- Research fund for academic visit, University of Oxford, 2022.

Teaching

USC

- Seminar in recent philosophy: towards a theory of spacetime theories (Spring 2024)
- Philosophy of physics (Fall 2024)

Koç University

- Introduction to Logic (Spring 2023)
- Metaphysics of Quantum Mechanics (seminar; Spring 2023)
- Metaphysics of Science: ontic structuralism (seminar; Spring 2022)
- Scientific Realism (seminar; Fall 2021)
- Metaphysics of Science: spacetime theories (seminar; Spring 2021)
- Philosophical Paradoxes (Humanity core; Fall 2021)
- Space and Time (Humanity core; Spring 2021)
- Ontology (Undergraduate elective; Fall 2020, Spring 2022)

Umass, Amherst

- Philosophy of Science (Spring 2020)
- Medical Ethics (Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019)

References

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