National University of Singapore
Department of Philosophy
presents

philosophy
seminar series

Philosophy of Science Meets Foundations of AI

Monday, 14 July 2025, 4pm – 5.30pm
Venue: AS3-05-23

I propose that contemporary philosophy of science and the foundations of artificial intelligence share significant common ground. My talk begins with an introduction to laws of nature as understood in modern philosophy, highlighting classic puzzles about the simplicity of physical laws and their connection to inductive inference. While challenges remain, I argue that the longstanding problem of coherence—famously raised by Popper as a critique of early Bayesianism—can be resolved by reinterpreting simplicity not merely as a guide to truth, but as a guide to lawhood (arXiv:2210.08143). Building on this perspective, I explore connections between simplicity and the double descent phenomenon observed in overfitted (and extremely complex) neural networks, suggesting that the superior predictive performance in these regimes may reflect an implicit preference for simpler laws. Next, drawing on joint work with Roderich Tumulka, I present a new class of impossibility results on learning in a quantum universe, where certain well-defined questions become in principle unanswerable unless one invokes extremely strong inductive biases (arXiv:2410.16860). I discuss their implications for quantum tomography and quantum machine learning, suggesting that the mathematical limits imposed by high-dimensional concentration of measure may not only underlie challenges in learning but also hint at deep connections between simplicity, lawhood, and prediction.

Eddy Chen

Eddy Keming Chen is an Associate Professor of Philosophy at the University of California, San Diego (UCSD), a Fellow of the John Bell Institute for the Foundations of Physics, and affiliated faculty in UCSD's Chinese Studies Program. He works primarily in philosophy of physics, philosophy of science, and metaphysics, with broader interests in AI, philosophy of mind, Chinese philosophy, decision theory, formal epistemology, philosophy of mathematics, and philosophy of religion. He also explores philosophy through film and is currently co-writing a screenplay about a time-travel romance. His first book, Laws of Physics, was published by Cambridge University Press in 2024. His paper on quantum mechanics in a time-asymmetric universe won the 2021 Popper Prize from the British Journal for the Philosophy of Science. His work on laws of nature has appeared in Nature, been featured on the cover of New Scientist, profiled in Scientific American, and recognized with the APA Public Philosophy Op-Ed Prize. His 2022 paper on nomic vagueness in The Philosophical Review was selected by The Philosopher's Annual as one of the ten best philosophy articles of the year. He is Co-PI on a Templeton Foundation grant on quantum foundations. More at: www.eddykemingchen.net

All are welcome