

# THE INTERRELATION OF PHYSICS AND PHILOSOPHY: A DIALOGUE BETWEEN SCIENCE AND THOUGHT

*Thursday 10 July 2025 19:40 (20 minutes)*

This paper examines the profound and enduring relationship between physics and philosophy, a relationship that has shaped the trajectory of human inquiry from antiquity to the present day. By tracing their shared historical roots, the paper highlights how early philosophical speculation laid the foundation for scientific reasoning. Despite the modern institutional separation between the two disciplines, physics continues to grapple with questions that are fundamentally philosophical in nature, questions concerning the essence of time, space, causality, determinism, and the nature of reality itself. The study investigates the epistemological structures underpinning scientific knowledge, such as the criteria for theory confirmation and falsifiability, and explores the ontological assumptions embedded within classical and modern physics. Special attention is given to paradigm, shifting moments in the history of science, including the contributions of figures like Aristotle, Newton, Popper, and Kuhn, as well as the radical implications of quantum mechanics and general relativity. Through an analysis of contemporary debates, such as those surrounding the interpretation of quantum mechanics, the multiverse, and the conceptual validity of string theory, the paper argues that philosophy remains indispensable for critically examining and contextualizing scientific thought. Far from being outdated, philosophical reflection serves as a compass for navigating the conceptual challenges of theoretical physics. Ultimately, the dialogue between philosophy and physics is portrayed as a dynamic and reciprocal exchange, one that not only enriches both fields but is essential for advancing our understanding of the universe.

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**Session Classification:** Poster Session 4

**Track Classification:** S09 –Physics Education, History and Philosophy of Physics