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Department of Physics

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2026, January 28 – 2:00 p.m., Room A206 – Polo Ferrari 1

The dawn of a quantum theory of measurement: on the role of historico-critical analysis in the area of the foundations of quantum mechanics

Abstract

In the area of the philosophy and foundations of quantum physics several prejudices and misconceptions still survive in absence of serious textual evidence: that is why some historical investigations can be put to the service of a more documented foundational analysis. This is certainly the case with the views of Bohr and von Neumann on the status of the measurement process within quantum mechanics, views that have been interpreted for a long time in controversial or plainly misleading terms. On the basis of some textual and conceptual analysis, I would like to show that – contrary to a widespread opinion – their views should be taken less far from each other than usually thought. As a consequence, I claim that Bohr and von Neumann can be taken to be essentially on the same side on the issue of the universality of quantum mechanics: hopefully, this might contribute to a more accurate history of the measurement problem in quantum mechanics.

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