

Grete Hermann and the Gamma-Ray Microscope *Gedankenexperiment*

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Abstract:

In 1935, Grete Hermann—a student of Emmy Noether's, Leonard Nelson's and briefly of Werner Heisenberg's—published one of (if not *the*) first philosophical treatments of quantum mechanics. It is a sad fact (partly due to lack of an English translation) that Hermann's manuscript remains largely unexamined by many who study the foundations of quantum mechanics. What little is said of Hermann regarding philosophy of physics concerns her attempt to salvage Kantian causation in light of the new quantum theory (cf. Léna Soler's 1996 and 2009).

In this paper, I deepen our engagement with Hermann by exploring a different aspect of her 1935 manuscript—namely, the section devoted to Heisenberg's infamous gamma-ray microscope thought experiment. First, I examine the interpretation of the uncertainty relations and the dual nature of light underlying Hermann's treatment of the thought experiment. Secondly, I situate and account for Hermann's influence regarding these interpretational issues within the larger, more familiar account of this history.