

APR11-2011-020088

Abstract for an Invited Paper
for the APR11 Meeting of
the American Physical Society

Solvay 1927: Quantum Theory at the Crossroads

ANTONY VALENTINI, Clemson University

We reconsider the crucial 1927 Solvay conference in the context of current research in the foundations of quantum theory. Contrary to folklore, the interpretation question was not settled at this conference and no consensus was reached; instead, a range of sharply conflicting views were presented and extensively discussed. Today, there is no longer an established or dominant interpretation of quantum theory, so it is important to re-evaluate the historical sources and keep the interpretation debate open. The proceedings of the conference contain much unexpected material, and are remarkable for their clear identification of key issues that remain controversial to this day. After providing a general overview, we focus on the extensive discussions of de Broglie's pilot-wave theory, which de Broglie presented for a many-body system, including the much misunderstood critique by Pauli.