

# On Hamilton-Jacobi Theory as a Classical Root of Quantum Theory

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## Abstract

This paper gives a technically elementary treatment of some aspects of Hamilton-Jacobi theory, especially in relation to the calculus of variations. The second half of the paper describes the application to geometric optics, the optico-mechanical analogy and the transition to quantum mechanics. Finally, I report recent work of Holland providing a Hamiltonian formulation of the pilot-wave theory.

**Keywords:** Hamilton-Jacobi theory, calculus of variations, optico-mechanical analogy, pilot-wave theory, Hamilton, deBroglie, Holland.

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