

Abstract Submitted
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The Meanings of Einstein's Principle of Constancy of the Velocity of Light, 1905-1929. FELIX T. SMITH, SRI International — Within 4 months in 1905, Einstein published his fundamental papers on both the photon phenomenology of light—a particulate description—, and on special relativity, a development based entirely on the wave theory. On the wave side, to establish Lorentz invariance Einstein used the postulate P_1 , that the observed velocity of light is independent of the velocity of the source. He also drew on the accepted doctrine of electromagnetism and optics that c was a “universal constant” (not further defined) and combined that with P_1 as his strongly affirmed Principle of Constancy of the Velocity of Light (P_{CVL}). This principle has been thought of as combining the postulate P_1 with a subpostulate P_2 , that c is strictly invariant in space and time. The successes of special relativity made reliance on postulate P_1 less important over time, and deSitter's analysis of the light curves of double stars (1912) converted its physical content from an axiom to an experimental fact. Despite Pauli's reminder (1921) that a slowly time-dependent $c(t)$ is still compatible with Lorentz invariance, the Principle P_{CVL} rapidly became identified entirely with P_2 and c became dogmatically invariant. In 1929 this greatly influenced the interpretation of the Hubble red-shift distance relationship.

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