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## Re-examining the Foundations of Supergravity: The Spin-1/2 Sector

*Thursday 4 September 2025 15:00 (20 minutes)*

This talk explores the overlooked spin-1/2 sector of basic supergravity, challenging the long-standing view—present since the origins of supergravity in the late 1970s—that it is non-physical. We show that this belief arose from assuming the validity of the Dirac conjecture of the theory of constrained Hamiltonian systems. We demonstrate that the conjecture does not hold in this particular case, and that additional off-shell analyses allow us to conclude that the spin-1/2 sector actually propagates. This result explains why unconventional supersymmetry (USUSY) models by Alvarez, Valenzuela, and Zanelli make phenomenological sense. Finally, we discuss the implications for supergravity phenomenology and outline open questions and future research directions in this area.

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