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The Clouds of Physics and Einstein's Last Query: Can Quantum Mechanics be Derived from General Relativity? FRIEDWARDT WINTERBERG, University of Nevada, Reno — Towards the end of the 19^{th} century, Kelvin pronounced as the "clouds of physics", 1) the failure of the Michelson-Morley experiment to detect an ether wind, and 2) the violation of the classical mechanical equipartition theorem in statistical thermodynamics. And he believed that the removal of these clouds would bring physics to an end. But as we know, the removal of these clouds led to the two great breakthroughs of modern physics: 1) The theory of relativity, and 2) to quantum mechanics. Towards the end of the 20^{th} century more clouds of physics became apparent. They are 1) the riddle of quantum gravity, 2) the superluminal quantum correlations, 3) the small cosmological constant. Furthermore, there is the riddle of dark energy making up 70% of the physical universe, the non-baryonic cold dark matter making up 26% and the very small initial entropy of the universe. An attempt is made to explain the importance of these clouds for the future of physics and conjectures for a possible solution are presented. They have to do with Einstein's last query: "Can quantum mechanics be derived general relativity", and with the question is there an ether?

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