1065-05-223   **Simone Severini***, Department of Physics & Astronomy, University College London, London, WC1E 6BT. *A role for the Lovász theta function in Quantum Mechanics: entanglement assisted capacity and noncontextuality.*

The mathematical study of how much information can be transmitted without error, the so-called zero-error capacities, was initiated by Shannon in the 50s. Only in 1979, Lovász solved the major open problem of Shannon concerned with this topic. The solution is based on a famous object called Lovász theta function, which greatly contributed to the developments of areas of Mathematics like semidefinite programming and extremal problems in combinatorics. The Lovász theta function is an upper bound to the zero-error capacity, however it is not always tight. I will show that the function is also an upper bound to the zero-error capacity when the parties can share certain physical resources, and that this quantity can be greater than the classical one. Additionally, I will propose a physical interpretation of the Lovász theta function as the maximum violation of certain noncontextual inequalities. This is joint work with Adan Cabello (Sevilla), Runyao Duan (Tsinghua), and Andreas Winter (Bristol/Singapore). (Received September 14, 2010)