SUPERSYMMETRIC AND NON-SUPERSYMMETRIC QUANTUM MECHANICS. Marco Aldi, Department of Mathematics and Applied Mathematics, Virginia Commonwealth University. Supersymmetry is a feature of certain quantum systems that has been intensively studied by both physicists and mathematicians. We introduce explicit quantum-mechanical systems of fermions on (hyper)graphs that naturally enjoy supersymmetry. We show that the ground states in a specific sector of the Hilbert space encode ground states of certain non-supersymmetric Hamiltonians arising in the context of quantum computational complexity. We explore some applications of this correspondence to algebra and topology. (Supported in part by: VCU Quest Award “Quantum Fields and Knots: and Integrative Approach”). Author Contact: maldi2@vcu.edu.