Frustrated electrons on a triangular lattice in a molecular Mott system

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<u>Abstract:</u> The Pd(dmit)₂ (dmit= $C_3S_5^{2^-}$) molecule provides conducting anion radical salts, (Et_xMe_{4-x}Z)[Pd(dmit)₂]₂ (Et= C_2H_5 -, Me=CH₃-, Z=N, P, As, Sb; x=0, 1, 2). A common feature of these Pd(dmit)₂ salts is a conducting anion layer with a quasi triangular lattice of the dimer unit [Pd(dmit)₂]₂. The conduction band is half-filled and two-dimensional. At ambient pressure, the Pd(dmit)₂ salts in the Mott insulating state behave as spin-1/2 Heisenberg antiferromagnets. Depending on choice of the closedshell cations, frustrated electrons on the anion layer exhibit various types of exotic electronic states, including spin liquid state, charge order, and valence bond solid state. The Mott insulating state can be removed by the application of pressure, and the system turns metallic and (frequently) superconducting. I will overview this exotic show window of strongly correlated twodimensional electrons with frustration.