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Electronic Pair-Binding and Hund's Rule Violations in Doped C60[1] HONG-CHEN JIANG, Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, STEVEN KIVELSON, Department of Physics, Stanford University — We calculate the electronic properties of the t-J model on a C60 molecule using the density-matrix renormalization group and show that Hund's first rule is violated and that for an average of three added electron per molecule, an effective attraction (pair-binding) arises for intermediate values of t=J. Specifically, it is energetically favorable to put four electrons on one C60 and two on a second rather than putting three on each. Our results show that a dominantly electronic mechanism of superconductivity is possible in doped C60.

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