I will review developments which allow one to discretize a class of supersymmetric theory while preserving some supersymmetry at non-zero lattice spacing. This class includes N=4 Super Yang-Mills. The key idea is to discretize a topologically twisted formulation of the continuum theory which naturally possesses a scalar supercharge whose algebra can be preserved on the lattice. The availability of a lattice formulation of this theory allows one to investigate strong coupling phenomena away from the planar limit and to make contact with holographic predictions for gravitational systems.