Contribution Title:	SUPERSYMMETRIC VACUA AND QUANTUM INTEGRABILITY
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I review my recent work with N. Nekrasov on relation between supersymmetric gauge theories and quantum integrable systems. Supersymmetric vacua of two dimensional N=2 susy gauge theories with matter are shown to be in one-to-one correspondence with the eigenstates of integrable spin chain Hamiltonians. The Heisenberg spin chain is mapped to the two dimensional U(N) theory with fundamental hypermultiplets, the XXZ spin chain is mapped to the analogous three dimensional super-Yang-Mills theory compactified on a circle, the XYZ spin chain and eight-vertex model are related to the four dimensional theory compactified on a torus. The correspondence extends to any spin group, representations, boundary conditions, and inhomogeneity, it includes Sinh-Gordon and non-linear Schroedinger models as well as the dynamical spin chains such as the Hubbard model. Compactifications of four dimensional N=2 theories on a two-sphere lead to the instanton-corrected Bethe equations. We propose a completely novel way for the Yangian, quantum affine, and elliptic algebras to act as a symmetry of a union of quantum field theories.