Our local star produces powerful magnetic spots which cause explosive events like solar flares and coronal mass ejections. Recent observations from NASA’s Kepler mission, and others like it, show that this is common on almost all stars. Sun and starspots lead to adverse space-weather which can impact satellite operations, terrestrial power grid reliability, and the possibility of manned spaceflight beyond the Earth’s magnetosphere. But where do sunspots come from? Over 400 years of observations have provided empirical clues, but decades of theoretical efforts have failed to produce an analytic or semi-analytic model for a realistic spot-generating dynamo. Sunspots must originate in the deep interior where highly turbulent convection, rotation, stratification, and plasma processes combine to yield a complex, chaotic, highly non-linear environment which must then be ripe for the self-organization of magnetic structures. Once generated in the deep interior, these coherent magnetic structures must then transit the solar convection zone as buoyant magnetic loops and finally erupt through the surface to form spots. With the continued growth of computing power, the first hints of a successful model for the solar dynamo are to be seen using magnetohydrodynamic models of turbulent convective dynamo action in a solar-like environment. I will particularly focus on the first convective dynamo simulation to self-consistently generate the precursors to magnetic spots on sun-like stars.