In this talk I will report our recent discoveries of topological superconductivity and Majorana bound state in Fe-based superconductor Fe(Te, Se). We have obtained convincing ARPES evidence of superconducting topological surface state of Fe(Te, Se) single crystal with Tc ~ 14.5K. By using low-temperature STM on this material, we clearly observe a pristine Majorana bound state inside a vortex core, well separated from non-topological bound states away from zero energy due to the high ratio between the superconducting gap and the Fermi energy in this material. This observation offers a new, robust platform for realizing and manipulating Majorana bound states at a relatively high temperature.