The search for broken time reversal symmetry (TRSB) in unconventional superconductors intensified in the past year as more systems have been predicted to possess such a state. Following our pioneering study of TRSB state in Sr$_2$RuO$_4$[2], we embarked on a systematic study of several other system predicted to be candidate of such novel state. The primary instrument for our studies is the Sagnac magneto-optic interferometer which we recently developed. This instrument can measure magneto-optic Faraday or Kerr effects with unprecedented sensitivity of 10 nanorad at temperatures as low as 100 mK [1].

In this talk we will review our recent studies of TRSB in several systems, emphasizing the study of the pseudogap state of high temperature superconductors [3].