1089-78-230 **Natalia Vladimirova*** (nvladimi@unm.edu), **Gregory Falkovich** and **Pearson Miller**. *Phase transitions and collective oscillations in optical turbulence.*

We consider turbulence within the Gross-Pitaevsky model and look into the creation of a coherent condensate via an inverse cascade originated at small scales. The growth of the condensate leads to a spontaneous breakdown of statistical symmetries of over-condensate fluctuations: first, isotropy is broken, then series of phase transitions mark changing symmetry from two-fold to three-fold to four-fold. In real space this symmetry is observed as a pattern in over-condensate fluctuations with a short-range positional and long-range orientational order (like in a hexatic phase). The interaction of the condensate with wave turbulence results in periodical transfer of a small fraction of waves between the condensate and the turbulent part of the spectrum. We show that these oscillations are not of a predator-prey type as was suggested earlier; they are due to phase coherence between the pairs of counter-propagating waves (anomalous correlations) imposed by condensate. (Received February 15, 2013)