1049-35-25 **Thomas Chen** and **Natasa Pavlovic*** (natasa@math.utexas.edu), Department of Mathematics, University of Texas at Austin, 1 University Station, C1200, Austin, TX 78712. *The quintic NLS as the mean field limit of a Boson gas with three-body interactions.*

In this talk we will discuss the dynamics of a boson gas with three-body interactions in dimensions $d = 1, 2$. We prove that in the limit where the particle number N tends to infinity, the BBGKY hierarchy of k-particle marginals converges to a limiting (Gross-Pitaevskii (GP)) hierarchy for which we prove existence and uniqueness of solutions. The solutions of the GP hierarchy are shown to be determined by solutions of a quintic nonlinear Schrödinger equation. Our proof is based on, and extends, methods of Erdös-Schlein-Yau, Klainerman-Machedon, and Kirkpatrick-Schlein-Staffilani. (Received January 24, 2009)