Coherent Lattice Vibrations, Kohn Anomalies, and Pseudogaps in Superconductors ALAN M. KADIN, Princeton Junction, NJ — A recent analysis has proposed [1] that the superconducting state is associated with charge density standing waves at \( k=2k_F \), coupled to coherent lattice vibrations at \( 2k_F-G \), where \( G \) is a reciprocal lattice vector. Independently, Aynajian et al. [2] have recently observed phonon spectral anomalies in Nb and Pb that correspond to Kohn anomalies in the Fermi surface, at energies matching the low T energy gap \( 2\Delta(0) \). Since Kohn anomalies are also defined by \( k=2k_F-G \), these observations appear consistent with [1]. This also suggests that Kohn anomalies and an associated pseudogap provide a universal precursor of the superconducting state. Further experiments are proposed that should provide direct evidence of the coherent lattice vibrations in the superconducting state of conventional electron-phonon superconductors, and of alternative coherent oscillations (spin waves, etc.) in unconventional materials.