1019-57-123 **Ralph L Cohen*** (ralph@math.stanford.edu), Dept. of Mathematics, Stanford University, Stanford, 94305. *The Floer homotopy type of the cotangent bundle and string topology.*

Let M be a closed, smooth manifold, and T^*M its cotangent bundle, endowed with its canonical symplectic structure. In this lecture I will discuss the "Floer homotopy type" of T^*M and show it is homotopy equivalent to the free loop space of the underlying manifold, LM. This realizes, on a space level, results of Viterbo, Salamon-Weber, and Abbodandolo-Schwartz, stating that the Floer homology, $HF_*(T^*M)$ is isomorphic to the homology of the loop space, $H_*(LM)$. Using ribbon graphs, I will then generalize this idea to construct operations in $HF_*(T^*M)$, that in an appropriate sense correspond to counting holomorphic curves in T^*M. This again uses ideas of Abbodandolo-Schwartz. Our operations will be constructed on the space level, so that any homological invariant may be applied. I will then show that these operations correspond to operations in string topology, as constructed by Chas-Sullivan and others. (Received August 11, 2006)