1084-57-321 **Shelly Harvey*** (shelly@rice.edu) and **Danielle O'Donnol**. *Combinatorial Spatial Graph Floer Homology.*

A spatial graph is an embedding, f, of a graph G into S^3. For each balanced and oriented spatial graph with a transverse disk, $f(G)$, we define a combinatorial invariant $HFG(f(G))$ which is a bi-graded module over a polynomial ring in V variables, where V. The gradings live in $\mathbb{Z}$ and $H_1(S^3 \setminus f(G))$. This invariant is a generalization of combinatorial link Floer homology defined by Manolescu, Ozsvath, Sarkar (MOS) for links in S^3. To do this, we define a grid diagram for each such spatial graph and show that every embedding can be put into grid form. Following MOS, our invariant is the homology of a chain complex that counts certain rectangles in the grid. Although the chain complex depends on the choice of grid, the homology depends only on the embedding. We also define an Alexander polynomial for this type of spatial graph and show it can be obtained as the graded Euler characteristic of $HFG(f(G))$. This is joint work with D anielle O'Donnol (Imperial College London). (Received September 04, 2012)