1128-13-114 **Michael R DiPasquale*** (mdipasq@okstate.edu), 401 Math Sciences Building, Stillwater, OK 74078, and **Max Wakefield**. *Multi-derivations on the moduli of the X_3 arrangement.*

A central conjecture in the theory of hyperplane arrangements states that freeness of the module of derivations of a hyperplane arrangement is combinatorial (i.e. can be determined from its lattice of intersections). The main evidence for this conjecture is a celebrated result of Terao which implies that the exponents of a free arrangement are combinatorial. The corresponding statement is not true for multi-arrangements; there are simple examples due to Ziegler of free rank two multi-arrangements whose exponents are not combinatorial. In this talk we consider a non-free arrangement of rank three (the X_3 arrangement) and give a complete classification of free multiplicities for all arrangements in its moduli space. There are very few arrangements for which such a classification is known; this is the first such classification for a non-free arrangement or an arrangement with non-trivial moduli space. As a consequence, we have a simple example where freeness of a fixed multiplicity changes as we move through the moduli space. This is joint work with Max Wakefield. (Received February 19, 2017)