1096-03-2629 **Joshua A Cole***, jacole1@butler.edu. *A density question where the usual constructions haven't worked.*

A seemingly-hard open problem in computability theory is whether the lattice of Muchnik degrees of effectively closed subsets of Cantor Space is dense. That is, given $A < B$ in this lattice, is there always C such that $A < C < B$? ($X \leq Y$ if from every element of Y, one may effectively obtain an element of X.) Why is such a simple question unresolved, even though it has been settled in the affirmative for very similar structures studied by computability theorists? Priority arguments and forcing constructions are the typical techniques for answering questions in our lattice, but there are significant combinatorial barriers to the use of both methods for the question of density, suggesting the need for something new or improved. Another way to describe the problem is that it is difficult to mix the two types of strategies that seem to be necessary (in either a priority or forcing construction). Some of the author's published results in the study of mass problems, especially results about length of agreement functions in priority arguments, will be used to illustrate this point, as well as examples from the research of others. The current state of the question and partial results will also be covered. (Received September 17, 2013)