RANDOM PACKINGS OF SPHEROCYLINDERS. Tim Green, Dr. Scott Franklin*, Department of Physics, Granular Materials Lab, teg0099@rit.edu, svfsps@rit.edu.

Piles of large aspect ratio granular materials have a tendency to form solid plugs, becoming completely rigid. This phenomenon does not occur for lower aspect materials, such as sand and rice. This research is an attempt to link percolation to this rigidity transition by creating simulated random packings of spherocylinders (cylindrical rods with hemispherical end caps). Packings are created using a protocol developed by O'hern [2003]; rods are placed at random in a space and enlarged until they overlap. The conjugate gradient method is then used to find the nearest minimum energy state. Put another way, we find the least amount of rearrangements (translations + rotations of all rods) that removes the overlaps. This method continues until particle overlaps cannot be removed, at which point the pile has become connected. Quantities such as average coordination number, pressure, and normal vibrational modes of the dynamical matrix are studied in order to quantify the packing's rigidity.