1154-VT-250 **John C. Wierman*** (jwierma1@gmail.com), Dept. of Applied Mathematics & Statistics, 100 Whitehead Hall, Johns Hopkins University, Baltimore, MD 21218. *Progress on bounding site percolation thresholds of Archimedean lattices.* Preliminary report.

Percolation models are infinite random graph models which have applications to phase transitions and critical phenomena. In the site percolation model, each vertex in an infinite graph G is retained independently with probability p and deleted otherwise, while an edge is retained only if both of its endpoints are retained. Similarly, in bond percolation models, the edges are retained independently. The percolation threshold is the critical probability $p_c(G)$ such that if $p > p_c(G)$ there is positive probability that the random subgraph of retained elements has an infinite connected component, while the probability that all of its components are finite is one if $p < p_c(G)$. There are a few lattice graphs for which the site percolation threshold is exactly known, but rigorous bounds for unsolved lattices have been very inaccurate. The substitution method, which has been successful for computing relatively accurate bounds for bond percolation thresholds, is being adapted to site percolation models. Recent progress in improving rigorous bounds for site percolation on the Archimedean lattices, which are vertex-transitive tilings of the plane by regular polygons, will be surveyed. (Received August 27, 2019)