Motivated by the prospect of nano-robots that assist human physiological functions at the nanoscale, we investigate the coating problem in the 3D model for hybrid programmable matter.

In this model, a single active agent with a strictly limited viewing range and the computational capability of a deterministic finite automaton can act on passive tiles by picking up a tile, moving, and placing it at some spot.

The goal of the coating problem is to fill each node of some surface graph with a tile.

In this talk, we present a generalized algorithm for an agent that operates on a graph that is a triangulation with constant degree of a closed 3D surface in which the boundary of each node is a chordless cycle, and edges have constantly many possible orientations.

We show that for a restricted class of surfaces, the algorithm can be directly applied to the 3D hybrid model.

To realize the algorithm on any other surface of size n and degree Δ, we construct a virtual surface graph on which our algorithm can be emulated in $O(\Delta^2 n^2)$ steps using $2^{(2\Delta)}$ types of passive tiles.