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Self-assembly of Low-coordinated Ground States via Monotonic Pair Potentials ETIENNE MARCOTTE, FRANK H. STILLINGER, SALVATORE TORQUATO, Princeton University — Monotonically decreasing radially symmetric pair potentials can lead to the self assembly of unusual low-coordinated ground states. The states include, but are not limited to, the square, honeycomb, and simple cubic crystals in two and three-dimensional Euclidean spaces R^2 and R^3 . We can determine optimal potentials for targeted ground states using inverse statistical mechanical techniques. Using a linear programming method, we are able to search over a wide parameter space while still enforcing constraints such as monotonicity and convexity on optimized potentials. The features present in the classes of short-ranged potentials that conform to these constraints suggest sufficient requirements for colloids to self assemble into a desired ground state.

Prefer Oral Session
 Prefer Poster Session

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