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Equilibrium and non-equilibrium aggregation in two dimensional systems with competing interactions MAHESH BANDI, TAMOGHNA DAS, OIST Graduate University — A two dimensional system of mono-disperse particles with competing short range attraction and long range repulsion is numerically investigated. Keeping the competing interaction strength fixed at low temperature and density, a dynamical transition from an equilibrium to a non-equilibrium state can be achieved by tuning the repulsion length alone. This is accompanied by a structural transition from non-compact (equilibrium) to compact (non-equilibrium) aggregates. Whereas strong bonding is responsible for non-compact cluster formation, caging dynamics in compact clusters result in non-exponential relaxation characteristic of glassy behaviour. With increasing temperature, the non-equilibrium aggregation gives way to an ergodic liquid. With increasing density, the system undergoes a geometric transition into a percolating gel state, independent of temperature and repulsion length.

Mahesh Bandi
OIST Graduate University

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