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**Dynamics across the morphological transition in two-dimensional aggregates**[1] MAHESH BANDI, TAMOGHNA DAS, OIST Graduate University — Microscopic dynamics of two-dimensional aggregates have been studied by analysing simulated particle trajectories generated by molecular dynamics. Tuning the competition between the short-range attraction and long-range repulsion in a particulate system at fixed temperature and density results in a continuous non-compact to compact morphological transition. The finite-size aggregates, obtained by very slow cooling, show long-time sub-diffusive behaviour irrespective of their morphologies. By analysing the relative displacement fluctuations of particles with respect to their nearest neighbours, non-compact aggregates can be attributed to bonding between particles while caging is found to be responsible for compact clusters. These dynamical mechanisms are further illustrated by the self-displacement fluctuation of particles which show a continuous change from power-law to exponential behaviour across the non-compact to compact transition.

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Mahesh Bandi
OIST Graduate University

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