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Dynamics of particles and defects on spherical crystals RODRIGO GUERRA, COLM KELLEHER, PAUL CHAIKIN, New York Univ NYU — Repulsive particles confined to two dimensions can form nearly perfect crystals that melt via the well-know Kosterlitz-Thouless two-step process. By contrast, when identical particles are confined to the surface of a sphere, the curvature and topology of the surface distorts the crystal lattice and forces it to accommodate point-like disclinations and chains of dislocations. Extensive numerical and theoretical investigation has shown that these extended scars are intrinsic to the ground-state-energy configuration of these packings, as they relieve some of the stress induced by the curvature of the surface. Nevertheless, the effect of these defects on the kinetics and phase behavior of spherical crystals is not at all well understood. Here we present results of computer simulations and experiments that suggest that these scars facilitate the motion of particles close to them and fundamentally alter the nature of the mobility and liquid-to-solid transition of packings of particles confined to spherical surfaces.

Rodrigo Guerra
New York Univ NYU

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