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Glassy Dynamics in the Rotator Phase of Two-Dimensional Janus Crystals JING YAN, SHAN JIANG, JONATHAN WHITMER, STEPHEN ANTHONY, ERIK LUIJTEN, Department of Materials Science and Engineering and Department of Engineering Sciences and Applied Mathematics, Northwestern University, STEVE GRANICK, Departments of Materials Science and Engineering, Physics, and Chemistry — Janus particles, spheres with two different sides, represent the simplest building blocks whose interparticle interaction is orientation dependent. When confined on regular lattices, they epitomize basic physical problems from the arrangement of spins in magnetic materials, to rotating molecules in plastic crystals. Here we study both in experiment and in simulation, the heterogeneous dynamics in a two-dimensional crystal of amphiphilic Janus spheres. Single particle tracking reveals that orientation along can generate phenomenology resembling conventional translational supecooled liquids and glasses. Characteristic cage break events, which requires anti- correlated rotation of particles sitting on neighboring lattices, were indentified and characterized in detail. Recent experiments aiming at selectively perturbing the system using external field, such as magnetic field, will also be discussed.

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