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**Shear alignment and orientational order of shape-anisotropic grains** RALF STANNARIUS, SANDRA WEGNER, University of Magdeburg, BALÁZS SZABÓ, TAMÁS BÖRZSÖNYI, Hungarian Academy of Sciences, Budapest — Granular matter research was focused for a long time mainly on ensembles of spherical or irregularly shaped grains. In recent years, interest has grown in the study of anisometric, i.e. elongated or flattened particles [see e. g. Börzsönyi, Soft Matter 9, 7401 (2013)]. However, many related phenomena are still only little understood, quantitative experiments are scarce. We investigate shear induced order and alignment of macroscopic shape-anisotropic particles by means of X-ray computed tomography. Packing and orientation of individual grains in sheared ensembles of prolate and oblate objects (ellipsoids, cylinders and similar) are resolved non-invasively [T. Börzsönyi PRL 108, 228302 (2012)]. The experiments show that many observations are qualitatively and even quantitatively comparable to the behavior of well-understood molecular liquid crystals. We establish quantitative relations between aspect ratios and shear alignment. The induced orientational order influences local packing as well as macroscopic friction properties.

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