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Impact and crater formation in an inhomogeneous granular medium PHILIP DREXLER, Haverford College, NATHAN KEIM, PAULO ARRATIA, University of Pennsylvania — Non-circular impact crater shapes, including polygons, have been observed on many terrestrial planets as well as moons and asteroids. In this talk, we investigate how the impact of a spherical projectile on a granular bed (sand) is affected by inhomogeneity of the bed. To create inhomogeneity, we locally inject nitrogen gas beneath the bed to balance the hydrostatic pressure of the sand. Our experimental results show that in low energy impacts and when the inhomogeneity is within two ball diameters of the impact, the sphere is deflected and rotated, and the resulting crater is non-circular. We characterize these behaviors as a function of drop height and location of the impact relative to the inhomogeneity, and we relate our findings to a model of forces in granular impact.

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