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The role of substrate wetting and drop shape in splashing dynamics ANDRZEJ LATKA, SIDNEY NAGEL, James Franck Institute, University of Chicago, Chicago, Illinois 60637, USA — The impact of a liquid drop on a solid surface yields a beautiful splash via an intricate interaction of the liquid, the substrate and, most surprisingly, the surrounding air. Varying the liquid's viscosity or surface tension and the substrate's roughness or elasticity results in strikingly different splash morphologies. While one might also have expected the wetting properties to affect splashing, we show here that changing the substrate from fully wetting to non-wetting does not significantly alter the splashing behavior. We also investigate how the drop's evolving shape influences the dynamics. When the drop first contacts the surface, there is a region of high negative curvature; the bulk of the descending liquid must feed the sheet rapidly spreading over the substrate by flowing around this concavity. After the drop has spread sufficiently, this concavity disappears and the flows within the drop change their shape. We find that the effect of air on splashing is significantly stronger in the initial regime. This dependence sheds light on low-velocity drop impacts.

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