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Universal Microstructure of Jammed Packings in Higher Dimensions ERIC CORWIN, Department of Physics and Material Science Institute, University of Oregon, Eugene, Oregon 97403, PATRICK CHARBONNEAU, Department of Chemistry and Department of Physics, Duke University, Durham, North Carolina 27708, FRANCESCO ZAMPONI, LPT, École Normale Supérieure, UMR 8549 CNRS, 24 Rue Lhomond, 75005 France — Jammed packings' mechanical properties depend sensitively on their detailed local structure. We simulate the structure of jammed packings of frictionless spheres over a range of spatial dimensions d=3-10 using a variety of preparation protocols for both hard and soft spheres. We provide a complete characterization of the pair correlation close to contact and of the force distribution. We find that even as the density for jamming depends strongly on the packing protocol there nevertheless exist universal scaling relationships that hold true for all jammed packings. These relationships connect the behavior of particles participating in the mechanical structure of the packing and particles that bear no force but are almost in contact.

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