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Jamming in attractive soft spheres[1] BRIAN TIGHE, DION KOEZE, LINGTJIEN HONG, ABHISHEK KUMAR, TU Delft — While jamming is best understood in the context of purely repulsive soft spheres, emulsions and other experimental realizations of the soft sphere model commonly display weakly cohesive forces. We perform simulations of soft spheres with a finite-ranged attractive tail in the pair potential. The resulting attractive soft sphere packings can be stable at volume fractions below the purely repulsive jamming point. These new jammed states have counter-intuitive properties – for example, while attraction introduces tensile forces, their presence leads to an increase in the compressive stress. We use critical scaling analysis to characterize the geometry and mechanics of attractive soft sphere packings as a function of both the volume fraction and the range of the attractive interaction.

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Brian Tighe
TU Delft

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