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Diagnosing the hyperuniformity of two-dimensional jammed packings of spheres[1] REMI DREYFUS, Centre National de la Recherche Scientifique, YE XU, University of Pennsylvania, SALVATORE TORQUATO, University of Princeton,, ARJUN YODH, University of Pennsylvania — In the colloidal domain, ascertaining the degree to which disordered jammed structures are hyperuniform is gaining interest because the hyperuniformity property (vanishing of infinite-wavelength density fluctuations) seems to endow the jammed structure with novel physical properties. Indeed, it has recently been shown that hyperuniform disordered structures can be produced to exhibit a complete photonic bandgap. However, determining whether a 2D packing of spheres is hyperuniform or not is non-trivial, especially from experimental datasets where imperfection exists. In this talk, we will use numerical simulations and experimental investigations to show how we can diagnose whether a packing is hyperuniform or not.

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Remi Dreyfus
Centre National de la Recherche Scientifique

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