



**Inverse design of the octagonal quasicrystal in a non-additive hard-disk mixture using the symmetry-based order parameter.**

(a) Evolution of the mean fitness during the inverse design protocol. (b) Evolution of the design parameters, size ratio  $q = \sigma_S/\sigma_L$ , small species composition  $x_S$ , and packing fraction  $\eta$ , for the inverse design of the QC8 using the symmetry-based fitness function. Each dot represents a sample from a specific generation. The dotted lines are the bounds imposed for the optimization problem. (c) Typical configuration snapshot of a octagonal quasicrystal obtained during the last generation. (d) Diffraction pattern of the configuration in (c).