Disordered hyperuniform configurations from artificial atoms to exotic 2D materials

Ü. Seleme Nizam[1,2], Sercan Hüsnügil[3], Muhammed H. Güneş[3], Danial Vahabli[4], Michaël Barbier[1], Ghaith Makey[1,3], Yusuf Özer[3], Serim Ilday[1,*]

1 UNAM-National Nanotechnology Research Center & Institute of Materials Science and Nanotechnology, Bilkent University, Ankara, 06800, Turkey

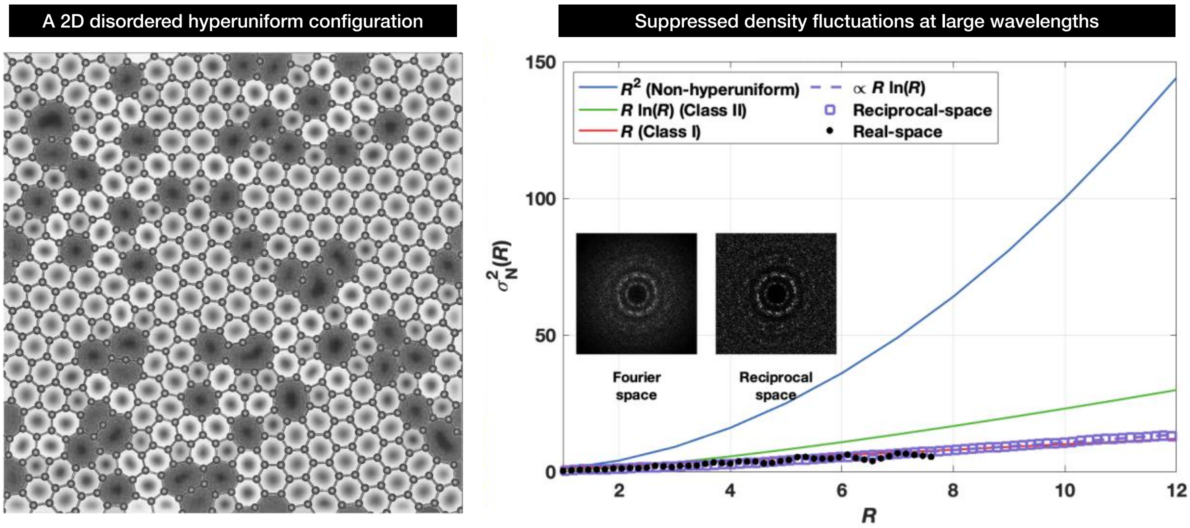
2 Department of Physics, Boğaziçi University, Istanbul, 34342, Turkey

3 Department of Physics, Bilkent University, Ankara, 06800, Turkey

4 Department of Physics, Middle East Technical University, Ankara, 06800, Turkey

[*]Corresponding author e-mail (serim@bilkent.edu.tr)

Disordered hyperuniform configurations [1,2] of a material are statistically isotropic but able to suppress density fluctuations at large length scales (long wavelengths), similar to periodic crystals, but with no Bragg peaks. These exotic configurations exhibit interesting properties, explored for various device applications, showing significantly and consistently better performance than their crystalline counterparts [3–8]. Unfortunately, these configurations have been fabricated mainly using additive manufacturing or chemical etching techniques. We recently provided evidence that it is possible to self-assemble disordered hyperuniform configurations with the flexibility of visiting various hyperuniform configurations [9]. Here, I will speculate on the exciting prospects of using our universal dissipative self-assembly methodology to create 2D disordered configurations atom-by-atom from an extensive material library.



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