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On the Anderson localization conjecture in Dusty Plasma CONSTANZE LIAW, KYLE BUSSE, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — In 1958, Anderson suggested that sufficiently large impurities in a semi-conductor could lead to spatial localization of electrons. This idea unfolded into the field of Anderson Localization, one of the most fascinating phenomena in solid-state physics as it plays a major role in the conductive properties of imperfectly ordered materials. The *Anderson Localization Conjecture* claims that random disorder of any strength causes localization of electrons in the medium. The problem has proven to be highly non-trivial. Over the years the community has argued whether spatial localization occurs in 2D for small impurities. From a mathematical standpoint, the conjecture is still considered an open question. In 2013, Liaw challenged the commonly held assumption that localization holds in 2D by introducing a new mathematically more rigorous method to test for extended states, and applying it to the discrete random Schrödinger operator. One of the advantages of the underlying method is its versatility. It can be applied to any ordered system such as colloids, crystals, and atomic lattices. In a cross-disciplinary effort we merge this method with a numerical code used to simulate 2D physics systems, in preparation for experimentally testing the theory against complex plasma crystals.

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