

Abstract Submitted
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Critical Point Transitions between Dust Particle Structures in a Complex Plasma.¹ TRUELL HYDE, LORIN MATTHEWS, JIE KONG, KE QIAO, JORGE CARMONA-REYES, MUDI CHEN, ZHIYUE DING, EVA KOSTADINOVA, BO ZHANG, CASPER, Baylor University — In 1934 Wigner predicted theoretically that a gas of electrons, in which the kinetic energy was comparable to the average potential energy, would form a symmetric structure (i.e., a crystalline phase) at some critical value of the ratio of these energies. Since this time, various Wigner structures have been observed experimentally on Earth, for example, the electron structures (Wigner ‘islands’) observed floating on the surface of superfluid helium. To date, most experimentally observed Wigner clusters have assembled in the presence of external system confinement, making the fundamental physics behind these correlation driven effects surprisingly difficult to determine. In this talk it will be argued, using experimental data collected in a complex plasma, that there is a basis set of fundamental parameters which determine the critical point transition for a known set of operating conditions.

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