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When Charge Quantization Leads to the Halon Effect -Part I(ONLINE presentation)

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Under certain circumstances, a quasiparticle (or a static impurity) with a sharply defined integer particle charge becomes the so-called halon: It features a bimodal spatial charge distribution, with a small core and a halo of an arbitrarily large—critically divergent—size. I will discuss two distinctively different types of halons. The first type takes place at the point of a fluctuational quantum phase transition (for example, superfluid—Mott-insulator transition in two dimensions). The second type is a mobile Fermi polaron of large mass.

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