1154-35-1496 **Robert Buckingham*** (buckinrt@uc.edu), Department of Mathematical Sciences, University of Cincinnati, Cincinnati, OH 45221. *Multiple-pole solutions of the nonlinear Schrodinger equation.*

The focusing nonlinear Schrodinger equation admits pure soliton solutions whose spectral data consists of poles of arbitrary order. If N is the pole order, these solutions qualitatively resemble N solitons approaching a single point, interacting, and separating again. Using the nonlinear steepest-descent method, we carry out the first analysis of the large-order asymptotic behavior of such solutions. These multiple-pole solitons exhibit a remarkable degree of structure, including a near-field limit with rogue-wave-type behavior described by Painleve functions, and a far-field limit with decaying, non-oscillatory, and oscillatory regions. We give explicit formulas for the leading-order behavior in each of these regimes. This is joint work with Deniz Bilman and Dengshan Wang. (Received September 15, 2019)