Global Bifurcation of Surface Capillary Waves on a 2D Droplet

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Date: Apr 4, 2024
Time: 3:00 PM
Room: MSCS 514

Abstract: The existence of steady traveling waves bifurcating from a flat surface is a classical problem in water wave theory. The well-known Stokes waves form a global continuum of periodic steady gravity waves which approach a limiting singular solution with a 120° angle at the top. Recently, Dyachenko et al. obtained numerical works suggesting a different branch of solutions bifurcating from a circular droplet in 2D. In this talk, we show a rigorous global bifurcation result constructing a set of such solutions. The obtained solutions are steady surface capillary waves in 2D, and have $m$-fold rotational symmetry. This is joint work with Gary Moon.