

2026-2027 Erdős Colloquium



Speaker: Manuel del Pino, University of Bath, UK

Opening remarks by Kevin Knudson, Interim Associate Dean, CLAS, UF

Monday, September 14, 2026, 3:00-3:50 PM, Room TBA; Refreshments at 2:30 PM in LIT 339

Compact Equilibria in the Liquid Drop Model

Abstract: This work addresses the liquid drop model, introduced by Gamow in 1930 and Bohr–Wheeler in 1939, to describe the structure of atomic nuclei in nuclear physics. The problem involves finding a surface in three-dimensional space that is critical for a specific energy functional, balancing surface tension and nonlocal repulsion, subject to a volume constraint. Spherical solutions always exist and minimize the energy for sufficiently small volumes. However, for larger volumes, constructing non-minimizing critical points becomes more challenging. In this study, we present a new class of large-volume solutions, resembling “pearl collars” arranged along an axis in the shape of a large circle, with geometry close to Delaunay’s unduloids—surfaces of constant mean curvature. We also construct non-minimizing solutions with small mass that resemble two nearly identical spheres connected by a narrow neck. This is joint work with Mónica Musso, Andrés Zúñiga, and Rupert Frank.

About the speaker: Manuel del Pino is a Chilean mathematician and Professor of Mathematics at the University of Bath, internationally recognized for his contributions to nonlinear partial differential equations and singularity formation. He received his undergraduate degree from Universidad de Chile in 1987 and his Ph.D. in Mathematics from the University of Minnesota in 1992. After postdoctoral positions at the Institute for Advanced Study and the University of Chicago, he joined the faculty at Universidad de Chile, where he became a professor in 2002. He was an invited speaker at the 2010 International Congress of Mathematicians in Hyderabad and has been a member of the Chilean Academy of Sciences since 2010. In 2018, he became a Professor of Mathematics at the University of Bath and was awarded a Royal Society Research Professorship.

About the Erdős Colloquium: Paul Erdős (1913-1996) was one of the most renowned mathematicians of the 20th century. Between 1973 and 1996, he was a frequent visitor to the University of Florida. In 1998-99, under the leadership of Chair Krishnaswami Alladi, the Department of Mathematics established the annual Erdős Colloquium Lecture Series in pure mathematics at the University of Florida.