

Title: Computational complexity of steady fluid flows in Euclidean space

Abstract: Beltrami fields are the most flexible solutions to the stationary Euler equations. They cannot only exhibit arbitrary topological or dynamical complexity, but they are powerful enough to simulate a universal Turing machine. In this lecture I will present the recent construction of a Beltrami flow in Euclidean space that is Turing complete. Far from being a bizarre phenomenon, this occurs with probability one, but it requires an infinite amount of energy, which is consistent with the tape bounded Church-Turing thesis. This is based on joint work with Robert Cardona and Eva Miranda.