Title: Time-Optimal Control of a Three-Spin Chain

Abstract: The problem of designing time-optimal controls for an NMR three-spin chain is a linear control problem (zero drift). Solution curves for this problem are sub-Riemannian geodesics on the Lie group SO(4). This talk will present the Euler system for this control problem and the method for lifting solution curves in coadjoint orbits to the full state space, as well as progress towards explicit solutions in closed form. This work is supported by the Army Research Laboratory at Adelphi, Maryland, under the direction of Dr. Howard Brandt.