1164-37-15 **Jacob Bedrossian** and **Alex Blumenthal***, ablumenthal6@gatech.edu, and **Samuel Punshon-Smith**. *Fisher information and Lyapunov exponents of weakly dissipative, weakly driven stochastic differential equations.*

The Lyapunov exponent measures the rate at which nearby initial conditions of a dynamical system converge or diverge: a positive exponent, indicating divergence, is a classical hallmark of chaotic behavior. Unfortunately, it can be profoundly difficult to estimate the Lyapunov exponents of dynamical systems of physical interest. On the other hand, for volume-preserving systems subjected to random noise, positivity of the Lyapunov exponent must hold unless some severe degenerate behavior is present (due to work of Furstenberg and many others). A significant drawback of this theory is that it provides no quantitative estimate of Lyapunov exponents, only positivity. In this talk, I will discuss recent work with J. Bedrossian and S. Punshon-Smith providing a new, more quantitative perspective on Furstenberg-type criteria for Lyapunov exponents for SDE using a Fisher information-type identity and a quantitative re-working of aspects of Hormander's hypoellipticity theory. As an application, we are able to establish positivity of the Lyapunov exponent for a class of systems subjected to weak dissipation effects (e.g., drag, viscosity), including the Lorenz 96 system with arbitrarily many oscillators. (Received December 14, 2020)