

Avalanches in particulate matter: simulations, topology & machine learning

(ARO proposal pending: PI: Kondic)

This project seeks to understand stick-slip dynamics in granular materials using carefully chosen systems in two and three dimensions. This project is carried out in collaboration with experimental scientists at Duke and computational topology group at Rutgers university. NJIT part of the projects involves carrying out simulations and data analysis characterizing stick-slip dynamics across the broad range of relevant length and time scales. The simulations are based on molecular dynamics/discrete elements computations that have been developed at NJIT. More information about ongoing project is available at the [CFSM page](#). Data analysis techniques include modern methods based on computational topology and will include development of machine learning-based algorithms for the purpose of predicting avalanches. The described project is based on the research that has been carried out at NJIT since 2008 under the support by NSF and DARPA.