



Partial Differential Equations and Applied Mathematics Seminar

Phantom Traffic Jams, Autonomous Vehicles, and the Future of Traffic Modeling.

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A fundamental feature of traffic flow is the fact that stop-and-go traffic waves can arise even in the absence of discernable causes (such as obstacles or bottlenecks). We first show how this “phantom traffic jam” phenomenon can be explained via instabilities in different types of traffic models. Then we investigate the question, how the insertion of autonomous vehicles onto the roadways will affect dynamic phenomena such as instabilities and traffic waves. In particular, we study the situation in which only a small percentage of the flow is automated, while the vast majority of vehicles remains human-controlled (the near future). We show how the impact of such vehicles on traffic (in)stability can be modeled, and then present the results from an actual traffic flow experiment. We close with an outlook on how traffic flow on our roadways is about to change fundamentally, and how this will greatly affect traffic modeling at the interface of applied mathematics and engineering.

Friday, October 20th, 2017 at 11AM.
Korman Center, Room 245.

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