

## **Conservation law models of traffic flow: Optimization and game equilibria.**

Speaker: **Alberto Bressan**

Affiliations: Eberly Family Chair Professor of Mathematics  
Director, Center for Interdisciplinary Mathematics  
Mathematics Department, The Pennsylvania State University

Webpage: <http://personal.psu.edu/axb62/>

The first lectures will review various macroscopic models of traffic flow, on a single road and on a network of roads. In particular, we shall consider

(i) non-local models, where the velocity of each driver depends on a weighted average of the traffic density ahead, and

(ii) road junction models, where the traffic flow at the intersection is regulated by the presence of a buffer.

In connection with these conservation law models, two cost functions can be introduced, penalizing early departure and late arrival, for each driver.

This leads to a global optimization problem, where the departure times of the various drivers should be scheduled in order to minimize the sum of all travel costs. In addition, it is also of interest to find equilibrium solutions, where no driver can reduce his own cost by changing departure time or route to destination.

Results on the existence and characterization of these solutions will be discussed, together with open problems.