Speaker: **Vladimir Itskov**
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Title: **: The geometry of memory patterns in recurrent networks**

Abstract:

The allowed patterns of activity among neurons in a recurrent network are constrained by both the structure of inputs and the structure of recurrent connections. One can think of a recurrent network as a gating device that allows only certain patterns of activity in response to feedforward input. In this framework, allowed memory patterns correspond to stable fixed points of the recurrent network dynamics. The set of neurons co-activated at a stable fixed point is called a stable clique.

We study the relationship between coarse network properties and the combinatorics of stable cliques (memory patterns) associated to recurrent networks. This requires a geometric study of stable submatrices, and our results make unexpected connections to discrete and convex geometry.

This is a joint work with Carina Curto and Anda Degeratu.