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**Excursion sets, peaks and multipole moments:  
connecting the large scale structure and the  
velocity field**

Friday, 28 April 2017, 11:30

Room A304

I will present recent developments in the analytical methods to predict abundance, clustering and bias of Dark Matter halos. In standard analytical approaches, halos are identified either with sufficiently high peaks of the matter density field, or with the largest spheres enclosing sufficiently high density. I will revise the physical assumptions leading to this standard picture, and argue that halos should instead be defined as locations of convergence of the velocity field. Together with a simple model of collapse, this assumption leads to a surprisingly rich structure. This allows to make simple - yet remarkably accurate - analytical predictions for halo statistics, a necessary ingredient on the road to precision cosmology.