



**Conference on Long-Range Interacting Many-Body Systems:
from Atomic to Astrophysical Scales
(25 - 29 July 2016)**

Venue: ICTP Leonardo da Vinci Building - Budinich Lecture Hall
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Title:

Self-gravitating systems and cosmological structure formation

Speaker:

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Abstract:

I will give a brief overview of the problem in cosmology of the formation of the "large scale structures" in the universe, and describe the regulated Newtonian problem which provides an excellent approximation to it over a large range of spatial and temporal scales. I will then sketch first some of the essential analytical results for typical cosmological initial conditions, and subsequently summarise the main results emerging from large numerical simulations and some of the important open problems concerning them. In a final part I will describe one dimensional toy model versions of the full three dimensional problem, which despite their simplicity reproduce most of the essential qualitative features of the real problem.