



**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:

**Long-range systems with nonequivalent ensembles**

Speaker:

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Abstract:

The problem of determining whether the microcanonical (fixed energy) ensemble and the canonical (fixed temperature) ensemble give the same predictions has a long history in statistical mechanics. I will present in this talk the theory that surrounds this problem and its applications to long-range systems having a nonconcave entropy function in the thermodynamic limit. This property, as will be seen, is the main property determining the equivalence of ensembles at the three levels commonly considered in statistical mechanics, namely, the level of thermodynamic functions, equilibrium states, and probability distributions.