



## *colloquia@iasi*



*"La mente è come un paracadute.  
Funziona solo se si apre"  
A. Einstein*

### **Some Stochastic Models in Mathematical and Systems Biology And why they are all wrong!**

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#### Abstract

The first part of this talk will be devoted to the definition and analysis of some simple stochastic models concerning some models of interest in mathematical biology under extrinsic stochastic fluctuations, with main focus on infectious diseases.

Where possible, we apply analytical methods.

In the second part of this talk we will show that the models proposed in its first part... are "wrong" and we propose more realistic models and inferences.

In the third part of this talk we will focus on first—order phase transitions in models that are non-spatial and scalar: a phenomenon very different from the Horsthemke & Lefever's noise—induced transitions.

#### Bibliography

[1] P. Manfredi and A. d'Onofrio (eds). Modeling the interplay between human behavior and the spread of infectious diseases. Springer, New York, 2013.

[2] Wang, Z., Bauch, C. T., Bhattacharyya, S., d'Onofrio, A., Manfredi, P., Perc, M., Perra, N., Salathe, M., Zhao, D. (2016). Statistical physics of vaccination, Physics Reports 664, 1-113.

[3] A.d'Onofrio (ed) Bounded Noises in Physics, Biology and Engineering. Birkhauser (2013)