

THE CRM APPLIED MATHEMATICAL PHYSICS (CAMP) SEMINARS



CENTRE DE RECERCA MATEMÀTICA

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History-dependence, Sample Space Reducing processes and the emergence of generalised scaling exponents

Abstract:

From complex networks to critical phenomena, scaling laws emerge in a somehow regular way, and the comprehension of the mechanisms behind scaling patterns has become one of the hot topics of modern statistical physics. In this talk I will show how history- or path-dependence is deeply linked with the scaling patterns observed in many complex systems in which the path described through their evolution is often constraining their future space of alternatives. The link between scaling and history dependence will be provided by the recently developed theory of Sample Space Reducing (SSR) processes.

SSR processes are a totally new route to scaling based on the unique assumption that the phase space reduces as long as the process unfolds. SSR processes reveal a source of many interesting phenomena, among which it is worth to highlight the extreme resilience of scaling exponents (specially, Zipf's law) under disparate configurations of the system, which would lead into extremely different outcomes if the process would consist in a sequence of independent events. Applications of the theory of SSR comprise diffusive phenomena in complex networks, or avalanche phenomena.

Date: February 8, 2017

Place: Room C1/028

Time: 15:00

