Dynamical systems

The research activity is focused on statistical properties of dynamical systems, in a wide perspective, encompassing both deterministic and stochastic evolutions.
While we have reached quite a profound understanding of important cases (regular *integrable* systems, or fully chaotic *unstable* models) the behaviour in between is still rich of open problems, of physical significance, since this *middle land* is thought to be generic. The same situation appears in the stochastic setting, when we modify the picture of simple random walks, for instance. A typical signature of this intermediate situation is the occurrence of *anomalies*, like long time tails, ergodicity breaking, anomalous transport and so on. A more detailed understanding of these features would not only enrich our mathematical understanding of dynamics: as a matter of fact anomalous behaviour has been observed in a huge variety of contexts, from animal foraging to migration of cell constituents, from epidemic spreading to fluctuations in stock markets.

Detailed research proposals may be found at the link
http://www.dfm.uninsubria.it/artuso/Roberto_web_page/theses.html

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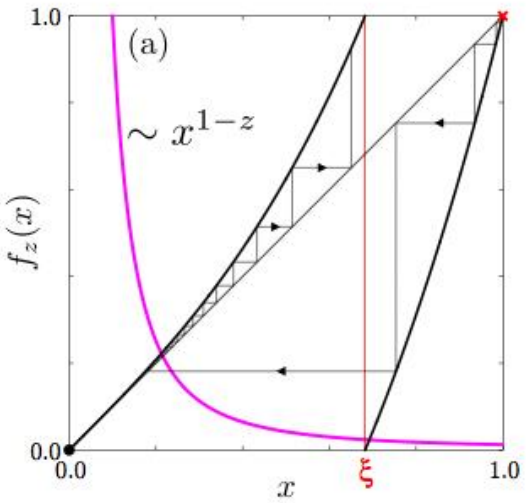

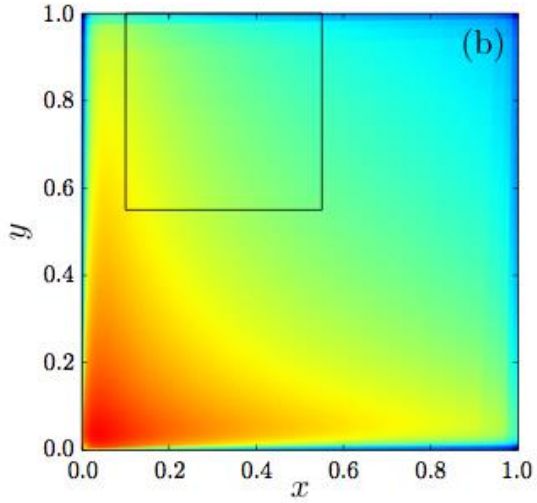

http://www.dfm.uninsubria.it/artuso/Roberto_web_page/home.html
A weakly chaotic map — Coupled intermittent map: phase space

References:

- M. Sala, R. Artuso and C. Manchein, Anomalous dynamics and the choice of Poincaré recurrence set, Phys.Rev. E94, 052222 (2016)
- R. Artuso, C. Manchein and M. Sala, Correlation decay and large deviations for mixed systems, arXiv:1601.02921
- M. Sala and R. Artuso, Explicit Oseledets' splitting for Standard-like maps, Chaos 25, 023113 (2015)

- R. Artuso, G. Cristadoro, M. Degli Esposti and G.S. Knight, Sparre-Andersen theorem with spatiotemporal correlations, Phys.Rev. E89, 052111 (2014)
- R. Artuso and R. Burioni, Anomalous Diffusion: Deterministic and Stochastic perspectives, in A. Vulpiani, F. Cecconi, M. Cencini, A. Puglisi and D. Vergni (Eds.), Large Deviations in Physics, Springer Lect.Notes Phys. 885, Springer, Berlin, 2014