



Optimization on networks

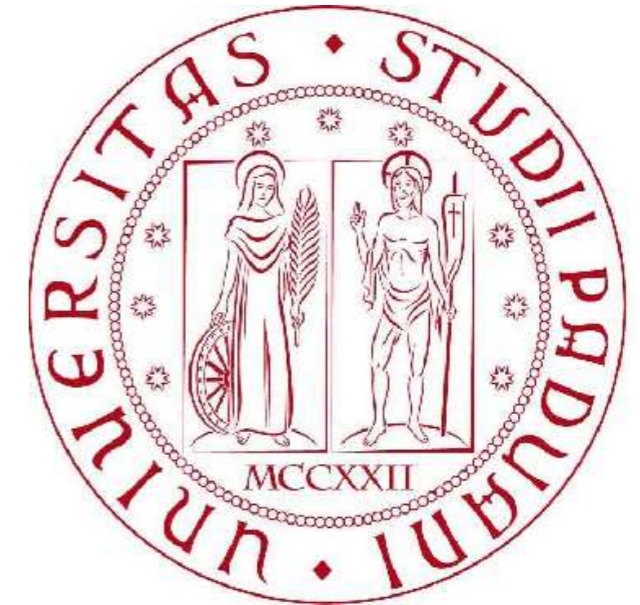
via message-passing algorithms

Caterina De Bacco

Supervisors: Prof. Silvio Franz and Prof. Satya Majumdar

Personal background

- **M.Sc:** 2010-12, University of Padua.
- **Erasmus:** 2011, Imperial College London.
- **B.Sc:** 2007-10, University of Padua.
- **Summer internship:** Summer '11, Centrica Energy, London.



Imperial College
London

centrica

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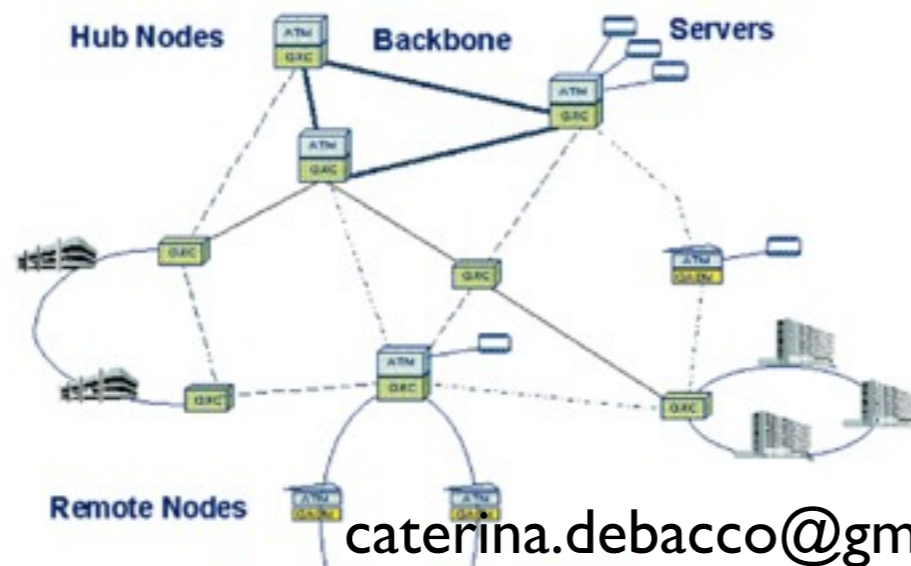
Current projects

● Traffic Optimization on networks:

- Supervisor: Prof. Silvio Franz
- Collaborations: Prof. D. Saad, B. Yeung (Aston) + Prof. R. Zecchina's group (Politecnico di Torino)

● Applications

- Transportation networks
- Wireless communication (optical networks)
- Circuit design



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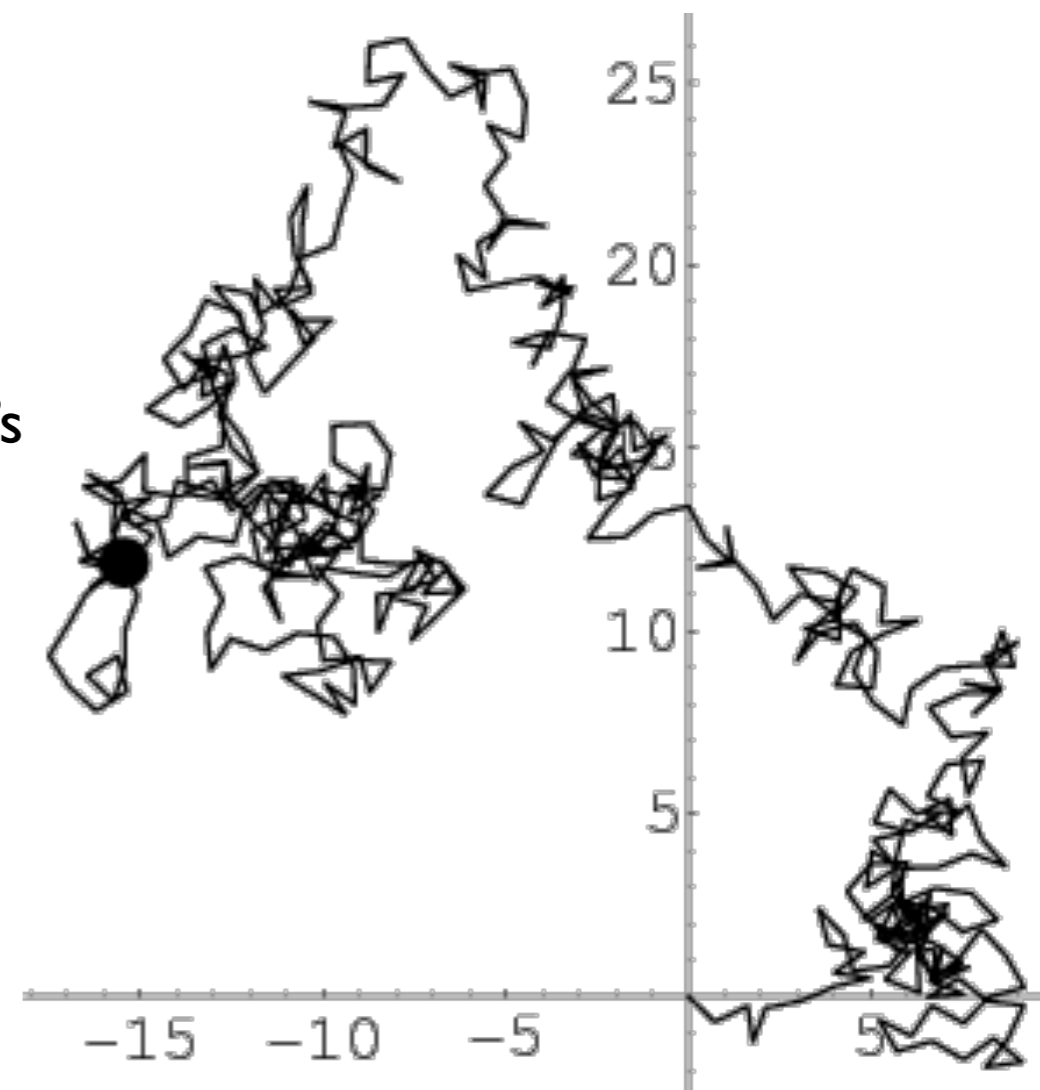
Current projects

- **Statistics of random walks on networks:**

- Supervisor: Prof. Satya Majumdar
- Collaborations: Prof. P. Sollich and R. Kuehn (King's College London)

- **Master thesis:**

- Supervisors: Prof. E. Orlandini and F. Baldovin (University of Padua)
- Collaborations: Prof. K. Sekimoto (ESPCI Paris)



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Training

- [Netadis Summer school](#) at ICTP Trieste and [Autumn school](#) at Hillerod
- [Autumn School](#) on Statistical Physics, Optimization, Inference and Message-Passing Algorithms, Les Houches, France.
- [School](#) Analysis of Complex Networks: Structure and Dynamics, Politecnico Milano.
- Joint CRM-Imperial College [school and workshop](#) in complex systems, Barcelona

Training

- French course
- Tutoring master students in a 2-week project
- Doctoral training: entrepreneurship, scientific publication
- Planned: outreach activities

Secondement

- Oct-Dec '13 at **Politecnico di Torino**:

R. Zecchina, A. Braunstein, L. Dall'Asta, F.

Altarelli

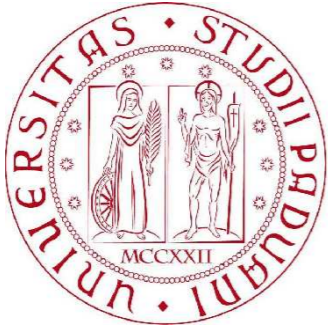


- I-week visit at **Aston University**:

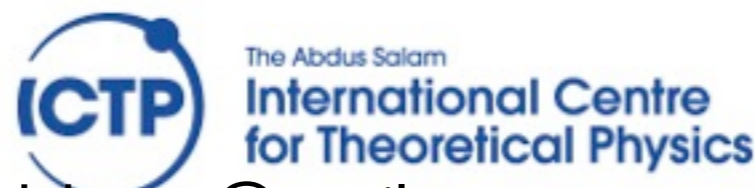
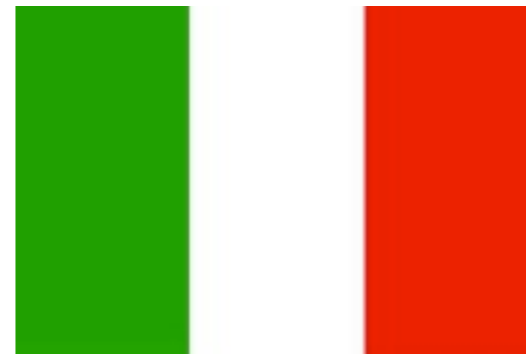
D. Saad, B. Yeung



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Networking



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A classical microscopic model of heat bath with non-locality

Caterina De Bacco, Fulvio Baldovin, Enzo Orlandini, Ken Sekimoto

(Submitted on 14 Nov 2013)

We present a solvable model of non-local heat bath coupled to two Brownian particles. The model is an extension of [R. Zwanzig, J. Stat. Phys. 9, 215 (1973)] with an imposition of Galilean invariance of the whole system. The result shows how and what bath-mediated effective potential appears, and its relation to the friction kernel through the sum-rule theorem of linear response theory. The work to change the friction kernel, which has not been accessible on the level of Langevin dynamics, is addressed and several concrete results are presented. The present work orients the study of non-local environments, including its implication to far from equilibrium process.

Comments: 4 main pages, 2 figures, 2 supplemental material pages

Subjects: **Statistical Mechanics (cond-mat.stat-mech)**; Biological Physics (physics.bio-ph); Fluid Dynamics (physics.flu-dyn)

Cite as: **arXiv:1311.3448 [cond-mat.stat-mech]**

(or **arXiv:1311.3448v1 [cond-mat.stat-mech]** for this version)

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Thanks!

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