

Sorin TĂNASE-NICOLA

sorintan@umich.edu

Office address

Physics Department, University of Michigan
405, Church Street
Ann Arbor, 48109MI, United States
Phone: +1 734.615.3306
Fax: +1 734.763.9694

Personal address

2007 S. Huron Pkwy #11
Ann Arbor, 48104MI, United States

Personal Information

Date of birth: July, 9, 1977
Place of birth : Slatina, Romania
Citizenship: Romanian

Present position

Research fellow (Post-Doc) University of Michigan, United States, since June, 2007.

Education

- 2001 - 2004 PhD under the supervision of Jorge Kurchan,
University Paris VI (Pierre et Marie Curie – PMC)
Laboratoire de Physique et Mécanique des Milieux Hétérogènes (PMMH)
École Supérieure de Physique et de Chimie Industrielles (ESPCI),
Paris, France. Defended 29 October 2004.
Title: **Rare and Unstable Trajectories**. *Localisation methods for
transition paths and computation of Lyapunov exponents.*
- 1999 - 2003 Student, École Normale Supérieure, Paris (ENS).
2000 - 2001 DEA (Master) Theoretical Physics, ENS and PMC.
1999 - 2000 Physics studies (Undergraduate), ENS and PMC.
1996 - 1999 Student, Physics Faculty, University of Bucharest, Romania.
1992 - 1996 Student, "Radu Greceanu" high-school , Slatina, Romania.

Research experience

- 2007-
2004-2007 Research fellow (Post-Doc) University of Michigan, United States ,
Research Scientist (Post-Doc) AMOLF, Amsterdam,
group of Pieter Rein ten Wolde;
subject: fluctuations effects in (bio)chemical networks.
- 2001 Master research project, Statistical Physics Laboratory, ENS, Paris
group of Daniel Bonn;
subject: Aging and Shear Rejuvenation of the Laponite Colloidal Glass.
- 2000 Undergraduate experimental project, Pierre Aigrain Laboratory, ENS,
"Coherent and Non-Linear Optics" group
subject: Optical properties of quantum dots.
- 1999-2000 Undergraduate project, Statistical Physics Laboratory, ENS, Paris
group of Werner Krauth;
subject: New simulation methods of hard disk systems.
- 1998-1999 Collaboration in the dosimetry department at the Public Health Ministry, Bucharest, Romania
subject: Calibration of solid-state personal dosimeters.

Languages

Romanian, French, English.

Work in progress

- “Dynamical models and evolutions of developmental genetic network” with D. Lubensky (in progress);
- “Modelling the (inter) and (intra)species expression divergence” with D. Lubensky and P. Witkopp (in progress);
- “Phase transition in a bistable reaction-diffusion (bio)chemical network” with D. Lubensky (to be submitted);
- “Non-equilibrium nucleation in sheared Ising systems” with C. Valeriani, D. Frenkel, R. Allen et P.R. ten Wolde (to be submitted);
- “Exact Green’s function reaction-diffusion algorithm” with K. Takahashi et P.R. ten Wolde (to be submitted);
- “Switching dynamics of the flagellar motor” with S. van Albada and P.R. ten Wolde (to be submitted).

Presentations

- “Regulatory control and the costs and benefits of biochemical noise”, talk, APS March Meeting, New Orleans, march 2008.
- “Fitness effects of fluctuations”, invited talk, Symposium on Bioinformatics and biomathematics, CWI, Amsterdam, april 2007.
- “Cost of fluctuations in biochemical networks”, talk, Biolateral triangle meeting, Paris, january 2007.
- “Fluctuations in chemical networks. Heterogeneity and response to changes”, invited talk, Extreme events in complex systems Conference, Dresden, october 2006.
- “Stochasticity at the cellular level. Models and consequences”, invited talk, Biophysics talks, ENS, Paris, september 2006.
- “Supersymmetry and reaction rates”, invited talk, Theoretical Physics Seminary, Bucharest, july 2006.
- “Noise in biochemical networks. Modularity and correlations”, talk, Biolateral triangle meeting, Amsterdam, march 2006.
- “Signal detection, modularity and correlated fluctuations in biochemical signalling networks”, poster, Scientific Meeting FOM, Lunteren, january 2006.
- “Noise in biochemical networks. Modularity and correlations”, talk, Internal AMOLF Kleyn Colloquium, Amsterdam, april 2005.
- “Topological methods for searching barriers and reaction paths”, poster, Scientific Meeting FOM, Lunteren, january 2005.

Publications

Refereed papers

1. Regulatory control and the costs and benefits of biochemical noise, S. Tănase-Nicola and P. R. ten Wolde, *PLOS Comp. Biol.* (2008), arXiv:0711.3812 submitted.
2. Reaction coordinates for the flipping of genetic switches, M. J. Morelli, R. J. Allen, S. Tănase-Nicola, and P. R. ten Wolde, *Biophys. J.* **94**, 3413–3423 (2008).
3. Eliminating fast reactions in stochastic simulations of biochemical networks: a bistable genetic switch, M. J. Morelli, R. J. Allen, S. Tănase-Nicola, and P. R. ten Wolde, *J. Chem. Phys.* **128**, 045105 (2006).
4. Signal detection, modularity, and the correlation between extrinsic and intrinsic noise in biochemical networks, S. Tănase-Nicola, P. B. Warren, and P. R. ten Wolde, *Phys. Rev. Lett.* **97**, 068102 (2006).
5. Diffusion of transcription factors can drastically enhance the noise in gene expression, J. S. van Zon, M. J. Morelli, S. Tanase-Nicola, and P. R. ten Wolde, *Biophys. J.* **91**, 4350 (2006).
6. Exact results for noise power spectra in linear biochemical reaction networks, P. B. Warren, S. Tănase-Nicola, and P. R. ten Wolde, *The Journal of Chemical Physics* **125**, 144904 (pages 11) (2006).
7. Kramers equation and supersymmetry, J. Tailleur, S. Tănase-Nicola, and J. Kurchan, *Journal of Statistical Physics* **122**, 557 (2006).
8. Metastable states, transitions, basins and borders at finite temperatures, S. Tănase-Nicola and J. Kurchan, *Journal of Statistical Physics* **116**, 1201 (2004).
9. Topological methods for searching barriers and reaction paths, S. Tănase-Nicola and J. Kurchan, *Phys. Rev. Lett.* **91**, 188302 (2003).
10. Statistical-mechanical formulation of Lyapunov exponents, S. Tănase-Nicola and J. Kurchan, *J. Phys. A* **36**, 10299 (2003).
11. Laponite: Aging and Shear Rejuvenation of a Colloidal Glass, D. Bonn, S. Tanase, B. Abou, H. Tanaka, and J. Meunier, *Phys. Rev. Lett.* **89**, 015701 (2002).

Refereed Conference Publications

1. Mapping reaction paths in phase-space, J. Trailleur, S. Tănase-Nicola, and J. Kurchan, *International Journal of Modern Physics B* **20**, 5254 (2006).
2. Characteristics of TLD-100 fading and its influence on the calibration of personal dosimeters, A. Vasilache, R. S. Tănase-Nicola, and R. Tiron, *Radiation Protection Dosimetry* **85**, 183 (1999).

Invited Contribution

1. Biophysics: Pass on the message, P. Rein ten Wolde and S. Tanase-Nicola, *Nat Phys* **2**, 371 (2006).

Referents

- Jorge Kurchan
Laboratoire de Physique et Mécanique des Milieux Hétérogènes
UMR CNRS 7636 École Supérieure de Physique et de Chimie Industrielles
10, rue Vauquelin, 75231 Paris Cedex 05, France
Phone: (+33) (0)1 40 79 4522
Fax: (+33) (0)1 40 79 4523
e-mail: jorge@pmmh.espci.fr
- David K. Lubensky
Norman M. Leff Assistant Professor, Department of Physics & Biophysics Graduate Program,
University of Michigan
450 Church St., Ann Arbor MI 48109-1040, USA
Phone: +1 734.936.1540
Fax: +1 734.763.9694 Email: dkluben@umich.edu
- Pieter Rein ten Wolde
Biochemical Networks group
FOM Institute AMOLF
Kruislaan 407
1098 SJ Amsterdam
Tel: +31 20 608 1394
Email: tenwolde@amolf.nl