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Génophysique / Genomic Physics Group
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Google Scholar
ResearcherID

CURRICULUM VITAE

Name: Marco COSENTINO LAGOMARSINO

Place and date of birth: Verona (Italy), June 26th, 1974.

Current Appointment: Directeur de recherche de 2ème classe (DR2), CNRS.
Group leader Génophysique / Genomic Physics group.
UMR7238 Université Pierre et Marie Curie.

Academic Qualifications: 2011. HDR (habilitation à diriger des recherches). University Pierre and Marie Curie / Sorbonne, Paris (FR)

2004. Ph.D. in physics, University of Leiden (NL)

1999 M.Sc in theoretical physics, University of Milan (IT)

Scientific Career, Degrees and Habilitations

2015 - CNRS Research Director (Directeur de Recherche de deuxième classe, DR2) section 02 (theoretical physics) and interdisciplinary section 51 (modeling of biological systems), Computational and Quantitative Biology, UMR 7238 CNRS, Université Pierre et Marie Curie - Sorbonne, Paris (FR). Group Leader of the "GénoPhysique" (Genomic Physics) group.

2009 - 2015 CNRS Researcher (Chargé de Recherche de première classe, CR1) section 02 (theoretical physics) and interdisciplinary section 43/51 (modeling of biological systems), Computational and Quantitative Biology Unit UMR 7238 CNRS and Université Pierre et Marie Curie - Sorbonne, Paris (FR). Group Leader of the "GénoPhysique" (Genomic Physics) group.

2013 Abilitazione Scientifica Nazionale (habilitation for Italian Professor positions), Sectors 02/B2 (Theoretical Physics / Condensed Matter) and 02/B3 (Applied Physics).

Sep 2011 HDR (Habilitation à diriger des recherches), Université Pierre et Marie Curie - Sorbonne, Paris. Thesis "A statistical-physics exploration of the proteome.". Referees: Prof. Andrea Parmeggiani, Dr. Rosalind Allen, Dr. Madan Madan Babu. Other Jury Members: Prof. Alessandra Carbone, Prof. Vladimir Lorman, Dr. Antonio Celani, Dr. Hervé Isambert.
http://www.lgm.upmc.fr/mcl/publi/MCL_hdr.1.0.pdf

Jul 2007 - Nov 2009 Research associate, theory group, physics department, University of Milan (Italy), and I.N.F.N., Milan.

Nov 2005 - Jun 2007 Postdoc Curie Institute, RNA dynamics and biomolecular systems group (H. Isambert), and research associate, University of Milan.

Nov 2005 - Oct 2006 Postdoc (Human Frontier) Curie Institute, theoretical biophysics group (J.F. Joanny), and research associate, theory group, physics department, University of Milan.

Oct 2004 - Oct 2005 Postdoc (PHYNECS European Network) at the Curie Institute (Paris, France) in the theoretical biophysics group, with Jean François Joanny.

Scientific Career, Degrees and Habilitations (continued)

- Mar 2000 - Mar 2004 PhD at AMOLF (FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands). “Bio-organization” group. Supervisor Marileen Dogterom (Leiden University). Phd Thesis “Biologically Inspired Problems Concerning Semiflexible Filaments: Organization in Plant Cell Geometries, Hydrodynamics of Propulsion”. (March 2004 - September 2004: AMOLF postdoc contract extension.) <http://www.lgm.upmc.fr/mcl/publi/tesi.pdf>
- Mar 1999 - Feb 2000 Intern Dept. of Physics of the University of Milan with professors B. Bassetti (University of Milan) and P. Jona (*Politecnico*, Milan.)
- Mar 1999 Master's Degree in theoretical physics at the University of Milan, Thesis: “Active transport far from equilibrium, the case of molecular motors. Dynamics, Cooperative effects, Thermodynamics”, supervisor B. Bassetti. Grade 110/110 *cum laude*.
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Referee Activity

I review articles for the journals *PNAS*, *PLoS Computational Biology*, *PLoS Genetics*, *Systems and Synthetic Biology*, *Molecular BioSystems*, *Microbiology*, *BMC Microbiology*, *Nucleic Acids Research*, *Physical Review Letters*, *Physical Review E*, *BMC Systems Biology*, *Biophysical Journal*, *Journal of Chemical Physics*, *mBio*, *PLoS ONE*, *Soft Matter*, *Physica D*, *Frontiers* and other minor journals and proceedings.

I have reviewed grants for the Human Frontier Science Program Organization, Agence nationale de la recherche (ANR), Stichting FOM (NL), National Science Center Poland, the National Centre for Biological Sciences (NCBS, India), Région Languedoc-Roussillon, University of Montpellier 2, CEFIPRA (Indo-French Centre for the Promotion of Advanced Research).

Committees and Boards

[2011-] Board Member, PhD Complex Systems for Life Sciences, Torino, IT.

Panel Member. HDR (Habilitation a Diriger des Recherches). Sven Van Teeffelen, Pasteur Institute, Paris, 2016

Panel Member. Selection Committee PhD School “Interface Pour le Vivant” (IPV), Université Pierre and Marie Curie, 2016.

Panel Member. PhD Noreen Walker (Supervisor: S. Tans). AMOLF Amsterdam and TU Delft, NL, 2016.

Panel Member. PhD Tommaso Brotto (Supervisor J. Kurchan). University of Milan and École Normale Supérieure Paris, 2016.

Examiner. MPhil Victor Allard (Supervisor P. Cicuta). University of Cambridge 2016.

Panel Member. Selection for a Group Leader position. Institut de Biologie Paris Seine - Sorbonne, Paris, 2015.

Examiner. MPhil Theresa Jakuszeit (Supervisor P. Cicuta). University of Cambridge 2015.

Panel Member. PhD Silvia Zaoli (Supervisor A. Rinaldo). EPFL Lausanne 2014-2017.

Panel Member. PhD Jacopo Grilli (Supervisor A. Maritan). University of Padova 2015.

Panel Member. PhD Hafez El Sayyed (Supervisor O. Espeli). Collège de France / Université Paris-Sud, Paris 2013-2016.

Panel Member. PhD Orso Maria Romano (Supervisor S. de Monte). École Normale Supérieure, Paris 2013-2016,

Committees and Boards (continued)

Panel Member. Pranami Bora (Supervisor M. Morelli). IIT / IFOM Campus and Open University, Milan 2013-2016.

Panel Member. PhD Giovanna de Palo (Supervisor C. Altafini). SISSA International School for Advanced Studies Trieste 2012.

Panel Member. PhD Giovanni Iacono (Supervisor C. Altafini). SISSA International School for Advanced Studies Trieste 2012.

Panel Member. PhD Ladan Amin (Supervisor V. Torre). SISSA International School for Advanced Studies Trieste 2012.

Referee. Matteo Osella (Supervisor M. Caselle), 2010 PhD programme in complexity in post-genomic biology, University of Turin (Italy).

Panel Member. PhD Richard Stein (Supervisor H. Isambert), Institut Curie / UPMC, Paris 2009.

Honors – Awards

Prime d'excellence CNRS 2011-2014

HFSP Young Investigator Grant 2009

HFSP Young Investigator Grant 2014

Funding ID

Current Support

2014-: PI of Human Frontier Science Program Young Investigator Grant “Nucleoid proteins and DNA structure, global regulation of the bacterial transcription network.” with B. Sclavi, P. Cicuta, K. Dorfman (1.200M\$ for the whole team).

2014-: CEFIPRA (Indo-French Centre for the Promotion of Advanced Research) Grant “Genome-scale analysis of differential propensities of different chromosomal domains for horizontal gene insertion in *Escherichia coli*” (co-PI with Aswin Seshasayee and Bianca Sclavi). 37.5 keuros + 2yr postdoc position.

2014-: ICS (Institut du Calcul et de la Simulation) 2yr postdoc funds UPMC (90 keuro).

Past support

2009-2013: PI of Human Frontier Science Program Young Investigator Grant “Nucleoid proteins and DNA structure, global regulation of the bacterial transcription network.” with B. Sclavi, P. Cicuta, K. Dorfman (1.350M\$ for the whole team).

2011: UPMC Convergence 15k euros (no salaries). Co-investigator with Philippe Thomen (UPMC).

2009: INFN (Istituto Nazionale per la Fisica Nucleare) PI11 (20k euros for the Milan Theory Group)

2008-9: Royal Society travel grant (12k pounds) with P. Cicuta (Cavendish Laboratory, Cambridge).

2008-2011: PUR University of Milan. "Applicazioni della teoria dei campi classica e quantistica: aspetti formali, fenomenologici e statistici" (31k euros for the young researchers of the Theory Group, PI Dr A. Vicini)

Languages

Italian mother tongue.
English, advanced, written and spoken.
French, intermediate.
Basic Dutch.

Student Supervision and Teaching

Supervised Postdocs and PhD Students:

- 2016- Joachim Rambeau. Postdoc, HFSP. Single-cell gene expression and physiology of chromosome organization. Only Supervisor
- 2015- Marco Gherardi. Postdoc, HFSP. Polymer physics and bacterial chromosome organization. Only Supervisor.
- 2015- Malik Yousuf. Postdoc, CEFIPRA. Horizontal transfer and nucleoid structure. Co-Supervisor with Bianca Sclavi.
- 2014- Eleonora de Lazzari. PhD Student, UPMC. Gene families distributions across bacterial genomes: from models to evolutionary genomics data. EDpif PhD School, UPMC, Paris, Only Supervisor.
- 2014-2016 Qing Zhang. Postdoc. Replication kinetics and cell growth. ISC/CALSIMLAB Postdoc UPMC Paris. Only Supervisor.
- 2011-2014 Vittore Scolari. PhD Student, UPMC Paris and NCBS Bangalore. Polymer physics and bioinformatics analysis of the E. coli nucleoid. Co-supervision with Ashwin Sehasayee, NCBS India. Funded by a UNESCO fellowship for the scientific collaboration between first- and third-world countries.
- 2011-2013 Matteo Osella. Postdoc. Nucleoid Organization and Population Heterogeneity. UPMC Paris. Only Supervisor.
- 2010-2012 Mina Zarei. Postdoc. Nucleoid Organization and Transcription Networks. UPMC Paris and Univ. of Milan. Only Supervisor.
- 2009-2012 Matthew Grant. PhD Student. Bacterial growth physiology. Univ. of Cambridge. Co-supervisor (with P. Cicuta).
- 2007-2010 Luigi Grassi. PhD Student. New and old in the light of evolution. Univ. of Turin, IT. Co-supervisor (with M. Caselle).
- 2004-2008 Isaac Llopis. PhD Student, Univ. of Barcelona. Simulations of Filaments with Hydrodynamic Interactions. Co-supervisor (with I. Pagonabarraga).

Supervised Undergraduate Students:

- 2016 Sebastiano Ariosto. Rouse model with one large monomer. Graduate Thesis. Univ. of Milan. Grade 105/110.
- 2015-2016 Jacopo Marchi. Stochastic models of the E. coli cell cycle. Univ. of Milan, Master 2 stage UPMC.
- 2015-2016 Francesco Penone. Gene-family distributions in Matagenomics data. Univ. of Milan, Master 2 stage UPMC.
- 2015 Anna Musselli. Modelling gain-loss dynamics of horizontal transfer in bacterial genomes. Univ. of Pavia. Erasmus Placement, Master 2 stage.
- 2015-2016 Ludovico Calabrese. Active movements in the subdiffusion of chromosomal loci. Graduate Thesis. Univ. of Milan. Grade 105/110.
- 2015 Andrea Silva. Inference of dependency networks between gene families. Univ. of Milan. Master 1 Stage UPMC.
- 2013 Andrea Cavallone. Models of clonal interference. Master Thesis University of Turin.
- 2013 Renaud Dessalles. Division dynamics of single E. coli cells. Master 2 Stage, Mathématiques pour les sciences du vivants, ENSTA Paris Tech.
- 2011-2012 Maria Fumagalli. Stochastic models of evolving bacterial populations under controlled conditions. Master Thesis. Univ. of Milan. Grade 110/110 *cum laude*.
- 2012 Stefano Brasca. Horizontal transfer dynamics in bacterial genomes. Graduate Thesis. Univ. of Milan. Grade 101/110.
- 2012 Giulio Fatti. Evolutionary models for asexual reproduction. Graduate Thesis. Univ. of Milan. Grade 101/110.
- 2012 Filippo Marchetti. Replication kinetics of the yeast genome. Graduate Thesis. Univ. of Milan. Grade 101/110.
- 2012 Maria Cristina Romano. Graduate Thesis. Univ. of Milan. A collisional model for gene horizontal transfer in a bacterial "gas". Grade 100/110

Student Supervision and Teaching (continued)

- 2010-11 Orso Maria Romano. Modelling DNA-replication kinetics with a discrete origins nucleation-and-growth model. Graduate Thesis. Univ. of Milan. Grade 103/110, French Grade 16.
- 2010-11 Giulia Malaguti. Genome evolution through chromosomal rearrangements. A statistical mechanics approach. Master Thesis. Univ. of Milan. Grade 110/110 *cum laude*.
- 2010-11 Elisa Brambilla. Experimental and data analysis techniques for measuring gene expression of bacterial endogenous regulatory circuits at varying growth rate. Master Thesis. Univ. of Milan and UPMC Paris. Grade 110/110 *cum laude*.
- 2010 Enrnesto Giussani. The gene dnaA e and the initiation of replication in E.coli, an experimental analysis. Graduate Thesis. Univ. of Milan. Grade 107/110.
- 2010 Michele Biella. Statistical models for the growth of a genome in a finite universe of homology classes. Graduate Thesis. Univ. of Milan. Grade 110/110 *cum laude*.
- 2010 Marco Grisi. Tracking of fluorescent loci on the E. coli nucleoid. Graduate Thesis. Univ. of Milan. Grade 110/110 *cum laude*.
- 2010 Andrea Angelini. Branched Polymer Model for the E. coli Chromosome Master Thesis. Univ. of Milan. Grade 107/110
- 2009 Matteo Giani. A Coloring Model for yeast transcription network evolution. Graduate Thesis. Univ. of Milan. Grade 107/110
- 2009 Arianna Bottinelli. Statistical Models of Constrained Evolution for Protein Interaction Networks. Master Thesis. Univ. of Milan. Grade 110/110 *cum laude*
- 2009-2010 Vittore Scolari. DNA Conformation and the transcriptional regulation network. Master Thesis. Univ. of Milan. Grade 110/110 *cum laude*
- 2009-2010 Gabriele Micali. Transcription network evolution by duplication-innovation. Grade 100/110. Graduate Thesis. Univ. of Milan.
- 2009-2010 Mattia Fiorentini. Correlations between colloidal particles driven by optical traps. Graduate Thesis. Univ. of Milan. Grade 100/110
- 2009 Stefano Minoia. Graduate Thesis. Correlation functions for linear arrays of trapped spheres at low Reynolds numbers. Univ. of Milan, IT. Grade 110/110 *cum laude*
- 2009 Giulia Malaguti. Graduate Thesis. Bacterial Gene Expression, Transcription Network and DNA geometry. Univ. of Milan, IT. Grade 110/110 *cum laude*
- 2009 Massimiliano Baraldi. Synchronization of minimal systems in low-Reynolds number fluids. Graduate Thesis. Univ. of Milan, IT. Grade 110/110 *cum laude*
- 2009 Jacopo Grilli. Graduate Thesis. Univ. of Milan, IT. Functional Content of Genomes, Multiscaling and Chinese Restaurant Process. Grade 110/110 *cum laude*
- 2009 Thomas Vassallo. Anomalous finite-size effects of the Chinese Restaurant Process. Graduate Thesis. Univ. of Milan, IT. Grade 107/110.
- 2009 Andreina Chietera. Theory and Experiments for the oscillating nrd Transcriptional Self-regulator in E. coli. Graduate Thesis. Univ. of Milan, IT. Grade 110/110.
- 2008-9 Maria Fumagalli. Application of the Belief Propagation Algorithm to the Whole-Genome-Duplication Network of Yeast. Graduate Thesis. Univ. of Milan, IT. Grade 110/110 *cum laude*.
- 2008-9 Francesco Garue. Spin Models for the Whole-Genome-Duplication Transcription Network of yeast. Master Thesis. Univ. of Milan. Grade 110/110. entry*[2008-9] Manuel Buda. Timing of the replication-initiation circuit in E. coli. Master Thesis. Univ. of Milan. Grade 108/110.
- 2008 Pietro Rotondo. Hydrodynamics of a two-bead colloidal pump. Graduate Thesis Univ. of Milan. Grade 110/110 *cum laude*.
- 2007-8 Diana Fusco. Master Thesis. Transcriptional Plasticity After the Yeast Whole-Genome Duplication (in collaboration with M. Caselle, Turin). Grade 110/110 *cum laude*.
- 2007-8 Luca Ciandrini. Role of Topology in Dynamic Boolean Network Models. Master Thesis Univ. of Pavia IT. Grade 110/110 *cum laude*
- 2008 Elisa Brambilla. Introducing Domain Specificity in a Duplication/Innovation/Loss Model for Proteomes. Graduate Thesis, Univ. of Milan, IT. Grade 110/110 *cum laude*.
- 2008 Andrea Angelini. Evolution of a Proteome by Duplication, Innovation and Loss of Domains. Graduate Thesis, Univ. of Milan, IT. Grade 107/110.
- 2007 Marco Leoni. Master Thesis. Hydrodynamic Interactions and Artificial Cilia. Grade 110/110 *cum laude*. Co-supervisor (with P. Cicuta).
- 2007 Roberto Bondesan. Swimming Microfilaments. Graduate Thesis, Univ. of Milan, IT. Grade 110/110 *cum laude*. Co-supervisor (with P. Cicuta).
- 2007 Ulisse Ferrari. A quantitative approach to the DnaA Promoter. Graduate Thesis, Univ. of Milan, IT. Grade 110/110 *cum laude*. Co-supervisor (with B. Sclavi)
- 2007 Alessandro Amato. Size Scaling in the Chinese Restaurant Process. Graduate Thesis, Univ. of Milan, IT. Grade 110/110 *cum laude*.

Student Supervision and Teaching (continued)

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| 2007 | Vittore Scolari. Clustering of Genomes Using Domain Usage. Graduate Thesis, Univ. of Milan, IT. Grade 110/110. |
| 2007 | Alessandro Motta. Dynamic Transitions and Feedback in Boolean Network Models. Graduate Thesis, Univ. of Milan, IT. Grade 110/110 <i>cum laude</i> . |
| 2007 | Philip Heijning. Master Thesis (Erasmus Project). Evolution of Protein Domains. Univ. of Milan, IT. |
| 2006-7 | Alessandro Sellerio. Master Thesis. Evolution of Transcription Networks. Univ. of Milan, IT. Grade 110/110 <i>cum laude</i> . |
| 2006-7 | Salvatore Mandrà. Master Thesis. Boolean Optimization Models of Transcription Networks. Univ. of Milan, IT. Grade 110/110 <i>cum laude</i> . Co-supervisor (with B. Bassetti) |
| 2006 | Paolo Margaretti. Master Thesis "Modelli Evolutivi in Reti Genetiche", Univ. of Milan, IT. Grade 110/110. Co-supervisor (with F. Capuani) |
| 2005-6 | Carlo Maffi. Master Thesis "Dynamical Properties of Boolean Models Inspired to Transcriptional Regulation Networks", Univ. of Milan, IT. Grade 110/110 <i>cum laude</i> . |
| 2005-6 | Diana Fusco. Graduate Thesis, Univ. of Milan, IT. Grade 110/110 <i>cum laude</i> . |
| 2003 | Enrico Conti. Post-master stage, "Microtubules in Confined Geometries", AMOLF, NL. |
| 2002 | Chris Retif. Master Thesis work, "Lithographic Fabrication of Microchambers", AMOLF, NL. |

Teaching Statement:

I typically like to work with advanced students and prefer a "hands on" approach, where students are stimulated to manipulate the subject and use it as a flexible tool, rather than to assimilate it as a static construct. I consider teaching an important occasion to deepen (and refresh) my understanding of elementary and advanced topics. I believe that fun is essential in learning.

Teaching:

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|-----------|---|
| 2014 | The Abdus Salam ICTP/SISSA Spring College on the Physics of Complex Systems, Trieste, IT. Course "Elements of Statistical Biological Physics" (10 hours). |
| 2009- | Course "Computational Methods in Theoretical Physics" at the University of Milan. Complex Networks module (25 hours/ year + supervision of 40h individual hands-on projects). |
| 2008- | Lectures for the Doctorate School of "Complex Biological Systems" at the University of Turin (2-3 hours/year). Since 2012, organization of one lecture day (8 hours/year). |
| 2012-2014 | Lectures for the L3 course "Modélisation en biologie" at the École Normale Supérieure Paris (9 hours / year). |
| 2012-2014 | Lectures for the Erasmus mundus Master course "Introduction to Biophysics" at the École Normale Supérieure Cachan (2 hours / year). |
| 2012 | PhD Course on polymer physics, Doctoral School in Physics, University of Turin (10 hours). |
| 2004-2009 | Lectures on advanced themes of biological physics in connection with the course of Statistical Mechanics held by Bruno Bassetti in Milano (about 4-8 hours /year). |
| 2002 | Lectures on molecular motors, EMBO Practical course "Plant cell biology" Wageningen, NL (8 hours). |
| 1997-2000 | Guide at the National Science Museum of Milano. |

Publications

71 Publications in international peer-reviewed journals. 3 Refereed proceedings. 2 Book Chapters. 2 Theses.

1406 Citations (Google Scholar). H-index 19 (Google Scholar), 16 (Scopus), 14 (Web of Science). [Scopus and Web of Science have trouble indexing some citations because of double last name]

In Peer-reviewed Scientific Journals

(square brackets [] indicate author position)

2016

Javer A, Cosentino Lagomarsino M, Cicuta P. **Bacterial Chromosome Dynamics by Locus Tracking in Fluorescence Microscopy**. *Methods Mol Biol*. 2016;1431:161-73. 2016 [II]

Marco Gherardi, Federico Bassetti, and Marco Cosentino Lagomarsino, **Law of corresponding states for open collaborations**. *Phys. Rev. E* 93, 042307, 2016. [last]

Hafez El Sayyed, Ludovic le Chat, Elise Lebailly, Elise Vickridge, Carine Pages, Francois Cornet, Marco Cosentino Lagomarsino and Olivier Espéli **Mapping Topoisomerase IV binding and activity sites on the *E. coli* genome**. *PLOS Genetics*, 12;12(5):e1006025. doi: 10.1371/journal.pgen.1006025, 2016 [VII]

Widder et al. **Challenges in microbial ecology: building predictive understanding of community function and dynamics**. *ISME Journal*, *ISME J*. E-print. doi: 10.1038/ismej.2016.45, 2016. [consortium paper]

AS Kennard, M Osella, A Javer, S Tans, P Cicuta, M Cosentino Lagomarsino **Individuality and universality in the growth-division laws of single *E. coli* cells**. *Phys. Rev. E*, 93, 012408. [last]

2015

Adicptaningrum A, Osella M, Moolman MC, Cosentino Lagomarsino M, Tans SJ. **Stochasticity and homeostasis in the *E. coli* replication and division cycle**. *Sci Rep*. 5:18261 (doi: 10.1038/srep18261) 2015 [IV]

M Cosentino Lagomarsino, O Espéli, I Junier **From structure to function of bacterial chromosomes: Evolutionary perspectives and ideas for new experiments**. *FEBS Lett*. doi: 10.1016/j.febslet.2015.07.002 2015. [I]

Scolari VF, Sclavi B, Cosentino Lagomarsino M, **The nucleoid as a smart polymer**. *Front Microbiol*. 6:424 doi: 10.3389/fmicb.2015.00424, 2015. [last]

Gherardi M, Cosentino Lagomarsino M **Characterizing the size and shape of sea ice floes**. *Scientific Reports* 5:10226, 2015. [last]

Pietro Rotondo, Marco Cosentino Lagomarsino, and Giovanni Viola **Dicke Simulators with Emergent Collective Quantum Computational Abilities** *Phys. Rev. Lett*. 114, 143601 2015 [II]

Vittore F Scolari, Marco Cosentino Lagomarsino **Combined collapse by bridging and self-adhesion in a prototypical polymer model inspired by the bacterial nucleoid**. *Soft Matter* 11, 1677-1687 DOI: 10.1039/C4SM02434F, 2015. [last]

Fumagalli MR, Osella M, Thomen P, Heslot F, Cosentino Lagomarsino M. **Speed of evolution in large asexual populations with diminishing returns**. *J Theor Biol* 365, 21, 23–31, 2015. [last]

Marco Zamparo, Federica Chianale, Claudio Tebaldi, Marco Cosentino Lagomarsino, Mario Nicodemi and Andrea Gamba **Dynamic membrane patterning, signal localization and polarity in living cells**. *Soft Matter*, 11-5 DOI: 10.1039/C4SM02157F, 2015.

2014

Publications (continued)

Srinivasan R, Scolari VF, Cosentino Lagomarsino M, Seshasayee AS. **The genome-scale interplay amongst xenogene silencing, stress response and chromosome architecture in Escherichia coli.** Nucleic Acids Res., 43 (1): 295-308, 2014.

Salvatore Mandrà, Marco Cosentino Lagomarsino, and Marco Gherardi **Soft bounds on diffusion produce skewed distributions and Gompertz growth.** Phys. Rev. E 90, 032805, 2014.

Avelino Javier, Nathan J Kuwada, Zhicheng Long, Vincenzo G Benza, Kevin D Dorfman, Paul A Wiggins, Pietro Cicuta, Marco Cosentino Lagomarsino **Persistent super-diffusive motion of Escherichia coli chromosomal loci.** Nature Communications 5 3854, 2014. [last]

Z Long, A Olliver, E Brambilla, B Sclavi, M Cosentino Lagomarsino, KD Dorfman **Measuring bacterial adaptation dynamics at the single-cell level using a microfluidic chemostat and time-lapse fluorescence microscopy.** Analyst 139 (20), 5254-5262, 2014.

J Grilli, M Romano, F Bassetti, M Cosentino Lagomarsino, **Cross-species gene-family fluctuations reveal the dynamics of horizontal transfers.** Nucleic Acids Research, 42 (11) 6850-6860 2014. [last]

M Osella, E Nugent, M Cosentino Lagomarsino, **Concerted control of Escherichia coli cell division.** PNAS 111 (9), 3431-3435, 2014. [last]

Vivek V Thacker, Krystyna Bromek, Benoit Meijer, Jurij Kotar, Bianca Sclavi, Marco Cosentino Lagomarsino, Ulrich F Keyser, Pietro Cicuta **Bacterial nucleoid structure probed by active drag and resistive pulse sensing** Integrative Biology 6 (2), 184-191 2014. [VI]

2013

M. Gherardi, S. Mandrà, B. Bassetti and M. Cosentino Lagomarsino, **Evidence for soft bounds in Ubuntu package sizes and mammalian body masses** PNAS 110 (52), 21054-21058, 2013 [last]

Avelino Javier, Zhicheng Long, Eileen Nugent, Marco Grisi, Kamin Siritwetchakul, Kevin D. Dorfman, Pietro Cicuta and Marco Cosentino Lagomarsino, **Short-time Movement of E. coli Chromosomal Loci Depends on Coordinate and Subcellular Localization** Nature Communications 4, 3003 2013. [last]

I. Llopis, M. Cosentino Lagomarsino, I. Pagonabarraga, C. P. Lowe, **Cooperative motion of intrinsic and actuated semiflexible swimmers,** Physical Review E 87, 032720 2013.

Mina Zarei, Bianca Sclavi and Marco Cosentino Lagomarsino. **Gene silencing and large-scale domain structure of the E. coli genome** Mol. BioSyst., 9, 758-767 2013. [last]

Matteo Osella and Marco Cosentino Lagomarsino. **Growth-rate-dependent dynamics of a bacterial genetic oscillator** Phys. Rev. E 87, 012726 2013. [last]

Nicolas Agier, Orso Maria Romano, Fabrice Touzain, Marco Cosentino Lagomarsino and Gilles Fischer **The spatio-temporal program of replication in the genome of Lachancea kluyveri** Genome Biol and Evol, 5(2):370-88 2013 (doi: 10.1093/gbe/evt014) [IV].

Zhicheng Long, Eileen Nugent, Avelino Javier, Pietro Cicuta, Bianca Sclavi, Marco Cosentino Lagomarsino and Kevin Dorfman. **Microfluidic chemostat for measuring single cell dynamics in bacteria,** Lab Chip, 13(5):947-54 2013 [VI]

Jezequel N., Cosentino Lagomarsino M, Heslot F, Thomen P. **Long-term diversity and genome adaptation of Acinetobacter baylyi in a minimal-medium chemostat** Genome Biol Evol, (1):87-97 (doi: 10.1093/gbe/evs120) 2013 [II]

2012

Arianna Bottinelli, Bruno Bassetti, Marco Cosentino Lagomarsino, and Marco Gherardi. **Influence of homology and node age on the growth of protein-protein interaction networks.** Phys. Rev. E 86, 041919, 2012 [III]

Publications (continued)

Bruot N, Kotar J, de Lillo F, Cosentino Lagomarsino M, Cicuta P. **Driving potential and noise level determine the synchronization state of hydrodynamically coupled oscillators.** Phys. Rev. Lett. 109, 164103, 2012 [IV]

Damet L, Cicuta JM, Kotar J, Cosentino Lagomarsino M, Cicuta P. **Hydrodynamically synchronized states in active colloidal arrays.** Soft Matter 8, 8672-8678, 2012 [IV]

Grassi L, Grilli J and Cosentino Lagomarsino M. **Large-scale dynamics of horizontal transfers.** Mobile Genetic Elements. 2, 3 163-167, 2012 <http://dx.doi.org/10.4161/mge.21112> [last]

Benza, V.G. Bassetti, B. Dorfman, K.D. Scolari, V.F. Bromek, K, Cicuta, P. and Cosentino Lagomarsino, M. **Physical descriptions of the bacterial nucleoid at large scales, and their biological implications** Rep. Prog. Phys. 75 076602 doi:10.1088/0034-4885/75/7/076602 2012 [last]

Scolari, V.F. Zarei, M. Osella, M., Cosentino Lagomarsino, M. **NuST (Nucleoid Survey Tools): analysis of the interplay between nucleoid organization and gene expression.** Bioinformatics. 15;28(12):1643-4. Apr 23, 2012 (Epub) [last]

Cicuta, G.M. Onofri, E. Cosentino Lagomarsino, M. Cicuta, P. **Patterns of synchronization in the hydrodynamic coupling of active colloids.** Phys Rev E Stat Nonlin Soft Matter Phys. 2012 85 016203. [III]

Grassi, L. Caselle, M. Lercher, M.J. Cosentino Lagomarsino, M. **Horizontal gene transfers as metagenomic gene duplications.** Mol Biosyst. 2012 Mar;8(3):790-5. [last]

Grilli, J. Bassetti, B. Maslov, S. Cosentino Lagomarsino, M. **Joint scaling laws in functional and evolutionary categories in prokaryotic genomes.** Nucleic Acids Res. 2012 Jan;40(2):530-40. [last]

2011

Grant, M.A. Saggiaro, C. Ferrari, U. Bassetti, B. Sclavi, B. Cosentino Lagomarsino, M. **DnaA and the timing of chromosome replication in Escherichia coli as a function of growth rate.** BMC Syst Biol. 21;5:201, 2011. [last]

Bruot, N. Damet, L. Kotar, J. Cicuta, P. Cosentino Lagomarsino, M. **Noise and synchronization of a single active colloid.** Phys Rev Lett. 26;107(9):094101, 2011. [last]

Scolari, V.F. Bassetti, B. Sclavi, B. Cosentino Lagomarsino, M. **Gene clusters reflecting macrodomain structure respond to nucleoid perturbations.** Mol Biosyst. 7(3):878-88, 2011. DOI: 10.1039/C0MB00213E [last]

2010

Pierobon, P. Mine-Hattab, J. Cappello, G. Viovy J-L, and Cosentino Lagomarsino, M. **Separation of time scales in one-dimensional directed nucleation-growth processes.** Phys. Rev. E 82, 061904, 2010. [last]

Grassi, L. Fusco, D. Sellerio, A.L. Corà, D. Bassetti, B. Caselle, M. and Cosentino Lagomarsino, M. **Identity and divergence of protein domain architectures after the Yeast Whole Genome Duplication event.** Mol. Biosyst., 6, 2305 - 2315, 2010. [last]

Fusco, D. Grassi, L. Caselle, M. Bassetti, B. and Cosentino Lagomarsino, M. **Ordered structure of the transcription network inherited from the yeast whole-genome duplication.** BMC Syst Biol, 4, 77 2010. [last]

Leoni, M. Bassetti, B. Kotar, J. Cicuta, P. and Cosentino Lagomarsino, M. **Minimal two-sphere model of the generation of fluid flow at low Reynolds numbers.** Phys Rev E 81, 036304 2010. [last]

Angelini, A. Amato, A. Bianconi, G. Bassetti, B. and Cosentino Lagomarsino, M. **Mean-field methods in evolutionary duplication-innovation-loss models for the genome-level repertoire of protein domains.** Phys Rev E 81, 021919 2010. [last]

Kotar, J. Leoni, M. Bassetti, B. Cosentino Lagomarsino, M. and Cicuta, P. **Hydrodynamic synchronization of colloidal oscillators.** Proc Natl Acad Sci U S A 107, 7669-7673, 2010. [co-last]

Publications (continued)

2009

Bassetti, B., Zarei, M., Cosentino Lagomarsino, M. and Bianconi, G. **Statistical mechanics of the “Chinese restaurant” process: Lack of self-averaging, anomalous finite-size effects, and condensation.** Phys. Rev. E 80 066118 2009. [III]

Bailey, A.G., Lowe, C.P., Pagonabarraga, I. and Cosentino Lagomarsino, M. **Accurate simulation dynamics of microscopic filaments using “caterpillar” Oseen hydrodynamics.** Phys. Rev. E 80 046707 2009. Selected for the November 1, 2009 issue of the Virtual Journal of Biological Physics Research. [last]

Ciandrini, L., Maffi, C., Motta, A., Bassetti, B. and Cosentino Lagomarsino, M. **Feedback topology and XOR-dynamics in Boolean networks with varying input structure** Phys Rev E **80** 2 026122 2009. Selected for the September 15, 2009 issue of the Virtual Journal of Biological Physics Research. [last]

Abbott, J.J., Cosentino Lagomarsino, M., Zhang, L., Dong, L., Nelson, B.J. **How should microrobots swim?** The International Journal of Robotics Research 2009, 0: 0278364909341658 [II]

Cosentino Lagomarsino, M., Sellerio, A.L., Heijning, P.D. and Bassetti, B. **Universal features in the genome-level evolution of protein domains** Genome Biology 2009, 10:R12 doi:10.1186/gb-2009-10-1-r12 (preprint hdl:10101/npre.2007.1376.1). [I]

Cosentino Lagomarsino, M., Bassetti, B., Castellani, G., Remondini, D. **Functional models for large-scale gene regulation networks: realism and fiction** Molecular BioSystems, 2009, DOI: 10.1039/b816841p (arXiv:0805.2288). [I]

Sellerio, A.L., Bassetti, B., Isambert, H. and Cosentino Lagomarsino, M. **A comparative evolutionary study of transcription networks.** Molecular BioSystems, 2009, 5, 170 - 179, DOI: 10.1039/b815339fin (arXiv:0805.2288). [last]

Leoni, M., Kotar, J., Bassetti, B., Cicuta, P., Cosentino Lagomarsino, M. **A basic swimmer at low Reynolds number.** Soft Matter, 2009, 5, 472 - 476, DOI: 10.1039/b812393d (arXiv:0807.1867). [last]

Before 2009

Van den Heuvel, M.G.L., Bondesan, R., Cosentino Lagomarsino, M., Dekker, C. **Single-molecule observation of anomalous electro-hydrodynamic orientation of microtubules.** Phys. Rev. Lett., Sep 12;101(11):118301 2008. [III] Selected for the September 15, 2008 issue of the Virtual Journal of Biological Physics Research. Reviewed in Nature Nanotechnology 3(10):580, Research Highlights, Oct 2008 (doi:10.1038/nnano.2008.289).

Bassetti, F., Cosentino Lagomarsino, M., Mandrá, S. **Exchangeable random networks.** Internet Mathematics, 4(4) 357-400 2007. arXiv:0707.3545. [II]

I. Llopis, I. Pagonabarraga, M. Cosentino Lagomarsino, C.P. Lowe **Sedimentation of pairs of hydrodynamically interacting semiflexible filaments** Phys Rev E 76, 061901 2007. [III] Selected for the December 15, 2007 issue of the Virtual Journal of Biological Physics Research.

Fusco, D., Jona, P., Bassetti, B., Cosentino Lagomarsino, M. **DIA-MCIS. An Importance Sampling Network Randomizer for Network Motif Discovery and Other Topological Observables in Transcription Networks** Bioinformatics, 23(24):3388-90. Epub Sep 27 2007. [last]

Bassetti, F., Cosentino Lagomarsino M., Bassetti B. and Jona P. **Random Networks Tossing Biased Coins.** Phys Rev E, 75, 056109 2007 (cond-mat/0604024). [II]

Cosentino Lagomarsino M., Jona. P. Bassetti, B., and Isambert, H. **Hierarchy and feedback in the evolution of the E. coli transcription network** Proc Nat Acad Sci USA 104(13), 5516 2007. [I]

Cosentino Lagomarsino M., Tanase C., Mulder B., Dogterom, M. Emons A., Vos, J. **Evaluating the Role of Elasticity in Plant Cell Cortical Microtubule Organization: A combined In Vitro and Modeling Approach.** Biophys J. 92(3):1046-57 2007. [I]

Publications (continued)

Lacoste, D., Cosentino Lagomarsino M., Joanny, J.F., **Fluctuations of a Driven Membrane in an Electrolyte.** Europhys. Lett. 77, 18006 2007 (cond-mat/0609507) [II]

Zumdieck A., Cosentino Lagomarsino M., Tanase C., Kruse K., Mulder B., Dogterom M., Julicher F., **Continuum description of the cytoskeleton: Ring formation in the cell cortex.** Phys. Rev. Lett, 95, 258103 2005 (q-bio.SC/0510050). [I - shared] Selected for the December 15, 2005 issue of the Virtual Journal of Biological Physics Research.

Cosentino Lagomarsino M., Jona. P. Bassetti, B., **Logic Backbone of a Transcription Network.** Phys. Rev. Lett. 95, 158701, 2005 (q-bio.MN/0412020). [I] Selected for the October 15, 2005 issue of the Virtual Journal of Biological Physics Research.

Cosentino Lagomarsino M., Lowe, C.P., Pagonabarraga, I. **Hydrodynamic induced deformation and orientation of a microscopic elastic filament.** Phys. Rev. Lett. 94, 14, 148104, 2005. [I] Selected for the April 15, 2005 issue of the Virtual Journal of Biological Physics Research.

Cosentino Lagomarsino M., Jona. P. Bassetti, B., **Metachronal waves for deterministic switching two-state oscillators with hydrodynamic interaction.** Phys Rev E 68, 021908, 2003. [I] Selected for the September 1, 2003 issue of the Virtual Journal of Biological Physics Research.

Cosentino Lagomarsino M., Capuani, F., Lowe, C.P., **A simulation study of the dynamics of a driven filament in an Aristotelian fluid.** J. Theor. Biol. 2003 Sep 21;224(2):215-24. [I]

Cosentino Lagomarsino M., Dogterom M., Dijkstra. M., **Isotropic nematic transition of long, thin, hard spherocylinders confined in a quasi-two-dimensional planar geometry.** J. Chem. Phys., Vol. 119, No. 6, 8 August 2003. [I]

Cosentino Lagomarsino, M., Jona, P. Bassetti, B., **Rowers coupled hydrodynamically. Modeling possible mechanisms for the cooperation of cilia.** Eur. Phys. J. B 26, 81 (2002). [I]

Bassetti, B., Cosentino Lagomarsino M., Jona. P. **A model for the self-organization of microtubules driven by molecular motors.** Eur. Phys. J. B 15, 483-492 (2000). [II]

In Peer-reviewed Conference Proceedings

Llopis I., Cosentino Lagomarsino M., Pagonabarraga I., **Cooperativity and Hydrodynamic Interactions in Externally Driven Semiflexible Filaments.** CCP07 conference proceedings, Brussels, Computer Physics Communications, 179 (1-3) 150-154 (2008). [II]

Cosentino Lagomarsino M., Sellerio, A., Isambert, H. and Bassetti, B. **A large-scale evolutionary approach to the analysis of transcription networks** Proceedings SYSBIOHEALTH Symposium, Milano 2007. [I]

Cosentino Lagomarsino M., Bassetti B. and Jona P., **Randomization and Feedback Properties of Directed Graphs Inspired to Gene Networks**, Lecture Notes in Bioinformatics (Springer, 2006). Proceedings of the CMSB conference 2006. [I]

Book Chapters and Theses

Grassi, L., Grilli, J., Cosentino Lagomarsino, M. "Metagenomic Potential for Understanding Horizontal Gene Transfer" Encyclopedia of Metagenomics Springer New York. DOI 10.1007/978-1-4614-6418-1_704-4 2014.

Cosentino Lagomarsino M., Bassetti B. and Jona P. "The Large-scale Logico-chemical Structure of a Transcription Network". International Journal of Condensed Matter, Advanced Materials, and Superconductivity Research, Volume 9 Issue 1, Nova Science Publishers, 2010 (q-bio.MN/0502017). [I]

HDR Thesis "[A statistical-physics exploration of the proteome.](#)" UPMC, Paris 2011.

Phd Thesis "[Biologically Inspired Problems Concerning Semiflexible Filaments: Organization in Plant Cell Geometries, Hydrodynamics of Propulsion.](#)" ISBN: 90-77209-08-5. AMOLF, Amsterdam 2004.

Publications (continued)

Scientific Writings for a General Audience

Cosentino Lagomarsino, M., Bassetti, B. **Systems Biology tra buzzword e realtà**. XlaTangente June 2008 (<http://www.xlatangente.it>).

Cosentino Lagomarsino, M. **Corti circuiti batterici**. XlaTangente September 2008 (<http://www.xlatangente.it>).

Conference Contributions, Lectures, Seminars

Organized Conferences

"Quantitative Laws II: from physiology to ecology, from interaction structures to collective behavior" Lake Como School of Complex Systems. Como 13-25 June 2016 (in preparation).

Workshop of the Complex Systems Group, Physics Dept., University of Milan. Lake Como School of Complex Systems. Milan, 28 Jan 2016.

Institute of Physics / Society of Biology Conference "Quantitative Methods in Gene Regulation III" Corpus Christi College, Cambridge, UK, 7-8 Dec 2015.

Workshop "Micro-flow and Survival", Lorentz Center, Leiden NL, April 20-24, 2015

"Seminaire Darwin" workshops, Paris (Once/twice yearly, Nov 2014-).

Since 2013 (Three yearly events), "Paris Biological Physics Community Day". One-day yearly workshop organized by young scientist. I am the sponsor and founder of this event, with A. Walczak.

"Cross Disciplinary Genomics" Symposium, University Pierre et Marie Curie Paris, Since 2011 (*Five 2-Day conferences held yearly in October-November*).

Since 2011. Yearly 1-day lecture symposium (held in February-March) for the PhD School of Complex Biological Systems, University of Turin, Italy.

Institute of Physics / Society of Biology Conference "Quantitative Methods in Gene Regulation II" Corpus Christi College, Cambridge, UK, 12-13 Dec 2013.

Organizer and Chair, "Workshop on Statistical Physics / Biology, and Quantitative Laws of Genome Evolution", Lake Como June 2013, co-sponsored by the Lake Como School of Advanced Studies in Complex Systems and the iPoLS, International Physics of Living Systems Network.

"Giornata Scientifica tra Meccanica Statistica e Biologia", 9 Nov 2012, physics department, University of Milan.

"Journées Darwin" conferences, held periodically at the Henri Poincaré institute, Paris (Twice yearly 2011-2013 - then discontinued).

Workshop on mechanisms of global regulation in bacteria. October 8 2010, ENS Cachan, Paris. With B. Sclavi, sponsored by the Human Frontier Science Program Organization.

Since 2009, I contribute organizing the UMR7238 lab seminars, with about 4-7 speakers/year.

Lectures, Seminars at Conferences or Institutions.

Ecole Normale Supérieure, Biophysics seminar, Paris November 26 2015, "Chromosome dynamics in *E. coli*" (invited seminar).

Workshop "Bringing Maths to Life (BMTL)", October 19-21, 2015 Naples "Quantitative laws in gene-family evolution" (keynote conference talk).

Conference Contributions, Lectures, Seminars (continued)

Workshop "Living systems, from interaction patterns to critical behavior". Venice, 16-19 September 2015 "Statistical laws in genome evolution" (keynote conference talk).

Workshop & Summer School on "Models of Life" 2-8 August 2015 Krogerup, Copenhagen, DK "Cell size fluctuations and cell cycle control in *E. coli*" (invited conference talk).

Institut Curie, Theory group seminar, Paris June 4 2015, "Scaling concepts in single-cell division" (invited seminar).

Conference Biophysics across scales : from single molecules to organisms international Physics of Living Systems (iPOLs) Network, June 1-3 2015 - Montpellier, France. "Fluctuations of size and cell-cycle control in single *E. coli* cells" (invited conference talk).

Advanced Workshop on "Interdisciplinary View in Chromosome Structure Function. The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 15 - 19 September 2014. "Combined effects of self-adhesion and bridging in a prototypical nucleoid-inspired model" (invited conference talk).

Biozentrum Basel, September 8 2014, "Bacterial genome plasticity and gene-family abundance fluctuations" (invited seminar).

Workshop. The self-organised cytoplasm July 16, 2014 to July 18, 2014 CECAM-HQ-EPFL, Lausanne, Switzerland. "Organization of the *E. coli* nucleoid, a physicists' perspective" (invited conference talk).

Conference The Biology and Physics of Bacterial Chromosomes - June 16-18, 2014 - Birmingham, UK. "Rapid chromosomal movements in *Escherichia coli*" (invited conference talk).

NYU Biology Guest Seminar, April 18th, 2014, Dept of Biology, New York University. "Rapid Chromosomal Movements in *E. coli*" (invited seminar).

Laufer Center Seminar April 15th, 2014, Stony Brook University, "Statistical laws in genome evolution" (invited seminar).

Seminar, Department of Molecular and Cellular Biology, Harvard University (Kleckner Group), Apr 7, 2014. "Concerted control of *E. coli* cell division" (invited seminar).

Mirny group Lab Meeting, Massachusetts Institute of Technology, Boston, Apr 8th 2014. "Models and clues about the organization of the *E. coli* genome" (invited seminar).

Seminar at Institute for Theoretical Physics, KU Leuven (B). Apr 3 2014. "Physical Organization and Dynamics of the Bacterial Chromosome" (invited seminar).

Seminar. University of Padua, Physics Dept 6 Jun 2014. "Physics of the Bacterial Chromosome" (invited seminar).

Workshop. Games in Evolution: Models and Microbes, Paris, December 5-6, 2013. "Control of cell division in single *E. coli* cells" (invited conference talk).

Workshop *FiSiCo*, Complex Systems Group, Physics Dept. University of Milan. 11 Sept 2013. "Genome Partitioning Laws" (invited conference talk).

15 May 2013 Meeting Complex and Emergent Behaviours in Biological Systems, School of Physics and Astronomy The University of Manchester. "Cell-size control in *E. coli*" (invited conference talk).

Seminar at SISSA, Trieste, 30 Oct 2012 "Statistical physics and emergent laws of genome composition." (invited seminar).

Workshop. The Biology and Physics of Bacterial Genome Organization, 18-22 June 2012 Lorentz Center Leiden (NL). "Apparent diffusion of chromosomal loci at short time scales, and possible physical interpretations" (invited conference talk).

Conference Contributions, Lectures, Seminars (continued)

CoSy Seminar, Centre for Interdisciplinary Mathematics, University of Uppsala. "Laws of genome composition, bringing monod's "operon model" to the scale of genomics", 29 May 2012 (invited seminar).

Seminar at NCBS (National Center for Biological Science) Bangalore, India. "Combinatorial and physical aspects in the large-scale organization of bacterial genomes." Feb 9 2012 (invited seminar).

Seminar at the University of Grenoble Dec 16 2011. "Large-scale organization of bacterial genomes" (invited talk).

IOP Conference, Quantitative Methods in Gene Regulation Sep 22-23 2011, London (UK) "Genome Partitioning and Large-scale Transcriptional Regulation" (conference talk).

European Conference on Complex Systems 2011, Satellite Meeting on Hierarchy, Vienna Sep 12-16 2011, "Hierarchy in transcriptional regulation within and across the genomes" (invited conference talk).

Seminar at the Institute for Complex Systems ISC-PIF, Paris, May 11 2011, "Hierarchy in transcriptional regulation within and across the genomes" (invited seminar).

Laboratory for Systems Biology, RIKEN Center for Developmental Biology Kobe, Japan, December 1 2010 "DnaA and the timing of chromosome replication in E.coli. A systems biology modeling approach" (invited talk).

Yukawa Institute for Theoretical Physics, Kyoto University, Japan November 29 2010 "A model-system approach to biological fluid pumping" (invited talk).

Institute for Advanced Biosciences Keio University, Tsuruoka, Japan, November 25 2010. "Contiguous gene clusters respond to supercoiling and occupancy perturbations of the E. coli nucleoid" (invited talk).

Invited talk, Kaneko Lab, Department of Basic Science, The University of Tokyo, November 24 2010 "The recipe for a Genome. Scaling laws and partitioning in functional categories and evolutionary classes"(invited talk).

EMBO Conference, EMBL Heidelberg (DE), September 29 - October 3 2010. "Ordered structure of the transcription network inherited from the yeast whole-genome duplication" (conference talk).

BIOPHYS10 Conference, Arcidosso (IT), September 9-11 2010. "Ordered structure of the transcription network inherited from the yeast whole-genome duplication" (conference talk).

SMBE 2010 Conference, Society for Molecular Biology and Evolution, Lyon (FR), July 4-8 2010. "Ordered structure of the transcription network inherited from the yeast whole-genome duplication" (poster).

Invited talk, LPTMS, Dept of Physics, University of Paris-Sud (FR) July 10 2010. "The constrained growth of functional and evolutionary partitioning of a genome" (invited talk).

Invited talk, Dept of Theoretical Physics (LAPTH), University of Annecy (FR) 3 June 2010. "Scaling Laws in Genome Partitioning" (invited talk).

Conference. Colloque Theoretical Physics of Biological Systems, Institut Henri Poincare, 17-18 December 2009 "Scaling laws, evolution, and proteome partitioning" (invited talk).

Meeting. Journée Scientifique Gen-Dev, University Paris VI October 6 2009 "Timing of E. coli Replication Initiation" (invited talk).

Invited talk, Dept of Physics, University of Edinburgh (UK) June 16 2009. "Synchronization of colloidal oscillators" (invited talk).

Invited talk, Dept of Systems Biology, University of Aberdeen (UK) June 15 2009. "Scaling Laws in the Protein-domain Content of Genomes" (invited talk).

Conference. Biowire2009 Workshop, Cambridge (UK) June 11-12 2009. "Synchronization of colloidal oscillators" (invited conference talk).

Conference Contributions, Lectures, Seminars (continued)

Invited lecture. Ph.D Programme in Complexity in Post-genomic Biology, University of Torino, March 4, 2009. "Modeling Regulatory Circuits" (seminar).

ECCB09 Conference on Computational Biology, Genova (IT) March 18-20 2009. "Plasticity of the yeast transcription network after the whole-genome duplication" (poster).

Conference, RECOMB Meeting Systems Biology and Regulatory Genomics 2008, "Plasticity of the yeast transcription network after the whole-genome duplication", MIT, Boston USA, 28 October - 2 November 2008 (poster).

Invited talk. ICTP Trieste, IT. August 13, 2008. "Domain Soup, Chinese Restaurant" (seminar).

Invited talk. Ecole Normale Supérieure Cachan, FR, July 11, 2008. "Comparative topological and evolutionary analysis of transcription networks" (seminar).

Invited talk. Physics Dept, University of Leiden, NL, April 9, 2008. "Domain Soup, Chinese Restaurant" (seminar).

Invited lecture. Ph.D Programme in Complexity in Post-genomic Biology, University of Torino, March 6, 2008. "Topological analysis of transcription networks" (seminar).

Talk. Sporadic Q-BIO seminar, Dep. of Physics, Univ of Milan, January 18 2008. "L'universo delle proteine come zuppa di domini. Ricette da un ristorante cinese" (seminar).

Invited talk. SYSBIOHEALTH Symposium 2007, Milan (IT) October 16-19, 2007. "A large-scale evolutionary approach to the analysis of transcription networks" (seminar).

Invited talk BIOPHYS07 Conference, Arcidosso (IT), September 3-5 2007. "Hierarchy and Feedback in the Evolution of Transcription Networks" (seminar).

Statphys 23 (IUPAP Conference on Statistical Physics), Genova (IT) 9-13 July 2007. "Hierarchy and feedback in transcription networks" (poster).

Conference, From Biophysics to Medicine KAIST Cavendish Workshop 28-30 June 2007, Univ. of Cambridge (UK), "Active Membranes, the Role of Ion Channels" (seminar).

Invited seminar, 26 March 2007, Dept of Pharmacology, Univ. of Pavia (IT), "Hierarchy, Feedback and the E. coli Transcription Network" (seminar).

Invited seminar, 1 November 2006, Univ. of Montpellier (FR), "Feedback and Hierarchy in the Evolution of the E. coli Transcription Network" (seminar).

Invited seminar, 24 October 2006, Dept of Physics, Univ. of Torino (IT), "Making Some Sense of the E. coli Transcription Network" (seminar).

Conference, CMSB (Computational Methods in Systems Biology), 18-19 October 2006, "Randomization and Feedback Properties of Directed Graphs Inspired by Gene Networks" (seminar).

Conference, XX Sitges Conference, "Functional Robustness in the E. Coli Transcription Network", Sitges (Barcelona), 5-9 June 2006 (poster).

Invited seminar, 18 November 2005, Informatics Dept, University of Milan II "Bicocca" (IT). "Models of transcription networks" (seminar).

Conference, Juelich Soft Matter Days 2005, "Nonequilibrium membranes with ion conducting channels", Bonn, 1-4 October 2005 (poster).

Conference, SoftComp Network Meeting, "Electrohydrodynamics of membranes with ion conducting units", Bonn, 31-31 October 2005 (seminar).

Conference Contributions, Lectures, Seminars (continued)

Conference, "La biophysique théorique sur la Montagne Sainte-Genevieve" Paris, 30 June 2005. "A simple model of large scale transcriptional control"(seminar).

Invited seminar, 9 March 2005, Dept Fisica Fonamental, University of Barcelona (ES). "A simple model for the logico-chemical structure of a transcription network" (seminar).

Invited seminar, 14 February 2005, ESPCI Paris (FR). "A simple model for the logico-chemical Structure of a transcription network" (seminar).

Invited seminar, 23 June 2004, University of Montpellier (FR). "A physics point of view on the organization of cortical microtubules in interphase plant cells" (seminar).

Invited seminar, 9 June 2004, Physics Dept, University of Koeln (D). "A scenario for the problem of pre-prophase band formation in interphase plant cells" (seminar).

Fysisch Colloquium. 14 May 2004, Physics Dept, University of Leiden (NL). "Swimming Together" (seminar).

ALW Biophysics Conference, Lunteren (NL), September 29-30, 2003. Large Scale Instabilities Driven by Active Components in Filamentous Systems (poster).

4th European Biophysical Society Congress, Alicante, 5-9 July 2003. "Cortical Microtubules in Plant Cells. Benchmarking the Dynamic Spring" (poster).

PHYNECS meeting "Nonequilibrium Physics from Complex Fluids to Biological Systems" St. Feliu de Guixols, Spain, June 16-20, 2003. Seminar entitled " The Physics of Plant Cell Cortex Microtubules" (seminar).

Invited seminar, 16 April 2003, Computer Science Dept., University of Crema (IT). "Dinamica di un filamento forzato in un fluido aristotelico" (seminar).

Invited seminar, 20 September 2002, Polymers and Colloids Group, Cavendish Lab, Cambridge (UK). "A physics point of view on the organization of microtubules in the cortex of plant cells" (seminar).

Invited seminar, 7 July 2002, Max Planck Institute for the Physics of Complex Systems. Dresden, (Germany) "Forced Swimming. Dynamics of a semiflexible filament in an Aristotelian Fluid" (seminar).

European Molecular Biology Organization Course on Plant Cell Biology. AMOLF Amsterdam (NL). 16-26 June 2002. "The Physics of Molecular Motors" (lecture).

VII convegno nazionale di Meccanica Statistica e dei Sistemi Complessi, Parma (IT), 3-5 June 2002. "Forced Swimming. Dynamics of a semiflexible filament in an Aristotelian Fluid" (poster).

Invited seminar at the Oncology Dept., Vrije Universiteit, Amsterdam, (NL). 3 May 2002. "A physics point of view on force generation, dynamics and organization of microtubules" (seminar).

Seminar at the Theory Group, Physics Dept., University of Milano (IT). 7 Jan 2002. "Nuoto forzato. Dinamica di un filamento elastico in un fluido aristotelico" (seminar).

Lecture at the Theory Dept, University of Milan (IT). May 14, 2001." "Rowers" coupled hydrodynamically. Symmetry breaking, macroscopic flows, and metachronal waves (collective motions) by stochastic noise"(seminar).

ALW Biophysics Conference, Lunteren (NL), October 4-5, 2000. "Biological Rods: microtubules as a model system for the isotropic to nematic transition in a slit pore" (poster).

Lecture at the Theory Dept, TU Munich (GE), December 20,1999 . "A model for the Self Organization of Microtubules driven by Molecular Motors" (lecture).

XVI GNSR Meeting, Milan (IT), November 17-19, 1999. "On the self-organization of microtubules and molecular motors" (lecture).

Conference Contributions, Lectures, Seminars (continued)

IV National Conference of Statistical Physics, Parma (IT), June 23-25, 1999. "A model for the Self Organization of Microtubules driven by Molecular Motors" (lecture).

Relevant Attended Workshops, Programs and Schools

Understanding Microbial Communities; Function, Structure and Dynamics. Scientific Programme. Isaac Newton Institute (Cambridge UK), Aug 11 to Dec 19 2014.

Conference. 14th Human Frontiers Science Program (HFSP) Awardees Meeting. Lugano, Switzerland 6 - 9 July, 2014

Workshop. The Biology and Physics of Bacterial Genome Organization, Lorentz Center Leiden (NL) 18-22 June 2012.

Kavli Institute for Theoretical Physics Program on Microbial and Viral Evolution "Viral11", February - March 2011.

EMBO Workshop. Evo-Devo meets Marine Ecology: New Frontiers in Ocean Science. 9-11 Oct 2009, Ischia, Napoli Italy.

Workshop, Evolvability: the evolution of evolution, Villa Monastero, Varenna (IT) April 2007.

Thematic Institute Complex Biological Networks: Gene Regulation and Protein Interaction, Turin, September 2005.

Interdisciplinary School: Noise and robustness in transcriptional regulatory networks, Calais, September 2005.

Dynamics of Biological Systems. Krogerup, Copenhagen, August 2002.

Fundamental Problems in Statistical Physics X. Altenberg, Germany. August 2001.

Han Sur Lesse (BG) Winter School On Theoretical Physical Chemistry. February 2001.

Most Relevant Scientific Visits

April 2014. Brookhaven National Laboratory, USA. Visit Maslov Group.

February 2012. NCBS Bangalore India. Visit Seshasayee Group.

February - March 2011. University of California at Santa Barbara, Kavli Institute for Theoretical Physics Program - Microbial and Viral Evolution.

November-December 2010. Scientific Visits to Tokyo University / Yukhawa Institute Kyoto / KEIO University Tsuruoka/ RIKEN Kobe, Japan

June - September 2009. Visiting Scientist of the Biological and Soft Systems Group, Cavendish Laboratory, University of Cambridge.

2002 - 2004. Multiple visits for a long-term collaboration project with the Max Planck Institute for the Physics of Complex Systems (Dresden, Germany), group of Frank Jülicher.
