

Jacopo Grilli

CONTACT INFORMATION	Postdoctoral Scholar Zoology bld., room 403 Department of Ecology and Evolution University of Chicago 1101 E. 57th st., Chicago 60637 IL, USA	 <i>Mobile:</i> +1-773-431-3968 jgrilli@uchicago.edu home.uchicago.edu/~jgrilli/
PERSONAL	Born in Milan, July 22, 1987. Italian citizen.	

VITA

- January 2015 to *present*
Postdoctoral Scholar at Department of Ecology and Evolution, University of Chicago.
Advisor: S. Allesina
 - January 2012 to February 2015
Ph.D. in Physics at **Università degli Studi di Padova**, Padova, Italy.
Advisor: A. Maritan
 - October 2011 to December 2011
Post-Master Scholarship ‘ex 60%’ 2011 at Department of Physics and Astronomy G. Galilei, **Università degli Studi di Padova**, Padova, Italy.
 - October 2009 to July 2011
M.S. in Theoretical Physics at **Università degli Studi di Milano**.
Advisors: A. Maritan and B. Bassetti. Final grade *110/110 cum Laude*.
 - October 2006 to October 2009
B.S. in Physics at **Università degli Studi di Milano**.
Advisors: B. Bassetti and M. Cosentino Lagomarsino. Final grade *110/110 cum Laude*.
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GRANTS, FELLOWSHIP AND AWARDS

- January 2014
Fellowship sponsored by the Ing. Aldo Gini private foundation in Padua, funding a visit of 6 months at the University of Chicago [4.8k€].
 - January 2012 to December 2014
Three years fellowship for Ph.D. studies from **Università degli Studi di Padova**.
 - October 2011 to December 2011
Post-master scholarship ‘ex 60%’ 2011.
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VISITS

- November 18, 2013 to May 30, 2014
Visiting Student at Department of Ecology and Evolution, The University of Chicago, Chicago, IL, USA.
- July 22, 2013 to August 3, 2013
Visiting Student at Departamento de Electromagnetismo y Física de la Materia, Universidad de Granada, Granada, Spain.
- February 20, 2012 to March 31, 2012
Visiting Student at Genomic Physics Group, Genomique des Microorganismes, UMR 7238 CNRS - Université Pierre et Marie Curie, Paris, France.

- June 1, 2010 to June 28, 2010
Summer Internship under the supervision of S. Maslov at Department of Condensed Matter Physics, Brookhaven National Laboratory, Upton, NY, USA.
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PUBLICATIONS

- [1] J. Grilli, G. Barabás, M. Michalska-Smith and S. Allesina. Higher-order interactions stabilize dynamics in competitive network models. *Nature*. 548, 210-213. 2017.
doi:10.1038/nature23273
- [2] J. Grilli and S. Allesina. Last name analysis of mobility, gender imbalance, and nepotism across academic systems. *Proceedings of the National Academy of Sciences*. 114(29):7600-7605. 2017.
doi:10.1073/pnas.1703513114
- [3] C. Tu, J. Grilli, F. Schuessler and S. Suweis. Collapse of resilience patterns in generalized Lotka-Volterra dynamics and beyond. *Physical Review E*. 95, 062307. 2017.
doi:10.1103/PhysRevE.95.062307 arXiv:1606.09630
- [4] E. de Lazzari, J. Grilli, S. Maslov and M. Cosentino Lagomarsino. Family-specific scaling laws in bacterial genomes. *Nucleic Acids Research*. 45 (13): 7615-7622. 2017
doi:10.1093/nar/gkx510 arXiv:1703.09822
- [5] J. Grilli, M. Osella, A.S. Kennard and M. Cosentino Lagomarsino. Relevant parameters in models of cell division control. *Physical Review E*. 95, 032411. 2017.
doi:10.1103/PhysRevE.95.032411 arXiv:1606.09284
- [6] J. Grilli, M. Adorisio, S. Suweis, G. Barabás, J.R. Banavar, S. Allesina and A. Maritan. Feasibility and coexistence of large ecological communities. *Nature Communications*. 8:0. 2017.
doi:10.1038/ncomms14389 arXiv:1507.05337
- [7] S. Azaele, S. Suweis, J. Grilli, I. Volkov, J.R. Banavar, and A. Maritan. Statistical mechanics of ecological systems: neutral theory and beyond. *Review of Modern Physics*. 88, 035003. 2016.
doi:10.1103/RevModPhys.88.035003 arXiv:1506.01721
- [8] J. Grilli, T. Rogers and S. Allesina. Modularity and stability in ecological communities. *Nature Communications*. 7:12031. 2016.
doi:10.1038/ncomms12031
- [9] J. Hidalgo, J. Grilli, S. Suweis, A. Maritan and M.A. Muñoz. Cooperation, competition and the emergence of criticality in communities of adaptive systems. *Journal of Statistical Mechanics: Theory and Experiment*. 2016(3):033203. 2016.
doi:10.1088/1742-5468/2016/03/033203 arXiv:1510.05941
- [10] A.S. Kennard, M. Osella, A. Javer, J. Grilli, P. Nghe, S. Tans, P. Cicuta and M. Cosentino Lagomarsino. Individuality and universality in the growth-division laws of single *E. coli* cells. *Physical Review E*. 93, 012408. 2016.
doi:10.1103/PhysRevE.93.012408 arXiv:1411.4321
- [11] S. Suweis, J. Grilli, J.R. Banavar, S. Allesina and A. Maritan. Effect of localization on the stability of mutualistic ecological networks. *Nature Communications*. 6:10179. 2015.
doi:10.1038/ncomms10179

- [12] S. Allesina, J. Grilli, G. Barabás, S. Tang, J. Aljadeff and A. Maritan. Predicting the stability of large structured food webs. *Nature Communications*. 6:7842. 2015. doi:10.1038/ncomms8842
- [13] J. Grilli, G. Barabás and S. Allesina. Metapopulation persistence in random fragmented landscapes. *Plos Computational Biology*. 11(5):e1004251. 2015. doi:10.1371/journal.pcbi.1004251
- [14] J. Hidalgo[‡], J. Grilli[‡], S. Suweis, M.A. Muñoz, J.R. Banavar and A. Maritan. Information-based fitness and the emergence of criticality in living systems. *Proceedings of the National Academy of Sciences*. 111(28):10095-10100. 2014. doi:10.1073/pnas.1319166111 arXiv:1307.4325
- [15] J. Grilli, M. Romano, F. Bassetti and M. Cosentino Lagomarsino. Cross-species gene-family fluctuations reveal the dynamics of horizontal transfers. *Nucleic Acids Research*. 42(11):6850-6860. 2014. doi:10.1093/nar/gku378
- [16] S. Suweis[‡], J. Grilli[‡] and A. Maritan. Disentangling the effect of hybrid interactions and of the constant effort hypothesis on ecological community stability. *Oikos*. 123(5):525-532. 2014. doi:10.1111/j.1600-0706.2013.00822.x arXiv:1301.1569
- [17] J. Grilli, S. Suweis and A. Maritan. Growth or reproduction: emergence of an evolutionary optimal strategy. *Journal of Statistical Mechanics: Theory and Experiment*. 2013(10):P10020. 2013. doi:10.1088/1742-5468/2013/10/P10020 arXiv:1306.5877
- [18] J. Grilli, S. Azaele, J.R. Banavar and A. Maritan. Absence of detailed balance in ecology. *Europhysics Letters*. 100:38002. 2012. doi:10.1209/0295-5075/100/38002 arXiv:1210.5819
- [19] J. Grilli, S. Azaele, J.R. Banavar and A. Maritan. Spatial aggregation and the species-area relationship across scales. *Journal of Theoretical Biology*. 313:87-97. 2012. doi:10.1016/j.jtbi.2012.07.030 pmid:22902426 arXiv:1209.3591
- [20] L. Grassi, J. Grilli and M. Cosentino Lagomarsino. Large-scale dynamics of horizontal transfers. *Mobile Genetics Elements*. 2(3):163-167. 2012. doi:10.4161/mge.21112 pmid:23061026
- [21] J. Grilli, B. Bassetti, S. Maslov and M. Cosentino Lagomarsino. Joint scaling laws in functional and evolutionary categories in prokaryotic genomes. *Nucleic Acids Research*. 40(2):530-540. 2012. doi:10.1093/nar/gkr711 pmid:21937509 arXiv:1101.5814

PREPRINTS

- [22] T. Gibbs, J. Grilli, T. Rogers, S. Allesina. The effect of population abundances on the stability of large random ecosystems. arXiv:1708.08837
- [23] C. Tu, S. Suweis, J. Grilli, M. Formentin and A. Maritan. Cooperation promotes biodiversity and stability in a model ecosystem. arXiv:1708.03154
- [24] C. Cadart, S. Monnier, J. Grilli, R. Attia, E. Terriac, B. Baum, M. Cosentino Lagomarsino and M. Piel. Size control in mammalian cells involves modulation of both growth rate and cell cycle duration. bioRxiv:2017/08/22/152728

- [25] K. Jovic, M.G. Sterken, J. Grilli, R.P.J. Bevers, M. Rodriguez, J.A.G. Riksen, S. Allesina, J.E. Kammenga, L.B. Snoek. A point of no return leading to death during heat-shock in *C. elegans*.
 bioarXiv:2017/05/16/135988
- [26] M. Adorisio, J. Grilli, S. Suweis, S. Azaele, J.R. Banavar and A. Maritan. Spatial maximum entropy modeling from presence/absence tropical forest data.
 arXiv:1407.2425

‡ indicates equal contributions

SEMINARS,
 CONFERENCES
 AND SCHOOLS

- May 2, 2017
 International Centre for Theoretical Physics, Trieste, Italy.
 ◇ *Invited seminar: **Higher-order interactions stabilize the dynamics of ecological communities.***
- February 27, 2017
 Second Science of Science Meeting, Chicago, IL, USA.
 ◇ *Invited talk: **What's in a Last Name? Mobility, Gender Imbalance and Nepotism across Academic Systems***
- January 26, 2017
 Santa Fe Institute, Santa Fe, NM, USA.
 ◇ *Invited seminar: **Higher-order interactions stabilize the dynamics of ecological communities.***
- April 15, 2016
 Laboratory of Computational and Quantitative Biology, Paris, France.
 ◇ *Invited seminar: **Coeexistence in large ecosystems: from structure to function.***
- April 12, 2016
 International Centre for Theoretical Physics, Trieste, Italy.
 ◇ *Invited seminar: **Coeexistence in large ecosystems: from structure to function.***
- August 9 - August 14, 2015
 100th ESA Conference, Baltimore, MD, USA.
 ◇ *Contributed talk: **Feasibility and stability of large ecosystems.***
- June 15 - June 19, 2015
 Granada Seminar, La Herradura, Spain.
 ◇ *Contributed talk: **Persistence of a population in randomly fragmented landscapes.***
- May 26, 2015
 The University of Chicago, Chicago, USA.
 ◇ *Seminar: **Stability and feasibility of large ecosystems.***
- March 26, 2015
 Wageningen University, Wageningen, The Neatherlands.
 ◇ *Invited seminar: **On the stability of large ecosystems.***
- December 18, 2014
 Workshop on Physics of Complex Systems, Padova, Italy.
 ◇ *Invited talk: **Emergence of criticality in communities of living systems***

- November 3, 2014
Department of Environmental Systems Science, ETH, Zürich, Switzerland.
◊ *Invited seminar: **Spatial aggregation and spatial fragmentation: simple random models for spatial ecology.***
- October 6, 2014
Dipartimento di Fisica, Università di Torino, Torino, Italy.
◊ *Invited seminar: **Scaling laws in genome evolution.***
- September 22 - September 26, 2014
ECCS 2014, European Conference on Complex Systems, Lucca, Italy.
◊ *Contributed talk: **Persistence of a population in randomly fragmented landscapes.***
- December 17, 2013
University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, USA.
◊ *Invited seminar: **Emergence of criticality in living systems through adaptation and evolution: Practice Makes Critical.***
- September 16 - September 20, 2013
ECCS 2013, European Conference on Complex Systems, Barcelona, Spain.
◊ *Contributed talk: **Emergence of criticality in living systems through adaptation and evolution: Practice Makes Critical.***
- June 27 - July 5, 2013
Workshop on Quantitative Laws of Genome Evolution, Como, Italy.
◊ *Contributed talk: **Universal properties of ecological interactions and stability of ecosystems.** Awarded as F1000 Best Young Presentation.*
- March 13 - 15, 2013
CompleNet 2013, IV Workshop on Complex Networks, Berlin, Germany.
◊ *Contributed poster: **Complexity-stability relation in ecological networks***
- December 20, 2012
Workshop on Physics of Complex Systems, Padova, Italy.
◊ *Invited talk: **Growth or Reproduction? Emergence of a Strategy***
- November 26 - December 7, 2012
Winter School on Quantitative Systems Biology, Trieste, Italy.
- November 9, 2012
Scientific day in honor of Bruno Bassetti, Milan, Italy.
◊ *Invited talk: **Growth or Reproduction? Emergence of a Strategy***
- July 23 - August 3, 2012
Summer School “Emergent Order in Biology”, Cargèse, France.
◊ *Contributed poster: **Emergence of scaling laws in functional and evolutionary partitioning of genomes***
- June 20 - 22, 2012
XVII Conference on Statistical Physics and Complex Systems, Parma, Italy.
◊ *Contributed talk: **Spatial distribution of species across scales***

SKILLS AND EXPERTISE

Languages

Italian (native speaker), English (fluent) and Spanish (good)

Analytical

Stochastic Processes and SDE, Equilibrium Statistical Mechanics, Random Matrix theory

Computational

OS: *Linux*, Programming and Scripting: *C/C++*, *Python*, *R*, *Bash*, *Awk*, Scientific Softwares: *Grace*, *Latex*, *Mathematica*, Image Editing: *Inkscape*

TEACHING
EXPERIENCE

October 2014

Lecturer for a module on Complex Systems (with S. Suweis), at Master in Scientific Communication, Università degli Studi di Padova

September 2014

Tutor at ESTAGE, internship for high-school students at Department of Physics and Astronomy, Università degli Studi di Padova

November 2012 - June 2013

Tutor Junior at Università degli Studi di Padova

Mathematics (for 1st year Geology students), Mathematical Analysis and Linear Algebra (for 1st year Physics students)

MENTORING
EXPERIENCE

1 B.Sc. Thesis (M. Insolia, B.Sc. in Physics 2014, Padova, co-supervised with A. Maritan).

2 M.Sc. Thesis (E. De Lazzari, M.Sc. in Physics 2013, Padova and M. Adorisio, M.Sc. in Physics 2014, Padova, both co-supervised with A. Maritan and S. Suweis).

ORGANIZING
EXPERIENCES

Amsterdam, 20 September 2016

Co-organizer of **LIVING 2.0**, workshop on robustness, adaptability and critical transitions in Living Systems (CCS 2016 satellite meeting).

Venice, 16-19 September 2015

Co-organizer of the workshop **Living systems: from interaction patterns to critical behavior**.

Lucca, 25 September 2014

Co-organizer of **LIVING**, workshop on robustness, adaptability and critical transitions in Living Systems (ECCS 2014 satellite meeting).

PROFESSIONAL
ACTIVITIES

Reviewer for *Nature Ecology and Evolution*, *Nature Communications*, *Plos Computational Biology*, *Physical Review X*, *Ecology Letters*, *American Naturalist*, *Journal of Statistical Mechanics*, *Physical Review E*, *Frontiers in Ecology and Evolution*, *Scientific Reports*, *Plos One*, *Proceedings of the Royal Society B*, *Methods in Ecology and Evolution*, *Journal of Theoretical Biology*, *Oikos*, *Entropy*, *Journal of Biogeography*, *Journal of Complex Networks*, *Communications in Nonlinear Science and Numerical Simulation*

Publons ID 558637

Member of **Ecological Society of America** (2015), Member of **Complex System Society** (2013-2014), Member of **American Physical Society** (2014)

REFERENCES

Stefano Allesina

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Amos Maritan

Full Professor, Department of Physics and Astronomy G. Galilei, Università degli Studi di Padova, Via Marzolo 8, 35131 Padova, Italy
e-mail: amos.maritan@pd.infn.it; phone: +39-049-827-7175

Marco Cosentino Lagomarsino

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