Davide Maestrini

Curriculum Vitae

Contact Information

Department of Computational Medicine
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Academic Appointments

08/2019 - Present: Research Scientist, Department of Qantitative Medicine, UCLA.

03/2016 - 07/2019: Postdoctoral Fellow, Department of Mathematical Oncology
Beckman Reseach Institute, City of Hope National Research Center, Duarte, USA.

Education

2012-2016: Ph.D. in Applied Mathematics, University of East Anglia, Norwich, UK.

2006-2011: Laurea Specialistica (Master's Degree) in Physics of the Fundamental Interactions (Theoretical Physics), Università degli Studi di Torino, Italy.

2002-2006: Laurea Triennale (Bachelor's degree) in Physics, Università degli Studi di Torino, Italy.

Teaching experience

03/2017 - 07/2019: Lecturer on stochastic processes, stochastic differential equations, Itô calculus, statistical mechanics and phase transitions, special relativity, dimensional reduction techniques (PCA, LLE, Diffusion Map, t-SNE, h-SNE, and UMAP).
Department of Mathematical Oncology, Duarte, CA, USA.

02/2019 - 07/2019: Lecturer for the module *Mathematical Modelling and Methods for Biomedical Science*.
Irell & Manella Graduate School of Biological Science, Duarte, USA.
Topics covered: fundamentals of calculus, basic programming concepts, introduction to MATLAB and Python, growth models, dynamical systems, Lotka-Volterra system, Brownian motion and numerical solutions of stochastic differential equations.

08/2016-02/2017: Learning Enhancement Tutor for Mathematics and Statistics
University of East Anglia, Norwich, UK.

2013-2017: Lectures on superfluids and Bose-Einstein condensates
Department of Physics, Università degli Studi di Torino, Italy.

10/2012-02/2017: Teaching Assistant
University of East Anglia, Department of Mathematics, Norwich, UK.
Topics covered: Linear Algebra, Calculus, Multivariable Calculus, Complex Analysis, Differential Equations, Partial Differential Equations, Mechanics, Quantum Mechanics.

2007-2012: Private High School Mathematics and Physics teacher, Italy.

Research interests

I am an applied mathematician with specific training and expertise in statistical mechanics, non-linear dynamics, and stocastic processes. My research focuses on various aspects of cancer dynamics, mathematical models of the immune system, theoretical aspects of the process of aging, DNA structure, mathematical models of drug addiction and neural circuitry.

Publications

Submitted or in preparation

10. Y. Markaki, **D. Maestrini**, T. Chou. *X chromosome inactivation is mediated through 50 topologically-confined Xist RNA granules that accumulate high local protein activities perpetrating formation of a chromosome condensate.* In preparation.
9. **D. Maestrini**, T. Chou, M.R. D'Orsogna. *A mathematical model of "wanting","liking", and brain reward circuitry in drug addiction.* In preparation.
8. R. Dessalles, Y. Pan, M. Xia, **D. Maestrini**, M. R. D'Orsogna, and T. Chou. *How heterogeneous thymic output and homeostatic proliferation shape naive T2 cell receptor clone abundance distributions.* In preparation.
7. **D. Maestrini**, S. Branciamore, M. Caselle and R. Rockne. *On the concept of temperature in the Acute Myeloid Leukemia development.* In preparation.
6. P. Sahoo, X. Yang, D. Abler, **D. Maestrini**, V. Adhikarla, D. Frankhouser, H. Cho, V. Machuca, D. Wang, M. Barish, M. Gutova, S. Branciamore, C. Brown, and R. Rockne. *Mathematical deconvolution of CAR T-cell proliferation and exhaustion from real-time killing assay data.* J. R. Soc. Interface. 17:20190734, doi: http://doi.org/10.1098/rsif.2019.0734
5. L. X. T. Nguyen, B. Zhang, D. H. Hoang, D. Zhao, S. Branciamore, **D. Maestrini** , Y.-L. Su, S. Rodriguez, F. Pichiorri, S. Rosen, M. A. Caligiuri, S. J. Forman, L. Li, M. Kortylewski, R. Rockne, Y.-H. Kuo, N. Carlesso, G. Marcucci *FLT3-ITD Activates Cytoplasmic Drosha-Dependent Non-Canonical Mechanisms of Mir-155 Biogenesis in Acute Myeloid Leukemia.* Blood 2019; 134 (Supplement 1): 2722, doi: https://doi.org/10.1182/blood-2019-131871
4. R. C. Rockne, S. Branciamore, J. Qi, G. J. Cook, W.-K. Hua, E. Carnahan, A. Marom, H. Wu, **D. Maestrini**, X. Wu, C. Guo, D. O'Meally, Y.-C. Yuan, Z. Liu, N. Carlesso, L. D. Wang, S. Forman, Y.-H. Kuo, G. Marcucci *State-Transition Analysis of Time-Sequential Gene Expression Identifies Critical Points That Predict Acute Myeloid Leukemia Development.* bioRxiv 238923; doi: https://doi.org/10.1101/238923
3. **D. Maestrini**, D. Abler, V. Adhikarla, S. Armenian, S. Branciamore, N. Carlesso, G. Marcucci, Y.-H. Kuo, P. Sahoo, R. Rockne *Aging in a relativistic biological space-time.* Front. Cell Dev. Biol., 29 May 2018 | https://doi.org/10.3389/fcell.2018.00055
2. **D. Maestrini** and H. Salman, *Entropy of Negative Temperature States for a Point Vortex Gas.* H. J Stat Phys (2019) 176: 981. https://doi.org/10.1007/s10955-019-02329-w
1. H. Salman and **D. Maestrini** *Long-range ordering of topological excitations in a two-dimensional superfluid far from equilibrium.* Phys. Rev. A **94**, 043642 (2016)

Conferences, workshops and seminars

10/2019 — *UCLA Seminar Series: Research Frontiers in Biomathematics.*
Talk: *On the concept of epigenetic temperature and spatial organization of chromatin.*

07/2019 *Society for Mathematical Biology 2019.*
University of Montréal, Québec, Canada.
Talk: *On the concept of temperature in the process of aging and AML development.*

02/2019 *8th Annual Southern California Systems Biology Conference.*
Univeristy of California Irvine, United States.

02/2018 *Ninth Workshop Dynamical Systems Applied to Biology and Natural Sciences.*
Dipartimento di Matematica, Università di Torino, Italy
Poster: *Equation and dynamics of state transition from health to leukemia.*

11/2017 *Multi-scale Systems Modeling Biology Methods for Studying Biomedical Processes Under Stress or with Chronic or Acute Disease.*
University California Riverside, United States.

10/2017 *IMO Workshop 7: Stroma.*
Moffitt Cancer Center, Tampa, United States.

04/2017 *Frontiers in Mathematical Oncology: Young Investigators Conference.*
University of Maryland, College Park, United States.

12/2015 *Nonlinear Physics Workshop*, Torino, Italy.
Talk: *Geometry Induced Transition of Turbulent Vortex States in 2D Bose-Einstein Condensates.*

07/2015 *Non-equilibrium Quantum Dynamics in Low Dimensions.*
University of Durham, UK.
Poster: *Vortex Clustering and Negative Temperature States in Two-Dimensional Bose-Einstein Condensates.*

06/2015 *First Eastern Arc Conference on Topological Solitons and Quantum Fluids.*
University of East Anglia, Norwich, UK.
Talk: *Vortex Clustering and Negative Temperature States in Two-Dimensional Bose-Einstein Condensates.*

03/2015 *Outreach in Maths.* University of East Anglia, Norwich, UK.
Talk: *The Shape of the Droplets.*

08/2014 *S.I.A.M. Conference on Nonlinear Waves and Coherent Structure.*
University of Cambridge, UK.
Talk: *Clustering and Negative Temperature Regime in a Point Vortex Gas.*

06/2014 *TIQF 2014 - Turbulence in Quantum Fluids Workshop.*
University of Glasgow, UK.
Talk: *Clustering and Negative Temperature Regime in a Point Vortex Gas.*

07/2013 *NOTSCON - Conference on Statistical Physics and Condensed Matter.*
University of Nottingham, UK.
Poster: *Vortex Dynamics in Two-Dimensional Bose-Einstein Condensates.*

References

These people are familiar with my professional qualifications and my character:

Prof. Tom Chou
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University of Los Angeles
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Prof. Maria R. D'Orsogna
Dept. of Mathematics
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Prof. Russell Rockne
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City of Hope Beckman Research Institute
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Prof. Sergio Branciamore
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School of Mathematics
University of East Anglia
Norwich, United Kingdom
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Prof. Miguel Onorato
Dipartimento di Fisica
Università degli studi di Torino
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University of East Anglia
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