Curriculum Vitae

EDUARDO HENRIQUE COLOMBO

PERSONAL INFORMATION

NAME: Eduardo Henrique Filizzola Colombo
BIRTH: Rio de Janeiro, Brazil | January 8, 1988
NATIONALITY: Brazilian; Italian.
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I'm a physicist interested in the macroscopic phenomena that emerge in biological populations, focusing on topics such as population survival in heterogeneous environment, self-organization and ecosystem diversity. My works mostly tackles spatialtemporal patterns that arise from individual-level interactions and how it influences different community-level outcomes.

EDUCATION

2014 - 2018	Doctoral degree in Physics, PUC-RIO, March 2018. Advisor: Prof. Celia Anteneodo. Awarded with FAPERJ-Nota10 fellowship for outstanding students.
2012 - 2014	Master's degree in Physics, PUC-RIO, February 2014. Advisor: Prof. Celia Anteneodo. Awarded with FAPERJ-Nota10 fellowship for outstanding students.
2007 - 2012	Bachelor's degree in Physics, PUC-RIO, December 2012.

PROFESSIONAL ACTIVITY

2020 -	Postdoctoral Research Associate at Departament of Ecology and Evolutionary Biology, Princeton University.
Jun/2018 - 2020	Postdoctoral researcher at Institute for Cross-Disciplinary Physics and Complex Systems (Palma de Mallorca, Spain).

FELLOWSHIPS AND GRANTS

2017 - 2017	CAPES visiting student fellowship/PDSE. Ministry of Science and Technology.
2016 - 2018	Nota10 fellowship. Research Foundation of Rio de Janeiro State.
2014 - 2016	CNPq-DG fellowship and grant. Ministry of Science and Technology.
2013 - 2014	Nota10 fellowship. Research Foundation of Rio de Janeiro State.
2012 - 2013	CAPES fellowship. Ministry of Education of Brazil.
2009 - 2011	Scientific initiation fellowship. Ministry of Education of Brazil.
2007 - 2009	Scientific initiation fellowship. Research Foundation of Rio de Janeiro State.

LIST OF PUBLICATIONS

PREPRINTS	*Landscape-induced spatial oscillations in population dynamics.* , V. Dornelas, E.H. Colombo, C. López, E. Hernández-García. Under review
2019	*Connecting metapopulation heterogeneity to aggregated lifetime statistics.* E.H. Colombo. Ecological Complexity 39, 100777.
2019	*Heat flux direction controlled by power-law oscillators under non-Gaussian fluctuations.* E.H. Colombo, L. Defaveri, W. Morgado, C. Anteneodo. Phys. Rev. E 100, 032118.
2019	*Single-species fragmentation: The role of density-dependent feedbacks.* V. Dornelas, E. H. Colombo and C. Anteneodo. Phys. Rev. E 99, 062225, 2019

2019 *Spatial eco-evolutionary feedbacks mediate coexistence in prey-predator systems.* E.H. Colombo, R. Martínez-García, C. López, E. Hernández-García. Scientific Reports 9, 18161.

2018 *Nonlinear population dynamics in a bounded habitat.* E. H. Colombo and C. Anteneodo. J. Theor. Biol., v. 446, 11 , 2018.

2016 *Population dynamics in an intermittent refuge.* E. H. Colombo and C. Anteneodo. Phys. Rev. E, v. 94, p. 042413, 2016.

2015 *Metapopulation dynamics in a complex ecological landscape.* E. H. Colombo and C. Anteneodo. Phys. Rev. E, v. 92, p. 022714, 2015.

2014 *Effect of environment fluctuations on pattern formation of single species.* L. A. da Silva, E. H. Colombo, and C. Anteneodo. Phys. Rev. E, v. 90, p. 012813, 2014.

2012 *Nonlinear diffusion effects on biological population spatial patterns.* E. H. Colombo and C. Anteneodo. Phys. Rev. E, v. 86, p. 036215, 2012.

In preparation *Pulsed signaling as a route to pattern formation.* E.H. Colombo, C. López, E. Hernández-García.

Participation in Research Projects

- Maria de Maeztu Program for units of Excellence in R&D (2019 -).
- Emergent social, technical and ecological complex systems project. Coordinator: Pere Colet. ESOTECOS FIS2015-63628-C2-2-R (AEI/FEDER,EU) (2018-2019).
- Dinâmica de sistemas complexos. Coordinator: Prof. Celia Anteneodo. APQ1- FAPERJ - E110.369/2014 (2014-2016).
- Dinâmica estocástica em sistemas complexos. Coordinator: Prof. Celia Anteneodo. Ed. Universal, MCT/CNPq 14/2013, 480392/2013-7 (2013-2016)
- Mecânica Estatística, fundamentos, aspectos teóricos e aplicações. Coordinator: Prof. Celia Anteneodo. APQ1 - FAPERJ E26/111.646/08 (2008-2010)
- Problemas em Fisica Granular. Coordinator: Prof. Welles Morgado. APQ1 -FAPERJ - E26/111.455/2008 (2008-2010).

Stays abroad

April-September 2017 – Institute for Cross-Disciplinary Physics and Complex systems under supervision of Prof. Emilio Hernández-García (Palma, Spain).

Presentations

Invited seminars

2018 *Population survival in spatiotemporal environments.* IFISC (Palma, Spain).
2015 *Impact of environment spatial structure in population dynamics.* Bio-Rio meeting (Niterói, Brazil).
2015 *Metapopulation dynamics: complex habitats and dispersal strategy.* Seminar at Applied Mathematics School at Getúlio Vargas Foundation (Rio de Janeiro, RJ).

Conference participation

Talks

2019 *Spatial eco-evolutionary feedbacks mediate coexistence in prey-predator systems.* (contributed talk). Fluctuations, tipping points and emergence in eco-evolutionary dynamics (Leeds, UK).

2018 *Species mixing determines predators' optimal perception range and coexistence times in predator-prey dynamics* (contributed talk). Physics and Ecology: Challenges at the frontier (Menorca, Spain).

2016 *Metapopulation dynamics and self-organization* (invited talk). International Conference on Structural Nonlinear Dynamics and Diagnosis (Marrakesh, Marroco).

2015 *Role of habitat spatial structure and dispersal strategy* (contributed talk). National Meeting of Statistical Physics (Vitória, Brazil).

2015 *Metapopulation dynamics in a complex habitat* (contributed talk). Models in Population Dynamics and Ecology (Niterói, Brazil).

2014 *The effects of nonlinear diffusion and environment fluctuations in the self-organization of biological populations* (invited talk). III Dynamics days South America (Valparaiso, Chile).

2014 *Nonlocality, nonlinear diffusion and environment fluctuations in biological population patterns* (contributed talk). XXXVII Brazilian Meeting on Condensed Matter Physics (Sauipe, Brazil).

Posters

2018 *Nonlinear population dynamics in a bounded habitat* (Poster). XXII Congreso de Física Estadística (Madrid, Spain).

2017 *Population dynamics in a intermittent refuge* (Poster). Crossroads in Complex Systems (Palma, Spain).

2016 *Population dynamics in a intermittent refuge* (Poster). Encontro de Física 2016 (Natal, Brazil).

2013 *Nonlinear subdiffusion induces population fragmentation* (Poster). XIII Latin American Workshop on Nonlinear Phenomena (Córdoba, Argentina).

2013 *Nonlinear diffusion in biological population* (Poster). Mathematical Methods and Modeling of Biophysical Phenomena (Cabo Frio, Brazil).

Complementary education

2018 School on Physics Applications in Biology, 40hrs (ICTP – SAIFR, São Paulo, Brazil).

2017 VII GEFENOL Summer School on Statistical Physics of Complex Systems, 60hrs (IFISC, Palma, Spain).

2017 VI Southern-Summer School on Mathematical Biology, 40hrs (ICTP – SAIFR, São Paulo, Brazil).

Skills

Analytic methods for stochastic process; Mathematical modeling; Numerical integration of differential equations; Agent-based computer simulations; Cloud-computations; C, C++ and python programming languages; MATLAB; Maple;

Languages

English — Understands, speaks, writes and reads well;
Portuguese — Understands, speaks, writes and reads well;
Spanish — Understands and reads well, basic speaking and writing;