

Curriculum Vitae of Giordano De Marzo

Professional email:

ORCID:

Nationality:

giordano.de-marzo@uni-konstanz.de

0000-0002-3127-5336

Italian

Academic Positions

02/2024-Ongoing

Institution

Postdoctoral Researcher and Lecturer

Konstanz University

Education and training

11/2020-03/2024

Thesis Title

Principal subjects

Supervisor

Institution

Grade

09/2018-07/2020

Principal subjects

Supervisor

Institution

Grade

09/2015-09/2018

Principal subjects

Supervisor

Institution

Grade

PhD in Physics

Modeling Complex Digital Systems

Social and Economic Complexity

Vittorio Loreto, Luciano Pietronero

Sapienza University and Enrico Fermi Research Center

Summa cum Laude

Master's Degree in Theoretical Physics

Statistical Mechanics, Complex Systems

Luciano Pietronero

Sapienza University

110/110 with honors

Bachelor Degree in Physics

Broad topics in Physics

Luciano Pietronero

Sapienza University

110/110 with honors

Work and other experiences

03/2024-06/2024

Position

Main activities and responsibilities

08/2020-12/2023

Position

Main activities and responsibilities

03/2023-06/2023

Position

Main activities and responsibilities

08/2023-10/2023

Position

Main activities and responsibilities

10/2022-12/2022

Position

Main activities and responsibilities

06/2022-08/2022

Position

International Labour Organization

External consultant

Economic Complexity based analysis of the job market of different countries (Russia, Uruguay, Brazil, South Africa)

Translated

External consultant

Language economics. Development of algorithms to determine the best languages for online sales and forecasts on future market opportunities.

Konstanz University

Visiting PhD Student

Study of emergent and collective behaviors in groups of Large Language Models, network growth simulations with Generative Agents.

International Labour Organization

External consultant

Natural Language Processing. Analysis and classification of a large dataset of online job vacancies in Russian Language

Sony CSL Paris

Visiting PhD Student

Analysis of how recommendation algorithms affect polarization and novelties discovery in groups of agents.

United Nations University

External consultant

Main activities and responsibilities
11/2021-05/2022
Position
Main activities and responsibilities
08/2021-10/2021
Position
Main activities and responsibilities
10/2020-03/2021
Position
Main activities and responsibilities

Natural Language Processing. Identification of skill demand in online job posts on Naukri.com

Complexity Science Hub Vienna

Junior Data Scientist

Development of reputation algorithms for collaborative systems. Analysis of cryptocurrencies and chess openings.

International Labour Organization

External consultant

Natural Language Processing. Analysis and classification of a large dataset of online job vacancies posted on Naukri.com

Advanced School in AI

Student

Postgraduate school in Artificial Intelligence organized by The Institute for Cognitive Sciences and Technologies (ISTC) of CNR.

Scientific appointments

01/2023-Ongoing
03/2022-Ongoing
02/2021-01/2024

Junior Research Fellow at Complexity Science Hub Vienna.

Research Fellow at Imminent Research Center.

PhD Fellow at Sapienza School for Advanced Studies.

Scholarships, Grants and Awards

2024
2023
2020-2023
2023
2022
2022
2016-2020
2017-2019
2018
2015
2015

EPO CodeFest, Second classified team (10000€)

Research Credits, OpenAI (5000€)

Scholarship, Sapienza School for Advanced Studies (3 years of accomodation)

Research Grant, DAAD (4000€)

Research Grant, Fondazione Zegna (5000€)

Research Grant, Imminent (20000€)

Scholarship, Sapienza University (8000€)

Working Scholarship, Sapienza University (2000€)

Degree-award, Sapienza University(1200€)

Seventh Place, Italian Natural Science Olympiad (1200€)

Bronze Medal, Italian Physics Olympiad (400€)

Students

2022
Title
Supervisor
External Supervisor
Institution
2021
Title
Supervisor
External Supervisor
Institution
2021
Title
Supervisor
External Supervisor
Institution

Alessandro Bellina

Ergodicty and Consensus in simple Recommender Models

Vittorio Loreto, Luciano Pietronero

Giordano De Marzo, Andrea Tacchella

Sapienza University of Rome

Francesco Pandolfelli

The Complex Ecosystem of Cryptocurrencies

Vittorio Loreto

Giordano De Marzo

Sapienza University of Rome

Giulio Iannelli

Opinion Polarization in the Multistate Voter Model with recommendation algorithms

Claudio Castellano

Giordano De Marzo

Sapienza University of Rome

Teaching

2024/2025

Network Science of Socio-Economic Systems

Role	Lecturer
Degree Program	Master's Degree in Social and Economic Data Science
Institution	Konstanz University
2024	Computational Modeling of Social Systems
Role	Lecturer
Degree Program	Master's Degree in Social and Economic Data Science
Institution	Konstanz University
2024	Deep Learning for the Social Sciences
Role	Lecturer
Degree Program	Master's Degree in Social and Economic Data Science
Institution	Konstanz University
2023	Classical Mechanics
Role	Teaching Assistant
Degree Program	Bachelor Degree in Physics
Institution	Sapienza University of Rome

Publications

- [P1] Servedio, Vito DP, Alessandro Bellina, Emanuele Calò, and Giordano De Marzo. "Economic Complexity in Mono-Partite Networks." J. Phys. Complex. 6 015002 (2025).
- [P2] Di Bona, Gabriele, Alessandro Bellina, Giordano De Marzo, Angelo Petralia, Iacopo Iacopini, and Vito Latora. "The dynamics of higher-order novelties." Nature Communications 16.1 (2025): 393.
- [P3] Labini, Francesco Sylos, Roberto Capuzzo-Dolcetta, Giordano De Marzo, and Matteo Straccamore. "Exploring the dark matter disk model in dwarf galaxies: Insights from the LITTLE THINGS sample." Astronomy & Astrophysics 693 (2025): A248.
- [P4] De Marzo, Giordano, Pietro Gravino, and Vittorio Loreto. "Recommender systems may enhance the discovery of novelties." Journal of Physics: Complexity 5, no. 4 (2024): 045008.
- [P5] Bellina, Alessandro, Giordano De Marzo, and Vittorio Loreto. "Time-Dependent Urn Models reproduce the full spectrum of novelties discovery." arXiv preprint arXiv:2401.10114 (2024). Accepted on Physical Review Research.
- [P6] Aufiero, Sabrina, Giordano De Marzo, Angelica Sbardella, and Andrea Zaccaria. "Mapping job fitness and skill coherence into wages: an economic complexity analysis." Scientific Reports 14, no. 1 (2024): 11752.
- [P7] Sylos Labini, Francesco, Giordano De Marzo, Matteo Straccamore, and Sébastien Comerón. "The Tully–Fisher relation and the Bosma effect." Monthly Notices of the Royal Astronomical Society 527, no. 2 (2024): 2697-2717.
- [P8] Bellina, Alessandro, Claudio Castellano, Paul Pineau, Giulio Iannelli and Giordano De Marzo. "The effect of Collaborative-Filtering based Recommendation Algorithms on Opinion Polarization." Physical Review E 108.5 (2023): 054304.
- [P9] Sylos Labini, Francesco, Matteo Straccamore, Giordano De Marzo, and Sébastien Comerón. "Mapping non-axisymmetric velocity fields of external galaxies." Monthly Notices of the Royal Astronomical Society 524, no. 1 (2023): 1560-1600.
- [P10] De Marzo, Giordano, and Vito DP Servedio. "Quantifying the complexity and similarity of chess openings using online chess community data." Scientific Reports 13.1 (2023): 1-12.
- [P11] De Marzo, Giordano, Federico Attili, and Luciano Pietronero. "Growing inequality in systems showing Zipf's law." Journal of Physics: Complexity 4.1 (2023): 015014.

- [P12] De Marzo, Giordano, and Giulio Iannelli. "Effect of spatial correlations on Hopfield Neural Network and Dense Associative Memories." *Physica A: Statistical Mechanics and its Applications* 612 (2023): 128487.
- [P13] De Marzo, Giordano, Francesco Pandolfelli, and Vito DP Servedio. "Modeling innovation in the cryptocurrency ecosystem." *Scientific Reports* 12.1 (2022): 12942.
- [P14] Agliari, Elena, et al. "The emergence of a concept in shallow neural networks." *Neural Networks* 148 (2022): 232-253.
- [P15] Iannelli, Giulio, Giordano De Marzo, and Claudio Castellano. "Filter bubble effect in the multistate voter model." *Chaos: An Interdisciplinary Journal of Nonlinear Science* 32.4 (2022): 043103.
- [P16] De Marzo, Giordano, et al. "Quantifying the unexpected: A scientific approach to Black Swans." *Physical Review Research* 4.3 (2022): 033079.
- [P17] De Marzo, Giordano, Francesco Sylos Labini, and Luciano Pietronero. "Zipf's law for cosmic structures: How large are the greatest structures in the universe?." *Astronomy and Astrophysics* 651 (2021): A114.
- [P18] De Marzo, Giordano, et al. "Dynamical approach to Zipf's law." *Physical Review Research* 3.1 (2021): 013084.
- [P19] Agliari, Elena, and Giordano De Marzo. "Tolerance versus synaptic noise in dense associative memories." *The European Physical Journal Plus* 135.11 (2020): 1-22.
- [P20] De Marzo, Giordano, Andrea Zaccaria, and Claudio Castellano. "Emergence of polarization in a voter model with personalized information." *Physical Review Research* 2.4 (2020): 043117.

Preprints

- [W1] Bellina, Alessandro, Giordano De Marzo, and Vittorio Loreto. "Physical modelling of global macrosystems evolution." *arXiv preprint arXiv:2411.03394* (2024).
- [W2] De Marzo, Giordano, Claudio Castellano, and David Garcia. "Language Understanding as a Constraint on Consensus Size in LLM Societies." *arXiv preprint arXiv:2409.02822* (2024).
- [W3] Servedio, Vito DP, Alessandro Bellina, Emanuele Calò, and Giordano De Marzo. "Economic Complexity in Mono-Partite Networks." *arXiv preprint arXiv:2405.04158* (2024).
- [W4] De Marzo, Giordano, Luciano Pietronero, and David Garcia. "Emergence of scale-free networks in social interactions among large language models." *arXiv preprint arXiv:2312.06619* (2023).
- [W5] De Marzo, Giordano, Nanditha Mathew, and Angelica Sbardella. "Who creates jobs with broad skillsets? the crucial role of firms." No. 94. ILO Working Paper, 2023.

Conferences

Contributed Talks

- | | |
|------------|--|
| 02/09/2024 | Conference on Complex Systems CCS'24 (Exeter, UK) |
| 17/06/2024 | International Conference on Network Science Netsci2024 (Quebec City, Canada) |
| 22/01/2024 | International Conference on Network Science NetsciX2024 (Venezia, Italy) |
| 10/07/2023 | International Conference on Network Science Netsci2023 (Vienna, Austria) |
| 08/11/2022 | Complex Networks and their Applications 2022 (Palermo, Italy) |
| 17/10/2022 | Conference of Complex Systems 2022 (Palma de Mallorca, Spain) |
| 10/07/2022 | Complex Networks (Lipari, Italy) |
| 22/06/2021 | I Conference of the Italian Society of Statistical Physics (Parma, Italy) |

27/05/2024	Invited Talks Workshop on Social Simulation with Large Language Models (CSH, Vienna, Austria)
10/07/2023	Posters International Conference on Network Science Netsci2023 (Vienna, Austria)
20/06/2022	II Conference of the Italian Society of Statistical Physics (Parma, Italy)

Seminars

2025	CEU Department of Network and Data Science, Research Seminars Series
2024	Complexity Science Hub Vienna, CSH Talk Series
2024	MPI for Dynamics and Self-Organization, Neural Systems Theory Group Seminars

Events Organization

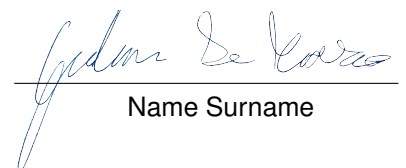
2024	Fostering Research Synergies v2.0, Young Researchers Workshop (CREF, Rome)
2024	PhD and Young Researchers Workshop (CSH, Vienna)
2023	Fostering Research Synergies, Young Researchers Workshop (IMT, Lucca)

Referee Activity

I have been peer reviewer for the following journals: *Physica A*, *EPJ B*, *EPJ Data Science*, *Scientific Reports*, *Urban Affairs Review*, *Monthly Notices of the Royal Astronomical Society*, *Probability in the Engineering and Informational Sciences*, *Journal of Informetrics*, *Applied Network Science*.

Konstanz, January 23, 2025

Place and date



Name Surname