

# Leonardo Di Gaetano

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🌐 Leonardo Di Gaetano    🎓 Scholar  
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## Education

- 2020 – **Ph.D. in Network and Data Science**, Central European University.  
Thesis title: *Structures, dynamics, and application of higher order networks.*
- 2018 – 2020 **M.Sc. in Theoretical Physics**, University of Catania.  
Thesis title: *Dynamical instability and Lyapunov exponents in temporal networks.*  
110/110 cum laude
- 2015 – 2018 **B.Sc. in Physics**, University of Catania.  
Thesis title: *Chaos in social systems: a research about talent, luck, and success.*  
110/110 cum laude
- 2010 – 2015 **Diploma di Maturità Scientifica**, Liceo Scientifico Galileo Galilei, Catania.  
100/100 cum laude





## Training

- 2024 **Visiting Ph.D, student**, Group on Web Science and Social Computing, UPF, Barcelona.  
Research on the effects of higher-order interactions on polarization in social media.
- 2023 **Visiting Ph.D, student**, DIEP, UVA Amsterdam.  
Research on higher-order hubs in structural brain networks.
- 2022 **Visiting Ph.D, student**, VUMC, Amsterdam.  
Research on node and network classification for epilepsy on functional brain networks.
- 2020 **Visiting Master student**, QMUL, London.  
Master Thesis.



## Teaching

- 2024 **Senior TA for Fundamentals of Data Analysis (Lecturer of 2 ECTS)** (B.Sc.)  
Department of Data Science and Society, at Central European University.
- 2022 **TA for Dynamical systems** (Ph.D.)  
Department of Network and Data Science, at Central European University.
- 2021 **TA for Introduction to Mathematics** (B.Sc.)  
Department of Quantitative Social Science, at Central European University.  
Department of Politics, Philosophy, and Economics, at Central European University.
- 2019 **TA for Mathematics** (B.Sc.)  
Department of Biology, at University of Catania.
- TA for Physics** (B.Sc.)  
Department of Biology, at University of Catania.




## Conferences

- 2024  **NetSciX**, Venice.  
Oral presentation: *Higher-order biomarkers for epilepsy surgery: an extended neighbourhood perspective of brain networks.*
- 2022  **CCS**, Palma de Mallorca.  
Oral presentation: *Percolation and topological properties of temporal higher-order networks.*
- 2023  **Netsci**, Vienna.  
Oral presentation: *Percolation and topological properties of temporal higher-order networks.*
-  **Netsci, Brain Networks Satellite**, Vienna.  
Oral presentation: *Higher-order biomarkers for epilepsy surgery: an extended neighbourhood perspective of brain networks.*

## Summer schools

- 2020  **Summer School on Economic Networks**, Oxford University.
- 2023  **Complexity 72h**, Palma de Mallorca.

## Skills

- Languages  Italian (Native), English (Proficient), Spanish (Intermediate), German (Basic).
- Coding  Python (Advanced), Matlab (Intermediate), R (Basic), NetLogo (Intermediate),  $\LaTeX$ .
- Web Dev  HTML.

## Certification and Awards

### Teaching Certification


- 2023-2024  **Certificate of Teaching in Higher Education.** Awarded by Yehuda Elkana Center.

### Awards

- 2024  **Advanced PhD Award Recipients.** Awarded by Central European University.

## Research

### Journal Articles

- 1** **L. Di Gaetano**, F. Battiston, and M. Starnini, "Percolation and topological properties of temporal higher-order networks," *Phys. Rev. Lett.* **132**, 037401, *Editors' Suggestion*, 2024.  URL: <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.132.037401>.
- 2** **L. Di Gaetano**, G. Carugno, F. Battiston, and F. Coghi, "Dynamical fluctuations in a minimal model of higher-order networks," *Second round of revision in Physical Review Letters*, 2024.
- 3** A. Caligiuri, V. M. Eguíluz, **L. Di Gaetano**, T. Galla, and L. Lacasa, "Lyapunov exponents for temporal networks," *Physical Review E*, vol. 107, no. 4, p. 044305, 2023.
- 4** S. Chowdhary, E. Andres, A. Manna, L. Blagojević, **L. Di Gaetano**, and G. Iñiguez, "Temporal patterns of reciprocity in communication networks," *EPJ Data Science*, vol. 12, no. 1, p. 7, 2023.
- 5** Q.F. Lotito, M. Contisciani, C. De Bacco, *et al.*, "Hypergraphx: A library for higher-order network analysis," *Journal of Complex Networks*, vol. 11, no. 3, cnado19, 2023.

- 6 G. Di Bona, **L. Di Gaetano**, V. Latora, and F. Coghi, “Maximal dispersion of adaptive random walks,” *Physical Review Research*, vol. 4, no. 4, p. Lo42051, 2022.

### In preparation

- 1 **L. Di Gaetano**, F. Battiston, A. P. Millan, and F. S. Nobrega, “Emergence of higher-order structural hubs in the human brain,” 2024.
- 2 **L. Di Gaetano**, F. S. Nobrega, G. Bianconi, F. Battiston, and A. P. Millan, “Higher-order biomarkers for epilepsy surgery: An extended neighborhood perspective of brain networks,” 2024.
- 3 D. Abella, P. Birello, **L. Di Gaetano**, *et al.*, “Unraveling higher-order dynamics in collaboration networks,” 2023.