

UNIVERSITÀ DEGLI STUDI DI MILANO

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MARCO GHERARDI — CURRICULUM VITAE

COGNOME: Gherardi

NOME: Marco

DATA DI NASCITA: 11/02/1979

ACADEMIC CAREER AND EDUCATION

- 2018–2021 — Researcher at Università degli Studi di Milano, Physics Dept. (RTD — Ricercatore a tempo determinato, lettera a)
- 2016–2017 — Senior post-doctoral researcher at the Laboratory of Computational and Quantitative Biology (LCQB), UMR 7238 CNRS - Université Pierre et Marie Curie, Paris, France.
- 2012–2015 — Post-doctoral research fellow (“Assegnista di Ricerca”) at Università degli Studi di Milano. [Partially financed by Fondo Sociale Europeo (Regione Lombardia), through the grant “Dote Ricerca”.]
- 2009–2011 — Post-doctoral fellow at SRMP, CEA Saclay, France.
- 2009 — Ph.D. in theoretical physics, Università degli Studi di Milano. Supervisor: Prof. Sergio Caracciolo. Dissertation “Conformal walks in two dimensions”.
- 2005 — Master’s degree in physics (cum Laude), Università degli Studi di Milano. Dissertation “Critical behavior of the Domb–Joyce model”.

OTHER AFFILIATIONS

- 2017 — Visiting scientist at IFOM, the FIRC Institute of Molecular Oncology, Milano, Italy.

- 2018–2021 — I.N.F.N. associate; iniziativa specifica “BIOPHYS: Theoretical physics tools applied to systems of biological interest”
[web.infn.it/CSN4/IS/Linea6/BIOPHYS/Research.html]
- 2018–2021 — I.N.F.N. associate; iniziativa specifica “SFT: Low-Dimensional Systems, Integrable Models and Applications”
[web.infn.it/CSN4/IS/Linea1/SFT/index.html]
- 2019–2021 — Member of SIFS, Società Italiana di Fisica Statistica
- 2018–2021 — Member of the groups “Fisica Teorica” and “Fisica dei Sistemi Complessi” at the Department of Physics, Università degli Studi di Milano

MAIN RESEARCH INTERESTS

Keywords: Statistical Mechanics and Phase Transitions, Machine Learning, Data Science, Polymer Physics, Biophysics

Machine learning and neural networks. — Fundamental theoretical understanding of machine learning (and deep learning in particular) is lagging with respect to the impressive advances in applications. Notably, there is raising consensus, in both the computer science and the statistical physics communities, that a useful theory of learning should be aware of, and parameterized by, data structure. I have a long-term project in this direction, involving collaborators from several universities, which leverages mean-field approximations, replica theory, and numerical computation.

Biophysics. — I work on the physics of the bacterial chromosome, to understand its rich dynamics and the rheology of the complex intracellular medium. Having simple interpretable theoretical models is crucial if one is to extract solid biologically-relevant measures from experiments. I work in collaboration with experimental groups doing microrheology in vivo and single-molecule nanomechanical manipulation (e.g. with magnetic tweezers).

PUBLICATIONS

Journal articles: 36

Book chapters: 2

Other publications: 1

Citations: 249 (Scopus), 392 (Scholar)

H-index: 9 (Scopus), 11 (Scholar)

Articles and Book Chapters

42. S. Caracciolo, R. Fabbriatore, M. Gherardi, R. Marino, G. Parisi, G. Sicuro *Criticality and conformality in the random dimer model* arXiv:2012.13956 [submitted]

41. R. Droghetti, N. Agier, M. Gherardi, G. Fischer, M. Cosentino Lagomarsino, *An evolutionary model identifies the main selective pressures for the evolution of genome-replication profiles*. [submitted]
40. Russo et al., *Drug-induced colorectal cancer persister cells show increased mutation rate* [submitted]
39. M. Gherardi, *Solvable model for the linear separability of structured data*, Entropy **23**(3):305 (2021)
38. P. Rotondo, M. Pastore, M. Gherardi, *Beyond the storage capacity: Data driven satisfiability transition*, Phys. Rev. Lett. **125**, 120601 (2020)
37. M. Pastore, P. Rotondo, V. Erba, M. Gherardi, *Statistical learning theory of structured data*, Phys. Rev. E **102**, 032119 (2020) [Editor's suggestion]
36. M. Cristofalo, C.A. Marrano, D. Salerno, R. Corti, V. Cassina, A. Mammola, M. Gherardi, B. Sclavi, M. Cosentino Lagomarsino, F. Mantegazza, *Cooperative effects on the compaction of DNA fragments by the nucleoid protein H-NS and the crowding agent PEG probed by Magnetic Tweezers*, Biochimica et Biophysica Acta (BBA) — General Subjects, **1864**:12, 129725 (2020)
35. V. Erba, S. Ariosto, M. Gherardi, P. Rotondo, *Random geometric graphs in high dimension*, Phys. Rev. E **102**, 012306 (2020)
34. P. Rotondo, M. C. Lagomarsino, M. Gherardi, *Counting the learnable functions of geometrically structured data*, Phys. Rev. Research, **2** (2020) [Editor's suggestion]
33. M. Russo, G. Crisafulli, A. Sogari, et al, *Adaptive mutability of colorectal cancers in response to targeted therapies*, Science **366**:6472, 1473 (2019)
32. V. Erba, M. Gherardi, P. Rotondo, *Intrinsic dimension estimation for locally under-sampled data*, Scientific Reports **9**, 17133 (2019)
31. F. Borra, M. Cosentino Lagomarsino, P. Rotondo, M. Gherardi, *Generalization from correlated set of patterns in the perceptron*, J. Phys. A: Math. Theor. **52**, 38 (2019)
30. A. Bottinelli, M. Gherardi, M. Barthelemy, *Efficiency and shrinking in evolving networks*, J. Royal Soc. Interface **16**, 154 (2019)
29. G. Teza, S. Suweis, M. Gherardi, A. Maritan, M. Cosentino Lagomarsino, *Network model of conviction-driven social segregation*, Phys. Rev. E **99**, 032310 (2019)
28. M. Gherardi, V. Scolari, R.T. Dame, M. Cosentino Lagomarsino, *Chromosome Structure and Dynamics in Bacteria: Theory and Experiments*, in *Modeling the 3D Conformation of Genomes*, Ed. G. Tiana, L. Giorgetti, CRC Press (2019)
27. M. Negri, M. Gherardi, G. Tiana, M. Cosentino Lagomarsino, *Spontaneous domain formation in disordered copolymers as a mechanism for chromosome structuring*, Soft Matter **14**, 6128–6136 (2018)

26. A. Mazzolini, J. Grilli, E. De Lazzari, M. Osella, M. Cosentino Lagomarsino, M. Gherardi, *Zipf and Heaps laws from dependency structures in component systems*, Phys. Rev. E **98**, 012315 (2018)
25. A. Mazzolini, M. Gherardi, M. Caselle, M. Cosentino Lagomarsino, M. Osella, *Statistics of shared components in complex component systems*, Phys. Rev. X **8**, 021023 (2018)
24. S. Caracciolo, A. Di Gioacchino, M. Gherardi, E.M. Malatesta, *Solution for a bipartite Euclidean traveling-salesman problem in one dimension*, Phys. Rev. E **97**, 052109 (2018)
23. K.E. Polovnikov, M. Gherardi, M. Cosentino Lagomarsino, M.V. Tamm, *Fractal folding and medium viscoelasticity contribute jointly to chromosome dynamics*, Phys. Rev. Lett. **120**, 088101 (2018) [Editor's suggestion]
22. P. Rotondo, A. L. Sellerio, P. Glorioso, S. Caracciolo, M. Cosentino Lagomarsino, M. Gherardi, *Current quantization and fractal hierarchy in a driven repulsive lattice gas*, Phys. Rev. E **96** 052141 (2017)
21. A. Di Gioacchino, M. Gherardi, L. G. Molinari, P. Rotondo, *Jack on a Devil's staircase* Proceedings of Congresso del Dipartimento di Fisica, UNIMI (2017)
20. M. Gherardi, L. Calabrese, M. Tamm, M. Cosentino Lagomarsino, *Model of chromosomal loci dynamics in bacteria as fractional diffusion with intermittent transport*, Phys. Rev. E **96** 042402 (2017)
19. A. Bottinelli, R. Louf, M. Gherardi, *Balancing building and maintenance costs in growing transport networks*, Phys. Rev. E **96** 032316 (2017)
18. Q. Zhang, F. Bassetti, M. Gherardi, M. Cosentino Lagomarsino, *Cell-to-cell variability and robustness in S-phase duration from genome replication kinetics*, Nucleic Acids Res. **45**:14 8190 (2017)
17. G. Dell'Aquila, et al., *Nutrient consumption and chain tuning in diatoms exposed to storm-like turbulence*, Nature Scientific Reports **7** 1828 (2017)
16. M. Gherardi and M. Cosentino Lagomarsino, *Procedures for model-guided data analysis of chromosomal loci dynamics at short time scales*, ed. O. Espeli. Springer Publishing Company, Incorporated, 2017, in Methods in Molecular Biology. The Bacterial Nucleoid – Methods and Protocols ISBN 1978-1-4939-7097-1 (2017)
15. M. Gherardi, A. Amato, J-P. Bouly, S. Cheminant, M. Ferrante, M. Ribera d'Alcalà, D. Iudicone, A. Falciatore, M. Cosentino Lagomarsino, *Regulation of chain length in two diatoms as a growth-fragmentation process*, Phys. Rev. E **94** 022418 (2016)
14. M. Gherardi, P. Rotondo, *Measuring logic complexity can guide pattern discovery in empirical systems*, Complexity **21**:S2 397–408 (2016)

13. P. Rotondo, L.G. Molinari, P. Ratti, M. Gherardi, *Devil's staircase phase diagram of the fractional quantum Hall effect in the thin-torus limit*, Phys. Rev. Lett. **116** 256803 (2016)
12. M. Gherardi, F. Bassetti, M. Cosentino Lagomarsino, *Law of corresponding states for open collaborations*, Phys. Rev. E **93** 042307 (2016).
11. M. Gherardi, M. Cosentino Lagomarsino, *Characterizing the size and shape of sea ice floes*, Nature Scientific Reports **5** 10226 (2015).
10. S. Mandrà, M. Cosentino Lagomarsino, M. Gherardi, *Soft bounds on diffusion produce skewed distributions and Gompertz growth*, Phys. Rev. E **90** 032805 (2014)
9. A. Nigro, M. Gherardi, *A parafermionic generalization of the Jaynes-Cummings model*, J. Phys. A **47** 265205 (2014)
8. M. Gherardi, S. Mandrà, B. Bassetti, M. Cosentino Lagomarsino, *Evidence for soft bounds in Ubuntu package sizes and mammalian body masses*, Proc. Natl. Acad. Sci. U.S.A. **110** (52) 21054 (2013) [Highlighted in the front section "This Week in PNAS", Proc. Natl. Acad. Sci. U.S.A. 2013 **110** (52) 20845-20846]
7. M. Gherardi, A. Nigro, *q-deformed Loewner evolution*, J. Stat. Phys. **152** 452 (2013)
6. M. Gherardi, *Theta-point polymers in the plane and Schramm-Loewner evolution*, Phys. Rev. E **88** 032128 (2013)
5. A. Bottinelli, B. Bassetti, M. Cosentino Lagomarsino, M. Gherardi, *Influence of homology and node-age on the growth of protein-protein interaction networks*, Phys. Rev. E **86** 041919 (2012)
4. M. Gherardi, T. Jourdan, S. Le Bourdieu, G. Bencteux, *A hybrid deterministic/stochastic algorithm for large sets of rate equations*, Comput. Phys. Commun. **183** 1966 (2012)
3. S. Caracciolo, M. Gherardi, M. Papinutto, A. Pelissetto, *Geometrical properties of two-dimensional interacting self-avoiding walks at the θ -point*, J. Phys. A: Math. Theor. **44** 115004 (2011)
2. M. Gherardi, *Exact sampling of self-avoiding paths via discrete Schramm-Loewner evolution*, J. Stat. Phys. **140** 1115–29 (2010)
1. M. Gherardi, *Whole-plane self-avoiding walks and radial Schramm-Loewner evolution: a numerical study*, J. Stat. Phys. **136** 864–74 (2009)

Other Publications

- *Teatro e Scienza*, Stratagemmi — Prospettive Teatrali, 9 (2009)
[www.stratagemmi.it/nove-2009/]

TEACHING

Physics Dept., Università degli Studi di Milano

- *Metodi Computazionali della Fisica* (LM17), Lecturer, 10h per year, 2020–2021.
- *Laboratorio di Fisica Computazionale* (L30), Lecturer, 30h per year, 2018–2021.
- *Laboratorio di Fisica Computazionale* (L30), Teaching Assistant, 40h per year, 2013–2017.
- *Fisica Moderna* (L30), Teaching Assistant, ~30h per year, 2007, 2011.
- *Laboratorio di Calcolo* (L30), Teaching Assistant, ~30h per year, 2006–2007.

Biotechnology Dept., Università degli Studi di Milano

- *Fisica I* (L02), Teaching Assistant, 40h per year, 2008, 2011–2015.

Physics Dept., Università degli Studi di Padova

- *Interdisciplinary applications of statistical mechanics* (Ph.D. Physics), Lecturer, 24h, 2017.

[www.dfa.unipd.it/index.php?id=1461]

ORGANIZATION OF SCHOOLS AND WORKSHOPS

- International Summer School “Statistical Physics of Deep Learning” [to be held in June 2022]. Organizers: Alessandro Laio, Marco Gherardi, Francesco Ginelli, Guido Tiana.
- International Summer School “Model guided data science”, Lake Como School of Advanced Studies, Como, 2/10/2019 – 6/10/2019 (one week). Organizers: Federico Bassetti, Fabrizio Capuani, Marco Cosentino Lagomarsino, Marco Gherardi
[mgds.lakecomoschool.org/]
- International Summer School “Quantitative Laws II: From physiology to ecology, from interaction structures to collective behavior”, Lake Como School of Advanced Studies, Como, 13/6/2016 – 24/6/2016 (two weeks). Organizers week 1: Marco Cosentino Lagomarsino, Matteo Osella, Fabrizio Capuani. Organizers week 2: Federico Bassetti, Marco Gherardi.
[qlsb.lakecomoschool.org/files/2016/06/program7.pdf]
- Workshop “3rd workshop of the complex systems group”, Università degli Studi di Milano, 28/1/2016
[sites.google.com/site/fisicounimi/announcement-2016]

TALKS AND SEMINARS

- International Summer School “Model guided data science” — 2019, Como. (Opening speech, 2/9/2019) [mgds.lakecomoschool.org/]
- Invited seminar at Bocconi University, Milano, *Machine learning of geometrically structured data* (5/6/2019, invited by Riccardo Zecchina)
- Invited seminar at Montpellier University, *Quantitative laws of software evolution* (23/5/2017, invited by Estelle Pitard and Luca Ciandrini)
- Invited talk at the international workshop “1st qBio mini-Workshop” — 2017, IFOM, Milano, *How jiggly is a folded chromosome in a crowded environment?* (20/2/2017) [www.ifom.eu/events/2017-qbio-workshop/download/Speakers-qbio-workshop-2017.pdf]
- International Summer School “Quantitative Laws II: From physiology to ecology, from interaction structures to collective behavior” — 2016, Como. (Opening speech of second week, 20/6/2016, “From interaction structures to collective behavior”) [qlsb.lakecomoschool.org/files/2016/06/program7.pdf]
- Invited seminar at Uppsala University (Sweden), *Quantitative laws of software evolution* (16/5/2015, invited by David Sumpter and Arianna Bottinelli)
- Contributed talk at the “2nd Workshop of the Complex Systems Group” — 2015, Università degli Studi di Milano, *Measuring complexity in biology, technology, and logic* (15/1/2015)
- Informal talk at “Collective Behaviour in Growing Systems” — 2014, Bath (19/11/2014)
- Contributed talk at “European Conference on Complex Systems” — 2014, Lucca, *Software as a complex organism* [www.eccs14.eu] (my talk does not appear on the PDF program in the eccs14 site because it was added after finalization of the program. I gave the talk on September 22 at 12:45 in track 2)
- Contributed talk at “Quantitative Laws of Genome Evolution” — 2013, Como, *Soft bounds in the evolution of software packages (and other animals)* (2/7/2013) [qlge.lakecomoschool.org/files/2014/01/GenEv_programme.pdf]

FUNDING

- Piano di Sostegno alla Ricerca UNIMI 2020 “Automate Monte Carlo simulation on hardware accelerators”, 9k€
- Fondazione Cariplo (via Fondazione Alessandro Volta), for the School “Model-Guided Data Science”, 2019, 10k€
- Piano di Sostegno alla Ricerca UNIMI 2018 “GPU computing in theoretical physics”, 8k€

- Fondazione Cariplo (via Fondazione Alessandro Volta), for the School “Quantitative Laws II”, 2016, 20k€
- Capo unità dipartimentale (coordinator of departmental unit) in a project submitted for the SEED 2019 grant funded by University of Milan. The project received an evaluation (84.3) over threshold, but did not get funded.

HONORS AND RECOGNITIONS

- “*Editor’s suggestion*” of 3 publications: Phys. Rev. E 102, 032119 (2020); Phys. Rev. Research, 2 (2020); Phys. Rev. Lett. 120, 088101 (2018).
- Inclusion in the section “*This week in PNAS*” of 1 publication: Proc. Natl. Acad. Sci. U.S.A. 110, 21054 (2013).

REVIEWING AND ADVISING

- 1 Ph.D. thesis (Andrea Mazzolini, Turin University. Supervisor: Michele Caselle)
- Revisor of a visiting professorship application for the Leverhulme Trust (2018)
- Reviewer for Phys. Rev. Lett., Phys. Rev. X, Phys. Rev. Research, Phys. Rev. E, Scientific Reports, J. Stat. Mech., Phys. Lett. A, Physica A, Journal of Engineering and Technology Management, Proceedings of the Royal Society A, Cellular and Molecular Life Sciences.

OUTREACH

- Interviewed for *La Provincia di Como*, “In pista il domatore delle informazioni” (Sara Cerrato), 17/9/2019
- Interviewed for *WIRED*, “Il Software è un Mammifero” (Gianluca Dotti), N.60 March 2014

PARTNERSHIPS

I initiated a collaboration with PoliS-Lombardia — Istituto regionale per il supporto alle politiche della Lombardia. The long-term goal is the application of novel innovative data-science methods originating in academic research to problems of societal relevance. The first product of this collaboration was the organization, in partnership with PoliS-Lombardia, of the summer school “Model-guided data science” (see ORGANIZATION OF SCHOOLS AND WORKSHOPS above).

ONGOING COLLABORATIONS

- Sergio Caracciolo (Università degli Studi di Milano) on combinatorial optimization.
1 publication in 2018. 1 article submitted.
- Vittorio Loreto (SONY Computer Science Lab, Paris) on the dynamics of spreading in social systems. Co-supervision of MSc student Claudio Chiappetta.
1 article in preparation: Alberto Bracci, Claudio Chiappetta, Marco Gherardi, Enrico Ubaldi, Vittorio Loreto, Vito Servedio, *Modelling the rise and fall of echo chambers*.
- Michele Caselle and Matteo Osella (Università degli Studi di Torino) on quantitative laws in genomics and more recently on machine learning.
2 publications since 2018.
- Marco Cosentino Lagomarsino’s group “Statistical Physics of Cells and Genomes” (IFOM, Milano) on genome organization in bacteria.
3 publications (including a book chapter) since 2018.
- Alberto Bardelli (Department of Oncology, Università degli Studi di Torino) and Marco Cosentino Lagomarsino (IFOM, Milano) on persistence states in cancer.
1 publication in 2019. 1 article submitted: Russo et al. *Drug-induced colorectal cancer persister cells show increased mutation rate*
- Marc Barthelemy (Center of Social Analysis and Mathematics, Paris) on the evolution of transport networks.
1 publication in 2019.
- Francesco Mantegazza (Università degli Studi di Milano Bicocca) on polymers under tension.
1 publication in 2020.
- Francesco Ginelli (Università degli Studi dell’Insubria) on statistical physics of machine learning.

SUPERVISION OF STUDENTS

Ph.D. Students

- Arianna Bottinelli, 2015, Uppsala Universitet (co-supervised with David Sumpter).
- Eleonora De Lazzari, 2016, UPMC, Paris. (co-supervised with Marco Cosentino Lagomarsino).
- (Informally) Pietro Rotondo (2013–15), Andrea Di Gioacchino (2015–17), Mauro Pastore (2018–20), Riccardo Fabbriatore (2018–20), Vittorio Erba (2019–), Università degli Studi di Milano.

Master and Bachelor Students

- Andrea Lazzari, 2021, BSc “Analisi del Perceptron e della sua espressività nella classificazione di dati strutturati”
- Theivan Pasupathipillai, 2020, BSc “Intrinsic dimension of protein families as a proxy of diversity and evolutionary constraints”
- Matteo Robert Child, 2020, BSc “A Deep Learning Approach to the Classification of Anomalous Diffusion Trajectories”
- Luca Zilli, 2020, BSc “Short-time forecasting using chaos theory: the case of the Italian energy market”
- Dario Barone, 2020, BSc “Espressività del perceptron nella classificazione di dati strutturati”
- Clarissa Lauditi, 2020, MSc “Statistical physics of learning in a neural network with positive weights”
- Sebastiano Ariosto, 2020, Msc “Random geometric graphs in high dimension”
- Mirko Rossini, 2020, Msc “Geometry of structured datasets via multi-scale persistency analysis”
- Simone Ciceri, 2020, Bsc “Geometrical processing of data in multilayer neural networks”
- Rosalba Pacelli, 2019, MSc “The effect of data structure on the capacity of simple neural networks”
- Jacopo Ciccoianni, 2019, MSc “Inference of dependency structures from occurrences”
- Adalberto Valsecchi, 2019, BSc “Fisica statistica delle rappresentazioni latenti in machine learning”
- Mattia Corigliano, 2019, BSc “A statistical physics approach to drug resistance and drug tolerance in cancer”
- Claudio Chiappetta, 2018, MSc “Modelling the birth and evolution of echo chambers”
- Ludovico Calabrese, 2018, MSc “Genome-level evolutionary dynamics and constrained statistical models of gene content”
- Francesco Borra, 2017, MSc “Generalization from correlated inputs in a simple model of supervised neural network”
- Pietro Rossi, 2017, MSc “Diffusione anomala in potenziali disordinati” (Anomalous diffusion in disordered potentials)
- Pietro Glorioso, 2017, BSc “Trasporto anomalo in un gas su reticolo unidimensionale con interazioni repulsive a lungo raggio” (Anomalous transport in a 1D lattice gas with long range repulsive interactions)

- Matteo Negri, 2017, MSc
- Luca Vismara, 2017, MSc “A particle-statistics description of gene families across genomes”
- Marco Vitali, 2016, BSc “La dinamica delle comunicazioni umane” (A model for inter-event time distributions in human communication dynamics)
- Sebastiano Ariosto, 2016, BSc “Effetti della taglia nel tracking dei loci cromosomici: un modello di tipo Rouse” (A Rouse-type model accounting for the effect of ParB-GFP oligomerization on the tracking of chromosomal loci)
- Francesco Penone, 2016, MSc “Signatures of gene family scaling laws in microbial ecosystems”
- Andrea Melloncelli, 2016, MSc “Universality and specificity in human communication dynamics: the case of Reddit”
- Lorenzo Moro, 2016, BSc “Modelli di frammentazione del ghiaccio marino” (Models of sea-ice fragmentation)
- Ludovico Calabrese, 2015, BSc “Moti attivi nella subdiffusione di loci cromosomici” (Active motion and subdiffusion of chromosomal loci)
- Andrea Papale, 2015, MSc “Topological characterization of the spin-glass transition in the random Boolean Hopfield network”
- Paolo Mesiano, 2015, BSc “A random-network model of dependency structures”
- Mariacristina Romano, 2015, MSc “Models for hierarchical inheritance structures in object-oriented programming languages”
- Marco Saltini, 2015, MSc “The dependency network of mathematical theorems” (topological properties of the dependency network of formal mathematics)
- Andrea Silva, 2014, BSc “Comportamento collettivo e struttura interna nella dinamica del software” (size dynamics and internal dependency structure in software evolution)
- Marco Antonelli, 2014, MSc “Automaton for spin evolution of isolated pulsars” (discrete stochastic model of superfluid vortex dynamics in neutron stars, for the investigation of the role of self-organized criticality in pulsar glitches)
- Francesco Penone, 2013, BSc “Il ruolo della duplicazione nell’evoluzione delle reti di interazione proteina-proteina” (coupling between homology and topology in protein-protein interaction networks)

LANGUAGES

- *Italian*, native
- *English*, understanding C2, speaking C1, writing C1
- *French*, understanding B2, speaking B1, writing B1

DATA: 15/03/2021

LUOGO: Milano