

PERSONAL INFORMATION

Francesco Mambretti

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🔗 [francescomambretti.github.io](https://github.com/francescomambretti)

Gender Male | Date of birth 27/08/1993

Nationality Italian



MAIN SKILLS

Molecular Dynamics; Monte Carlo; DNA simulation; C++; Python; data analysis; machine learning; High performance computing; theory and simulation of soft matter.

PRESENT JOB

February 2021 – present

Postdoctoral researcher in Physics

Università degli Studi di Padova, Dipartimento di Fisica e Astronomia; and INFN - via Marzolo 8, Padova, 35131 - Italia

Postdoctoral Researcher at the Laboratory of Interdisciplinary Physics (<https://www.liphlab.com/>) at the University of Padova, Italy. Supervisor: prof. Samir Suweis.

Topics: computer simulation of DNA oligomers (with OxDNA); data analysis; machine learning; genetic algorithms; Bayesian statistics.

Co-supervisor of 3 Bachelor theses.

WORK EXPERIENCES

September 2017-March 2021

PhD student in Physics

PhD student (XXXIII cycle) at the University of Milan, Italy. Tutor: prof. Davide E. Galli. Thesis title: **Emergent phenomena in condensed matter, soft matter and complex systems** (<https://air.unimi.it/handle/2434/820780>).

Topics: crystal growth in supercooled argon-krypton liquids; emergent properties of 1D and 2D soft matter; Stochastic Resistor Networks; soft patchy particles binary mixtures.

Co-supervisor of 7 Bachelor theses and 5 Master theses.

November 2017 - present

University teaching assistant

Courses:

- Measurement of nanoscale interactions in biological systems and data analysis (From 2020/21, 12 h/year)
- Laboratory for Numerical Treatment of Experimental Data (2018/19-2020/21, 36 h/year)
- Numerical Simulation Laboratory (2019/20-2020/21, 36 h/year)
- Mathematics (2017/18, 40 h/year)

May 2015 - present

tutor c/o Camplus College - Fondazione CEUR

tutor of Mathematical Analysis, Linear Algebra and Physics at the Camplus CEUR Colleges in Milano (Città Studi, Humanitas, Lambrate, Turro).

EDUCATION AND TRAINING

- April 2017 - September 2017 and May 2021 - present **Graduate goer**
at the Physics Department of the Università degli Studi di Milano, Italy, co-working with the research group of prof. D. E. Galli.
- January 2015 - April 2017 **Master degree in Physics**
Università degli Studi di Milano, Milano - Italy.
Thesis: **Microscopic study of the structural phase transition in supercooled argon-krypton liquid mixtures**, 110 cum laude/110. Supervisor: prof. D. E. Galli.
- September 2011 - December 2014 **Bachelor degree in Physics**
Università degli Studi di Milano, Milano - Italy.
Thesis title: **Microscopic characterisation of undercooled argon-krypton liquid mixtures via Molecular Dynamics simulations**, 107/110. Supervisor: prof. D. E. Galli.
- September 2006 - June 2011 **Classical high school diploma**
Liceo "B.Zucchi", Monza (MB) - Italy. Final mark 94/100.

SCIENTIFIC ACTIVITY

- Ongoing collaborations *prof. T. Bellini*, Università degli Studi di Milano; *prof. D. E. Galli*, Università degli Studi di Milano; *dr. R. Grisenti*, Goethe Universität, Frankfurt; *prof. P. Milani*, Università degli Studi di Milano; *dr. D. Pini*, Università degli Studi di Milano; *dr. E. Locatelli*, Università degli Studi di Padova;
- Publications ORCID: 0000-0002-3712-3595
arXiv.org: francesco.mambretti
Author of **5** publications on international peer-reviewed journals (Nature Materials, Physical Review E, Entropy, Scientific Reports) and of 1 manuscript in preparation to be submitted to PNAS.
– <https://doi.org/10.1038/s41598-022-15996-9>
– <https://doi.org/10.3390/e24040458>
– <https://link.aps.org/doi/10.1103/PhysRevE.104.044602>
– <https://link.aps.org/doi/10.1103/PhysRevE.102.042134>
– <https://doi.org/10.1038/s41563-020-0613-z>
- Talks & posters I have given 9 talks and presented 5 posters in national and international workshops, schools and conferences.
- Grant I have won 2 CINECA ISCRA C grants (equivalent total value \approx 4400 euro).
- Reviewer I currently serve as a reviewer for Physical Review B, E and Materials; I have also reviewed contributions for Conference on Complex Systems 2022.
- Society membership Since 2021, I am a member of the Organizing Committee and of the External Relations committee of the CSS/Italy <https://italy.cssociety.org/>
- Participation into school, conferences and workshops Since 2014 participated into >15 national and international workshops, schools and conferences.

Computer skills

- OS: MacOS, Linux e Windows
- programming languages, high level: C++, Python, MPI, C, CUDA, bash, LaTeX, Gnuplot. Basic level: OpenMP, Fortran, Mathematica, awk.
- Molecular Dynamics (LAMMPS, OxDNA, GROMACS) and Molecular Visualization/Analysis (VMD, Ovito, JMOL, oxView) software. Basic PLUMED usage.
- development of custom Monte Carlo, Parallel Tempering, Simulated Annealing and Genetic Algorithm codes. GitHub maintenance of such packages.
- PBS and SLURM schedulers

Since 2015, I regularly collaborate to ISCRA projects on CINECA supercomputing facilities. Moreover, I was involved in a LISA 2016 project, PI: prof. D. E. Galli.

Laboratory experiences At university and during PhD I took part in many experiments, in particular at the DESY and EU-Xfel facilities in Hamburg.

FOREIGN LANGUAGES

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user
Common European Framework of Reference (CEF) level

November 2015 CPE certificate (British Council, European level C2, mark: A – 221/230, november 2015).

OTHER INFORMATION

Charity and volunteering

- 2014 - 2021: guide to the scientific/technological exhibition organised in Rimini for the Meeting for Friendship amongst Peoples by Fondazione CEUR and Associazione Euresis. Curators of the exhibitions in the editions 2015-2018, 2020 and 2021.
- March - July 2020: Temporary Volunteer of Italian Red Cross, in Monza.
- since 2016 I am a member of AVIS (italian association of blood donors)
- 2010 - 2020: volunteering at the retirement home "Don Angelo Cambiaghi" in Monza.
- 2009 - 2016: volunteering at the "Cooperativa sociale ONLUS Iride", Monza.

Relational and artistic skills

- 2015 - 2019: member of the "Capitano Grandi" choir (Milano)
- individual lessons of classic, acoustic and electric guitar
- responsible in Catholic associations of groups of younger students

Certificates

- October 2019 – November 2019: First Aid basics, Italian Red Cross, Monza (16 hours).
- March 2019 and October 2019: UPEX safety training for EU-Xfel.
- June 2017 - August 2017: e-learning course for volunteers and workers, hosted by Fondazione Meeting Rimini and certified by E.BI.GEN. - UGL/CONFIMEA (8 h).

Other scientific/didactic activities Chairman/speaker for about 20 meetings/conferences for scientific dissemination.

Driving license B

Curriculum updated on 19/07/2022

I authorize the treatment of my personal data according to DL 30/06/2003 n. 196.