

# MAURO FACCIN

## Curriculum Vitæ

Ceped  
Université de Paris - Campus St Germain des Prés  
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<https://maurofaccin.github.io>

### ACTUAL POSITION

2021 - today **CEPED and IRD** Université de Paris, France  
Interests/Research line  
• Dynamical systems evolving on complex networks  
• Mesoscopic structures and their influence on the dynamical system  
• Applied data analysis for disease control  
• Analysis of information dynamics in social networks

### PROFESSIONAL EXPERIENCE

2021 - today **Université de Paris, (CEPED and IRD)** Paris, France  
PostDoc  
2015 - 2020 **Université Catholique de Louvain (ICTEAM)** Louvain la Neuve, Belgium  
PostDoc  
2011 - 2015 **ISI Fundation** Torino, Italy  
PostDoc  
2006 - 2011 **Bifi Institute** Zaragoza, Spain  
PhD

### FELLOWSHIPS AND PROJECTS

2021 - today **TRACTRUST (ANR-20-COVI-0102)**  
2017 - 2021 **Innoviris Iris-TB (D1.31402.007-F)**  
2015 - 2017 **MOVE-IN Louvain Fellowship (with support of Marie Curie Actions)**

### MEMBERSHIP

2018 - today **SICC - Italian Society for Chaos and Complexity**  
2015 - today **Network Science Society**  
Member  
2014 - today **Complex Systems Society**  
Member  
2013 - today **Frontiers in Quantum Computing**  
Review Editor

### COMMITTEES

1 Dec 2021 **Complex Networks 2021** Madrid, Spain  
Program Committee  
1 Dec 2020 **Complex Networks 2020** Madrid, Spain  
Program Committee  
10 Dec 2019 **Complex Networks 2019** Lisbon, Portugal  
Program Committee  
22 Feb 2019 **BeNet 2019** Hasselt, Belgium  
Program committee  
11 Dec 2018 **Complex Networks 2018** Cambridge, UK  
Program Committee  
29 Nov 2017 **Complex Networks 2017** Lyon, France  
Program Committee

15 Dec 2016	<b>BeNet 2016</b> Organizing committee	Louvain-la-Neuve, Belgium
30 Nov 2016	<b>Complex Networks 2016</b> Program committee	Milan, Italy
21 Sep 2016	<b>Coarse-graining of Complex Systems</b> Organizing committee	CCS2016, Amsterdam, Netherlands
2 Jun 2014	<b>Quantum Frontiers for Network Science</b> Organizing committee	NetSci 2014, Berkeley, California

## REVIEWER

- Advances in Complex Systems
- Applied Network Science
- APS (Physical Review E)
- Journal of Complex Networks
- Journal of Statistical Mechanics
- Natural Computing
- PLOS ONE
- Science Advances
- Scientific Reports

## TEACHING

2015-2020	<b>LINMA2111 Algorithms and Complexity</b> Université Catholique de Louvain	Assistant Professor
2005	<b>Physics and Math at primary school</b> NEST	Hetauda, Nepal
2004	<b>guide in Science Museum</b> Organizer: INFN	Padova, Italy

## EDUCATION

2020	<b>24CFU</b>	Univestità telematica Pegaso
2011	<b>PhD in Physics</b> supervisor: Pierpaolo Bruscolini	University of Zaragoza
2007	<b>Master in Physics and Technology</b> supervisor: Pierpaolo Bruscolini	University of Zaragoza
2005	<b>MSc in Physics</b> supervisor: Enzo Orlandini	University of Padova

## MAINTAINED PROJECTS

- **AISA**  
Python module aimed at partitioning a network through Autoinformation maximization
- **CartoTB**  
Cartography of predicted tuberculosis in high burden settings

## PUBLICATIONS

- **Measuring dynamical systems on directed hypergraphs** Phys Rev E, 106 (034306), 2022  
M. Faccin
- **Assessing the influence of French vaccine critics during the two first years of the COVID-19 pandemic** PLOS ONE, 17(8): e0271157  
M. Faccin, F. Gargiulo, L. Atlani-Duault, J.K. Ward

- **Data-driven identification of communities with high levels of tuberculosis infection in the Democratic Republic of Congo.** Sci Rep 12, 3912 (2022)  
M. Faccin, O. Rusumba, A. Ushindi, M. Riziki, T. Habiragi, F. Boutachkourt, E. André
- **State aggregations in Markov chains and block models of networks** Phys. Rev. Lett., 127, 078301 (2021)  
M. Faccin, M.T. Schaub and J.-C. Delvenne  
• Figure selected for the journal cover
- **Complex Networks from Classical to Quantum** Communications Physics 2-53 (2019)  
J. Biamonte, M. Faccin, M. De Domenico
- **Outbreak of multidrug-resistant tuberculosis in South Africa undetected by WHO-endorsed commercial tests: an observational study** The Lancet Infectious Diseases 2018  
Makhado, Matabane, Faccin, Pinçon, Jouet, Boutachkourt, Goeminne, Gaudin, Maphalala, Beckert, Niemann, Delvenne, Delmée, Razwiedani, Nchabeleng, Supply, de Jong, André
- **Entrograms and coarse graining of dynamics on complex networks** Journal of Complex Networks  
M. Faccin, M.T. Schaub, J.-C. Delvenne
- **Chiral Quantum Walks** Phys. Rev. A 93, 042302  
D. L. Lu, J. D. Biamonte, J. Li, H. Li, T. H. Johnson, V. Bergholm, M. Faccin, Z. Zimborás, R. Laflamme, J. Baugh, and S. Lloyd
- **Mapping the topography of a protein energy landscape** J. Am. Chem. Soc., 2015, 137 (46), pp 14610–14625  
R. D. Hutton, J. Wilkinson, M. Faccin, E. M. Sivertsson, A. Pelizzola, A. R. Lowe, P. Bruscolini, L. S. Itzhaki
- **Community Detection in Quantum Complex Networks** Phys. Rev. X 4 (4 2014), p. 041012  
M. Faccin, P. Migdal, T. H. Johnson, V. Bergholm, and J. D. Biamonte
- **Degree Distribution in Quantum Walks on Complex Networks** Phys. Rev. X 3 (4 2013), p. 041007  
M. Faccin, T. Johnson, J. Biamonte, S. Kais, and P. Migdal
- **Quantum Transport Enhancement by Time-Reversal Symmetry Breaking** Sci. Rep. 3 (2013). Ed. by NPG, p. 2361  
Z. Zimboras, M. Faccin, Z. Kadar, J. Whitfield, B. Lanyon, and J. Biamonte
- **MS/MS Spectra Interpretation as a Statistical-Mechanics Problem** Analytical Chemistry 85.10 (2013), pp. 4884–4892  
M. Faccin and P. Bruscolini
- **Ground-state spin logic** Europhysics Letters 99.5 (2012), p. 57004  
J. D. Whitfield, M. Faccin, and J. D. Biamonte
- **Analysis of the equilibrium and kinetics of the ankyrin repeat protein myotrophin** The Journal of Chemical Physics 134.7, 075102 (2011), p. 075102  
M. Faccin, P. Bruscolini, and A. Pelizzola

## CONFERENCES (ORAL CONTRIBUTIONS)

- 9 Nov 2022 **Data-driven mapping of tuberculosis incidence allows identifying communities with high circulation of tuberculosis in the Democratic Republic of Congo** Online  
The Union Conference 2022
- 9 Nov 2022 **Identification of urban areas presenting high incidence of tuberculosis using satellite images allows increasing the yield of active case finding in Kigali, Rwanda.** Online  
The Union Conference 2022
- 17 Oct 2022 **Use of compartmental models to detect high TB incidence rates in South-Kivu (DRC)** Palma de Mallorca/Online  
CCS 2022
- 30 May 2022 **Outreach of vaccine-critic content on French-speaking Twitter** Online  
CompleNet 2022
- 2 Dec 2021 **Autoinformation state aggregation** Madrid (Spain)  
Complex Networks 2021
- 30 Nov 2021 **Vaccine-critical discourse on French-speaking Twitter and its outreach** Madrid (Spain)  
Complex Networks 2021  
• Best lightning talk award

19 Oct 2021	<b>State aggregation for dynamical systems: An information-theoretic approach</b> Math Dept, Oxford University, (UK – Online)
7-9 Dec 2020	Network Seminar 2021 <b>Using predictive models and risk assessment tools to find unreported TB cases</b> Washington DC, USA (online)
20-24 Oct 2020	Global Digital Health Forum 2020 <b>Data-driven TB active-case finding in South Kivu (DRC)</b> Paris, France (online)
10-12 Dec 2019	The Union 2020 <b>Auto-information in non-Markovian diffusion systems</b> Lisbon, Portugal
22 Feb. 2019	Complex Networks 2019 <b>Variable aggregation for dynamical systems on networks</b> Hasselt, Belgium
23-28 Sept. 2018	Benet 2019 <b>A dynamical approach to block structure analysis</b> Thessaloniki, Greece
11-15 Jun 2018	CCS 2018 <b>Dynamical Markov Modules</b> Paris, France
21-24 Mar 2017	Netsci 2018 <b>Community detection in networks with non-Markovian dynamics</b> Dubrovnik, Croatia
30 Nov-2 Dec 2016	CompleNet 2017 <b>Behind Communities: Dynamics Define Modules</b> Milan, Italy
19-22 Sep 2016	ComplexNetworks 2016 <b>Beyond Communities: Dynamical Markov Modules</b> Amsterdam, Netherlands
May 30-June 3 2016	CCS 2016 <b>Mesoscopic Structure And Diffusion Process Memory</b> Seoul, Korea
10-15 Jan 2015	NetSci 2016 <b>Mesoscopic Structures and Diffusion Process Memory</b> Wrocław, Poland
2-6 Jun 2015	NetSci-X 2016 <b>Structural controllability of EEG temporal causal networks</b> Zaragoza, Spain
22-26 Sep 2014	NetSci 2015 <b>Quantum Approaches to Community Detection</b> Lucca, Italy
12-14 Mar 2014	ECCS 2014 <b>Community detection on quantum systems</b> Bologna, Italy
22-24 Jan 2014	CompleNet 2014 <b>Community Detection on Quantum Systems</b> Zaragoza, Spain
24-26 May 2013	BIFI2014 <b>Degree distribution in quantum complex networks</b> Waterloo, Canada
6-8 Nov 2012	IQC workshop on quantum computation and complex networks <b>Ground state spin logic</b> Torino, Italy
2-4 Feb 2011	Tensor Network States and Algebraic Geometry Workshop <b>Equilibrium and kinetics of the ankyrin repeat protein Myotrophin through a simple statistical mechanical model</b> Zaragoza, Spain
5-7 Feb 2009	V BIFI National Conference <b>Bayesian Characterization of Protein Tandem Mass Spectra</b> Zaragoza, Spain
8-9 May 2008	IV BIFI National Conference <b>Noise description in MSMS mass spectrometry, looking for a de novo sequencing algorithm</b> San Sebastian, Spain
	VI Jornadas Aragonesas de Estabilidad y Plegamiento de Proteínas

## CONFERENCES (POSTER CONTRIBUTIONS)

1 Dec 2021	<b>Directed hyper-graphs and dynamical systems</b> Complex Networks 2021	Madrid (Spain)
17-25 Sept 2020	<b>State aggregation in non-Markovian systems by auto-information maximization</b> Netsci 2020	Rome, Italy
17-25 Sept 2020	<b>The variability of network structures inferred from time series data</b> Netsci 2020	Rome, Italy
10-12 Dec 2019	<b>The variability of network structures inferred from time series data</b> Complex Networks 2019	Lisbon, Portugal
1-3 July 2019	<b>Variable aggregation on (broadcasting) networks</b> CCS/Italy 2019	Trento, Italy
23-25 Mar 2016	<b>Memory and Mesoscopic Structures in Diffusion Processes</b> CompleNet 2016	Dijon, France

- 7-10 Jul 2010 **Folding Pathways Characterization for Ankyrin Repeat Protein Myotrophin**  
Zaragoza, Spain  
IV Spanish Portuguese Biophysical Congress
- 2-6 Jun 2008 **Statistical characterization of fragment ions in MSMS mass spectrometry**  
Sitges, Spain  
XXI Sitges Conference on Statistical Mechanics: Statistical Mechanics of Molecular Biophysics

## COMPUTER SKILLS

Coding	Python, C, C++, Matlab, Fortran
Shell	Bash, iPython/Jupyter
Versioning	GIT, Subversion, Mercurial
Plotting	Gnuplot, Matplotlib, PGFPlots(latex)
Typesetting	Latex, LibreOffice, MSOffice, Markdown
Imaging	Gimp (Raster), Inkscape (Vectorial), Rawtherapee (RAW)
Web	HTML5, CSS/SCSS, static site generators, Wordpress

## LANGUAGES

Italian	Mother tongue
English	Fluent
Spanish	Fluent
French	Fair

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