

# MAURO FACCIN

## Curriculum Vitæ

Ceped  
Université de Paris - Campus St Germain des Prés  
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75006 Paris, France  
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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

## PUBLICATIONS

- **Measuring dynamical systems on directed hypergraphs** arXiv  
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. Boutachkout, 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)

- |                  |  |   |
|------------------|--|---|
| 30 May 2022      | <b>Outreach of vaccine-critic content on French-speaking Twitter</b>                 | Online                                      |
|                  | Complenet 2022   |   |
| 2 Dec 2021       | <b>Autoinformation state aggregation</b>   | Madrid (Spain)                              |
|                  | Complex Networks 2021  |   |
| 30 Nov 2021      | <b>Vaccine-critical discourse on French-speaking Twitter and its outreach</b>        | 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) |
|                  | Network Seminar 2021   |   |
| 7-9 Dec 2020     | <b>Using predictive models and risk assessment tools to find unreported TB cases</b> | Washington DC, USA (online)                 |
|                  | Global Digital Health Forum 2020   |   |
| 20-24 Oct 2020   | <b>Data-driven TB active-case finding in South Kivu (DRC)</b>                        | Paris, France (online)                      |
|                  | The Union 2020   |   |
| 10-12 Dec 2019   | <b>Auto-information in non-Markovian diffusion systems</b>                           | Lisbon, Portugal                            |
|                  | Complex Networks 2019  |   |
| 22 Feb. 2019     | <b>Variable aggregation for dynamical systems on networks</b>                        | Hasselt, Belgium                            |
|                  | Benet 2019   |   |
| 23-28 Sept. 2018 | <b>A dynamical approach to block structure analysis</b>                              | Thessaloniki, Greece                        |
|                  | CCS 2018   |   |
| 11-15 Jun 2018   | <b>Dynamical Markov Modules</b>  | Paris, France                               |
|                  | Netsci 2018  |   |
| 21-24 Mar 2017   | <b>Community detection in networks with non-Markovian dynamics</b>                   | Dubrovnik, Croatia                          |
|                  | CompleNet 2017   |   |

30 Nov-2 Dec 2016	<b>Behind Communities: Dynamics Define Modules</b> ComplexNetworks 2016	Milan, Italy
19-22 Sep 2016	<b>Beyond Communities: Dynamical Markov Modules</b> CCS 2016	Amsterdam, Netherlands
May 30-June 3 2016	<b>Mesoscopic Structure And Diffusion Process Memory</b> NetSci 2016	Seoul, Korea
10-15 Jan 2015	<b>Mesoscopic Structures and Diffusion Process Memory</b> NetSci-X 2016	Wrocław, Poland
2-6 Jun 2015	<b>Structural controllability of EEG temporal causal networks</b> NetSci 2015	Zaragoza, Spain
22-26 Sep 2014	<b>Quantum Approaches to Community Detection</b> ECCS 2014	Lucca, Italy
12-14 Mar 2014	<b>Community detection on quantum systems</b> CompleNet 2014	Bologna, Italy
22-24 Jan 2014	<b>Community Detection on Quantum Systems</b> BIFI2014	Zaragoza, Spain
24-26 May 2013	<b>Degree distribution in quantum complex networks</b> IQC workshop on quantum computation and complex networks	Waterloo, Canada
6-8 Nov 2012	<b>Ground state spin logic</b> Tensor Network States and Algebraic Geometry Workshop	Torino, Italy
2-4 Feb 2011	<b>Equilibrium and kinetics of the ankyrin repeat protein Myotrophin through a simple statistical mechanical model</b> V BIFI National Conference	Zaragoza, Spain
5-7 Feb 2009	<b>Bayesian Characterization of Protein Tandem Mass Spectra</b> IV BIFI National Conference	Zaragoza, Spain
8-9 May 2008	<b>Noise description in MSMS mass spectrometry, looking for a de novo sequencing algorithm</b> VI Jornadas Aragonesas de Estabilidad y Plegamiento de Proteínas	San Sebastian, Spain

## 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	<b>Folding Pathways Characterization for Ankyrin Repeat Protein Myotrophin</b> IV Spanish Portuguese Biophysical Congress	Zaragoza, Spain
2-6 Jun 2008	<b>Statistical characterization of fragment ions in MSMS mass spectrometry</b> XXI Sitges Conference on Statistical Mechanics: Statistical Mechanics of Molecular Biophysics	Sitges, Spain

## 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

Mauro Faccin