

## Chiara Poletto

Researcher (Chargée de Recherche)

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### Current position

Oct 2015 – present: Researcher (Chargé de Recherche) at the *Institut Pierre Louis d'Epidémiologie et de Santé Publique*, INSERM UMR S 1136, Paris, France. Part of the team “Communicable diseases surveillance and modelling” lead by Prof. Pierre-Yves Boëlle.

### Education

- 27 Mar 2009: PhD in Physics, Physics Department G. Galilei, University of Padua, Italy. Thesis: *Solvent induced interactions in biopolymers: origin of secondary motifs*, supervisor Prof. Amos Maritan
- 22 Mar 2005: Degree in Physics, Physics Department G. Galilei, University of Padua, Italy. Marks 110/110 *cum laude*.

### Professional Experience

- Fall 2019: visiting professor Physics Department G. Galilei, University of Padua
- Jan 2014 – Sep 2015: Post Doc at the EPIcx Laboratory within the team “Surveillance et Modélisation des maladies transmissibles” lead by Prof. Pierre-Yves Boëlle, *Institut Pierre Louis d'Epidémiologie et de Santé Publique*, INSERM UMR S 1136 (previously UMR S 707), Paris, France. Research project LIVEepi funded by ANR under the program ANIHWA, principal investigator Dr. Vittoria Colizza
- Sep 2012 – Dec 2013: visiting researcher at the EPIcx Laboratory, under the supervision of Dr. Vittoria Colizza, within the team “Epidémiologie, Systèmes d'Information, Modélisation” lead by Prof. Guy Thomas, INSERM UMR S 707, Paris, France.
- Feb 2009 – Dec 2013: Post Doc at the Computational Epidemiology Laboratory, ISI Foundation, Turin, Italy. Research projects: EpiFor funded by ERC – European Research Council, principal investigator Dr. Vittoria Colizza; Predemics funded by European Community FP7
- Jan 2006- Mar 2009: PhD in Physics, Physics Department G. Galilei, University of Padua
- May 2005 - Oct 2005: Research appointment, Physics Department G. Galilei, University of Padua

### Other relevant information

- May 2017 – Sep 2017: maternity leave

## Awards and Honours

- Sep 2015: Junior Scientific Award of the Complex Systems Society (CSS). The award is aimed at recognizing extraordinary scientific achievements by CSS young researchers (within 7 years of PhD competition).
- Sep 2014: Invitation in the contest of the Young Scientist Program to co-chair the session of Mathematical Modelling at the 5th ESWI (European Scientific Working group on Influenza) Conference, Riga, Sept 14-17 2014. Travel grant to participate to the conference.

## Funding

### Grants as PI

- Apr 2020 – Apr 2021: grant ANR Flash Covid-19, *NoCOV, Nowcasting and forecasting the COVID19 epidemic in the French general population*, role PI, amount 55.3K
- Jan 2019 – Dec 2022: grant Emergence de la Ville de Paris, *CompFlu, Advanced computational approaches for the integrative study of virological, epidemiological and socio-demographic drivers of influenza*, role PI, amount 210K
- Jan 2017 - June 2018: grant Emergence @ Sorbonne Universités, SU-16-R-EMR-48, *FluDE, Joint modelling of influenza diffusion and evolution: a data driven computationally intensive approach*, role PI, amount 67,2K.
- Jan 2017- Dic 2017: mobility grant PHC Galileo, 37414WD, *Mapping the risk of zoonotic emergence: a network perspective*, role PI.

### Other grants

- Jan 2020- Dec 2013: collaborative project H2020, 874850, *MOOD, Monitoring outbreak events for disease surveillance in a data science context*, role task leader.
- Jan 2016- Dec 2017: mobility grant PHC Tournesol, 35686NE, *Quantifying the impact of school holidays and week-ends on the spread of ILI: a multiscale approach*, role co-PI.
- Jan 2016- Dec 2017: mobility grant PHC Procope, 35473TK, *Optimal strategies for disease control in temporal networks*, role co-PI.
- Jan 2013- Dec 2016: collaborative project EC ANIHWA, 13-ANWA-0007-03, *LIVEpi, Prediction and control of vector- and movement-borne livestock epidemics*, role participant
- Jan 2012- Dec 2016: collaborative project ANR (French National Agency for Research), n.ANR-12-MONU-0018, *HARMSFLU, Harmonizing multiple scales for data-driven computational approaches to the modeling of influenza spread*, role participant
- Jan 2007- Dec 2013: collaborative project FP7, 278433, *Predemics, Preparedness, Prediction and Prevention of Emerging Zoonotic Viruses with Pandemic Potential using Multidisciplinary Approaches*, role participant.

### Fellowships

- Sep 2012-Mar 2013: Post-Doctoral Fellowship funded by the French Embassy in Italy and the Italian Ministry of Foreign Affairs for carrying out a 6-months research project at INSERM UMR S 707, Paris.
- Jun 2010: travel grant to the *Summer Institute in Statistics and Modelling of Infectious*

Diseases 2010, funded by the School of Public Health, University of Washington.

- Sep 2009: travel grant to the *European Conference of Complex Systems 2009*, funded by ASSYST.
- Jan 2006-Mar 2009: Doctoral Fellowship, Physics Department G. Galilei, University of Padua.
- May 2005-Oct 2005: Fellowship associated to the project *Protein Physics*, Physics Department G. Galilei, University of Padua

## Publications

### Pre-prints

1. F. Pinotti, L. Di Domenico, E. Ortega, M. Mancastroppa, G. Pullano, E. Valdano, P.-Y. Boelle, **C. Poletto**, V. Colizza, Lessons learnt from 288 COVID-19 international cases: importations over time, effect of interventions, underdetection of imported cases, medRxiv <https://doi.org/10.1101/2020.02.24.20027326>.
2. E Valdano, **C Poletto**, PY Boelle, V Colizza, Reorganization of nurse scheduling reduces the risk of healthcare associated infections, medrxiv 2019, <https://doi.org/10.1101/19007724>.
3. S. Chakraborty, X. R. Hoffmann, M. G. Leguia, F. Nolet, E. Ortiz, O. Prunas, L. Zavojanni, E. Valdano, **C. Poletto**, Dynamics of new strain emergence on a temporal network, arXiv:1805.04343

### Peer reviewed publications

1. P.-Y. Boëlle, C. Souty, T. Launay, C. Guerrisi, C. Turbelin, S. Behillil, V. Enouf, **C. Poletto**, B. Lina, S. van der Werf, D. Lévy-Bruhl, V. Colizza, T. Hanslik, T. Blanchon, Excess cases of influenza-like illnesses synchronous with coronavirus disease (COVID-19) epidemic, France, March 2020, *Eurosurveillance* 25(14):pii=2000326 (2020).
2. M. Gilbert, G. Pullano, F. Pinotti, E. Valdano, **C. Poletto**, P.-Y. Boelle, E. D'Ortenzio, Y. Yazdanpanah, S. P. Eholie, M. Altmann, B. Gutierrez, M. U. G. Kraemer, V. Colizza, Preparedness and vulnerability of African countries against importations of COVID-19: a modelling study, *The Lancet* S0140-6736(20)30411-6 (2020).
3. G. Pullano, F. Pinotti, E. Valdano, P.-Y. Boëlle, **C. Poletto**, V. Colizza, Novel coronavirus (2019-nCoV) early-stage importation risk to Europe, *Eurosurveillance* 25(4):pii=2000057 (2020).
4. F. Pinotti, F. Ghanbarnejad, P. Hövel, **C. Poletto**, Interplay between competitive and cooperative interactions in a three-player pathogen system, *Royal Society Open Science* 7 190305 (2020).
5. F. Pinotti, É. Fleury, D. Guillemot, P.-Y. Böelle, **C. Poletto**, Host contact dynamics shapes richness and dominance of pathogen strains, *PLoS Computational Biology* 15(5): e1006530 (2019).
6. D. Colombi, J. Serra Cobo, R. Metras, A. Apolloni, **C. Poletto**, M. Lopez-Roig, H. Bourhy, V. Colizza, Mechanisms for lyssavirus persistence in non-synanthropic bats in Europe: insights from a modeling study, *Scientific Reports*, 9, 537 (2019).
7. P. Coletti, **C. Poletto**, C. Turbelin, T. Blanchon, V. Colizza, Shifting patterns of seasonal influenza epidemics, *Scientific Reports* 8, 12786 (2018).
8. A. Darbon, E. Valdano, **C. Poletto**, A. Giovannini, L. Savini, L. Candeloro, V. Colizza, Network-based assessment of the vulnerability of Italian regions to bovine brucellosis, *Preventive Veterinary Medicine* 158, 25 (2018).

9. C. Guerrisi, C. Turbelin, C. Souty, **C. Poletto**, T. Blanchon, T. Hanslik, I. Bonmarin, D. Levy-Bruhl, V. Colizza, The potential value of crowdsourced surveillance systems in supplementing sentinel influenza networks: the case of France, *Eurosurveillance*, 23(25):pii=1700337 (2018).
10. J. Riou, **C. Poletto**, P. –Y. Boëlle, Improving early epidemiological assessment of emerging Aedes-transmitted epidemics using historical data, *PLoS Neglected Tropical Diseases*, 12(6): e0006526 (2018). Featured on PLoS Disease Forecasting & Surveillance Channel.
11. E. Valdano, M. Re Fiorentin, **C. Poletto**, V. Colizza, Epidemic threshold on continuous vs. discrete time evolving networks, *Physics Review Letters* 120 068302 (2018).
12. G. De Luca, K. Van Kerckhove, P. Coletti, **C. Poletto**, N. Bossuyt, N. Hens, V. Colizza, The impact of regular school closure on seasonal influenza epidemics: a data-driven spatial transmission model for Belgium, *BMC Infectious Diseases* 18:29 (2018). Coverage on the BMC Series blog.
13. A. Aleta, A. N. S. Hisi, S. Meloni, **C. Poletto**, V. Colizza, Y. Moreno, Human mobility networks and persistence of rapidly mutating pathogens, *Royal Society Open Science* 4, 160950 (2017).
14. J. Riou, **C. Poletto**, P.Y. Boëlle, A comparative analysis of Chikungunya and Zika transmission, *Epidemics* 19 43-52 (2017).
15. L. Bioglio, M. Génois, C.L. Vestergaard, **C. Poletto**, A. Barrat, V. Colizza, Recalibrating disease parameters for increasing realism in modelling epidemics in closed settings, *BMC Infectious Diseases* 16:676 (2016).
16. **C. Poletto**, P.Y. Boëlle, V. Colizza, Risk of MERS importation and onward transmission: a systematic review and analysis of cases reported to WHO, *BMC Infectious Diseases* 16(1) 448 (2016).
17. C.L. Vestergaard, E. Valdano, M. Génois, **C. Poletto**, V. Colizza, A. Barrat, Impact of spatially constrained sampling of temporal contact networks on the evaluation of the epidemic risk, *European Journal of Applied Mathematics*, doi:10.1017/S0956792516000309 (2016).
18. **C. Poletto**, V. Colizza, P.Y. Boëlle, Quantifying spatiotemporal heterogeneity of MERS-CoV transmission in the Middle East region: a combined modelling approach, *Epidemics* 15 1-9 (2016).
19. E. Valdano, **C. Poletto**, V. Colizza, Infection propagator approach to compute epidemic thresholds on temporal networks: impact of immunity and of limited temporal resolution, *the European Physical Journal B*, 88 341 (2015).
20. E. Valdano, L. Ferreri, **C. Poletto**, V. Colizza, Analytical computation of the epidemic threshold on temporal networks, *Physics Review X* 5, 021005 (2015). Highlight on Physics
21. E. Valdano, **C. Poletto**, A. Giovannini, D. Palma, L. Savini, V. Colizza, Predicting epidemic risk from past temporal contact data, *PLoS Computational Biology*, 11(3): e1004152 (2015). Journal Cover
22. **C. Poletto**, S. Meloni, A. Van Metre, V. Colizza, Y. Moreno, A. Vespignani, Characterising two-pathogen competition in spatially structured environments, *Scientific Reports* 5 7895 (2015)
23. **C. Poletto**, M. F. C. Gomes, A. Pastore y Piontti, L. Rossi, L. Bioglio, D. L. Chao, I. M. Longini, M. E. Halloran, V. Colizza, A. Vespignani. Assessing the impact of travel restrictions on international spread of the 2014 West African Ebola epidemic. *Eurosurveillance* 19:42 (2014)

24. P. Cantarelli, M. Debin, C. Turbelin, **C. Poletto**, T. Blanchon, A. Falchi, T. Hanslik, I. Bonmarin, D. Levy-Bruhl, A. Micheletti, D. Paolotti, A. Vespignani, J. Edmunds, K. Eames, R. Smallenburg, C. Koppeschaar, A. O Franco, V. Faustino, A. Carnahan, M. Rehn, V. Colizza. The representativeness of a European multi-center network for influenza-like-illness participatory surveillance. *BMC Public Health* 14:1 984 (2014)
25. S. Cauchemez, M. Ledrans, **C. Poletto**, P. Quenel, H. de Valk, V. Colizza, P-Y. Boëlle. Local and regional spread of chikungunya fever in the Americas, *Eurosurveillance* 19:28 (2014)
26. **C. Poletto**, C. Pelat, D. Levy-Bruhl, Y. Yazdanpanah, P-Y. Boëlle, V. Colizza, Assessment of the middle east respiratory syndrome coronavirus (MERS-CoV) epidemic in the middle east and risk of international spread using a novel maximum likelihood analysis approach, *Eurosurveillance* 19:23 (2014)
27. A. Apolloni, **C. Poletto**, J. J. Ramasco, P. Jensen, V. Colizza, Metapopulation epidemic models with heterogeneous mixing and travel behaviour, *Theoretical Biology and Medical Modelling*, 11:3 (2014)
28. M. Debin, C. Turbelin, T. Blanchon, I. Bonmarin, A. Falchi, T. Hanslik, D. Levy-Bruhl, **C. Poletto**, V. Colizza, Evaluating the feasibility and participants' representativeness of an online nationwide surveillance system for influenza in France, *PLoS ONE* 8(9): e73675 (2013)
29. **C. Poletto**, M. Tizzoni, V. Colizza, Human mobility and time spent at destination: Impact on spatial epidemic spreading, *Journal of Theoretical Biology* 338 41-58 (2013)
30. **C. Poletto**, S. Meloni, V. Colizza, Y. Moreno, A. Vespignani, Host mobility drives pathogen competition in spatially structured populations, *PLoS Computational Biology* 9(8): e1003169 (2013)
31. A. Apolloni\*, **C. Poletto\***, V. Colizza, Age-specific contacts and travel patterns in the spatial spread of 2009 H1N1 influenza pandemic, *BMC Infectious Diseases* 13, 176 (2013)
32. M. Tizzoni, P. Bajardi, **C. Poletto**, J. J. Ramasco, D. Balcan, B. Goncalves, N. Perra, V. Colizza, A. Vespignani, Real-time numerical forecast of global epidemic spreading: case study of 2009 A/H1N1pdm, *BMC Medicine* 10:165 (2012)
33. **C. Poletto**, M. Tizzoni, V. Colizza, Heterogeneous length of stay of hosts' movements and spatial epidemic spread, *Scientific Reports* 2:476 (2012)
34. P. Bajardi\*, **C. Poletto\***, J. J. Ramasco, M. Tizzoni, V. Colizza, A. Vespignani, Human Mobility Networks, Travel Restrictions, and the Global Spread of 2009 H1N1 Pandemic. *PLoS ONE* 6(1): e16591 (2011)
35. D. Balcan, V. Colizza, A.C. Singer, C. Chouaid, H. Hu, B. Gonçalves, P. Bajardi, **C. Poletto**, J.J. Ramasco, N. Perra, M. Tizzoni, D. Paolotti, W. Van den Broeck, A. J. Valleron, A. Vespignani, Modeling the critical care demand and antibiotics resources needed during the Fall 2009 wave of influenza A(H1N1) pandemic, *PLoS Currents: Influenza*. 2009 Dic 4:RRN1133.
36. V. Colizza, A. Vespignani, N. Perra, **C. Poletto**, B. Gonçalves, H. Hu, D. Balcan, D. Paolotti, W. Van den Broeck, M. Tizzoni, P. Bajardi, J.J. Ramasco, Estimate of Novel Influenza A/H1N1 cases in Mexico at the early stage of the pandemic with a spatially structured epidemic model, *PLoS Currents: Influenza*. 2009 Nov 11:RRN1129.
37. P. Bajardi, **C. Poletto**, D. Balcan, H. Hu, B. Goncalves, J.J. Ramasco, D. Paolotti, N. Perra, M. Tizzoni, W. Van den Broeck, V. Colizza, A. Vespignani, Modeling vaccination campaigns and the Fall/Winter 2009 activity of the new A(H1N1) influenza in the Northern Hemisphere, *Emerging Health Threats Journal*, 2:e11 (2009)

38. D. Balcan\*, H. Hu\*, B. Goncalves\*, P. Bajardi\*, **C. Poletto**\*, J.J. Ramasco, D. Paolotti, N. Perra, M. Tizzoni, W. Van den Broeck, V. Colizza, A. Vespignani, Seasonal transmission potential and activity peaks of the new influenza A(H1N1): a Monte Carlo likelihood analysis based on human mobility, *BMC Medicine*, 7:45, (2009). Recommended by F1000Prime
39. **C. Poletto**, A. Giacometti, A. Trovato, J. B. Banavar, A. Maritan, Emergence of secondary motifs in tube like-polymer in a solvent , *Physics Review E*, 77, 061804 (2008)
40. J. B. Banavar, T. H. Hoang, J. H. Maddocks, A. Maritan, **C. Poletto**, A. Stasiak, A. Trovato, structural motifs of biomolecules, *Proceedings of the National Academy of Sciences USA*, 104 (2007)

\* These authors contributed equally

### Book Chapters

1. Pastore-Piontti, Q. Zhang, M. F. C. Gomes, L. Rossi, C. Poletto, V. Colizza, D. L. Chao, I. M. Longini, M. E. Halloran, A. Vespignani, *Real-Time Assessment of the International Spreading Risk Associated with the 2014 West African Ebola Outbreak*, pp 39-56, in *Mathematical and Statistical Modelling for Emerging and Re-emerging Infectious Diseases*, G. Chowell, J. M. Hyman (editors), Springer (2016)

### **Committees**

#### Program committees

1. *The 8th International Conference on Complex Networks and their Applications*, Madrid, Spain Dec 1-3, 2020
2. *International School and Conference on Network Science 2020*, Rome, Italy July 6-10, 2020
3. *CompleNet 2020*, Exeter, UK Mar 31- Apr 3 2020
4. *The 8th International Conference on Complex Networks and their Applications*, Lisbon, Portugal, Dec 10-12, 2019
5. *Conference on Complex Systems 2019*, Singapore, 30 Sept- 4 Oct 2019.
6. *International School and Conference on Network Science 2019*, Burlington, VT, US May 27-31, 2019
7. *International Conference on Complex Systems 2018*, in Cambridge, MA, US, July 22-27, 2018.
8. *Conference on Complex Systems 2018*, Thessaloniki, Greece, 23-28 Sept 2018.
9. *The 7th International Workshop on Complex Networks and their Applications*, Cambridge UK, 11-13 Dec, 2018.
10. *The 6th International Workshop on Complex Networks and their Applications*, Lyon France, Nov 29-Dec 1, 2017.
11. *Conference of Complex Systems 2017*, Cancun, Mexico 17-22 Sep 2017.
12. 8th Conference on Complex Networks, Dubrovnik Croatia 21-24 Mar, 2017
13. *International School and Conference on Network Science* (Winter edition), Tel Aviv Jan 15-18, 2017
14. *2nd International Conference on Complexity, Future Information Systems and Risk*, Porto, Portugal 24-26 Apr 2017
15. Satellite Meeting *Digital Epidemiology and Surveillance*, of the *Conference of Complex Systems 2016*, Amsterdam, 20 Sep, 2016

16. *The 5th International Workshop on Complex Networks and their Applications*, Nov 30-Dec 2 2016, Milan Italy.
17. *Conference of Complex Systems 2016*, Amsterdam, The Netherlands 19-22 Sep 2016.
18. *CompleNet 2016 (7th workshop on complex networks)*, Dijon, France 23-25 Mar, 2016.
19. *Complex Networks: from theory to interdisciplinary applications*, satellite meeting of *Statphys26*, Marseille, France 11-13 July, 2016.
20. *International School and Conference on Network Science*, Zaragoza, Spain 1-5 Jun 2015.
21. *5th ESWI (European Scientific Working group on Influenza) Conference*, Riga, Latvia 14-17 Sep 2014.
22. *Satellite Meeting Temporal and Dynamic Networks: From Data to Models*, at the *International School and Conference on Network Sciences 2013*, Copenhagen 3-4 Jun, 2013
23. *European Conference of Complex Systems 2011*. Vienna, 12-16 Sep, 2011

#### Scientific committees

1. *Complex Networks Thematic School*, Les Houches, 7-18 Apr, 2014

#### Organising committees

1. *Databeers Paris*, Series of scientific dissemination events about data sciences.
2. Seminar series *SaMMBA, Statistical and Mathematical Modeling in Biological Applications*, Pasteur Institute, Paris, France.
3. *Satellite Meeting Networks in disease ecology: modeling interacting pathogens, multiple host layers, and evolution*, at the *International School and Conference on Network Sciences 2018*, Paris, 11 June 2018
4. *Satellite Meeting Modelling of Disease Contagious processes 6st edition*, of the *Conference of Complex Systems 2017*, Cancun, 20-21 Sep, 2017
5. *Satellite Meeting Modelling of Disease Contagious processes 5st edition*, of the *Conference of Complex Systems 2016*, Amsterdam, 21 Sep, 2016
6. *Satellite Meeting Modelling of Disease Contagious processes 3rd edition*, of the *European Conference of Complex Systems 2014*, Lucca, 25 Sep, 2014
7. *Satellite Meeting Modelling of Disease Contagious processes 2nd edition*, of the *European Conference of Complex Systems 2013*, Barcelona, 18 Sep, 2013
8. *Satellite Meeting Temporal and Dynamic Networks: From Data to Models*, at the *International School and Conference on Network Sciences 2013*, Copenhagen 3-4 Jun, 2013
9. *Satellite Meeting Data Driven Modelling of Contagious Processes*, of the *European Conference of Complex Systems 2012*, Brussels, 5 Sep, 2012

#### **Academic services**

##### Editor activity

1. Academic editor of PLOS ONE
2. Editor of PLOS Complexity Channel, [channels.plos.org/complexity](https://channels.plos.org/complexity)

##### Referee activity for peer-reviewed journals

Applied Network Science, Scientific Data, Nature Physics, Physics Review X, Nature Communications, PLoS Computational Biology, Eurosurveillance, Physical Review Letters, PLoS ONE, Scientific Reports, Journal of Theoretical Biology, Mathematical Biosciences,

PLoS Currents, BMC Infectious Diseases, BMC Research Notes, Proceedings of the Royal Society B, Proceedings of the Royal Society Interface, Royal Society Open Science, Influenza and Other Respiratory Viruses, Virology Journal, Physical Review E, EP J Data Science, European Journal of Physics B, Europhysics Letters, Journal of Statistical Mechanics: Theory and Experiment, New Journal of Physics, Journal of Computational Science, Enterprise Information Systems, International Journal of Bifurcation and Chaos, Peer J.

#### Referee activity for funding programs

French National Research Agency

European Science Foundation

Medical Research Council

#### Other academic services

- 2015-2019: Management Committee Substitute for France in the COST Action CA15109, *European Cooperation for Statistics of Network data science* (2015-2019)
- 2015-present: Elected member of the council of the Complex Systems Society
- 2015-present: Elected member of the steering committee of the Conference on Complex Systems

#### **Activities for expertise to governmental authorities/institutions:**

1. Member of the “Reacting” working group for risk assessment on the 2020 COVID-19 outbreak
2. Member of the modelling working group for risk assessment on the 2014 Western Africa Ebola outbreak for the Haute Conseil de la Santé Publique
3. Member of the modelling working group for risk assessment on the 2013 MERS-CoV outbreak for the Institut de Veille Sanitaire
4. Member of the “Reacting” working group for risk assessment on the 2014 Chikungunya outbreak in Saint Martin Island for the Institut de Veille Sanitaire and the Direction Generale de la Santé
5. Expert advise to the Institut de Veille Sanitaire for the design of a national influenza pandemic exercise

#### **Supervision**

##### Post Doc

1. 2017 - 2020 : Piotr Bentkowski, Post Doc in the context of the projects FluDE and CompFlu.
2. Fall 2019- spring 2020: Francesco Pinotti, Post Doc in the context of the projects CompFlu.

##### PhD

1. 2016-2019: Francesco Pinotti, PhD student at the Doctoral School of Public Health, Université Pierre et Marie Curie, project on the co-circulation of multiple pathogens.

##### Bachelor and master degree

1. Beatriz Arregui-García, internship for M2 Systems Complexes Université Paris Saclay, 2019-2020



2. Jesús A. Moreno López, internship for M2 Systems Complexes Université de, 2019-2020
3. Fabio Mazza, internship for M2 Systems Complexes Université Paris Diderot – Paris 7, 2018-2019
4. Francesco Pinotti, Internship of the double degree program in Physics, Université Paris SUD, Paris, France & University of Ferrara, Italy, 2015-2016. Title “co-circulation of multiple pathogens on a temporal network”
5. Sara Andraghetti, thesis of master degree in Mathematics, University of Turin, Italy 2014-2015. Title “multi-strain epidemics on temporal networks”.
6. Gino Almondo, thesis of bachelor degree in Physics, University of Turin, Italy, 2011-2012. Title “Modelling the interplay between social and epidemic dynamics”.

### **PhD students’ committees**

1. Graduate committee of Trevor Shoemaker, PhD School GAIA Montpellier University 2019.
2. Thesis advisory committee of Jonathan Bastard, PhD School “Frontières du Vivant”, University Paris Diderot 2018 – 2020.
3. Graduate committee of Julie Fournet, PhD in Theoretical Physics and Mathematics University Aix-Marseille 2016.
4. Graduate committee of Lorenzo Argante, PhD in Complex Systems for Life Science University of Torino 2015.

### **Teaching**

#### Invited lectures at International Schools

1. Lecture at the *Winter Workshop on Complex Systems* 2019, Zakopane, Poland Feb 4-8, 2019.
2. Lecture at the *Tehran school on Theory and Applications of Complex Networks*, Tehran, Iran, Aug 25-29, 2018.
3. Lecture at the *International School and Conference on Network Science*, Paris, France, Jun 11-15, 2018.
4. Lecture at the *Workshop Complexity 72h*, Lucca, Italy, May 7-11, 2018.
5. Lecture “Complexity in epidemic processes: can models help us face an outbreak?” *CCS Warm-up, III School on Complex Systems*, Amsterdam, Netherlands, Sep 16-18, 2016.

#### Courses and lectures at master programs:

1. Contract professor for the course *Life data epidemiology*. Master degree in Physics of Data, University of Padova. 2019-2020 academic year, 24 hours.
2. Lecture “Mixing: from random to realistic networks” of the course *Modelling of Infectious Diseases* organized by Pasteur-Cnam School of Public Health, Paris. For the academic years: 2015-2016, 2016-2017, 2017-2018.
3. Teaching Assistant of the course *Complexity in Social Systems*. Graduation Degree in Physics, University of Turin. 2010-2011 academic year.

#### Tutor activities

1. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Material Science, University of Padua. Italy. 2006-2007 academic year, 25 hours.

2. Tutor of the course *Mathematical Analysis I*. Bachelor Degree in Material Science, University of Padua. Italy. 2006-2007 academic year, 25 hours.
3. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Optics and Optometry, University of Padua. Italy. 2006-2007 academic year, 25 hours.
4. Tutor of the course *Mathematical Analysis I*. Bachelor Degree in Optics and Optometry, University of Padua. Italy. 2006-2007 academic year, 25 hours.
5. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Material Science, University of Padua. Italy. 2007-2008 academic year, 25 hours.
6. Tutor of the course *Mathematical Analysis I*. Bachelor Degree in Material Science, University of Padua. Italy. 2007-2008 academic year, 25 hours.
7. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Optics and Optometry, University of Padua. Italy. 2007-2008 academic year, 25 hours.

### **Invited talks at conferences and workshops**

1. Invitation to the *Institute for Infectious Disease modelling Symposium*, Seattle, USA, 20-22 Apr 2020.
2. Invitation to the *School and Workshop on Plasmids as Vehicles of Antimicrobial Resistance Spread*, International Center for Theoretical Physics, Trieste, Italy Mar 2-6, 2020 (postponed due to the coronavirus outbreak)
3. Host contact dynamics shapes richness and dominance of pathogens strains, *11<sup>th</sup> Conference on Dynamical systems applied to biology and natural sciences (DSABNS)*, Trento, Italy, Feb 4-7, 2020.
4. Multi-pathogen co-circulation on networks: capturing the complexity of pathogen ecology *10th International Conference on Complex Networks (CompleNet'19)*, Tarragona, Spain, Mar 18-21, 2019. Springer Complexity seminar.
5. Accounting for variable and heterogeneous human behaviour in the assessment of an epidemic, *13<sup>th</sup> SICC International Workshop, Topics in Nonlinear Dynamics: complexity and the city*, Torino, Italy, Oct 29-30, 2018.
6. *International Conference on Control of Complex Systems and Networks*, Heringsdorf, Usedom, Germany, Sep 4-8, 2016
7. Dynamical model of Middle East Respiratory Syndrome spread: uncovering ecological and behavioural drivers of propagation of an emerging disease, *Journées GDR Statistique et Santé & Société Française de Biométrie*, Lyon, France, 27-28 Jun, 2016.
8. Assessing the vulnerability to infections of time-evolving contact networks, MBI workshop *Generalised network structures and dynamics*, Columbus OH, United States, 21-25 March, 2016.
9. Multi-pathogen competition and persistence in a spatially structured environment, Satellite Meeting *Modelling of Disease Contagious processes 4th edition of the Conference of Complex Systems 2015*, Tempe, AZ, United States, 30 Sep 2015.
10. Host mobility drives pathogen competition in spatially structured populations, *Simulation Models of Infectious Diseases*, Antwerp, Belgium 17-18 Apr 2013
11. Epidemic spreading on time-varying networks of human contacts, *Statistical Network Science*, Leiden, Netherland, 2-5 Apr 2013
12. Multiscale Networks and the spatial spread of infectious diseases, *Dagstuhl Seminar "Data Mining, Networks and Dynamics"*, Dagstuhl School, Germany, 6-11 Nov 2011
13. Multiscale Networks and the spatial spread of infectious diseases, *SIAM Conference on Application of Dynamics Systems*, Snowbird, Utah, United States, 22-26 May 2011

14. Human mobility, a key ingredient of global epidemic models: the case of the H1N1 pandemic, *Recent approaches in modelling animal infectious diseases*, Teramo, Italy, 28-30 Sep 2010

### **Invited seminars**

1. Host contact dynamics shapes richness and dominance of pathogen strains: implication for the spread of *Staphylococcus Aureus* in hospital settings, Department of Physics G. Galilei University of Padova, Padova 18 Dec 2019
2. Accounting for variable and heterogeneous human behaviour in the assessment of an epidemic, Centre for Research and Interdisciplinarity, Paris 28 Feb 2019.
3. Spatial spread of emerging diseases: epidemic assessment and risk of international spread, INSERM & Université Paris Diderot Infection Antimicrobials Modelling Evolution (IAME), Paris 17 Nov 2016.
4. Modelling disease spatial spread and real time assessment of emerging pathogen events, SaMMBA (Statistical and Mathematical Modelling in Biological Applications) Seminar series, Institut Pasteur, Paris. 8 Oct, 2014.
5. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, College of Medical, Veterinary & Life Sciences University of Glasgow. 29 May, 2014.
6. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, Department of Mathematics, University of Oxford, UK. 7 May, 2014.
7. Network-based approaches for the spatial spreading of communicable diseases Laboratoire de Biométrie et Biologie Évolutive CNRS 5558, Lyon, France, 18 Apr, 2014
8. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, London School of Hygiene and Tropical Medicine, London, UK. 3 Apr, 2014
9. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, Institute for Biocomputation and Physics of Complex Systems BIFI, University of Zaragoza, Zaragoza, Spain. 12 Sep 2013
10. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, CNRS and Centre de Physique Théorique (CPT), Marseille, France. 27 Mar, 2013
11. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, Institute for Cross-Disciplinary Physics and Complex Systems (IFISC), University of Balears. Palma de Mallorca, Spain. 2 Oct, 2012
12. Heterogeneous human mobility behaviour and the spatial spread of infectious diseases, Department of Physique, University de Padua, Padua, Italy Apr 2012
13. Impact of human behaviour and mobility on the geographical spread of infectious diseases: implication for epidemic containment, INSERM UMR-S 707, Paris, France, 21 Nov, 2011
14. Human mobility in emerging epidemics: a key aspect for response planning, Institut Rhônealpin des Systèmes Complexes (IXXI), Lyon, France, Jul 2010
15. Emergence of secondary motifs in tube-like polymers in a solvent, Max Planck Institut für Metallforschung, Stuttgart, Germany, Oct 2008
16. Emergence of secondary motifs in tube-like polymers in a solvent, International School for Advanced Studies, Trieste, Italy, Jul 2008
17. Emergence of secondary motifs in tube-like polymers in a solvent, ISI Foundation, Turin, Italy, Jul 2008

## Contributed oral presentations at international conferences

1. Host contact dynamics shapes richness and dominance of pathogen strains C. Poletto, F. Pinotti, E. Fleury, D. Guillemot, P-Y. Boëlle, *Epidemics*7, Charleston SC, USA 3-6 Dec, 2019.
2. Integrating dynamical modelling and phylogeographic inference to uncover the drivers of global influenza circulation C. Poletto, T. Bedford, M. Suchard, V. Colizza, P. Lemey, *Epidemics*6, Sitges Spain, 29 Nov - 1 Dec, 2017.
3. Emerging pathogen threats: risk assessment in the era of global awareness and response, CCS'16 Satellite *Digital Epidemiology and Surveillance*, Sep 20, 2016, Amsterdam.
4. Analytical computation of the epidemic threshold on temporal networks: impact of immunity and latency period, C. Poletto, E. Valdano, V. Colizza, *Complex Networks from theory to interdisciplinary applications 2016*, Marseille July 11-13, 2016.
5. Discrete vs. Continuous time formulation of the epidemic threshold on a temporal network, C. Poletto, E. Valdano, V. Colizza, *International School and Conference on Network Sciences 2016*, Seoul, Korea May 30-Jun 3, 2016.
6. Quantifying spatiotemporal heterogeneity of MERS-CoV transmission in the Middle East region: a combined modelling approach, C. Poletto, V. Colizza, P.Y. Boëlle, *Epidemics*5, Clearwater Beach FL, United States, 1-4 Dec 2015.
7. Competing spreading processes on temporal networks, C. Poletto, S. Andraghetti, A. Darbon, E. Valdano, M. Tizzoni, V. Colizza, *Conference on Complex Systems 2015*, Tempe AZ, United States, 28 Sep-2 Oct 2015.
8. Analytical Computation of the Epidemic Threshold on Temporal Networks, C. Poletto, E. Valdano, L. Ferrei, V. Colizza, Recognizing the Relevance of Change: Analysis and Control of Time-evolving Networks in Epidemiology and Evolutionary Medicine, Berlin, Germany 20-22 July 2015.
9. Global reaction to the 2014 West Africa Ebola epidemic: modification of the global air-travel network and its impact on the international epidemic spread, C. Poletto, M. F. C. Gomes, A. Pastore y Piontti, L. Rossi, L. Bioglio, D. L. Chao, I. M. Longini, M. E. Halloran, V. Colizza A. Vespignani, *International Conference of Computational Social Science*, Helsinki, Finland, 8-11 Jun 2015.
10. Competing spreading processes on temporal networks, C. Poletto, S. Andraghetti, A. Darbon, E. Valdano, M. Tizzoni, V. Colizza, *International School and Conference on Network Sciences 2015*, Zaragoza, Spain, 1-5 Jun 2015.
11. Monitoring influenza syndrome and influenza-related behaviour in France through a participatory system: 3 years of Grippenet.fr, C. Poletto, *5th International Conference on Digital Health*, Florence, Italy 18-20 May 2014
12. Monitoring influenza syndrome and influenza-related behaviour in France through a participatory system: 3 years of Grippenet.fr, C. Poletto, *3rd International Conference on Digital Disease Detection*, Florence, Italy 21-22 May 2014
13. Persistence of rapidly mutating pathogens on a metapopulation network, A. Aleta, A. Hisi, C. Poletto, S. Meloni, Y. Moreno, V. Colizza *European Conference of Complex Systems 2014*, Lucca, Italy, 22-26 Sep 2014
14. Une approche intégrative pour la caractérisation initiale de l'épidémie due au virus MERS-CoV, C. Poletto, C. Pelat, D. Levy-Bruhl, Y. Yazdanpanah, P-Y. Boëlle, V. Colizza, *VI<sup>e</sup> Congrès International d'Épidémiologie - ADELFI – EPITER*, 10-12 Sep 2014 Nice, France

15. Persistence of rapidly mutating pathogens on a metapopulation network, A. Aleta, A. Hisi, C. Poletto, S. Meloni, Y. Moreno, V. Colizza *International School and Conference on Network Sciences 2014*, Berkely, United States, 2-6 Jun 2014
16. Host mobility drives pathogen competition in spatially structured populations, C. Poletto, S. Meloni, V. Colizza, Y. Moreno, A. Vespignani *European Conference of Complex Systems 2013*, Barcelona, Spain, 16-20 Sep 2013
17. Host mobility drives pathogen competition in spatially structured populations, C. Poletto, S. Meloni, V. Colizza, Y. Moreno, A. Vespignani *International School and Conference on Network Sciences 2013*, Copenhagen, Denmark, 3-7 Jun 2013 selected as "ignite talk"
18. Host mobility drives pathogen competition in spatially structured populations, C. Poletto *MISMS Research Workshop on Influenza at the animal-human interface*, Padua, Italy Feb 25-Mar 1, 2013
19. Heterogeneous human mobility behaviour and the spatial spread of infectious diseases, C. Poletto, M. Tizzoni, A. Apolloni, V. Colizza *European Conference of Complex Systems 2012*, Brussels, Belgium, 3-7 Sep 2012. Selected for the plenary section
20. Human travel and time spent at destination: impact on the epidemic invasion dynamics, C. Poletto, V. Colizza *International School and Conference on Network Sciences 2011*, Budapest, Hungary, 6-10 Jun 2011
21. Human mobility in emerging epidemics: a key aspect for response planning, C. Poletto, P. Bajardi, V. Colizza, J. J. Ramasco, M. Tizzoni, A. Vespignani. *American Physical Society March meeting*, Portland, United States, 21-25 Mar 2010
22. Seasonal transmission potential of the new influenza A H1N1 : a Monte Carlo likelihood analysis based on human mobility, C. Poletto, D. Balcan, H. Hu, B. Goncalves, P. Bajardi, J.J. Ramasco, D. Paolotti, N. Perra, M. Tizzoni, W. Van den Broeck, V. Colizza, A. Vespignani. *European Conference of Complex Systems 2009*, Coventry, United Kingdom, 13-17 Sep 2009
23. Emergence of secondary motifs in tube-like polymers in a solvent, C. Poletto, *Entropy in Biomolecular Systems*, Split, Croatia, 10-16 Aug 2008

### **Oral presentations at national meetings**

1. Assessment of the MERS-CoV epidemic situation in the Middle East region, C Poletto, C. Pelat, D. Levy-Bruhl, Y. Yazdanpanah, P-Y. Boelle, V. Colizza, *Séminaire scientifique InVS & UMR S 707 – Edition 2013*. Paris, France 11 Dec 2013
2. Age-specific contacts and travel patterns in the spatial spread of 2009 H1N1 influenza pandemic, C. Poletto, A. Apolloni, V. Colizza *Séminaire scientifique InVS & UMR S 707 – Edition 2012*. Paris, France 14 Nov 2012

### **Posters Presentations**

1. *Epidemics*<sup>5</sup>, Clearwater Beach FL, United States, 1-4 Dec 2015.
2. *9<sup>th</sup> Conference Louis Pasteur in Emerging Infectious Diseases*, Paris, France 8-10 Apr, 2014
3. *Epidemics 4*, Amsterdam, Netherlands, 19-22 Nov, 2013.
4. *EE<sup>2</sup> - Epiwork/Epifor 2nd International Workshop - Facing the Challenge of Infectious Diseases*, Pré-Saint-Didier, Italy, 18-20 Jan, 2012.
5. *Epidemics 3*, Boston, US, 29 Nov- 2 Dec, 2011.
6. *II Warsaw School of Statistical Physics*, Poland, 15-22 Jun, 2007.

7. *National Workshop of Statistical Physics and Complex Systems*, Parma, Italy, 29 Jun- 1 Jul, 2005.

## Dissemination

Invited talk at *La scienza in un bicchiere*, series of dissemination lectures, Castelfranco Veneto, Italy, Feb 20, 2015.

## Media Coverage

Media coverage of the research work related to the coronavirus outbreak: 40+ media hits. Selected:

1. Il Bo Live, [Coronavirus: metodi e piani per il contenimento delle infezioni](#) 28 Feb, 2020
2. BBC, [Which African countries are most at risk from the coronavirus?](#), Feb 20, 2020
3. France 24, [Coronavirus study pinpoints African nations' vulnerabilities](#), Feb 19, 2020
4. Le monde, [Coronavirus : Egypte, Algérie et Afrique du Sud, pays africains les plus exposés](#), Feb 19, 2020
5. Repubblica, [Le rotte del contagio](#), Feb 13, 2020
6. Nature, [Scientists fear coronavirus spread in countries least able to contain it](#), Feb 13, 2020
7. Science, [Scientists are racing to model the next moves of a coronavirus that's still hard to predict](#) Feb 7 2020
8. Le monde, [Coronavirus : l'Europe doit s'attendre à de nouveaux cas importés de Chine, Jan 28, 2020](#)
9. AGI.it, [Il rischio che il virus cinese arrivi in Italia](#) jan 27, 2020

Media coverage of the activity of my research activity:

1. *La Recherche* - [Limiter les vols aériens ralentit peu la propagation d'une épidémie](#), Jul-Aug 2018

Media coverage of the paper "The impact of regular school closure on seasonal influenza epidemics: a data-driven spatial transmission model for Belgium" (2018)

1. *BMC Series blog* - [Extending Christmas to fight the flu](#). Jan 15, 2018.

Media coverage of the paper "Analytical computation of the epidemic threshold on temporal networks", Valdano et al. *Physics Review X* (2014):

1. *Pacific standard* - [Fighting epidemic with math](#). May 7, 2015
2. *Physics*, [When Does a Disease Turn Epidemic?](#) April 8, 2015

Media coverage of the paper "Assessing the impact of travel restrictions on international spread of the 2014 West African Ebola epidemic" Poletto et al. *Eurosurveillance* (2014):

1. France 2, *Télématin Sciences*, ["Prévoir une épidémie"](#), Jan 31, 2015.
2. La Stampa (italian) - ["Frontiere chiuse contro Ebola" Il Big Data svela che e' un errore](#). Nov 19, 2014.
3. Corriere Comunicazioni (italian) - [L'Ebola? Si sconfigge \(anche\) con i big data](#). Nov 14, 2014.
4. Inserm (french) - [Ebola: les restrictions de transport n'empêchent pas la diffusion du virus](#). Nov 7, 2014.

5. Bloomberg Businessweek - [Ebola travel bans buy only time, not safety](#). Nov 4, 2014.

Media coverage of the paper “Human mobility and time spent at destination: Impact on spatial epidemic spreading” Poletto et al. *Journal of Theoretical Biology* (2013):

1. Inserm. [Dissemination des maladies infectieuses, un nouvel modele predictif](#). Sept 24, 2013.
2. Allodocteurs. [Un nouveau modele pour evaluer les risques de pandemie](#). Sept 24, 2013.

Media coverage of the paper “Seasonal transmission potential and activity peaks of the new influenza A(H1N1): a Monte Carlo likelihood analysis based on human mobility” Balcan et al. *BMC medicine* (2009):

1. The Economist - [Dr. Seldon, I presume. Data from social networks are making social science more scientific](#). Feb 23, 2013.
2. The National (the UAE national newspaper) - [Battling human diseases - on a computer](#). Apr 26, 2011.
3. Vanity Fair - [Suina: due miliardi di contagi](#). July 1, 2009.
4. The Lancet - [Preparation for a pandemic: influenza A H1N1](#). May 8, 2009.
5. Yahoo! news - ‘Worst Case’ Scenario for flu Estimated. May 1, 2009.
6. Emerging Health Treats - [Swine flu: modellers look to weeks ahead](#). April 30, 2009.
7. Liberazione - [Il nostro laboratorio per studiare la messicana è il computer](#). April 30, 2009.
8. NewScientist.com - [Why travel bans won't prevent a flu pandemic](#). April 29, 2009.
9. La Stampa - [I numeri per prevedere la pandemia](#). April 29, 2009.
10. Radio3Scienza. April 27, 2009.

### **Conferences, Schools, Tutorials attended**

1. Workshop of Scientific and Evolutionary Writing (SEW), Institut des Systèmes Complexes Paris Île-de-France, Jan 30-31 2019.
2. SSM (*State Spaces Models*) Tutorial, Joseph Dureau, Institute Pasteur, Paris, Mar 6-7, 2014.
3. *Merging the Genetic and the Epidemiology of Infectious Diseases*, London School of Hygiene & Tropical Medicine, London, Apr 10, 2013.
4. *Course Spatial Analysis in Epidemiology*, Torino University, Turin, Italy, Jun 20-22, 2011.
5. *Summer Institute in Statistics and Modelling in Infectious Diseases*, School of Public Health University of Washington, Seattle, USA, Jun 13-Jul 1, 2010.
6. Intensive Course *Epidemiology in Action: Intermediate Analytic Methods*, Rollins School of Public Health of Emory University, Atlanta, USA, Jan 11-14, 2010.
7. Thematic Institute, *Lyapunov analysis, from theory to geophysical applications*, Institute of Complex Systems, Paris, France, Oct 26–28, 2009.
8. *International Workshop on Network Science*, Venice, Italy, Jun 23-Jul 3, 2009.
9. *Facing the Challenge of Infectious Diseases*, ISI Foundation, Torino, Italy, Oct 13-17, 2008
10. *19th Chris Engelbrecht Summer School in Theoretical Physics*, Cape Town, South Africa, Jan 23-Feb 1, 2008.

11. *National Workshop of Statistical Physics and Complex Systems*, Parma, Italy, Jun 21-23, 2006.