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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*.

Current position

Jan 2014 – present: 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 LIVEpi funded by ANR under the program ANIHOWA, principal investigator Dr. Vittoria Colizza

Professional Experience

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 University of Padua

Awards and Fellowships

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 to be held in Riga in Sept 14-17. Travel grant to participate to the conference.

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: Scholarship for attending the *Summer Institute in Statistics and Modelling of Infectious Diseases* 2010, funded by the School of Public Health, University of Washington.

Sep 2009: Bursary for attending *European Conference of Complex Systems 2009*, funded by ASSYST project.

Jan 2006- Mar 2009: Doctoral Fellowship, Physics Department G. Galilei, University of Padua.

May 2005-Oct 2005: Fellowship associated to the project *Protein Physics*, for carrying out a 6-months research project at the Physics Department G. Galilei, University of Padua

Publications

1. **C. Poletto***, C. Pelat*, D. Levy-Bruhl, Y. Yazdanpanah, P-Y. Boelle, V. Colizza, Assessment of the MERS-CoV epidemic situation in the Middle East region, accepted for publication in *Eurosurveillance*, arxiv:1311.1481 (2014)
2. 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)

3. 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)
4. **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)
5. **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)
6. 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)
7. 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)
8. **C. Poletto**, M. Tizzoni, V. Colizza, Heterogeneous length of stay of hosts' movements and spatial epidemic spread, *Scientific Reports* **2**:476 (2012)
9. 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)
10. 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.
11. 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.
12. 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)
13. 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)
14. **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)
15. 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

Participation to Scientific/Program Committees

1. Scientific Committee of Complex Networks Thematic School, Les Houches, Apr 7-18, 2014
2. Program Committee of the Satellite Meeting *Temporal and Dynamic Networks: From Data to Models*, at the *International School and Conference on Network Sciences 2013*, Copenhagen Jun 3-4, 2013
3. Program Committee of the *European Conference of Complex Systems 2011*. Vienna, Sep 12-16, 2011

Participation to Organizing Committees

1. Organizing Committee of Satellite Meeting *Modelling of Disease Contagious processes 3rd edition*, of the *European Conference of Complex Systems 2014*, Lucca, Sep 22-26, 2014
2. Organizing Committee of Satellite Meeting *Modelling of Disease Contagious processes 2nd edition*, of the *European Conference of Complex Systems 2013*, Barcelona, Sep 18, 2013
3. Organizing Committee of the Satellite Meeting *Temporal and Dynamic Networks: From Data to Models*, at the *International School and Conference on Network Sciences 2013*, Copenhagen Jun 3-4, 2013
4. Organizing Committee of the Satellite Meeting *Data Driven Modelling of Contagious Processes*, of the *European Conference of Complex Systems 2012*, Brussels, Sep 5, 2012

Referee activity

Nature Communications, Journal of Theoretical Biology, Mathematical Biosciences, Proceedings of the Royal Society B, Proceedings of the Royal Society Interface, PLoS ONE, Physical Review E, Journal of Computational Science, European Journal of Physics B, Europhysics Letters, Scientific Reports, Enterprise Information Systems, Journal of Statistical Mechanics: Theory and Experiment, New Journal of Physics

Invited Talks

1. Host mobility drives pathogen competition in spatially structured populations, C. Poletto, *Simulation Models of Infectious Diseases*, Antwerp, Belgium 17-18 Apr 2013
2. Epidemic spreading on time-varying networks of human contacts, C. Poletto, *Statistical Network Science*, Leiden, Netherlands, 2-5 Apr 2013
3. Multiscale Networks and the spatial spread of infectious diseases, C. Poletto, *Dagstuhl Seminar "Data Mining, Networks and Dynamics"*, Dagstuhl School, Germany, 6-11 Nov 2011
4. Multiscale Networks and the spatial spread of infectious diseases, C. Poletto, *SIAM Conference on Application of Dynamics Systems*, Snowbird, Utah, United States, 22-26 May 2011
5. Human mobility, a key ingredient of global epidemic models : the case of the H1N1 pandemic, C. Poletto, *Recent approaches in modelling animal infectious diseases*, Teramo, Italy, 28-30 Sep 2010

Contributed oral presentations at international conferences

1. 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
2. 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"
3. 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
4. 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
5. 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
6. 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
7. 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
8. 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

Invited Seminars

1. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, London School of Hygiene and Tropical Medicine, London, UK. Apr 3, 2014
2. 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. Sep 12 2013

3. Impact of heterogeneous features of hosts and pathogens on the spatial spread of epidemics, CNRS and Centre de Physique Théorique (CPT), Marseille, France. Mar 27, 2013
4. 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. Oct 2, 2012
5. Heterogeneous human mobility behaviour and the spatial spread of infectious diseases, Department of Physique, University de Padua, Padua, Italy Apr 2012
6. Impact of human behaviour and mobility on the geographical spread of infectious diseases: implication for epidemic containment, INSERM UMR-S 707, Paris, France, Nov 21, 2011
7. Human mobility in emerging epidemics: a key aspect for response planning, Institut Rhônealpin des Systèmes Complexes (IXXI), Lyon, France, Jul 2010
8. Emergence of secondary motifs in tube-like polymers in a solvent, Max Planck Institut für Metallforschung, Stuttgart, Germany, Oct 2008
9. Emergence of secondary motifs in tube-like polymers in a solvent, International School for Advanced Studies, Trieste, Italy, Jul 2008
10. Emergence of secondary motifs in tube-like polymers in a solvent, ISI Foundation, Turin, Italy, Jul 2008

Posters Presentations

1. *9th Conference Louis Pasteur in Emerging Infectious Diseases*, Paris, France Apr 8-10, 2014
2. *Epidemics 4*, Amsterdam, Netherlands, Nov 19-22, 2013.
3. *EE² - Epiwork/Epifor 2nd International Workshop - Facing the Challenge of Infectious Diseases*, Pré-Saint-Didier, Italy, Jan 18-20, 2012.
4. *Epidemics 3*, Boston, US, Nov 29-Dec 2, 2011.
5. *II Warsaw School of Statistical Physics*, Poland, Jun 15-22, 2007.
6. *National Workshop of Statistical Physics and Complex Systems*, Parma, Italy, Jun 29-Jul 1, 2005.

Conferences and Schools attended

1. *Merging the Genetic and the Epidemiology of Infectious Diseases*, London School of Hygiene & Tropical Medicine, London, Apr 10, 2013.
2. *Course Spatial Analysis in Epidemiology*, Torino University, Turin, Italy, Jun 20-22, 2011.
3. *Summer Institute in Statistics and Modelling in Infectious Diseases*, School of Public Health University of Washington, Seattle, USA, Jun 13-Jul 1, 2010.
4. Intensive Course *Epidemiology in Action: Intermediate Analytic Methods*, Rollins School of Public Health of Emory University, Atlanta, USA, Jan 11-14, 2010.
5. Thematic Institute, *Lyapunov analysis, from theory to geophysical applications*, Institute of Complex Systems, Paris, France, Oct 26-28, 2009.
6. *International Workshop on Network Science*, Venice, Italy, Jun 23-Jul 3, 2009.
7. *Facing the Challenge of Infectious Diseases*, ISI Foundation, Torino, Italy, Oct 13-17, 2008
8. *19th Chris Engelbrecht Summer School in Theoretical Physics*, Cape Town, South Africa, Jan 23-Feb 1, 2008.
9. *National Workshop of Statistical Physics and Complex Systems*, Parma, Italy, Jun 21-23, 2006.

Involvement in funded projects

EpiFor: project funded by ERC (European Research Council) through the program starting grant, with principal investigator Dr. Vittoria Colizza, running in the period Jul 2008 – Dec 2013 (website www.epifor.eu). My contribution into the project consisted in carrying out research work (scientific output includes 12 publications, among which 5 are co-funded by other projects listed here), drafting reports and managing the website. I was involved full time in the period Jan 2009 – Dec 2011, and part-time in the period Jan 2011 – Dec 2013.

Predemics: European collaborative project funded by European Union FT7, running for the period Nov 2011 – Oct 2016 (website predemics.biomedtrain.eu/cms/default.aspx). My contribution into the project consisted in carrying out research work in collaboration with other project partners (scientific output includes 5 publications co-funded by other projects listed here), participating to project meetings, drafting reports. I participated into the project for the ISI Foundation project partner. I was involved part time in the period Jan 2011 – Dec 2013.

HARMS-flu: national collaborative project funded by ANR, with principal investigator Dr. Vittoria Colizza, running in the period Dec 2012 – Dec 2015 (website www.harmsflu.org). I am currently involved in the project as external collaborator. I carry out research activity in the context of the project (scientific output until now includes 5 publications co-funded by other projects listed here), I

participate to meeting organisation and to the management of the website.

LIVEEpi: European collaborative project funded by ANR through the program ANIHWA, running in the period Jan 2014 – Dec 2016. I carry out research activity for the project and I participate to meeting organisation. I am involved full time since Jan 2014.

Current and past collaborations

National

1. Institut de Veille Sanitaire (French Institute for Public Health Surveillance), Paris. Continuous collaboration
2. Institut Pasteur, Paris. Collaboration in the context of the project Predemics
3. CNRS UMR-7332 and Centre de Physique Théorique (CPT), Marseille. Collaboration in the context of the project HARMS-flu
4. Laboratoire de Physique ENS de Lyon (UMR 5672) and Institut Rhônealpin des Systèmes Complexes (IXXI), Lyon. In the context of the development of multi-host spatial model for addressing human heterogeneities and spatial spread of diseases

European

1. Evolutionary and Computational Virology Lab, University of Leuven, Leuven, Belgium. Collaboration within the project Predemics
2. Institute of Evolutionary Biology, University of Edinburgh, Edinburgh, UK. Collaboration within the project Predemics
3. London School of Hygiene & Tropical Medicine (LSHTM) London, UK. In the context of the development of multi-host spatial model for addressing human heterogeneities and spatial spread of diseases
4. Centre for Health Economics Research and Modelling Infectious Diseases and Centre for Evaluation of Vaccinations, University of Antwerp, Belgium. In the context of the analysis of human contact patterns and mobility, and their variation during school-term/school-holiday period
5. Department of Animal Biology, Universitat de Barcelona and the Biodiversity Research Institute (IRBio), Barcelona, Spain. In the context of modelling the spread of rabies among bats. Collaboration within the project Predemics
6. Institute for Biocomputation and Physics of Complex Systems (BIFI), University of Zaragoza, Zaragoza, Spain. In the context of the modelling of multi-pathogen interaction
7. Institute for Cross-Disciplinary Physics and Complex Systems (IFISC), Palma de Mallorca, Spain. In the context of the development of multi-host spatial model for addressing human heterogeneities and spatial spread of diseases
8. ISI Foundation, Turin, Italy. Continuous collaboration

International

1. Fred Hutchinson Cancer Research Centre, Seattle, USA. In the context of modelling multi-pathogen dynamics
2. Northeastern University, Boston, USA. In the development of a multi-scale computational model for epidemic spreading
3. Indiana University, Bloomington, USA. In the context of the study of the 2009 H1N1 influenza pandemic

Teaching

1. Supervision of the thesis of Sara Andraghetti on the multi-pathogen competition on a dynamical network of contacts. Master degree in Mathematics, University of Turin. Start in academic year 2013-2014, foreseen end by Oct 2014.
2. Supervision of the thesis "Modelling the interplay between social and epidemic dynamics" of Gino Almondo. Bachelor degree in Physics, University of Turin. 2011-2012 academic year.
3. Teaching Assistant of the course *Complexity in Social Systems*. Graduation Degree in Physics, University of Turin. 2010-2011 academic year.
4. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Material Science, University of Padua. Italy. 2006-2007 academic year, 25 hours.
5. Tutor of the course *Mathematical Analysis I*. Bachelor Degree in Material Science, University of Padua. Italy. 2006-2007 academic year, 25 hours.
6. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Optics and Optometry, University of Padua. Italy. 2006-2007 academic year, 25 hours.
7. Tutor of the course *Mathematical Analysis I*. Bachelor Degree in Optics and Optometry, University of Padua. Italy. 2006-2007 academic year, 25 hours.
8. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Material Science, University of Padua. Italy. 2007-2008 academic year, 25 hours.

9. Tutor of the course *Mathematical Analysis I*. Bachelor Degree in Material Science, University of Padua. Italy. 2007-2008 academic year, 25 hours.
10. Tutor of the course *Foundations of Physics I*. Bachelor Degree in Optics and Optometry, University of Padua. Italy. 2007-2008 academic year, 25 hours.

Language skills

1. Italian, native speaker
2. English, fluent
3. French, conversant

Computer skills:

1. Linux/Unix, Mac OS X and Windows: all common applications (office package, browsers, ...).
2. Familiar with C and C++ programming languages.
3. Good knowledge of Python
4. Good knowledge of Mathematica.
5. Basic knowledge of Esri's ArcGIS.

Area of Research

My scientific background is in physics of complex systems. My research activity focuses on the application of tools of statistical physics to biological problems. Currently my research interest is on the characterization and modeling of the spatiotemporal spread of infectious diseases. Through a theoretical and computational approach, I aim at characterizing the complex interplay between demography, individual mobility network and epidemic spreading.