Antoine Allard
Curriculum Vitæ

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Education

Ph.D. in Physics, *Université Laval*, 2009–2014
- Thesis Title: *Percolation sur graphes aléatoires: Modélisation et description analytique*[1]
- Thesis added to the Board of Honour for receiving the highest overall mark

M.Sc. in Physics, *Université Laval*, 2006–2008
- Thesis Title: *Modélisation Mathématique en Epidémiologie par Réseaux de Contacts: Introduction de l'Hétérogénéité dans la Transmissibilité*[2]
- Thesis added to the Board of Honour for receiving the highest overall mark

B.Sc. in Physics (Theoretical Physics option), *Université Laval*, 2003–2006
- Rouge et Or Distinction for excellence in academic undergraduate results
- Nominated 2003 AESGUL Prize for "Student of the year" (chosen by the peers)

Complex Systems Summer School, *Santa Fe Institute*, 2011

Research and Teaching Experience

Research

Post-doctoral Research Associate, *Universitat de Barcelona*, 2014–present

Ph.D. Candidate, *Université Laval*, 2009–2014

Master Student, *Université Laval*, 2006–2008

Research Assistant, Division of Mathematical Modeling, *University of British Columbia Centre for Disease Control*, Vancouver, Canada, 2006–2007

Undergraduate Research Assistant, Nonlinear Dynamics Group, *Université Laval*, 2006

Undergraduate Research Assistant, Radio Oncology Department, *Centre de Recherche de l'Hôtel-Dieu de Québec*, 2005

Undergraduate Research Assistant, Astrophysics Group, *Université Laval*, 2004

Teaching

Teaching Assistant, PHY-3000 Statistical Physics, *Université Laval*, 2009, 2010 and 2013
- Nominated 2013 AESGUL Prize for "Staff member of the year" (elected by the undergraduate students)

Teaching Assistant, PHY-2502 Nonlinear Dynamics, Chaos and Complexity, *Université Laval*, 2007 and 2012

Foreign Language Assistant, *St. Anthony's RC Girls School/Hetton School*, Sunderland, United Kingdom, 2008–2009

Teaching Assistant, PHY-1002 Mathematical Physics II, *Université Laval*, 2006 and 2007
- Awarded 2006 AESGUL Prize for "Staff member of the year" (elected by the undergraduate students)

[1] Percolation on random graphs: Modelling and analytical description
[2] Mathematical modelling in contact networks for epidemiology: Introduction of heterogenity in transmissibility.

Awards

Fellowships

Postdoctoral Fellowship, *Fonds de recherche du Québec – Nature et Technologies* (FRQ-NT), 2014

Frederick Banting and Charles Best Canada Graduate Scholarships - Doctoral Awards, *Canadian Institutes of Health Research* (CIHR), 2008

Doctoral Research Scholarship, *Fonds de recherche du Québec – Nature et Technologies* (FRQ-NT), 2008 (declined)

Doctoral Research Scholarship, *Fondation de l'Université Laval*, 2008 (declined)

Undergraduate Student Research Award, *Natural Sciences and Engineering Research Council of Canada* (NSERC), 2006

Undergraduate Student Research Award, *Natural Sciences and Engineering Research Council of Canada* (NSERC), 2005

Other Recognitions

Board of Honour for a Ph.D.'s Thesis, Faculty of Graduate Studies, Université Laval, 2014

Nominated 2013 AESGUL Prize for "Staff member of the year" as the Teaching Assistant of PHY-3000 Statistical Physics (elected by the undergraduate students), 2014

Board of Honour for a Master's Thesis, Faculty of Graduate Studies, Université Laval, 2009

Third Place at the Student Competition (Poster Presentation), Congress of the Canadian Association of Physicists, Quebec City, 2008

2006 AESGUL Prize for "Staff member of the year" as the Teaching Assistant of PHY-1002 Mathematical Physics II (elected by the undergraduate students), 2007

Rouge et Or Distinction for excellence in academic undergraduate results, 2006

Nominated 2003 AESGUL Prize for "Student of the year" (chosen by the peers), 2004

Other Activities, Skills and Interests

Involvement and Volunteerism

Board member of the Student Investment Fund, 2012–2013

Treasurer, Graduate Physics Student Union, 2011–2012

Student representative at the Physics Professoral Assembly, 2010–2012

Member of the Physics Graduate Program Committee, 2009–2011

Treasurer, Undergraduate Physics Student Union, 2004–2006

Skills

Languages : French, English and minimal Spanish

Computers : C++, Matlab/GNU Octave, Maple, LaTeX, GNU/Linux, Python, R

Interests

Sports and Outdoors: running, rock climbing, cycling, camping, hiking, skiing

Music: upright bass and acoustic guitar

Travel: East Africa (2007), Europe (2005, 2008–2010, 2013), Western Canada (2000, 2006–2007), USA (2011–2014)

Publications

Research publications[3] (refereed)

- *A general and exact approach to percolation on random graphs*, **A. Allard**, L. Hébert-Dufresne, J.-G. Young, and L. J. Dubé, *in preparation*
- *Complex networks are an emerging property of hierarchical preferential attachment*, L. Hébert-Dufresne, E. Laurence, **A. Allard**, J.-G. Young, and L. J. Dubé, *in preparation*
- *Universal growth constraints of human systems*, L. Hébert-Dufresne, **A. Allard**, J.-G. Young, and L. J. Dubé, *submitted for publication*
- *A system-level model for the microbial regulatory genome*, A. N. Brooks, D. J. Reiss, **A. Allard**, W.-J. Wu, D. M. Salvanha, C. L. Plaisier, S. Chandrasekaran, M. Pan, A. Kaur, and N. S. Baliga, Mol. Syst. Biol. 10, 740 (2014)[4] [0]
- *Coexistence of phases and the observability of random graphs*, **A. Allard**, L. Hébert-Dufresne, J.-G. Young, and L. J. Dubé, Phys. Rev. E 89, 022801 (2014)[5] [1]
- *Epidemics on contact networks: a general stochastic approach*, P.-A. Noël, **A. Allard**, L. Hébert-Dufresne, V. Marceau, and L. J. Dubé, J. Math. Biol. (2014) [2]
- *Percolation on random networks with arbitrary k-core structure*, L. Hébert-Dufresne[6], **A. Allard**[6], J.-G. Young, and L. J. Dubé, Phys. Rev. E 88, 062820 (2013) [2]
- *Global efficiency of local immunization of complex networks*, L. Hébert-Dufresne[6], **A. Allard**[6], J.-G. Young[6], and L. J. Dubé, Sci. Rep. 3, 2171 (2013) [8]
- *Bond percolation on a class of correlated and clustered random graphs*, **A. Allard**, L. Hébert-Dufresne, P.-A. Noël, V. Marceau, and L. J. Dubé, J. Phys. A 45, 405005 (2012) [9]
- *Exact solution of bond percolation on small arbitrary graphs*, **A. Allard**, L. Hébert-Dufresne, P.-A. Noël, V. Marceau, and L. J. Dubé, EPL 98, 16001 (2012) [3]
- *Propagation on networks: an exact alternative perspective*, P.-A. Noël, **A. Allard**, L. Hébert-Dufresne, V. Marceau, and L. J. Dubé, Phys. Rev. E 85, 031118 (2012) [12]
- *Structural preferential attachment: Stochastic process for the growth of scale-free, modular and self-similar systems*, L. Hébert-Dufresne, **A. Allard**, V. Marceau, P.-A. Noël, and L. J. Dubé, Phys. Rev. E 85, 026108 (2012) [3]
- *Structural preferential attachment: Network organization beyond the link*, L. Hébert-Dufresne, **A. Allard**, V. Marceau, P.-A. Noël, and L. J. Dubé, Phys. Rev. Lett. 107, 158702 (2011) [11]
- *Modeling the dynamical interaction between epidemics on overlay networks*, V. Marceau, P.-A. Noël, L. Hébert-Dufresne, **A. Allard**, and L. J. Dubé, Phys. Rev. E 84, 026105 (2011) [33]
- *Adaptive networks: Coevolution of disease and topology*, V. Marceau, P.-A. Noël, L. Hébert-Dufresne, **A. Allard**, and L. J. Dubé, Phys. Rev. E 82, 036116 (2010)[7] [71]
- *Propagation dynamics on networks featuring complex topologies*, L. Hébert-Dufresne, P.-A. Noël, V. Marceau, **A. Allard**, and L. J. Dubé, Phys. Rev. E 82, 036115 (2010)[7] [22]
- *Heterogeneous bond percolation on multitype networks with an application to epidemic dynamics*, **A. Allard**, P.-A. Noël, L. J. Dubé, and B. Pourbohloul, Phys. Rev. E 79, 036113 (2009)[8] [53]

[3] Known number of citations in brackets (obtained with `Google Scholar`).
[5] Selected by the editors and referees to appear in the *Editors' Suggestions* section of Phys. Rev. E.
[6] Equal contribution.
[7] Also in the *Virtual Journal of Biological Physics Research*, issue 7, vol. 20 (2010).
[8] Also in the *Virtual Journal of Biological Physics Research*, issue 7, vol. 17 (2009).

Other publications (refereed)

- *The Social Zombie: Modelling undead outbreaks on social networks*, L. Hébert-Dufresne, P.-A. Noël, V. Marceau, **A. Allard**, and L. J. Dubé, R. Smith? (Ed.), University of Ottawa Press, *Forthcoming (September 2014)*
- *Des ponts d'Euler à la grippe aviaire: De l'abstraction mathématique à la réalité sociale des épidémies*[9], **A. Allard**, P.-A. Noël, and L. J. Dubé, Accromath 4 (winter-spring 2009)

Selected presentations (presenter underlined)

- *Percolation on clustered and correlated random graphs: General formalism and applications* (poster), **A. Allard**, L. Hébert-Dufresne, J.-G. Young, and L. J. Dubé, International School and Conference on Network Science, Copenhagen, Denmark, 2013
- *Hard-core random networks as an effective model of bond percolation on real networks* (oral), L. Hébert-Dufresne, **A. Allard**, J.-G. Young, and L. J. Dubé, International School and Conference on Network Science, Copenhagen, Denmark, 2013
- *Bond and site percolation on clustered and correlated random graphs* (oral), **A. Allard**, L. Hébert-Dufresne, J.-G. Young, and L. J. Dubé, Joint CRM-Imperial College School and Workshop in Complex Systems, Barcelona, Spain, 2013
- *Unveiling hidden communities through cascading detection on network structures* (oral), J.-G. Young, **A. Allard**, L. Hébert-Dufresne, and L. J. Dubé, 2nd International Conference on Complex Sciences, Santa Fe, New Mexico, 2012
- *Exact solution of bond percolation on small arbitrary graphs* (oral), **A. Allard**, L. Hébert-Dufresne, P.-A. Noël, V. Marceau, and L. J. Dubé, International School and Conference on Network Science, Evanston, Illinois, 2012
- *Using network organization to hinder propagation in structured populations* (poster), L. Hébert-Dufresne, **A. Allard**, J.-G. Young, and L. J. Dubé, International School and Conference on Network Science, Evanston, Illinois, 2012
- *Multitype modular networks as a model of clustered social networks* (poster), **A. Allard**, P.-A. Noël, L. Hébert-Dufresne, V. Marceau, and L. J. Dubé, International School and Conference on Network Science, Boston & Cambridge, Massachusetts, 2010
- *Time evolution of epidemics on complex networks* (poster), P.-A. Noël, **A. Allard** & L. J. Dubé, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2009
- *Heterogeneous Bond Percolation on Complex Networks: Application to Epidemiology* (poster), **A. Allard**, P.-A. Noël, L. J. Dubé & B. Pourbohloul, Canadian Association of Physicists Congress, Québec City, 2008 (**Third place at the student competition**)

Last modified
August 5, 2014

[9] From Euler bridges to avian flu: From mathematical abstraction to the social reality of epidemics.