GUILLAUME ST-ONGE

Ph.D. candidate in Physics studying Complex Networks

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RESEARCH INTERESTS: Complex networks, Spreading Processes, Criticality, Statistical Inference

EDUCATION

Ph.D. in Physics 2018–Present

- Université Laval
- Advisors: Louis J. Dubé and Laurent Hébert-Dufresne

M.Sc. in Physics 2015–2017

- Université Laval
- Advisor: Louis J. Dubé
- Thesis title: *Propagation dynamics on random networks: characterization of the phase transition*
- Honor board (highest grade attributed unanimously by the jury)

B.Sc. in Physics 2012–2015

- Université Laval
- Theoretical physics concentration

SCHOLARSHIPS AND HONORS

Doctoral Research Scholarships

- Natural Sciences and Engineering Research Council of Canada ($35 000/yr.) Jan. 2018–Dec. 2020
- Fonds de recherche du Québec – Nature et Technologies* ($20 000/yr.) Jan. 2018–Dec. 2020

Master's Research Scholarships

- Natural Sciences and Engineering Research Council of Canada ($17 500/yr.) Sept. 2015–Aug. 2016
- Fonds de recherche du Québec – Nature et Technologies ($15 000/yr.) Sept. 2015–Aug. 2017
- Desjardins Foundation* ($3 000/yr.) Oct. 2015

Academic Medal 2016

- Governor General's Academic Medal (Silver) : Highest academic standing, B.Sc. degree

Undergraduate Research Awards

- Natural Sciences and Engineering Research Council of Canada ($4 500) 2015
- Natural Sciences and Engineering Research Council of Canada ($4 500) 2014
- Natural Sciences and Engineering Research Council of Canada ($4 500) 2013

Other Awards

- *Concours d'expression scientifique Pierre Amiot*† (3rd place), Université Laval 2017
- Student merit award–Direction mention, Université Laval 2015
- Pedagogue of the year, Physics Students Association, Université Laval 2014

*Awarded but declined
†Scientific communication prize

PUBLICATIONS

Published or accepted in peer-reviewed journals

7. *Phase transition in the recoverability of network history* 2019
   J.-G. Young, **G. St-Onge**, E. Laurence, C. Murphy, L. Hébert-Dufresne, P. Desrosiers
   Accepted at Phys. Rev. X
6. *Efficient sampling of spreading processes on complex networks using a composition and rejection algorithm* 2019
   G. St-Onge, J.-G. Young, L. Hébert-Dufresne, L. J. Dubé
   Comput. Phys. Commun. **240**, 30-37
5. *Universality of the stochastic block model* 2018
   J.-G. Young, **G. St-Onge**, P. Desrosiers, L. J. Dubé
   Phys. Rev. E **98**, 032309
4. *Phase transition of the susceptible-infected-susceptible dynamics on time-varying configuration model networks* 2018
   G. St-Onge, J.-G. Young, E. Laurence, C. Murphy, L. J. Dubé
   Phys. Rev. E **97**, 022305
3. *Geometric evolution of complex networks with degree correlations* 2018
   C. Murphy, A. Allard, E. Laurence, **G. St-Onge**, L. J. Dubé
   Phys. Rev. E **97**, 032309
2. *Exact vectorial model for nonparaxial focusing by arbitrary axisymmetric surfaces* 2016
   D. Panneton, **G. St-Onge**, M. Piché, S. Thibault
   J. Opt. Soc. Am. **33**, 801–810
1. *Needles of light produced with a spherical mirror* 2015
   D. Panneton, **G. St-Onge**, M. Piché, S. Thibault
   Opt. Lett. **4**, 419–422

In submission

- *Recovering the past states of growing trees*
  G. T. Cantwell, **G. St-Onge**, J.-G. Young
  Preprint: arXiv:1910.04788
- *Thresholding normally distributed data creates complex networks*
  G. T. Cantwell, Y. Liu, B. F. Maier, A. C. Schwarze, C. A. Serván, J. Snyder, **G. St-Onge**
  Preprint: arXiv:1902.08278

PATENTS

- *Hybrid nanocomposite materials, laser scanning system and use thereof in volumetric image projection* 2017
  C. Allen, S. Thibault, A. Talbot-Lanciault, P. Blais, **G. St-Onge**, P. Desaulniers
  CA Patent No. 2983656

RESEARCH EXPERIENCE

Research group of Pr. Louis J. Dubé (Université Laval, Québec, Canada)

- *Computational and theoretical analysis of spreading processes in complex networks* 2018–Present
  Ph.D. student
- *Propagation dynamics on complex networks* 2015–2017
  M.Sc. student
- *Statistical physics of complex networks* 2015
  Undergraduate research assistant

Research group of Pr. Michel Piché (Université Laval, Québec, Canada)

- *Highly focused laser beam modeling* 2014
  Undergraduate research assistant

Research group of Pr. Claudine Allen (Université Laval, Québec, Canada)

- *Development of an optical system for biodetection* 2013
  Undergraduate research assistant

Workshops and schools

- *Complex Systems Summer School* 2018
  Santa Fe (New Mexico), USA
- *Complex Networks Winter Workshop* 2018
  Québec (Québec), Canada

TEACHING EXPERIENCE

- PHY-3500: *Computational Physics* 2016, 2018
  Teaching assistant : guidance for students projects, marking
- PHY-3000: *Statistical Physics* 2016–2018
  Teaching assistant : lectures, marking

SELECTED CONFERENCE CONTRIBUTIONS AND INVITED LECTURES

Oral presentations

- *Mesoscopic localization of spreading processes on networks* 2019
  G. St-Onge, V. Thibeault, L. Hébert-Dufresne, L. J. Dubé
  14th International School and Conference on Network Science, Burlington, VT, USA
- *SIS dynamics on time-varying random networks* 2017
  G. St-Onge, J.-G. Young, E. Laurence, C. Murphy, L. J. Dubé
  Institute for Disease Modeling, Seattle, WA, USA
- *Susceptible-infected-susceptible dynamics on the rewired configuration model* 2017
  G. St-Onge, J.-G. Young, E. Laurence, C. Murphy, L. J. Dubé
  12th International School and Conference on Network Science, Indianapolis, IN, USA
- *Modeling ultra-sharp needles of light using vector diffraction theory* 2014
  G. St-Onge, D. Panneton, M. Piché, S. Thibault
  50th Canadian Undergraduate Physics Conference, Kingston, ON, Canada

Poster presentation

- *Co-evolution of Growth and Dynamics on Network* 2016
  G. St-Onge, E. Laurence, C. Murphy, J.-G. Young and L. J. Dubé
  11th International School and Conference on Network Science, Seoul, Republic of Korea

SERVICES

- *Volunteer*, Coupe de Science (youth science contest) 2016
- *Volunteer*, Festival de Sciences et Génies (science festival) 2015
- *Volunteer*, Jeux photoniques (youth science contest) 2012–2014
- *Mentoring*, Physique mathématique III (undergraduate course) 2014
- *Mentoring*, Physique mathématique I et II (undergraduate courses) 2013

SKILLS AND LANGUAGES

Computer

- *Programming Languages*: C++, Python, MATLAB/GNU Octave, Bash, HTML
- *Tools*: GNU/Linux, Git, LaTeX, Jupyter Notebook

Languages

- French–native speaker
- English–fluent (spoken and written)