Laurent Hébert-Dufresne

PERSONAL
DETAILS

Associate Professor
Vermont Complex Systems Center & Department of Computer Science
University of Vermont
Burlington, VT, USA

Professeur Associé
Département de Physique, de Génie Physique, et d'Optique
Université Laval
Québec, QC, Canada

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Twitter: @LHDnets
Websites: http://laurenthebertdufresne.github.io/, https://joint-lab.github.io/ (and Google Scholar profile)

RESEARCH
INTERESTS

Networks, Models and Data Science of Complex Systems in Biology, Epidemiology, Ecology & Sociology

PROFESSIONAL
EXPERIENCE

The University of Vermont, Burlington, Vermont
Associate Professor, Department of Computer Science, 2021–present
Assistant Professor, Department of Computer Science, 2018–2021
Group leader, Laboratory for Structure & Dynamics, 2018–present
Co-Director, The Translational Global Infectious Diseases Research Center, 2021–present
Core Team, Vermont Complex Systems Center, 2017–present

Université Laval, Québec, QC, Canada
Professeur Associé, Département de Physique, de Génie Physique, et d'Optique, 2017–present
Ph.D. in physics, 2011–2014, Advisor: Professor Louis J. Dubé
M.Sc. in physics, 2009–2011, Advisor: Professor Louis J. Dubé
B.Sc. in physics, 2006–2009, concentration in theoretical physics

Network Science Society
Board Member & Conference Oversight Committee, 2018–present

Institute for Disease Modeling, Bellevue, Washington
Postdoctoral Researcher, 2016–2018

Santa Fe Institute (SFI), Santa Fe, New Mexico
James S. McDonnell Foundation Postdoctoral Fellow, 2014–2016
Research Fellow, 2016–2018

AWARDS

Funding
- National Institutes of Health — National Institute of General Medical Sciences: "*Translational Global Infectious Diseases Research Center Phase II*" (Core Director, **$11.7M**, 2023)
- National Science Foundation — Behavioral and Cognitive Science :
"Conference: Interdisciplinary Open Practices Workshop: Understanding & Designing Organizing Practices for Open Ecosystems" (Senior Personnel, **$50k**, 2023)
- Alfred P. Sloan Foundation — "*VErmont ReSearch OSPO (VERSO)*" (co-PI, **$566k**, 2021)
- National Institutes of Health — National Institute of General Medical Sciences: "*Multi-Scale Modeling of SARS-CoV-2 Dissemination Dynamics*" (Contributor, **$322k**, 2021)
- DARPA — '*Leveraging AI to Guard Online Open Source Networks (LAGOON)*" (co-PI, **$500k**, 2021)
- National Institute of Food and Agriculture / NSF's Ecology and Evolution of Infectious Diseases — "*Predicting Livestock Disease Transmission Dynamics under Alternate Biosecurity Risk Management Interventions and Behavioral Responses of Livestock Producers*" (co-PI, **$2.47M**, 2021)
- National Science Foundation — Office of Integrative Activities:

"Harnessing Spatiotemporal Data Science to Predict Responses of Biodiversity and Rural Communities under Climate Change" (Investigator, **$4M**, 2020)

- Google Open Source — Open-source Complex Ecosystems And Networks (OCEAN) (PI, **$1.0M**, 2019)
- National Institutes of Health — National Institute of Allergy and Infectious Diseases: "*A Phase II Evaluation of the Safety and Protective Efficacy of the Live Attenuated Tetravalent Dengue Vaccine TetraVax-DV...*" (Key Personnel, **$1.3M**, 2019)
- National Institutes of Health — National Institute of General Medical Sciences: "*Translational research to prevent and control global infectious diseases*" (Project Leader, **$12.3M**, 2018)
- Army Research Office — Network Sciences Division: "*Increasing Student Participation at the NetSci Conference*" (PI, **$10K**, 2018)
- National Science Foundation — Division of Graduate Education: "*NRT: Quantitative & Evolutionary STEM Training (QuEST)*" (co-PI, **$3M**, 2018)
- National Science Foundation — Division of Mathematical Sciences: "*Network comparison, a cornerstone of the foundations of network science*" (PI, **$125K**, 2016)

Recent prizes

- American Physical Society — Outstanding Referee (2021)
- International Society for Artificial Life — Award for Exceptional Service (2021)
- Free Open Source Software (FOSS) — FOSS Impact Paper Award (2021)
- James S. McDonnell Foundation — Postdoc. Fellowship in Studying Complex Systems ($200K, 2013)

PUBLICATIONS   Preprints and other writings are available at `http://laurenthebertdufresne.github.io/publications/`.

Peer-reviewed papers in reverse chronological order:

89. G. St-Onge, **L. Hébert-Dufresne** & A. Allard (2023)
    Heterogeneous transmission in groups induces a superlinear force of infection/
    Proc. Natl. Acad. Sci. U.S.A. (in press)

88. A. J. Allen, C. Moore & **L. Hébert-Dufresne** (2023)
    A network compression approach for quantifying the importance of temporal contact chronology.
    Phys. Rev. Lett. (in press)

87. J. Lovato, **L. Hébert-Dufresne**, J. St-Onge, R. Harp, G. Salazar Lopez, S. P. Rogers, I. Ul Haq, & J. Onaolapo (2023)
    Diverse Misinformation: Impacts of Human Biases on Detection of Deepfakes on Networks.
    npj Complexity (in press)

86. B. M. Althouse, B. Wallace, B. Case, S. V. Scarpino, A. Allard, A. Berdahl, E. R. White, & **L. Hébert-Dufresne** (2023)
    The unintended consequences of inconsistent pandemic control policies.
    BMC Global and Public Health (in press)

85. E. R. Colgate, C. Klopfer, D. M. Dickson, B. Lee, M. J. Wargo, A. Alam, B. D. Kirkpatrick, & **L. Hébert-Dufresne** (2023)
    Network analysis of patterns and relevance of enteric pathogen co-infections among infants in a diarrhea-endemic setting.
    PLOS Computational Biology 19(11):e1011624

84. M. C. Boudreau, A. J. Allen, N. J. Roberts, A. Allard, & **L. Hébert-Dufresne** (2023)
    Temporal and probabilistic forecasts of epidemic interventions.
    Bulletin of Mathematical Biology 85:118

83. J. Meluso & **L. Hébert-Dufresne** (2023)
    Indirect social learning through collective performance favors decentralization.
    Proc. Natl. Acad. Sci. U.S.A. 120(34):e2303568120

82. T. Waring, M. Niles, M. Kling, S. Miller, **L. Hébert-Dufresne**, H. Sabzian Papi, N. Gotelli, & B. J. McGill (2023)
    Operationalizing cultural adaptation to climate change: contemporary examples from United States agriculture.
    Proc. R. Soc. Lond. B 378:1889

81. B. K. M. Case, Jean-Gabriel Young, & **Laurent Hébert-Dufresne** (2023)
    Accurately summarizing an outbreak using epidemiological models takes time.
    Royal Society Open Science 10:230634

80. **L. Hébert-Dufresne**, G. St-Onge, J. Meluso, J. Bagrow, & A. Allard (2023)
    Hierarchical team structure and multidimensional localization (or siloing) on networks .
    Journal of Physics: Complexity 4 035002

79. D. O'Gara, S. F. Rosenblatt, **L. Hébert-Dufresne**, R. Purcell, M. Kasman, & R. A. Hammond (2023)
TRACE-Omicron: Policy Counterfactuals to Inform Mitigation of COVID-19 Spread in the United States.
Advanced Theory and Simulations

78. A. Allard, C. Moore, S. V. Scarpino, B. M. Althouse & **L. Hébert-Dufresne** (2023)
The role of directionality, heterogeneity and correlations in epidemic risk and spread
SIAM Review 62(2), 471-492

77. B. J. M. Williams, C. B. Ogbunugafor, B. M. Althouse & **L. Hébert-Dufresne** (2022)
Immunity-induced criticality of the genotype network of influenza A (H3N2) hemagglutinin
PNAS Nexus 1(4), pgac143

76. M. Z. Trujillo, **L. Hébert-Dufresne** & J. Bagrow (2022)
The penumbra of open source: projects outside of centralized platforms are longer maintained, more academic and more collaborative
EPJ Data Science 11, 31

75. J. Lovato, A. Allard, R. Harp, J. Onaolapo & **L. Hébert-Dufresne** (2022)
Limits of Individual Consent and Models of Distributed Consent in Online Social Networks
2022 ACM Conference on Fairness, Accountability, and Transparency 225102262

74. B.K.M. Case, J.-G. Young, D. Penados, **L. Hébert-Dufresne** & L. Stevens (2022)
Spatial epidemiology and adaptive targeted sampling to manage the Chagas disease vector *Triatoma dimidiata*
PLOS Neglected Tropical Diseases 16(6): e0010436

73. J.R. Minot, M.Z. Trujillo, S.F. Rosenblatt, *et al.*, **L. Hébert-Dufresne** & A.M. Roth (2022)
Distinguishing In-Groups and Onlookers by Language Use
12th Workshop on Computational Approaches to Subjectivity, Sentiment & Social Media Analysis 157-171

72. J. Meluso, J. Austin-Breneman, J. Bagrow & **L. Hébert-Dufresne** (2022)
A review & framework for modeling complex engineered system development processes
IEEE Transactions on Systems, Man, and Cybernetics: Systems

71. M. Warrick, S. F. Rosenblatt, J.-G. Young, A. Casari, **L. Hébert-Dufresne** & J. Bagrow (2022)
The OCEAN mailing list data set: Network analysis spanning mailing lists and code repositories
2022 Mining Software Repositories Conference (in press)

70. A. J. Allen, M. C. Boudreau, N. J. Roberts, A. Allard & **L. Hébert-Dufresne** (2022)
Predicting the diversity of early epidemic spread on networks
Phys. Rev. Research 4, 013123

69. **L. Hébert-Dufresne**, T. M. Waring, G. St-Onge, M. T. Niles, *et al.,*, N. Gotelli & B. J. McGill (2022)
Source-sink behavioral dynamics limit institutional evolution in a group-structured society
Royal Society Open Science 9, 211743

68. J. Garland, K. Ghazi-Zahedi, J.-G. Young, **L. Hébert-Dufresne** & M. Galesic (2022)
Impact and dynamics of hate and counter speech online
EPJ Data Science 11, 3

67. J. Meluso, **L. Hébert-Dufresne**, J. P. Bagrow, & R. Razzante (2022)
Masculinity Contest Cultures and Inclusive Cultures: Insights From an Agent-Based Model of Organizational Socialization and Promotion
Research on Social Issues in Management (in press)

66. G. St-Onge, I. Iacopini, V. Latora, A. Barrat, G. Petri, A. Allard & **L. Hébert-Dufresne** (2022)
Influential groups for seeding and sustaining hypergraph contagions
Communications Physics 5, 25

65. G. St-Onge, H. Sun, A. Allard, **L. Hébert-Dufresne** & G. Bianconi (2021)
Universal nonlinear infection kernel from heterogeneous exposure on higher-order networks
Phys. Rev. Lett. 127, 158301

64. E. Aguilar, N. J. Roberts, et al., **L. Hébert-Dufresne** & B. D. Zusman (2021)
Adaptive staffing can mitigate essential worker disease and absenteeism in an emerging epidemic
Proc. Natl. Acad. Sci. U.S.A. 118:34

63. M. Z. Trujillo, S. F. Rosenblatt, G. de Anda Juregui, E. Moog, **L. Hébert-Dufresne** & A. M. Roth (2021)
When the echo chamber shatters: Examining the use of community-specific language post-subreddit ban
Proceedings of the Fifth Workshop on Online Abuse and Harms, 164178

62. J. Bedson, L. A. Skrip, et al., **L. Hébert-Dufresne** & B. M. Althouse (2021)
A review and agenda for integrated disease models including social and behavioral factors
Nature Human Behaviour 5, 834846

61. J.-G. Young, A. Casari, K. McLaughlin, M.Z. Trujillo, **L. Hébert-Dufresne** & J.P. Bagrow (2021)
Which contributions count? Analysis of attribution in open source
2021 Mining Software Repositories Conference

60. L. Skrip, M. P. Fallah, J. Bedson, **L. Hébert-Dufresne** & B. M. Althouse (2021)
Coordinated support for local action: A modeling study of strategies to facilitate behavior adoption in urban poor communities of Liberia for sustained COVID-19 suppression
Epidemics 37, 100529

59. P. Burnham, S. Alger, B. Case, H. Boncristiani, **L. Hébert-Dufresne**, & A. Brody (2021)
Flowers as dirty doorknobs: Demonstration of a virus transmission mechanism between Apis mellifera and Bombus impatiens
Journal of Applied Ecology 58:10 2065-2074

58. L. Skrip, P. Selvaraj, et al., **L. Hébert-Dufresne** S.V Scarpino, & B.M. Althouse (2021)
Seeding COVID-19 across sub-Saharan Africa: An analysis of reported importation events across 49 countries
Am. J. Trop. Med. Hyg. 104:5 1694–1702

57. S. Kojaku, **L. Hébert-Dufresne**, E. Mones, S. Lehmann, & Y.-Y. Ahn (2021)
The effectiveness of backward contact tracing in networks
Nature Physics 17, 652-658

56. D. Carrillo et al. (2021)
Containing future epidemics with trustworthy federated systems for ubiquitous warning and response
Front. Comms. Net. 2:621264

55. G. St-Onge, V. Thibeault, A. Allard, L. J. Dubé & **L. Hébert-Dufresne** (2021)
Social confinement and mesoscopic localization of epidemics on networks
Phys. Rev. Lett. 126, 098301

54. G. St-Onge, V. Thibeault, A. Allard, L. J. Dubé & **L. Hébert-Dufresne** (2021)
Master equation analysis of mesoscopic localization in contagion dynamics on higher-order networks
Phys. Rev. E 103, 032301

53. B. J. M. Williams, G. St-Onge & **L. Hébert-Dufresne** (2021)
Localization, epidemic transitions, and unpredictability of multistrain epidemics with an underlying genotype network
PLOS Comput. Biol. 17(2): e1008606

52. **L. Hébert-Dufresne**, B.M. Althouse, S.V. Scarpino, & A. Allard (2020)
Beyond R0: Heterogeneity in secondary infections and probabilistic epidemic forecasting
J. R. Soc. Interface 17, 172.

51. J. Garland, K. Ghazi-Zahedi, J.-G. Young, **L. Hébert-Dufresne** & M. Galesic (2020)
Countering hate on social media: Large scale classification of hate and counter speech.
ACL Workshop on Online Abuse and Harms 102-112.

50. H. Hartle, B. Klein, S. McCabe, A. Daniels, G. St-Onge, C. Murphy, & **L. Hébert-Dufresne** (2020)
Network comparison and the within-ensemble graph distance
Proc. R. Soc. Lond. A 476, 2243

49. B. Lee, J. P. Hanley, S. Nowak, J. H. T. Bates & **L. Hébert-Dufresne** (2020)
Modeling the Impact of School Reopening on SARS-CoV-2 Transmission Using Contact Structure Data from Shanghai.
BMC Public Health 20, 1713.

48. E. R. White, & **L. Hébert-Dufresne** (2020)
State-level variation of initial COVID-19 dynamics in the United States: The role of local government interventions
PLOS One 15(10): e024064.

47. B.M. Althouse, E.A. Wenger, J.C. Miller, S.V. Scarpino, A. Allard, **L. Hébert-Dufresne**, & Hao Hu (2020)
Superspreading events in the transmission dynamics of SARS-CoV-2: opportunities for interventions and control
PLoS Biology 18(11): e3000897.

46. **L. Hébert-Dufresne**, D. Mistry & B.M. Althouse (2020)
Spread of infectious disease and social awareness as parasitic contagions on clustered networks.
Phys. Rev. Research 2, 033306

45. J. Bedson, M.F. Jalloh, D. Pedi, et al., L.A. Skrip, B.M. Althouse, & **L. Hébert-Dufresne** (2020)
Community Engagement during outbreak response: standards, approaches, and lessons from the Ebola outbreak in Sierra Leone.
BMJ Global Health 5:e002145

44. S. F. Rosenblatt, J. A. Smith, G. Robin Gauthier & **L. Hébert-Dufresne** (2020)
Immunization Strategies in Networks with Missing Data.
PLoS Comput. Biol. 16(7): e1007897

43. **L. Hébert-Dufresne**, S. V. Scarpino & J.-G. Young (2020)
Macroscopic patterns of interacting contagions are indistinguishable from social reinforcement.
Nature Physics 16, 426–431

42. L.A. Skrip, J. Bedson, S. Abramowitz, et al., **L. Hébert-Dufresne**, and B.M. Althouse (2020)
Unmet needs and behavior during the Ebola response in Sierra Leone: a retrospective, mixed-methods analysis of community feedback from the Social Mobilization Action Consortium.
Lancet Planetary Health 4(2): e74-e85

41. J. Ring IV, J.-G Young & **L. Hébert-Dufresne** (2020)
Connected graphs with a given degree sequence: Efficient sampling, correlations, community detection and robustness.
Proceedings of NetSci-X 2020, Springer Proceedings in Complexity. Springer, Cham

40. S. Chowdhury, **L. Hébert-Dufresne** & J. Frolik (2020)
Effective Implementation of Energy Aware Polarization Diversity for IoT Networks Using Eigenvector Centrality.
Proceedings of NetSci-X 2020, Springer Proceedings in Complexity. Springer, Cham

39. J.-G. Young, G. St-Onge, E. Laurence, C. Murphy, **L. Hébert-Dufresne** & P. Desrosiers (2019)
Phase transition in the recoverability of network history.
Phys. Rev. X 9, 041056

38. 72 Hours of Science event (2019)
Dynamics of beneficial epidemics.
Scientific Reports, 9, 15093

37. **L. Hébert-Dufresne** & A. Allard (2019)
Smeared phase transitions in percolation on real complex networks.
Phys. Rev. Research, 1, 013009

36. E. Libby, **L. Hébert-Dufresne**, S.-R. Hosseini & A. Wagner (2019)
Syntrophy emerges spontaneously in complex metabolic systems.
PLOS Comput Biol 15(7): e100716

35. G. St-Onge, J.-G. Young, **L. Hébert-Dufresne** & L. J. Dubé (2019)
Efficient sampling of spreading processes on complex networks using a composition and rejection algorithm.
Comput. Phys. Commun. 240: 30-37

34. A. Allard & **L. Hébert-Dufresne** (2019)
Percolation and the effective structure of complex networks.
Phys. Rev. X, 9, 011023

33. M. Price, A. C. Legrand, Z. M.F. Brier & **L. Hébert-Dufresne** (2019)
The Symptoms at the Center: Examining the Comorbidity of Posttraumatic Stress Disorder, Generalized Anxiety Disorder, and Depression with Network Analysis.
Journal of Psychiatric Research 109: 52-58

32. **L. Hébert-Dufresne**, A. F. A. Pellegrini, U. Bhat, S. Redner, S. W. Pacala & A. Berdahl (2018)
Edge fires drive the shape and stability of tropical forests.
Ecology Letters, 21, 794-803

31. A. Allard, B. M. Althouse, S. V. Scarpino & **L. Hébert-Dufresne** (2017)
Asymmetric percolation drives a double transition in sexual contact networks
Proc. Natl. Acad. Sci. U.S.A., 114(34), p.8969-8973

30. A. Allard, B. M. Althouse, **L. Hébert-Dufresne** & S. V. Scarpino (2017)
The risk of sustained sexual transmission of Zika is underestimated
PLOS Pathogens, 13(9): e1006633

29. **L. Hébert-Dufresne**, A. Allard, P.-A. Noël, J.-G. Young & E. Libby (2017)
Strategic tradeoffs in competitor dynamics on adaptive networks.
Scientific Reports, 7, 7576

28. J.-G. Young, P. Desrosiers, **L. Hébert-Dufresne**, E. Laurence & L. J. Dubé (2017)
Finite-size analysis of the detectability limit of the stochastic block model.
Phys. Rev. E, 95, 062304

27. U. Bhat, M. Shrestha & **L. Hébert-Dufresne** (2017)
Exotic phase transitions of k-cores in clustered networks.
Phys. Rev. E, 95, 012314

26. S. V. Scarpino, A. Allard & **L. Hébert-Dufresne** (2016)
The effect of a prudent adaptive behaviour on disease transmission.
Nature Physics, 12, 1042-1046

25. **L. Hébert-Dufresne**, J. A. Grochow & A. Allard (2016)
Network structure at multiple scales via a new network statistic: the onion decomposition.
Scientific Reports, 6, 31708

24. J.-G. Young, **L. Hébert-Dufresne**, A. Allard & L. J. Dubé (2016)
Growing networks of overlapping communities with internal structure.
Phys. Rev. E, 94, 022317

23. **L. Hébert-Dufresne**, A. Allard, J.-G. Young & L. J. Dubé (2016)
Constrained growth of complex scale-independent systems.
Phys Rev E, 93, 032304

22. **L. Hébert-Dufresne** & B. M. Althouse (2015)
Complex dynamics of synergistic coinfections on realistically clustered networks.
Proc. Natl. Acad. Sci. U.S.A., 112(33), p.10551-10556

21. B. M. Althouse *et al.* (2015)
Enhancing disease surveillance with novel data streams: challenges and opportunities.
EPJ Data Science 4:17

20. A. Allard, **L. Hébert-Dufresne**, J.-G. Young, & L. J. Dubé (2015)
General and exact approach to percolation on random graphs.
Phys Rev E, 92, 062807

19. **L. Hébert-Dufresne**, E. Laurence, A. Allard, J.-G. Young & L. J. Dubé (2015)
Complex networks as an emerging property of hierarchical preferential attachment.
Phys Rev E, 92, 062809

18. J.-G. Young, A. Allard, **L. Hébert-Dufresne** & L. J. Dubé (2015)
A shadowing problem in the detection of overlapping communities.
PLOS ONE, 10(10): e0140133

17. **L. Hébert-Dufresne**, V. Marceau, P.-A. Noël, A. Allard & L. J. Dubé (2014)
The Social Zombie: modelling undead outbreaks on social networks.
Mathematical Modelling of Zombies. Robert Smith?, ed.
University of Ottawa Press.

16. B. M. Althouse & **L. Hébert-Dufresne** (2014)
Epidemic cycles driven by host behavior.
J. R. Soc. Interface, 11, 20140575

15. A. Allard, **L. Hébert-Dufresne**, J.-G. Young & L. J. Dubé (2014)
Coexistence of phases and the observability of random graphs.
Phys. Rev. E, 89, 022801

14. P.-A. Noël, A. Allard, **L. Hébert-Dufresne**, V. Marceau & L. J. Dubé (2014)
Epidemics on contact networks: a general stochastic approach.
J Math Biol, 69(6), p.1627-1660

13. **L. Hébert-Dufresne**, A. Allard, J.-G. Young & L. J. Dubé (2013)
Percolation on random networks with arbitrary k-core structure.
Phys Rev E, 88, 062820

12. **L. Hébert-Dufresne**, A. Allard, J.-G. Young & L. J. Dubé (2013)
Global efficiency of local immunization on complex networks.
Scientific Reports, 3, 2171

11. **L. Hébert-Dufresne**, O. Patterson-Lomba, G. M. Goerg & B. M. Althouse (2013)
Pathogen mutation modeled by competition between site and bond percolation.
Phys Rev Lett, 110, 108103

10. B. M. Althouse, O. Patterson-Lomba, G. M. Goerg & **L. Hébert-Dufresne** (2013)
Targeting and timing of treatment influences the emergence of influenza resistance in structured populations.
PLOS Comput Biol, 9(2), e1002912

9. O. Patterson-Lomba, B. M. Althouse, G. M. Goerg & **L. Hébert-Dufresne** (2013)
Optimizing treatment regimes to hinder antiviral resistance in influenza across time scales.
PLOS ONE 8(3): e59529

8. **L. Hébert-Dufresne**, A. Allard, V. Marceau, P.-A. Noël & L. J. Dubé (2012)
Stochastic process for the growth of scale-free, modular and self-similar systems.
Phys Rev E, 85, 026108

7. A. Allard, **L. Hébert-Dufresne**, P.-A. Noël, V. Marceau & L. J. Dubé (2012)
Bond percolation on a class of correlated and clustered random graphs.
J. Phys. A: Math. Theor. 45, 405005

6. A. Allard, **L. Hébert-Dufresne**, P.-A. Noël, V. Marceau & L. J. Dubé (2012)
Exact solution of bond percolation on small arbitrary graphs.
EPL, 98, 16001

5. P.-A. Noël, A. Allard, **L. Hébert-Dufresne**, V. Marceau & L. J. Dubé (2012)
   Propagation on networks: an exact alternative perspective
   Phys Rev E, 85, 031118

4. **L. Hébert-Dufresne**, A. Allard, V. Marceau, P.-A. Noël & L. J. Dubé (2011)
   Structural preferential attachment: Network organization beyond the link.
   Phys Rev Lett, 107, 158702

3. V. Marceau, P.-A. Noël, **L. Hébert-Dufresne**, A. Allard & L. J. Dubé (2011)
   Modeling the dynamical interaction between epidemics on overlay networks.
   Phys Rev E, 84, 026105

2. V. Marceau, P.-A. Noël, **L. Hébert-Dufresne**, A. Allard & L. J. Dubé (2010)
   Adaptive networks: coevolution of disease and topology.
   Phys Rev E, 82, 036116

1. **L. Hébert-Dufresne**, P.-A. Noël, V. Marceau, A. Allard & L. J. Dubé (2010)
   Propagation dynamics on networks featuring complex topologies.
   Phys Rev E, 82, 036115

Other recent writings

- J. Bongard, J. Lovato, **L. Hébert-Dufresne**, R. Dasari, & L. Soros
  Introduction to the 2020 Conference on Artificial Life Special Issue.
  Artificial Life 27 (3–4), 141-142 (2022)

- **L. Hébert-Dufresne**
  Halting the Spread of COVID-19 and Escaping the Madness of Crowds.
  In: The Complex Alternative: Complexity Scientists on the COVID-19 Pandemic. SFI Press (2021)

- A. Casari, K. McLaughlin, M.Z. Trujillo, J.-G. Young, J.P. Bagrow & **L. Hébert-Dufresne**
  Open source ecosystems need equitable credit across contributions.
  Nature Computational Science 1, 2 (2021)

- A. Allard, L. J. Dubé & **L. Hébert-Dufresne**
  La modélisation mathématique pour cartographier le complexe et l'inconnu.
  Magazine de l'ACFAS, September 22 2020

- S. Crabtree & **L. Hébert-Dufresne**
  Face aux changements environnementaux, la transdisciplinarité : le cas des cryonoses .
  Magazine de l'ACFAS, September 22 2020

- **L. Hébert-Dufresne** & J.-M. Fontan
  Dossier bifurcation : conversation éditoriale.
  Magazine de l'ACFAS, September 22 2020

- J. Lovato & **L. Hébert-Dufresne**
  A How-To: reflections on planning virtual science conferences.
  Medium, August 6 2020

- J. Bongard, J. Lovato, **L. Hébert-Dufresne**, R. Dasari, & L. Soros
  The 2020 Conference on Artificial Life.
  ALIFE 2020: The 2020 Conference on Artificial Life, pp. i–782, MIT Press (2020)

- **L. Hébert-Dufresne** & V. Chuqiao Yang
  Misinformation about an outbreak like COVID-19 is important public health data.
  STAT, April 7 2020

- G. St-Onge, V. Thibeault, A. Allard, L. J. Dubé & **L. Hébert-Dufresne**
  COVID-19: Cancel your next large event, and tell your friends to cancel theirs.
  Medium, March 14 2020

OTHER
SCIENTIFIC
ACTIVITIES

Publishing and funding agencies

- Review panels for the National Science Foundation, the National Institutes of Health, the European Research Council, and the Natural Sciences and Engineering Research Council of Canada
- Editor for PLOS Complexity Channel (2018–2020)
- Guest editor for Science Advances
- Reviewer for: Nature, Nature Physics, PNAS, Nature Communications, Science Advances, Nature Human Behavior, Physical Review X, Physical Review E, Physical Review Letters, Journal of the Royal Society Interface, PLOS Computational Biology, PLOS ONE, Scientific Reports, and others.

Conferences as chair and organizer

- Chair of "NetSci 2024" in Québec, Canada (June 2024)
- Director of the "Complex Networks Winter Workshop" in Québec City (Dec. 2018, 2019, 2020, 2023)
- Organizer of "*Workshop on the Dynamics of Interacting Contagions*", SFI (2023).
- Organizer of "*Workshop on Higher-order Interactions*", KIAS, Seoul, Korea (March 2023)
- Director of the "Complex Networks Winter Workshop" in Melbourne, Australia (Jul. 2022)
- Program Chair of "NERCCS 2022" in Buffalo, NY (Mar. 2022)
- Co-organizer of "ALife 2020" in Montréal, Québec, Canada (July 2020)
- Chair of "NetSci 2019" in Burlington VT (May 2019)
- Co-organizer of "Symposium on the Science of Stories" in Burlington VT (Oct. 2018)
- Co-organizer of "Symposium on Health & Wellness Behavior" in Burlington VT (Sep. 2018)
- Organizer of "Contagion on Networks 2018", Paris (Jun. 2018).
- Organizer of "Contagion on Networks 2017", Indianapolis (Jun. 2017).
- Organizer of "*Strategies in Adaptive Systems*", SFI (Jan. 2017).
- Organizer of "*Studying the Interplay of Hard Modularity and Dynamics*", SFI (Jan. 2016).
- Organizer of "*From Co-Infection to Cultural Dissonance*", SFI (Sep. 2013).

Program committees

- "Conference on Complex Systems 2020", online (Dec 2020).
- "2020 Spring Simulations Conference", Fairfax VA (May 2020).
- "The 8th International Workshop on Complex Networks", Lisbon, Portugal (Dec. 2019).
- "NERCCS2019", Binghamton NY (Apr. 2019).
- "COMPLENET'19", Tarragona, Spain (Mar. 2019).
- "Conference on Complex Systems 2018", Thessaloniki, Greece (Sep. 2018).
- "International Conference on Complex Systems 2018", Cambridge MA (July 2018).
- "The 7th International Workshop on Complex Networks", Campbridge UK (Dec. 2018).
- "IC2S2 2018", Evanston IL (Jul. 2018).
- "SIAM Workshop on Network Science", Portland OR (Jul. 2018).
- "NetSci 2018", Paris, France (Jun. 2018).
- "The 6th International Workshop on Complex Networks", Lyon, France (Dec. 2017).
- "9th International Conference on Social Informatics", Oxford, UK (Sep. 2017).
- "Conference on Complex Systems 2017", Cancun, Mexico (Sep. 2017).
- "NetSci 2017", Indianapolis IN (Jun. 2017).
- "The 5th International Workshop on Complex Networks", Milan, Italy (Dec. 2016).

OTHER EXPERIENCES

Teaching

- (2020–present) CS/CSYS 395: Data Lab
- (2018–present) CS/CSYS 302: Modeling Complex Systems
- (2018–present) CS/CSYS 295: Algorithms for Complex Networks
- (2017–present) Co-PI and Leadership team of NRT: Quantitative & Evolutionary STEM Training.
- (2015–2016) Tutorial series on Graphs and C++, Santa Fe Institute's REU program
- (2015) Statistical Physics and Networks, Complex Systems Winter School, IISER Mohali, India

Academic mentorship

- (2022–present) Nicholas Landry, TGIR postdoctoral fellow
- (2021–present) Jonathan St-Onge, complex systems Ph.D. student
- (2020–present) John Meluso, OCEAN postdoctoral fellow
- (2020–present) Andrea Allen, complex systems and data science M.Sc
- (2020–present) Nicholas Roberts, complex systems Ph.D. student
- (2020–present) Milo Trujillo, complex systems Ph.D. student
- (2019–2021) Connor Klopfer, complex systems and data science M.Sc, thesis: *Network and Ecological Methods to Study Enteric Pathogen Co-infections*
- (2019–present) Mariah Boudreau, mathematics Ph.D. student
- (2019–2020) Blake Williams, complex systems and data science M.Sc, thesis: *On the Dynamics and Structure of Multiple Strain Epidemic Models and Genotype Networks*
- (2018–present) Alexander Daniels, complex systems Ph.D. student
- (2018–present) B. K. M. Case, computer science Ph.D. student
- (2018–present) Samuel F. Rosenblatt, computer science Ph.D. student
- (2018–2022) Guillaume St-Onge, physics & computer science Ph.D. student, thesis: *Processus de contagion sur réseaux complexes au-delà des interactions dyadiques.*

- (2018–2019) Blake Williams, mathematics undergraduate honor thesis, thesis: *Analysis and modeling of the genotype network of Influenza.*
- (2016–2017) Andrea Allen, mathematics undergraduate student, project: *Quantifying chronology in temporal networks with an epidemic diffusion approach to network comparison.*
- (2015–2017) Maurice Bokanga, computer science undergraduate student, project: *Using mobility data to redefine cities and their structure.*
- (2014–2015) Christopher LeSueur, high-school student, project: *Graph structure of trades between sports teams reflects a collective assessment of performance.*

Volunteering

- (2018–2020) Lecture series organizer, Research Jams, at the Vermont Complex Systems Center
- (2014–2016) Lecture series organizer, Reckless Ideas, at the Santa Fe Institute.
- (2014–2015) Research mentorship for high-school students via inspire Santa Fe.
- (2014–2015) Science fair judge, via The Santa Fe Alliance for Science.
- (2011–2022) Online mentorship for high-school students via Academos Cybermentorat.

Talks and invited lectures

- Modeling Pandemic Intervention Acceptance for Disease Mitigation.
  Panel on Understanding (Health) Information Spreading, Northeastern University, MA (invited 2023)
- Modeling networks with probability generating functions, message passing, and network compression.
  Network Science Institute Complexity Speaker Series, Northeastern University, MA (invited 2023)
- Contagions that challenge the assumption of a linear relationship between exposure and transmission.
  Northeast Regional Conference on Complex Systems (NERCCS 2023), Clarkson University, NY (invited 2023)
- Interplay of individual and group dynamics in the study of contagions and cooperation.
  KIAS-Vermont Workshop on Higher-order Interactions in Network Science, Seoul, Korea (invited 2023)
- Network epidemiology: Behaviour, contact tracing, surveillance, and climate change.
  International Centre for Diarrhoeal Disease Research, Bangladesh (invited 2023)
- Approximate master equations for contagion and group selection dynamics on higher-order networks.
  Dynamic Days US 2023, online (invited 2023)
- Advances in the analytical modeling of complex networks using network compression.
  KIAS-KU International Workshop on Theoretical Challenges in Network Science, Seoul, Korea (invited 2022)
- Importance of individual heterogeneity for contact tracing and probabilistic epidemic forecasting.
  2021 Virtual North East Regional IDeA Conference (invited 2021)
- Emergence, localization, bistability and optimal seeding of contagions on higher-order networks.
  SIAM Dynamical Systems 2021, Portland OR
  Symposium on Modeling collective human behavior in social systems (invited 2021)
- Co-evolution of disease spread with collective and adaptive behaviour in humans.
  SIAM Dynamical Systems 2021, Portland OR
  Symposium on Modeling collective human behavior in social systems (invited 2021)
- The importance of heterogeneity and adaptivity of human behavior for epidemic models.
  Growth Lab, Harvard University (invited 2020)
- Seeding simplicial contagions in hypergraphs with heterogeneous structure.
  Sunbelt 2020 (talk).
- Introduction & Tutorial to Network Epidemiology.
  net-COVID, Online Workshop (invited 2020).
- Quantifying human behavior in network epidemiology.
  Université de Sherbrooke, Sherbrooke QC (invited 2019)
  Institute for Disease Modeling, Bellevue WA (invited 2019)
  Harvard T.H. Chan School of Public Health, Boston MA (invited 2019)
  University of Michigan, Center for the Study of Complex Systems, Ann Arbor MI (invited 2019)
  Santa Fe Institute, Santa Fe NM (invited 2018).
- Sequential phase transitions in percolation on complex networks.
  NetSci 2018 International conference, Paris, France. (talk)
- Interacting simple contagions are complex contagions.
  Networks in Disease Ecology, Paris, France. (invited 2018)
- Spread of Viruses and Ideas in the Age of Echo Chambers.
  Reckless Idea Lecture Series, Burlington VT. (invited 2018)

- Asymmetric percolation drives a double transition in sexual contact networks.
  NetSci 2017 International conference, Indianapolis, Indiana. (talk)
- Symposium on Systems and Design Thinking, Royal Military College Saint-Jean. (invited panelist)
- Network Comparison.
  University of Vermont's Complex Systems Center, Burlington VT. (invited 2017)
  University of Colorado Boulder, Boulder CO. (invited 2017)
- Unexpected consequences of human behavior in network epidemiology.
  BioFrontiers Institute, Boulder CO. (invited 2017)
  Institute for Systems Biology, Seattle WA. (invited 2017)
- Multi-scale network analysis and reconstruction via a new statistic: The onion decomposition.
  NetSci 2016 International conference, Seoul, Korea. (talk)
- Strategic tradeoffs in competitor dynamics on adaptive networks.
  NetSci 2016 International conference, Seoul, Korea. (talk)
  Women Corporate Directors Foundation. (invited 2016)
- Disease dynamics in 2016 (invited series with Daniel B. Larremore).
  SFI's President Circle.
  Los Alamos Rotary Club.
  Christus St. Vincent Medical Center.
- Complex dynamics of synergistic coinfections on realistically clustered networks.
  Conference on Complex Systems 2015, Tempe AZ. (talk)
  Departament de Física Fonamental, Universitat de Barcelona, Barcelona, Spain. (invited 2015)
  Institute for Scientific Interchange, Turin, Italy. (invited 2015)
  NetSci 2015 International conference, Zaragoza, Spain. (talk)
- Epidemic cycles driven by host behaviour.
  Dynamics of and on networks, Santa Fe NM (invited 2014)
- Complex networks are an emerging property of hierarchical preferential attachment.
  Santa Fe Institute, Santa Fe NM (invited 2014)
  NetSci 2014 International conference, Berkeley CA. (outstanding poster)
- Hard-core random networks.
  NetSci 2013 International conference, Copenhagen, Denmark. (talk)
- On the constrained growth of complex systems.
  COMPLEX 2012, Santa Fe NM. (talk)
- Global efficiency of local immunization.
  NetSci 2012 International conference, Chicago IL. (poster)
- Structural preferential attachment.
  NetSci 2011 International conference, Budapest, Hungary. (talk)
- Propagation dynamics on complex topologies.
  NetSci 2010 International conference, Boston MA. (poster)

VARIA   Society membership

- Network Science Society (board member)

- Complex Systems Society

- International Network for Social Network Analysis

A few examples of media coverage (on me or my work or my research groups)

- COVID-19: Comment certains malades deviennent des supercontaminateurs. *Le Monde*, 2020

- Données épidémiologiques: la pénurie cachée. *Mediapart*, 2020

- L'épidémie s'essouffle, l'espoir revient. *Le Figaro*, 2020

- How memes and social media shape the spread of coronavirus. *cnet*, 2020

- How large a gathering is too large during the coronavirus pandemic? *Science News*, 2020

- Get the Message. *Santa Fe Reporter*, 2020

- Laurent Hébert-Dufresne on Halting the Spread of COVID-19. *Complexity Podcast*, 2020

- AlphaGo, COVID-19 Contact Tracing and New Data Set. *Data Skeptic podcast*, 2020

- No, a Border Wall Won't Stop Coronavirus. *Wired*, 2020

- UVM gets $1M from Google for open source research. *WCAX3*, 2020

- Modéliser l'épidémie du coronavirus. *Les années lumière, Radio-Canada*, 2020

- Send your sick colleague home — but don't hire a replacement. *Nature Microbiology*, 2016.

- When Things Go Viral and Everybody Wins. *gizmodo*, 2016.

Other interests

- Biking, hiking, snow-shoeing, music, cooking, whiskey, coffee and French pastries!