

SENTINEL NORTH RESEARCH CHAIR ON THE APPLICATIONS AND THEORY OF NETWORK ANALYSIS

Faculty of Science and Engineering

MISSION

The mission of the Research Chair on the Applications and Theory of Network Analysis is to develop new analysis and modelling tools to better understand the complex systems of the changing North.

CHAIR CREATED ON: August 28, 2019

BACKGROUND

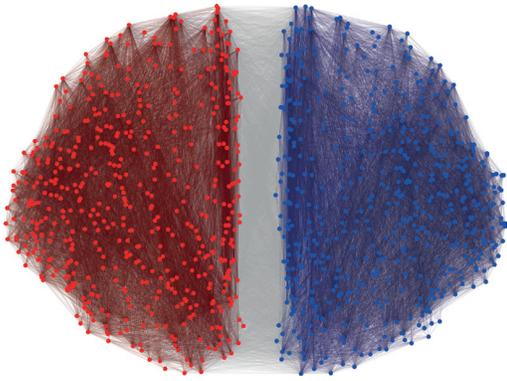
While reductionism has unlocked some of the greatest scientific breakthroughs of the past century, many systems defy such analysis. These complex systems, made up of many different elements, have properties that lie hidden when those elements are studied independently but emerge from the interactions between them. In other words, these systems are much more than the sum of their parts, and to understand them we need to explicitly examine all of the elements and their interactions to understand how they work and predict their behaviour.

CHAIRHOLDER

Antoine Allard holds a PhD in the physics of complex networks. During his doctoral studies he worked on improving mathematical models used to describe the spread of disease in human populations. He was a postdoctoral fellow first at Universitat de Barcelona, then at Centre de Recerca Matemàtica at Universitat Autònoma de Barcelona, then again at Universitat de Barcelona with its new complex systems institute. His work has expanded the modelling techniques used in his research, including tools taken from non-Euclidean geometry and deep learning.



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OBJECTIVES

- > Develop the next generation of mathematical tools to simulate and better understand the behaviour of complex systems
- > Analyze and guide research on specific complex systems to help uncover how they function through scientific collaborations both within Université Laval and on the national and international levels
- > Use the Chair's work to further the study of the spread of infectious disease in northern communities, the structure of the brain and the influence it has on psychiatric disorders, and complex interactions in the microbiomes of northern ecosystems, among other things

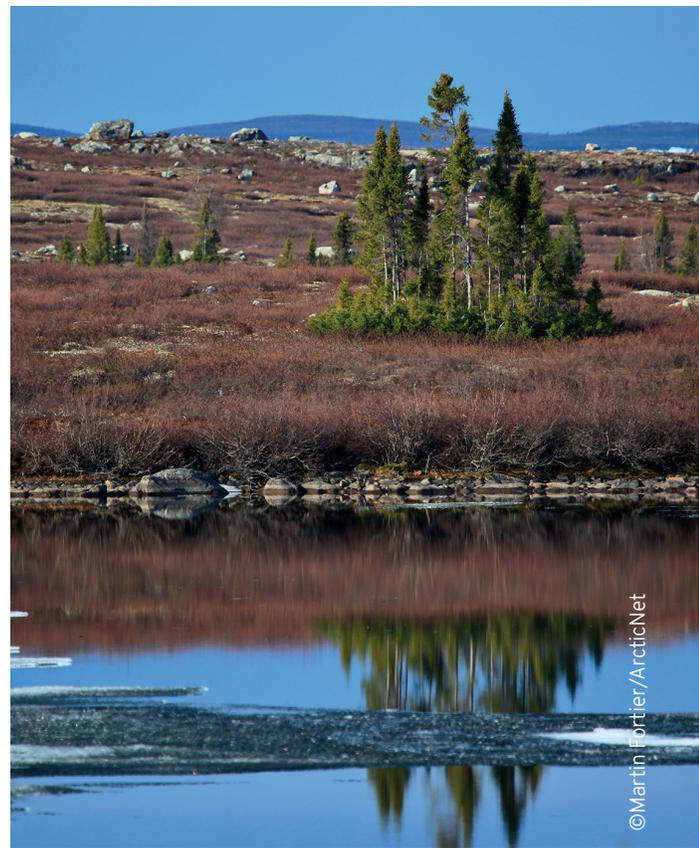
PARTNER

Funded by the Canada First Research Excellence Fund, Sentinel North allows Université Laval to draw on over a half-century of northern and optics/photonics research to develop innovative new technology and improve our understanding of the northern environment and its effect on human beings and their health. This new Chair is part of the major transdisciplinary research program at Sentinel North whose mission includes training the next generation of researchers that will help address some of the complex challenges facing the changing North.



BENEFITS

- > Develop the next generation of mathematical tools to better understand and model complex systems of all sorts, and thereby better understand the changing North
- > Attract standout students by offering them a stimulating academic environment where they can do world-class research and make a place for themselves on the world stage
- > Further strengthen Sentinel North's current leadership in northern research by partnering with other interdisciplinary initiatives currently underway in the program at Université Laval, within Canada, and abroad
- > Establish lasting transdisciplinary collaborations at Université Laval and promote a transdisciplinary approach to university research, which is crucial to addressing the biggest scientific challenges of the 21st century



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INFORMATION

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