MEMORIAL UNIVERSITY

Department of Electrical and Computer Engineering

Biophysical Communication Engineering Lab

Research Employment Opportunity: Signaling and Communication in Layered Biological Environments (Ph.D.)

Project Summary	The BioPhysComm Lab seeks a **new Ph.D. student** to undertake research to understand how molecules propagate across layers with distinct physical properties. This project will be primarily focused on theoretical and simulated results, and will include experimentation through collaborators.
Supervisor	Dr. Adam Noel
Degree to be Earned	Ph.D. in Electrical or Computer Engineering
Funding	**$24,000** per year for the first four years as a registered Ph.D. student.
Location	Core Science Facility, Memorial University, St. John's, NL, Canada
Target Start Date	**September 2026** (or as soon as possible)
Application Components	A complete application should include the following merged into a single PDF: • Cover letter with a statement of research interests • CV summarizing academic and professional experience • Copy of academic transcript(s) (can be unofficial) • Writing sample (preferably peer-reviewed)
Application Deadline	For guaranteed consideration, please apply by **May 22, 2026**.
Contact	Email adam.noel@mun.ca for informal inquiries or additional information

Project Description

Molecular communication (MC) is an emerging interdisciplinary field within communication engineering and inspired by signaling with molecules in nature. Many of our normal biological processes use molecular signaling, and it is also common in biomedical and biological research. Tools from MC can be used to understand the signaling processes used by bacteria, cancer cells, neurons, plants cells, and more, thereby encouraging us to develop strategies that strengthen healthy communication links or deter unhealthy links.

Heterogeneous layers arise in many practical molecule transport applications, including organ spheroids in organ-on-chip systems, tissue surrounding blood vessels, and the bacterial ecosystem within the millimetre-scale interface between the atmosphere and ocean. The BioPhysComm Lab has recently studied these systems and developed mathematical models to characterize propagation across layers.

This employment opportunity is for a Ph.D. student to develop new mathematical modeling approaches for signaling and communication within layered systems, including bounded and unbounded systems with spherical, cylindrical, and parallel layers. The student will validate derivations by developing new simulation algorithms. Results will also be verified experimentally with the support of interdisciplinary collaborators in academia and industry.

Selection Criteria

1. You must have or be close to completing a Master's degree in Engineering (Electrical, Computer, or Biomedical), Science (Physics or Computer Science), Applied Math, or closely-related discipline. Exceptional other backgrounds will be considered, including an applicant with an outstanding undergraduate degree.
2. You must meet the admission requirements set forward by the School of Graduate Studies (mun.ca/become/graduate/).
3. Required Competencies: We are particularly interested in candidates with a strong background in communications, signal processing, mathematical modeling, and programming.
4. Desired Competencies: Familiarity with random processes, fluid transport, and/or cell biology is also an asset.

Only candidates selected for an interview will be contacted.

About the BioPhysComm Lab

The Biophysical Communication Engineering (BioPhysComm) Lab works on biophysical signal propagation, cellular signal processing, and molecular communication engineering.

We're interested in the signalling cues that drive the behaviour of living cells and other microscale processes. We're promoting new ways of understanding how cells use molecules to communicate. Our long-term objective is to use communications and signal processing tools to improve the understanding of biophysical processes and how to interact with them at a microscopic level. More information can be found at engr.mun.ca/∼adamnoel/research.html.

About the Department of Electrical and Computer Engineering

Housed in Memorial University's new Core Science Facility, the Department of Electrical and Computer Engineering offers degrees in both electrical engineering and computer engineering at the bachelor's, master's, and doctorate levels. No matter what degree you pursue, we want you to feel inspired. We'll challenge you to do your best. We'll connect you with engineering leaders. And we'll mentor you so you'll understand what's possible and what you need to do to get there. More information can be found at mun.ca/engineering/ece/.

About Memorial

As Newfoundland and Labrador's only university, Memorial has a special obligation to the people of this province. Established as a memorial to the Newfoundlanders who lost their lives on active service during the First World War and subsequent conflicts, Memorial University draws inspiration from these sacrifices of the past as we help to build a better future for our province, our country and our world. More information can be found at mun.ca/main/about/.

Equality, Diversity, and Inclusion Statement

Memorial University is committed to employment equity, diversity, inclusion, and anti-racism, and encourages applications from all qualified candidates, including: women; people of any sexual orientation, gender identity, or gender expression; Indigenous Peoples; visible minorities and racialized people; and people with disabilities. Memorial is committed to providing an inclusive learning and work environment. If there is anything we can do to ensure your full participation during the application process please contact equity@mun.ca directly and we will work with you to make appropriate arrangements. In assessing applications, Memorial recognizes the legitimate impact that leaves (e.g., parental leaves, leave due to illness) can have on a candidate's record of achievement.

Land Acknowledgement

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.