MEMORIAL UNIVERSITY

Department of Electrical and Computer Engineering

Biophysical Communication Engineering Lab

Research Employment Opportunity: Designing a Molecular Radar to Characterize the Ocean Surface Microlayer (M.Eng.)

Project Summary	The BioPhysComm Lab seeks a Master's student to model, simulate, and experimentally measure molecule propagation through the ocean surface microlayer. Results will be used to develop a molecular radar to estimate the microlayer's physical properties.
Supervisor	Dr. Adam Noel
Degree to be Earned	M.Eng. (thesis-based)
Funding	**$20,000** per year for the first two years as a registered M.Eng. 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 (unofficial) of academic transcript(s) • Writing sample (e.g., technical report or published paper)
Application Deadline	For guaranteed consideration, apply by **May 22, 2026**
Contact	Email adam.noel@mun.ca for informal inquiries or additional information

Project Description

Molecular communication 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.

The ocean surface microlayer (OSM) is a small and harsh ecosystem at the millimetre-scale interface between the atmosphere and ocean. The OSM has distinct physical properties and is known to host dense populations of bacteria. The BioPhysComm Lab is engaging in a new collaboration with the Biology and Physics departments at Memorial University to develop a "molecular radar" that will use observations of molecule propagation to estimate the OSM properties, including layer thickness and molecule diffusion coefficient.

This employment opportunity is for a Master's student to join our lab's work and contribute to the development of the molecular radar. The work will include a combination of analytical modeling, particle simulation, laboratory experimentation, and physics-informed machine learning.

Selection Criteria

1. You must have or be close to completing an undergraduate degree in Engineering (Electrical, Computer, Biomedical, or Mechanical), Science (Physics, Biology, or Computer Science), Applied Math, or closely-related discipline. Exceptional other backgrounds will be considered.
2. You must meet the admission requirements set forward by the School of Graduate Studies (mun.ca/become/graduate/).
3. Expected Competencies: We are particularly interested in candidates with a strong background in biophysics, machine-learning tools, and mathematical modeling.
4. Desired Competencies: Familiarity with random processes and/or programming 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.