# New Graduate School Opportunities
in
# Sustainable Antibiofouling Solutions

**Are you interested in developing technology that supports coastal communities?**

**Are you interested in sustainable solutions to global economic challenges in trillion-dollar industries?**

**Would you like to collaborate with a diverse group of specialists toward a common goal?**

Biofouling is the unwanted growth of organisms on submerged surfaces, commonly known through the adhesion of barnacles and mussels on marine infrastructure, e.g., docks, ship hulls, and water inlets. It has tremendous economic and environmental impacts through increased fuel costs, greenhouse gas emissions, reduced aquaculture yields, and the inadvertent transport of invasive species. Historical (tributyltin) and contemporary (other metal-based) solutions to biofouling include biocidal coatings, which though effective, have long-term consequences when introduced into the environment, where they can partition into sediment and exert their biocidal effects for decades.

The federal government has invested in the development of sustainable anti-biofouling technology through the provision of an NSERC Alliance Missions grant for a partnership of Atlantic Canadian academic researchers and industry partners. These operational funds complement new instrumental infrastructure in the CFI-funded Water Treatment and Environmental Remediation (WaTER) and microbiology laboratories at Cape Breton University. Researchers at Cape Breton University have partnered with teams at Dalhousie University, St. Francis Xavier University, and Memorial University of Newfoundland Grenfell Campus to form a multi-institutional research network to coordinate graduate training, research outcomes and deliverables, intellectual property development, and market translation of novel sustainable marine coatings to address the overall project goals. We are partnered with industry via Kavacha (Canoe Cove, Prince Edward Island) for anti-biofouling coating formulations, Zero Waste Farms (Main Brook, Newfoundland and Labrador) for waste valorization, and Clean Valley CIC (Dartmouth, Nova Scotia) for aquaculture solutions for market-oriented R&D.

Cape Breton University

DALHOUSIE UNIVERSITY

QUAECUMQUE SUNT VERA

ST. FRANCIS XAVIER UNIVERSITY

GRENFELL CAMPUS

MEMORIAL UNIVERSITY

***Available Projects***

*Project A (Dr. Tony Walker, Dalhousie University and Dr. Martin Mkandawire, Cape Breton University):*

This project consists of the development of novel coating materials, understanding their properties and impact on efficacy, and life cycle analyses to understand their sustainability compared with each other and current market solutions. Additionally, the candidate will explore the off-target ecological impacts of shipborne coatings, including as shed microplastics. The candidate will be registered in a Master of Environmental Studies program offered by the School for Resource and Environmental Studies, Dalhousie University but will be part of a multi-institutional team. The target start date is September 2022. For more information regarding the project please contact Dr. Tony Walker at trwalker@dal.ca

Work Location(s): Dalhousie, Halifax, Nova Scotia (coursework and literature studies) and CBU, Sydney, Nova Scotia (experimental work and literature studies).

*Project B (Dr. Russell Wyeth, St. Francis Xavier University and Dr. Ken Oakes, Cape Breton University):*

This project is focused on developing experimental approaches for evaluating anti-biofouling activity during high-throughput and field testing of coatings and/or UVC irradiation. The candidate will be registered in a Master of Science program at St. Francis Xavier University and will interact with the Center for Biofouling Research, but also participate in the multi-institutional team including some travel to do experimental work at Cape Breton University. The target start date for this project is January 1, 2023 or earlier. For more information regarding the project please contact Dr. Russell Wyeth at rwyeth@stfx.ca and/or visit https://wyethlab.ca/

Work Location(s): St. Francis Xavier, Antigonish, Nova Scotia with occasional travel to CBU, Sydney, Nova Scotia.

*Project C (Dr. Shegufta Shetranjiwalla, Grenfell Campus, Memorial University of Newfoundland, Corner Brook, Newfoundland and Labrador and Dr. Xu Zhang, Cape Breton University):*

This project is focused on the development of novel (bio)polymeric coatings for marine anti-fouling applications and will include biopolymer extraction, synthetic functionalization, and materials characterization. The candidate will be registered in a Master of Science program at Memorial University of Newfoundland on their Grenfell Campus, but will also closely interact with the multi-institutional network. This project has a target start date of September 2022. For more information please contact Dr. Shegufta Shetranjiwalla at sshetranjiwalla@grenfell.mun.ca

Work location: Memorial University of Newfoundland, Grenfell Campus, Corner Brook, Newfoundland and Labrador with some potential travel to CBU.

***Equity, Diversity, and Inclusion Statement***

The research team is committed to minimizing barriers to participation by all candidates while maintaining a safe and productive work environment, e.g., modified or flexible work schedules for student parents or caregivers, access to assistive technologies for those with disabilities in consultation with university accessibility centers, and modification of work in consultation with candidates in the event of pregnancy. The team is approachable, supportive, and interested in your academic and professional development and will do their best to ensure that each candidate can meet their professional goals, grow their technical and professional skills, and gain expertise in their field of interest despite any challenges or difficulties that may arise.

***Information for Applicants***

The closing date for applications is **Friday, June 17, 2022**.

For general inquiries please contact the Project Coordinator, Andrew Carrier at Andrew_Carrier@cbu.ca

General Qualifications

Candidates must have completed a relevant BSc (Honours) program and meet any additional requirements of the graduate school to which they are applying (see links below). Successful candidates will have a strong record of academic achievement and accomplishment in one or more undergraduate research projects. Competitiveness for externally funded student scholarships is also an asset and students will be encouraged to apply for such support as appropriate.
All work will be performed in English, and applicants whose native language is not English should have a good command of speaking, listening, reading, and writing in English. Recent IELTS or TOFEL test results may be appended to your application and may be required for admission to the host institution.

Project A

The candidate should have a background in chemistry and an interest in the interface of chemistry, biology, and environmental science. Prior knowledge or experience in surface science, emulsions, nanotechnology, and/or microbiology are assets.

Project B

Scientific skills or expertise in any of the following would be beneficial: biofouling communities, marine fieldwork, digital image analysis, phycology, marine invertebrate zoology, aquatic biomechanics, or advanced statistical analyses with R.

Project C

The candidate should have chemical laboratory experience in polymer synthesis, and experience in NMR, FT-IR, and mass spectrometry. Knowledge of biopolymer extraction and other analytical techniques, including electrochemistry, is an asset.

***Submitting an Application***

Please submit a cover letter and a résumé or curriculum vitae detailing your experience and any peer-reviewed publications, an unofficial transcript, a writing sample (for example, your undergraduate thesis or other relevant work), and a statement of interest indicating the project(s) that you are interested in to **Andrew_Carrier@cbu.ca** (note the underscore) using the subject "Graduate Opportunities". For works with multiple authors please indicate your specific contributions.

We invite applications from all eligible applicants, with preference given to Canadian citizens or permanent residents. Applicants from under-represented groups, including women, visible minorities, transgender individuals, those with disabilities, etc., may choose to identify themselves in their correspondence.

Applicants must meet the eligibility requirements for the host institution, which can be found as follows:

***Dalhousie University (Halifax, Nova Scotia)***

https://www.dal.ca/academics/programs/graduate/environmental-studies/admissions.html

***St. Francis Xavier University (Antigonish, Nova Scotia)***

https://www.stfx.ca/admissions

***Memorial University of Newfoundland, Grenfell Campus (Corner Brook, Newfoundland and Labrador)***

https://www.mun.ca/main/become-a-student/