undergraduate
RESEARCH AWARDS
symposium

EXPERIENCE. KNOWLEDGE.

Schedule **UNC 200**

September 17, 2019

4:15 pm ***Opening Remarks and Introduction of first presenter by Dr. Robin Young***

4:30 pm **Athena Ranger**, Biology (Dr. Andis Klegeris) URA

Evaluating the therapeutic potential of Kainic acid analogs as a treatment for Alzheimer's disease.

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by abnormal proteins within the brain, as well as neuroinflammation. There are no effective treatments for AD. Overactivation of microglia, the immune cells of the brain, contributes to AD by killing neurons. Compounds that reduce this overactivation may help to slow the progression of AD. Previously, kainic acid (KA) was shown to regulate the immune responses of microglia; therefore, seven novel KA analogs were synthesized and tested. Several KA analogs showed trends towards an inhibition of pro-inflammatory microglial functions. These analogs will be optimized further to enhance their potential to reduce neuroinflammation.

4:45 pm **Sophia Russo**, Biology (Dr. Mark Rheault) URA

Gene knockout to study insect resistance: The validation of CRISPER-Cas9 technology

Resistance to current insect control strategies can have detrimental impacts on agriculture, human and animal health, and the economy. New, effective and environmentally-friendly insect control strategies are urgently needed. Organic cation transporters (ORCTs) play an important role in the detoxification and elimination of insecticides. This study used CRISPR-Cas9 technology to knockout ORCTs in the fruit fly midgut and renal tubule. The results were validated to determine the stability of ORCT knockouts using a polymerase chain reaction (PCR). Future studies will assess the functional role of these ORCT knockouts in insecticide detoxification and excretion.

5:00 pm **Lucas Starchuk,** Biology (Dr. Sanjoy Ghosh) URA

Effects of SAMe in omega-6 polyunsaturated fatty acids induced toxicity in the heart

Omega-6 polyunsaturated fatty acids have been shown to reduce antioxidant levels in the heart. This can lead to a toxic state called oxidative stress, which plays a role in heart disease. S-adenosyl methionine (SAMe) is an antioxidant currently approved for the treatment of alcoholic liver disease, which also exhibits oxidative stress. Heart cells were treated with SAMe and then exposed to fatty acids. Assays were performed to measure cell viability, reactive oxygen species (ROS) generation, and antioxidant levels. SAMe was not shown to reduce ROS or increase cell viability, therefore supplementation may not be beneficial under these conditions.

5:15 pm **Stephanie McCann**, Biology (Dr. Daniel Durall) NSERC-USRA

Differences between *S. cerevisiae* and *S. uvarum* of non-volatiles produced during fermentation

Yeast is an essential part of the wine making process, both producing alcohol from simple sugars during fermentation, as well as producing compounds that uniquely affect the aroma and flavor profile of the final product. The differing effects of selected strains belonging to two yeast species, *S. cerevisiae* and *S.uvarum*, on the non-volatile profile of Chardonnay wine was

examined at different temperatures. No significant differences were noted between the chemical profiles of wines fermented at different temperatures, but differences in the sugar concentration of wines fermented with non-typical strains (*uvarum*) suggest that these strains may have the ability to metabolize unique compounds that more commonly used yeast strains (*cerevisiae*) do not. This study may be significant for the local wine industry as *S.uvarum* can be found naturally in Okanagan wineries.

5:30pm **Erica Packard**, Biology (Dr. Melanie Jones) NSERC-USRA

Effects of fire severity on pine seedlings

Wildfires are an important part of the ecology of BC forests, but the patterns of fire occurrence and severity are changing with unknown consequences. The ability for ponderosa pine to regenerate after wildfire is enhanced by colonization with ectomycorrhizal fungi, a symbiotic soil fungi that exchanges nutrients with its host. The objective of this study is comparing the effects of low and high severity fires on naturally regenerating seedlings. Samples were collected monthly from three 2018 wildfire sites in the Okanagan valley. Preliminary results show no significant difference found between low and high severity sites, but further analysis of gathered data is being done. Additional work is being done analyzing the nutrient content of the sampled seedlings and the sites' soil.

5:45 pm **Tushar Dave**, Biology (Dr. Philip Barker) NSERC-USRA

Exploring protein interactions of Tumor Necrosis Receptors in *Drosophila melanogaster* (fruit fly).

Tumor Necrosis Factors (TNF) act on Tumor Necrosis Factor Receptors (TNFRs) to regulate nervous system organization. *Drosophila* expresses only two TNFRs named Wengen and Grindelwald. The aim of this research was to explore if these two receptors interact with each other using Proximity Ligation Assay. We first characterized antibodies targeting Wengen and Grindelwald by Western blot and then tested these antibodies, *in vitro*, using Immunocytochemistry (ICC). Our results showed that both Wengen and Grindelwald antibodies were suitable for Western blot but not for ICC. Further investigation is required to determine if Wengen and Grindelwald interact with one another.

6:00 pm **Victoria Lange**, Chemistry (Dr. Isaac Li) NSERC-USRA

Construct and characterize a split-GFP library for super-resolution imaging probes

Super-resolution microscopy is a novel technique that can reveal nanoscopic structures within cells by using software to enhance images beyond the diffraction limit of light. This research project sought to optimize imaging techniques by further investigating the characteristics of Green Fluorescent Protein. This protein can be split into two non-fluorescent fragments that regain fluorescence as the pieces reassemble. By conjugating the protein fragments to two complementary single strands of DNA, it allows for rapid detection of fluorescence. This improved protocol would allow researchers to accurately map receptor-ligand interactions and further visualize unknown cellular interactions.

6:15 pm **Sydney Neumeier**, Chemistry (Dr. Isaac Li) URA

Developing a novel electrophoresis assay to quantify single-molecule interactions

All biological systems exert tensile forces, whether between cells, proteins or DNA. By quantifying these forces on a molecular level, the mechanical and physical aspect of some diseases can be explored. The aim of this project was to develop a gel-electrophoresis assay to quantify the DNA-DNA interactions between a specific DNA construct and create a repeatable, inexpensive and functional force sensor. Based off the initial simulations and method development, it has been concluded that by modifying the DNA sequence of the construct, this system has the potential for the rapid analysis and quantification of molecular forces acting in living systems.

6:30 pm **Yuen Yee Leung**, Chemistry (Dr. Thuy Dang) IURA

Oxidation of camptothecin (CPT) backbone through the use of oxidative enzymes

Camptothecin (CPT), extracted from *Camptotheca acuminata*, is an anticancer drug that inhibits the enzyme topoisomerase I's function leading to tumor cell death. CPT can be converted into other derivatives such as Irinotecan for clinical treatment of various cancers. This research aims to characterize and utilize enzymes, specifically oxidative enzymes, already present in the plant's biosynthetic pathway to hydroxylate CPT, allowing for sustainable synthesis of these derivatives to meet the market's demands. Bioinformatics, molecular cloning and biochemical techniques were used to successfully clone and express 20 different genes and identify their enzymatic activity. This study paves way for complete elucidation of CPT's pathway.

6:45 pm **Taylor Gray**, Chemistry (Dr. Wes Zandberg) URA

Development of Analytical tools for the analysis of mammalian milk glycoproteins

Protein-linked sugars in human milk are known to act in the infant gut as a nutrient source. How milk proteins promote the health consumers of dairy products is unknown. The protein-linked sugar profile may vary depending on the cow (diet, lactation stage*, etc.*), species (human, cow, goat, camel, *etc*.), or the specific protein (whey *vs.* casein). We have developed a qualitative method to evaluate the sugar compositions from a milk protein samples using liquid chromatography-mass spectrometry. This method can be used to develop more human-like infant formulas and also permit food scientists to study how milk products promotes human health.

7:00 pm **Nina Mohtarundin**, Chemistry (Dr. Wes Zandberg) URA

Developing a screening tool for identifying methods to block the growth of gut pathogens

Clostridium perfringens is a bacteria that is commonly known to infect poultry flocks and is one of the leading causes of foodborne illnesses in people. As consumers become more aware of the use of antibiotics in poultry farms, it becomes increasingly important for us to study and understand the mechanism of the bacterial infection on a biochemical level. This enables us to block the biological pathway of infection and hence, prevent the use of antibiotics in animals without sacrificing the health of the animals. My talk will describe my research to developing new tools to screen C. perfingens' ability to establish infections in the avian gut.

7:15 pm **Ryland Giebelhaus**, Chemistry (Dr. Susan Murch) NSERC-USRA

Validation and Application of an Underivatized Method to Detect Glyphosate and its metabolite AMPA in Food Samples

In modern agriculture, one of the most commonly used herbicides-chemicals used to control the growth of unwanted plants is Round-Up (glyphosate). Given the recent scrutiny surrounding glyphosate, there is a need for a reliable method to quantify glyphosate in food samples. Current methods involve complex sample preparation and derivatization. My objective was to optimize and validate an underivatized method to measure glyphosate. I performed a single laboratory validation demonstrating the reproducibility, repeatability, accuracy, and precision of the method. My analysis showed that glyphosate was present in organically grown red lentils, comparable to the conventionally grown lentils of the same variety.

7:30 pm End of first session and reception to follow

September 18, 2019

4:00 pm ***Opening Remarks and Introduction of first presenter by Dr. Bonar Buffam***

4:15 pm **Keeley Lainchbury**, Psychology (Dr. Paul Davies) URA

Bias in the Legal System: How Race and Confessions Impact a Verdict

Confession evidence and racial biases are factors that can influence how jury members reach a verdict. This research explored the relationship between offender race, confession evidence, and verdicts rendered with an undergraduate university sample. Participants identified when a confession appeared coerced, evidenced by lower ratings of guilt than for voluntary confessions. Results indicated White offenders received higher ratings of guilt than Aboriginal offenders for the same crime. As such, this research highlights how race is perceived in a criminal context. Results can inform legal proceedings to ensure fair trials for those accused.

4:30 pm **Ross St. George**, Psychology (Dr. Marvin Krank) URA

A Pilot Study Using Fitbits for Research in Addiction Treatment Clinics: Inadvertent Discoveries

The pilot study, designed to use Fitbits for identifying emotional distress in individuals with addiction, revealed meaningful findings about conducting such research at inpatient addiction clinics and scientific research using Fitbits. Challenges were identified relating to the collection of consolidated longitudinal data, as well as the implementation of research methodologies in the context of addiction treatment clinics. This may suggest that a more pragmatic approach may be to reduce the frequency of researcher-participant contact or to have the research program implemented by the actual addiction treatment clinic. Moreover, Fitbits were proven to be problematic, suggesting their lack of empirical worthiness.

4:45 pm **David Shifflett**, Psychology (Dr. Paul Gabias) URA

What could a square represent? Different response patterns for blind, blind-folded, and sighted participants

This research suggested that imaginativeness and blindness were associated in the context of a simple stimulus display such as a square. The blind, blindfolded, and sighted felt or viewed a raised-line square. They stated what the square represented to them. The relative frequencies of concrete responses were compared across the three groups. The blind described the square as representing concrete objects with referents in the real world significantly more often than the blindfolded or sighted. In the context of a simple stimulus display, the blind seemed more imaginative than the blindfolded and sighted.

5:00 pm **Maxine Van Zyl**, Psychology (Dr. Harry Miller) URA

Comparison of WCST and ToH in Assessing Executive Function and Predicting MPAI Scores

Stroke survivors encounter many obstacles on their rehabilitation journey. Often, executive functions such as learning, planning and problem solving are impaired, which along with physical disabilities, hinder an individual's ability to live independently. This pilot study investigated two measures of executive functioning, the Tower of Hanoi and the Wisconsin Card Sorting Test, on their ability to predict patient rehabilitation outcomes as assessed by the Mayo-Portland Adaptability Inventory. The purpose of the study was to determine whether the Tower of Hanoi should be used to supplement the Wisconsin Card Sorting Test and thereby improve executive functioning assessment and guide rehabilitation efforts.

5:15 pm **Marcus Savery**, Earth & Environmental Sciences (Dr. Ed Hornibrook) URA

Quantifying fugitive emission of methane from the Glenmore Landfill

Methane is a powerful greenhouse gas that contributes to climate change. Determining emissions from heterogeneous sources such as landfills is challenging due to irregular landcover. An automated sampling system was developed to collect air samples during night-time inversions of the atmosphere when gas emissions are trapped in a stable boundary layer. Methane fluxes also were measured directly from local sources such as wetlands and compost piles that exhibit more regular emission patterns. Data from the two approaches were used to estimate total fugitive emissions of methane from the Glenmore Landfill.

5:30 pm **Nicholas Tochor**, Earth & Environmental Sciences (Mathieu Bourbonnais) URA

Spatial-temporal sampling approaches for wildlife occupancy modeling

Wildlife occupancy models predict the use and non-use of resource units throughout space and time to estimate the abundance of species of interest; however, they are highly sensitive to sampling design. A GIS-based time series analysis incorporating grizzly bear GPS telemetry and environmental data was developed to identify spatial-temporal patterns of habitat selection in Alberta, Canada from 2001-2015. The model predicted habitat selection with 96% accuracy and identified key variables as year, climate, conifer abundance, elevation, and distance to roads. By relating patterns of selection with occupancy, we can better inform sampling design for occupancy studies and wildlife conservation.

5:45 pm **Shaniya Anand**, Anthropology (Dr. Christine Schreyer) IURA

Vile Biimo Le'shaha (We Share The Same Understanding): Inspiring Healing Through a Conlang

My research examines how the constructed language, Marosha, could be a resource in self-healing, community-building, and therapeutic contexts. My main research goal was to determine whether having access to constructed vocabulary could benefit individuals, who have experienced anxiety or trauma in their lives, by helping them to better understand, normalize, and express their experiences. In total, 48 participants completed the online survey, which ran for three weeks. The results showed that participants who had experienced trauma or anxiety related to these words and found them useful, as did individuals who identified as non-binary genders and members of the LGBT+ community.

6:00 pm **Eric Douglas**, Geography (Dr. Mary Stockdale / Dr. Eric Li) URA

North Okanagan Food Economy Study

This research examines local food purchasing behavior and preferences using a mixed methods approach. An attempt is made to offset the often unreliable self-reported data that occupies most of this field of study. A two stage, quantitative and qualitative study revealed results that enforce the notion that local food is highly preferred and considered as a superior alternative to conventional products by participants. A nuanced approach was used to determine the most common food types purchased from local sources as well as identify areas of strength and weakness in the regional food economy in the North Okanagan.

6:15 pm **Yaxin (Louisa) Li,** Management (Dr. Jennifer Davis) IURA

Measuring the Impact of the Falls Prevention Clinic on Health Care Expenditure and Health Outcomes/Quality of Life

Falls are a leading cause of morbidity and mortality among seniors. Falls are costly ranging from US $10,749 per fall-related injuries and US $23,483 per fall-related hospitalization. Fortunately, falls are preventable through targeting modifiable risk factors. The primary objective of this study was to estimate the impact of a Fall Prevention Clinic – a multifactorial approach for falls prevention -- on health resource utilization. We collected HRU over 12 months. Seminal

research demonstrated the prevention method used by Falls Prevention Clinic leads to a 40% decline in falls. Given our HRU projections, $2.1 billion healthcare dollars could be saved using this approach.

6:30 pm **Somin Lee**, Management (Dr. Eric Li) IURA

Soft Power and Nation Rebranding: The Transformation of Korean National Identity through Cosmetic Surgery Tourism

The purpose of this paper is to examine how nation re-branding could serve as a new soft power building strategy. The authors analyzed a variety of secondary data to unpack strategies that marketers and government agencies adopt to promote the notion of K-beauty. Findings of our analysis show that the development of Korea's cosmetic tourism is a new extension of the recent *Hallyu* culture. The popularity of K-beauty also shows both internal and external influences where Korean citizens are normalized cosmetic surgery as new norm and accepted practice. The paper provides new conceptual framework that connect nation branding with the theory of soft power.

6:45 pm **Dias Yessensayev**, Management (Dr. Eric Li) IURA

Systematic Review of Corporate Philanthropy

Corporate giving has contributed $20.77 billion towards the overall charitable giving in 2017. The growth of interest for corporate social responsibility continues to drive the momentum of corporate philanthropy (CP), transforming it from purely altruistic to strategic, which configures the relationship between marketing and society. By moving beyond the corporate-centric assessment, the notion of corporate philanthropy is re-conceptualized through the stakeholder-oriented perspective. Our proposed integrated framework illustrates the relationships between the antecedents and consequences of corporate philanthropy based on a systematic review of extant literature in marketing and management. Additionally, the impacts of (CP) on market systems are evaluated.

7:00 pm **Madelaine Lekei**, Anthropology (Dr. Fiona McDonald) URA

The Enabled Environment: Navigating Public Bathrooms and Accessibility in the Okanagan

In Canada, public bathrooms are complicated spaces where understanding the social dynamics of human rights is entangled with private human functions. The recently passed Accessible Canada Act addresses barriers that hinder the full and equal participation of individuals with disabilities. To date, there remains an absence of research on the accessibility of these political spaces. Through a four month, mixed-methods sensory ethnography, this study captures (1) a baseline understanding of accessibility in the Okanagan; (2) recommendations for training around the new Act for frontline workers in public libraries; and (3) insights into how users navigate inaccessible public bathrooms.

7:15 pm **Jo Scofield**, Sociology (Dr. Jasmin Hristov) URA

Community Perspective on International Support of Pro-Choice Activism in El Salvador

Abortion is currently criminalized in El Salvador. This has created many human rights issues that local and international groups are working to remedy. This project explores the involvement of international activist groups in El Salvador with the Salvadorian grassroots activists. Interviews were used to collect information from local activists on this topic. This information will allow international solidarity efforts to be optimized and therefore increase the efficacy of work on all sides. It is essential that international groups remember local activists are the experts on their own communities. Respecting this is an essential part of effective support.

7:30 pm End of second session and reception to follow

September 19, 2019

4:00 pm ***Opening Remarks and Introduction of first presenter by Dr. Bonar Buffam***

4:15 pm **Daniyal Mirza**, Political Science (Dr. Carey Doberstein) IURA

Decriminalization Model for Canada

Canada is currently going through an opioid crisis. In 2016 the province of British Columbia declared a province-wide public health emergency and declared the opioid problem an epidemic. There have been efforts to combat this problem, but what Canada needs is a more radical approach if it wants to begin fixing the issue. My research will set out to show decriminalization as a viable option for Canada. I will do this by looking at the example of Portugal, which has decriminalized drugs, and the rollout of marijuana legalization within Canada to find a way to apply decriminalization within Canada.

4:30 pm **Michaela Sullivan-Paul**, Political Science (Dr. Carey Doberstein) URA

Are Canadian Provinces Drunk on Power?

This research aims to understand how the vision of a united Canadian confederation is challenged by the presence of interprovincial trade barriers. Using the Canadian wine industry as a case study, the restrictive trade of liquor and wine between provincial borders since the Prohibition era suggests a fragmented liquor regulation and distribution system that encourages provincial favouritism over cohesive and effective domestic policy. This research has gathered the opinions and perspectives of wine producers, winery association representatives, liquor agents, lawyers, and economists from Canada's two wine producing provinces – Ontario and British Columbia – to contribute to these findings.

4:45 pm BREAK

5:00 pm **Mathew Saurette**, Mathematics (Dr. Rebecca Tyson) URA

Modeling Urban Dispersal of Mountain Pine Beetles Influenced by Low-level Wind Currents

The Mountain pine beetle (MPB), an insect native to western North America, killed 50% of total commercial lodgepole pine in British Columbia during the recent outbreak that started in the early 1990s. When epidemic levels of MPB accumulate in forests surrounding an urban environment, municipal trees become at risk of attack. The ability to predict which trees need protection would be a significant help in efforts to preserve municipal trees. In this talk, I will present a model for MPB movement in an urban landscape that includes the effects of low-level wind currents on MPB movement and potential attack patterns.

5:15 pm **Tianhao Wang**, Media Studies (Dr. Khalad Hasan) IURA

Mobile-Based Solution for Senior Citizens to Improve Their Technological Skill

People frequently use computing devices such as smartphones and desktop computers to access information. Though the younger generation feels comfortable using these devices, there is growing concern that many senior citizens face difficulties using these devices due to the lack of technical expertise. In this project, I developed a mobile-based solution to help senior citizens to improve their technical skills. More specifically, I developed an Augmented Reality application that guides senior people with step-by-step instructions on how to perform tasks on a computing device.

5:30 pm **Jonathan Gresl**, Computer Science (Dr. Ramon Lawrence) NSERC-USRA

Improving Sustainability in Agriculture using Wireless Sensor Networks

Wireless sensor networks can provide meaningful data to farmers and assist in achieving higher crop yields and lower production costs. Existing wireless technologies are constrained by limited transmission ranges, high power consumption, and complex deployment. This research explores improving the practicality of setting up wireless sensor networks for agriculture

including vineyards. Our approach deploys affordable sensor nodes that store, process, and transmit data directly to a central gateway using long-range radio transmitters that consume minimal power. Further, a publish/subscribe data messaging protocol enables interoperability. The result is a system that adapts easily and requires little maintenance from the user.

5:45 pm **Jakob Marshall**, Physics (Dr. Andrew Jirasek) NSERC-USRA

Polymer Gel Dosimetry using On-Board Cone Beam Computed Tomography

Radiation therapy treatment plans are becoming increasingly complicated for use in cancer treatment. Increased sophistication requires superior measurement tools. Polymer gel dosimeters are one of the few dosimeters with the ability of volumetric dose measurements. Polymer gel dosimeters are imaged many ways including using X-ray Computed Tomography (CT). Recently it has been shown that Cone Beam Computed Tomography (CBCT) is also an imaging option. The ability of CBCT in polymer gel dosimetry was compared against CT. While CT measurements exhibited a higher signal to noise ratio and minimized dose difference, CBCT was found to remain a viable imaging option.

6:00 pm **Sarah Wyse,** Mathematics (Dr. Javad Tavakoli) NSERC-USRA

A Note on Data Manifolds and their Applications

The stock market has long been studied to predict future trends; however, pattern discovery within historic data has received less attention. As described in "*The Geometry of Data*" by Casey Chu, using distance to determine similarities between data sets is greatly important to clustering data into recurring patterns. Advances in probabilistic methods using patterns could lead to improved accuracy in forecasting stocks. Chu applies these methods to 2727 data points from daily stock prices over 10 years. It was found that the most prominent patterns are increasing or decreasing trends and that self-transitions between patterns are of the greatest probability.

6:15 pm **David Hallinen**, Physics (Dr. John Hopkinson) IURA

Student Response to Various Teaching Methods in First Year Physics at UBCO

Changes were made to first year Physics courses in 2017. We tested if the changes improved students' abilities to apply Newtonian Reasoning using a standardized test that has been widely used in Physics Education Research. We found evidence that showed: students who participated in tutorials showed slightly more improvement than those who did not, that new Laboratories reconciled some commonly held misconceptions but also introduced others, students with less high school physics experience underperformed, there was a significant gender gap, and interactive teaching methods produced significant conceptual gains on the standardized test while traditional teaching methods did not.

6:30 pm **Carolina Leyton**, FCCS (Dr. Margaret Reeves/Dr. David Jefferess) IURA

Jigsaw Puzzle Girls: Understanding Young Latina Identity in a North American Setting through Narrative and Ethnography

Through an exploration of young adult (YA) fiction and ethnographic material, this research considers the challenges of growing up Latina in a North American setting. Every day, Latinas in the North America face a multiplicity of oppressions that generate internal struggles and affect how these women look at themselves. In order to better understand these conflicts, an analysis of YA novels and ethnographies was conducted utilizing concepts from post-colonial theory, critical race theory and Latino studies. When comparing the fictional representation of Latinas to the sociological studies of the Latina experience, four fundamental factors were found to affect this group of women the most profoundly: religion, family life, sexuality, and body image. The learning outcomes of this research served to generate a workshop for the UBCO community and gave me the tools to write my own fictional short-story about the struggles an international student faces when two cultures clash in a single body.

6:45 pm **Abdul Elramali**, Engineering (Dr. Mohammad Zarifi) IURA

Ground Penetrating Radar (GPR)

When it is critical to study what lies beneath the surface of the earth without excavation, the Ground penetrating radar (GPR) is one of the most advanced technologies in non-invasive sensing. Conventionally, GPR is mainly used in the geological and construction industries to conduct surveying tasks and building integrity inspections without altering its physical structure. The research was directed towards utilizing different technologies to carrying out GPR sensing that is cost effective, portable and automated. These advancements will allow GPR technology to perform a wider range of tasks such as inspecting pipelines for corrosion and leakages.

7:00 pm **Wenting Luo**, Engineering (Dr. Kevin Golovin) IURA

Saline Ice Adhesion Reduction

In the polar area and northern Canada, sea ice is a common occurrence, which often accompanies structural damage to vessels and gas exploration. Many studies have been done on ice adhesion strength; however, little has been done to investigate saline ice adhesion. In this project, we studied the shear component of saline ice adhesion on different surfaces and with different salinities. Compared to pure ice adhesion, a dramatic decrease in ice adhesion was observed in saline ice above -21℃. The lower saline ice adhesion above -21℃ is likely due to the coexistence of brine and ice observed.

7:15 pm **Noah Marshall**, Mathematics (Dr. Rebecca Tyson) NSERC-USRA

Modelling the effects of roadside mortality on western toad populations

Western toads (Bufo Boreas) must migrate annually from terrestrial habitat in order to breed in an aquatic environment. During this migration many populations face road mortality. In conservation efforts, mitigation measures have been suggested to reduce this road mortality. Typically, not much is known about the overall population dynamics. Thus, we seek to develop and apply a mathematical model of the toad population in order to understand and make numerical predictions on how Western Toad populations respond to changes in road mortality. Different mortality (or the complement, survivorship) are investigated as well as certain changes.

7:30 pm End of third session with reception to follow