

COLLEGE CHEMISTRY CANADA
45TH ANNUAL CONFERENCE
MAY 24-27, 2018



HOSTED BY
NAIT CHEMICAL TECHNOLOGY
EDMONTON, ALBERTA

45th College Chemistry Canada Conference At-A-Glance

Thursday May24	Friday May25	Saturday May 26	Sunday May 27
12:45pm – 4:30pm Syncrude Research Facility tour. Bus departs from NAIT (NEST parking lot) 6:00pm – 8:00pm Welcome reception and registration CRAFT Beer Market, 10013 101A Ave NW, Edmonton	8:00am – Registration 8:30am – 10:00am – Plenary talk 10:00am – 10:20am Coffee break 10:20am – 12:00pm – Session 1 12:00pm – 1:00pm Lunch 1:00pm – 2:40pm Session 2 2:40pm – 3:00pm Coffee break 3:00pm - 4:00pm Session 3 6:30pm Banquet at Ernest's	7:00am Fun run 8:45am – 9:30am Employer Panel 9:30am – 9:50am Coffee break 9:50am – 11:20am Session 4 11:20pm – 12:30pm Lunch 12:30pm – 4:00pm Green Chemistry Symposium 4:30pm University of Alberta Campus Saint-Jean Green Labs tour. Bus departs from the NAIT CAT Building (118 Ave and 106 St parking lot)	8:30am – 10:00am – Plenary talk 10:00am – 10:20am Coffee break 10:20am – 11:00am C3 AGM 11:00am – 12:00pm Session 5 12:00pm C3 President's Message and Closing Remarks
Posters available for viewing from 8:00am on Friday until 12:00pm on Sunday Nanalysis Exhibitor Booth in the Glass Box (second floor of CAT Building)			

All sessions in the Dow Theatre CAT 191

All lunches and coffee breaks in the NAITSA Student Lounge – CAT Building Second Floor

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SCHOOL OF APPLIED
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May 24, 2018

Dear Colleagues,

The Chemical Technology Program welcomes you to the 45th Annual College Chemistry Canada (C3) Conference here at the Northern Alberta Institute of Technology in Edmonton, Alberta. We hope that you will have an inspirational, fulfilling, and enjoyable experience at the conference.

The central theme of the conference is Chemistry: From Classroom to Career. The conference line-up includes three plenary speakers, 28 contributed talks and two poster presentations on topics including active teaching strategies in the classroom and laboratory, creating supportive learning environments, and methods to increase student engagement.

We are excited to be collaborating with the University of Alberta Campus St. Jean for an afternoon of teaching and integrating green chemistry in education. To address questions regarding expectations and challenges of graduates of chemistry programs, we have invited a panel of our industry partners to provide their perspective and experience.

For their contributions, we would like to thank our plenary speakers: Charles Lucy (University of Alberta), Heather Kaminsky (NAIT Centre for Oil Sands Sustainability), and Amy Cannon (Beyond Benign). We would like to extend our appreciation to our industry partners EPCOR, Gilead Sciences, Imperial Oil, InnoTech Alberta, Cargill, and NALCO Champion for their participation. We would also like to acknowledge our sponsors for their substantial support: NAIT School of Applied Sciences and Technology, NALCO Champion, University of Alberta Campus St. Jean, PerkinElmer, VWR, and Nanalysis Corp. Along with our financial contributors, a big thank you to the many other local businesses for their contributions to the conference bags and door prizes. It is also crucial that we recognize all of those individuals who donated many hours to bring the conference together including: Arlana Moskalyk, John Barnard, Joe Clifford, Michael Slaney, Melanie Kaban, Cindy Rothwell, Elena Atrazheva, Jennifer Yaseyko, Olek Sukhorukov, Brittany Ewaskiw, Mary D'Mello, and Evelyn LeClair.

Our main goal is to provide you with a conference that will continue to foster the camaraderie that is the C3 organization, where new ideas are shared, new friends and contacts are made, and innovation in chemical education can flourish.

Enjoy!!

Paula Hawrysz

Laura Lucan

2018 C3 Conference Organizing Committee Chairs

11762 - 106 Street NW,
Edmonton, Alberta, Canada T5G 2R1
www.nait.ca

A LEADING POLYTECHNIC COMMITTED TO STUDENT SUCCESS

May 26th 2018

Dear C₃ Conference attendees,

We are very excited to have collaborated with NAIT to organize a symposium on integrating green chemistry in lecture and laboratory courses at this year's College Chemistry Canada Conference. We are thrilled that Amy Cannon, Executive Director of Beyond Benign has accepted to travel to Edmonton to be our plenary speaker. After attending this symposium, we hope that you'll find inspiration and resources to introduce and improve practices of green chemistry in your lectures and labs.

Our interest into incorporating more sustainable practices in teaching chemistry both in class and in the laboratories came a few years ago from a summer project. This project aimed to eliminate fresh water wastage from the use of condensers in undergraduate organic chemistry labs. During that summer, a water recirculating system was created in our lab and then used successfully with our students to save close to 15 000 liters of water per year. Our work caught the attention of the University's Sustainability Office and in 2016 we were awarded the Campus Sustainability Leadership Award and also became one of four Green Model Labs at the University of Alberta. Since then we have 'greened' several experiments and practices, and have also introduced a third year undergraduate green chemistry course at Campus Saint-Jean. Our mission as a Model Green Lab is to demonstrate our sustainable practices to users and guests and to keep improving for our lab to become even more green and safe. The idea of organizing this symposium with the C₃ Conference and to take you on a tour of our Model Green Lab came from that very mission.



We hope you enjoy this afternoon of sharing green ideas!

Sincerely,

Sarah Pelletier, Ph.D.
Director of the Science Teaching Labs and
Chemistry Professor

and

Vima Babooram, Ph.D.
Sessional Lecturer (Chemistry)



May 24th, 2018

Dear Colleagues,

Welcome to the 45th College Chemistry Canada Conference in Edmonton! This is the third conference held at NAIT (*thanks to the organizing committee and volunteers for adding to the host institute record*). If this is your first C₃ conference or the nth one, we hope your time here provides opportunities for sharing ideas, networking, and fun memories.

The speakers and activities this year will cover the theme of “Chemistry: From Classroom to Career” (*another C3 connection*). We have the opportunity to learn from our trials and tribulations in chemical education, share dialogue with the employer panel, find more applications of chemistry in the world and potentially research a variety of beverages. There may even be a couple of ‘double-double’ speakers (C₃ Glossary: *participants who submit two talk abstracts expecting only one to be accepted but end up with two talks to give*).

On behalf of the C₃ Executive Members and Directors, we wish you an enriching experience with the collegial C₃ community.

Warm regards,

Jimmy Lowe, President - C₃

Friday, May 25

Time	Name	Title
8:30	Stewart Cook, Dean of SAST	Opening remarks
8:45	Dr. Charles Lucy	Plenary Lecture: "Experiences and Benefits of a Career Development Course for Chemistry Students"
10:00-10:20	Coffee break	
	<i>Session 1. Effective Practices for Teaching Chemistry (Chair: Cindy Rothwell, NAIT)</i>	
10:20-10:40	Angela Crane Dalhousie University	Testing to Learn – A Glimpse into the Group Test Experience in Large Classes
10:40-11:00	Yann Brouillette Dawson College	Using myDALITE, the Free Interactive Rationale-Driven Problem-Solving Web-Based Tool Before, During and After my Chemistry Classes
11:00-11:20	Carl Doige Okanagan College	Bidding for students' commitment and attention in first year chemistry – the messiness of dangling carrots
11:20-11:40	Jessie Key Vancouver Island University	Best Practices in Figure and Diagram Design for Chemical Education
11:40-12:00	Jennifer Wolf, Rosamaria Fong, Jimmy Lowe, Bob Bower (BCIT) Matthew Fong, Sidney Fels (UBC)	Teaching chemistry writing, lab concepts and techniques through effective use of videos
12:00-1:00	Lunch sponsored by NALCO Champion, An Ecolab Company	
	<i>Session 2. Learning in Labs (Chair: Paula Hawrysz, NAIT)</i>	
1:00-1:20	Laura Lucan NAIT	Using student projects to update course content - a sustainable approach
1:20-1:40	Mel Schriver Crandall University	Metal Analysis by Combustion in Introductory Chemistry using Coffee Cup Calorimetry
1:40-2:00	François Gauvin Université de Saint-Boniface	GHS/WHMIS 2015 - Are You Ready for December 1st 2018?
2:00-2:20	Kelly Resmer Mount Saint Vincent University	Universal design for learning in undergraduate chemistry labs
2:20-2:40	Ken Hoffman Rocky View Schools	Symmetry: The Terra Incognita of Student Reasoning
2:40-3:00	Coffee break	
	<i>Session 3. Tips in Chemistry Instruction (Chair: John Lee, Camosun College)</i>	
3:00-3:20	Erin Evoy University of British Columbia	Science 101: An adult education initiative
3:20-3:40	Dietmar Kennepohl Athabasca University	It's Not Just About the Technology: Integrating Appropriate ICTs in the Laboratory
3:40-4:00	Erika Merschrod Memorial University of Newfoundland	Improving student engagement through collaborative design of rubrics (5 min tip)

Saturday, May 26

Time	Name	Title
7:00	Fun Run	
8:45-9:30	"Chemistry: From Classroom to Career" Employer Panel (Cargill, EPCOR, Gilead Sciences, Imperial Oil, InnoTech Alberta)	
9:30 – 9:50	Coffee break	
	<i>Session 4. Tools of the Trade (Chair: Paula Hawrysz, NAIT)</i>	
9:50-10:10	Erika Merschrod Memorial University of Newfoundland	Preparing students for a career, not just a job
10:10-10:30	Brett McCollum Mount Royal University	Chemistry students connecting with international peers to improve verbal communication skills and develop professional identity
10:30-10:50	Jose Rodriguez Nunez University of British Columbia	Introducing transferable skills in second year Analytical Laboratories
10:50-11:10	Dr. Matt Zamora Nanalysis Corp.	Revolutionizing undergraduate labs with benchtop NMR: An active learning approach
11:10-11:30	Katherine Darvesh Mount Saint Vincent University	Cooking up a New Experiment: a Kitchen Chemistry Home Experiment for an online Chemistry course
11:30-12:30	<i>Integration of Green Chemistry in Lecture and Laboratory Courses Symposium (Chairs: Sarah Pelletier, Vima Babooram, University of Alberta Campus St Jean)</i>	
12:30-1:15	Dr. Amy Cannon	Plenary Lecture: Green Chemistry Education: Preparing next generation chemists to practice sustainability through chemistry
1:20-1:40	Sudhir B. Abhyankar Grenfell Campus, Memorial University of Newfoundland	Green Chemistry, Environmental and Social Justice: An All Inclusive Approach to environmental chemistry education
1:40-2:00	Andrew P. Dicks University of Toronto	Teaching Reaction Efficiency Through the Lens of Green Chemistry: Should Students Focus on the Yield, or the Process?
2:00-2:20	Erika Daley My Green Lab	Making Organic Chemistry Teaching Labs Safer and More Sustainable
2:20-2:40	Coffee break	
2:40-3:00	Keshwaree Babooram Campus Saint-Jean, University of Alberta	A Green Chemistry Course to Support our Efforts toward a Culture of Sustainability
3:00-3:20	Kile McKenna and Sharon Brewer Thompson Rivers University	Connecting Applied Chemistry, Green Analytical Chemistry, and Sustainability at TRU
3:20-3:40	Hind Al-Abadleh Wilfrid Laurier University	A Course on Integrating the Relevance of Graduate Research in Chemistry to the United Nations Sustainable Development Goals
3:40-4:00	Karl Z. Demmans University of Toronto	GCI's Contributions to the Chemistry Teaching Fellows Program at UofT
4:30	University of Alberta Faculté Saint-Jean Green Labs Tour	

Sunday, May 26

Time	Name	Title
8:45-10:00	Dr. Heather Kaminsky	Plenary Lecture: "From Classroom to Career: Helping Students on the Path to an Applied Research Career"
10:00 – 10:20	Coffee break	
10:20-11:00	C3 AGM	
	<i>Session 5. Designing, Choosing, and Using Instructional Resources (Chair: Arlana Moskalyk, NAIT)</i>	
11:00-11:20	Yann Brouillette Dawson College	Comic Book Chemistry Part Eight: Heroic Experiences
11:20-11:40	Kristy M. Erickson Red Deer College	Understanding Structure: A Student-as-instructor Teaching Activity for VSEPR Shapes
11:40-12:00	Mel Schriver Crandall University	The On-Campus Outdoor Chemistry Laboratory: Betula and Sugar in the First Year Chemistry Course
12:00	C3 President's Message and Closing Remarks	

Posters:

1. Dhruv Nandakumar (University of California Davis): "Exploring the Effectiveness of Engaging Students in a Discussion about a Socio-Scientific Issue"
2. Vivian Mozol, Brian Gilbert, Judy Tran (University of Calgary): "Escaping to a Career in Chemistry"

45th College Chemistry Canada Conference Sponsors



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2018 College Chemistry Canada Student Scholarship Recipients

The College Chemistry Canada Executive Committee is very pleased to announce the recipients of the 2018 C3 Host College Student Scholarship and the 2018 C3 General Student Scholarship.

They are **Marc Ang** from NAIT and **Brian Gilbert** from the University of Calgary, respectively.

2018 C3 Host College Student Scholarship



The C3 Host College Student Scholarship is designed to help a student pursue studies at a Canadian college or university in science, and to raise the profile of College Chemistry Canada. To reflect the diversity of programs and objectives of colleges in Canada, the criteria for awarding are left to the institution which hosts the annual C3 conference.

Marc just completed the first year of the Chemical Technology program at NAIT and for the summer he is working in a lab at the Imperial Oil Strathcona Refinery. Marc is interested in the fields of organic chemistry and biochemistry and in the future he would like to work in a lab involved with the synthesis of drugs and the study of drug interactions with the human body.

2018 C3 General Student Scholarship



The C3 General Student Scholarship is designed to help a student pursue studies at a Canadian college or university, or other post-secondary institution) in science, and to raise the profile of College Chemistry Canada.

At the University of Calgary, **Brian Gilbert** is pursuing a B.Sc. in the Natural Sciences Program from the Faculty of Science and a B. Ed. from Werklund School of Education. Brian has a passion for Chemistry and Chemical Education and it is very involved in research related to Open Educational Resources. Brian is very interested in all aspects of student life and acted as a mentor and the friendly face of the university to incoming students. He is the president of the Natural Sciences Student Association (NSSA) at the University of Calgary.

Plenary Lecture

Friday, May 25, 8:45 – 10:00am, CAT 191

Professor Charles Lucy

Department of Chemistry, Gunning/Lemieux Chemistry Centre
University of Alberta, Edmonton, AB, T6G 2G2
E-mail: charles.lucy@ualberta.ca



“Experiences and Benefits of a Career Development Course for Chemistry Students”

Abstract

What job can I get with a chemistry degree?

This is a common question asked by students. Many (most?) chemistry instructors do not have the resources or experience to confidently answer this question. This presentation discusses a number of the strategies that we developed at the University of Alberta to raise awareness of students to career opportunities in chemistry.

We developed *Introduction to Industrial Chemistry* [1] to introduce our students to the practices, environment, concepts, and other issues associated with the industrial workplace. The course has no traditional lectures. Rather it consists of seminars by chemists from local industry, industrial tours, informational interviews, and professional skills development such as resume writing and interview skills. Prior to these events, students watch short videos related to the career or industry [2], and post a reflection or question. As a final exam, students apply to a job description provided by a local chemist, and then do a “mock interview.”

The challenges and outcomes of the career course will be discussed, but my key message is don't try to do it by yourself. There are many willing and eager to help you. And it does not need to be a full course for students (and instructors) to benefit.

To get the most out of this discussion, bring a smart phone or laptop.

1. www.ualberta.ca/chemistry/undergraduate-program/courses/chem-300
2. www.ualberta.ca/chemistry/undergraduate-program/resources-for-careers-in-chemistry

Plenary Lecture

Saturday, May 26, 12:30 – 1:15pm, CAT 191

Dr. Amy Cannon

Executive Director, Beyond Benign, 100 Research Drive, Wilmington, MA 01887

E-mail: Amy_Cannon@beyondbenign.org



“Green Chemistry Education: Preparing next generation chemists to practice sustainability through chemistry”

Abstract

Today’s global sustainability challenges will involve innovative chemical solutions. Green chemistry by definition is the intentional design of safer, less hazardous products and processes that reduce or eliminate hazardous substances. The implementation of green chemistry throughout educational systems is essential to support a growing global greener chemicals market. Through innovation in the laboratory and with changes in chemical education, chemistry students can be prepared to solve 21st century problems.

This presentation will discuss techniques and resources for adopting green chemistry throughout our educational systems and highlight higher education programs that are aimed at transforming chemistry education, including Beyond Benign’s Green Chemistry Commitment, a voluntary, flexible framework for chemistry departments to adopt green chemistry theory and practice. The Commitment aims to transform chemistry education in higher education to equip students with the skills and knowledge to design safer, more sustainable products and processes. Additional resources will be presented, including a newly available Green Chemistry Resource Guide for the Organic Chemistry Lab Course.

Plenary Lecture

Sunday, May 27, 8:45 – 10:00am, CAT 191

Dr. Heather Kaminsky, P.Eng.

Ledcor Chair - Oil Sands Environmental Sustainability, NAIT

9413 - 20th Ave. NW, Edmonton, AB, T6N 1E5

E-mail: hkaminsky@nait.ca



“From Classroom to Career: Helping Students on the path to an Applied Research Career”

Abstract

Applied research is the art of applying scientific principles to solve practical problems. At the Center for Oil Sands Sustainability these problems range from determining the best test methods to measure properties of crude oil to the best types of chemical additives to add to oil sands tailings to speed up reclamation.

Good research requires good technicians and technologists. Training good technicians and technologists requires mentorship. This presentation talks about the role of technicians and technologists in the research I have conducted in my career as well as highlighting some of the mentorship I have received in my career from summer student to Lead Researcher. I will also talk about the ways NAIT's Center of Oil Sands Sustainability involves students in our research.

Contributed Oral Presentations

Friday, May 25, 2018

Session 1. Effective Practices for Teaching Chemistry

Chair: Cindy Rothwell, NAIT, AB

10:20-10:40 Angela Crane (Dalhousie University, NS) *“Testing to Learn – A Glimpse into the Group Test Experience in Large Classes”*

Abstract: For a first year student, the first midterm of the course is a significant point of anxiety due to a culture that places emphasis on grades rather than learning. As such, the First Year Chemistry Team at Dalhousie began to pose the questions - how can we modify our testing structure to lower test anxiety for our students and why can't students have a learning experience during a test? As a result the team decided to turn a routine testing situation into an opportunity for active learning by introducing group tests as part of the course. Throughout the group test, students are able to discuss test questions with their peers, network with their classmates, and potentially receive a small grade incentive for successfully completing the test as a group. This presentation will highlight the benefits (and disadvantages) of the group testing model, as well as discuss how this learning activity was successfully integrated into a large class of 1300-1500 students.

10:40-11:00 Yann Brouillette (Dawson College, QC) *“Using myDALITE, the Free Interactive Rationale-Driven Problem-Solving Web-Based Tool Before, During and After my Chemistry Classes”*

Abstract: DALITE: The Distributed Active Learning Interactive Technology Environment is a web-based tool designed on the principles of Peer Instruction that promotes student's self explanation and asynchronous explanation to others. This design-based research project involved practitioners and researchers in the co-design process. Mainly used for chemistry and physics, DALITE provides immediate and detailed feedback to instructors and greatly supports the flipped classroom method or active learning approach in general. Students are better prepared for class and teachers can identify conceptual issues before class and tailor their class to focus on these specific issues. It involves the learners in a variety of tasks including writing explanations for conceptual questions, reflecting on and comparing these explanations to those of peers and experts, and taking part in the social construction of the database repository by voting on the most convincing explanations. It also allows students to focus on both the collective and the individual – what does the class know and what do specific individuals need to know, where are they falling short.

Taking DALITE to the next level: What have we learned from a web-based peer instruction application? Available from:

[https://www.researchgate.net/publication/288210142 Taking DALITE to the next level What have we learned from a web-based peer instruction application](https://www.researchgate.net/publication/288210142_Taking_DALITE_to_the_next_level_What_have_we_learned_from_a_web-based_peer_instruction_application) [accessed Apr 24 2018].

11:00-11:20 Carl Doige (Okanagan College, BC) *“Bidding for students’ commitment and attention in first year chemistry – the messiness of dangling carrots”*

Abstract: Most educators would agree that students need directed practice and rich feedback in order to attain a level of understanding and skill in a particular discipline. Many educators also support the notion that such practice and feedback is most effective under formative conditions: that is, in a low-risk environment, where mistakes are viewed as opportunities to improve understanding and where successful learning is linked to effort and self-regulation. For more than a decade, I have implemented an online formative feedback (FF) program, outside of the regular course assessments, to assist students in their learning. Because the aim was to foster a mastery goal orientation, no grades were assigned to the students’ participation. While some students may have benefitted from this strategy, a significant weakness to the (FF) program was that, in general, less than half of the students participated. As a result, in the past two years I have implemented a modification to the FF program. In this incarnation, the FF program constituted 3% of the students overall grade and therefore, in principle, the students were required to participate. In this presentation, I will discuss how this modification affected the level and quality of the students’ participation.

11:20-11:40 Jessie Key (Vancouver Island University, BC) *“Best Practices in Figure and Diagram Design for Chemical Education”*

Abstract: Best practices and tips to consider when designing figures and diagrams for use in your lecture and course material. Emphasis will be placed on making your figures clearer and more accessible to today’s learners.

11:40-12:00 Jennifer Wolf, Rosamaria Fong, Jimmy Lowe, Bob Bower (BCIT, BC), Matthew Fong, Sidney Fels (University of British Columbia, BC) *“Teaching chemistry writing, lab concepts and techniques through effective use of videos”*

Abstract: The goal of this project is to assist students in their preparation and report-writing for the CHEM 0012 labs at BCIT. CHEM 0012 is a Chemistry 12 BC high-school equivalency course offered in the Technology Entry (TE) program at BCIT. Many students entering CHEM 0012 have limited or no lab experience. Two new sets of videos were made: one set of videos helped students to review lab concepts and provided guidance in writing their lab reports; another set of videos provided demonstrations of new techniques. Additionally, some videos previously developed for different courses were available to the students for reviewing some basic lab techniques. The students have the option to view the videos using the ViDeX system, a video-player application developed at UBC. Through the ViDeX system, the students' viewing behaviour and habits can be analyzed. The ViDeX system allows for tracking of key-word searching via transcripts and images, and for monitoring the frequency and duration of views. Student interviews at the end of the course will help to evaluate the effectiveness of the videos and allow for future improvements. An overview of the project and results to date will be presented.

Session 2. Learning in Labs

Chair: Paula Hawrysz, NAIT, AB

1:00-1:20 Laura Lucan (NAIT, AB) *“Using student projects to update course content - a sustainable approach”*

Abstract: The Project Management course has a long tradition and is a graduation requirement in the Chemical Technology diploma program at NAIT. At the beginning of the course, teams of 2-4 students are formed; each team is responsible for the completion of an assigned project and has a faculty advisor. Program faculty take turns teaching this course, based on their professional interests.

Maintaining up-to-date courses, in line with technical trends and industry demands, is an important part of polytechnic education. A variety of factors (time, complexity) sometimes preclude the updating of laboratory experiments in a timely manner. Assigning specific experimental tasks as student projects helps alleviate these factors.

Two student projects completed in the Winter 2018 term will be presented. One project involves the simultaneous analysis of a multi-component mixture by UV-Vis spectroscopy. The other project involves the analysis of riboflavin by fluorescence spectroscopy. Both projects will be implemented as experiments in the laboratory component of the Molecular Spectroscopy course.

1:20-1:40 Mel Schriver (Crandall University, NB) *“Metal Analysis by Combustion in Introductory Chemistry using Coffee Cup Calorimetry”*

Abstract: Flash bulbs represent an opportunity for students in the first year chemistry laboratory to be introduced to statistical analysis, stoichiometry, metal analysis and calorimetry. A variety of flashbulbs, utilizing a range of metal masses and metal compositions as the ignition metal, can be purchased on the used market for as little as 50 ¢ per bulb. Flashbulbs are used in the first laboratory (multiple bulbs are dissected and the average mass of the ignition metal determined as an introduction to statistical methods). The flash bulbs are used later in the semester for the thermochemistry laboratory as a problem based learning opportunity to determine the identity of the ignition metal using coffee cup calorimeters. Flash bulbs represent a sealed chemical reaction that can approximate a thermochemically closed system. Manufacturing standards for flash bulbs in the 1960's and 1970's were high enough that differences between bulbs are trivial. The laboratory exploits the change in ignition metal that occurred in the early 1960's (J.Chem.Ed., 38, 97 (1961) and simple combustion enthalpies to readily identify the ignition metals. Student response has been largely positive due to the high reproducibility and specificity of the results obtained using simple probeware and coffee cup calorimeters.

1:40-2:00 François Gauvin (Université de Saint-Boniface, MB) *“GHS/WHMIS 2015 - Are You Ready for December 1st 2018?”*

Abstract: On June 28th 2014, the Canadian Hazardous Products Act (HPA) was modified to comply with the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS). This led to the repeal of the 1988 Controlled Products Regulations (CPR), replacing them with the new Hazardous Products Regulations (HPR) on February 11th 2015. The HPR will be applied by provincial and territorial occupational safety and health agencies via the new Workplace Hazardous Material Information System 2015 (or WHMIS 2015).

Between February 11th 2015 and December 1st 2018, a three-stage Transition Period was planned to make sure all workplaces comply on time with the HPR. Although the major challenges of this transition are for the suppliers (manufacturers, importers, and distributors), the employers (including academic institutions) must also be ready for the December 1st deadline. Among other things, this means all labels and safety data sheets need to be up-to-date in their hazardous products inventory.

This talk will describe the approach we used at the Université de Saint-Boniface for, on the one hand, keeping our chemical inventory up-to-date and, on the second hand, to comply with GHS/WHMIS 2015 requirements.

2:00-2:20 Kelly Resmer (Mount Saint Vincent University, NS) *“Universal design for learning in undergraduate chemistry labs”*

Abstract: Universal Design for Learning (UDL) is a set of principles that taps into brain networks of recognition, strategic and affective domains to engage the why, what and how of learning (<http://www.cast.org/>). Incorporating UDL can help foster an equitable and inclusive learning environment by providing students with multiple means of representation, engagement and expression. In this presentation I will discuss how I’ve incorporated UDL in the undergraduate chemistry lab with multiple instructional and assessment practices. The methods used include using team-based learning, giving students choice on what type of assessments to submit for grading, videos to supplement lab learning, detailed grading rubrics and pointing out applications of the lab lessons. Developing these materials, lab lessons and assessments with UDL principles has appeared to reduce student lab anxiety, increased motivation and allowed students to demonstrate their unique strengths.

2:20-2:40 Ken Hoffman (Rocky View Schools, AB) *“Symmetry: The Terra Incognita of Student Reasoning”*

Abstract: This presentation will propose a change in high school chemistry curricula from the current nomenclature and proportional reasoning focus to a function and spatial reasoning focus.

High School Chemistry teachers have tended to view proportional reasoning, i.e. stoichiometry, as the primary problem solving tool in the chemistry education arsenal. Once the symbolism of chemistry syntax has been unlocked, proportional reasoning and a balanced chemical equation will solve most problems. Proportional Reasoning is addressed in the Alberta Mathematics curriculum in grade 8 and spirals up through the curriculum in various guises. In grade 11 and 12 chemistry, little knowledge of chemical structure is required to solve stoichiometry problems and what knowledge is needed can either be decoded from a data sheet or memorized. Transformative learning in chemistry, with enduring and far-reaching applications, results from a deep understanding of chemical structure. To understand chemical structure a student needs strong spatial reasoning skills and a strong grounding in symmetry elements. Each of these is lacking in our school curriculum. A change in curriculum focus stands to foster greater diversity of thinking among students and incorporate a cohort of students who had not been previously enticed by or suited to the current curriculum.

Session 3. Tips in Chemistry Instruction

Chair: John Lee, Camosun College, BC

3:00-3:20 Erin Evoy (University of British Columbia, BC) *“Science 101: An adult education initiative”*

Abstract: Science 101 is an adult education, community outreach program run through the Faculty of Science at the University of British Columbia. Science 101’s students are low-income adults who have had difficulty accessing higher education in the past. The free three-month course offers introductory science lectures across a wide breadth of science topics, accessible to those with a high school education or less. Lectures are made engaging through the use of “real world” case studies, hands-on activities, and demonstrations.

Students complete a final research project, during which many students acquire or improve basic computer skills. They work towards these final projects during facilitated tutorials, where they learn to recognize credible sources of information, access books on the UBC libraries website, and synthesize information on a topic of interest to the individual.

The program includes field trips to local science attractions, including the Vancouver Aquarium and TRIUMF, Canada’s particle accelerator centre, which provide context for the material presented in the classroom.

The talk will elaborate on the above points, and discuss the benefits of an adult education program to both the students and the participants from UBC, as well as some challenges experienced during two years as a program coordinator.

3:20-3:40 Dietmar Kennepohl (Athabasca University, AB) *“It’s Not Just About the Technology: Integrating Appropriate ICTs in the Laboratory”*

Abstract: There are special challenges associated with the teaching of chemistry, the biggest one being how to handle the practical or laboratory components. Because information and communication technologies (ICTs) are playing an ever expanding key role in the rapid development of the knowledge economy and global open learning movement, they have become the de facto primary focus for the future of education. This presentation will examine the skills inventory for the 21st century scientist, emerging learner preferences and perspectives, and the role of the laboratory in chemical education, and the challenge of integrating ICTs with some evaluation of what is effective and what is not.

Athabasca University (AU) – Canada’s Open University has the mission to reduce barriers to university-level education and offers its curriculum entirely online and at a distance. This presentation reflects over twenty five years of experience as a chemistry professor and senior administrator at an open and online university and highlights a few of the alternative approaches in providing a high quality learning environment in the laboratory.

3:40-3:50 Erika Merschrod (Memorial University of Newfoundland, NL) *“Improving student engagement through collaborative design of rubrics”*

Abstract: I will present my experience with developing rubrics in collaboration with my class. My initial goal was to make the assessment process more transparent, and hopefully increase student "buy-in" to the assessment tools. Through this process I have found additional (and perhaps more important) benefits: developing the rubrics served as a formative assessment tool in itself, with associated improvements in time-management on the part of the students.

Developing rubrics takes class time, so I will focus this "quick tips" presentation on some ways that I have found to streamline the process. I may also convince you that collaborative development of rubrics is class time well spent!

Contributed Oral Presentations

Saturday, May 26, 2018

Session 4. Tools of the Trade

Chair: Paula Hawrysz, NAIT, AB

9:50-10:10 Erika Merschrod (Memorial University of Newfoundland, NL) *“Preparing students for a career, not just a job”*

Abstract: How do we prepare students for a fulfilling career, when we and the students are often bogged down with pragmatic concerns about covering content and meeting prerequisites for accreditation or a specific job? And for those of us who have only ever worked in academia and are very far in age from our students (i.e. old), how aware are we of current career options or the aspirations of our students?

I will lead us through a series of questions that we will address as a group, culminating in a short list of suggestions for making time and space in our courses for career exploration.

10:10-10:30 Brett McCollum (Mount Royal University, AB) *“Chemistry students connecting with international peers to improve verbal communication skills and develop professional identity”*

Abstract: Chicken foot and moose antlers may be descriptions that your students use when they don't remember the proper names for the isopropyl and tert-butyl moieties. These local dialects represent a type of incorrect terminology known as interlanguage (Selinker, 1972). Without a strong command of the language of chemistry, students struggle with mechanistic reasoning (Flynn et al., 2017), are unable to communicate like professionals (Bhattacharyya and Harris, 2018), and the repercussions can persist beyond the undergraduate experience (Bhattacharyya and Bodner, 2005).

To support both student learning of course content, improve students' chemistry communication skills, and reduce the use of interlanguage, faculty at Mount Royal University and the University of Illinois Springfield designed a series of collaborative learning experiences for organic chemistry. For 6 weekly assignments, students completed a portion of the assignment on their own and then communicated over video chat with their assigned international partner to collaboratively complete the assignment.

In this session, I will present data from student descriptions of their OCA experience (Skagen et al., 2018). Revisions to the OCA design and implications of the study will be discussed. Expansion of the initiative has begun. Information on how to participate in the International Network for Chemistry Language Development (INCLD) will be shared.

References:

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- Bhattacharyya, G. and Harris, M.S. (2018). Compromised Structures: Verbal Descriptions of Mechanism Diagrams. *J. Chem. Educ.* 95(3), 366–375. DOI: 10.1021/acs.jchemed.7b00157
- Flynn, A. B., Featherstone, R. B. (2017). Language of mechanisms: exam analysis reveals students' strengths, strategies, and errors when using the electron-pushing formalism (curved arrows) in new reactions. *Chem. Educ. Res. Pract.* 18, 64-77.
- Selinker, L. (1972). Interlanguage. *IRAL*, 10(1-4), 209-232.
- Skagen, D., McCollum, B., Morsch, L., Shokoples, B. (2018). Developing communication confidence and professional identity in chemistry through international online collaborative learning. *Chem. Educ. Res. Pract.* 19, 567-582. DOI: 10.1039/C7RP00220C

10:30-10:50 Jose Rodriguez Nunez (University of British Columbia, BC) *“Introducing transferable skills in second year Analytical Laboratories”*

Abstract: The second year analytical laboratories at UBC-Vancouver underwent major changes in 2015. As a result, six new experiments have been developed and implemented since. In addition, a number of activities meant to develop students' transferable skills were introduced into the laboratory curriculum. For example, mandatory prelab quizzes, student-led prelab talks, oral reports, and completion of guided-inquiry projects are major features of the current Analytical laboratories. In this talk, I will describe how these activities are run and how they can be of use in students' careers.

10:50-11:10 Dr. Matt Zamora (Nanalysis Corp., AB) *“Revolutionizing undergraduate labs with benchtop NMR: An active learning approach”*

Abstract: Educational curricula trends are shifting towards hands-on, guided-inquiry approaches that help students obtain meaningful learning. Even though nuclear magnetic resonance (NMR) is the most commonly used characterization technique in inorganic and organic chemistry, it is usually the least available to undergraduate students. Since the biggest restriction to including NMR spectroscopy in laboratories is the limited accessibility of high-field NMR, benchtop NMR provides an easy solution. Through the use of innovative and creative experiments to teach students the applications of NMR spectroscopy outside of ordinary "characterization-only" analyses, benchtop NMR helps to implement a more hands-on pedagogical strategy to the laboratory.

Students can operate a real spectrometer instead of simply looking at printed spectra.

Within a laboratory context, simply handing out pre-printed spectra of model compounds does little to remove the mystery associated with NMR spectroscopy. As access to an NMR spectrometer has previously been the limiting factor, strategies have focused on increasing the accessibility and acquisition of raw data. This presentation will focus on outlining how organic experiments, both classic and contemporary, can be revolutionized with student-access to benchtop NMR spectroscopy.

11:10-11:30 Kathy Darvesh (Mount Saint Vincent University, NS) *“Cooking up a New Experiment: a Kitchen Chemistry Home Experiment for an online Chemistry course”*

Abstract: The lab component of a chemistry course poses significant challenges when adapting the course to an online delivery mode. Kennepohl and Shaw outline various ways to meet these challenges, including simulations, labs conducted by remote control, on-campus lab sessions held over brief time intervals, and home-study experiments, either using a laboratory kit with chemicals sent to the student, or with common household materials, (so-called “kitchen chemistry”)(1). I have employed the latter approach in developing the online version of Chemistry 1005: a course (with lab component) designed to prepare students for General Chemistry. Students who take Chem1005 have typically either not taken high school Chemistry, or they are looking for a refresher course prior to taking university-level General Chemistry. I was encouraged to find out how many lab learning outcomes could be achieved at this level using items to be found in a typical kitchen. In my presentation, I will describe a heat capacity experiment that has been adapted for home-study.

(1) D. Kennepohl and L. Shaw (Eds) *Accessible Elements: Teaching Science Online and at a Distance*, Canada: AU Press, 2010.

Contributed Oral Presentations

Saturday, May 26, 2018

Symposium:

Integration of Green Chemistry in Lecture and Laboratory Courses

Chairs: Sarah Pelletier, Vima Babooram, University of Alberta Faculté Saint-Jean, AB

1:20-1:40 Sudhir B. Abhyankar (Grenfell Campus, Memorial University of Newfoundland, NL) *“Green Chemistry, Environmental and Social Justice: An All Inclusive Approach to environmental chemistry education”*

Abstract: There is little doubt that education in green chemistry has played a key role in sustainable development. As chemical educators, we have been training our students to apply the principles and practices of green chemistry as the progress through their undergraduate careers. In the last few years, there has been an increasing demand that our students should also be trained in the areas of environmental and social justice before they embark on their chosen careers. This will allow them to design and execute chemical processes that will include not only the economic and environmental implications, but will also consider environmental and social justice as components of societal implications.

This presentation will focus upon how this can be achieved in green chemistry education

1:40-2:00 Andrew P. Dicks (University of Toronto, ON) *“Teaching Reaction Efficiency Through the Lens of Green Chemistry: Should Students Focus on the Yield, or the Process?”*

Abstract: This presentation will focus on some green metrics of current interest to chemistry instructors as an example of industry-driven education. It will highlight a recent shift from the teaching of established reaction metrics including yield and atom economy (AE) to industrially-relevant global mass metrics such as process mass intensity (PMI). A proposal will be made that all chemistry students should undertake a “global mass inventory” to determine material efficiency in a chemical transformation they perform as part of their curriculum. Context will be provided to each described metric through reference to a common undergraduate organic experiment: the aldol condensation of benzaldehyde and acetone to form dibenzalacetone.

2:00-2:20 Erika Daley (My Green Lab, CA) *“Making Organic Chemistry Teaching Labs Safer and More Sustainable”*

Abstract: Despite the underlying fundamental reliance on chemistry innovations for a more sustainable future, undergraduate chemistry teaching laboratories still rely on traditional experiments that are resource-intensive and employ hazardous reagents. The recently released ‘A Guide to Green Chemistry Experiments for Undergraduate Organic Chemistry Labs’ seeks to provide educators with a set of safer, greener alternative organic chemistry experiments to demonstrate key transformations at the undergraduate level. This presentation will focus on how to use the guide to educate the next generation of scientists to design experiments with sustainability in mind, and how to use it as a resource for innovation and best practices in research labs.

2:40-3:00 Keshwaree Babooram (University of Alberta Faculté Saint-Jean, AB) *“A Green Chemistry Course to Support our Efforts toward a Culture of Sustainability”*

Abstract: This presentation focuses on a green chemistry course, CHIM 340 that was recently added to the University of Alberta’s Campus Saint-Jean’s calendar. The idea of this new course stems from our recent achievements toward the creation of a sustainability culture in chemistry. These include the incorporation of a number of green chemistry principles in the general chemistry and organic chemistry experiments, a green space certification of the teaching lab, and a model green lab award. Over the last two decades, green chemistry has gained considerable interest and it has made and continues to make its way into industry, namely pharmaceuticals, chemicals and manufacturing, as well as the academic sector. It therefore, becomes the responsibility of various stakeholders of universities and other educational institutions to promote green chemistry education. With proper training, we will be able to produce a new generation of chemists trained to perform in a safer and more responsible way, hence positively impacting the environment, health, and safety. CHIM 340 does exactly that through the teaching of concepts and applications of green chemistry, and through a site visit and a guest lecture. This presentation highlights the contents and the goals of this new course. The assessment tools used to evaluate students will also be presented, and students’ response and future plans for the course will be discussed.

3:00-3:20 Kile McKenna, Sharon Brewer (Thompson Rivers University, BC) *“Connecting Applied Chemistry, Green Analytical Chemistry, and Sustainability at TRU”*

Abstract: At Thompson Rivers University, one of the fourth year lecture courses is CHEM 4600, Selected Topics in Applied Chemistry. This course is always team-taught and typically consists of two or three modules which change on a yearly basis, as do the faculty assigned to teach the course. The goal of this course is to be able to expose students to new and developing areas in applied chemistry. This talk will introduce CHEM 4600 and provide the background to its development as a course, discuss a recently taught module on Green Analytical Chemistry, and give both a faculty and student perspective on how this module topic led to an undergraduate student research project funded by the TRU Sustainability Office.

3:20-3:40 Hind Al-Abadleh (Wilfrid Laurier University, ON) *“A Course on Integrating the Relevance of Graduate Research in Chemistry to the United Nations Sustainable Development Goals”*

Abstract: In September 2015, the United Nations published 17 Sustainable Development Goals (SDGs) for 2030 that address the most important economic, social, environmental and governance challenges of our time. Yet, it is not common to find an explicit emphasis on sustainability topics in chemistry undergraduate or graduate curriculum. A new graduate level course was offered at Wilfrid Laurier University that aims to address the role of chemistry and biology in realizing seven SDGs: water, clean energy, climate, life below water and on land, responsible consumption and production, and good health and wellbeing. The course, Perspectives in Biological and Chemical Sciences (BH800), with a theme on ‘sustainability’, was offered for the first time in Winter 2018 to MSc and PhD students. This talk will describe the goals and structure of this course, and survey results of students at the end of the semester.

3:40-4:00 Karl Z. Demmans (University of Toronto, ON) *“GCI’s Contributions to the Chemistry Teaching Fellows Program at the University of Toronto”*

Abstract: The department of chemistry at the University of Toronto provides its graduate students the experience in developing pedagogical tools through the Chemistry Teaching Fellows Program (CTFP). In this program, a graduate student pairs with a faculty member to revamp undergraduate courses and laboratory experiments. This lecture will introduce the Green Chemistry Initiative (GCI) and then focus on two CTFPs that our members have developed over the years to enhance the undergraduate curriculum.

Contributed Oral Presentations

Sunday, May 27, 2018

Session 5. Session 5. Designing, Choosing, and Using Instructional Resources

Chair: Arlana Moskalyk, NAIT, AB

10:20-10:40 Yann Brouillette (Dawson College, QC) *“Comic Book Chemistry Part Eight: Heroic Experiences”*

Abstract: The intertwined relationships of chemistry and superhero ability forms the basis of much science fiction. But in the POW WOW agenda, knowledge can be triple distilled. Super heroes have an undercover mission to arouse public curiosity about chemistry while fighting the most treacherous villain of all, ignorance.

This talk continues previous years' presentations about the “Chemistry of Superheroes”, focusing this time on the mysterious chemistry protocols in mainstream comics. Chemical evidence will be used to analyze certain super powers, innovative armors and marvelous abilities described in comic book universes. A fun and critical look at rational explanations describing out-of-the-ordinary events impersonated by characters seen in movies, TV shows and graphic novels will be investigated.

From Ant-Man's shrinking ability and Mjolnir's lightning effects to the Ghostbusters' ectoplasmic manifestations, key chemical concepts can be extracted from supernatural stories. As a result, by discerning magic from scientific, a comic book fan can be a chemistry enthusiast.

10:40-11:00 Kristy M. Erickson (Red Deer College, AB) *“Understanding Structure: A Student-as-instructor Teaching Activity for VSEPR Shapes”*

Abstract: Do people actually learn best by teaching? Do they think they learn best by teaching? Those are the questions! In this preliminary study, first-year students enrolled in Chemistry 211 (Introductory Chemistry I) were given the opportunity to participate in an in-class activity that allowed them to (1) learn how to identify a particular VSEPR shape, and (2) teach their peers how to learn that shape name. Anonymous student feedback (from questionnaires) was then collected. This presentation outlines the details of the in-class activity, the questionnaire results, and future directions for this study.

11:00-11:20 Mel Schriver (Crandall University, NB) *“The On-Campus Outdoor Chemistry Laboratory: Betula and Sugar in the First Year Chemistry Course”*

Abstract: We have created a laboratory involving sap collections from young birch trees (*Betula*) that monitor the variations in the daily output and chemical composition of tree sap using commercial glucometers. The lab links to the organic chemistry and biochemistry sections of introductory biology and chemistry. The method is sacrificial for the trees, selected and monitored by small groups of students and involving the late winter limbing of the entire tree and tethering so that entire spring sap output leaves the tree at the top of the trunk to be collected on a daily basis in water bottles that slip over the end of the trunk. The tree is then cut down so that the mass and age may be determined. The relationship between the invert sugar content of the sap as measured by glucometers (glucose via fermentation) to the total sugar (sucrose) is explored in the laboratory to provide calibration and reference data. Sap runs from maple trees (*Acer*) are more commonly known and there have been dated published accounts of chemical laboratories involving maple sap (*J.Chem.Ed.*, 1953; 1973) and syrup (*J.Chem.Ed.*, 2007) this is the only account that we are aware of that uses Birch as the study focus.

Contributed Poster Presentations

1. Dhruv Nandakumar (University of California Davis): *“Exploring the Effectiveness of Engaging Students in a Discussion about a Socio-Scientific Issue”*

Abstract: Chemistry is deemed to be irrelevant to students due to heavy emphasis on theory rather than applications in current science classrooms. This study attempts to determine student-perceived relevance of chemical education by integrating a Socio-Scientific Issue (SSI), such as Hydraulic Fracturing, into General chemistry curricula. The aim was to engage students with the topic by facilitating a discussion on scientific applications.

A lesson plan was designed to stimulate self-directed learning by allowing students to contrast and defend different points of view on hydraulic fracturing. Students were first given an extensive Prezi on Hydraulic Fracturing to provide a base knowledge of the issue. During discussion, students were assigned the role of Politician, Scientist, Environmentalist, or Oil Company Representative to encourage them to discuss the numerous perspectives on Hydraulic Fracturing.

Pre- and post-quizzes were administered to students to gauge how much was learned from this activity. An additional survey was also administered after the activity to measure how students responded to the activity. Results showed that most of the students perceived the lesson plan as relevant and interesting. This encourages contextualizing the chemistry curriculum through an SSI, to enable them to view the relevance of chemistry beyond the classroom environment.

2. Vivian Mozol, Brian Gilbert, Judy Tran (University of Calgary): *“Escaping to a Career in Chemistry”*

Abstract: A classroom that involves "Active learning" involves students thinking about the things they are doing while they are doing them (Bonwell & Wilson, 1991). Active learning strategies must have students directly engaging with the content of a class and collaborating with each other (Patton, 2015), and has been definitively shown to be more effective than lectures in promoting both comprehension and memory (Freeman et al, 2014). During active learning, students must engage in such higher-order thinking tasks as analysis, synthesis, and evaluation (Renkl et al, 2002). What chemistry related job description has not included a desire for the applicant to have strong skills such as these?

The authors have been examining how to help develop these skills through the use of a new active learning strategy based on the now popular idea of an “Escape Room”. The interactive poster, which the authors will present, introduces their first generation of a chemistry-driven escape room. The puzzles in the room are aimed for students at the junior to senior high-school level in the province of Alberta. Work is ongoing to extend this idea to first year post-secondary classes by having students engage in much more rigorous examinations of the chemistry behind the escape room puzzles.

Wireless Access at NAIT

The NAIT Main Campus has an extensive WiFi network in all buildings

Guest access to the campus wireless network is available either via **eduroam** (credentials from your home institution required) or via the **public** NAIT network.

Connecting to eduroam:

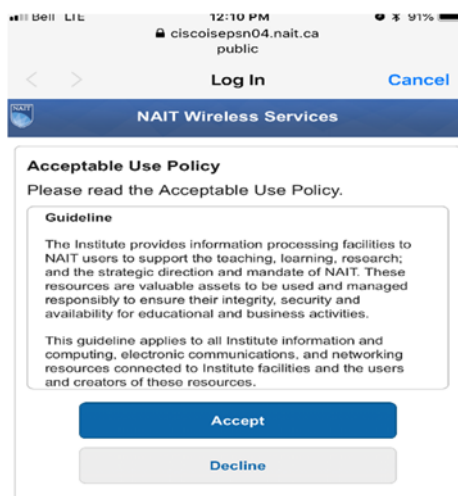
Select **eduroam** from the list of available WiFi networks.

Sign in by entering your user id and password when prompted. Please note that your **eduroam** user id should include your institution's domain name, e.g. **username@institution.ca**. You may receive a warning asking you to accept a security certificate.

Connecting to public:

Select **public** from the list of available WiFi networks.

Once your device is connected to the **public** network, you will have to accept the Acceptable Use Policy to be granted Internet access.



Note: MacEwan Residence is a wireless facility. The WiFi network is set-up and serviced by Shaw. If you are a Shaw subscriber, you can use the Shaw Go SSID, otherwise you can use the University Residence SSID. Please contact the Residence Front Desk at (780) 633-8000 or residence@macewan.ca for details and questions.

If you need further assistance, please ask one of the NAIT volunteers.

45th College Chemistry Canada Conference

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Recommended Nearby Restaurants and Pubs

Pubs/Bars Close to Grant MacEwan

1. The Canadian Brewhouse (240 m)
 - 10338 109 St NW
2. Mercer Tavern (600 m)
 - 10363 104 St NW
3. The Pint Public House (650 m)
 - 10125 109 St NW
4. Hudsons Canada's Pub (650 m)
 - 10141 109 St NW
5. Fionn MacCool's City Centre (1.1 km)
 - 10200 102 Ave NW (City Centre Mall)
6. Craft Beer Market (1.5 km)
 - 10013 101A Ave NW
7. Sherlock Holmes Pub (1.5 km)
 - 10012 101A Ave NW
8. The Underground Tap & Grill (1.6 km)
 - 10004 Jasper Ave

Pubs/Bars Close to NAIT

1. The Duck (220 m)
 - 10416 118 Ave NW
2. Good Neighbor Pub & Grill (450 m)
 - 11824 103 St NW
3. Boston Pizza (800 m)
 - 11440 106 St NW
4. Runway 29 Pub & Lounge (1.1 km)
 - 11312 109 St NW
5. Moxie's Grill & Bar (1.5 km)
 - 10628 Kingsway NW

Things to do in Edmonton May 26th:

More information at <https://exploreedmonton.com/event-calendar/>

Terry Fox-Running to the Heart of Canada exhibit at the TELUS World of Science

Take an in-depth look at Terry Fox's famous 143 day journey from St. John's, Newfoundland to Thunder Bay, Ontario. Developed by the Canadian Museum of History, in partnership with Terry Fox's family, the exhibit features a wide array of artifacts and archival materials including Terry's journal and artificial leg. Learn more about the Canadian hero who's Marathon of Hope raised \$24 million and has since lead to over \$700 million being raised for cancer research.

Located approximately 5.8km from NAIT main campus
Address: 11211 142 Street NW, Edmonton, Alberta
Saturday hours: 9:00am-6:00pm

St. Albert Kinsmen Rainmaker Rodeo and Exhibition

Watch some of the best cowboys and cowgirls, spend time browsing the marketplace where various vendors have some fantastic items up for sale, and take the family to the midway with more than 20 deluxe rides and games at the Rainmaker Rodeo & Exhibition. This year brings some of the hottest acts to the concert stage, an exciting parade and festival entertainment for all ages.

Address: Kinsmen Fairgrounds, 47 Riel Drive, St.Albert, Alberta (14.0km from NAIT main campus)
There is a park and ride option available from the Village Transit Station in St. Albert at Gate Ave/Grange Road (see next page)

Rainmaker Rodeo

Free Park and Ride



Trips depart Village Transit Station Every 15 minutes.

Please park only in designated Park and Ride areas. Respect private property.

Friday (May XX)		Saturday (May XX)		Sunday (May XX)	
First trip from VTS	Last trip from Rodeo	First trip from VTS	Last trip from Rodeo	First trip from VTS	Last trip from Rodeo
3:15 p.m.	2:10 a.m.	10:15 a.m.	2:10 a.m.	10:15 a.m.	6:25 p.m.



Starting at 6:30 PM under the big top is the Rainmaker Music Fest with performing acts by the James Barker Band, Dan Davidson, River Town Saints, & Emo Leblanc. Tickets on sale now! You can purchase tickets through ticketmaster

<https://www1.ticketmaster.com/rainmaker-music-fest-james-barker-banddan-st-albert-alberta-05-26-2018/event/11005470A78377DF?artistid=2302931&majorcatid=10001&minorcatid=2#efeat4212>

UFest – Edmonton Ukrainian Festival

Experience the colourful sights, toe-tapping sounds and culinary aromas of Edmonton's newest festival – UFest Edmonton Ukrainian Festival! UFest Edmonton Ukrainian Festival is a celebration of Ukrainian culture, food, music, dance and a whole lotta fun. This free two-day event will take place Friday May 25 and Saturday May 26 at Borden Park in Edmonton. UFest will feature two stages of non-stop entertainment from Alberta's best Ukrainian dancers, bands and musicians, with special guests from Ukraine. On Saturday night, head over to the beer gardens stage for UFest After Dark - an outdoor 'zabava' party featuring two of Edmonton's most popular Ukrainian bands. Enjoy Ukrainian food vendors, beer gardens, artisan demonstrations, vendor marketplace and more!

Located approximately 5.0km from NAIT main campus
Address: 7507 Borden Park Rd, NW Edmonton, AB T5B4W8
Entrance fee is free!

Events from 11:00am-8:00pm and the UFest After Dark is from 8:00pm-11:00pm

Check out the link for more information <https://www.ufest.ca/>

Haskin Canoe Sunset Tour Through the City of Edmonton (Laurier to Capilano Park)

View the orange and red glow of the sun setting as you paddle on the still waters of the North Saskatchewan. Haskin Canoe's sunset tours are a one-of-a-kind opportunity to transport through Edmonton's own backyard. You'll enjoy the serenity of this water adventure and may even be lucky enough to hear the distant cry of a loon or splash of a beaver. Don't forget to bring your binoculars and camera to view the birds and wildlife that you may encounter along the shoreline.

Voyageur Canoe
\$50/person + GST
\$25/for youth 17 & under
(Includes shuttle from Capilano Park to Laurier Park)

Where: Laurier Park to Capilano Park
Time: 2 to 2.5 hours on the water
When: 6pm to 11pm (approx. depending on month)
*Reservations required
To book your tour check out this link : <https://www.haskincanoe.ca/evening-paddles/>

Located approximately 12km from NAIT main campus
Address: Sir Wilfrid Laurier Park, 13221 Buena Vista Rd NW

Conference Notes

Conference Notes



Main Campus

LEGEND

- Information
- Hourly Parking
- Bus Stop
- Parking for persons with disabilities
- Motorcycle Parking
- Bicycle Compound
- Student Permit Parking
- Daily Parking

- PWA Pedway A PWD Pedway D
- PWB Pedway B PWE Pedway E
- PWC Pedway C PWE Pedway F

Emergency Meeting Points

BUILDING INDEX

- S** Activities Centre
- O** Central Building
- G** Centre for Chemical Studies
- C** Cenovus Centre for Power Engineering Technology
- H** Electronics Wing
- L** Engineering Technologies Annex
- C** Gateway Mechanical Services Centre for Building Environment Technology
- W** hp Centre for Information and Communications Technology
- PE** Human Resources Building
- PEB** Princess Elizabeth Building
- A** Industrial Building
- V** Industrial Technical Building
- CAT** JR Shaw School of Business
- J** J-Wing
- U** Learning Resources Centre
- F** Medical Wing
- QA** Parkade
- QB** Parkade
- Y** Petro-Canada Centre for Millwright Technology
- N** Sandvik Coromant Centre for Machinist Technology
- D** Services Building
- B** Shell Manufacturing Centre
- X** South Learning Centre
- Y** Spartan Centre for Instrumentation Technology
- E** Technical Building
- HET** Heavy Equipment Technology Building
- CAT** Centre for Applied Technology

OFFICES AND SERVICES

- Accounting Cash Office, **E-114**
- Athletics, **S-105**
- Campus Recreation Services, **O-117**
- CAT Computer Commons, **CAT-215**
- Computer Training Centre, **W-111**
- Continuing Education, **W-111**
- Counselling, **W-111PB**
- Encana Aboriginal Student Centre, **E-121**
- Health Services, **O-119 (South Lobby)**
- International Centre, **W-101**
- Library Services, **U-310**
- NAIT International Administration, **E-134**
- NAITSA Computer Commons, **W-203**
- NAITSA (NAIT Students' Association) **E-131**
- Office of the Registrar, **O-115 (South Lobby)**
- Protective Services, **D-104**
- Services for Students with Disabilities, **W-111PB**
- Shop at NAIT, **X-114**
- Student Awards, **O-101**
- Student Counselling Centre, **W-111PB**
- Student Engagement, **O-117**
- Student Service Centre, **CAT-180**
- Advising and Financial Aid Services
- Apprenticeship Information
- International Information
- Parking Office
- Registrarial Information and Transactional Services
- Student Payments
- Student Study Lounge, **U-210**
- Student Wellbeing and Community, **O-117**
- Tutorial Centre, **U-210A**

LOCATIONS

- Edmonton**
- Main Campus, 11762 - 106 Street NW
- Patricia Campus, 12204 - 149 Street
- Souch Campus, 7110 Gateway Boulevard
- NAIT Distribution Centre, 11311 - 120 Street
- Calgary**
- NAIT Calgary, 816 - 55 Avenue NE