



COLLEGE CHEMISTRY CANADA
LA CHIMIE COLLEGIALE AU CANADA

PRESENTS



COLLEGE CHEMISTRY CANADA
46TH ANNUAL CONFERENCE

MAY 24-26, 2019 HOSTED BY CAMOSUN COLLEGE

46th College Chemistry Canada Conference At-A-Glance

THURSDAY MAY 23 RD	FRIDAY MAY 24 TH	SATURDAY MAY 25 TH	SUNDAY MAY 26 TH
3:00- 7:00 pm Whale watching with Eagle Wing Tours. If you would like to go: Meet at 12, Erie Street, Fisherman's Wharf.	10:00 -11:00 am Tour of Ocean Networks Canada on the UVic Campus 1:00 -5:00 pm Scooter Tour of Victoria Meet at 685 Humboldt Street on the corner of Douglas and Humboldt. Don't forget your driver's licence. 6:00 pm – 9:00 pm Welcome reception, registration, and tours, at the Phillips Brewery, 2010 Government Street.	Fisher Building Room 100 8:00 am - Registration 8:30 am - Welcome and Territorial Acknowledgement 8:45 am - Plenary Lecture 10:00 am – Coffee Break 10:20 am - Session 1 12:00 pm - Lunch 1:00 pm - Session 2 2:40 pm – Coffee Break 3:00 pm - Session 3 4:00 pm - Close of Day 1 Blue Crab Restaurant in the Coast Hotel. 6:00 pm - Pre-banquet drinks 7:00 pm - Banquet	7:00 am - Fun Run UVic Campus Fisher Building Room 100 8:55 am - JW Gibbs Trophy 9:00 am - Session 4 10:20 am – Coffee Break 10:40 am - Session 5 11:30 am - AGM 12:10 pm - BBQ Lunch in the courtyard 1:10 pm - Session 6 2:30 pm – Coffee Break 2:50 pm - Session 7 3:35 pm - Closing remarks, photo.

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May 23rd, 2019

Dear C3 Colleagues,

Camosun College's School of Arts and Science, is delighted to welcome you all to the 46th Annual, College Chemistry Canada Conference, here in beautiful Victoria B.C.

The theme of this year's conference is the Art of Chemistry. Art is creative and inspiring. We all aspire to achieve these qualities in our teaching practice. Our canvas is the class room, through our myriad of teaching styles, we are able to create a rich and colourful foundation that students can embellish to help them understand, and have a positive impact on the world around them. Learning from each other enriches our practice, and it is our absolute pleasure to welcome Dr. Peter Mahaffy as our plenary speaker. Dr. Mahaffy will be speaking on 'Systems thinking, SOCMs, and educating about the molecular basis of sustainability'. A topic that is published in this month's edition of Nature Sustainability, and will be featured in a special edition of the Journal of Chemistry Education later this year. In addition, you the C3 community, have contributed a wealth of fabulous abstracts, and we know that everyone will enjoy an inspirational and fulfilling experience.

We would like to take this opportunity to extend our immense gratitude to the sponsors for their generous support and financial contributions: Perkin Elmer, the Chemical Institute of Canada (CIC), Vancouver Island Division, Fisher Scientific, Nanalysis, MacMillan Publishing, and the Phillips Brewing and Malting Works. In addition, we are grateful to the numerous local business that have contributed door prizes.

As the saying goes, it takes a village (or in this case a department!), to raise a conference, and we would be remiss if we were not to mention all our colleagues who were part of putting together this conference: Blair Surridge, Carol Chalmers, Ryan Fradette, David Stuss, Silvija Smith, Tatiana Popa, Larry Lee and everyone else in the department that always had an attitude of "anything you need". Thanks also go to our amazing fundraiser Christina Bauzon.

The fabulous artwork for our conference advertising was done by Camosun's very own Ken Steacy. Ken and his wife Jean started the hugely successful Comics and Graphic Novels Program here at the College. Ken is a Canadian Hall of Fame Comic Book Creator, and most recently collaborated with Margaret Atwood on War Bears. It is always a pleasure to work with him on our 'edutainment' projects.

We hope you enjoy the Conference, and that we are able to provide you with a platform where ideas are shared, friendships are renewed and formed, and the 'Art of Chemical Education' can be celebrated.

Yours in Chemistry,

John Lee

Andrea Fong

2019 Conference Organizing Committee Chairs.



May 25th, 2019

Dear colleagues and guests,

Welcome to Victoria and the 46th C3 Conference. Fun fact – Camosun College hosted the C3 way back in 1982 – way before I even thought about being a chemistry instructor. This week will offer speakers, fun activities, AGM and networking with the theme "The Art of Chemistry". You will also get to meet our new winners of the C3 Awards, Editor's Awards and 'Chemmys'.

I am extremely appreciative of all the Executive and Regional Directors contributions this past year. Many thanks to the conference coordinators John, Andrea and volunteers who will be getting us on time through this event.

Have a fantastic conference & all the best,

Jimmy Lowe, President

Conference Schedule

TIME	NAME	TITLE
8:00 am	Registration and Coffee	Outside Fisher 100
8:30 am	Conference Organizers	Welcome and Territorial Acknowledgement
8:45 am	Dr Peter Mahaffy	Systems thinking, SOCMs, and education about the molecular basis of sustainability
10:00-10:20	Coffee Break	Sponsored by Perkin Elmer
Session 1:	Chair: John Lee	Camosun College
10:20-10:40	Andrew P. Dicks University of Toronto	Reinventing Past Experiments: We all Scream for Sunscreen.
10:40-11:00	Katherine Darvesh Mount Saint Vincent University	Development of Chemistry Learning Outcomes: A Team Approach.
11:00-11:20	Sudhir B. Abhyankar Grenfell Campus Memorial University	What makes the second year organic courses so difficult: Forty years of reflection from students and teachers alike.
11:20-11:40	Nicole T. A. Sandblom University of Calgary	Creating via scientific writing: Providing flexibility to chemistry students in selecting topics, while learning about the writing process.
11:40-12:00	Alexandra Weissfloch VIU	A Dose of Toxicology in the Organic Classroom
12:00-1:00	LUNCH	Sponsored by Perkin Elmer
Session 2:	Chair: Ryan Fradette	Camosun College
1:00-1:20	Scott McIndoe University of Victoria	Getting hands-on with molecular geometry.
1:20-1:40	Ernie Prokopchuk Yukon College	Strange Things Done: Textbooks, Labs and Lates.
1:40-2:00	Melanie Kaban NAIT	It's all FUN and GAMES until something gets learnt.
2:00-2:20	Jennifer Wolf BCIT	Enhancing the teaching of first-year chemistry laboratories with effective use of videos
2:20-2:40	Carl Doige Okanagan College	Happy Prof, Happy Class: Positive reinforcement as a means to reduce student's digital distraction.
2:40-3:00	Coffee Break	Sponsored by Fisher Scientific
Session 3:	Chair: Larry Lee	Camosun College
3:00-3:20	Kris Quinlan University of Toronto	Chemistry Scholar's Day: A New Outreach Event
3:20-3:40	David Stuss Camosun College	Integrating Indigenous Perspectives in the Chemistry Classroom
3:40-4:00	Yann Brouillette Dawson College	Comic Book Chemistry Part 9: Science and Modern Mythology

TIME	NAME	TITLE
7:00 am	THE FUN RUN	Meet outside UVic Residences
8:00 am	Coffee and Snacks	Available from 8:00 am outside Fisher 100
8:55-9:00 am	J.W.Gibbs	In the form of a trophy
Session 4:	Chair: Blair Surridge	Camosun College
9:00-9:20	Charles Lucy University of Alberta	Mini-case studies to engage and prepare students for a classic quant lab
9:20-9:40	Erin Evoy UBC	Use of the online peer-to-peer feedback platform compare in materials chemistry
9:40-10:00	Jimmy Lowe BCIT	BCIT's GCMS will be live on the ILN
10:00-10:20	Larry Lee Camosun College	Student Preparation for Laboratory Work: The Use of Flowcharts
10:20-10:40	Coffee Break	Sponsored by Nanalysis
Session 5:	Chair: TBD	
10:40-11:00	Jose Rodriguez Nunez UBC	Inquiry-based Demonstrations in the Undergraduate Curriculum.
11:00-11:20	Matthias Paul University of Victoria	Modern Making Methods for Chemists
11:20-11:25	Kelly Resmer Mount Saint Vincent University	Prelab preparation for activation of background knowledge 5 minute teaching tip
11:25-11:30	Sofia Donnecke UVic	Gif refreshers for Reinforcing Lab Technique 5 minute teaching tip
11:30-12:10	AGM	
12:10-1:10	BBQ LUNCH	Sponsored by the CIC VI Division
Session 6:	Chair: Paula Hawysyz	NAIT & C3 President Elect
1:10-1:30	Sherrie Wang North Island College	Teaching Chemistry Using Tablet with OneNote
1:30-1:50	Todd Stuckless Langara College	A Langara Research Project
1:50-2:10	Gabriel Oba Lakehead University	Using Cell phones and laptops to create a fun learning experience in the classroom
2:10-2:30	Robin Stoodley UBC	Cognitive tasks in the chemistry lab, students are surprised at #7.
2:30-2:50	Coffee Break	Sponsored by McMillan
Session 7:	Chair: Jimmy Lowe	BCIT & C3 President
2:50-2:55	Yann Brouillette Dawson College	Periodic Table of the Elements Colouring Book 5 min teaching tip
2:55-3:15	Andy Ahiabu Perkin Elmer	Incorporating Analytical Instruments into College/Undergraduate Level Educational Curricula
3:15-3:35	Sudhir B. Abhyankar Grenfell Campus Memorial University	Sustainable Future, Green Chemistry and meeting the UN Sustainable Development Goals: An Integrated Approach.
3:35-4:00	President Jimmy Lowe	Closing Remarks, François Gauvin presents information on the 47 th Annual Conference in Winnipeg, the Group Photo.

Thank you to the 46th College Chemistry Canada
Conference Sponsors



Chemical Institute of Canada | *For Our Future*
Institut de chimie du Canada | *Pour notre avenir*



2019 College Chemistry Canada Student Scholarship Recipients

The College Chemistry Canada Executive Committee is very pleased to announce the recipients of the 2019 C3 Host College Student Scholarship and the 2019 C3 General Student Scholarship.

2019 C3 Host College Student Scholarship.

The C3 Host College Student Scholarship is designed to help a domestic student pursue studies at a Canadian college or university in science, and to raise the profile of the College Chemistry Canada organization. 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.

Working as a line chef inspired a passion in Kourosh "Kookie" Pazandeh to study food chemistry and molecular gastronomy. Kookie returned to education as a mature student, intent on pursuing his goal of entering the Food Science Program at UBC. Continuing his work as a line chef to finance his studies, he has maintained an impeccable GPA in his first and second year chemistry courses. He has recently been accepted into the highly competitive UBC program, and is currently completing the last of his courses to finish his Associates Degree of Science, here at Camosun.



2019 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 educational institution) in science, and to raise the profile of College Chemistry Canada

Erin Evoy has a passion for chemical education. At our 2018 Conference, Erin highlighted her role as a program coordinator for the UBC Science Outreach Program, Science 101, providing education opportunities to the most vulnerable population of Vancouver's Downtown Eastside. Through her work as a TA at UBC, Erin has worked to improve the teaching and learning of chemistry. At this year's conference, Erin will be presenting the peer-review exercise she has developed to help students with the high order cognitive task of assessing research literature. Erin's PhD research focus is on the physical properties of atmospheric aerosols.



Plenary Lecture

Saturday May 25th 8:45 -10:00 am

Dr. Peter Mahaffy

Chemistry Department and the King's Centre for Visualization in Science,
The King's University, Edmonton, Alberta, Canada T6B 2H3



Peter Mahaffy is professor of chemistry at the King's University in Edmonton, Canada, and co-director of the King's Centre for Visualization in Science (KCVS), which provides digital learning resources used by over a half million students, educators, and the public from over 100 countries each year. Peter's current research interests include rich contexts for chemistry learning, systems thinking in chemistry education, visualization in science, and climate change science education. He is a recipient of national and international awards for his work in chemistry education, including the 3M National Teaching Fellowship. He is a past chair of the CIC Chemistry Education Division and IUPAC's Committee on Chemistry Education.

"Systems thinking, SOCMEs, and educating about the molecular basis of sustainability"

ABSTRACT

What is systems thinking? What is the molecular basis of sustainability? What on earth is a SOCME? And why might I care about any of this as a C3 educator?

I will present preliminary outcomes from the work of a global IUPAC task force on *Systems Thinking in Chemistry Education* (STICE) which has the goal of moving learners from fragmented knowledge of chemical reactions and processes toward a more holistic understanding of the field. As part of the work of this group, we have published an article this month in *Nature Sustainability*ⁱ that unpacks the concept of the molecular basis of sustainability, and suggests ways in which systems thinking can be used to help present and future students tackle the increasingly urgent global sustainability challenges that are making headlines.

A tool developed with Tom Holme (Iowa State University) to visualize systems and define boundaries for chemistry students is Systems Oriented Concept Map Extensions (SOCMEs), which we will illustrate with examples from planetary cycles of reactive nitrogen and carbon. And stay tuned – you will find much more on systems thinking in chemistry education in a special issue of the *Journal of Chemical Education* entitled "*Reimagining Chemistry Education: Systems Thinking and Green & Sustainable Chemistry*," to be published in late 2019.ⁱⁱ

ⁱ Mahaffy, P.G.; Matlin, S.; Holme, T.A.; MacKellar, J. "*Systems Thinking for Education about the Molecular Basis of Sustainability*," **Nature Sustainability**, May 13, 2019, accessible at <https://rdcu.be/bBCMs> and accompanied by a blog that gives a personal account of the story behind the article - <https://go.nature.com/2HID3TL>.

ⁱⁱ Mahaffy, P.G.; Brush, E.J.; Haack, J.A.; Ho, F.M. (2018). "*Journal of Chemical Education Call for Papers-Special Issue on Reimagining Chemistry Education: Systems Thinking, Green & Sustainable Chemistry*," **Journal of Chemical Education**, 95 (10), 1689-1691.

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Contributed Presentations

SATURDAY MAY 25TH, 2019

10:20-10:40

Andrew P. Dicks
University of Toronto



Reinventing Past Experiments: We All Scream For Sunscreen

Over the last ten years, undergraduates at the University of Toronto have synthesized a cinnamate ester sunscreen analog via a three-step pathway (1,2). This recipe-driven experiment has been incorporated into a third-year course ("Organic Synthesis Techniques") (3). During January/February 2019, the synthesis was repurposed in an introductory attempt to teach "laboratory autonomy" to students, prior to more self-directed experiments embedded later in the semester (4). Laboratory guidelines were modified to provide more general directions for the second and third synthetic steps, rather than prescriptive instructions, and students were told to "carry their material through" in order to generate as much final product as possible. The "winning" student who formed the sunscreen analog with the highest yield and purity was awarded the Sunscreen Cup and received a bonus 1% towards their final course grade. This talk will outline the motivation for this pedagogical approach, along with student results and feedback.

(1). Stabile, R. G.; Dicks, A. P. J. Chem. Educ. 2004, 81, 1488-1491. (2). Goodreid, J. D.; Dicks, A. P. Chem. Educ. 2012, 17, 133-136. (3). Dicks, A. P.; Batey, R. A. J. Chem. Educ. 2013, 90, 519-520. (4). Edgar, L. J. G.; Koroluk, K. J.; Golmakani, M.; Dicks, A. P. J. Chem. Educ. 2014, 91, 1040-1043.

SATURDAY MAY 25TH, 2019

10:40-11:00

Katherine Darvesh
Mount Saint Vincent University



Development of Chemistry Learning Outcomes: A Team Approach

Chemistry departments across the country are at various stages when it comes to developing learning outcomes. Some are early on in the process, while others have had learning outcomes in place for some time. Having a good set of learning outcomes at the program level and the course level can enable a department to breathe new energy into their curriculum and their course offerings but getting started can be daunting. I will summarize some of the current thinking on learning outcomes. I will highlight the central role of our Teaching and Learning Centre in facilitating the process for our Chemistry department.

Contributed Presentations

SATURDAY MAY 25TH, 2019

11:00-11:20

Sudhir B. Abhyankar

Grenfell Campus, Memorial University of Newfoundland



What makes the Second Year Organic Chemistry courses so difficult?: Forty Years of Reflection from students and Teachers Alike

Second year organic chemistry or "Orgo" has earned the distinction of being one of the most challenging courses in the undergraduate degree programs in Canada and the U.S. After getting the feed-back from hundreds of students over the last forty years, it may be the time to seek some answers. This presentation will hopefully generate some interesting discussions during the question period and beyond.

SATURDAY MAY 25TH, 2019

11:20-11:40

Nicole T. A. Sandblom

University of Calgary



Creating via scientific writing: providing flexibility to chemistry students in selecting topics while learning about the writing process

Writing and Reviewing Scientific Reports is the scientific writing course offered by the Faculty of Science at the University of Calgary. Chemistry majors and most Geoscience majors require this course. Required courses can be stressful for students and instructors. We wanted to make the experiences of students, teaching assistants and instructors involved in the course less stressful and more creative. The course redesign considers the wellness of students as they learn to think about writing as a process. Students self-select topics with support from instructors, improve their writing skills iteratively and reflect on their learning.

Contributed Presentations

SATURDAY MAY 25TH, 2019

11:40-12:00

Alexandra N. E. Weissfloch
Vancouver Island University



A Dose of Toxicology in the Organic Classroom

Toxicology, which is inextricably linked to green chemistry, is an important topic for young chemists to be exposed to. But, how can it be incorporated into organic chemistry, whilst taking very little time away from the traditional and fundamental materials? A few examples of the infusion of toxicology into second-year organic chemistry will be presented.

SATURDAY MAY 25TH, 2019

1:00-1:20

Scott McIndoe
University of Victoria



Getting hands-on with molecular geometry

Comprehension of the 3D structure of objects usually represented in 2D is a critical part of understanding molecular geometries. The frequency with which students actually get hands-on with 3D molecular structures is often limited to a singular laboratory session. We sought to develop a set of molecular shapes that were inexpensive enough not only to deploy in a first-year laboratory setting but also to allow the students to take the set home with them to study at their leisure. Laser-cut acrylic parts in five colors were used, and each set could be quickly assembled into the 13 different molecular shapes commonly encountered at the first-year level. The set of shapes was attractive, useful, and easy and fast to fabricate, and they were appreciated by our students. All files have been released in an open-source format, so any interested parties can deploy these models as soon as they secure access to a suitable laser cutter or 3D printer.

Contributed Presentations

SATURDAY MAY 25TH, 2019

1:20-1:40

Ernie Prokopchuk
Yukon College



Strange Things Done: Textbooks, Labs, and Lates

I used to believe that there were some fairly standard expectations of a face-to-face chemistry course, beyond the obvious chemistry content. Students needed to attend class, penalties were assessed for late work, textbooks were essential, and labs should be exhaustively tested and polished so the instructor knew exactly what should happen. What if that changed? What would happen if there were no more late penalties, textbooks were tossed, and labs were left rough? This presentation outlines my experiences with those very changes.

SATURDAY MAY 25TH, 2019

1:40-2:00

Melanie Kaban
NAIT



It's all FUN and GAMES until something gets learnt.

NAIT offers courses for upgrading in high school Chemistry courses. By incorporating the component of fun and games, it might make some of the concepts easier to understand and learned a different way. Here are some games that could help with introductory concepts.

Contributed Presentations

SATURDAY MAY 25TH, 2019

2:00-2:20

Jennifer Wolf
BCIT



Enhancing the teaching of first-year chemistry laboratories at BCIT with effective use of videos

The goal of this project is to create videos for some of our first-year chemistry laboratory courses at BCIT, and to deliver them through the ViDeX ("Video Experience") player video system developed in the UBC department of Electrical and Computer Engineering. Videos delivered through this system had previously been developed for our high-school chemistry equivalency courses. The success of that project led us to develop and deliver videos for our first-year courses. Many students entering BCIT have limited or no chemistry lab experience. The videos were designed to help the students review course theory concepts to help them more effectively prepare for the lab. The videos also provided a resource for guidance in writing their lab reports. Additionally, some videos previously developed for different courses were available to the students for reviewing some basic lab techniques. The ViDeX player allows the students to watch the video from beginning to end, but also select and review chosen sections using the text transcript and film-strip view of the video. In addition, the instructor can observe how the students are using the videos and use that information to help develop better video delivery. In general, the students found that the videos and ViDeX system enhanced their overall lab experience and understanding of the material. An overview of the project, the student and instructor impressions on using the videos and ViDeX player, and data from the viewing behaviour of the student using the ViDeX player will be presented.

SATURDAY MAY 25TH, 2019

2:20-2:40

Carl Doige
Okanagan College



Happy prof, happy chemistry class: Positive reinforcement as a means to reduce students' digital distraction

Recent studies have shown that many students will text in class, even when cell phones are prohibited. Further, many students believe they are able to text without the instructor knowing. As instructors, should we be concerned - and if so, is there anything we can do about it? In this presentation, I will explore recent data on student (poor) performance while multitasking and provide a fun self-awareness activity for students on their ability to multitask. General strategies to help students regulate cell phone use will be examined and I will describe a specific approach used in my first year general chemistry class which was based on positive reinforcement and which kept students minds focused on moles, intermolecular forces, and reaction kinetics rather than Instagram, Facebook, Twitter and Snapchat.

Contributed Presentations

SATURDAY MAY 25TH, 2019

3:00-3:20

Kris Quinlan
University of Toronto



Chemistry Scholars Day: A New Outreach Event

Chemistry Scholars Day is a high school outreach event, designed to replace individual high school class visits. The Department of Chemistry hosts Gr. 11 students from across the Greater Toronto Area in a day filled with chemistry, including faculty research talks, a departmental tour, breakout groups with undergraduate program students, and a career panel. The design, schedule and impact of this new event will be discussed.

SATURDAY MAY 25TH, 2019

3:20-3:40

David Stuss
Camosun College



Integrating Indigenous Perspectives in the Chemistry Classroom

This talk is a wide-ranging, exploratory inquiry into ways of integrating indigenous perspectives in the context of teaching chemistry. The central questions addressed focus on different ways of knowing, and the implications of those differences -- for students, for instructors, and for our shared human future.

Contributed Presentations

SATURDAY MAY 25TH, 2019

3:40-4:00

Yann Brouillette
Dawson College



Comic Book Chemistry Part 9: Science & Modern Mythology

Without any prior comic book knowledge, chemistry students can successfully engage in pedagogical projects that brings down boundaries between the arts and sciences to stimulate discussions about elements and their reactivity. Since shaping teaching like story-telling can make knowledge more meaningful, exploring superhero chemistry is an attention-grabbing angle for engaging students in science from K-12 through university. This talk continues previous years' presentations about the "Chemistry of Superheroes", focusing this time on the chemistry behind mystical illusions in mainstream comics. Chemical evidence will be used to analyse certain super powers, innovative armours and marvellous 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 Lucifer's smoking hands and Thor's lightning strikes to the Jedi light bending force, key chemical concepts can be distilled from supernatural stories. Comic books and Chemistry can team-up to strengthen pedagogical approaches to learning via STEAM-based lectures, videos and class projects. After all, if knowledge is power, teachers can be superheroes.

Recommended Readings: Chemistry in the Comics: Molecular Marvels of Captain America; Brouillette, Y.; Lubell, W. D. ChemViews Magazine 2018. https://www.chemistryviews.org/details/ezine/11114434/The_Molecular_Marvels_of_Captain_America.html Comic Book Chemistry: Teaching Science Using Super Heroes; Brouillette, Y. CIRCE Magazine STEAM Edition 2019, 1, 47-58. <http://www.educationthatinspires.ca/2019/01/14/circe-steam-magazine-now-available/>

SUNDAY MAY 26TH, 2019

9:00-9:20

Charles Lucy
University of Alberta



Mini-case studies to engage and prepare students for a classic quant lab

Our Quant Lab is classical. Students are given an unknown for which they must determine the concentration of one or more components. All marks are on the accuracy of their analysis. Being off by as little as 2% results in a failed lab. We take this approach to prepare students for the real world, where mistakes can have dire consequences. But while this is an important learning opportunity, students are understandably terrified.

If a student receives a failing grade in a lab, the student does a post-mortem with the instructor to determine the cause of the failure. Historically about 80% of these post-mortems identify the fatal error. This exercise enables the student to avoid making the same blunder again. But students only learn what they did wrong after they fail. And not all students fail, and so not all get to share in this valuable learning experience.

We have developed mini-case studies, which are faux lab notebook pages for a failed experiment. In lecture, groups of students do a post-mortem of the faux lab to discover the fatal error (only to discover that there is usually more than one thing that went wrong). The outcomes of these mini-case study exercises will also be shared in the presentation.

Contributed Presentations

SUNDAY MAY 26TH, 2019

9:20-9:40

Erin Evoy
University of British Columbia



Use of the online peer-to-peer feedback platform ComPAIR in materials chemistry

A peer-to-peer feedback activity was implemented in a third-year materials chemistry course. An online platform, ComPAIR, allowed students to answer an assigned question online, and then use the same platform to anonymously review their peers' responses. Each student was required to a) answer the assigned question and b) read six peers' responses and provide written feedback as well as assign a grade using a given rubric and answer key. The assigned questions generally required students to analyze and interpret data to draw conclusions. The activity was run three times throughout the semester, before each of two midterms and the final exam. Qualitative results based on students' responses to a survey will be presented to evaluate the impact of the activity.

SUNDAY MAY 26TH, 2019

9:40-10:00

Jimmy Lowe
BCIT



BCIT's GCMS will be live on the ILN

Kevin Soulsbury (Kevin_Soulsbury@bcit.ca) and Jimmy Lowe (Jimmy_lowe@bcit.ca), BCIT Dept of Chemistry.

Many educational institutes do not have the funding or space for analytical instrumentation. One solution is to have remote access to equipment such as NMR and Atomic Absorption Spectroscopy (see the BC-Integrated Lab Network (ILN) at <http://truchemonline.wixsite.com/bciln>). This is an opportunity to provide an engaging experience for students.

In our talk, we will discuss the challenges of setting up the tools to permit students to analyze samples using the technique of GC-MS via remote access. A real-time demonstration of the analysis of volatiles in cough drops using GC-MS will be included.

Contributed Presentations

SUNDAY MAY 26TH, 2019

10:00-10:20

Larry Lee
Camosun College



Student preparation for Laboratory work, the use of Flowcharts in Chemistry.

How do you prepare a student for laboratory work to work effectively and efficiently? A student laboratory manual will normally consist of pre-laboratory questions, an introduction to the concept with theoretical aspects, a recipe for the laboratory work, and post-laboratory questions. While students are expected to have read the lab (a day or two prior) and completed the pre-laboratory questions, these activities are not enough to get them mindful of the laboratory procedures to allow them to finish within the allotted laboratory time. In the art-of-chemistry theme, my solution is to have students draw pictures in a flow diagram to represent what they will be expected to do. This allows them to visualize and think about the laboratory procedure. This preparation will help students be confident and ask thoughtful questions during lab.

SUNDAY MAY 26TH, 2019

10:40-11:00

Jose Rodriguez Nunez
University of British Columbia



Inquiry-based Demonstrations in the Undergraduate Curriculum

Most undergraduate chemistry classes, especially courses in introductory chemistry, have a suite of in-class demonstrations geared at increasing student interest. In general, demonstrations are presented as follows: first the instructor gives a lecture on a given topic, then the demo is performed, and lastly the lecturer makes connections between what is observed and the lecture topic. Although these demonstrations are memorable – generally presenting bright colour changes or explosions – they do not necessarily allow for students to interact with observations in a meaningful fashion. Another method is to perform inquiry-based demonstrations. In this format, students are asked to make predictions prior to the demonstration using scaffolded worksheet or clicker questions. Once the demonstration takes place, students can check their predictions and draw further conclusions. Using this approach, students engage with the demonstration at a deeper level which may improve their efficiency as a teaching tool. In this talk I will present the use of inquiry based in-class demonstrations using activities I have performed in first and third year courses.

Contributed Presentations

SUNDAY MAY 26TH, 2019

11:00-11:20

Mathias Paul
University of Victoria



Modern Making Methods for Chemists

Digital design software has become increasingly user-friendly, to the point that anyone with a small amount of training can start designing sophisticated objects. Fabrication of these objects is easy thanks to the current accessibility of 3D printing and laser cutting. Chemists have a good spatial sense and this appreciation of 3D lends itself well to learning 3D design skills. This presentation will share some of the applications of modern making methods in the classroom and in the lab, and will provide tips and tricks as to how to get started yourself in making useful devices.

SUNDAY MAY 26TH, 2019

11:20-11:25

Kelly Resmer
Mount Saint Vincent University



Prelab preparation for activation of background knowledge.

Universal Design for Learning (UDL) checkpoint 3.1 encourages instructors to 'activate or supply background knowledge' in their students for meaningful learning to occur (1). Effective learning requires students to have relevant background knowledge, so they have a base to build their new knowledge on. In the lab setting, meaningful lab learning occurs when students are adequately informed of the theory, procedures and calculations needed to understand and perform the experiment. By addressing UDL checkpoint 3.1 students will be prepared to build connections, strengthening lab learning. In this presentation I'll discuss methods I use to prepare students for the lab so students have knowledge to carry out and comprehend the experiment. I'll describe how I use videos, info-graphics and quizzes. I'll discuss formative assessment strategies so student and instructor are provided with feedback on their existing knowledge.

(1) Centre for Applied Special Technologies - CAST (2018). UDL and the learning brain. Wakefield, MA. Retrieved from <http://www.cast.org/our-work/publications/2018/udl-learning-brain-neuroscience.html> (accessed April 16, 2019)

Contributed Presentations

SUNDAY MAY 26TH, 2019

11:25-11:30

Sofia Donnecke
University of Victoria



Gif refreshers for Reinforcing Lab Technique

No matter how many times a student reads the lab manual, written instructions on a new technique will rarely leave the student prepared to execute it themselves. Once in lab, instructor demonstrations can be challenging to see from a distance and are only performed once before they attempt the procedure themselves. If the student is still unsure once the lab has started, they use up valuable time waiting for their instructor to answer further questions. Video is an easy alternative to introduce new lab techniques to students. Providing short videos of the lab technique will help decrease the time and stress of the student preparing to execute the lab. While lab manuals contain a picture or two and lengthy descriptions, a fast paced, gif recipe-type video can fully demonstrate every step in minutes. Furthermore, the student can pause and rewatch the video as many times as needed. This is not to say that prelab videos should replace instructor demos, but rather, serve as a complimentary learning tool. Instructor demos can be used to reinforce and elaborate on what the student is already familiar with, leaving students more confident to start the lab.

SUNDAY MAY 26TH, 2019

1:10-1:30

Sherrie Wang
North Island College



Teaching Chemistry Using Tablet with OneNote

The presentation will show the usage of a pen-enabled Surface Book for white board projection utilizing a Microsoft Wireless Display Adapter. This setup allows for a more active teaching style than traditional PowerPoint slides would enable. Moreover, this is particularly true when teaching second-year organic chemistry. Here, OneNote and OneNote 2016 are used for presenting teaching materials in class. The OneNote Class Notebook add-in allows interactive management of teaching materials directly with students. In comparison to the Blackboard Learn, the Class Notebook provides facile two-way communications from teachers to students and vice versa. It will also show you how to use OneNote as a drawing canvas for interactive teaching. Additionally, OneNote Class Notebook application will be demonstrated.

Contributed Presentations

SUNDAY MAY 26TH, 2019

1:30-1:50

Todd Stuckless
Langara College



A Langara Research Project

Langara is a teaching college that has only recently become NSERC eligible, with concomitant efforts to further develop their program of applied research. Our own group there is working with an environmental engineering firm, developing modern techniques for the treatment of wastewater effluent from the anaerobic digester at a local dairy farm. Specifically, we are attempting to use pyrolyzed waste woods to effectively capture ammonia vapor from the effluent, to create a value added soil amendment product.

SUNDAY MAY 26TH, 2019

1:50-2:10

Gabriel Oba
Lakehead University



Using cell phones and laptops to create a fun learning experience in a classroom.

The rise of portable electronic devices creates new challenges for instructors in the classroom.

Students are in general easily distracted by the use of laptops, smartphones... during classes.

How can we incorporate the use of these electronic devices to enhance the learning ability of today's students?

I will present a few examples of useful resources available online that can be used to make a lecture fun and capture the attention of the audience in a classroom. The goal is to increase students' participation, stimulate their curiosity and make a science class such as chemistry class even more appealing.

Contributed Presentations

SUNDAY MAY 26TH, 2019

2:10-2:30

Robin Stoodley
UBC



Cognitive tasks in the chemistry lab; Students are surprised at #7!

Chemistry laboratory courses have many learning objectives, only some of which are typically clear to students and instructors. Objectives usually include developing hands-on skills, practicing the scientific method, maintaining a laboratory notebook, determining uncertainties, writing in scientific style, practicing critical thinking, working with partners, and so on.

With so many objectives, it is difficult to clearly characterize the teaching experience. We will describe use of Carl Wieman's (2015) list of cognitive tasks needed for experimental research as a viewpoint for a) improving instructor clarity about the objectives of experimental chemistry courses, and b) selecting course development goals. The context for this latter point will be UBC's 3rd year chemistry laboratory courses which have a unique and flexible delivery model.

Students select their own set of experiments, meaning that each student typically receives a unique learning experience. Curious about whether this model leads to a level of specialization that is 'too hot', 'too cold' or 'just right', we studied the breadth and depth of student experience with the cognitive tasks. We'll discuss these results, and their implications for our lab delivery model.

SUNDAY MAY 26TH, 2019

2:50-2:55

Yann Brouillette
Dawson College



Periodic Table of the Elements Colouring Book

A collaborative project to create a palpable introduction to the building blocks of matter produced a Periodic Table Colouring Book, illustrating the known elements of Mendeleev's table. In an internationally accessible format, each page displays only the atomic number and symbol of an element, in addition to a few black & white outlines representing an example of its real-world application. The chemical elements are the Lego blocks of the world. Since kids from ages 4 to 99 enjoy assembling Lego blocks, this colouring book is not just "for children"; all can enjoy and learn from it. A free downloadable version of the entire Periodic Table Colouring Book is available for all. Science is an evolving field, and this book will be old-fashioned one day. But until then, enjoy colouring the world!

Contributed Presentations

SUNDAY MAY 26TH, 2019

2:55-3:15

Andy Ahiabu
Perkin Elmer



Incorporating Analytical Instruments into College/Undergraduate Level Educational Curricula

Inherently, Chemistry is a laboratory-based discipline, and the importance of practical skills cannot be overemphasized. As the Educational curricula is evolving, so is the need to incorporate analytical instruments into Educational curricula at the College and Undergraduate levels. The goal is to offer practical skills to graduates. PerkinElmer has long taken an interest in providing educational and training material for both current users and students. This presentation will highlight our efforts and discuss ways to incorporate Analytical instruments such as Fourier-transform Infrared (FT-IR) spectroscopy, Ultraviolet-visible (UV-Vis) spectroscopy and Atomic Absorption Spectroscopy (AAS) into College and Undergraduate level Chemistry programs.

SUNDAY MAY 26TH, 2019

3:15-3:35

Sudhir B. Abhyankar
Grenfell Campus, Memorial University of Newfoundland



Sustainable Future, Green Chemistry and meeting the UN Sustainable Development Goals: An Integrated Approach

In the fall of 2015, the United Nations General Assembly adopted a new sustainable development agenda, which includes 17 sustainable goals (SDGs). The primary focus of the goals is to end poverty, protect the planet and ensure prosperity for all. Green chemistry has a unique, important and essential role in reaching these goals. It is our primary responsibility to train the future chemistry professionals in understanding and applying the principles and practices of green chemistry in their undergraduate and graduate education. This presentation will outline the way in which we can prepare our students to accept and propose solutions to many challenges they will face in their professional careers.

Contributed Posters

POSTERS ARE AVAILABLE FOR VIEWING IN THE SPONSORS AREA OUTSIDE FISHER 100.

Andrew P. Dicks
University of Toronto



The Green Chemistry Commitment:

For more than two decades individual faculty from various colleges and universities have brought green chemistry, emphasizing materials and methods that are inherently safer for human health and the environment, to their students and research programs. As global calls for sustainability in the chemical enterprise ramp upward, the need to more widely integrate green chemistry into the background of all our students becomes imperative, preparing students to be competitive in the workplace and to solve important problems that they will encounter. The Green Chemistry Commitment (GCC) is a consortium project that seeks to encourage colleges and universities to commit to changing the education of tomorrow's chemists. Currently over 50 colleges and universities are participating: from research-intensive universities to primarily undergraduate institutions to community colleges, nationally and internationally. They include the University of Toronto and Vancouver Island University in Canada. The flexible framework allows all to participate in ways that best fit the local needs of the institution. The program is distinctive but not exclusive. We will present how to adapt the GCC framework to a wide range of colleges and universities, with the goal of encouraging broadened participation.

Andrew P. Dicks
University of Toronto



A Systems-Thinking Department: Fostering a Culture of Green Chemistry Practice.

During the last decade, the University of Toronto has adopted a systems-thinking approach where green and sustainable chemistry education is built into the overall departmental framework. Here, green chemistry principles are embedded throughout a variety of interconnected modules within the Department of Chemistry, including undergraduate curricula (both in the classroom and teaching laboratory), a graduate student-led organization, and other department-wide initiatives. This fully-integrated model exposes students at all academic levels to sustainable practices using a variety of approaches throughout their education. Instead of treating green chemistry as a stand-alone topic or sub-discipline, and potentially highlighting it in a specific assignment, laboratory exercise, or course, the approach seeks to integrate it into the curriculum as a whole. This strategy challenges students to develop a well-rounded chemistry education that highlights the theory and skills required to become informed citizens and scientists.

The progress made has allowed the University of Toronto to become the first Canadian institution to be recognized through the Green Chemistry Commitment in 2016, which is a program developed by Beyond Benign (an organization offering a variety of educational green chemistry resources to assist instructors).

This poster will provide an overview of the initiatives that have supported the culture of green chemistry practice in our department. The contributions include specific examples at each level of undergraduate teaching (both in the classroom and laboratory), graduate-level initiatives, and general departmental efforts.

Contributed Posters

POSTERS ARE AVAILABLE FOR VIEWING IN THE SPONSORS AREA OUTSIDE FISHER 100.

Erika Merschrod
Memorial University of Newfoundland



Increasing accessibility in an introductory chemistry course: lower costs, decolonization of content, and adaptation for different learning styles and academic content.

I will present my experience with adopting the OpenStax Chemistry textbook for a revised version of an introductory chemistry course. What started as a way to reduce costs for students ended up having much broader impacts on the course itself, with changes to the curriculum, decolonization of some content, and adaptation of in-class activities to accommodate a wide range of learners. By focusing on what the students needed to learn, rather than being driven by a particular textbook, I felt better about what I was teaching and student grades improved dramatically. The adaptation did come at a cost, both in my time and in ruffling feathers, but hopefully others can benefit from what I have done so far! All materials I developed for and used in the course are available to anyone who is interested.

Blair Surridge^{*}, Taylor Dew-Jones^{*},
Brent Staples^{*}, and Euan Thomson⁺
Camosun College^{*} Phillips Brewing and Malting⁺



GC/MS Analysis of Aroma Active Compounds. Application to the development of a novel dry hopping method

A collaborative research project with Phillips Brewing and Malting was carried out as a 2nd year analytical chemistry "special" lab project. A GC/MS method using SPME technique will be described as well as its application to the analysis of beer (Phillips Short Wave Pale Ale) comparing regular dry hopping vs a novel sonication/cavitation technique of dry hopping. In general, for analytical lab projects students must meet with their instructor on two occasions outside of regular lab time. Firstly, to discuss the nature of the project, analytes/matrix, and possible ordering of chemicals. In the second meeting standard solutions are prepared and sample analysis is discussed. Finally, in the assigned lab time students prepare samples and carry out the analytical measurement. Reporting out was done using a google spread sheet so classmates can follow progress.

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Wireless Access at Camosun College

Camosun Guest Wireless

Camosun guest wireless is for guests visiting Camosun College. No login is required, however you must agree to the terms of use. If your institution provides eduroam services, you should connect to the eduroam network. You do not need to change your username or password.

In the event that you are unable to access wireless services, please contact a conference organizer from Camosun, who will be happy to assist you.

Restaurants and Pubs:

UVIC AREA

Felicita's Pub: in the Student Union Building on campus.

The Commons Kitchen, Cadboro Commons building, lower level. Open for breakfast from 7:00 am

A short walk from Rez, down Sinclair Road is Cadboro Bay Village where you will find:

Jusu Bar: Organic, plant forward food and juices. Closes at 6pm

Thai Lemongrass: Thai food, Lunch/Dinner

Mutsuki An: Japanese food, Lunch/Dinner. Closes 8 pm not open Sunday/Monday

Olive Olios: Espresso and Bistro, 7am to 5 pm

DOWNTOWN

BEST PLACES WITH A WATERFRONT PATIO:

Canoe Brewpub, 450 Swift Street, Amazing Beer and good food, huge patio. Live music on Thursday and Saturday.

Lure Restaurant and Bar, (in the Delta Ocean Point).

The Local, 1205 Wharf St. Pub style restaurant with a big outside patio, gets busy.

JUST GOOD PLACES TO EAT. (IN ORDER OF \$\$\$\$ TO \$)

The Courtney Room, 619 Courtney Street, Just awarded the #10 best new restaurant in Canada. Dining room very fancy and expensive, but the bar menu is just as good and less \$

OLO Restaurant, 509 Fisgard Street, Again fancy, but the Menu!

Little Jumbo, down the hall, 506 Fort Street, Cool venue, great menu, be prepared to wait, (it's that good)

Brasserie L'Ecole, 1715 Government Street, French Cuisine (Steak frites), cocktails, best Belgian beer selection outside of Belgium. They don't take reservations, line up starts at 5.30. Put your name on the list and come back later, it's worth it.

Veneto, 1450, Douglas Street beneath the Rialto Hotel. Lounge type atmosphere. Good menu.

Zambri's, 820 Yates Street in the Atrium Building. Good Italian Food.

Bodega, 1210 Broad Street. Tapas, good atmosphere.

Tacofino, 787 Fort Street. Tacos....done right!

10 Acres, 611 Courtney Street, Farm to table, local food, excellent menu and atmosphere.

Cactus Club, 1125 Douglas Street. Decent menu in a lounge style atmosphere.

Rebar, 50 Bastion Square, Vegan and Gluten Free.

Browns Social House, Victoria Falls, 809 Douglas Street

Bin 4 Burger, 911 Yates St. Gourmet Burgers.

Sen Zushi, 940 Fort Street, ,Top notch sushi.

The Green Leaf, 1684 Douglas St, Victoria, Best Vietnamese Pho in town

Red Fish, Blue Fish, insanely good outdoor waterfront eatery in Victoria's inner harbour. Often has long lunch time line-ups but worth the wait.

Noodle Box, 818 Douglas Street, decent noodle menu if you need a spice fix.

Pubs:

Walk down Government Street and you will find several pubs:

The Bard and Banker, The Irish Times, The Garricks Head and The Churchill

On Lower Douglas Street: The Sticky Wicket Pub: It's huge, lively and there is beach volleyball on the rooftop. A Victoria Institution!

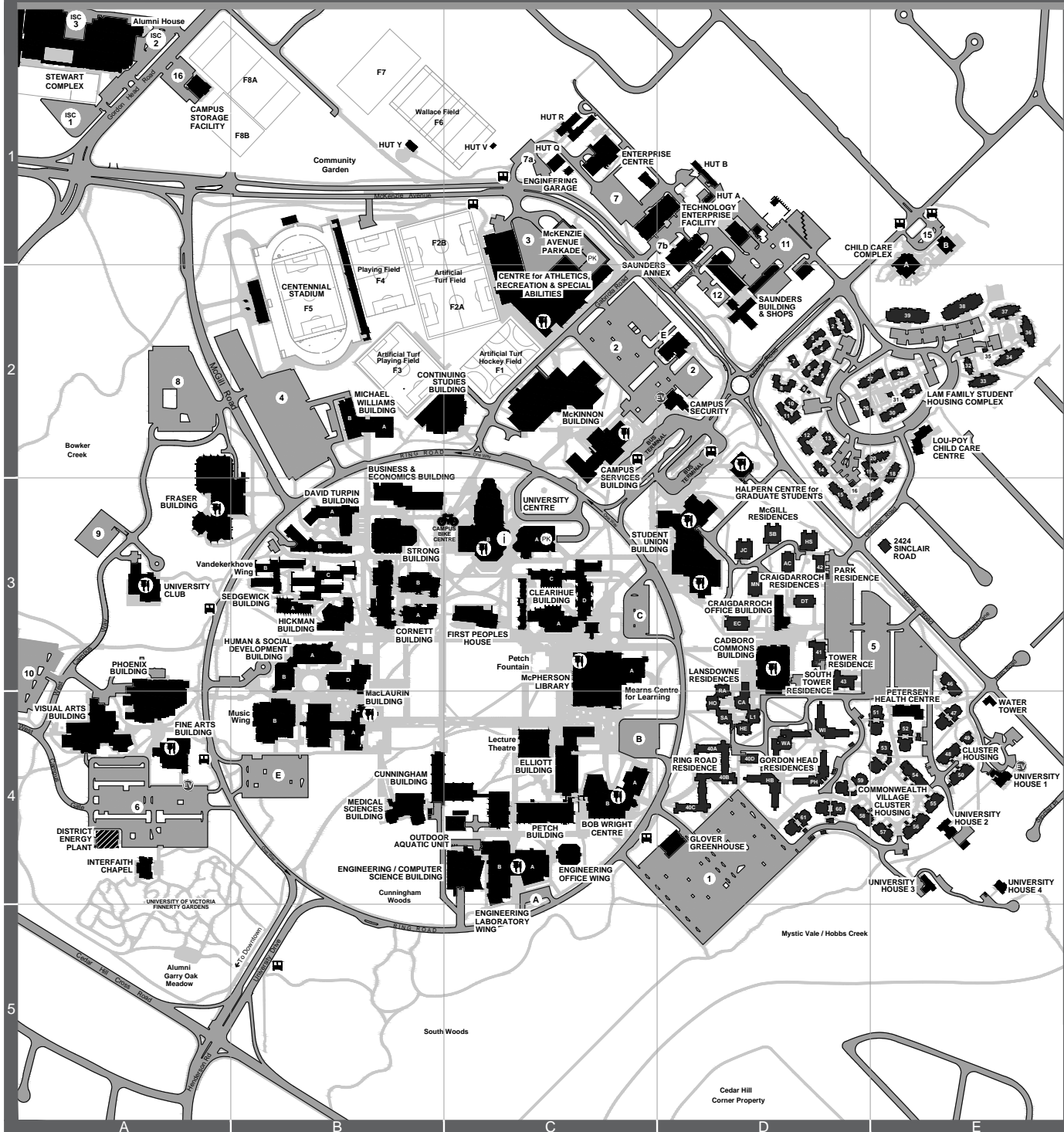
On Pandora Street: The Drake, Huge beer selection, Hipster zone, beard and plaid shirt essential.

Swan's BrewPub, adjacent on the corner of Pandora and Wharf.

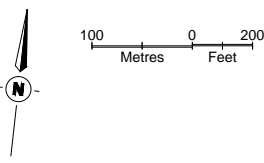
Conference Notes

Conference Notes

Campus Map

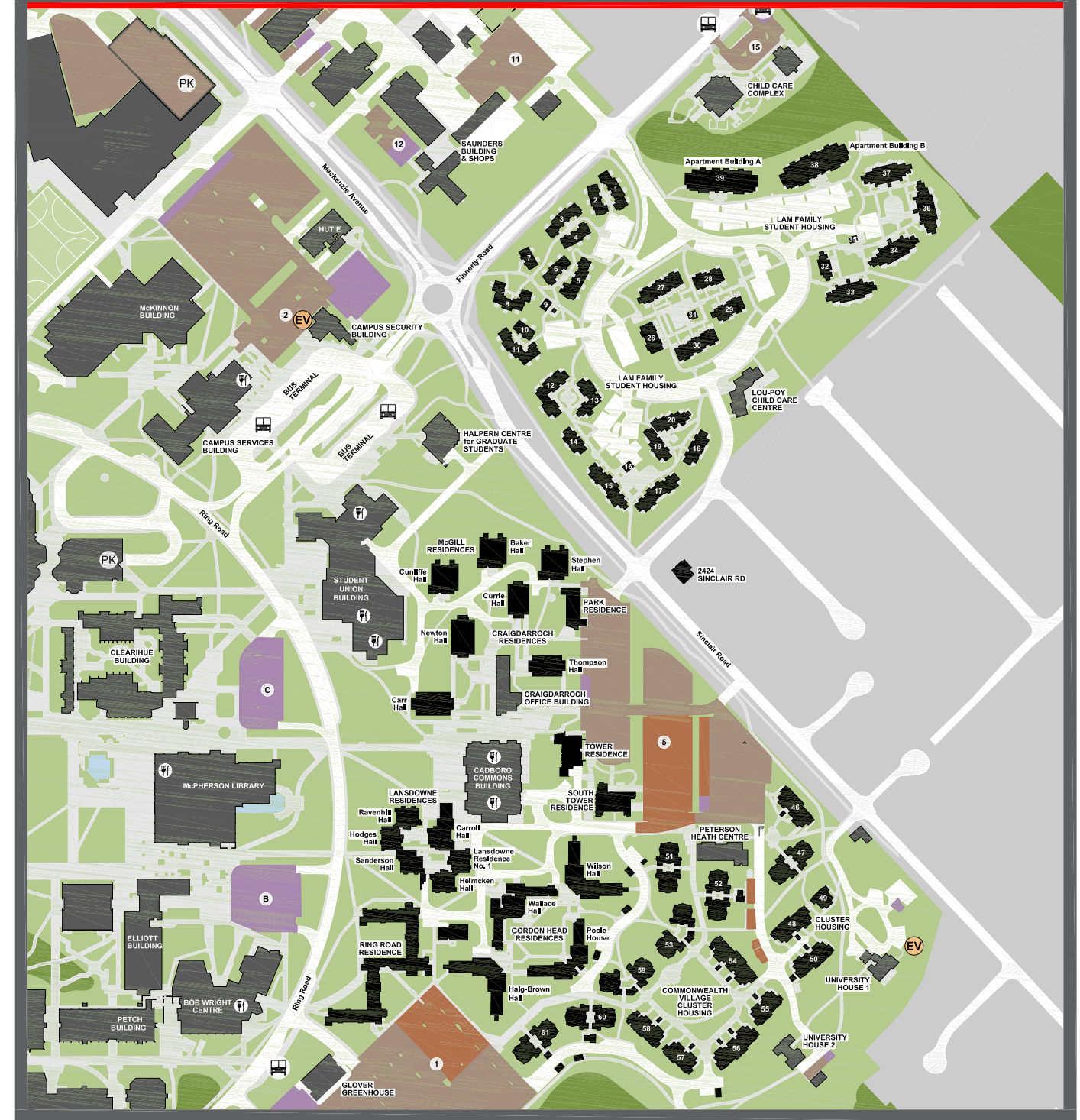


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|------------------------------|-----------------------------------|---------------------|
| Buildings | General Pay Parking | Bus Stop |
| Residences | Reserved Parking | Food Service Outlet |
| Buildings Under Construction | Parkade | Welcome Centre |
| | Electric Vehicle Charging Station | |

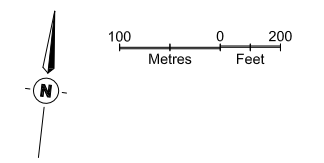


July 2018

Residence Map



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|------------------------------|--------------------------|-----------------------------------|
| Residences | General Pay Parking | Bus Stop |
| Buildings | Reserved Parking | Food Service Outlet |
| Buildings Under Construction | Student Resident Parking | Electric Vehicle Charging Station |



April 2018

47e Congrès de Chimie collégiale au Canada (C3)

47th College Chemistry Canada (C3) Conference

UNIVERSITÉ DE SAINT-BONIFACE
(WINNIPEG, MANITOBA)

UNIVERSITÉ DE SAINT-BONIFACE
(WINNIPEG, MANITOBA)

RETENEZ CES DATES: DU 22 AU 24 MAI 2020

MARK YOUR CALENDAR: MAY 22 – 24, 2020



THÈME DU CONGRÈS :

LES DÉFIS DE L'ENSEIGNEMENT DE LA CHIMIE, DU PRIMAIRE JUSQU'À L'UNIVERSITÉ

CONFERENCE THEME :

NUTS & BOLTS CHALLENGES IN CHEMISTRY EDUCATION, FROM PRIMARY SCHOOL TO UNIVERSITY LEVEL

CONFÉRENCIERS INVITÉS / KEYNOTE SPEAKERS



Sharon Brewer
Thompson Rivers University
(Kamloops, BC)



Yann Brouillette
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(Montréal, QC)

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