SCIEMATICS'15

May 7th, 8th, & 9th

University of Regina

Regina SK

Sponsors

Alpha

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Sciematics 2015 Schedule

Thursday, May 7th 2015 Saskatchewan Science Centre

6:30 PM Registration

7:00 PM Welcome, Acknowledgements, and Introductions

4 Awards of Merit Presentations

7:30 PM Address from Sponsor SaskEnergy

7:35 PM Keynote Address

Contemporary Research in Science in Saskatchewan

Jerome Konescni, CEO, Innovation Saskatchewan

Dr. Tanya Dahms, Professor, Chemistry and Biochemistry, Faculty of Science, University of Regina

Dr. Karen Meagher, Associate Professor, Mathematics and Statistics, Faculty of Science, University of Regina

Scott Campbell, Director of STEMStates, and Project Director for STEMFEST

8:40 PM Thank you and Announcements

8:45 PM Wine and Cheese

Entertainment provided by Greenall High School Jazz Band

Friday, May 8th 2015 Education Building, University of Regina

8:30 AM Registration

9:00 AM Session 1

10:15 AM Nutrition Break

10:30 AM Session 2

11:45 AM Lunch

1:00 PM Session 3

2:15 PM Nutrition Break

2:30 PM Session 4

Display will be open for viewing throughout the day

Saturday, May 9th 2015 Education Building, University of Regina

9:00 AM – 11:30 AM *Career Education in Renewed Secondary Science Curricula*

Chair, Dean Elliott, Science Consultant, Ministry of Education

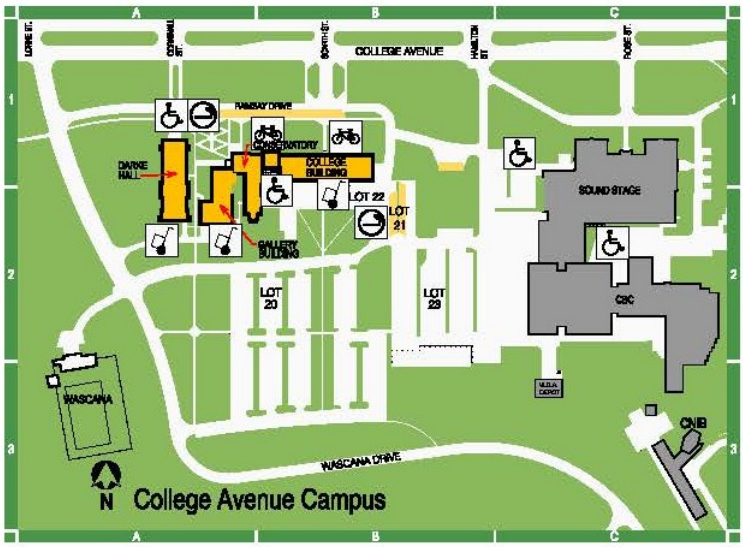
Janet Uchacz-Hart, Executive Director, Saskatoon Industry Education Council - SaskCareers.ca

Dr. Netha Dyck, Dean, School of Nursing, Saskatchewan Polytechnic

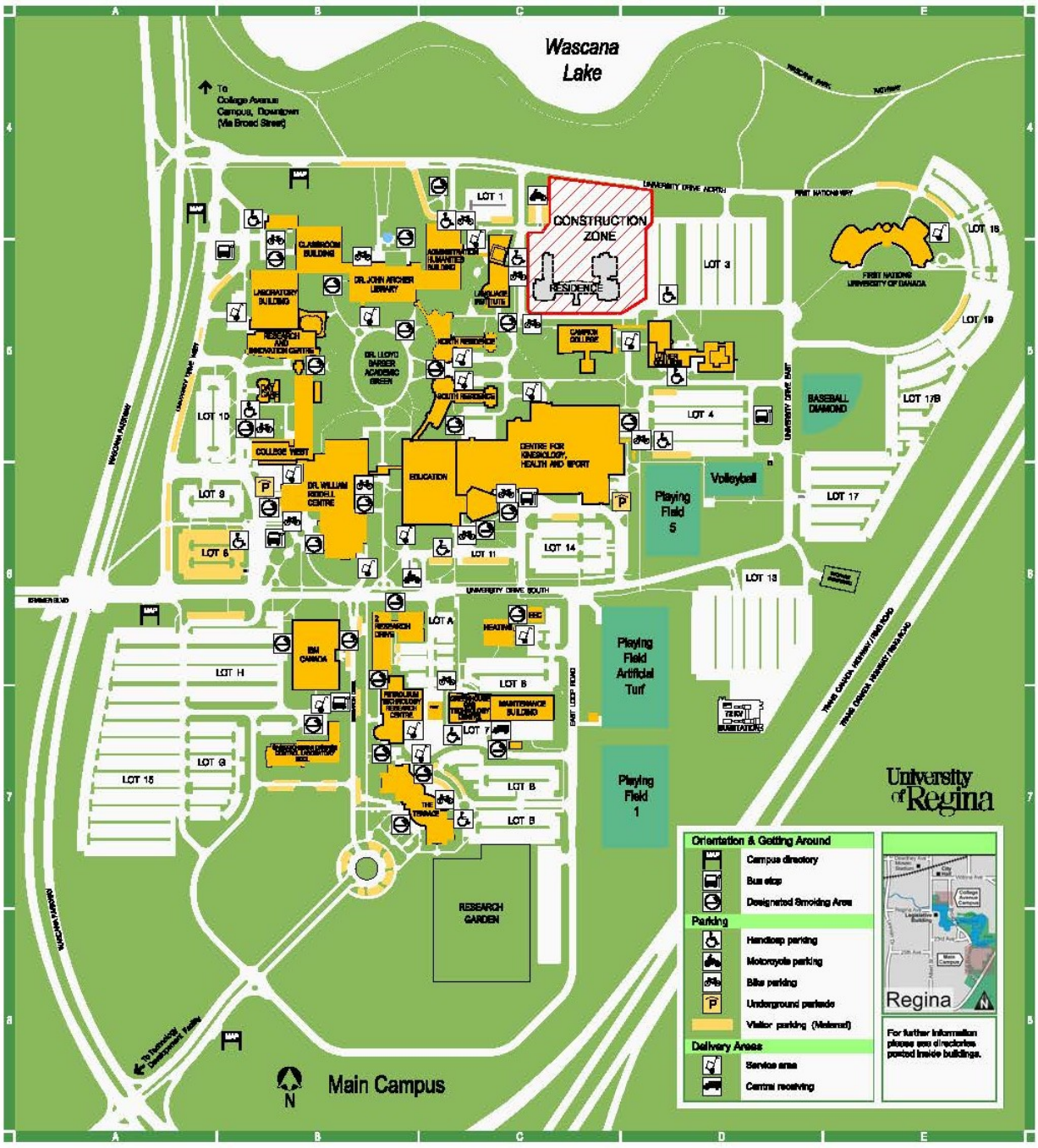
Lynda Kushnir Pekrul, Dean, School of Health Sciences, School of Animal and Biosciences, Saskatchewan Polytechnic

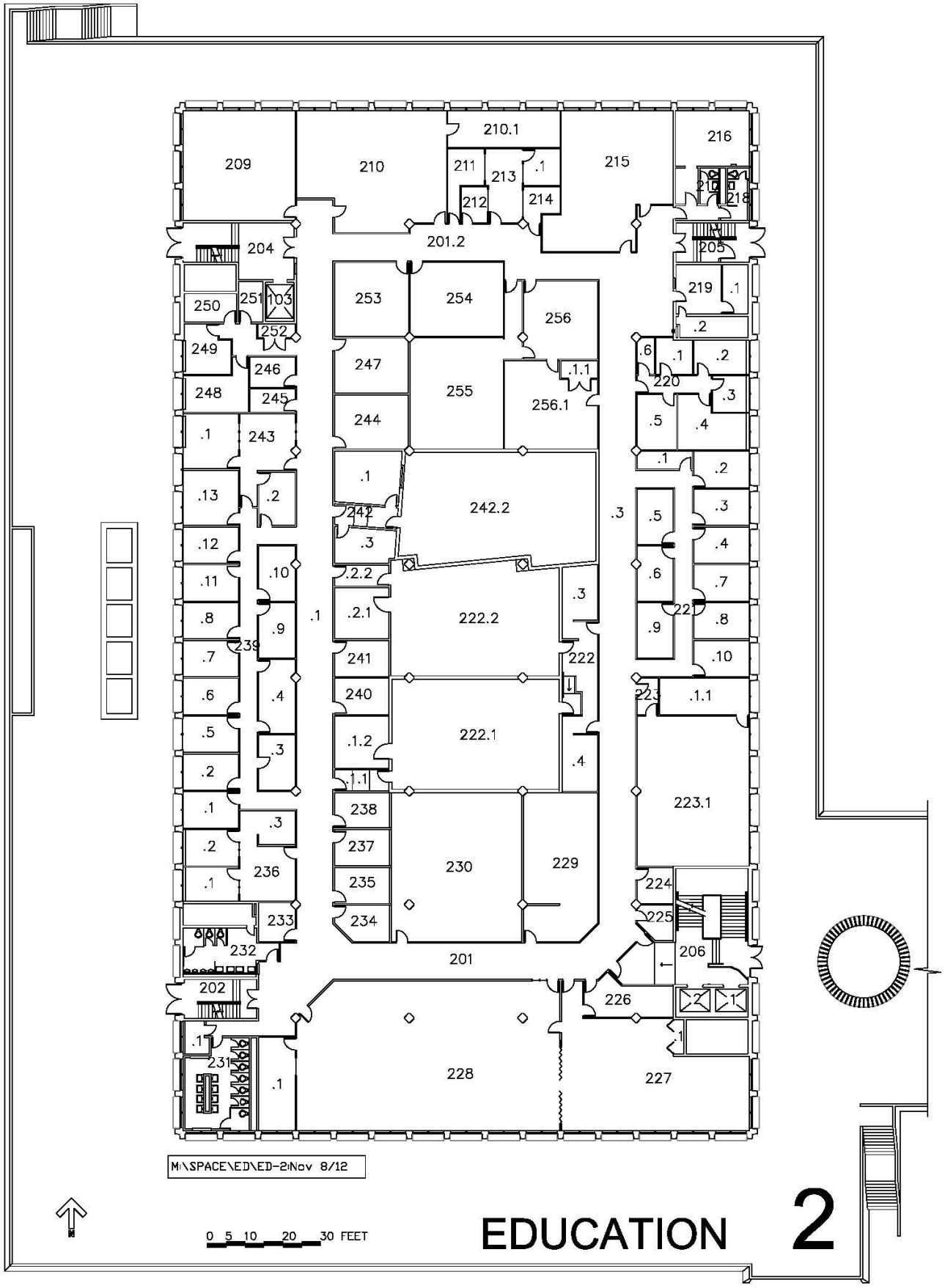
Brenda Suru, Acting Dean, School of Mining, Energy & Manufacturing, School of Natural Resources & Built Environment, Saskatchewan Polytechnic

Rob Miller, Computer Systems Technology Department, School of Information and Communications Technology, Saskatchewan Polytechnic



Code	Building Name	Grid Location
MAIN CAMPUS		
AH	Administration-Humanities	C4
CM	Campion College	C5
CK	Centre for Kinesiology, Health and Sport	C5
CL	Classroom Building	B4
CW	College West	B5
DC	Day Care	B3
ED	Education Building	C5
FN	First Nations University Of Canada	B4
GG	Greenhouse Gas Technology Centre (GGTC)	C7
HP	Heating Plant Building	C8
LB	Laboratory Building	B5
LC	Luther College	D5
LI	Language Institute	C5
LY	Dr. John Archer Library	B4
NR	North Residence	C5
RI	Research and Innovation Centre	B5
RC	Dr. William Riddell Centre	B6
SR	South Residence	C5
TD	Technology Development Facility	
COLLEGE AVENUE CAMPUS		
CB	College Building	B1
CN	Conservatory	A1
DH	Darke Hall	A1
GA	Gallery Building	A2
INNOVATION PLACE		
2R	Two Research Drive Building	C8
SH	Saskatchewan Disease Control Laboratory	E7
IT	The Terrace	C7
IB	IBM Canada	B8
PT	Petroleum Technology Research Centre (PTRC)	C7

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Keynote Address

Contemporary Research in Science in Saskatchewan

Jerome Konescni, CEO, Innovation Saskatchewan

Dr. Konecsni joined Innovation Saskatchewan in October of 2011. The organization was created to coordinate and facilitate the strategic development of an innovation agenda for the province. His appointment was based on extensive experience in Saskatchewan's research and innovation community. Before joining Innovation Saskatchewan, he served as Director General of the National Research Council's Plant Biotechnology Institute in Saskatoon recognized as Canada's technology leader in plant science.

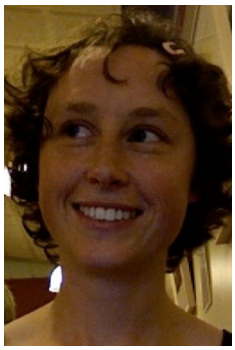
Dr. Konecsni also brings an entrepreneurial background from prior positions as the President and CEO of both Genome Prairie and BioSmart Technologies, and as Vice President Corporate Development for Bioriginal Food & Science Corporation. He also served as Vice President - Agricultural Biotechnology, Small Industry Services, Marketing and Commercialization and Corporate Services at the Saskatchewan Research Council. He has extensive international experience and has managed and facilitated many international research collaborations and consortia. His leadership profile also includes service on a number of Boards and Committees such as: Chair of AgWest Bio and the Saskatchewan Nutraceutical Network, Vice Chair of STEP and Member of the Knowledge Translation Committee of SHRF.

Dr. Konecsni was born in Saskatchewan and received his education from University of Saskatchewan and a doctorate from Karunya University in India.

Dr. Tanya Dahms, Professor, Chemistry and Biochemistry, Faculty of Science, University of Regina

Tanya Dahms was born and schooled in Guelph, Ontario. She specialized in Biology and Chemistry at the University of Waterloo (B. Sc. 1990) and then doctoral studies as a National Science and Engineering Research Council (NSERC) scholar in the area of protein fine structure and dynamics (Ph. D. 1996) at Ottawa University and the Institute for Biological Sciences at the National Research Council (NRC) of Canada. Subsequently she was awarded an NSERC postdoctoral fellowship to study protein architecture by X-ray crystallography at Purdue University. It was there that she worked with and became interested in membrane proteins and the associated cell interfaces and began to seek out microscopy techniques to facilitate their study, leading her to the Steacie Institute of Molecular Sciences at NRC as an NSERC/NRC visiting fellow. Tanya was appointed to the Department of Chemistry and Biochemistry at the University of Regina (UofR) as an Assistant Professor in 1999 to teach and establish a biochemistry laboratory focusing on cell interfaces. She launched and maintains the UofR scanning probe microscopy that specializes in atomic force microscopy (AFM), and which she has recently expanded to include integrated AFM and confocal microscopy. She is currently full professor in the same department and her work focuses on the surface architecture of various microbes as a function of growth, development and xenobiotics (i.e. antifungal drugs, herbicides). Her current work focuses on evaluating microbial growth and development, and dysfunction in response to biosynthetic cell wall/envelope mutants and xenobiotics by atomic force microscopy (AFM), force spectroscopy, scanning electron-, confocal microscopy, FCS and metabolomics. Since joining UofR, she has been a visiting fellow to NIH, co-recipient of the AstraZeneca award in Chemistry, has served on numerous grant selection committees, at the international (NSF), national (NSERC) and provincial (SHRF) levels, regularly reviews for wide-readership international journals and has been an invited speaker in Europe and Korea. She was awarded the 2012 UofR President's Teaching and Learning Scholar with Drs. Gendron and Pontes-Ferriera, acknowledging her highly innovative teaching practice. Tanya is grateful to the students, postdoctoral fellows, collaborators, University of Regina staff, and granting agencies that make her research program possible.

Dr. Karen Meagher, Associate Professor, Mathematics and Statistics, Faculty of Science, University of Regina



Dr. Meagher is an associate professor of Mathematics at the University of Regina where she has been working since 2007. Her first degree came from the University of Alberta and was followed with a Masters of Math at the University of Waterloo. After that, she worked for two years as a computer programmer in Edmonton and at Simon Fraser University in Vancouver before returned to school to do a Ph.D. at the University of Ottawa and completing an NSERC post-doctorate fellowship at the University of Waterloo. She recently completed a sabbatical leave at the University of Malta. Her research area is graph theory and discrete math. She claims to be most obsessed with a result that is known as the Erdos-Ko-Rado theorem and has recently completed a book about it. She has published around 20 journal articles and have had three students complete their Ph.D. under her supervision. In addition to her University accomplishments she has two little kids (aged 4 and 9) and a husband.

Scott Campbell, Director of STEMStates, and Project Director for STEMFEST

Scott Campbell is a Director with the Global STEM States, an international Association and grass roots movement of educators and professionals who are committeed to the development of science, technology, engineering and mathematics education to better allign with future skills needs and the careers of tomorrow. He is currently working in Saskatchewan on the hosting the 2nd International Festival of Science, Technology, Engineering and Mathematics (STEMfest), a festival of over 30 events which takes place in September 2015.

Having led education projects across the Asia Pacific, Scott has been working on understanding STEM pedagogy and what it means to move from teaching in silos to teaching across curricula. His presentation will be on “Becoming the Educator of Tomorrow”, and will explore where classrooms are heading and what you need to do know to be the teacher of tomorrow.

Friday May 8

Session 1 9:30 am-10:15 am

TEACHING FORENSIC SCIENCE **room 210**

Phil Langford, PVSD & Carla Cooper, PVSD

This workshop will contain activities that can be taught to students in a variety of courses, including Forensic Science 30. This will be largely a station-based, hands-on session for teachers to explore items to incorporate into the courses they teach.

An Arc Midpoint Computation: **room 215**

Developing Logical Thinking and a Number Sense

Gregory Akulov, Luther High School

Session considers a generalization of the midpoint formula for the case of a circular arc and discusses its links to curriculum. Presentation includes materials for innovative lessons, assignments and projects with a special focus on applied problem solving. Participants will be provided with several digital and printed resources.

Project WET 2.0 Supports New Science 10 and ES20 Curricula **room 223.1**

Jane Wilson, High School Science, NESD, &

Lizabeth Nicholls, Project WET Canada

This fun, hands-on workshop session, from SaskOutdoors, introduces teachers to the newly revised Project WET 2.0 Activity Guide. Participants will participate in sample activities and receive copies of the new draft cross-reference guides between Science 10 and ES20 and Project WET 2.0.

Physics 30 **room 314**

Ellen Fritz, Lloydminster RCSSD;

Geoffrey Haacke, Northwest SD;

Karen Kennedy-Allin, SE Cornerstone SD;

Daniel Dion, Conseil des ecoles fransaskoises; and

Dean Elliott & Fatma-Zohra Henni from the Ministry of Education

Ministry representatives along with the teacher-writers, will provide an overview of the renewed Physics 30 course.

Identify Patient Zero of a Zombie Apocalypse With the Power of an ELISA! **room 319**

Bob Malyk, Bio-Rad

Are your students interested in the Zombie Apocalypse? Using Bio-Rad's ELISA Immuno Explorer Kit your students can track a zombie pathogen outbreak. You can also use this kit to teach your students about how ELISA is a powerful antibody-based bio-detection tool used to detect human immunodeficiency virus (HIV), bird flu, mad cow disease, genetically modified organisms, and the molecular markers of cancer, pregnancy, or drug use. This kit facilitates teaching about immune system functions and about the unique properties of antibodies that have revolutionized medicine, epidemiology, and life science research. Science is fascinating and when paired with a fun fictional story (zombies), or a relevant, real-world topic (HIV), your students will not only be interested, they will learn more while staying engaged with the scientific world around them.

Bring Environmental Science Lessons to Life in Your Classroom **room 320**

Corey Zeigler, McGraw Hill

Recognizing we can make a difference is the key to understanding today's environmental systems and challenges.

Join us for an invigorating and engaging workshop to see demos and classroom activities to share with your students to enable them to learn from real-life issues to find real-life solutions.

A course correlation will also be included that discusses how and where the textbook will enhance teaching Saskatchewan's environmental science course outcomes.

Science on Stage Canada (SOSC): Ramp Up Your Student Engagement **room 321**

Johanne Patry, Tim Molnar & Tracy Walker

SOSC brings together science educators to share their expertise and "innoventive" approaches to engaging learners. Participants in this session will gain experience with the hands on minds science activity, "Bath Quakes." This is a turnkey project that is a fun, creative, instructive, involves scientific inquiry processes, knowledge, and skills from different science subject areas, and is adaptable across K-12.

Participants will also learn about other "innoventive" activities, projects and programs that are applicable to the classroom. Participants will have the opportunity to learn about how they can be involved with SOSC in STEMfest 2015 taking place in Saskatoon this fall.

Student-Directed Study Topics for Environmental Science 20 **room 341**

Stephen Cheng, University of Regina

Stephen Cheng will share the photos captured in some of his recent trips and address the interesting topics that can be discussed and explored in Environmental Science 20.

- When Iceland was first settled over a thousand years ago, it was covered by trees. However, the trees found on the island today are not native; most were planted in the past few decades. What caused the native trees to disappear?
- Iceland gets most of the heating and electricity generation from renewable sources. Is it possible for the rest of the world to get its energy from renewable sources?
- The Great Smog of 1952 killed thousands of people in London. Since then, smog has become less common in the Capital of the UK. What has been done? How can we prevent the disaster happen again?

- Comparing the Amazon and the Prairie, what are the roles of agriculture and human impact on the natural ecosystem?
- Green roofs have been used in Norway for hundreds of years. Are we re-inventing the green roofs? What can we learn from Norway?

Strategies and Resources to promote deep learning of Health Science 20 topics (Repeated) **room 390**

Craig White, Education Specialist, Let's Talk Science

CurioCity by Let's Talk Science is a free web-enabled program that Health Science 20 teachers can use to address a variety of curriculum outcomes. These outcomes include alternative approaches to health care; ethical issues in health care and treatment; the impact of lifestyle choices on health; genetically modified organisms (GMOs); food nutrition; and interpretation of diagnostic results. Students will find a host of information related to current health science issues for use in the student-directed study outcomes. In addition to these knowledge and STSE resources, CurioCity also has a wealth of information related to the variety of health science related career pathways. This presentation will provide Health Science 20 teachers with practical strategies for getting the most out of these resources.

Session 2 10:30 am -11:45 am

Health Science 20 **room 210**

Carla Cooper, Tina Rioux, Amy Lafontaine

As curriculum writers and pilot teachers, Tina, Amy and Carla have established a deep understanding of the HS20 curriculum. Based on this experience, they have developed various activities that have been shared across the province throughout the HS20 pilot process. This workshop will focus on showcasing these activities, as well as newly developed activities, that you can implement into your Health Science 20 course.

LATEX: A Document Preparation System **room 215**

George Huczek, Prince Albert Catholic SD

Mathematics and science documents have specific technical formatting requirements such as equations, tables, diagrams and graphs. Word processors do not handle these tasks well. In this session participants will discover LATEX, how it is used, and how it can be introduced to students in secondary level maths and science classes.

LATEXis free, platform independent software, based on TEX, and sup-ported by a large community of users. It has become the de facto standard for publishing mathematical and scientific documents. It can be used to prepare reports, articles, slide presentations, handouts, tests, HTML documents, books, bibliographies, and much more. It is widely used in MOOCs (Massive Open Online Courses) for writing formulas and equations, and is perhaps the best platform available for thesis preparation.

Participants will be given an introduction to LATEX, information on how to obtain it, and how to use it with students at secondary or postsecondary levels.

Fertile Ground **room 223.1**

Kate Grapes & Lynn Carter, Sask Mining Association

What do mixtures and solutions and the provincial mineral, have in common? Potash ore is a mixture and one of the methods of mining potash is by dissolution. The Saskatchewan Mining Association (SMA), along with teachers and industry, has developed several lessons about potash mining that are aligned with the outcomes and indicators of the **Grade 7 Mixtures and Solutions and Earth's Crust and Resources** and the "old" **Chemistry 30 Solubility and Solutions** units. These lesson plans can also be used in the **Practical and Applied Arts Energy and Mines 10/20/30** course as well as **Physical Science 20**. This SMA presentation includes a hands-on demonstration of the potash kit activities, as well as information about other education outreach programs offered by the SMA for Saskatchewan educators. Help grow your knowledge of one of Saskatchewan's major resources.

Participants will receive a potash kit

Chemistry 30 **room 314**

Helen Forbes, Good Spirit SD;

Jacinthe Deblois, Conseil des ecoles fransaskoises;

Norm Lipinksi, St. Paul's RCSSD;

Nancy Fraser, SE Cornerstone SD; and

Dean Elliott & Fatma-Zohra Henni from the Ministry of Education

Ministry representatives along with the teacher-writers, will provide an overview of the renewed Chemistry 30 course.

Find Your Superpower! **room 315**

Cassie Hawrysh

Go behind the scenes of the world's fastest sport on ice with Canadian National Team Skeleton Racer, Canadian Champion & World Cup medalist: Cassie Hawrysh. Discover what it takes to challenge the physics of motion, employ unique geometric and mechanical innovations, weather pattern data, and the chemistry of sport specific nutrition - real superpowers via science & math - all in the pursuit of passion!

Bio-Rad. Engineer the Tools for Inquiry of Candy Food Dyes **room 319**

Bob Malyk

What's in your candy? Extract colourful food dyes from candy and separate them on a do-it-yourself agarose electrophoresis box to identify what dyes make them so appealing. This inquiry based activity is a great skills lab by teaching pipetting, gel electrophoresis and making solutions with stunning results. Turn this into a complete STEM activity by building your own horizontal electrophoresis box so your students can investigate the science and engineering behind a workhorse in the biotech lab.

Physical Science 20 – Equipment for Labs and Activities **room 320**

Annette Enns-Wind,

Are you a chemistry teacher, wondering about physics equipment? Or are you a physics teacher wondering about chemistry materials to teach the new Physical Science 20? Be prepared to try out some equipment and learn about the course from a curriculum writer who has experienced teaching this new course.

Biotechnology for Grade 9 Science **room 321**

Leah Hermanson or Susan Jorgensen

Learn about biotechnology in agriculture from an agricultural scientist and the connection to Grade 9 science! As the world population grows, so too does the importance of science and technology in feeding, clothing and fuelling the world. Biotechnology has a key role in this. Our invited scientist will review the processes of biotechnology and it's applications in agriculture. This will be followed by an introduction to the Biotechnology Kit for Grade 9 science: DNA Extraction and Food Dye Electrophoresis. In this kit students will isolate DNA from wheat germ as well as perform electrophoresis on comparative food dye samples. The kit is closely coordinated with the provincial curriculum and will provide students the opportunity to use scientific methods, design and conduct investigations, as well as gather, analyze and interpret data.

Engaging Saskatchewan High School Students **room 341**

with the National High Altitude Balloon Experiment

David Gerhard, University of Regina;

Nicole Anderson, **Regina Catholic SD**; and

Stephen Cheng, **University of Regina**

The National High Altitude Balloon Experiment program is the first Canada-wide experiment carried out by universities, colleges, high schools and science centres to study the stratosphere, gather environmental data, take photographs, share their findings, and create scholarly research. In this presentation, an overview of the low-cost balloon kit developed by the University of Regina team will be provided. Data collected and video captured in recent launches will be described. Details of how the balloon experiment can be integrated with the new Saskatchewan Environmental Science 20 curriculum will be discussed. Participants will also learn how the turnkey solution may be used to engage students in mathematics and science.

Strategies and Resources to promote **room 390**

deep learning of Health Science 20 topics (Repeated)

Craig White, Education Specialist, Let's Talk Science

CurioCity by Let's Talk Science is a free web-enabled program that Health Science 20 teachers can use to address a variety of curriculum outcomes. These outcomes include alternative approaches to health care; ethical issues in health care and treatment; the impact of lifestyle choices on health; genetically modified organisms (GMOs); food nutrition; and interpretation of diagnostic results. Students will find a host of information related to current health science issues for use in the student-directed study outcomes. In addition to these knowledge and STSE resources, CurioCity also has a wealth of information related to the variety of health science related career pathways. This presentation will provide Health Science 20 teachers with practical strategies for getting the most out of these resources.

Ten Years of Discovery: **room 391**

Science in Saskatchewan and beyond at the synchrotron in Saskatoon

Tracy Walker, Educational Outreach Coordinator, Canadian Light Source Inc.

In 2005 the Canadian Light Source, one of Canada's largest science facilities, opened its doors to scientists from around the world. Since then researchers have used infrared light and x-rays to study a staggering array of topics including cancer, green energy, oil sands, archeology, forensics, superconductivity, pharmaceuticals, toxicology, space, materials, medical isotopes, advanced technology and many more. This presentation will give some examples of the best research and technological advances using CLS, and draw connections to Saskatchewan Curriculum and educational programs offered by CLS. Opportunities to take home a poster will be available. Please drop by our booth to chat.

Session 3 1:00 pm – 2:15 pm

Re-Developing your field trip **room 210**

Julie Fisowich, Saskatchewan Science Centre

Field trips are an exciting event for both you and your students, but how do you make the most out of your excursion? This workshop will be your chance to experience the hands on learning that takes place at the Saskatchewan Science Centre. We will take you through materials you can add to your field trips to make it the best possible learning experience outside the classroom. Inquiry learning techniques will be used as we explore the free choice learning environment of a science centre.

The Expanding Universe **room 215**

Patrick A. Kossmann, Perimeter Institute of Theoretical Physics

We are part of an incredibly amazing universe. Students will be able to complete activities focused on different aspects of the cosmos from the Big Bang, to the Cosmic Microwave Background (CMB), to the expanding universe. This grade 7-12 classroom kit provides teachers with print and digital resources to inspire students and aid with understanding of the universe using activities based on these topics that are easily adapted to any curriculum.

Rock'n the Classroom: **room 223.1**

Amy Lafontaine, Sask Mining Association

Come **Explore and Discover** curriculum-correlated lesson plans and activities focused on Saskatchewan's Earth Resources. This workshop will showcase lessons and teaching resources that the Saskatchewan Mining Association (SMA) has developed to correlate with Grade 7 Earth's Crust and Resources; Science 9, Science 10, Physical Science 20, Chemistry 30 Solubility and Solutions; new Chemistry 30 , Practical and Applied Arts Energy and Mines 10, 20 and 30, and Careers in Mining. These resources can also be used in the new Earth Science 30 course. Participate in hands-on activities to learn how **uranium is processed** or how **seismic surveys** help to interpret the ground beneath our feet. Discover how the SMA is developing curriculum-correlated resources to complement the new Secondary Science courses and find out how you can have the best PD experience of your career on the 2015 Rock'n the Classroom GeoVenture Program this summer.

From minerals and rock cycles to mining cycles and bicycles, learn about mineral resources and how they are extracted and used in daily life. Rock'n the Classroom is a workshop to provide teachers with classroom resources, enhanced knowledge and increased confidence to teach about Saskatchewan's mineral resources.

The Canadian Math Wars, 2011—2015 **room 312**

Egan J Chernoff

The Math Wars, Eh? Believe it or not, the teaching and learning of mathematics has become a staple of local, provincial and national media coverage over the last four years. The purpose of this session is to provide a historical overview of the (most recent) debate over the teaching and learning of mathematics, as found in the media. The historical overview will, of course, touch on many of the "hot topics" of the debate (e.g., PISA, TIMSS, WISE Math, WNCP, "new" math, new Saskatchewan curriculum, and others) and time for discussion at the end of the presentation will be strictly preserved.

Biology 30 **room 314**

Mick Rissling, Regina Public SD;

Lindsay Shaw, Prairie South SD;

Kim Temoshawsky, Chinook SD;

Rob Gosselin, Good Spirit SD, and

Dean Elliott and Fatma-Zohra Henni from the Ministry of Education

Ministry representatives along with the teacher-writers, will provide an overview of the renewed Biology 30 course.

Health Professions Education: **room 315**

How the new Health Science course interfaces with post-secondary opportunities

Lynda Kushnir Pekrul, Saskatchewan Polytechnic

The School of Health Sciences and the School of Animal and BioScience have a host of programs that high school teachers and students might want to explore and consider as part of the "career explorations" section in the new Health Science 20 curriculum. Programs at Saskatchewan Polytechnic are demanding and very different from traditional university offerings. Come and hear about what Sask Polytech has to offer! Bring your questions as we review options, opportunities and the realities of a health science education for your students.

Personalization and Customization of Your Core Science Resource **room 318**

Lionel Sanders

How are you going to build your new science program? With a core text? With a binder of photocopied ideas? With information from the Internet? And more importantly where will you find the time to do all this work? In this workshop we'll explore how to combine both print and digital resources to make your own customized high quality, low cost print resource. And, we'll explore how other teachers are using this model to make the transition to integrating technological solutions into their teaching practice. This session will focus on grades 11 and 12.

Physical Science 20 – Reductionist or Holistic **room 319**

Rory Bergermann

Are you anxious about teaching this class for the first time this fall? Are you stressed about how to fit all of these outcomes into one semester? Relax. Come and listen to one of the curriculum writers share how to make your Physical Science 20 class a fun & engaging holistic experience for students. We believe in working smarter, not harder by doing activities that lead to a deeper interconnection.

Equilibrium, moving forward (or backwards)? **room 320**

Larry Mossing

Outline: Equilibrium continues to be a major part of Chemistry 30 and a challenging concept to teach. Several illustrations of this concept will be discussed while making reference to a comprehensive module that will be available to participants.

Biotechnology for Grades 11 and 12 **room 321**

Leah Hermanson or Susan Jorgensen

Learn about biotechnology in agriculture from an agricultural scientist and the connection to Health Sciences 20 and Biology 30! As the world population grows, so too does the importance of science and technology in feeding, clothing and fuelling the world. Biotechnology has a key role in this. Our invited scientist will review the processes of biotechnology and it's applications in agriculture. The scientist will review the processes of biotechnology and it's applications in agriculture. This will be followed by an introduction to the two Biotechnology Kits developed for Health Sciences 20 and Biology 30. The Bacterial Transformation kit includes materials to transform bacterial cells by adding a plasmid. The Bovine Spongiform Encephalopathy (BSE) Gel Electrophoresis kit includes materials required for students to use electrophoresis techniques to identify the contaminated food source responsible for BSE in a herd of cattle. Both kits are closely coordinated with provincial curriculum. These kits will help students to use appropriate tools and techniques to gather, analyze, and interpret data by designing and conducting a scientific investigation.

Space Balloons and Computer Science: **room 341**

Open Source Data Gathering with the National High Altitude Balloon Experiment

David Gerhard, University of Regina & Stephen Cheng, University of Regina

In The National High Altitude Balloon Experiment, teams across Canada will be launching stratospheric balloons and gathering data from the edge of space. The balloon kit developed by the University of Regina is based on open source hardware and software, and is a demonstrative case-study in integrating cutting-edge technology into class activities. This workshop will focus on the design of the experiment, the choice of sensing equipment, the software for data collection, and the analysis of the resulting data, from the standpoint of computer science, mathematics, and statistics. The Smart Citizen kit, a component of the balloon package, will be discussed in detail as a standalone environmental sensor, with a focus on using computing to support other classes like Environmental Science.

Environmental Resources for the new high School Sciences **room 390**

Pam Belcher, Destination Conservation Saskatchewan

The Saskatchewan Environmental Society (SES) offers a number of environmental education resources free for download. The materials include lessons, videos, audits (energy assessments) and campaigns. Of specific interest to teachers in the high school sciences, the SES has power point and video resources around oil sands, uranium development and climate change. Other SES environmental education programs that may be of interest to teachers around the province are the Boreal Watershed Monitoring Program, Smarter Science Better Buildings, and Destination Conservation Saskatchewan. Beyond SES resources, there are excellent and balanced materials around the issues related to resource development and climate change being created by other organizations. Following the presentation, teachers are sent additional resources specific to their individual requests.

Gale **room 391**

Dynamic Databases to Promote Inquiry and Support the New Sask Secondary Science Curriculum

Brendan O'Dacre, Nelson Education

This session will offer an overview of multiple Gale online database resources that directly assist in instruction of the new secondary science curriculum. A walkthrough of functionality and recent upgrades to these resources will give both beginners and advanced users of Gale research resources something new to take to their classrooms. While focusing on instructional multimedia content that directly aligns to curriculum outcomes, participants will see how online educational databases can assist in directing inquiry. Participants will also have the opportunity to drill down into some of the backend supports for teachers looking to better use technology in their classroom to engage students.

Session 4 2:30 – 3:45

TEACHING STRATEGIES FOR ENVIRONMENTAL SCIENCE 20 **room 210**

Phil Langford, Prairie Valley SD & Lyle Benko, University of Regina

During this 70 minute workshop, teachers will be introduced to a number of strategies, projects, research ideas, and resources that can be utilized for teaching the new Environmental Science 20 course.

Natural Resources of Saskatchewan **room 215**

Bernadette Slager, Saskatchewan Forestry Association

During this workshop session participants will join in on some hands on activities that help young people understand more about the environment they live in. These activities are taken from lessons developed for teachers of students in all grade levels. The activities are usually used as attention grabbers to get students interested in the coming lesson. They are anywhere from two to five minutes each.

We will also include an introduction to the Focus on Forests – First Nations Lessons that were created to help teach about the forests using some storytelling, talking stick and sacred circle methods.

At the end of the sessions participants will be introduced to the website where they will have access to all the material we cover.

Careers in the Mining Industry **room 223.1**

Kate Grapes & Lynn Carter, Sask Mining Association

Not everyone in mining is a miner! Mining companies in Saskatchewan employ people in over 120 career pathways. Accountants, Security Guards, Engineers, Welders, Geologists and Heavy Equipment Operators are just a few of these. This workshop will look at the Saskatchewan mining sector's growing need for new employees in the next 5 – 10 years. Participants will try out an activity highlighting potential careers in the minerals industry, based on Holland's personality and work environment profiles. Participants will receive a set of Saskatchewan Explore For More career profile cards.

Saskatchewan Science Safety Workshop **room 312**

James Palcik

Flinn Scientific Canada is a recognized leader in science lab safety. This is an extraordinary opportunity to attend a comprehensive workshop facilitated by Canada's science safety experts. Plenty of free resources and awareness about your own science program provided. Must-attend session to prevent accidents from occurring in the classroom / prep room.

Making Connections Between University Researchers and High Schools **room 314**

Len Brhelle, Regina Public SD;

Dr. Bjoern Wissel, University of Regina; and

Dr. Nader Mobed, University of Regina

Discussion about ongoing discussions the University of Regina, the Ministry of Education, and shool division consultants to find ways to connect Regina area teachers and students in a meaningful way with researchers at the U of R. Given secondary science curriculum renewal, developing these types of partnerships seems to be a natural progression.

Several researchers at the U of R have stated their interest in working with secondary teachers and their students. The Regina area school division science consultants also believe it to be a good idea. This session will act as a forum for people to get together to discuss possibilities for it to happen

Literacy & Science: Together is Better **room 318**

Lionel Sanders

"Tell me and I forget,

Show me and I remember,

Involve me and I understand"

This practical, hands-on workshop will engage participants in a variety of activities inspired by the cross-curricular integration of skills and habits of mind present in both literacy and science. Ready to use lesson ideas and activities will spark and scaffold student inquiry while building a literacy rich environment in your classroom as students observe, question, predict and infer in a variety of contexts. See how literacy and science can support each other and foster creative and innovative thinking that can be easily transferred to other content areas. It won't matter which comes first or where you place these ideas and activities in your day as students will deepen and extend their thinking and understanding in meaningful contexts full of opportunity for reading, writing and vocabulary development while having fun!

This session focuses on grades 4 to 10.

Marvelous Microbes - Microbiology activities for the new curriculum. **room 319**

Michelle Wall

Whether you're a new teacher with no experience working with bacteria, or a seasoned pro with plenty of know-how, the new curriculum will have us all scrambling for ideas. Microbiology, with its broad application in the real world, is an excellent springboard from which to launch a variety of activities. The new Health and Environmental Science 20 courses provide ample opportunity to bring bacteria into the classroom. Learn how to work safely with microorganisms, while opening your students' eyes to this unseen realm.

The Study of Aquatic Systems in (and out) of the High School Classroom **room 320**

Kristen Simonson & Rhonda Phillips

This seminar will look at how to actively study aquatic systems in senior science....the focus will be on determining the health of a local watershed by using an in-depth riparian assessment (place-based learning), an assessment of the bio-indicators from that watershed (such as the identification of macro-invertebrates) and by providing access to quality resources and adaptations that would be suitable for the new environmental science 20.

Participants should bring a flash drive, and will have the opportunity to purchase Rhonda's manual on aquatic explorations.

Forced to Think About Nature: Causes and Impacts of Extreme Weather **room 321**

Beverly Lewis-Hunte

Forces of Nature is a free teacher resource with DVD and lesson plans that compliment grades 7-12 geography and science curriculum. Through the examination of 4 Canadian natural disasters we can understand how extreme weather can tear places apart and at the same time bring people and industries together. Show students how the measurement of the rates of soil absorption can impact decisions on where and how cities are built. This workshop will show you how the exercises, experiments, weather research, data analysis, and risk management exercises connect the physical world with urban business & financial industries. Participants will be given a copy of the free resource.

Tetrahedral Kite Workshop **room 341**

Lana Elias, University of Saskatchewan

Participants will create their own inexpensive tetrahedral kite out of paper, straws, string and glue. Although curricular connections will be made to grade 6 science (flight) and math (tessellations and fractals) curricula, all teachers are welcome to join in the fun!

Using Energy Audits to Encourage Inquiry in Science **room 390**

Pam Belcher, Saskatchewan Environmental Society

The focus of this session is on grades 5-8, explaining and demonstrating how to use energy, water and waste audits. The Saskatchewan Environmental Society uses these assessments to help students figure out what the conservation issues in their school (and home) are, and show them how to use the results to plan action projects that make changes. The audits include a lot of math that can be adapted by teachers to fit appropriate outcomes. The energy audits also work well in themed projects where teachers are integrating subjects like science, social studies, health education and English language arts. Currently, the energy audits are being used as significant indicators in a program funded by the City of Saskatoon. The inquiry program, called Student Action for a Sustainable Future, partners with schools in the Saskatoon Public and Greater Catholic schools in designing and carrying out actions that will reduce greenhouse gas emissions.

The Saskatchewan Cradleboard Initiative **room 391**

Sandra Bonny, University of Saskatchewan

The Saskatchewan Cradleboard Initiative links STEM learning across educational and cultural contexts in support of our renewed, multi-vocal K-9 Science curriculum. In this session participants will be introduced to hands-on science activities and online resources developed by University of Saskatchewan students working with Aboriginal educators and community resources – How did Metis women practice solution chemistry? Why do fish scales make great glue? Where did the Dakota flute come from and how do they work? The SCI is affiliated with Buffy Sainte-Marie's Nihewin Foundation (Canada) supporting the success of all students through celebratory cross-cultural learning within core studies.

Saturday, May 9

9:00 – 11:30

Panel "Career Education in Renewed Secondary Science Curricula" **room 191**

Dean Elliott, Science Consultant, Ministry of Education

Janet Uchacz-Hart, Executive Director, Saskatoon Industry Education Council - SaskCareers.ca

Dr. Netha Dyck, Dean, School of Nursing, Saskatchewan Polytechnic

Lynda Kushnir Pekrul, Dean, School of Health Sciences, School of Animal and Biosciences, Saskatchewan Polytechnic

Brenda Suru, Acting Dean, School of Mining, Energy & Manufacturing, School of Natural Resources & Built Environment, Saskatchewan Polytechnic

Rob Miller, Computer Systems Technology Department, School of Information and Communications Technology, Saskatchewan Polytechnic

Dean Elliott from the Ministry of Education will chair this panel session. There will be a brief overview of secondary science renewal and then panel members will discuss career options available for students based on the new and renewed secondary science curricula. The audience will be invited to share success stories of engaging students in their career explorations.

Panel members will represent the University of Regina, University of Saskatchewan, Saskatchewan Polytechnic, and the Saskatoon Industry Education Council.