



**Saskatoon, Saskatchewan**

**August 9 – 14<sup>th</sup>, 2009**

**Festival Programme**

Teaching before Science on Stage:



Teaching after the first Science on Stage:



Teaching after the next Science on Stage

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### **Welcome of the Canadian Light Source and Saskatoon**

These are exciting times! Welcome to all of the delegates to the first Science on Stage Canada: Canada's Science Teachers' Festival. The Canadian Light Source is very honoured to be hosting this first ever event and we look forward to meeting with you all to discuss your ideas on how to inspire the next great generation of scientists. We at the Canadian Light Source consider science education as a core part of our mission and this event is something we consider truly important. Science is fun and at the same time should be educational. Events, like Science on Stage Canada, allow for an exchange of ideas and best practices for educators around the world. You are the ones that make science fun.

This first ever event in Canada has delegates from 4 provinces and 1 territory along with representation from 3 countries. This is truly a national and international event. What better location to host this festival? Saskatoon, where science and technology meet innovation, is the home for two of Canada's premier research facilities, the Canadian Light Source and the International Vaccine Centre (InterVac), along with one of Canada's top research universities, the University of Saskatchewan. This is a truly unique environment for you to find inspiration therefore we look forward to the outcomes.

Enjoy your stay in Saskatoon and we wish you a most productive week at Science on Stage Canada.



Jeff Cutler  
Director of Industrial Science  
Canadian Light Source

Welcome to Canada's first Science on Stage!

This festival is the foundation for what we hope will become a remarkable coming together of

- ✿ Canadians from distant parts of the country
- ✿ Cultures far and near
- ✿ Science teachers working with various age levels and in various disciplines
- ✿ Science educators representing diverse formal and informal organizations
- ✿ Educators and researchers with a common goal of inspiring students and creating meaningful learning experiences for students

Weaving together science teaching fair and professional development activities as well as discussions concerning science teaching we can build on the impressive success of the Science on Stage festivals in Europe over the past eight years. Our goal is to support educators in engaging students in the discourse and pursuit of science and technology learning where students become not just science literate but science wise.

Teachers play an important and crucial role in terms of how students engage and come to understand science. Their interaction with students influences what and how youth think about science, hence the need to involve students in expansive and rich learning situations that motivate, inspire and educate. It is more important than ever before that today's students cultivate an interest in and an appreciation for science whether this leads them to a career in science or a lifelong interest and involvement in science and science-related issues.

We believe that via a showcase of ideas from a convergence of science and educational communities sharing diverse experiences of science and science teaching first amongst ourselves then with colleagues from our local regions, there is the opportunity to enhance science education across Canada. Bringing together innovative educators promotes the sharing of experience, ideas, and strategies. Our organizing committee for SoSC 2009 reflects this convergence and we are very, very excited to welcome you to Canada's inaugural Science on Stage Festival!

<b>Tracy Walker</b>	<b>Johanne Patry Ph.D.</b>	<b>Annie Desilets</b>	<b>Phil Langford</b>	<b>Tim Molnar Ph.D.</b>
<b>SoSC Co-Chair</b>	<b>SoSC Co-Chair</b>	<b>Committee Member</b>	<b>Committee Member</b>	<b>Committee Member</b>
Educational Outreach Coordinator, CLS	Chairperson of National Steering Committee Canada Science on Stage; Math, science & technology counsellor, Collège Bourget; Assistant Professor, Université de Sherbrooke	Counsellor in Math, Science & Technology, Commission Scolaire Marie Victorin	Treasurer Council of Science Educators of Canada; Treasurer/Editor SK Science Teachers Association	Assistant Professor, Science Education Curriculum, University of SK



## Week at a Glance:

	Sunday 9	Monday 10	Tuesday 11	Wednesday 12	Thursday 13	Friday 14
8:00		<b>Breakfast</b>				
9:00		8:30 Keynote Speaker: Johanne Patry	8:30 Light and Matter Presentation	8:30 Synchrotron & Archaeology Presentation	8:30 Concurrent Sessions: Accelerator & Insertion Devices SGM; IR; Crystallography	8:30 Pedagogical discussions - Planning for the future
		9:15 Beamline Basics	9:30 Pedagogical Discussions - What do we need?	9:30 Synchrotron & the Environment Presentation		
10:00		10:00 Break			10:00 Break	10:00 Break
		10:20 Discussions - What are the issues?	10:30 Break	10:30 Break	10:30 Accelerator & Insertion Devices SGM; IR; Crystallography (continued)	10:30 Students on the Beamlines Presentation & Discussion
11:00			10:45 Synchrotron Imaging Presentation	10:45 Synchrotron & Materials Science Presentation		11:30 Fair: Tina Rioux
		11:30 Lunch break			12:00 Lunch break	Farewell Luncheon
12:00			11:45 Lunch break	11:45 Lunch break		Keynote Speaker: John Tse
		12:30 & 1:15 Concurrent sessions: Beamlines Up-close & Seeing Things	12:45 Understanding Plant Tissues Presentation	12:45 Discussions - What can SoSC do to help?	12:30 Radiation Safety; VESPERS; SM; Crystallography (double session)	Goodbyes ... :( Last minute Fair sharing
1:00	CLS open for display set up safety training for facility access available					
2:00		2:00 Science on Stage Fair	1:45 Selenium-Arsenic Puzzle in Bangladesh Presentation	2:00 Science on Stage Fair	2:00 Break	Disassembling the fair and leaving for home
3:00		Presentations by: Julie Bolduc-Duval Diana Hall	2:45 Science on Stage Fair Sophie Martin	Liz Wirtanen Patrick Fernet Glenn Guthrie	2:30 Radiation Safety; VESPERS; SM; Crystallography (double session)	
4:00		Michelle Tremel	Carly DeBoice	Richard Fink	taxi to German club	
		Sarah Torrie	Glenn Guthrie	Erick Foch		
5:00	4:30 Synchrotron 101 Presentation	walking/taxi transport	walking transport	<b>Fair Open for Science Educators</b>	Cultural Evening	
					FolkFest!!	<b>Key</b>
6:00	5:30 snack & facility tours	6:00 supper aboard Saskatoon Princess	Gala Supper - Boffins Speaker: David Katz		Public tranist to other pavillions of interest	SoSC Festival
						CLS Professional Devel.
7:00	Free Evening		6:00 cocktails		Pedagogical Discussion	
					Social	

## Sunday August 9th - Introductions

1- 4	Set up your booth	Facility Access safety training & photos for badges
4:00 - 4:30	WELCOME!!	From the SoSC Organizing committee and from CLS: Jeffrey Cutler, Director of Industrial Science
4:30 - 5:30	Synchrotron 101 - Tracy Walker	Tracy is the Educational Outreach Coordinator for the Canadian Light Source, giving a general overview of the synchrotron facility - how the light is produced and provide examples of research
5:30 - 7:30	Dr. Robert Blyth - Facility tour	Robert is the Assistant Director of Research for the CLS and an outreach enthusiast.
7:00 - ...	Walkabout campus? - free evening	

## Monday August 10th - SoSC begins

8:30- 9:15	Dr. Johanne Patry - Keynote Speaker	Johanne is a teacher as well as a math, science, and technology advisor at Collège Bourget Rigaud, QC. She has participated in five European Science on Stages and won the category of Self-Perception in the Teaching Process at SoSD in Berlin, 2008. She has attended the CLS Summer Workshop for Teachers and has brought students to participate in Students on the Beamlines.
9:15 - 10:00	Beamline Basics - Tom Regier	Tom is the Beamline Scientist for SGM. He will explain the basics of how synchrotron light is selected, manipulated and delivered to the endstations for experimentation.
10:00	Break	
10:20 - 11:30	Pedagogical discussions	What issues do we face as science educators? How can we pull together to support each other in facing these issues.
11:30	Lunch	
12:30 and 1:15	Beamlines Up-close - Dr. Lucia Zuin	Lucia is the Beamline Scientists for VLS-PGM, a soft x-ray beamline. She will show how the components of the beamline work together.
	Seeing Things - Dr. Emil Hallin	Emil is the Director of Strategic Scientific Development for the CLS. He will help us understand how we 'see' things at CLS.
2:00 - 4:00	Fair Focus: Julie Bolduc-Duval	Julie teaches physics and astronomy in a CEGEP in Thetford Mines, QC. She incorporates a trip to an amusement park and the design of a ride into her curriculum.
	Fair Focus: Diana Hall	Diana teaches physics to senior high school, gifted, and university students in Nepean, ON. She has created a game called Relativistic Pictionary. It is fun combining creative writing with special relativity.
	Fair Focus: Michelle Tremel	Michelle teaches junior and senior math and physics in Maymont, SK. She has developed methods to incorporate personally developed websites, wikis, and webquests into her classes as a way to engage students and extend learning beyond the classroom.
	Fair Focus: Sarah Torrie	Sarah teaches junior science and senior physics, including International Baccalaureate. She will present, "How to create an environment where students can design their own labs" sharing projects and activities that can be done from grades 9-12 that have a common inquiry rubric.
6:00	Riverboat Cruise	Enjoy supper and the City of Bridges from under the bridges :)

### Tuesday August 11th - Synchrotron Life Sciences & Fair Sharing

<b>8:30 - 9:30</b>	Light and Matter - Dr. Alex Moewes	Alex is a Canada Research Chair in Materials Science with Synchrotron Radiation as well as professor of Engineering Physics at the University of SK. He will help us understand what happens as light interacts with matter.
<b>9:30 - 10:30</b>	Pedagogical Discussions	Building on the list generated previously, we will explore how we, a group of educators, and SoSC can build supports to help.
<b>10:00</b>	Break	
<b>10:45 - 11:45</b>	Imaging - Dr. Dean Chapman	Dean is a Canada Research Chair in X-ray Imaging and Professor of Medicine. He will present work that he has done developing the technique of Diffraction Enhanced Imaging and the CLS Biomedical Imaging and Therapy Beamline.
<b>11:45</b>	Lunch	
<b>12:45 - 1:45</b>	Understanding plant tissues - Dr. Chithra Karunakaran	Chithra is the CLS Staff Scientist for Spectromicroscopy Beamline. She will present work that she is doing on the structure of plant cell walls with an eye towards more efficient development of biofuels from biomass materials.
<b>1:45 - 2:45</b>	Selenium-Arsenic Puzzle in Bangladesh - Dr. Graham George	Graham is the Canada Research Chair in X-ray Absorption Spectroscopy at the University of SK. He and his team have used synchrotron XAS to reveal the reason for the toxicological curiosity of their poisoned water supply.
<b>2:45 - 4:30</b>	Fair Focus: Sophie Martin	Sophie teaches grade four in Rigaud, QC. She has developed an activities based science laboratory in her school. She will present a "Bathquake" which has a focus on how to do scientific investigations building scientific knowledge.
	Fair Focus: Carly DeBoice	Carly is the Program Director for TELUS World of Science in Calgary, AB. Her project will outline how their recent programming focused on inquiry for elementary grades and how they will create learning opportunities for teens to engage with science and technology in purposeful ways.
	Fair Focus: Glen Guthrie	Glen represents the Sahtu Renewable Resources Board in Tulita, NT. He has facilitated school science and traditional economy projects in five communities in the NWT including year-round trapping, hunting and fishing components. These programmes have successfully helped to keep youth in school and contributed to real world science through wildlife management, watershed investigation, and partnerships between organizations and school science programs.
<b>6:00</b>	Gala Supper	Boffin's Club - walk through the gardens and lovely atmosphere Keynote Speaker: David Katz, Director of Enterprise SK

### Wednesday August 12th - Synchrotron Environment/Materials & Fair Sharing

<b>8:30 - 9:30</b>	Archaeology at the CLS - Dr. Liz Robertson	Liz is a professor of archaeology at the University of SK specializing in the relationship between past environments and precontact activity and is conducting a study of Beaver River Sandstone, an important tool stone in precontact history.
<b>9:30 - 10:30</b>	Synchrotron and the Environment - Dr. Lisa van Loon	Lisa is an Industry Scientist at CLS. She will share with us some of the work that has been done for industry clients in our focus area of the environment.
<b>10:30</b>	Break	

<b>10:45 - 11:45</b>	Synchrotron and Materials Science - Dr. Julie Thompson and Dr. Jigang Zhou	Julie is an Industrial Liaison Scientist and Jigang is an Industry Scientist , both on CLS' Business Development team. They will share with us some of the collaborations they have worked with industry on using synchrotron techniques.
<b>11:45</b>	Lunch	
<b>12:45 - 2:45</b>	Pedagogical Discussions	Spring boarding from yesterday, we will put our collective heads together to plan for supporting our colleagues in future SoSC
<b>3:00 - 5:00</b>	Fair Focus: Liz Wirtanen	Liz teaches Science and Technology to 13 & 14 year olds in Saint-Jerome, QC. In this learning situation students are invited to create an innovative energy efficient home concept powered by renewable energy sources (wind, water, geothermia or sun).
	Fair Focus: Patrick Fernet	Patrick represents ISPAJES (Ingénierie Simultanée Présentée Aux JEunes du Secondaire), a group working directly in schools with a mission to prevent dropouts and help develop student skills. Using a technique called “concurrent engineering”, students receive a request from a customer to design, build and develop a new product according to specifics needs.
	Fair Focus: Richard Fink	Richard represents the Petroleum Technology Research Center in Regina, SK. He is interested in engaging teachers in discussions to develop materials based on their research, particularly the Carbon Capture and Storage/Sequestration work in southern SK and the potential it offers for teachers to connect curriculum to a cutting edge, real world example of science.

**5-7pm Fair open to so Science Educators can join us ... (fingerfood provided)**

### Thursday August 13th - Synchrotron Practical Sessions

**Choose which session for each time slot you are interested in. There is a maximum of 5 participants in each session. Details about the sessions are listed at the end of the program.**

<b>8:30 - 10</b>	Accelerator	Controlling electrons and manipulating photons
<b>presentations concurrent</b>	Crystallography	DOUBLE SESSION I connecting proteins to crystals to diffraction patterns to structures
	Gaseous molecules under infrared light	Collect and analyse data in the Far IR beamline connecting physics and chemistry concepts
	SGM	Using soft x-rays to collect and analyse data
<b>10 :00</b>	Break	
<b>10:30 – 12</b>	Morning Sessions repeated	
<b>12:00</b>	Lunch Break	
<b>12:30 - 2</b>	Radiation Safety	Run diagnostics, take tests, lock down the synchrotron!
<b>presentations are concurrent</b>	Crystallography	DOUBLE SESSION I connecting proteins to crystals to diffraction patterns to structures
	VESPERS	Compare authentic medieval coins to reproductions
	SM - PEEM	Observe images of silicon samples at the sub-micron level!
<b>2 - 2:30</b>	Break	
<b>2:30 - 4:00</b>	Afternoon sessions are repeated	

### Friday August 14th - Wrapping Up and Plans for the Future

<b>8:30 - 10:00</b>	Pedagogical Discussions	SoSC for the future - what will it look like? How do we accomplish that? Let's make plans ...
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<b>10:00</b>	Break	
<b>10:30 - 11:30</b>	Students on the Beamlines - Dr. Robert Blyth	Robert, Assistant Director of Research at CLS, has been working with this program since its inception. He will present the program from the scientific research perspective and the unique opportunities it offers.
<b>11:30 - 12:00</b>	Fair Focus: Tina Rioux	Tina teaches junior science and senior biology courses at Evan Hardy Collegiate in Saskatoon, SK. She has attended two CLS teachers workshops and participated in Students on the Beamlines. She proposes the development of a Teachers Guide to SotB to make participating easier for teachers in the hopes that it will expand beyond the synchrotron. It is a work in progress so please be prepared to offer your input.
<b>12:00 - 1:00</b>	Lunch: Farewell Keynote Speaker - Dr. John Tse	John is a Canada Research Chair in Theoretical Materials Science. "Every day scientists face a challenging problem, a mystery, a puzzle we want to solve. Through that process, even if we don't solve the puzzle, we feel like we are making a contribution to a further understanding. That's really the motivation, creating something that will hopefully be useful to our colleagues and to everyone."
<b>Detailed Descriptions of Practical Sessions:</b>		
<b>Accelerator &amp; Insertion Device Physics:</b> Grant Bibrough (Accelerator Physicist) and Michael Sigrist (Insertion Device Specialist)		Accelerator physics IS the design and operation of a synchrotron by controlling the path the electrons take from the source to the storage ring where light is generated. A talk explaining some of the physics behind the control of the electron beam as it revolves around the storage ring and how it generates light will be given. Tour of the control room and discuss how the beam is tuned.
<b>From Crystals to Drug Design:</b> Dr. Pawel Grochulski (CMCF Beamline Scientist) & James Gorin (Science Associate) in the am and Dr. Stan Moore (University of SK) & James Gorin in the pm.		Prepare protein crystals for X-ray data collection. You will collect data, analyze diffraction patterns and learn how to use that information to determine the atomic structure of a protein. You will build part of a protein molecule at the graphics workstation and will learn how scientists use the high resolution biostructural information gathered at CMCF for research and drug design. <b>**Please note that this is a double session**</b>
<b>Gaseous Molecules Under Infrared Light:</b> Dr. Brant Billinghamurst (CLS Staff Scientist)		Collect and analyse the spectra of a simple molecule in gas form. Review the basics of Fourier transformation. Connect concepts in chemistry and physics through vibration-rotation spectroscopy.
<b>Radiation Safety:</b> Grant Cubbon (Radiological Control Coordinator)		Wander throughout the facility to become familiar with the various detection systems and monitoring conducted to ensure our safety. Have the opportunity to participate in a radiation survey and system lock downs as preparation to a user run.
<b>VESPERS:</b> Dr. Lisa van Loon (CLS Industrial Scientist)		We will use the microprobe on the VESPERS beamline to analyse an authentic medieval silver coin from the time of Edward I of England and compare that to the analysis of a modern reproduction.
<b>The state-of-the-art Photoemission Electron Microscope (PEEM) at the Canadian Light Source:</b> Dr. Uday Lanke (University of SK)		In this session, you will receive a brief presentation on the PEEM microscope, its operation principle and a couple of science application examples where the microscope could be useful. The microscope is capable of delivering spectroscopic as well as microscopic information at the sub-micron resolution scale.

In the evenings throughout the festival, there will be opportunities to explore the culture of Saskatoon and enjoy the companionship of your colleagues:

## **Walking Tour of Campus**

**Sunday, August 9<sup>th</sup>**

After the introduction to the Festival, you're welcome to take an informal walking tour of the beautiful University of Saskatchewan campus. The university features the finest grouping of collegiate gothic buildings in Canada. It is also considered to be one of the most beautiful campuses in the country. This tour is options and the remainder of your evening is free.

## **Shearwater Tours**

**Monday, August 10<sup>th</sup>**

Saskatoon is famous for being the City of Bridges, having 7 bridges spanning the South Saskatchewan River. It is also the site of one of the best kept in-city river valleys in the world, a playground for people and animals alike. View the historic riverbank from a different perspective – on the river itself with dinner provided (beverages are on your own).

## **Teaching Fair**

**Wednesday, August 12<sup>th</sup>**

In order to further promote your excellent science teaching, Wednesday concludes with opening the Teaching Fair to science educators in the local area. This punch and cheese event will allow you to explain your best practises to a more public audience.

## **Supper at Boffin's Club**

**Tuesday, August 11<sup>th</sup>**

Located in one of the most successful research parks in Canada, Boffins is one of Saskatoon's finest private clubs. After a full day, a walk through the spectacular garden and a gourmet supper is an ideal way to unwind. Since Tuesday is games night, you can ask for Kaiser, crib, chess or checkers.

## **Folkfest**

**Thursday, August 13<sup>th</sup>**

One of Saskatoon's most popular festivals, Folkfest allows you to explore the city's cultural diversity. Your 'passport' gives you access to seventeen cultural pavilions through the city as to special buses. Performers of all ages, exquisite artisans, global merchants, talented cooks, and enthusiastic servers gather to share their culture with you. We will start in 'Germany' with supper, after which you are free to explore.

## Delegates and their projects:

### **Liz Wirtanen – Saint-Jérôme, QC**

*Grade 8 Science and Technology Teacher*

In this learning situation, students are invited to create an innovative energy efficient home concept powered by renewable energy sources (wind, water geothermia and sun). Each team of four students must produce, within a timeframe of 3 weeks, a house prototype at a scale of 1:25, integrating 3 different energy producing modules. This activity reflects the fundamental values and priorities of the Quebec high school science program, including providing students with hands on experience, developing problem-solving abilities in a competency based learning environment, promoting awareness of global issues such as the energy crisis and climate change, providing students with significant learning opportunities, and covering fundamental concepts in science and technology. This situation is unique and innovative in its ability to demonstrate that electricity can easily be produced with basic materials such as magnets, electrical wire, chloroplast and wind, or water.

### **Julie Bolduc-Duval – Thetford Mines, QC**

*Physics and Astronomy Teacher in a CÉGEP (college)*

One of the most successful projects I've ever tried since I started teaching involved taking the students to an amusement park. This project was aimed at students studying in a technical program in mechanical engineering. Early in the semester, we went to the amusement park LaRonde, in Montreal, in order to study the rides. They had to take some measurements (time, length...) and to understand the concepts very well in order to answer the questions I gave them. The most interesting part of the project was the conception of a ride. I gave the students a few guidelines (g force required, the maximum power of the motor they could use, translation and rotation motion ...) and they were free to conceive the craziest ride they could imagine? This project obviously includes many physical concepts: force, acceleration, velocity, energy, power, rotation and translation... It can also link to more applied concepts: motors, technical drawing, hydraulic and pneumatic systems...

### **Patrick Fernet – Pierrefonds, QC**

*General Manager, ISPAJES*

In 2009, students attending ISPAJES (a one-year course designed to develop 12 competencies for high school students using a product development technique called "concurrent engineering") have received an order from a customer to design, build and develop a "carbon footprint" prototype capable of reducing CO<sub>2</sub> emissions in their school by one tonne per year and to obtain carbon credits for greenhouse gas emissions reductions according to the principals of the Kyoto protocol. ISPAJES is the only independent program in Quebec. Participating teachers receive formal training on the methods and also receive periodic support from university.

### **Sophie Martin – Rigaud, QC**

*Grade 4 Teacher*

This year my primary goal was to elaborate on the science activities in my classroom. Our school accepted to give us a budget and the space so that we could build a science laboratory. With the collaboration of my colleagues, we decided to develop activities concerning acids and bases, simple machines, the living world, electricity, and the environment. I present the activity, "How to build a bathquake." From my point of view, this project is really rich since by doing it, students learn a lot

about how to do scientific investigations, where the science rules come from, and how scientists built regularities. That was helpful all year when I had to teach regularities in mathematics. Also, during that project, they built their own representation of a gram, a millilitre, they learned how to use a balance, how to be accurate... and the list goes on and on.

## **Diana Hall – Ottawa, ON**

*Grade 11 & 12 Physics, AP Physics B, University and Gifted Levels Teacher*

Relativistic Pictionary – I present a fairly brief section of Relativity in my grade 12 class. I derive equations for solving problems and then focus a bit on space-time diagrams to illustrate similar problems. I created a game called Relativistic Pictionary. It is fun because it combines creative writing with special relativity. Students write a story containing relativistic events. They then illustrate the story on a space-time diagram. Students challenged to decipher the story from the diagram based on characters that have been introduced. They then compare their version of the story to the true story. They answer a couple of questions using the diagram. They are quite imaginative!

## **Sarah Torrie – Toronto, ON**

*Grade 8 & 9 Science, Senior Physics, and IB Physics*

Inquiry based learning – how to create an environment where students can design their own labs. The new science curriculum (2008) in Ontario has shifted the inquiry goals towards a student centred project focus. The four areas of inquiry are Initiating and Planning; Performing and Recording; Analysing and Interpreting; and Communicating. I will share techniques that help students build and use these skills but I will focus on design and planning. Successfully planning a lab is a difficult but very rewarding process. It is a skill that has to be taught and practised. I will share projects and activities that can be done from grades 9-12 that have a common inquiry rubric. This approach allows students to claim ownership of their labs, be involved in the entire process in a way that is not overwhelming or intimidating.

## **Glen Guthrie – Norman Wells NT**

*Renewable Resources Communication Officer, Sahtu Renewable Resources Board*

I create and facilitate school science and traditional economy projects in five communities in the NWT. These programs have brought youth back to school that have dropped out and kept youth in school. Students acquire respect for the land, respect for other people, survival skills, and a hands-on connection with their traditional heritage. Several wildlife management projects have been undertaken over the last five years including small animal capture, tag and release projects, traditional plant use projects, and bird and amphibian studies. The most ambitious project is the Bosworth Creek Monitory Project: a multidisciplinary high resolution investigation of a northern watershed that involves high school youth, elders, community volunteers, several post-secondary institutions, and federal and territorial government agencies. The BCMP has resulted in several original contributions to science in addition to the development of a partnership between government and non-government organizations to develop high school curriculum and lesson plans for the new Government of the Norwest Territories Experiential Science 30 program.

## **Carly DeBoice – Calgary, AB**

*Program Director for TELUS World of Science*

Inquiry: What does it mean? It's one of those educational phrases we've been hearing about. Coming from the science centre, we have a large focus on learning and how people learn. It drives our program development process. This year we've really taken a focus on inquiry, and have

developed some inquiry training programs, as well as gathered the best resources we could find. My project will focus on inquiry, what it means, and what the shift is for teachers in their classrooms. As inquiry is a key part of the curriculum for elementary, it is only a matter of time before it is mandated for all grades. Inquiry is essentially a shift in HOW one approaches science, and allows for students to make meaning themselves.

### Tina Rioux – Saskatoon, SK

*Junior Science and Senior Biology Teacher*

I believe there is a need to develop a guide that will ease the transition of teachers and students into their work at the CLS with the Students on the Beamlines project. Working outside of the school supports our school division goal of student engagement. It will provide an overview of what to expect from the SotB program to help ease anxiety of a new and unfamiliar situation. It is also my hope to help prepare students and give them an understanding of the commitment that is involved in the SotB project, and get them excited about the special opportunity they have before them. Such a guide could provide my colleagues venturing into this process insight into the scientific process used in “real” science and they could follow the process in a mock class experiment to write and design a proposal for submission, create and execute an experiment as well as create a poster sharing their findings.

### Michelle Tremel – Bruno, SK

*Junior and Senior Math and Physics Teacher*

Through the school year I created school websites for each of my classes (<http://08maymontphysics20.wepaint.com>). I would like to share ideas of using the Internet in the classroom as a way to engage students and help them with gain understanding. One project that we used the website to help was oral presentation. In physics 20 I gave students a list of possible topics (and I was open to suggestions) related to each of the areas we were taking. Students then introduced new topics to the class with a presentation. For example, some of the students presented rainbows to present refraction. In Physics 30 I introduced the course by having students select a webquest to do on a variety of topics we were covering. It let them select something they were interested in and created interest in the course. The pages I made were wiki pages, which means that you can have the students help make and modify the website. I got students to help find pages and videos to help them study and understand new concepts.

and present in

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