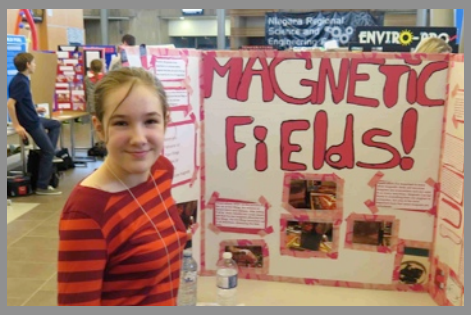
The TISP Canada Courier #11



October 14, 2015

"Digital Earth 2015" – Going to Space .. and back.

Students in Halifax experience encounters of a different kind during education activities at the "Digital Earth 2015" symposium. Imagine: meeting astronauts and walking on space maps!

For many of the 150 students the field trip to the Halifax World Trade and Convention Centre was real enough. After all, it was an afternoon on the town, off the school premises, and a nice sunny October day. Yet, as field trips go, this one was somewhat out of this world for the students. Their teachers had prepared them for the short trip to meet with delegates and other students and teachers attending the International Symposium for Digital Earth, organized by Saint Mary's University (***geography@smu.ca***) and held from October 5 to 9 in Halifax, Nova Scotia. Search engines were revving up. Enter: *Digital Earth.* Search! And, hey, here it says, courtesy of Wikipedia: "Digital Earth is an integral part of other advanced technologies including: earth observation, geo-information systems, GPS, communication networks, sensor webs, electromagnetic identifiers, virtual reality, grid computation, etc. It is seen as a global strategic contributor to scientific and technological developments, and will be a catalyst in finding solutions to international scientific and societal issues."

So, it all sounds a bit complicated and certainly very high-tech. But wait a minute, help is already on the way, all the way from space and back to Earth! For one, there is a gigantic floor map of Canada, spread out at the entrance to the venue,

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Issue #11
October 14, 2015

TISP Reports from the Regions

These columns summarize recent work, upcoming events as well as trials and accomplishments of TISP volunteers from across Canada. Reports are also filed with the minutes of the TISP-Canada Committee at *www.tisp.ieee.ca*.

Québec

AESTQ, the *Association pour l'enseignement de la science et de la technologie au Québec*, is holding its annual congress this year in Sherbrooke. The meeting is scheduled to take place at the University of Sherbrooke from October 14 to 16. This year marks the 50th anniversary of the AESTQ's congress. *Felicitations!*

For further information ***http://www.aestq.org/congres-annuel***

Ontario

Wolfram Lunscher of the IEEE Ottawa Section presented a 90 minute slide show and contributed a lesson plan on astronautics and rocketry before a grade 2 class in Stitsville Public School in early October. Wolf collaborated with the Canadian Space Society and used the opportunity to introduce the teachers present to TISP. On October 21, Wolf plans to give a presentation to the Christie Lake Kids in Ottawa to promote the IEEE Ottawa Sections's robotics competition scheduled for the winter months.

For information contact Wolfram at ***wlunscher@gmail.com***

TISP-Champion Murray MacDonald of the London, Ontario IEEE Section received some nice accolades following his TISP guest lecture for 55 pre-service science teachers at the Althouse College of Education, University of Western Ontario. Science Instructor Peder Nielsen relayed this comment: *"I had a 2P science class that was very apathetic towards the subject. In between units, I introduced them to the "Ship the Chip" engineering exercise we did in class with Murray MacDonald. The feedback was phenomenal and engagement was higher than any other lesson I had planned for them."* Well done, Murray!

Murray is organizing and participating in several activities this fall, including a Math Day for grade 6 students and the SPARK conference, in cooperation with the Thames Valley District School Board.

For information contact Murray at ***murraymacdonald@rogers.com***

Manitoba

Witold Kinsner, TISP Champion in Manitoba and President Elect of IEEE Region 7, has organized a "Design for Teachers" workshop in cooperation with teachers and university educators. The workshop was geared toward teaching assistants; more than 20 were in attendance.

For information contact Witold at the University of Manitoba at ***witold.kinsner@umanitoba.ca***.

Northern Canada

TISP-Canada secretary and IEEE Northern Canada Section member Rossitza Marinova co-organized the nation-wide Math Kangaroo contest with the help of several IEEE volunteers. Her Vancouver-based TISP volunteer Marc Isaak gave a helping hand in organizing a new Math Kangaroo event in British Columbia. The contest was held earlier this year in a number of Canadian cities and was deemed a great success. Rossitza hopes that more cities will be joining in 2016.

For information check ***kangaroo.math.ca*** or contact Rossitza at ***rossitza.marinova@concordia.ab.ca***.

What will these Kids think of next?!

This April, Dave Hepburn of IEEE Canada's Hamilton Section was once again one of some 90 judges at the Niagara Region Science and Engineering Fair (NRSEF). He filed this report.

These small fry never fail to amaze and amuse. And the messier the better. The young lady in the red striped outfit – age about 10 – had one of the better ones. The recipe:

- One 250 cc glass jar with close fitting lid.
- 240 cc of mineral oil.
- An assortment of bar magnets.
- Two thick books.
- 2 Tbsp iron filings.

Fill glass jar with mineral oil and stir in the iron filings. Replace lid on jar. Set jar aside and allow the iron filings to settle. Place one book on each side of jar. Place one magnet on each book, about 3 cm from side of jar. Slide magnets slowly towards side of jar.

It will be observed that the stronger the magnets and the closer to the jar, the more the iron filings will levitate off the bottom of the jar. The unresolved problem here, however, is what to do with the oily mess afterwards. The Hazmat boys are working on that.

Photo credit:David Hepburn

If you don't like mess, then try the following:

- Take a 1 Meter rule and lay flat on table.
- Take an assortment of small steel nuts.
- Take an assortment of small magnets.
- Take one small electronic weigh scale.

Place a nut on the extreme end of rule. Gradually slide a magnet towards the nut until the nut suddenly jumps up and flips over to the magnet. Record distance between face of magnet and the side of the nut closest to the magnet. Weigh the nut. Repeat until supply of nuts and magnets is depleted. Plot results neatly in graphical form.

In view of the fact that the NRSEF had decided to entitle the two prizes awarded by the IEEE as "An Understanding of Electricity and Magnetism", these two experiments were natural winners. It should be noted here that the NRSEF is no small event. There were over 250 exhibits scrutinized by 90 judges. Each judge is assigned at least 10 exhibits, and to ensure fairness, each exhibit is scrutinized by five judges. Some of the older students turned in some amazingly sophisticated studies, including, for example, DNA analysis and autism. And by 9:00 pm that same night, you get an e-mail advising you of which of your candidates have been selected. Awards night is the following Wednesday and lasts two hours, with no long-winded speeches allowed.

David Hepburn

For further information about this NRSEF, contact Dave at ***dehepburn@sympatico.ca***.

Photo credit: WTCC

While walking into the convention centre, students are taking a stroll across Canada on a gigantic RADARSAT space map.

Photo credit: James Boxall

Students in Halifax in a "down-to-Earth" encounter with astronaut Jeremy Hanson from the Canadian Space Agency.

"Digital Earth 2015", *continued from page 1*)

welcoming all the participants of the Digital Earth Symposium. "Canada from Space" is an immediate attraction. It invites everybody to walk from one end of the country to the other in less that forty giants steps: from coast, to coast, to coast; over rivers and lakes; prairies and mountain ranges; glaciers and sea ice. This enormous map is a mosaic comprised of digital images taken by Canada's RADARSAT satellite and is the first of its kind. The students explore how Earth observation satellites monitor Canada and how the data and geographic information can be used to inform Canadians. Through ten curriculum-linked activities, students can learn first-hand how pollution and natural disasters impact our country, the importance of Canada's arctic ice, and the scientific phenomenon of the northern lights (***http://www.canadiangeographic.ca/educational_products/canada_from_space_map.asp)***.

To everybody's great and pleasant surprise Canadian astronaut Jeremy Hanson is on site to greet the crowd. Clad in in his trademark blue work overall, Jeremy recounts some of his early field trips to the Canadian Arctic where he trained for a mission which will send him to the International Space Station, ISS, hopefully sometime soon. His enthusiasm about the job is captivating students, teachers and parents alike. Everybody hopes that he will get a chance to see Canada from space through his own eyes from the ISS and have an opportunity to operate one of Canada's engineering marvels, the Canadarm (***http://www.asc-csa.gc.ca/eng***).

Hang on for a minute! Isn't there another astronaut waiting in the wings? While the students are taking their seats in the main conference hall, Jeremy is joined via Skype call on two extra large screens by his fellow astronaut Rick Wiseman from NASA in Houston, Texas. Rick has recently returned from the International Space Station. He explains what it is like to live in the weightlessness of space on the ISS, to observe Mother Earth below, to conduct a constant stream of science and space technology experiments, some of which will ultimately prepare

Photo credit: Dirk Werle

A NASA scientist is providing a world wind tour of global environmental monitoring by satellites using the "Hyperwall."

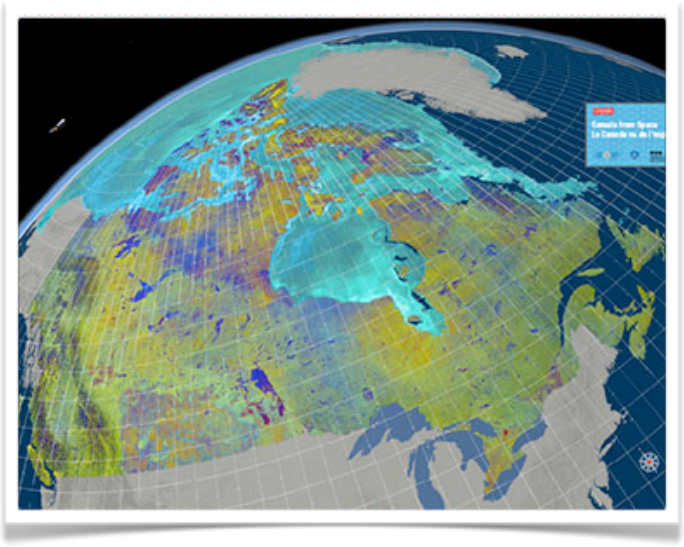


Photo credit: RCGS, CSA, MDA.

"Canada from Space" is a joint undertaking by the Canadian Space Agency and the Royal Canadian Geographic Society.

humans for longer space travel. Both astronauts share their views and experience. They were classmates in astronaut school back in 2009. Reid is showing amazing shots that he had taken with a long-lens digital camera from the observation cupola of the ISS as the Earth was passing below (***http://eol.jsc.nasa.gov/***). Both Jeremy and Reid are clearly very capable and engaging individuals who have started from modest beginnings and accomplished a lot. Their message to all the students: "Pursue your dreams and *never* give up!"

Soon after the astronauts sign off, the students begin to huddle around the next waypoint on their Digital Earth odyssey. It is marked by nine outsized television screens that come to life with the push of a button. Many young pairs of eyes (and many older ones, too!) are wide open and riveted to the screens with their intriguing displays of Earth observation satellite technology. NASA's hyperwall is a video wall capable of showing multiple high-definition satellite images and visualizations of the Earth's environment. Here are just a few of the stunning examples of life on our home planet that are on display: ocean currents, wind-fields and hurricanes, the expansion of urban areas (seen at day and during the night), air pollution (man-made and by dust storms and volcanic eruptions), as well as global vegetation patterns as they change during the seasons and over the course of several decades of observation (***svs.gsfc.nasa.gov/hw***). A scientist is on hand to explain to the students the phenomena, ideas, and examples of our changing planet.

Digital Earth is alive in Halifax this afternoon, in a down-to-Earth kind of way. The students are very excited as they walk to the entrance, this time crossing the giant floor map of Canada from the North Pole, heading South, and from there all the way home. What an adventure to combine science, space technology and geography!

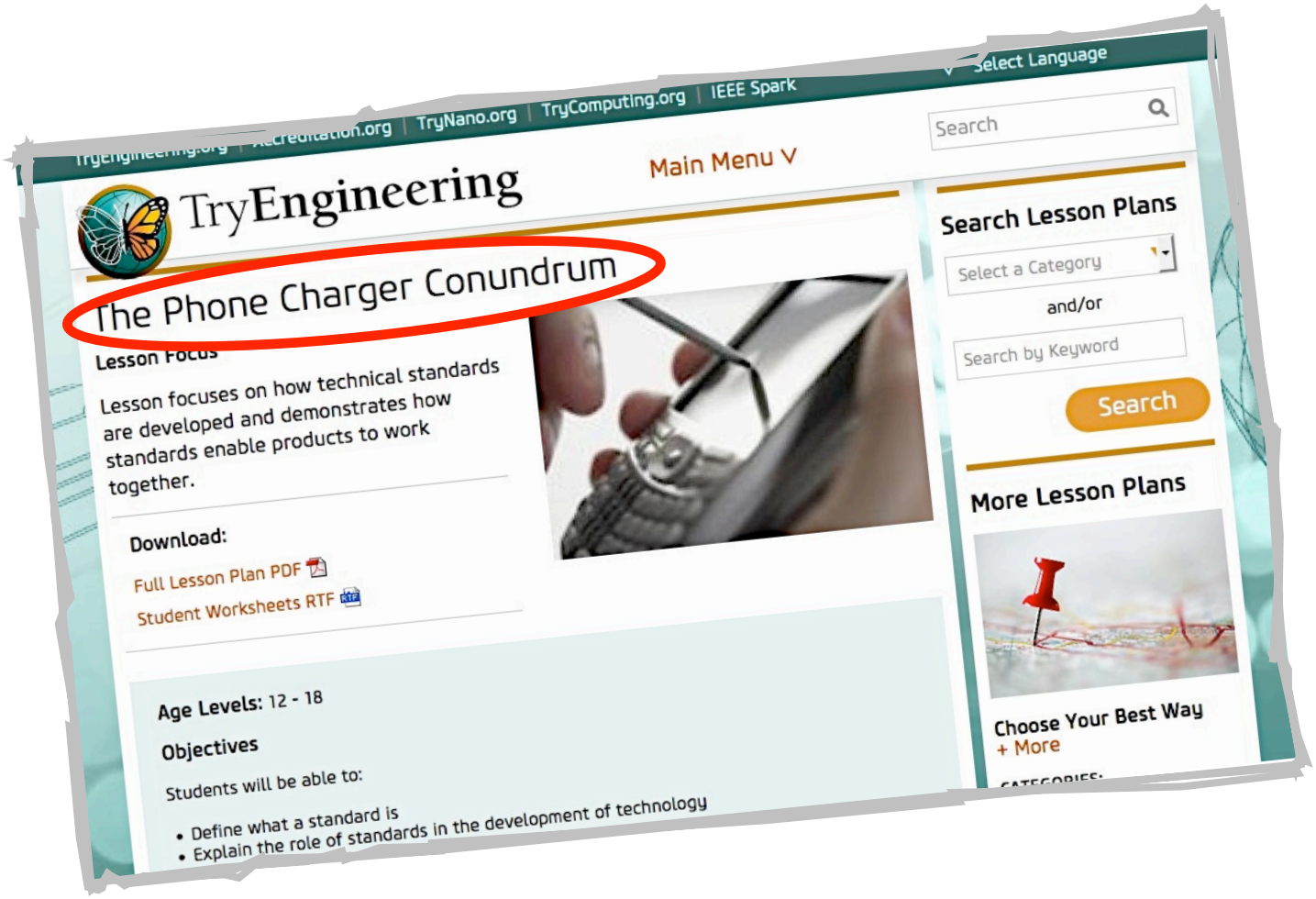
Dirk Werle

For further information on "Digital Earth 2015" in Halifax, contact Dirk at ***dwerle@ca.inter.net***.

Have you tried the www. tryengineering.org yet?

IEEE's web site for engineering education and training resources has a wealth of resources for teachers, students and parents. There are new lesson plans added every year. Check them out!

One of the recent additions to the roster of more than 100 lesson plans at ***TryEngineering.org*** is focusing on a common issue that we encounter almost everywhere today: Standards, and the phone charger conundrum. This lesson plan explores the question "What is a technical standard?" A technical standard is a norm or requirement that establishes uniform engineering or technical criteria, methods, process and practices. A standard is usually a formal document that spells out a specific set of requirements for an item, material, component or system. Standards influence virtually everything, such as computers, phones, communication systems, power and energy, tools, transportation, medical devices, safety, and even toys. Standards help enable products made by different companies to work together. This lesson plan engages students in engineering teamwork and planning for a brand-new wireless phone charger known as the "PowerFork". Tune-in!



TISP-Canada Mail Bag

TISP volunteer Anis Haque sends this electronic post card from Alberta

Greetings!

I thought I would share with you that I am in Grande Prairie, about 800 km north of Calgary, for a week-long science outreach program. I am doing a number of TISP-activities in cooperation with teachers and their grade 2 to 5 and 11 students. I will be presenting the activities at five different schools from May 11-15. We are doing three activities per day. I have two student volunteers with me; one of them is the IEEE Student Branch Chair at University of Calgary. We are expected to meet with over 700 students in a week. The activities we are doing include making electricity; buoyancy; sound; building a robot arm, and a presentation on engineering in general. Wish you were here!

Anis Haque

anis@ucalgary.ca

Photo credit: Anis Haque

Anis Haque, TISP-Canada Champion in Alberta, and a number of his disciples engaging in science experiments.

TISP goes to Ottawa

TISP volunteers present at the International Humanitarian Technology Conference, IHTC

Earlier this year, the IHTC took place in the Nations's capitol, Ottawa, from May 31 to June 4, 2015. The IEEE Ottawa Section was the main organizer (***http://www.ihtc2015.ieee.ca***). The program was chock-full of interesting exhibits, stimulating talks and hands-on workshops. TISP Champion Wolf Lunscher and TISP-Canada chair Dirk Werle made representations on behalf of TISP-Canada and conducted a workshop using one of the ***tryengineering.org*** lesson plans. Our choice was the water filtration experiment, for which simple implements were used to construct a device capable of filtering a glass of dirty water into something approaching potable. Needless to say that the attending engineers engaged to meet the challenge with skill and ingenuity!

Wolf Lunscher

wlunscher@gmail.com

Photo credit: Wolf Lunscher

Delegates at the International Humanitarian Technologies Conference testing their water filtration design experiment.

Some Guidelines for Contributors

Articles and news items are welcome and should be sent by email to the Editors.

The *TISP Canada Courier* accepts feature articles up to a length of 1000 words with suitable illustration material. Smaller news items should not exceed 500 words in length. Notices for upcoming events should be submitted in a timely fashion keeping in mind the semi-annual publication schedule of the *Courier*.

Although the editors will usually consult with contributors regarding any significant change to material submitted, the *TISP Canada Courier* reserves the right to publish such material with any change(s) necessary to meet space requirements, or as otherwise deemed necessary.

This electronic newsletter is issued quarterly by TISP Canada of IEEE Region 7. Current issues and back issues are freely available and may be retrieved at ***www.tisp.ieee.ca/publications.html***.

Newsletter Editors

Editor-in-chief:

Dirk Werle
dwerle@ca.inter.net

Associate Editors:

David Hepburn
dehepburn@sympatico.ca

Murray MacDonald
murraymacdonald@rogers.com

The editorial content of this newsletter does not represent official positions of the IEEE or its organizational units.

IEEE and TISP

The Teacher In-Service Program provides a forum for IEEE volunteers to demonstrate engineering, science and mathematics concepts by sharing their real-world experiences with local pre-university educators. IEEE offers workshops for its volunteers on how to provide in-service programs.

Part of the IEEE mandate is to address declining interest of students in engineering. IEEE needs to help raise everybody's awareness of technology. The "TryEngineering" initiative involves IEEE, IBM and the New York Hall of Science. To-date, ***TryEngineering.org*** lesson plans have been downloaded more than 15 million times. The site has various great features, including a search for accredited university and college programs in many countries, including Canada. Portals on ***TryComputing.org*** and ***TryNano.org*** have also been launched.

More information is available at ***www.ieee.org/education_careers/education/preuniversity/tisp***