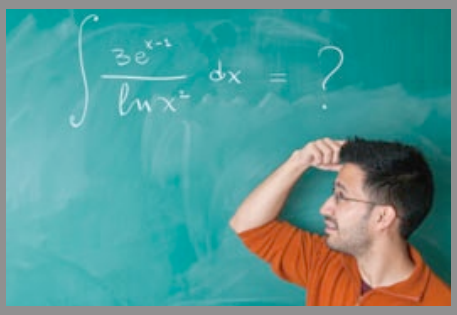
The TISP Canada Courier #6



June 19, 2013

Third TISP-Canada Workshop held in Vancouver

The TISP-Canada Workshop is a major event for our volunteers, future TISP-champions, and teachers. Anis Haque and Pat Finnigan review what transpired at the event in BC this May.

On May 10 and 11, IEEE Canada hosted its third Teacher In-Service Program (TISP) Training Workshop in Vancouver, British Columbia. Almost 50 attendees from western Canada, the Prairies, and Seattle,Washington, in the United States were all interested in volunteering to make local teachers more aware of available TISP expertise and resources. These promote an appreciation and understanding of mathematics, science, technology, and engineering, with the goal to assist teachers in encouraging students to pursue technical careers.

In her opening address, Ms.Yvonne Pelham, who is the manager of educational outreach at IEEE, welcomed the participants. She reminded us that students soon to become citizens have declining or "static" scientific literacy. This means they cannot participate effectively in public policy debate on science topics, nor ensure their children have a better education in these topics. The public perception of science and technology can only be changed using a multiplier effect where volunteers create enthusiasm among teachers, which gets passed on to students and their parents.

The specific goal of the TISP program is to develop IEEE champions who will spearhead TISP outreach and education activities in their local areas. More than 100 lesson plans have been vetted for safety and alignment to school science curricula, and are available on tryengineering.org. *(continued on page 4)*

Content

Issue #6
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TISP Reports from the Regions

TISP-Canada relies on active participation from all regions of the country. These columns report on recent work and upcoming events as well as trials and accomplishments of TISP volunteers across the country.

Manitoba

During the first half of 2013, TISP champions in Manitoba engaged students in more than a dozen (!) events and TISP-related activities. These included radio courses for university students in February, March and April; presentations covered such topics as rules and regulations, operating procedures, electricity and electric circuits, antenna systems, and modulation. During the month of February more than 200 high school students visited various laboratories at the Faculty of Engineering. University students worked with students from local high schools to build and test a small sun sensor for a space craft. (*TISP Canada Courier # 2* covers other aspects of the satellite program in greater detail.) Members of the University of Manitoba's satellite group also served as judges in a local Discovery Program and Hovercraft Competition; 12 high school teams competed for scholarships for post-secondary education by submitting their designs, testing their entries on a track and presenting a business report.

For further information contact local TISP Champion and University of Manitoba engineering professor Witold Kisner at ***w.kisner@ieee.org***.

Edmonton and Northern Canada

During Engineering Week in March, the Section organized several activities at Concordia University College of Alberta with Math Kangaro clubs. (More information on the Math Kangaro contest is contained in *TISP Canada Courier # 2*.)

Nine TISP volunteers conducted a total of four sessions. They involved 150 children in ***tryenginering.org*** activities, covering exercises in Biometrics, Energy and Rubber Band Racers.

For more information contact local TISP champions Rossitza Marinova or Mooney Sherman at ***rossitza.marinova@concordia.ab.ca*** and ***mooneysherman@shaw.ca***, respectively.

Ontario

TISP champion Murray MacDonald in London, Ontario, conducted ***tryengineering.org*** exercises with 30 students at the local Children's Museum. They "Shipped the Chip" and build "Rubber Band Racers."

Contact Murray for more detail at ***murraymacdonald@rogers.com***.

Photo credit: Leigh Day

Volunteers are the lifeblood of many events. Pictured here is the group that organized the 2013 National Engineering Month activities in Nova Scotia (see also page 7).

New lesson plans geared for tryengineering.org

Canadian TISP champions are contributing modules to on-line resources for use in the classroom.

New lesson plans, including modules prepared by Canadian TISP champions, are waiting in the wings to be added shortly to ***TryEngineering.org.*** The online engineering education resource for pre-university students, teachers, parents, and school counselors around the world presently contains an impressive archive of 114 plans, designed to align with education standards, allowing teachers and students alike to apply engineering principles in a classroom setting.

Aside from the popular lesson plans, the web site also features many other opportunities to explore engineering. Take *Insights from Experts*!

Leading practitioners tackle some of the most important questions for students who might be interested in pursuing an education or career in engineering. If you want to explore whether engineering is right for you, or are looking for information on how to get started, this is the place.

Want even more? Visit the *Ask an Expert* archive!

Photo credit: Steven McClain

IEEE manager Yvonne Pelham and TISP Canada champion Patrick Finnigan address the workhop participants.

Soon all workshop participants were busily engaged in hands-on activities, including "Ship the Chip" and "Beam Balance."

(**TISP-Canada Workshop**, *continued from page 1*)

Local IEEE sections can be very successful if they set simple goals such as "reach X teachers in the next Y months." The IEEE Education Activities Board (EAB) can reimburse sections in their first 12 months of activities in running teacher education sessions. Setting these goals is a major activity in the workshop. Liz Kurzawa, manager of the ***tryengineering.org*** web site attended, and ably assisted in running the entire workshop very smoothly. Yvonne reminded participants that all workshop presentation and materials will be available on the web shortly, and that IEEE education outreach is always interested in hearing testimonials from volunteers and teachers. Celebrate your successes by sending a note to Lynn Bowlby at ***l.bowlby@ieee.org***.

Hands-On Activity "Ship the Chip"

Dr. Anis Haque, Associate Director of Students in the Department of Electrical and Computer Engineering at the University of Calgary, led the participants in one of the many classic, simple, yet insightful hands-on activities straight from the tryengineering.org web site (see also page 3). Participants needed to design then build a package capable of protecting a single potato chip when the package was dropped from shoulder-height without breaking. This is a lot harder than it seems! Teams receive a score based on the "survival" of the chip (number of pieces after the drop), as well as minimizing package size and weight, which they measured.

Perspectives from IEEE's Vancouver Section

Alon Newton welcomed participants to Vancouver. He noted how critical science and technology education is to the economy. "It is not easy to create engineers". He had participated in an event at B.C. Science World where students commemorated the invention of the LASER. Students actually got to see the first LASER, as well as attend an interesting talk which they enjoyed immensely. These are examples of "opportunities" in the local community to excite students about technical study. Kouros Goodarzi, IEEE R7 Canada West Area chair, and former chair of the Vancouver Section, added his thanks to all who worked so hard to

organize the workshop. TISP is becoming a major activity for the Vancouver Section. Vice Chair Steven McClain was busy making sure all of the sessions were recorded. He also went "above and beyond" in organizing the materials for the hands-on sessions.

TISP and IEEE Region 7 – Dr. Keith Brown

As IEEE Region 7 (Canada) President, Keith reminded us that "IEEE is all about people," funding new initiatives like TISP at historically high levels, as well as continuing its core technical role, such as hosting conferences at the amazing rate of three per day! IEEE has partnered with more than 1,000 professional organizations, government and commercial entities in order to further both technical and humanitarian projects. TISP is important because there are just not enough technically trained employees for industry. The five percent of the workforce who are engineers and scientists are the innovators who create many jobs through the multiplier effect that innovation brings. Encouraging children to pursue scientific and technical careers will sustain our economy. Raising awareness does not happen overnight, and that's why programs such as TISP play a significant part.

TISP Volunteers – Anader Benyamin-Seeyar

As TISP-Canada Chair, Anader was delighted to see enthusiastic volunteers coming together as a very active Core Team and thanked IEEE for the support. Anader was very happy that so many volunteers attended the workshop and that 16 of the possible 20 IEEE Region 7 sections are well represented in the Core Team. He has plans to get the last ones "on board." Anader was very much looking forward to the action plans generated by the participants for local activites at the end of the workshop (see page 8 for details). He reminded us that the strong local efforts are being documented in the *TISP Canada Courier* and in the minutes of the monthly conference calls, all available at ***ieee.ca/tisp***.

For further information contact Pat Finnigan at ***Patrick_Finnigan@ieee.org*** and Anis Haque at ***sahaque@ucalgary.ca***.

Photo credit: Steven McClain

An evaluation team, lead by IEEE Canada's President Dr. Keith Brown (left), casts a critical eye on the various entries.

Photo credit: Steven McClain

There was a fair amount of trial and error involved during beam assembly, but, clearly, a good time was had by all.

But it only seems fair!

TISP-Canada Courier Associate Editor Dave Hepburn had a field day (actually, several of them!) on the science fair circuit in southern Ontario. Here is his report.

Round about this time of year in these parts seems to be Science and Engineering Fair season.

On March 28, Blair McCuish of the Hamilton Section attended the *Bay Area Science and Engineering Fair,* or *BASEF* for short. The Bay Area in question being Hamilton Bay, steel mills and all. This fair has been consistently supported by IEEE Canada's Hamilton Section for many years. Blair reports that this year the fair was held at Hillfield Strathallan College, where more than 300 projects were displayed. In the "General" category, each project was rigorously examined and graded by five judges.

However, in Blair's case, as a "Special Judge," (things are always special when Blair is around) the donor of the prize is required to select the recipients. He carefully reviewed all projects (and that's a lotta projects) against the criteria of the prize, which was the "Best Use of Electronics in a Project". Several projects made his short list, but two in particular seemed to make most use of electronics, and to these projects he eventually awarded the prizes. The ages of the recipients were between 14 and 16. Blair has since received thank-you letters from them. Overall, the Bay Area Engineering and Science Fair this year seemed to be a resounding success with a variety of projects being displayed.


LOCAL NEWS

Students from St. Michael Catholic Elementary School took home some hardware from the Niagara Regional Science Fair held at Brock University. From left: teacher Heidi Polti, Jessica Pardoe, Madison Hollister, teacher Dwane Smolders, Bethany Polti (front), Natasha Pillitteri, Katja Murray, principal Brian Palujanskas, and Julian Herrington.

St. Mike's cleans up at Science Fair

The Town Crier *Niagara This Week* prominently featured the Science and Engineering Fair in its April 18, 2013 issue.

Two weeks later the 51st *Niagara Region Science and Engineering Fair*, aka *NRSEF*, was held over a three-day spread of April 5, 6 and 7 at Niagara College. More than 200 projects were on display, and the grading system was the same as for the *BASEF*. Each project is examined by five judges and very methodically graded.

Hamilton Section had donated $100, which *NRSEF* decided to split into two categories of $50 each, for Grade 5 & 6, and Grades 7 & 8. As a member of the judging team Dave was assigned judge for these two categories, which encompassed about 22 projects. We had selected a title of *"The Best Understanding of Basic Electricity and Magnetism"*. One young fellow was about 10, and his experiment looked crude, simply three pieces of two-by-four nailed together in the shape of a "U". It turned out to be anything but! Before nailing it together, his dad had machined a slot 3/4" wide inside the perimeter of the "U" with a router. In the bottom of the slot the boy had set two quite strong permanent magnets. He had also cut a rectangle of 3/4" ply which just nicely slipped into the "U" (like a guillotine). On the bottom of the ply he had fixed two more magnets of opposite polarity. Hence the ply would not fit

right down due to the magnetic repulsion. He measured the gap. Then he put the whole thing in the freezer overnight and measured the gap next morning. The gap was significantly more. Next, he put the thing in the oven at 200 C. The gap was then found to be significantly less. Conclusion: the hotter they get, permanent magnets become weaker, and *vice versa*. The same boy got two other awards in some other category. Next year he is thinking of examining the use of magnetic repulsion in the suspension systems of cars.

The other prize went to a girl, also about 11. She had dismantled a vacuum cleaner motor, mounted it horizontally on a wooden frame, and put some simple paddles on the end of the shaft. The whole thing sat in a plastic tub. She then got a length of hose and a jug of water and poured the water on the paddles. They rotated enough to light some LEDs. The faster we poured, the brighter the lights. But we had some difficulty getting rid of the water afterwards. (We tipped it under the table when no one was looking). Dave modified the certificate to read *"A Fine Understanding of Hydro Electric Power Generation"*. And why not indeed?

For more detailed information contact Dave Hepburn at ***dehepburn@sympatico.ca***.

NEM @ MMM

Behind this cryptic address hides a special event in Nova Scotia. Curious? Read on!

If you think *Mic Mac Mall* in Dartmouth, Nova Scotia, is a busy place on a Saturday, it got even busier on April 6 during this year's *National Engineering Month* event!

The public court of the Province's largest mall complex was abuzz with student activities and competitions organized jointly by volunteers of Engineers Nova Scotia, Dalhousie University's Engineering Department, TISP-Canada and others. The TISP-sponsored *2nd Annual High School Engineering Design Competition* featured winning "Working with Wind Energy" designs. First prize went to a group of four students from Cole Harbour High, three of them budding women engineers!

Engineers Nova Scotia held the popular province-wide popular *Popsicle Stick Bridge Design Competition* for junior high students, and Dalhousie University students presented a life-size race car design. The shopping public was impressed, and the students had a lot of fun during NEM at the MMM court (… and by now you know what *that* stands for when you come and attend next year's event!)

For further information on National Engineering Month in Nova Scotia contact Chris Davies at ***davisc@halifax.ca***.

Photo credit: Vincent Zhang

Pround winners from Cole Harbour District High School in Nova Scotia, showing their High School Engineering Design awards.

TISP opportunities and action plans

Motivated by the recent TISP workshop, the new volunteers set about planning the next steps for TISP in their sections. Yvonne Pelham and Anader Benyamin-Seeyar provide a summary.

Two "global" brainstorming ideas emerged about how to implement TISP programs. First, we need to create outreach presentations and/or workshops for rural areas; we have good presence in big cities, but rural schools are just as important. Second, we should address private schools; there are quite a large number of private schools that might be receptive to using TISP hands-on lessons, and benefit from volunteer mentors.

Vancouver: The Section has identified six TISP regional champions to work with specific teachers on a monthly basis. They will piggy-back on the "Junior Achievement" program for making presentations to teachers and getting them involved. One participant who is a francophone will approach the two French-language schools in Vancouver to offer TISP programs and mentoring.

Victoria: UVic is hiring a graduate student to help meet with teachers and showcase the engineering faculty; this person could also present TISP. They propose to run a TISP workshop as part of teachers' PD activities (PD day session). They will take an initial look at the high-school curriculum and TISP lesson plans for curriculum mapping. It could be the model for efforts like this in other provinces, since "curriculum alignment" is often a topic of discussion when approaching teachers with new lesson plans.

Ottawa: The monthly Ottawa section newsletter includes a call for volunteers (such as TISP). The Ottawa participants will build on that in order to generate more interest in TISP. Ottawa section supports a Lego Mindstorms robotics competition in May. Ottawa section has held a TISP workshop in July 2012 at the Science & Technology Museum, and will continue with that this year.

Seattle: Alon, who works in Seattle, will spearhead an effort to present TISP to the Seattle Section. His proposal to the Seattle Section will be to identify TISP volunteers who can reach out to deserving neighbourhoods, where teacher-partners can be identified.

Northern Alberta: It was very clear as a result of the workshop that "our customer is the teacher." The Section will continue to find the correct grade-level for lesson plans (curriculum mapping), and use existing student volunteers to encourage students by continuing to run successful "community" events that involve younger students, parents, and teachers.

Ontario: The Ontario team will make presentations to three out-of-city districts this year. Also, a presentation will be made to at least one private school to gauge their interest. A session will be run with the Ontario "Science Advisors" in order to get their list of "wants and needs." We hope to identify at least one area they need help with in terms of lesson plan development, presentation, or mentoring. We plan to get at least three more active volunteers — with GOLD, WIE, and LM groups the most likely source. So, the overall goal is at least four presentations, one teacher feedback session, and three new volunteers.

Teachers' Corner, which usually appears in this space, will return in *TISP Canada Courier #7.*

Some guidelines for contributors

Articles and news items are welcome and should be sent via 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 quarterly publication schedule of the Newsletter.

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 available free of charge and may be retrieved at ***www.ieee.ca/tisp***.

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

IEEE Canada TISP

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 3 million times. The site has various great features, including a search for accredited university and college programs in many countries, including Canada. New portals on ***TryComputing.org*** and ***TryNano.org*** have also been launched.

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