



NEWSLETTER

ONTARIO ASSOCIATION OF PHYSICS TEACHERS
(An Affiliate of the American Association of Physics Teachers)
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Spring 2002 - A Conference to Remember The Annual Conference of the Ontario Association of Physics Teachers By John Pitre

Some days you are lucky and everything seems to go right. That seems to describe the OAPT Annual Conference held this year at the University of Toronto's Mississauga campus. From superb accommodation, guest speakers, workshop leaders, and contributed papers to fine warm weather, we had it all.

Local organizers, Wagih Ghobriel, Fraser Code and myself were happy to welcome about 80 participants to Thursday evening's opening barbeque on the patio of the Blind Duck Pub. After that it was immediately down to business with five workshops, the most popular of which was *Computers in the Curriculum* (Kevin Soltes, OAPT 2001-2002 president). It seems that computer interfaced motion and force sensors continue to gain in popularity with adoption in the classroom hindered only by lack of funding. Glenn Wagner's workshop, *Modeling Instruction*, employed computers also, but emphasized the interaction of the student with graphing software. Ted Groves was able to fill in the blanks for those of us who are unfamiliar with some aspects of the new grade 12 curriculum such as *Pneumatics and Hydraulics*. For teachers who just wanted to learn more about *Teaching Physics Without Fancy Math*, Fraser Code was able to help in areas such as time and time keeping, waves, and complex physical systems. For those who know it all, or least who have students who seem to know it all, David Bailey explained how to participate in *POPTOR, The Physics Olympiad Preparation Programme*. After all this work, it was back to the Blind Duck Pub for a well deserved reception sponsored by the Department of Physics.

Rather than take you through the conference program (available at the OAPT web site: <http://www.physics.uoguelph.ca/OAPT/index.html>), let me share with you some of the contributions of the invited speakers that I found most appealing. I apologize in advance for omitting to mention the excellent ideas in the contributed papers that would have been surely included by another writer.

For me, the intellectual fireworks started with the opening speaker Professor Robert Birgeneau, president of the University of Toronto. I was expecting a warm, friendly talk on the cold topic of *High Temperature Superconductivity*, but instead received a candid appraisal on the nature of research. President Birgeneau discussed all the predictions he made that were dead wrong, in addition to discoveries that were made quite accidentally. He was able to put a personal touch on the topic since he knew, and had worked with many of the top researchers in superconductivity. He explained how research is a very human enterprise and how, in the end, we should not take ourselves, or our ideas too seriously.

I guess that I am still a concrete thinker because I seem to forget ideas, but I do remember things that I have interacted with. That's why I remember *Motivating Students to be Excited about Science*, by Tom Coyle and Troy Lassau. They demonstrated how to include engineered materials in the classroom to excite students. Their premise was that a student's natural curiosity about how and why things work should be accessed in the classroom in a unique way. Well, their demonstrations certainly caught my attention. I especially liked the pieces of milk container polyethylene that they passed around to all participants. Stretch it in one direction and it stretches easily up to a point as the molecules line up, but no further as you try to stretch the molecules themselves. At this point we were amazed to find that it stretched easily in the other direction. Do you remember why? (This is a test!)

An open bar, courtesy of the office of the dean at UTM, was a very welcome prelude to the conference banquet. Some banquets have a smorgasbord, but we opted for a cyborg, Professor Steve Mann. His chief interest is in interfacing humans and computers. It's not often that an after dinner speaker comes with so much technical equipment, or that the speaker is so fascinating. As he spoke to us he was seeing the world through his glasses which were connected to a computer. This meant that a remotely connected person could see what he sees and could interact with him by typing in some message that he could view as he watches the world. Whether you agree or not with his vision, you have to be impressed by his dedication to his research. This is not just a part time area of study. It's his life.

Saturday morning saw two new speakers. Ted Nugent spoke to us about nanotechnology in his *Illuminating the World of the Small - Nanophotonics*, and Murray Stewart spoke about fusion research (*Fusion - Bringing the Iter Project to Canada*). It's now Saturday afternoon, and we still have a full house! Now that's dedication! Jerry Mitrovica was the last speaker, and spoke to us about *Taking the Fingerprints of Global Sea-Level Rise*. The beauty of this talk was that it could have been understood by any of our students who understand the simplest ideas about the force of gravity. For many years the measurements of global sea levels around the world seemed to be inconsistent with one another until Jerry's complex model (which includes, among other things, the melting of polar ice complexes) reconciled them. It achieved this by showing how the gravitational attraction between the ice masses and the nearby ocean water altered the local and remote sea levels. People were still talking about this later in the parking lot as I was leaving for home!

Ah, but maybe we all stayed to the end so that we would have a chance to win one of the many door prizes in the great conference giveaway. This feature/gimmick, initiated years ago by Diana Hall, continued this year through the efforts of John Beattie. John was also

responsible for much of the organizational effort that went into the running of this conference. Many thanks John, and many thanks to all those who made this year's conference a terrific success. Well done!

SEE YOU NEXT YEAR AT THE UNIVERSITY OF WESTERN ONTARIO!

Do you want to give back to your profession? Participate in the OAPT!

This wonderful organization needs volunteer help in the following capacities:

- ∞ Guest presenters
- ∞ Conference organizers, and facilitators
- ∞ Members of the executive committee
- ∞ Article, and classroom idea contributors for the Newsletter



New articles, ideas, or other information items may be sent to Glen Wagner (GWAGNER@cwahs.ugdsb.on.ca) or Paul Passafiume (paulpassafiume@hotmail.com). Ideas for demos may be sent to Ernie McFarland (elm@physics.uoguelph.ca).

Membership Matters!

Join the Ontario Association of Physics Teachers! Members receive a Newsletter and reduced registration rates at the annual conference.

As well, from time to time, the Association makes available special resources. Examples have included reprints of "Demonstration Corner" articles from the Newsletter, and the videotape, "The Physics of Dance," from a presentation at one of the annual conferences.

To become a member of the OAPT, send a cheque for \$8 (or a multiple thereof) payable to OAPT to:

Ernie McFarland
OAPT Membership Coordinator
 Department of Physics
 University of Guelph
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OAPT Contest Reminder

This year's contest is open to grade 11 students *only*, and will be held on May 6, 2003.

Last year's contest, with answers, is available from the OAPT web site (see page 2).

The previous five contests may be obtained from Terry Price (thprice@sympatico.ca) if teachers wish to have some student practice.

Teachers should encourage their 1st term students to register during the 1st term to ensure there are lots of participants.



The Demonstration Corner

Classroom Demonstration of Spectra

By Jim Hunt

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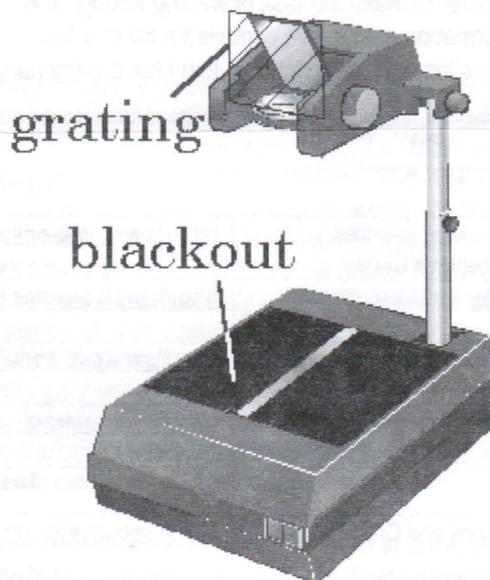
The availability of large sheets of plastic replica gratings has greatly increased the ability to show spectra to classroom-sized groups and, in the process, put on a nice light-show.

One way to do this is shown in the figure. A piece of grating is mounted in a stiff cardboard frame (to prevent curling or warping) and hung or taped in front of the objective mirror of an overhead projector. Be sure that the grating lines are vertical. Using opaque cardboard, mask off all of the light-base of the overhead except for a slit about 1 cm wide down the centre as shown. The result on the projector screen will be two spectacular continuous spectra, one on each side of centre.

So far the demonstration is obvious and perhaps already well known, but here are a few interesting wrinkles. It is easy to demonstrate absorption spectra by laying transparent coloured materials over the slit. The coloured transparency sheets are particularly good for this. It is best to put the absorbing material over just half of the slit so that the contrast with the pure white-light spectrum is apparent. Even shallow trays of absorbing solutions can be used, e.g., fluorescein, CuSO_4 , chlorophyll, etc.

Another interesting demonstration is to reverse the blacking on the overhead projector, that is, leave the entire light table uncovered except for a 1 cm wide opaque strip where the slit used to be. This shows the subtraction of colours. With no blackening the white splash of light on the screen can be thought of as the superposition of a number of white-light spectra. The opaque strip subtracts one of these leaving a spectrum of tints on the screen. Again, it is most effective if one half of the light table is left as shown and the lower half is reversed.

Sheets of diffraction grating 6" square can be obtained from Efstonscience in Toronto. See <http://www.e-sci.com> and search under "diffraction sheet."



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Submissions describing demonstrations will be gladly received by the column editor.

126th AAPT National Meeting

Will be held in Austin, TX, January 11-15, 2003

Teachers: Do you have particular topic that you would like to see covered at the next OAPT meeting? If so, please email Vida Ghaem-Maghani at vida.ghaem-maghani@tel.tdsb.on.ca

Useful Web Sites for Physics Teachers

By Paul Passafiume

Teachers are always interested in ways of bringing innovation into their classroom, and a great way of doing this for physics teachers is to make use of available technology. The internet is a wonderful source of such technology, and can really add spice and variation to the way you deliver your lessons. The trouble is, of course, that there's almost too much information; it's not well organized, and is therefore difficult to access.

In order to make the task of wading through this information easier, I've compiled a list of a few web sites (with descriptions) that I have personally found

quite useful. I think they will be very useful for any new teacher, and perhaps of value for the seasoned one as well.

If you have a site, or sites, that you feel are worth visiting please forward me the URL and perhaps I can generate a similar column every issue. My email is paulpassafiume@hotmail.com.

Happy surfing!

Site Name	Site Address	Brief Description
Physics Demonstration/Lab Sites		
Physical Sciences Resource Centre	http://www.psrc-online.org/	Labs, demos, evaluation tools
Physics Demonstrations	http://sprott.physics.wisc.edu/demobook/intro.htm	Demos mainly for senior physics
Berkeley Physics Lecture Demos	http://www.mip.berkeley.edu/physics/index.html	Demos mainly for senior physics
Interactive Physics	http://www.interactivephysics.com	IP simulations, and similar links
Java Applet Sites for Physics		
Jones and Childers...	http://webphysics.ph.msstate.edu/jc/library/	Many good applets covering many areas
Java Applets on Physics	http://www.physics.uoguelph.ca/Fendt_app/phe/phe.htm	An excellent source of applets.
Physlets	http://webphysics.davidson.edu/Applets/Applets.html	Create your own physlet!
General Education Related Sites		
Curriculum Services Canada	http://www.curriculum.org/	Curriculum data, & board course profiles
Ontario Ministry of Education	http://www.edu.gov.on.ca/eng/webmap.html	course profiles, 'raw' ministry documents
Science Associations		
Ontario Association of Physics Teachers	http://www.physics.uoguelph.ca/OAPT/	Conference, contest, general physics info.
Science Teachers Association of Ont.	http://www.stao.org/	Science, education, and conference info.
Miscellaneous		
Discovery School's Puzzlemaker	http://www.puzzlemaker.com/	Create a puzzle, or worksheet.
Marshall Brain's How Stuff Works	http://www.howstuffworks.com/	'Nough said!
Famous Physicists and The History of Physics		
Center for History of Physics	http://www.aip.org/history/	The history of U.S. physicists
Feynman Online	http://www.scs-intl.com/online/	The work and life of a great physicist