Ontario Association of Physics Teachers

NEWSLETTER

Volume XII, Number 3
March, 1990

WINTER MEETING OF THE AAPT/APS

(Report by Alan Hirsch, Section Representative)

The joint annual winter meeting of the AAPT (American Association of Physics Teachers) and APS (American Physical Society) was held in Atlanta, Georgia, from January 20 to 24, 1990. Important changes are being planned for the future of the AAPT as well as for science education in the U.S. A brief description of these changes as well as highlights of the meeting are summarized below.

- The Council of the AAPT approved a proposal to go from a two-meeting model to a three-meeting model starting in 1992. The winter meeting will change from being the administrative and joint meeting (with APS) to a smaller AAPT meeting with an experimental format that will vary from year to year. The joint meeting will be held in April to coincide with the large APS meeting, traditionally held in the Washington, DC, area. The summer meeting will change from June to August (probably the second week). It will continue to be held at a university campus, with the location varying across North America. It is expected that this meeting may attract the greatest number of AAPT members.

- The NSTA (National Science Teachers' Association) is introducing major changes in science education in the U.S. A program called Scope, Sequence, and Coordination will attempt to have science made compulsory for Grades 7 to 12. Four sciences, biology, chemistry, physics, and earth science, will be presented in Grades 7 and 8 at the experiential level, then again in Grades 9 and 10 at a concrete, experimental level with a little math included, and finally a third time in Grades 11 and 12 at a more abstract, analytical level. This mammoth undertaking will be expensive, controversial, and challenging. It will be interesting to see if such changes will have an impact on Canadian science education.

- The executive officer of AAPT, Jack Wilson, will resign from the position as of June 30, 1990.

- Numerous workshops were given at the meeting. Many related to computers in the physics lab. One popular workshop enabled participants to learn how to take high-speed photographs using an electronic flash.

- One session of invited and contributed papers dealt with collaborative (or cooperative) learning. It was comforting to learn that the difficulties in using this mode of learning can be overcome.

- Another session dealt with physics education in countries other than the U.S. Canada's situation was described by none other than Don Ivy from the University of Toronto. His talk was both entertaining and informative.

- Among the numerous other sessions were some that focused on women in physics and the transition from high school to college.

- A major address on environmental issues was given by Carl Sagan who was this year's recipient of the Oersted Medal.

- Future meetings of the AAPT are:

June 25 - 30, 1990 University of Minnesota
Minneapolis, MN

January 21 - 24, 1991 San Antonio, TX

June 24 - 29, 1991 UBC, Vancouver, B.C.

OAPT is affiliated with the AAPT

OAPT PHYSICS CONTEST

The OAPT Physics Contest for Grade 12 students will be written on Tuesday, May 8, 1990. Keep in mind that a new contest chairperson will be required for next year. It is possible that the responsibilities could be divided, with one person responsible for assembling the test and another person responsible for the administration and mailing. If you are interested, please contact George Kelly, any other member of the executive, or this newsletter.

CAP PRIZE EXAMINATION

The CAP Ontario High School Prize Examination will be written on Tuesday, April 24, 1990. This year's examination will be co-ordinated by the Physics Department at the University of Guelph. Information will be sent to all secondary schools in Ontario. For further information, contact Ernie McFarland at the University Of Guelph.

N.Y. SECTION OF AAPT TO MEET AT ROCHESTER IN APRIL

The New York Section of the AAPT will be meeting at the University of Rochester on Saturday, April 28. Members of the Ontario Section (i.e. the OAPT) are welcome to attend. It's only a short drive to Rochester from many areas of southern Ontario, so why not plan to spend a day sharing ideas with our American colleagues? To receive more information, contact:

Ken Evans
Kingston H.S.
403 Broadway
Kingston, NY 12401
U.S.A.
(914) 331-8186 (home)

SECRETARY-TREASURER REQUIRED

Peter Scovil will be completing his term as Secretary-Treasurer in June, 1990. Anyone willing to take on this position should contact Peter, any member of the executive, or this newsletter.

SUMMER WORKSHOP IN VIRGINIA

Virginia Military Institute conducts an annual two-week workshop in the effective use of lecture demonstrations. This year's workshop will be held from July 9 to July 20. Tuition is $595.

For more information, write:

Professor D. Rae Carpenter, Jr.,
Department of Physics & Astronomy,
Virginia Military Institute,
Lexington, VA 24450

or call 703-464-7503

12TH ANNUAL OAPT CONFERENCE

UNIVERSITY OF WINDSOR

JUNE 17, 18, 19, 1990

PROGRAM HIGHLIGHTS

ELECTRONICS MEASUREMENT WORKSHOP

Edwin A. Karlow

Loma Linda University, Riverside, California

Dr. Karlow is one of the developers of the CHAMP Interface now sold by Merlan Scientific and so has considerable expertise in electronics. He will illustrate how a variety of electronic devices and circuits can be utilized to teach physics concepts.

COMMERCIAL WORKSHOP - SUPERCHAMP

Merlan Scientific

This workshop will introduce the next generation interface, the SUPERCHAMP developed by Merlan Scientific and available for the next school year. Numerous possible uses in the physics lab will be illustrated.

1. DEMONSTRATIONS
2. ACTIVITY CENTRES IN PHYSICS

Frank Allen

Ottawa Board of Education

Mr. Allen is a creative physics teacher who will share his ideas on the effective use of demonstrations and activitity centres in physics classrooms.

FIBRE OPTICS

Jack Dyment

Bell Northern Research, Ottawa

Dr. Dyment will describe the current state of the art in fibre optics technology and predict the impact it will have on our lives in the next decade.

STUDENT MISCONCEPTIONS IN INTRODUCTORY PHYSICS

Ernie McFarland

University of Guelph

A familiar face to OAPT regulars, Mr. McFarland will describe some of the common misconceptions first year physics students bring with them.

AMUSEMENT PARK PHYSICS

Carole Escobar

Bellport Senior High School

Brookhaven, New York

[followed by a trip to BobLo Island Amusement Park]

Ms. Escobar has done a lot of work in developing activities that can be utilized in a field trip to an amusement park. She will share some of these with us and prepare us for our own trip to BobLo Island Amusement Park.

FOR INFORMATION, CONTACT:

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Sand and Soup

by **Patrick Whippey**
Department of Physics
University of Western Ontario
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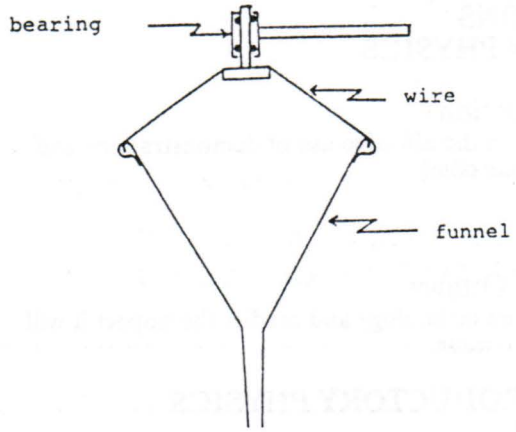
Materials

Funnel, small bearing, fine sand, two coffee tins, wire

Our funnel is metal with a large lip, and we used soft solder to fasten the wire to the funnel and the bearing. Make sure that the axis of the bearing lines up with the axis of the funnel.



Method

Put your fingers over the top of the funnel and pour in some sand from a coffee tin. As you let go, rotate the funnel. As the sand falls inside the funnel, it is forced inwards towards the centre. To conserve angular momentum, the funnel and the sand inside it speed up. At a sufficiently high speed, the friction forces on the grains of sand are large enough to prevent the sand from falling. Friction in the bearing gradually slows the rotation until more sand slides down the walls of the funnel. As it does so, the system speeds up again because angular momentum must be conserved. The cycle repeats until all the sand has fallen from the funnel.

We originally saw this demonstration written up in The Physics Teacher[1]. Our contribution was to use a good quality bearing to support the funnel. This is essential for a good demonstration. It is also important to use very fine sand. Be careful when you pour in the sand not to pour it over the bearing and cause it to seize up. Catch the sand in the second coffee tin.

Soup

How can you tell the difference between a can of chicken soup and a can of mushroom soup if the labels have been removed? Roll them down a gentle slope and see which one wins! I have just been playing on my kitchen counter, which is not quite level, and the difference is very obvious. We have also filled two transparent plastic bottles with water and put some crumpled plastic sheeting into one of them. As with the soup cans, one rolls much faster than the other.

The speed at which things roll down slopes depends how the initial potential energy at the top of the slope is shared between the translational kinetic energy and the rotational kinetic energy at the bottom. Spheres beat cylinders, which beat hoops. The chicken soup beats the mushroom soup because the chicken soup does not rotate inside the can, so the kinetic energy is mostly translational.

[1]David L. Mott, The Physics Teacher 22, 391, 1984.

Column Editor: Ernie McFarland, Physics Dept., University of Guelph, Guelph, Ontario, N1G 2W1

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

TWELFTH ANNUAL OAPT CONFERENCE

UNIVERSITY OF WINDSOR

JUNE 17, 18, 19, 1990

**** ABSTRACT FORM ****

Conference participants are invited to make a short presentation at the conference. This could be in the form of:

* a short talk on a topic of interest to you
* a demonstration that you use in teaching physics
* a description of a computer program useful in teaching
* a teaching strategy that works well for you.

PLEASE PRINT OR TYPE

NAME: _____
(Surname) (First Name)

HOME ADDRESS: _____
No. Street City Prov./State Code

BUSINESS ADDRESS: _____
No. Street City Prov./State Code

HOME PHONE: _____ BUSINESS PHONE: _____

SESSION: Talk (10 min.) □ My favourite demonstration (5 min.) □
Topics for Independent Studies in OAC Physics (5 min.) □

TITLE OF PRESENTATION: _____

SHORT DESCRIPTION: _____

_____

_____

_____

_____

_____

_____

EQUIPMENT REQUIRED:

Slide Projector □ Overhead □ IBM Computer □ VCR/Monitor □

Other (please specify) _____

PLEASE RETURN THIS FORM BY MAY 31 TO:

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