

Fourth Annual Physics Teacher Workshop
Monday, June 14, 2004
University of Manitoba, Winnipeg, Manitoba
Delta Hotel

Monday, June 14, 2004 - Delta Hotel, Room TBA

8:00 am **Registration and Refreshment**

8:30 am **Keynote Lecture by Dr. Helmy Sherif**, University of Alberta, **Winner of 2004 CAP Medal of Excellence in Physics Teaching**. Dr. Sherif has been named winner of this prestigious national medal for "outstanding physics teaching at both introductory and advanced levels, and for his exemplary work as a mentor to students and to former students." He has played a pivotal role in the physics careers of many students.

9:20 am **Demonstration of computer-based physics laboratory technology** by a Merlan Scientific representative.

10:20 am **Refreshment Break**

10:35 am **Fast Optimization of the Radiation Therapy of Tumours: The Impossible Possible** by Dr. S. P. Goldman, Dept. of Physics and Astronomy, University of Western Ontario. A crucial problem in radiation therapy is to optimize hundreds of beams so that the dose distribution is uniform inside the tumours and small inside organs at risk. A system of linear algebraic equations will handle this quickly but it is *impossible* to use: it results in negative beams! Instead we are forced to *search* numerically the optimal intensities, taking long computation times and yielding sometimes incorrect results. Our new solution made the *impossible* (a linear method) *possible* on physical grounds, delivering excellent dose distributions in times orders of magnitude shorter than present search methods.

11:25 am **Distance Learning from 820 km Straight Up: The Educational Potential of the MOST Space Telescope** by Dr. Jaymie Matthews, University of British Columbia. The MOST (Microvariability & Oscillations of STars) mission is the first all-Canadian scientific satellite in over 30 years. It is a small but powerful optical telescope and photometer in polar orbit, capable of detecting variations in the brightnesses of stars down to a few parts per million. It is searching for acoustic oscillations and convection in stars, and reflected light from planets outside the Solar System. MOST offers a great opportunity to introduce a wide range of physical, astronomical, technological and even political concepts in the classroom, all packaged in a "Humble" suitcase-sized observatory!

12:05 pm **LUNCH Sponsored by Canadian Institute for Photonic Innovation CIPI with guest speaker**

1:35 pm **Lost Amongst the Stars** by Heather R. Scott, Ridley College, St. Catherine's, ON. Recent changes in the Manitoba science curriculum have placed greater emphasis on Astronomy in the Senior 1 course. For many teachers, a lack of expertise in this area of science can lead to incomplete or incorrect coverage of topics, or, in some cases, even exclusion. This workshop will address the concerns of teachers new to astronomy and provide ideas for suitable in-class projects, hands-on demonstrations and a comprehensive list of teacher resources. A question and answer session on all things astronomical will follow!

2:20 pm **Ongoing Professional Development Projects - BC Association of Physics Teachers** by Donald Mathewson, Kwantlen University College. The BC Association of Physics Teachers is a chapter of the American Association of Physics Teachers. Our membership is comprised of a wide cross-section of high school, college and university physics teachers. The BCAPT executive has recently embarked on an ambitious series of professional development projects for teachers that have been enthusiastically embraced by the physics teaching community and have positively impacted the BC physics teaching community. For those within CAP and its member institutions interested in outreach, some information about the BCAPT and its professional development programs will be presented.

2:35 pm **Refreshment and Exhibits Break**

3:00 pm **ALTA to CANALTA : Moving Towards a Canada Wide Network Of Cosmic Ray Telescopes** by Dr. Jim Pinfold, University of Alberta. The ALTA (Alberta Large Time Coincidence Array) collaboration in Alberta has developed and deployed a very large area sparse array in Alberta the scientific purpose of which is to search for a non-random high energy cosmic ray phenomena. The detectors are placed in high-schools and colleges around Alberta. One of the unique features of ALTA is its strong educational dimension due to the involvement of high-schools students and teachers. The ALTA project is presented in the talk, along with initial plans for the development of the CANALTA (CANadawide-ALTA) project across Canada.

Other Related Congress Activities

- Teachers who are planning to arrive early are invited to the public lecture "A Cosmic Picture Show: Images from Astronomy" given by Dr. Jim Peebles, Princeton University on Sunday, June 13 at 7:00 pm.
- There are joint CAP/CASCA/COMP sessions around the theme of Enriching Our Teaching Through Integration on Sunday, June 13.
- The Division of Physics Education is holding a series of sessions on the theme of New Directions in the Physics Curriculum on Tuesday, June 15.



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