

Canadian wins 2009 Nobel Prize in physics

BY KAITLAN HUCKABONE

On 6 October, Dr. Willard Boyle received a stunning phone call from Stockholm, Sweden; he had won the Nobel Prize in Physics for his work in developing the Charge-Coupled Device (CCD) technology. This technology, which he developed with George Smith, is now commonplace in photographic equipment. Dr. Boyle is the only Canadian this year to receive a Nobel Prize.

Boyle was born in 1924 in Amherst, Nova Scotia. Until high school, he was homeschooled by his mother, whom he credits for his interest in science. After earning his BSc, MSc and PhD at McGill Uni-

versity, he joined Bell Labs in 1953, where we would invent the CCD. During his career, he also invented the first continuously operating ruby laser and also assisted in selecting lunar landing sites for the Apollo space program. After retiring in 1979, Boyle returned to Nova Scotia, where he now lives.

Boyle and Smith invented the technology in 1969 while working at Bell Labs. Boyle and Smith originally invented the CCD to act as a new form of electronic memory, but instead they became responsible for the rise of digital imaging. CCD operates by using the photoelectric effect first theorized by Albert Einstein. Light strikes the CCD

chip—a silicon plate about the size of a stamp—producing electrons in proportion to the intensity of incoming light, which are then gathered in photocells. The electron content is read out, transforming an optical image into electric signals and then into digital ones and zeros. Each cell is then recreated as a pixel.

The advantages of CCD imaging include being a thousand times more sensitive and cheaper to produce than photographic film and working across the entire light spectrum. The CCD's most obvious effect has been its revolutionizing of the commercial photography industry by leading to the creation of digital cameras. However, the tech-

nology is also important in several other fields, particularly astronomy and medicine. CCD technology is used in astronomy by everything from the Hubble telescope to Mars rovers. The field of medicine uses CCD technology for purposes such as taking images of the inside of the human body.

Dr. Boyle shares the prize with George Smith, his collaborator in the development of the CCD, and Charles Kao, who helped to develop fibre optic cables. They will be officially awarded the prize at the ceremony on 10 December.

CUPC 2009

The Canadian Undergraduate Physics Conference

BY LINDSAY CHERPAK AND HENRY NGO

The Canadian Undergraduate Physics Conference (CUPC), hosted by the University of Alberta, took place from 1 October to 5 October in Edmonton, Alberta this year. This annual event started in 1965, co-hosted by the University of Toronto and McGill University and has since been organized by a different group of undergraduate volunteers each year. The focus of CUPC is on undergraduate student presentations and invited keynote talks from distinguished scientists but other events include lab tours, a graduate school fair, the Annual General Meeting, social events in the evening, and a banquet at the end.

This year, 122 students gave oral and poster presentations of their undergraduate research work. The 15-minute talks and poster presentations covered a

range of topics from astrophysics to bio-medical fields and beyond. Volunteer judges (professors and graduate students) evaluated the presentations. Overall, the talks were well presented and contained very interesting research.

Lab tours happened both on Friday and Saturday, featuring external, off-campus labs as well as research groups on campus. This year's selection included NINT, Cross Cancer Institute, NanoFAB, as well as visits to labs within the University of Alberta. In addition, the public telescope was open on the first night, which fortunately had very clear weather allowing a very clear picture of Jupiter and the 4 largest Jovian satellites, a fitting view for the International Year of Astronomy!

CUPC will be returning to the Maritimes and Dalhousie University next year. Dalhousie has hosted CUPC 3 times in the past, in 2002, 1988, and 1978. Generally, CUPC

alternates between western and eastern sides of Canada. CUPC 2006, at the University of New Brunswick, in Fredericton, was the last time CUPC was in the Maritimes.

Students from all across Canada will travel to Dalhousie to experience a four day conference to share research experiences and prepare for future endeavours in their academic careers. Registration will begin in early 2010, at <http://cupc.physics.dal.ca>. Attending students will partake in the opportunity to experience some of Canada's eastern charm, while enjoying a weekend in Halifax.

Every day at the conference, leading researchers will enlighten undergraduates with the ongoing research in various fields of study. Next year, Dalhousie is proud to feature Jeff Dahn who specializes in topics including combinatorial materials science, Li-ion batteries and fuel cells to name a few. CUPC

2010 will also host three additional researchers highly acclaimed in their field of study.

To emerge from the academic environment, several nightly social events will be planned to entertain and introduce students to life at Dalhousie and some good old physics fun.

Grad schools and potential employers will come to CUPC giving students the opportunity to talk to representatives from several Canadian graduate schools to learn valuable information about their options after completion of an undergraduate degree.

For those interested in hosting CUPC 2011, the annual general meeting will allow potential universities to voice their bid and vote on the following location of CUPC. If your society and department are interested, be sure to prepare a bid to host CUPC 2011.