PUBLIC RELEASE: 06-OCT-2015

Prepared by the Canadian Association of Physicists

Canadian physicist shares Nobel Prize in Physics for solving neutrino mystery

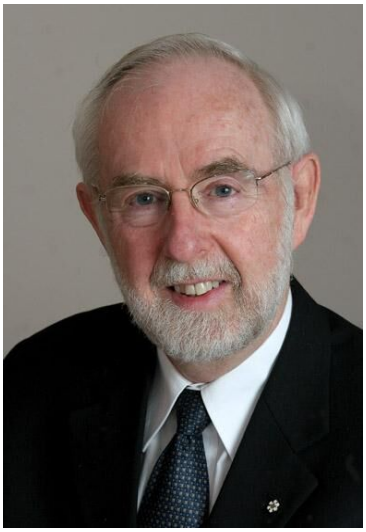

Image: Arthur B. McDonald of Queen's University and the Sudbury Neutrino Observatory Collaboration (now SNOLAB), joint winner of the 2015 Nobel Prize in Physics. (Credit: SNOLAB)

The Royal Swedish Academy of Sciences awarded the 2015 Nobel Prize in Physics jointly to Takaaki Kajita of the Super-Kamiokande Collaboration in Japan and to Arthur B. McDonald of the Sudbury Neutrino Observatory Collaboration in Canada for their key contributions to the discovery that neutrinos oscillate and thus have mass.

Neutrinos are elementary particles that are part of the standard model of particle physics. They are only affected by the weak force and gravity, which means that they pass through almost all normal matter without interacting in any way. This makes neutrinos notoriously difficult to detect. The Sudbury Neutrino Observatory Collaboration was able not only to detect neutrinos but also to determine that they oscillate between three types (known as flavours): electron neutrinos, muon neutrinos, and tau neutrinos. The existence of this oscillation proves that neutrinos also have a tiny mass which is a very important property for these particles. The discovery solved a decades-old particle physics mystery known as the solar neutrino problem and, as the Nobel Prize Academy said, "has changed our understanding of the innermost workings of matter."

McDonald has been an active member of the Canadian Association of Physicists since 1971, a CAP councillor in 1978, and received the CAP medal for Lifetime Achievement in Physics in 2003. He has also been a Professor at Queen's University since 1989 and was the founding director of the Sudbury Neutrino Observatory (now SNOLAB) in Sudbury, Ontario.

When commenting on his co-win, McDonald noted that it is a “very daunting experience, needless to say. Fortunately,” he added, “I have many colleagues as well who share this prize with me.”

The Canadian Association of Physicists gives its wholehearted congratulations to Dr. McDonald on his recognition.

Dr. Adam Sarty, President of the CAP, commented "To have one of our own CAP members achieve the highest honour in physics for his tireless pursuit of basic science and the fundamental nature of the universe, reflects very well on the commitment Canada placed on helping Dr. McDonald achieve these goals, and on the expert capabilities of his Canadian science team, but most importantly on the insight, ingenuity and drive of Dr. McDonald."

The Canada Foundation for Innovation, the Province of Ontario, and Vale have since invested in upgrades to SNOLAB, with experiments continuing to delve even deeper into the mysteries of the Universe, embarking on the study of the new frontier of dark matter.

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The Canadian Association of Physicists (CAP), with 1700 members, is Canada’s national association for physicists working in industry, academia and government. The CAP strives to unleash the full potential of physics and physicists for the benefit of Canada.