



News Release | Embargoed until February 2, 2014, at 9:00 p.m. PST

“Antimatter” team wins NSERC John C. Polanyi Award Canadian-led measurement brings scientists one step closer to understanding the anti-world

(Vancouver, BC) – Canadian scientists who were part of an international collaboration that narrowed the gap between sci-fi legend and reality will be receiving a prestigious national award at a ceremony in Ottawa today. For their work in creating, capturing, and characterizing the antihydrogen atom, the ALPHA-Canada Team are being presented with the NSERC John C. Polanyi Award for 2013, which “honours an individual or team whose Canadian-based research has led to a recent outstanding advance in the natural sciences or engineering.” The Award recognizes the seamless collaboration among the multidisciplinary team, their mastery of multiple technologies, and their tight integration with the international collaboration based at the CERN laboratory in Geneva, Switzerland.

The ALPHA Collaboration has developed a game-changing experimental program to help explain how the universe was able to form after the Big Bang. The initial breakthrough came in 2010 when they captured antihydrogen (the antimatter partner to normal hydrogen) for the first time. Then in 2011 they were able to hold antihydrogen in a sophisticated “magnetic bottle” for over 16 minutes – 5000 times longer than before. In the latest experiment, published in 2012 in the journal *Nature*, the collaboration (led by the Canadian team) measured for the first time the response of trapped antihydrogen to microwaves, which opened the door to comparing it to the extremely well-known response of normal hydrogen. Any discrepancy between the two would yield invaluable information for why the universe is dominated by normal matter, while the antimatter has all but disappeared.

The experiment was a multidisciplinary *tour de force*, combining more than a dozen plasma, atomic, condensed-matter, particle, detector, and accelerator physicists and students from the University of British Columbia (UBC), Simon Fraser University (SFU), the University of Calgary, York University and the TRIUMF subatomic physics research lab in Vancouver. Speaking on behalf of the ALPHA-Canada Team, Dr. Makoto Fujiwara enthused “We are thankful to NSERC, NRC, our home universities and TRIUMF, as well as our scientific colleagues around the globe for their risk-taking and support. ALPHA truly exemplifies the spirit of international cooperation.” TRIUMF Science Director Dr. Reiner Kruecken remarked “This award is a great honour for the ALPHA-Canada Team and TRIUMF is proud of the critical contributions by our scientists and staff to the breakthroughs of the international ALPHA collaboration in trapping and studying antihydrogen.”

The ALPHA experiment will soon be back online after a lengthy shutdown of the CERN facility. The Team has been hard at work making a series of improvements to the experimental apparatus. These enhancements will enable the collaboration to make much more detailed measurements of the atomic structure of antihydrogen, opening up a precision frontier into the anti-world.

Support for ALPHA-Canada and its research came from NSERC (National Science and Engineering Research Council, TRIUMF, AIF (Alberta Ingenuity Fund), the Killam Trust, and FQRNT (Le Fonds québécois de la recherche sur la nature et les technologies).

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NSERC John C. Polanyi Award

ALPHA-Canada Team: Dr. Michael Hayden (Simon Fraser University), Dr. Walter Hardy (University of British Columbia), Dr. Makoto Fujiwara (TRIUMF/University of Calgary), Dr. Art Olin (TRIUMF/University of Victoria), Dr. Dave Gill (TRIUMF), Dr. Scott Menary (York University), and Dr. Robert Thompson (University of Calgary)

Researchers Drs. Walter Hardy and Michael Hayden conceived and developed the microwave techniques for this latest experiment, working closely with Dr. Robert Thompson and his student Tim Friesen, and PhD student Mohammad Ashkezari (SFU). Meanwhile Drs. Art Olin, David Gill, Simone Stracka, Makoto Fujiwara, and Scott Menary teased faint signals from a sophisticated detector system to pinpoint matter-antimatter annihilation events.

About ALPHA-Canada: ALPHA is a collaboration of about 40 physicists from 15 institutions from Canada, Brazil, Denmark, Israel, Japan, Sweden, UK, and the USA. The full list of ALPHA-Canada team members (current and former) includes (Graduate students and postdoctoral trainees are indicated with asterisks):

University of British Columbia: Nathan Evetts*, Andrea Gutierrez*, Walter Hardy, Mario Michan*, Takamasa Momose, Sarah Seif El Nasr*

University of Calgary: Timothy Friesen*, Richard Hydomako*, Robert Thompson

Simon Fraser University: Mohammad Ashkezari*, Ryan Dunlop*, Michael Hayden

TRIUMF: Makoto Fujiwara, David Gill, Leonid Kurchaninov, Konstantin Olchanski, Art Olin, James Storey*, Simone Stracka*

York University: Chanpreet Amole*, Andrea Capra*, Scott Menary

See <http://alpha.web.cern.ch/alpha>

About TRIUMF: TRIUMF is Canada's national laboratory for particle and nuclear physics. Located on the south campus of the University of British Columbia, TRIUMF is owned and operated as a joint venture by a consortium of the following Canadian universities, via a contribution through the National Research Council Canada and building capital funds from the Government of British Columbia: University of Alberta, University of British Columbia, University of Calgary, Carleton University, University of Guelph, University of Manitoba, McGill University, McMaster University, Université de Montréal, University of Northern British Columbia, Queen's University, University of Regina, Saint Mary's University, Simon Fraser University, University of Toronto, University of Victoria, University of Winnipeg, York University. See <http://www.triumf.ca>.

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