UK Research and Innovation

The impact of UK–Canada research collaboration

By working together, researchers from the UK and Canada have been able to maximise the impact of their work – from infertility, to data privacy, to air pollution in microenvironments.

Image courtesy of SNO

"Here is the first time that somebody has found something where the Standard Model of Particle Physics gets it wrong."

Neutrinos are fundamental particles in the universe but have historically been misunderstood by scientists. Researchers from Canada, the US, and Japan spent over three decades working on the 'solar neutrino problem,' designing a way to detect neutrinos in different forms.

"You can get the accuracy that you want without having to spend as long computing."

How do meteorologists ensure their predictions are precise, accurate, and timely? Researchers in the UK and Canada developed a computational mesh method that adjusts the size of each mesh cell based on activity and changes in weather patterns, allowing researchers to focus on specific areas of the world.

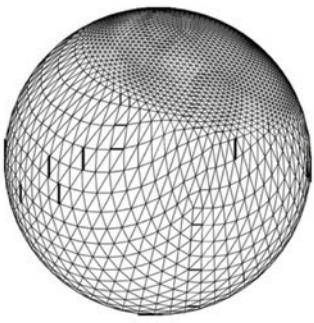

Image credit: CERN

"There's a lot of discussion and speculation about the future of the universe, which can be illuminated by our understanding of particle physics."

The discovery of the Higgs Boson particle in 2012 was one of the most important discoveries in the last decade, though not only for physics. This discovery has important implications for many different disciplines, and British and Canadian physicists have worked to communicate this potential to policymakers, journalists, and the public.

"Infertility is something that should be on all health agendas."

Infertility affects tens of millions of people around the world and can be a distressing and isolating experience. Researchers in Canada and the UK have developed surveys, guides, and apps to understand the emotional, psychological, and physiological effects of infertility and to improve the quality of life of those experiencing infertility, no matter the gender.

“There was a clear need for more technologies that address these particularly persistent contaminants.”

Heavy oils, solvents, and coal tars can contaminate soil across industrial sites. A civil engineer and a fire safety engineer teamed up to develop a method to safely smolder such hazardous organic liquids and commercialized the process.

Image credit: Dumelow/Wikimedia

“Lab animals — like all animals — feel pain. Why then do we not give them analgesics to help with the pain?”

How can scientists measure pain responses in animals used for research, such as rodents and rabbits, and ensure the animals receive necessary painkillers? Researchers in the UK and Canada developed a pain assessment and different analgesic formularies for research animals, which have many potential applications outside research labs, including for domesticated farm animals.

Image courtesy of Paul Flecknell

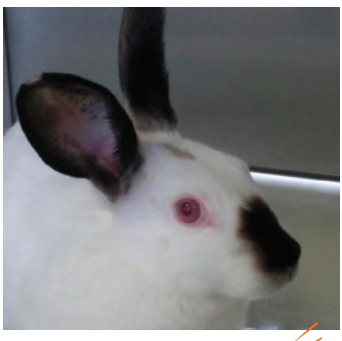

Image credit: Michael Davis-Burchat/Flickr

“Privacy protection is not just about the ‘black letter of the law’ but about a broader array of policy tools.”

Data protection has become one of the most pressing global challenges with the growing ubiquity of technology. Experts from Canada and the UK teamed up to study how policy regulations address data protection concerns and how regulatory officials and companies can use a wide range of tools to protect populations from data breaches.

“Just small increases could result in enormous economic benefit.”

Many people use canola oil for day-to-day cooking and baking, but how efficient is the oil production process? Researchers in the UK and Canada teamed up and discovered that genetic engineering of canola seeds could increase seed oil content, considerably increasing oil production.

Image credit: Nas2/Wikimedia

“These things could have been built for a few pounds from components sold at eBay, but they were being marketed for thousands of pounds.”

How would someone test the reliability of a bomb detector? A condensed matter physicist from Canada, now living in the UK, helped identify effective and ineffective methods of bomb detection using the response of metals, magnets, and other similar materials to electromagnetic signals.

What we really want to do is estimate individual exposures to air pollution.”

Air pollution in macroenvironments, such as cities, is regularly monitored, but air pollution in smaller spaces, like your kitchen, is not. Researchers in Canada and the UK developed a computer simulation model called pCNEM to help identify potential exposure to air pollution in microenvironments, like restaurants, schools, and homes.This model has been used to determine ozone air quality standards and air pollution regulations.

Image credit: Divya Abhat