The Big Bell Test chosen as a finalist for the ERC PERA Award

The Global physics experiment coordinated by ICFO in 2016 challenged Einstein with the help of 100,000 volunteers and now has been selected as a finalist for the Public Engagement and Research Awards of the ERC

July 01, 2022

On November 30th of 2016, for the first time, the world had the opportunity to participate in and contribute to a unique worldwide experiment that tested the laws of quantum physics using random numbers generated by humans.

The experiment was instigated by Carlos Abellan, co-founder of Quside (in 2016 a PhD student at ICFO), and coordinated by ICREA Prof. at ICFO Morgan Mitchell, in collaboration with a team of ICFO researchers including Antonio Acin, Jordi Tura, Georg Heinze, Pau Farrera, Hugues de Riedmatten, Valerio Pruneri, together with ICFO's KTT and Communications units. Twelve laboratories from around the world came together to put in motion the **BIG Bell Test: worldwide quantum experiments powered by human randomness**,

with the aim of demonstrating experimentally that the microscopic world is in fact as strange as quantum physics predicts: particles that behave in a random way, determining their properties only when we look at them; strange instantaneous interactions at a distance ... predictions that were questioned by Einstein, who rejected them completely.

The BIG Bell Test recruited participants all over the world to generate unpredictable sequences of zeros and ones (bits) through an online video game, all in one single day, November 30th. On that day, the bits were routed to state-of-the-art experiments in Brisbane, Shanghai, Vienna, Rome, Munich, Zurich, Nice, Barcelona, Buenos Aires, Concepcion Chile and Boulder Colorado, where they were used to set the angles of polarizers and other laboratory elements to determine how entangled particles were measured.

More than 100,000 participants contributed with more than 90 million random number bits, making possible a strong test of local realism, as well as other experiments on realism in quantum mechanics. The results obtained strongly disagreed with Einstein's worldview, closed the freedom-of-choice loophole for the first time, and demonstrated several new methods to study entanglement and local realism.

This year, the BIG Bell Test Project, submitted by Prof. Antonio Acin, has been selected as one of the nine finalists of the European Research Council's Public Engagement with Research Award. This Award was established to recognise those ERC grantees who successfully engage audiences outside their domain. The laureates selected by the jury and the winner of the public vote, that will take place from now until July 14th, will be revealed at EuroScience Open Forum (ESOF) on 14 July 2022 during the ceremony starting at 16:00 CEST an livestreamed on YouTube

CAST YOUR VOTE

The nine finalists of this award are very different in topic but all involve the participation and engagement of citizens.

In order to participate, learn about all of the nominated projects, and cast your vote, enter the ERC platform here. The Big Bell Test is in the i¿½**CITIZEN SCIENCE**i¿½ award categor

. The BBT was a monumental experience in every way. For the coordinating team and for t e +50 scientists that were running experiments all over the world that day, it was simp y amazing to see so many people from the four corners of the world participating in a quant m physics experiment, creating random numbers, taking control of the experiments in re l time, and actually defying Einstein's notion of quantum mechanics... Simply unforgettabl