

Science in the Pub – Tomás Gonzalo Velasco “Particle Physics, the Higgs and Beyond”

Last night Tomás Gonzalo Velasco –Physics PhD student at University College London - joined a lively crowd of SRUK/CERU researchers for a beer and bit of science at the Canal 125 Pub in London. This event was organized by the SRUK London Constituency.

In 2012 at Cern Switzerland, the Large Hadron Collider (LHC) discovered the existence of a particle that had been theoretically proposed in the 1960s by Peter Higgs and Francois Englert. This discovery not only proved these theoretical physicists right, but also merit them to win the 2013 Nobel Prize award in Physics.

To commemorate this Nobel Prize award, Tomás Gonzalo explained with humour the science behind the Higgs boson particle:

“The Higgs Boson is responsible for providing the elemental particles of their rest mass, it is the mass that they have when they are free. People mistakenly believe that the Higgs Boson is what gives mass to atoms, but this is not correct, the responsible for the mass of atoms is the binding energy of those systems” explained Tomás Gonzalo.

Tomás Gonzalo gave an engaging and fun talk providing the audience with the context to understand what the Higgs boson is and what implications it has in the rest of the field. He covered the history of Particle Physics from Ancient Greek Philosophers to Galileo, Newton, Dalton and Thompson. The discoveries in Physics suffered a revolution of theories and discoveries during the XX century, including the Quantum Mechanics, Special and General Relativity, Quantum Field Theory, Electroweak Theory and the BEH Mechanism and the Standard Model.

Tomás Gonzalo explained the achievements and flaws of the Standard Model. He emphasized the questions that remain to be answered and that current Particle Physics only can explain 4% of the total matter in the universe.

When asked to summarize his own work, Tomás Gonzalo explained: *“It sounds redundant, but I try to construct models that are beyond the Standard Model models”*

Tomás Gonzalo studied Physics and Computer Science at Universidad de Salamanca, he won a fellowship to study a Master in Physics at University of Cambridge. He is currently studying a PhD at the High Energy Physics, Department of Physics and Astronomy at UCL, where he makes models that make predictions on elemental particles. In the future - similarly to the theories of Higgs and Englert - these predictions could potentially be demonstrated in experiments using the Large Hadron Collider (LHC).

Tomás is a member and part of the online team at SRUK/CERU.