

Peter Higgs: the death of God

José Edelstein*

It was called the God particle, but it was his particle: the Higgs boson. The last piece, for the moment, of the Standard Model.

Peter Higgs' intense gaze was extinguished. His melancholy amber-grey eyes, small and lively, closed forever behind the thicket of bushy eyebrows. There is no one left in this world who can boast of having predicted an elementary particle. The Higgs boson, whose discovery was announced by CERN on 4 July 2012, capped one of the most glorious scientific endeavours in history.

A little more than six decades ago, the architecture of particle physics, its constituents and laws, was being discovered at great speed while a fundamental question persisted and grew: what is the origin of mass? Mathematics, that elegant language in which Nature whispers its secrets to us, emphatically asserted that point particles, lacking in size, had nowhere to store their mass. Higgs conceived of the possibility that this was a property acquired by the particles when they inhabited a medium with very special characteristics: the quantum vacuum. He proposed the mechanism in detail in mid-1964 and concluded that, if true, the vacuum itself would be capable of giving rise to a new particle, radically different from all known particles, the only one without spin: the Higgs boson.

It was not until 1976 that it was realised how this new inhabitant of the zoo of elementary particles could be found, but its discovery required the construction of more than one collider. Like a holy grail, its elusiveness only made it more famous and stirred the wings of the scientific community's desire. The wait lasted half a century. The astuteness of an editor suggested calling it "the God particle", conferring divine status on this shy, good-natured gentleman born in Newcastle upon Tyne in 1929.

Peter Higgs was an extremely austere and introverted man for whom there was immediate sympathy. An only child, with bouts of asthma that forced him to miss long periods of school as a child, he was, in his own words, "not a very sociable boy". His mother saw to it that little Peter studied and was apparently an excellent teacher: "Thanks to my mother's lessons I was well ahead of my classmates". He went to secondary school in Bristol, at Cotham Grammar School, which Paul Dirac had attended. Interestingly, they both predicted the existence of a new particle with theoretical arguments, as sophisticated as they were elegant, and both the positron

and the Higgs boson were found. No one could have imagined at the time of their discovery, by the way, that in the 21st century positrons would save millions of lives through their use in diagnostic imaging.

Overwhelmed by the sudden fame achieved with the discovery of his boson, Higgs said in a talk we had in Edinburgh that he would not answer the Swedish academy's call on the day he was awarded the Nobel Prize. On Tuesday 8 October 2013, at the last minute, it was reported that the announcement of the Nobel Prize in physics would be postponed by half an hour. I couldn't help laughing to myself, imagining Peter Higgs by the ringing phone. But then he told me that his decision was more drastic: "I went out for lunch in the Leith harbour area. I wanted to go further afield, to the West Highlands, but that plan didn't work out".

"On my way home in the evening, a woman about 65 years old, who identified herself as a former neighbour, stopped her car and crossed the road to say "Congratulations on the news" to which I replied "What news? She told me that her daughter had called her from London to tell her that I had won that prize". That award. That was literally how Peter Higgs referred to the Nobel Prize. He never gave it the slightest importance.

On 11 June 2023 I went to visit him in Edinburgh and he added a detail that he interpreted as very telling to this story. The exact spot where the neighbour stopped her car and congratulated him, just over a block from his house, was in front of the mansion where James Clerk Maxwell, one of the greatest scientists of all time, had spent part of his childhood and youth while studying in Edinburgh. Higgs' theory also explained the mechanism by which Maxwell's electromagnetism would have arisen from the electroweak interaction in the first moments after the Big Bang. His admiration for Maxwell and this secret connection with him was far more significant to him than the Nobel Prize in physics.

Despite his proverbial shyness, Higgs was very much connected to the cultural and political world of his time. A regular participant in Edinburgh Festival activities as long as health permitted, he even turned down invitations to lectures in order not to miss the multicultural atmosphere that pervaded the city during those days. He was interested in the history of the international brigades in the Spanish Civil War and denounced, along with many other physicists, the criminal coup d'état carried out by Augusto Pinochet in Chile. An avid reader, among others, of McEwan and Borges, Higgs was above all a great music lover. The main investment he made with the Nobel Prize money was to buy a stereo system to accompany him during the last years of his life, when he was unable to leave his home.

Peter Higgs received numerous honours and did so mostly with disdain. Instead, he was a person who was affectionate and connected to the little things. Also with the minor characters in his life. When he received the Prince of Asturias award, he invited some of us to share that moment. After the ceremony there was a private reception with the Spanish monarchy. Overwhelmed, after a few minutes, he told us that he wanted to go to a quieter place. The protocol officer was about to suggest an exclusive restaurant for an intimate and quiet dinner when Higgs replied "thank you very much but I rather prefer to go to La Paloma, just around the corner". That's where we headed. No stopovers. From sharing impressions with Prince Felipe in the lavish setting of the old Hospice of Oviedo to a restaurant with a paper tablecloth, joking waiters, cheerful drunks at the bar, shared portions and notable vermouth. That was Peter Higgs, the man.

*Theoretical Physicist, IGFAE, University of Santiago de Compostela
(jose.edelstein@gmail.com)