Why engineers enjoy quantum
Miriam Blaauboer

A dimly lit pub. A TV screen mounted in an upper corner is showing soccer World Cup quarter finals. Seated at the bar are a few onlookers, some of them watching the match, others looking at another, much larger, screen in the opposite corner. *'An evening about quantum mechanics'* it says on that screen. Below, in smaller font, *'how to live with uncertainties'*.

In front of the large screen three physicists are perched on high stools. One of them is gesticulating wildly and snippets of sentences can be heard at the bar: "…being here and there *at the same time*…, superposition…, undecided until you measure…." The small crowd that has gathered in front of the scientists consists of a few students, but mostly of older men and, to a lesser extent, women.

My hypothesis, largely based on anecdotal evidence, is that the majority of audiences like these - the visitors of today's *Science Café* on quantum mechanics - consist of retired engineers. Retired mechanical engineers, electrical engineers, aerospace engineers and the odd retired civil engineer, all of them deeply curious about quantum mechanics.

Why should that be so? It seems to me that quantum mechanics as a subject is sufficiently close to an engineer's academic background to be fundamentally interesting to him or her, especially because it has this fascinating strangeness to it. And yet, it is not part of the standard mechanical — or electrical, aerospace, etc. — engineering degree curriculum (it certainly wasn't 40-50 years ago, which is when the current generation of retired engineers got their degrees, and elective programmes such as minors did not yet exist).

Imagine a young engineering student in the seventies, who learns all about classical mechanics and electrodynamics. Occasionally, he hears something about quantum mechanics from fellow students in physics, about physical laws being different when objects become really small. His degree curriculum, however, does not provide any room for studying this in depth. Then, after graduation, many years pass by — filled with a career elsewhere, which again leaves him little time for learning more about quantum phenomena. But all the way through, his interest to understand this part of the physical world, fueled by occasional newspaper articles etc., remains. And then, forty years later, it is time for action. The engineer, now retired, enrolls in university courses for senior adults on quantum mechanics, attends Science Café sessions on quantum phenomena, and sends in quantum-related questions to the "Ask us why" column of popular physics journals.

Over time, I have met many engineers, retired but also younger, with real curiosity about quantum mechanics. My feeling is, that we as researchers in quantum (nano)science should cherish anyone's interest in the quantum world, and the way people genuinely wish to understand more about it. Through their enthusiasm, network and background, engineers in particular make great ambassadors for fundamental quantum-related research. And, last but not least — at the point where our capabilities as physicists come to a halt, they are able to actually engineer smart and useful quantum applications.

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