SP - (16204) - QUANTUM TECHNOLOGIES: A PROJECT FOR TEACHER PROFESSIONAL DEVELOPMENT

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Short Abstract

We present partial results on an ongoing project for teacher professional development whose purpose is to enhance physics teachers' knowledge, awareness, and drive to educational innovation along the lines of the "second quantum revolution". The project started with an initial course whose focus was not only on physical content, but on developing in teachers a professional commitment to the common goal of curriculum innovation, and is now in the phase of developing into a community of practice. Although centred on quantum computation, the course opened a much wider perspective on a longitudinal thread which touches several areas of physics, mathematics, logic, and information science. Seen from a teachers' perspective, such thread gives the possibility of exploring, throughout the curriculum, various crucial intersections in which the discourse on computation and the discourse on physics get closer and overlap, to the point of becoming essentially identical with the development of quantum computation. Adopting this perspective as a general guide, teachers can develop examples of educational design not necessarily directly related to quantum mechanics, but covering disparate areas of physics and mathematics, such as propositional logic, classical algorithms, thermodynamics, circuit theory.
The project is realized in the context of the Italian PLS (Plan for Science Degrees) and the education section of the Quantum Flagship. Due to the current well know limitations it was entirely delivered in the form of synchronous distance learning and was attended by around 30 teachers. Asynchronous discussion was performed using both generally available tools (Google drive, forms etc.) and a dedicated online forum set up on the servers of the University of Pavia.
Data collected within the initial course and their relationship to research questions will be discussed at the conference. In general, a strong appreciation and fascination emerge for the cultural significance of the introduced topics and connections.