PHYSICS:
Launching our future

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From Quantum in Pictures to practical Natural Language Processing, Music, and understandable AI

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This talk requires no particular technical mathematics background, as I will talk entirely in terms of simple pictures. These are the pictures of my new book, "Quantum in Pictures" [1], which is aimed at the teenage enthusiast, and pretty much everyone else too - the book had a more technical predecessor [2].

One finds the same pictures in natural language, and much of the high-level reasoning that goes on in our brain can be shaped according to those pictures. One consequence of this is that natural language really wants to live on a quantum computer, which is something that we meanwhile realised [3], and we have also made music with quantum computers [4]. All our software developed for doing so, lambeq and Quanthoven respectively, is freely available from GitHub, open-source, and well-documented and well-supported. You can have a go yourself!

We show how these pictures also guide us towards a new form of natural language, one in which different languages all become the same. This in turns forms a new template for interpretable compositional AI.

[1] Bob Coecke and Stefano Gogioso (December 2022) Quantum in Pictures. Quantinuum Pubs.

[2] Bob Coecke and Aleks Kissinger (2017) Picturing Quantum Processes. Cambridge University Press.

[3] https://www.forbes.com/sites/moorinsights/2021/10/13/cambridge-quantum-makes-quantum-natural-language-processing-a-reality/

[4] https://thequantuminsider.com/2021/11/19/roll-over-quanthoven-can-quantum-computers-be-programmed-to-become-quantum-composers/

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