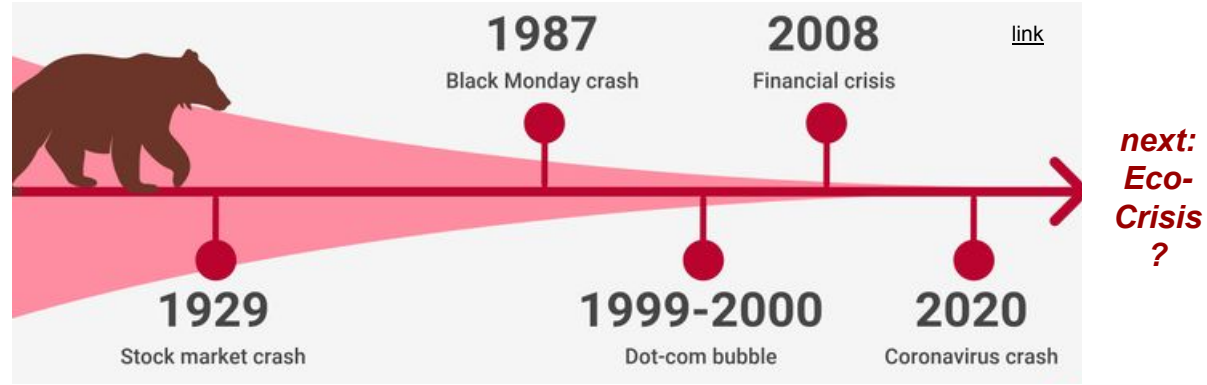


“Energy consumption matters both to our environment and our economy.” - John Baldacci

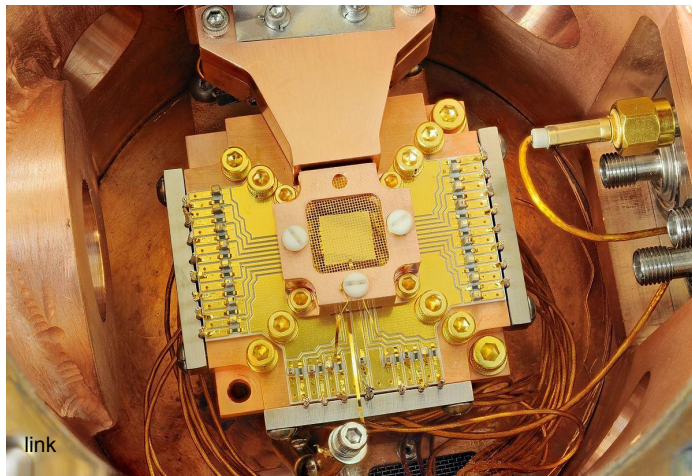
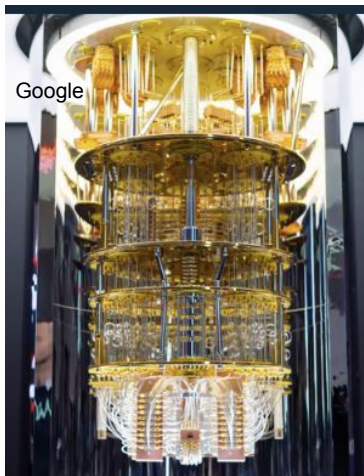


- The **environmental crisis we face will be worse than the pandemic**, Sir **David Attenborough** has said ahead of the UN COP26 summit in Glasgow in 2021.
- **Computers**, data centers and networks consume **10% of the world's electricity**: 30% of this electricity goes to power terminal equipment (computers, mobiles and other devices), 30% goes to data centers and 40% goes to the network.

("New Technologies' Wasted Energies", *CNRS News*, 2018.)

“Nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical.” - Richard Feynman

We are already transforming our *classical* computers to *quantum*.



But, the prevailed philosophy is: build the quantum computer first, and optimize its consumption later.

Why wait?

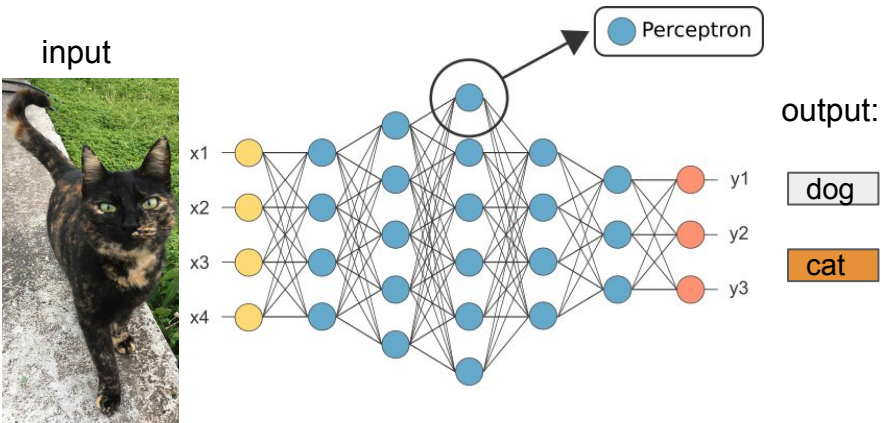
Energetic consumption impacts:

1. Qubits technology
2. Computing architecture
3. Error correcting codes
4. Quantum neural networks

Unlock your *Quriosity* with

Coldera

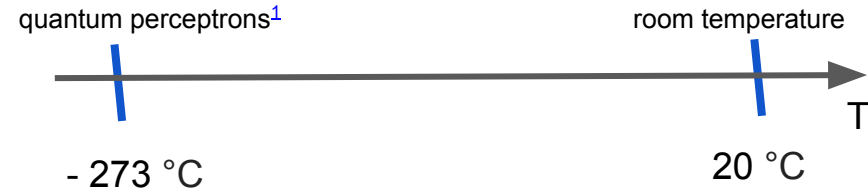
Quantum perceptrons are the quantum version of the perceptrons - the building block of classical neural networks.



Neural network

- We implement quantum perceptrons on existing quantum platforms.

They operate on *ultra cold* temperatures :



- We minimize their energetic consumption compared to classical perceptrons.
- We find interesting applications of quantum perceptrons, like the XOR gate.

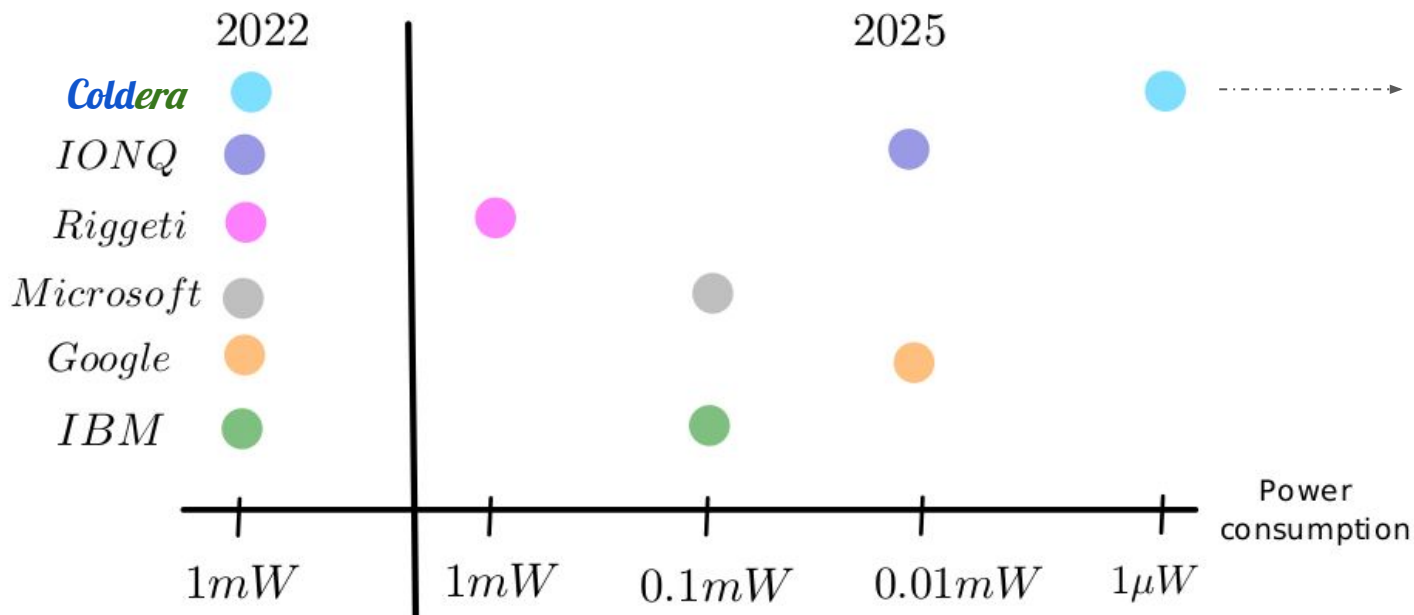
What we offer and what we get

1. **Coldera** offers direct hardware solutions for reducing the energetic consumption of quantum systems, starting from the quantum perceptron.
2. **Coldera** provides these energetic efficient solutions to research institutes and well-established companies on quantum computers:



3. **Coldera** receives for its energetic solutions:
 - a. 30K for common quantum hardware implementations and
 - b. 50K for specialized quantum hardware implementations.

The competitive landscape



Our focus on reducing the energetic consumption of quantum models guarantees our success.

“Quantum technologies need a quantum energy initiative”, A. Auffeves, arXiv:2111.09241, 2021.

“Energetics of a Single Qubit Gate”, J. Steven et. al., arXiv:2109.09648, 2021.

“Quantum supremacy using a programmable superconducting processor”, F. Arute et. al., *Nature* 574, 505–510 (2019)”

The team

Founder and CEO



Katerina Gratsea is a PhD candidate at ICFO. Her main research focus is on exploring the benefits of Quantum Neural Networks and their building block - the quantum perceptron. She has been awarded the prestigious Marie-Skłodowska Curie PhD Fellowship. Her expertise and hard-work are the main energy sources of the company.

Founder



Maciej Lewenstein is a theoretical physicist, currently an ICREA professor at ICFO. He has strongly collaborated with companies with the most recent example being QuSide. He has obtained numerous prizes and ERC Advanced grants validating his innovative and successful ideas.

Founder and CEO



Lluís Torner founded and leads ICFO in Barcelona (Spain). ICFO has led to several spin-offs. He obtained a PhD at the Polytechnic University of Catalonia (UPC). He has been awarded a number of prizes and remarkably is the recipient of the 2016 National Research prize of Catalonia and of the 2017 Nature mentorship award.

“The way to get started is to quit talking and **begin doing.**”

Walt Disney

March 2022	Perceptrons	
	Classical	Quantum
Power consumption	10mW ¹	1mW ² <i>Coldera</i>
XOR gate	No ³	Yes ⁴ <i>Coldera</i>

Quantum perceptrons already offer

- significant energetic advantage and
- direct applications (i.e. XOR gate) compared to their classical counterpart.

