



Mike & Co

Qiskit Hackathon Barcelona 2023

**Moody's Challenge
Quantum Computing for Option Pricing**



About Us

We've advanced beyond incremental efficiencies to bring quantum computing to the core of everything that matters most to your company.

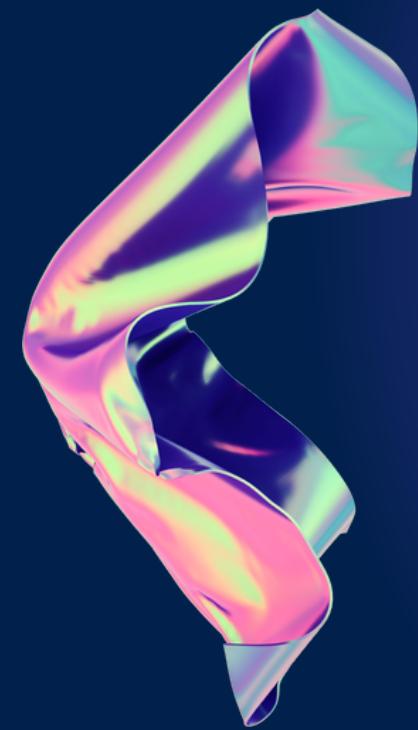
Quantum Computing for Option Pricing



Faster



More
efficient



More
accurate

Roadmap

Quantum circuits

Build the corresponding quantum circuits of the hybrid algorithm

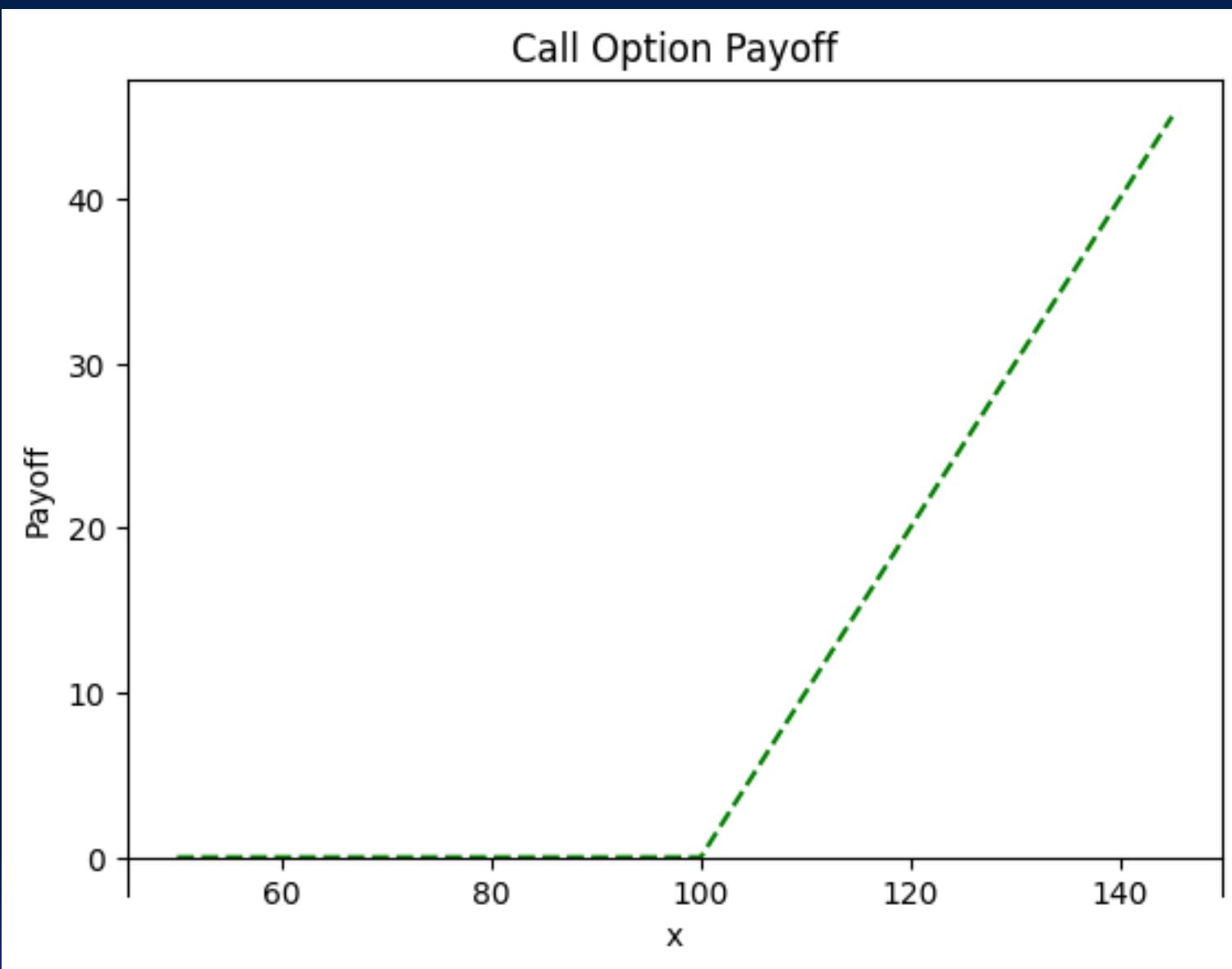
Option pricing

Price an european call option on a statevector simulator

Problem extensions

Extend the problem theoretically, implement additional features

$$C(S, \tau) = \max(S - k, 0)$$



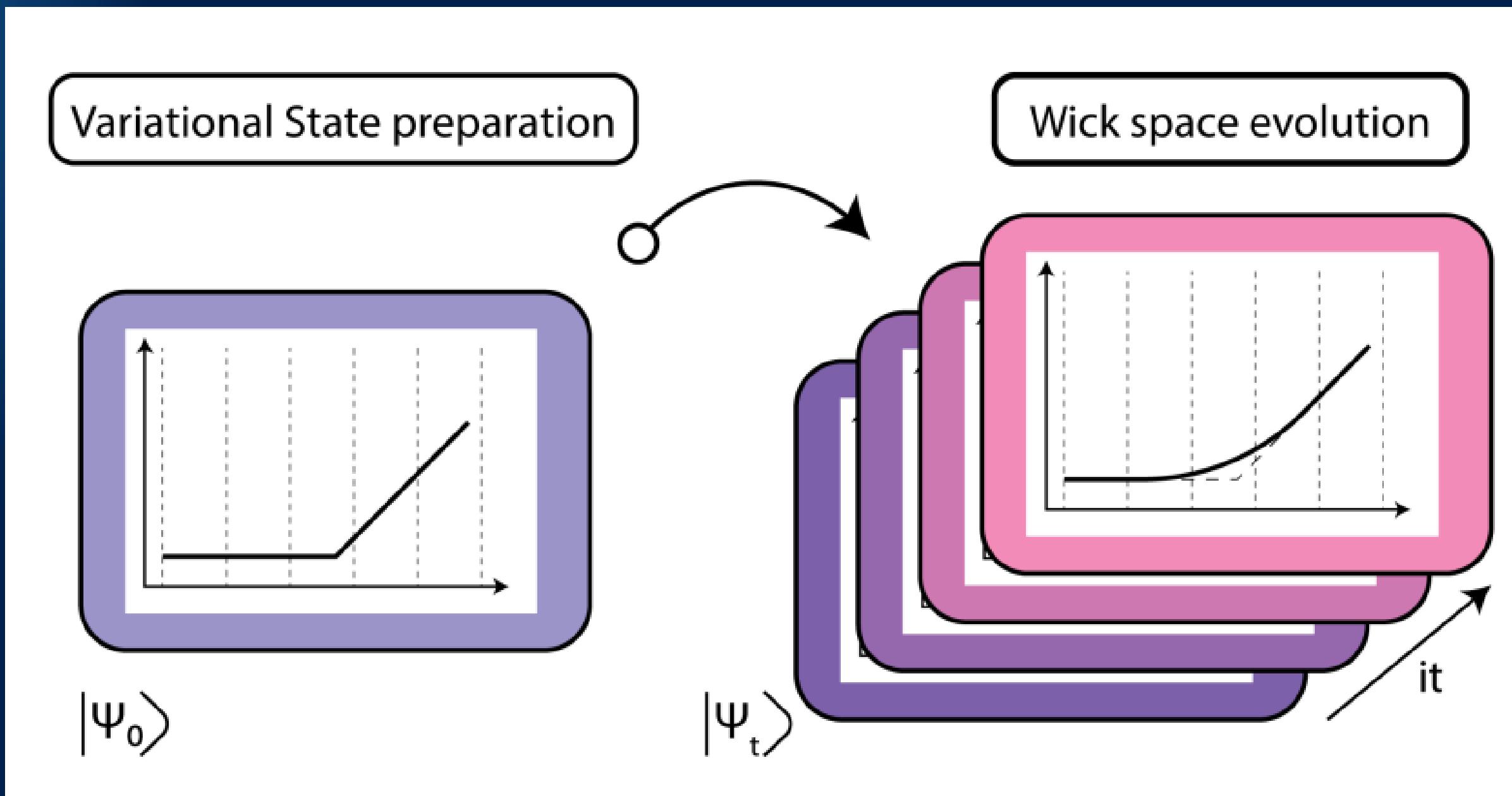
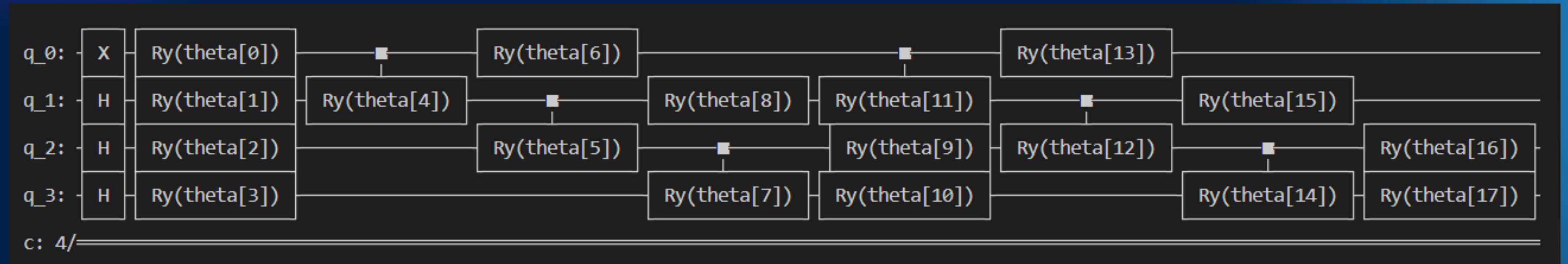


Image by Ricardo García, Moody's



SPSA optimizer

**gradient descent method for
optimizing systems with
multiple unknown parameters**

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Bonus

Types of options

American, Asian, or barrier options

Dimensions

Multidimensional
Black-Sholes

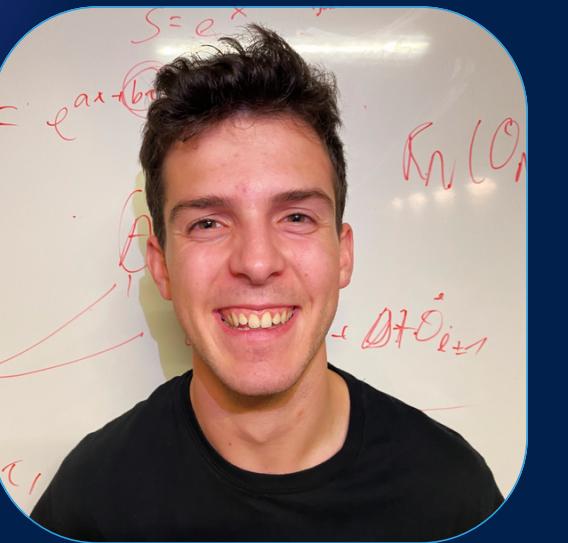
State Tomography

Method that allows us to avoid collapsing the wavefunction



**With good data and the right
technology, people and
institutions today can still
solve hard problems and change
the world for the better.**

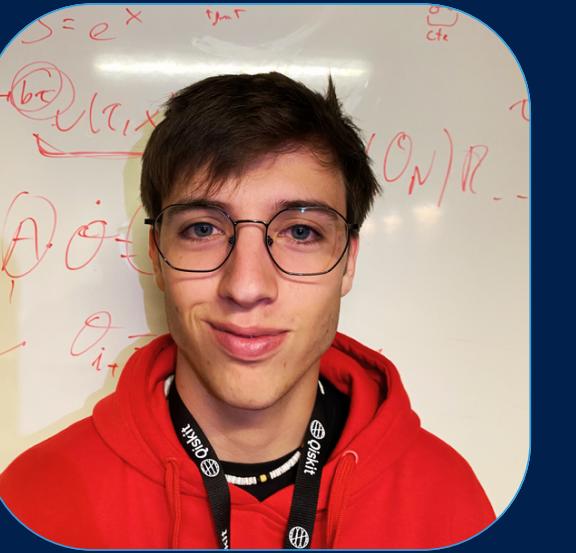
Team



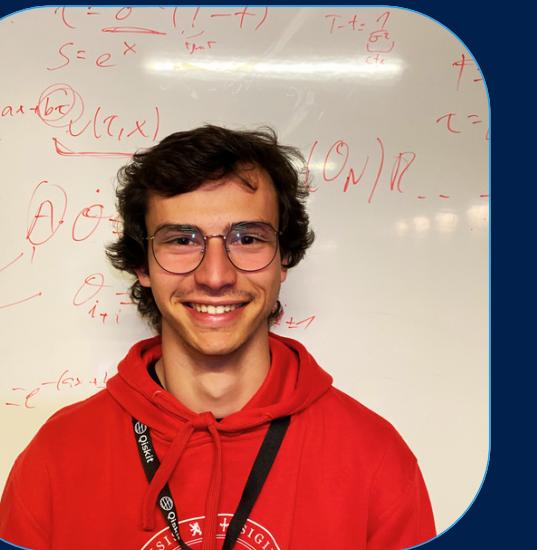
Mike #1
Coder



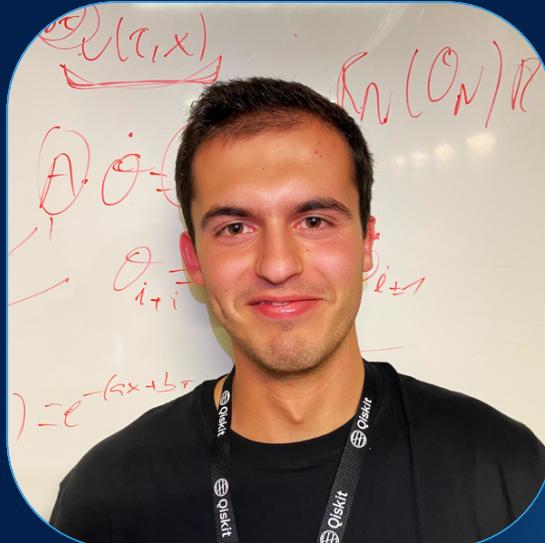
Iván
Scientist



Mike #2
Coder



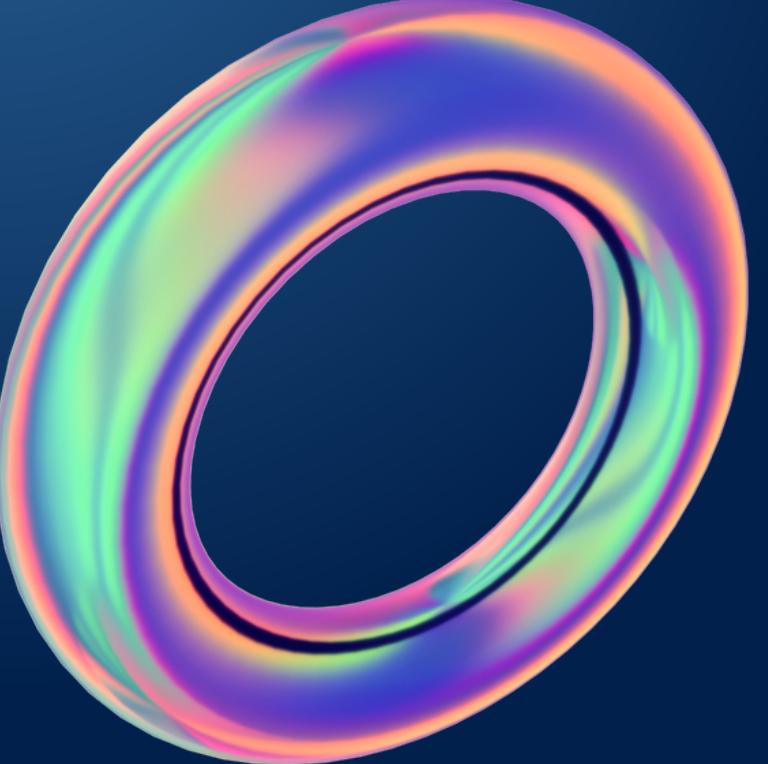
Manu
Leader



Mike #3
Scientist



Lucía
Coder



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