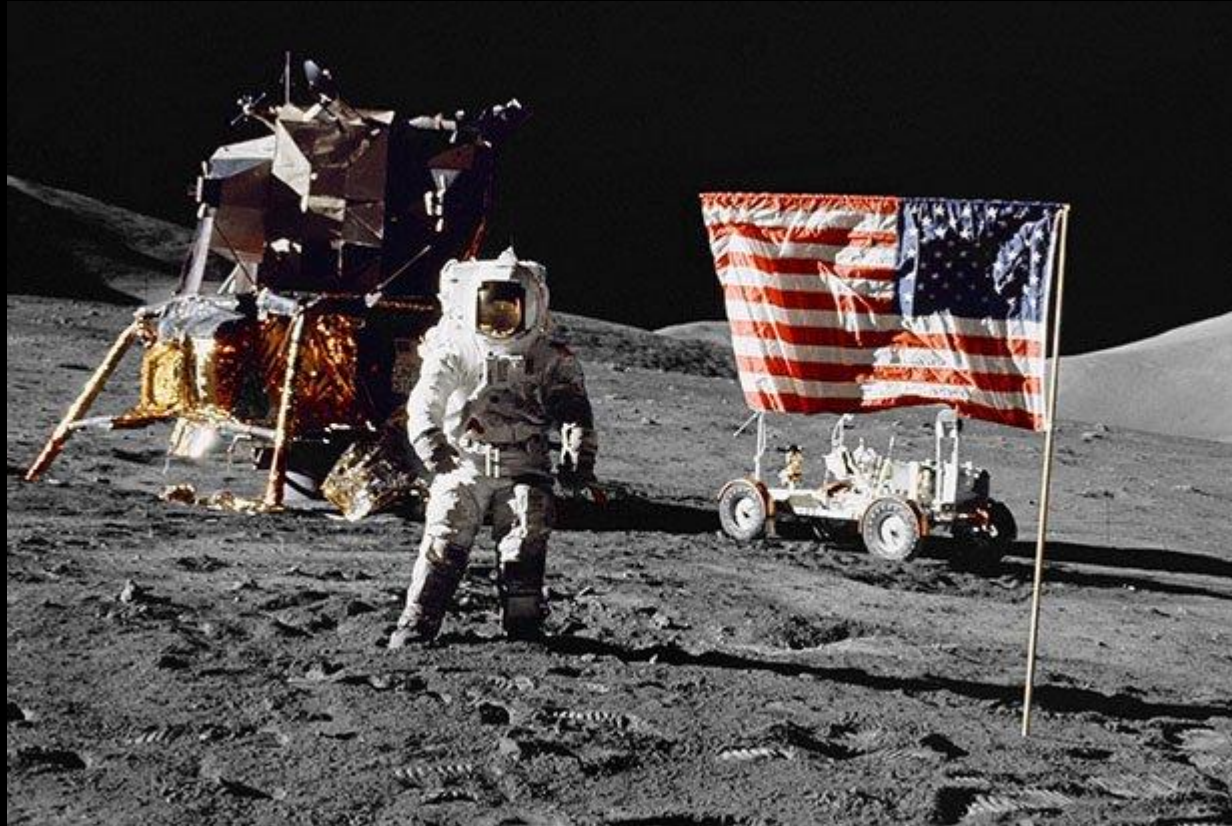


What happened on October 29th, 1969?

Not the moon landing!



Something even bigger...



The internet in 1969

Sending "LOGIN" while on the phone

"Do you see the L?"

"Yes, we see the L," came the response.

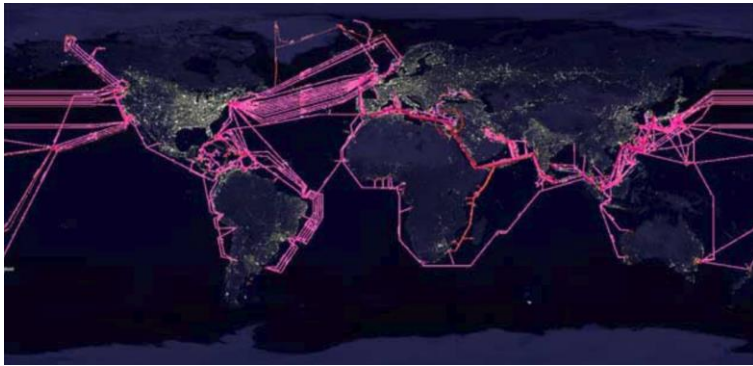
"We typed the O, and we asked, "Do you see the O."

"Yes, we see the O."

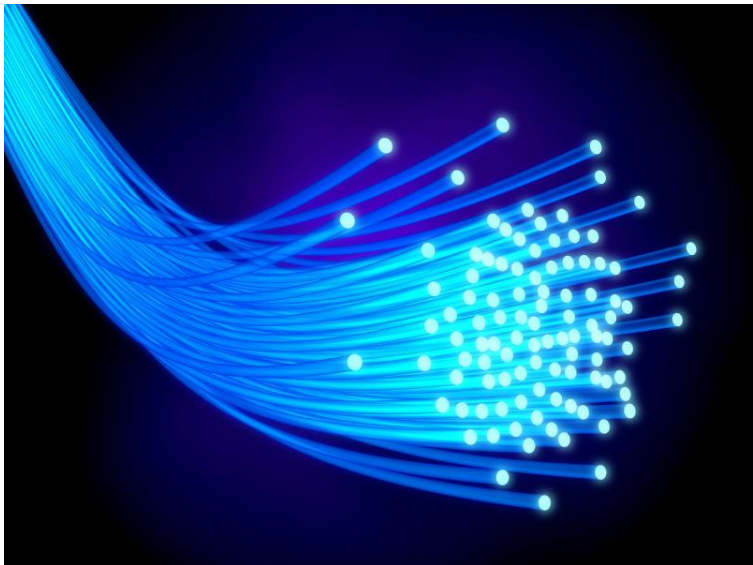
"Then we typed the G, and the system crashed"...

A revolution had begun

The internet today



NETFLIX



Light



Now, another revolution is underway

The quantum internet

Asst.Prof. Raphaël Van Laer



Quantum internet?

**The
Economist**

Keeping telecommunications secret

**The first quantum-
cryptographic satellite
network will be Chinese**



China uses a quantum satellite
to transmit potentially
unhackable data

TIME

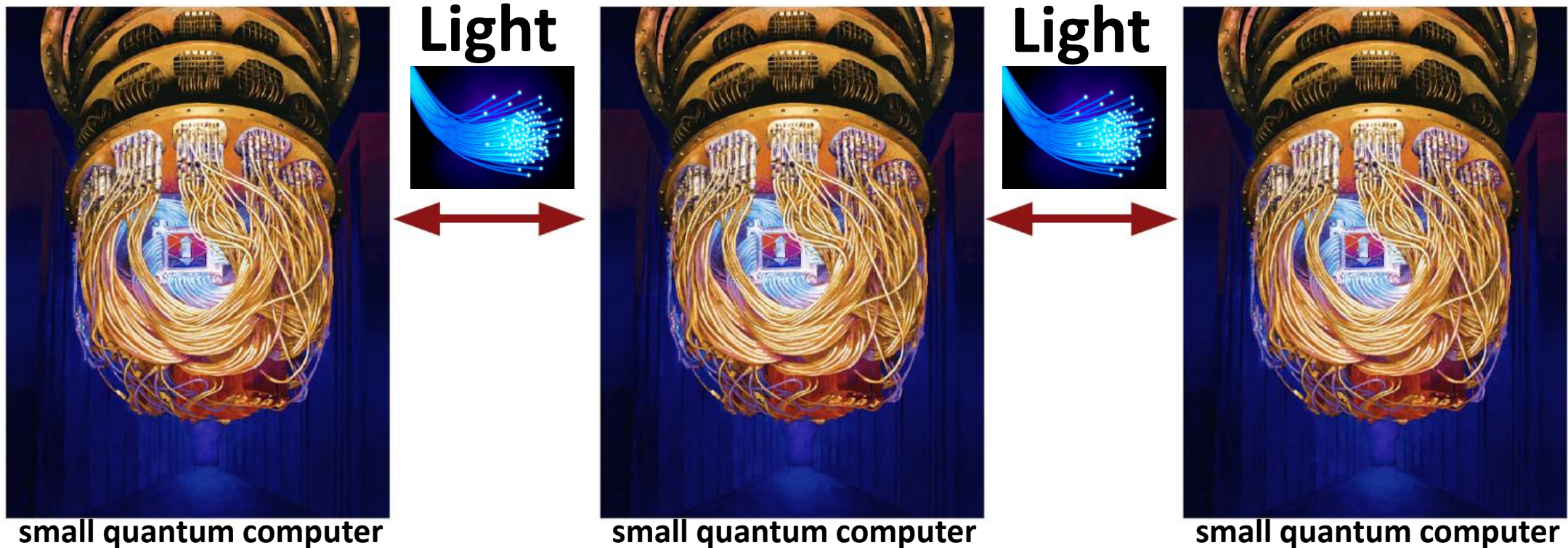
**Scientists Just Teleported an Object
Into Space for the First Time**

**BBC
NEWS**

**Teleportation: Photon particles today,
humans tomorrow?**

Big idea 1: large quantum computer

Quantum internet = Connecting small quantum computers



Build a large and useful quantum computer!

Big idea 1: large quantum computer



Quantum Datacenter

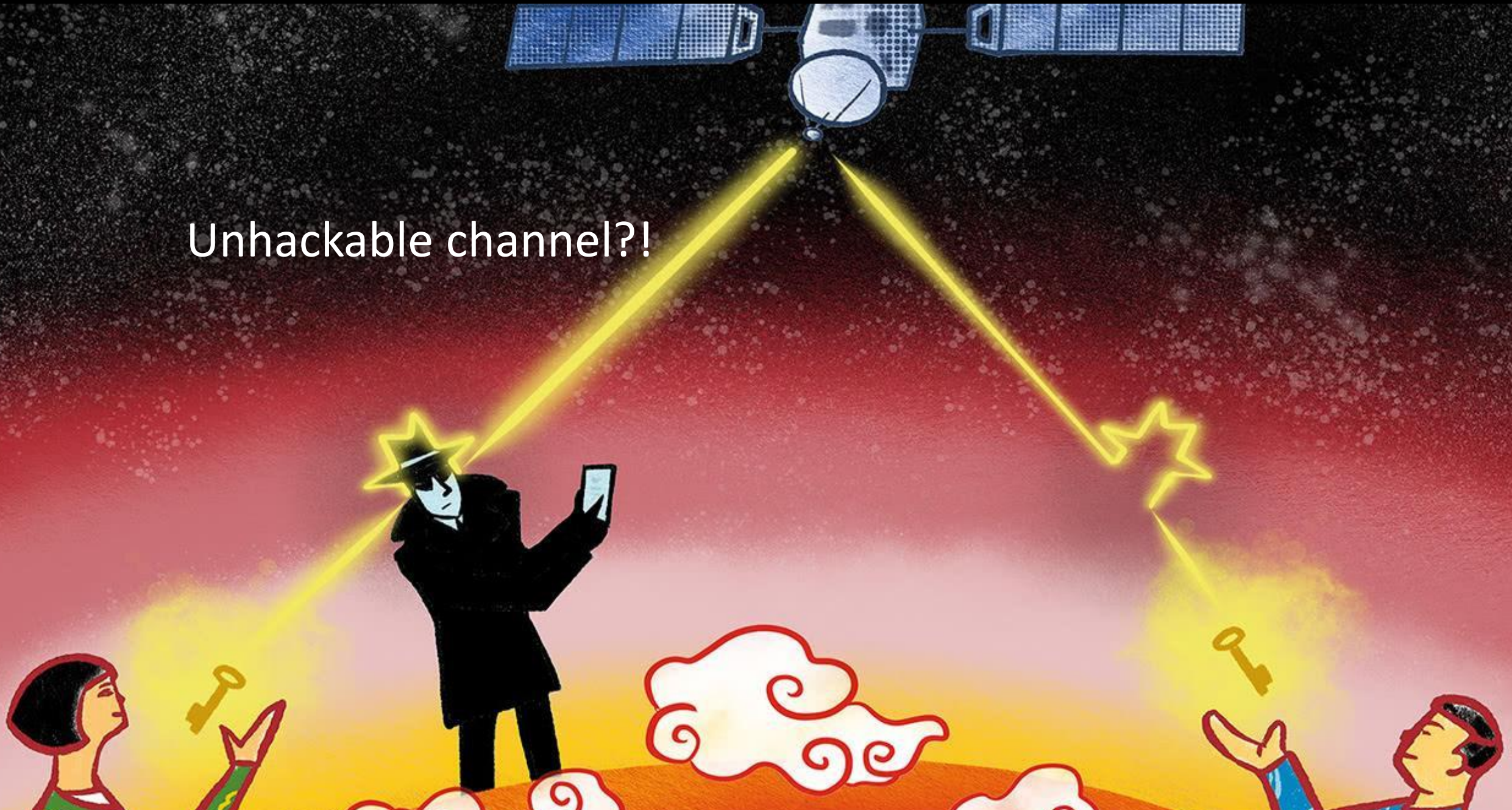
Google

Help discover medicine

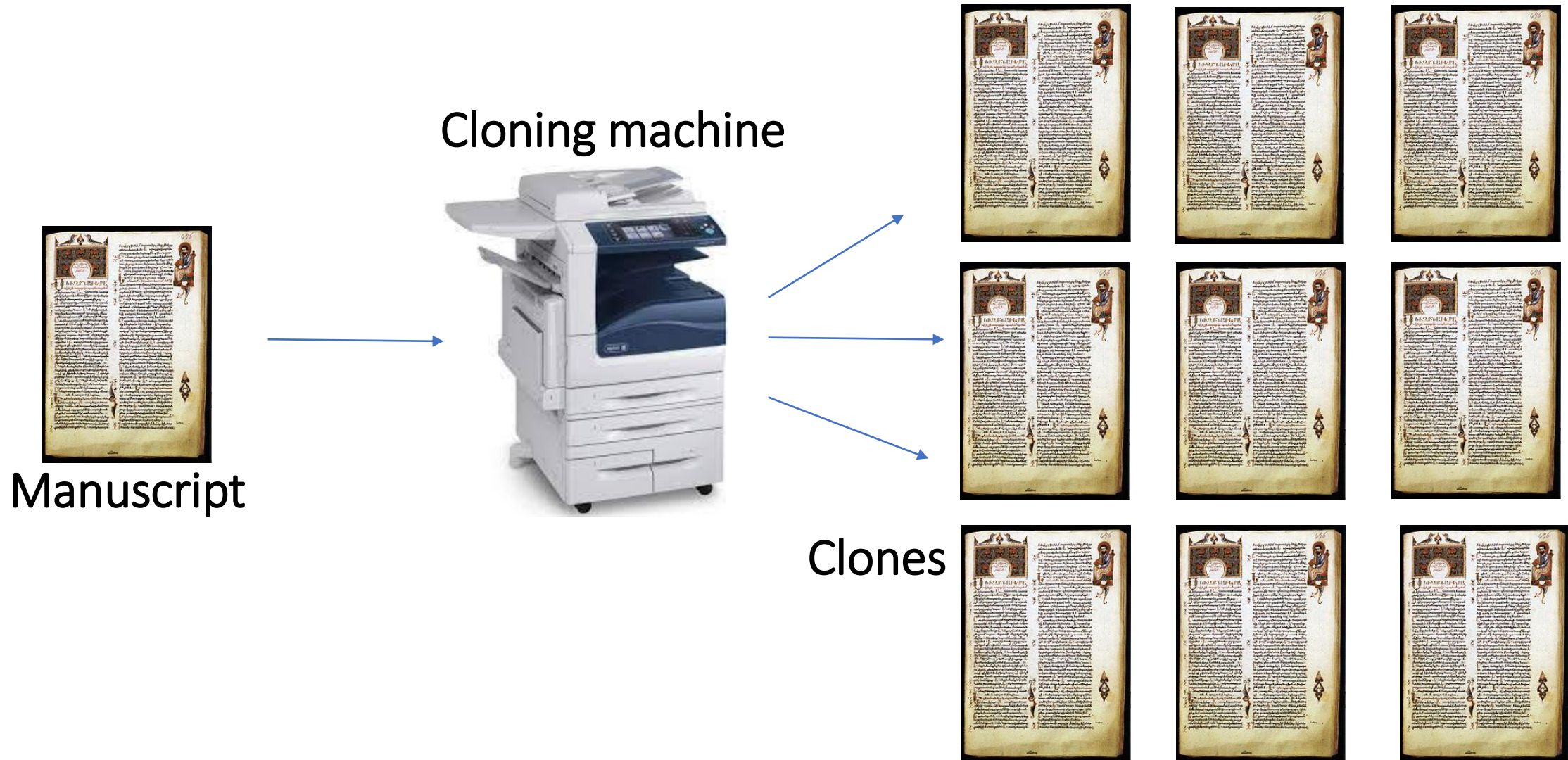


Big idea 2: No-cloning

Unhackable channel?!



A simple cloning machine



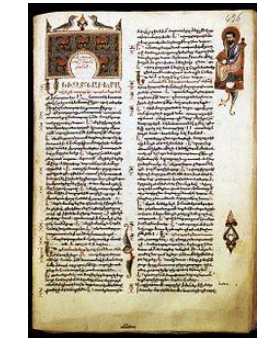
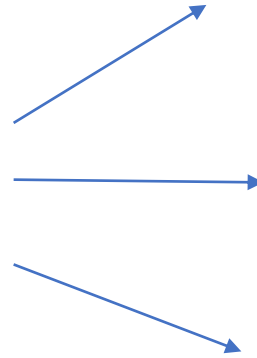
A quantum cloning machine cannot exist

Impossible!

Cloning machine



Quantum
Manuscript



Copies

A quantum cloning machine cannot exist

Impossible!

Cloning machine



Quantum
Manuscript



Quantum Mechanics } \Rightarrow $(A+B)^2 = A^2 + 2AB + B^2$
Cloning } \parallel $A^2 + B^2$ ~~\neq~~

Big idea 2: No-cloning

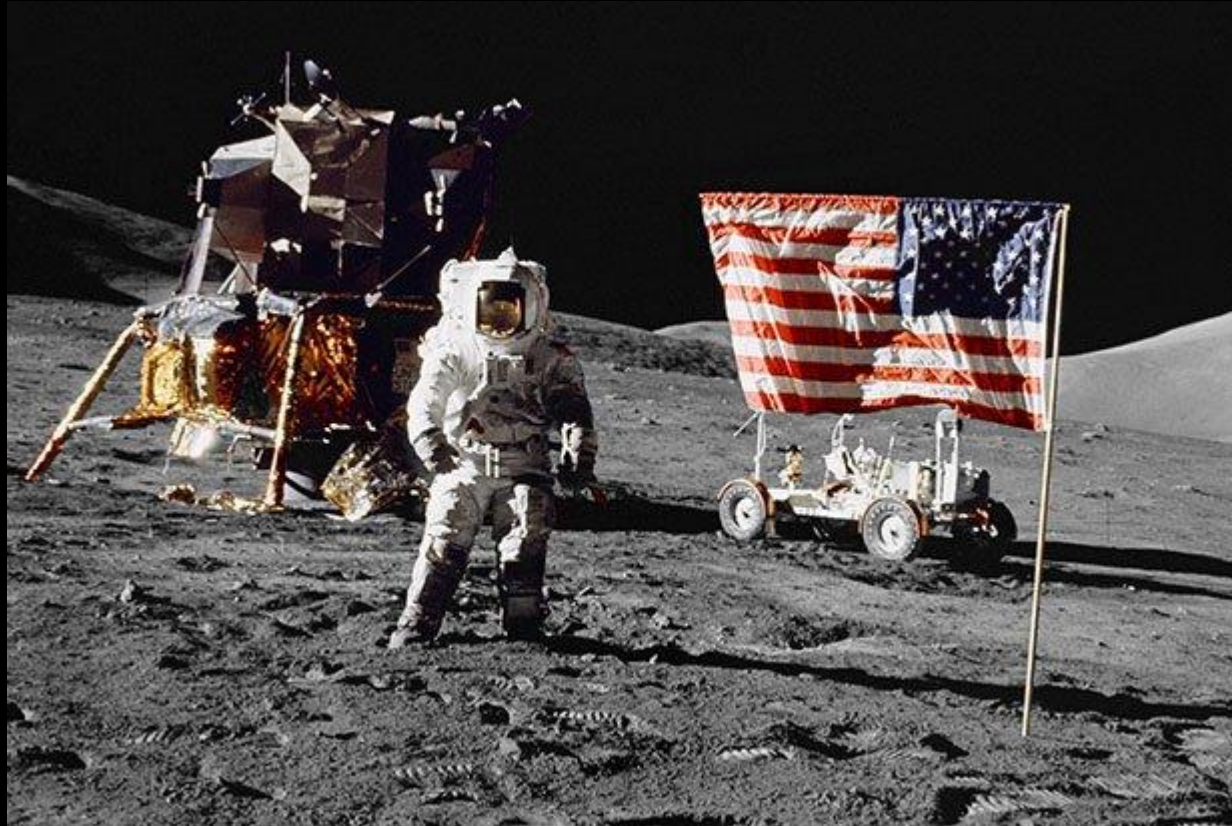
**The hacker can't copy!
More secure!**



Recap

What happened on October 29th, 1969?

Not the moon landing!



What happened on October 29th, 1969?



The internet in 1969



The quantum internet in 2022

Big idea 1: large quantum computer



Quantum Datacenter

Google

Help discover medicine

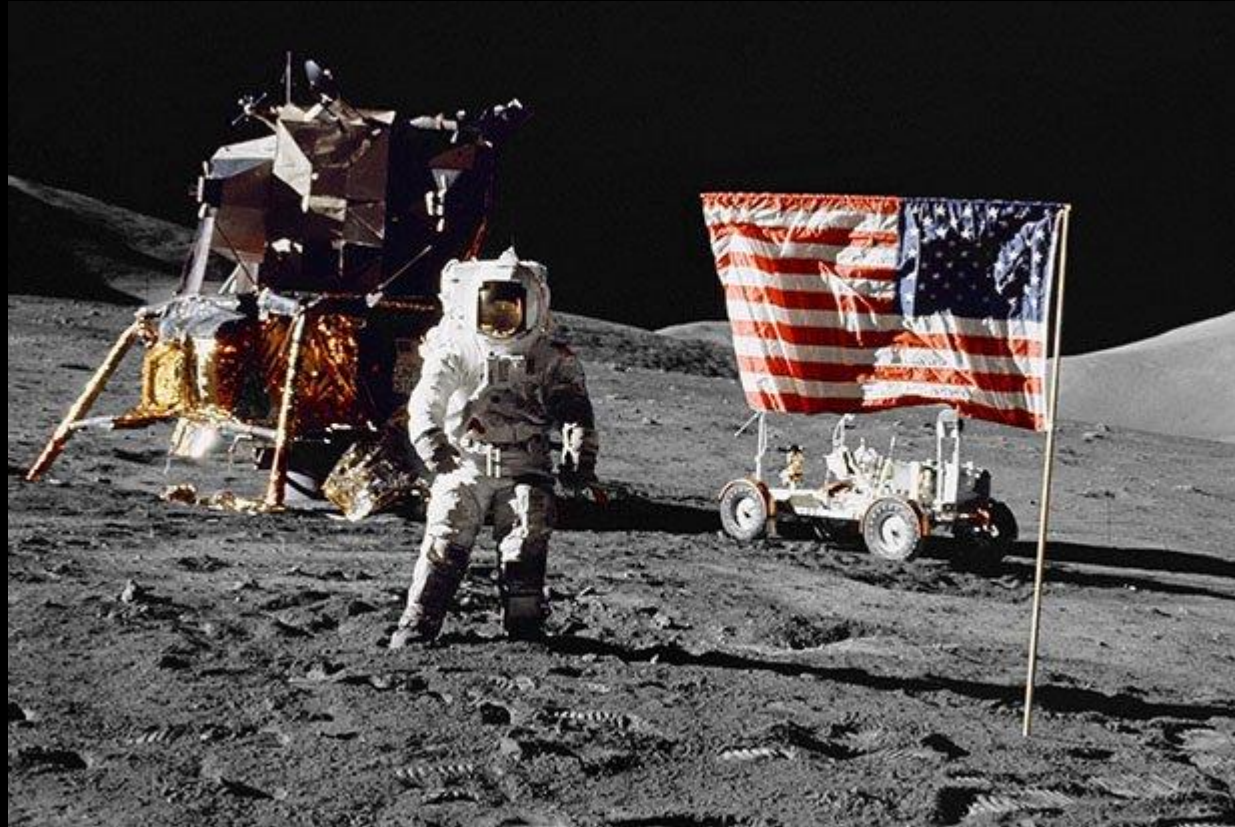


Big idea 2: No-cloning

**The hacker can't copy!
More secure!**



A journey into the unknown



Let's find the treasure