Encontros Matemáticos apresenta

Computação Quântica

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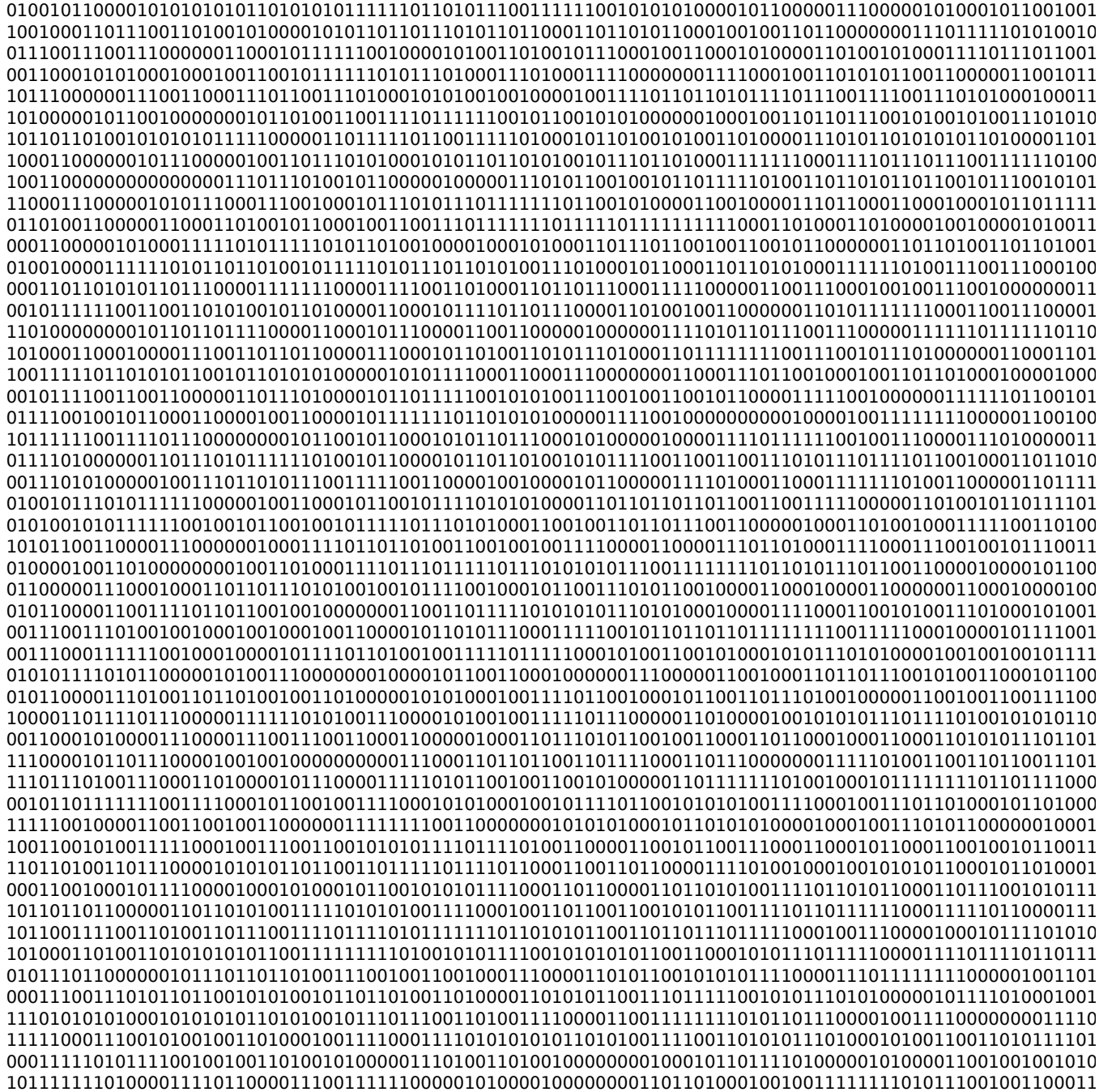
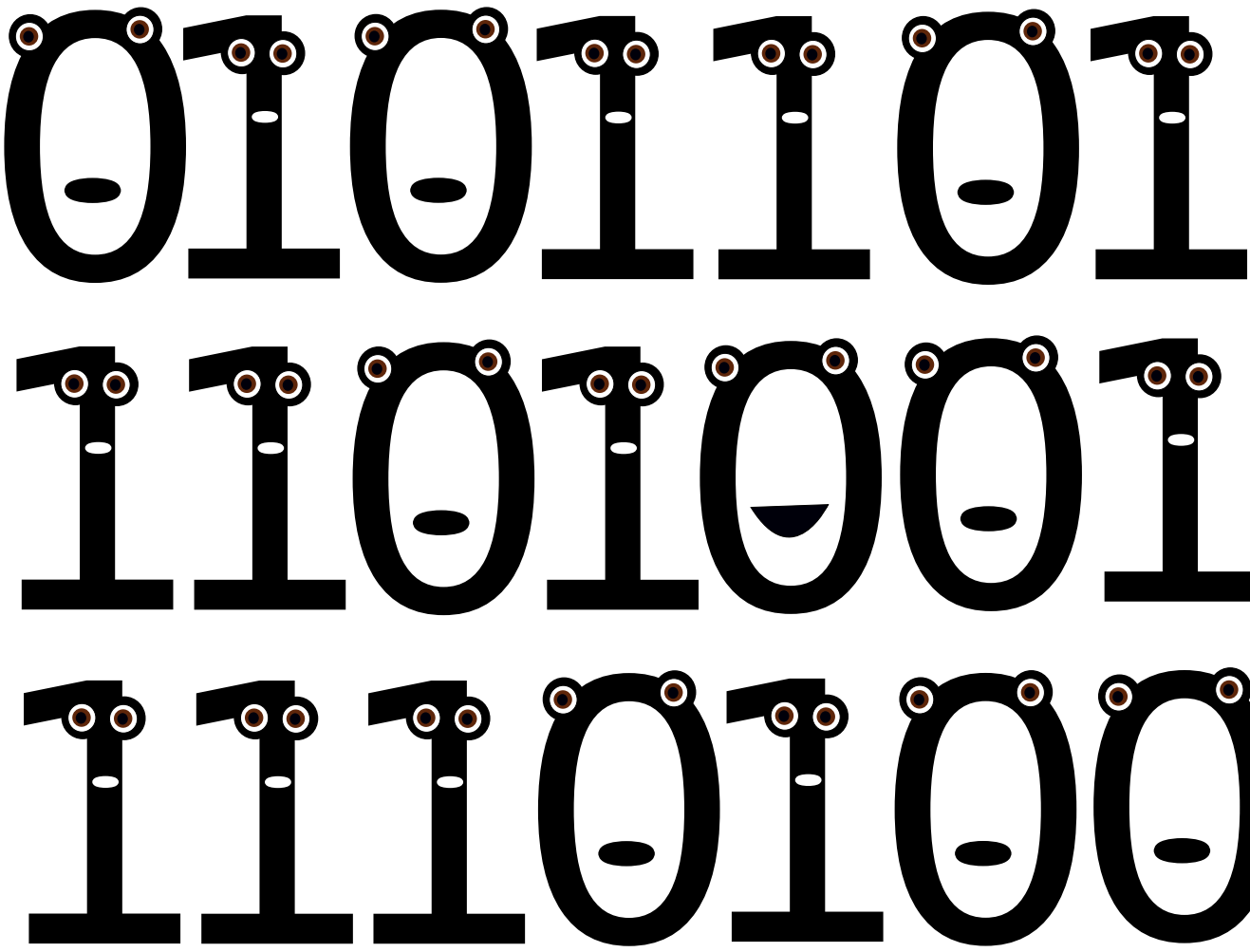
IM-UFRJ

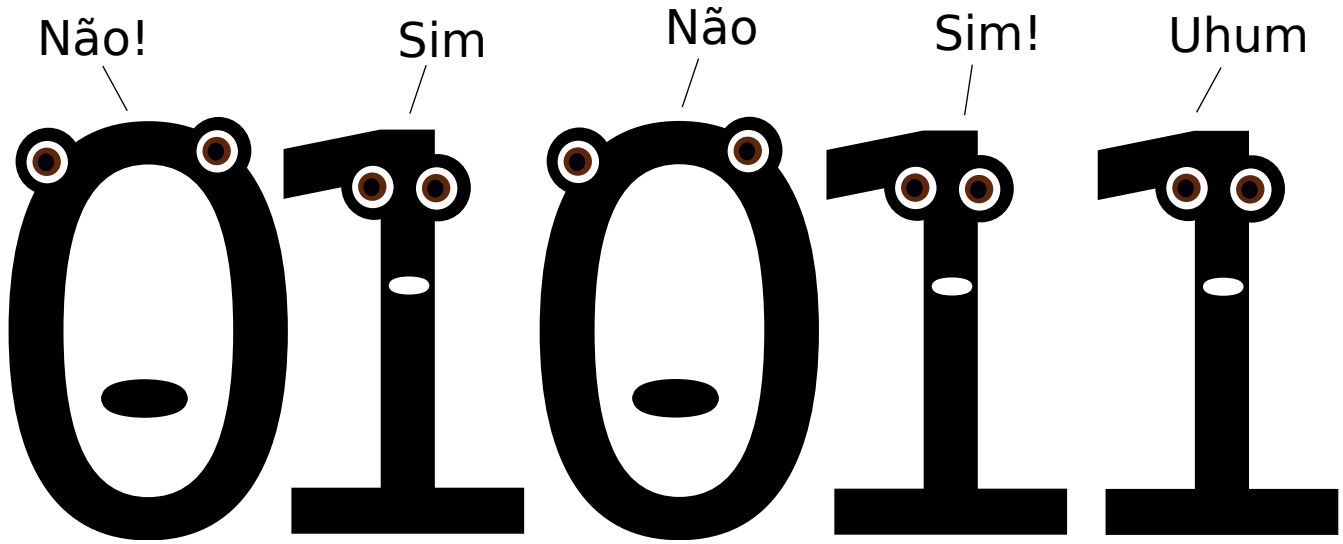
Computação Digital

Computação Quântica

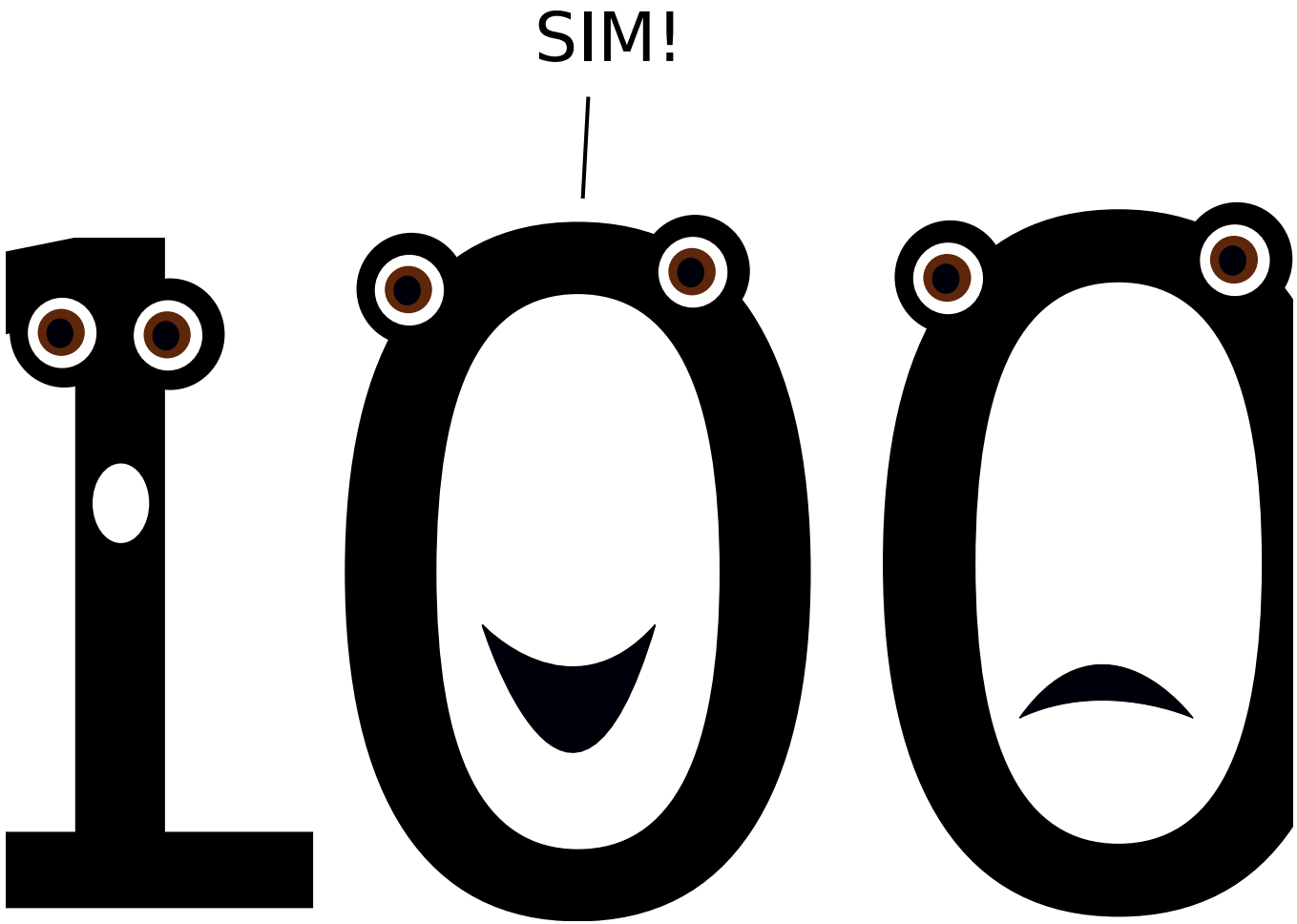
- Trapped-ion
- Fótons
- Algoritmos




01011011
11010001
11101000


Não!
Sim
Não
Sim!
Uhum
01011


Finalmente! É o meu grande dia!
Sim...
100


SIM!

A problem has been detected and Windows has been shut down to prevent damage
to your computer.

The problem seems to be caused by the following file: SPCMDCON.SYS

PAGE_FAULT_IN_NONPAGED_AREA

If this is the first time you've seen this Stop error screen,
restart your computer. If this screen appears again, follow
these steps:

Check to make sure any new hardware or software is properly installed.
If this is a new installation, ask your hardware or software manufacturer
for any Windows updates you might need.

If problems continue, disable or remove any newly installed hardware
or software. Disable BIOS memory options such as caching or shadowing.
If you need to use Safe Mode to remove or disable components, restart
your computer, press F8 to select Advanced Startup Options, and then
select Safe Mode.

Technical information:

*** STOP: 0x00000050 (0xFD3094C2,0x00000001,0xFBFE7617,0x00000000)

*** SPCMDCON.SYS - Address FBFE7617 base at FBFE5000, DateStamp 3d6dd67c

Computação Digital

bits

Sobre os *bits*:

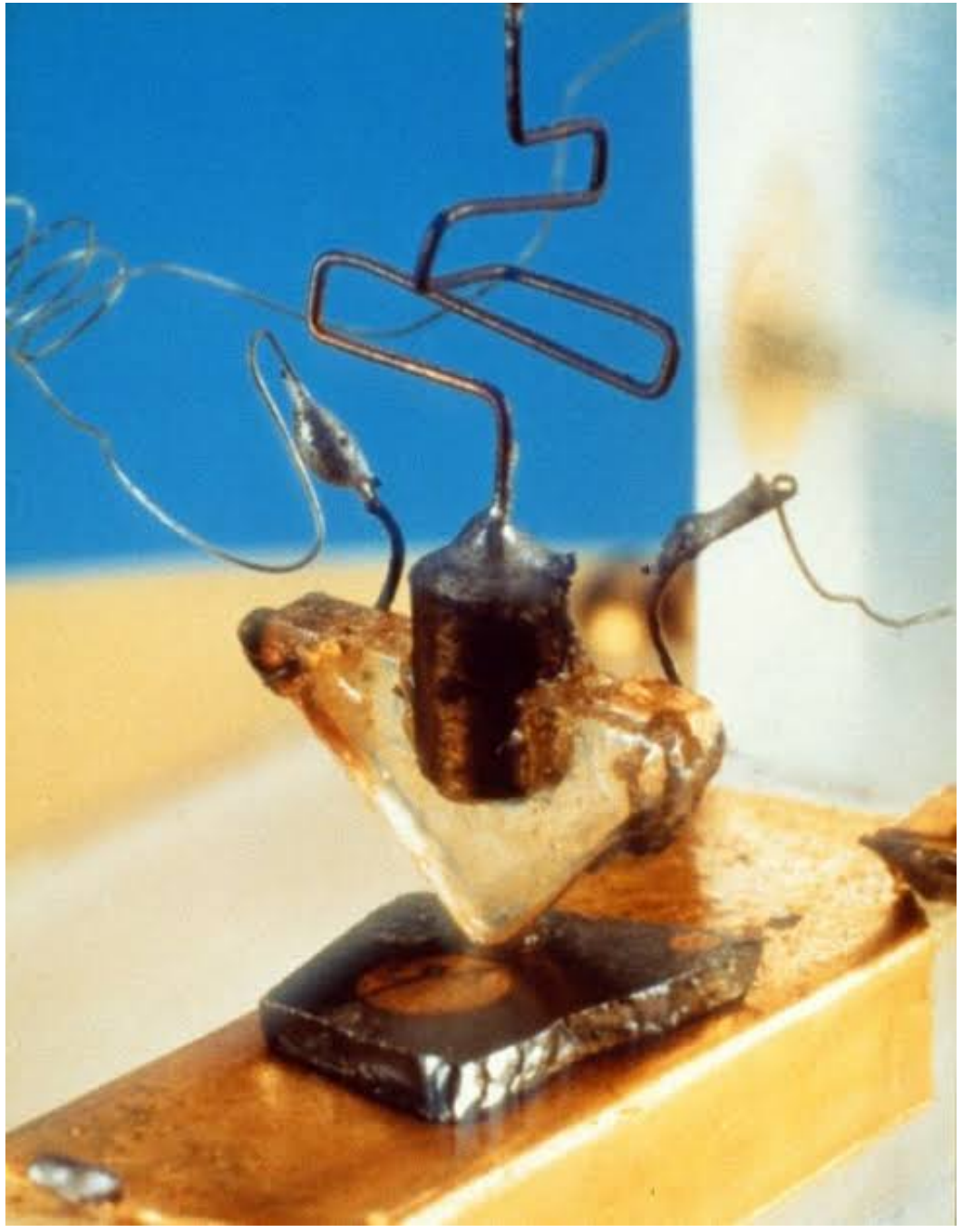
- Eles moram em $\mathbb{Z}_2$
- Formam vetores em $\mathbb{Z}_2^n$, onde cada $\vec{a} = (a_1, a_2, \ldots, a_n) \in \mathbb{Z}_2^n$ representa um valor entre $00...0 = 0$ e $11...1 = 2^n - 1$
- Realizamos operações *Booleanas* com eles: $\neg$, $\wedge$, $\vee$, $\oplus$.

George Boole

1815 - 1864

$$\neg : \mathbb{Z}_2 \to \mathbb{Z}_2$$

$$a \to \bar{a} = (1 - a)$$



Portas Lógicas

Arquitetura de Von Neuman

John Von Neuman

1903 - 1957

Fenômenos Quânticos

Richard Feynman

1918 - 1988

Computação Quântica

Trapped-ion

Oi íon aprisionado

Fótons

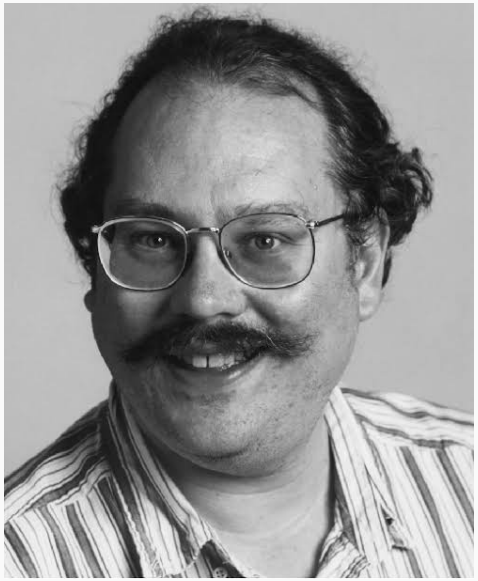
$$|\quad\rangle = \frac{|\quad\rangle + |\quad\rangle}{\sqrt{2}}$$

Algoritmo de Grover

Lov Grover

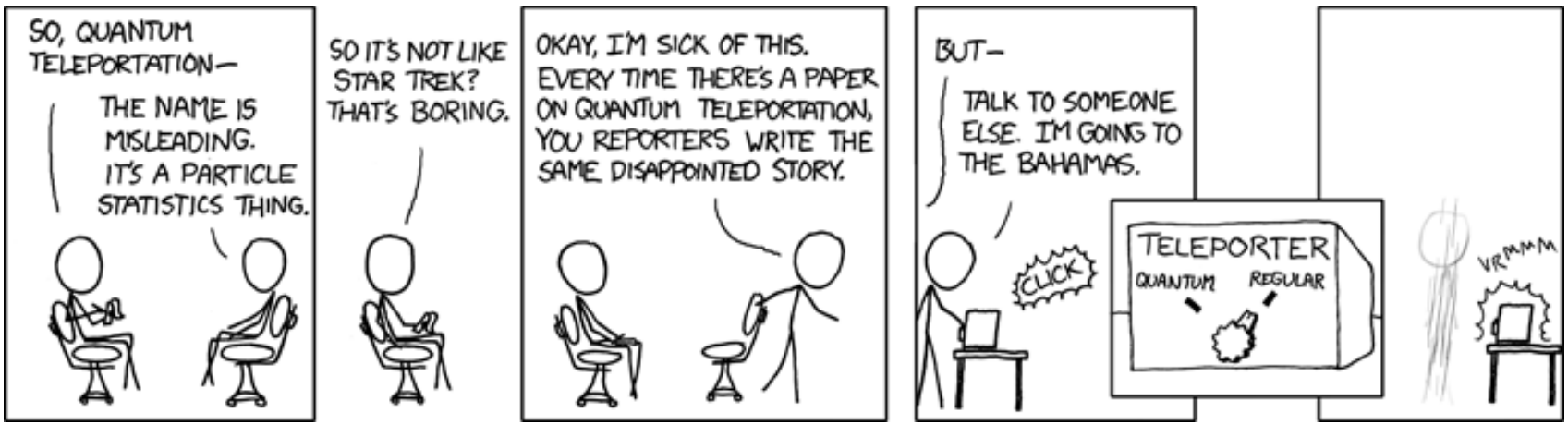
Bell Labs

Algoritmo de Shor



Peter Shor

MIT


SO, QUANTUM TELEPORTATION—
THE NAME IS MISLEADING. IT'S A PARTICLE STATISTICS THING.
SO IT'S NOT LIKE STAR TREK? THAT'S BORING.
OKAY, I'M SICK OF THIS. EVERY TIME THERE'S A PAPER ON QUANTUM TELEPORTATION, YOU REPORTERS WRITE THE SAME DISAPPOINTED STORY.
BUT—
TALK TO SOMEONE ELSE. I'M GOING TO THE BAHAMAS.
CLICK
TELEPORTER
QUANTUM
REGULAR
VRMMM

Teletransporte Quântico

Introduction to topological quantum computation with non-Abelian anyons, FIELD, B. & SIMULA, T., School of Physics and Astronomy, Monash University, Victoria 3800, Australia.