



# EMBRAPII CIMATEC Competence Center in Quantum Technologies Quantum Industrial Innovation – QuIN

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Financial resources from the PPI IoT/Manufatura 4.0

# Where are we?

Salvador, Bahia – NE of Brazil



# SENAI CIMATEC

- Founded in 2002;
- Center of Excellence for Technology Development and Innovation;
- Focus on researching and developing solutions for Brazilian Industry.
- University SENAI CIMATEC
  - Graduate and Postgraduate courses



**MAIN CAMPUS**



**06**  
Campuses



**1700**  
Collaborators  
and fellows



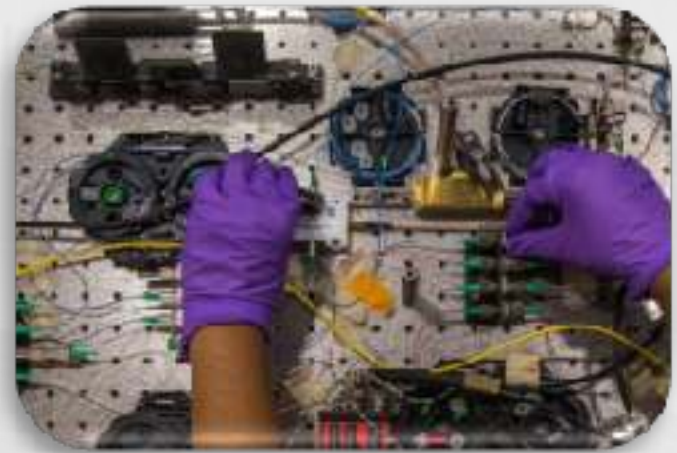
**US\$ 250**  
Million in investment



**44**  
areas of expertise

**SENAI = National Industrial Training Service**

# SENAI CIMATEC Infrastructure



Optical and Photonics Engineering



Quantum Simulator



HPC Center



Cybersecurity



Autonomous Robotics



Embedded Systems



Semi-Anechoic Chambers



Additive Manufacturing



Oil&Gas Production LAB



Green H2 Pilot Plant



CIMATEC

35,000 m<sup>2</sup>



CIMATEC  
PARK

4,000,000 m<sup>2</sup>

# SENAI CIMATEC Campuses



Sede  
SENAI CIMATEC



SENAI CIMATEC  
Park



SENAI CIMATEC  
Sertão



SENAI CIMATEC  
Mar



SENAI CIMATEC  
Digital e Criativo



SENAI CIMATEC  
Aeroespacial

# SENAI CIMATEC

# Bahia Aerospace Technology Park



MOBILIDADE AÉREA  
AVANÇADA



AVIAÇÃO



DEFESA



ESPAÇO

SENAI  
CIMATEC

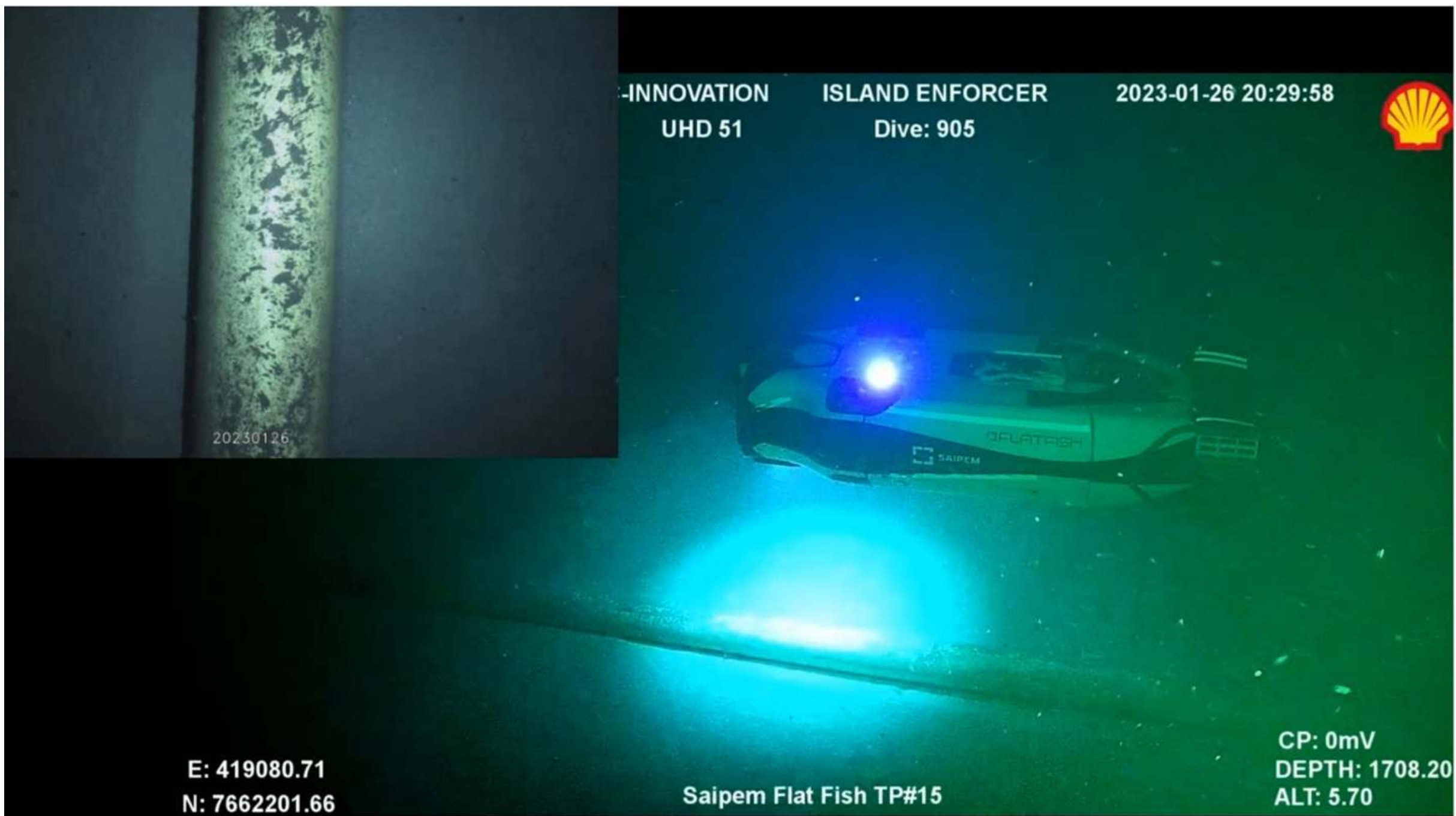
GOVERNO DO ESTADO  
BAHIA



MINISTÉRIO DA  
DEFESA

GOVERNO FEDERAL  
BRASIL  
UNIÃO E RECONSTRUÇÃO

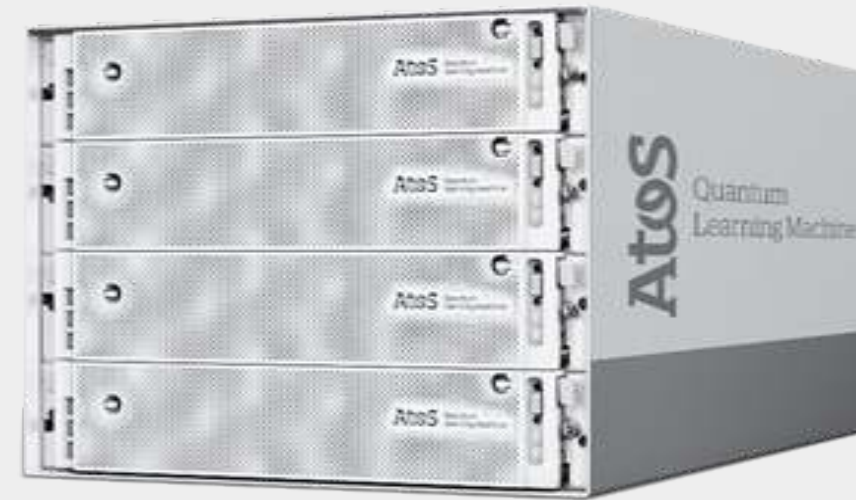
# INNOVATION CASE: FLATFISH



# Quantum Technology at CIMATEC



YEOMOJA



KUATOMU



EMBRAPII CIMATEC  
Competence Center in  
Quantum Technologies

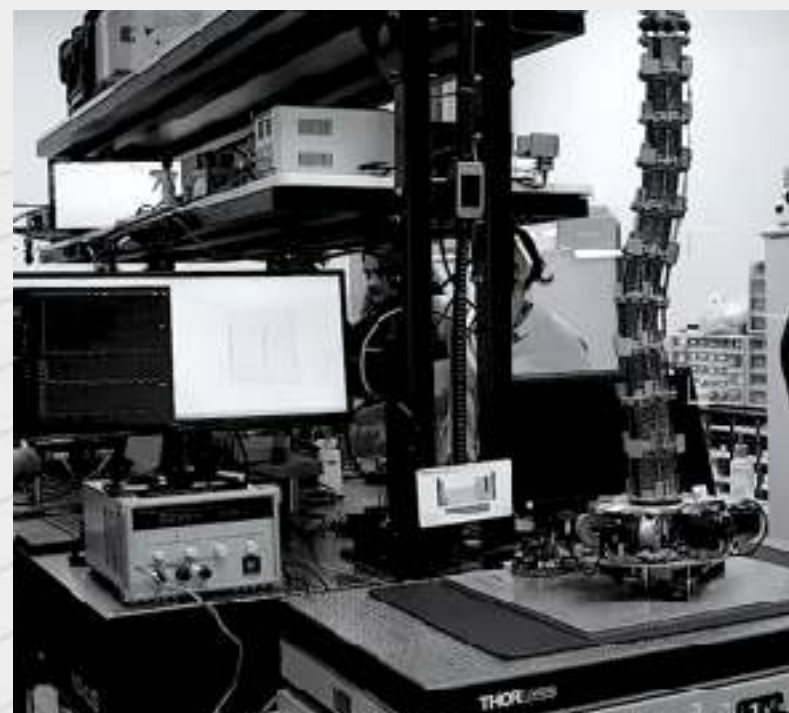


2014



2015

OPTICS & PHOTONICS LAB



2018



OGUN



2020

2021



LAQCC



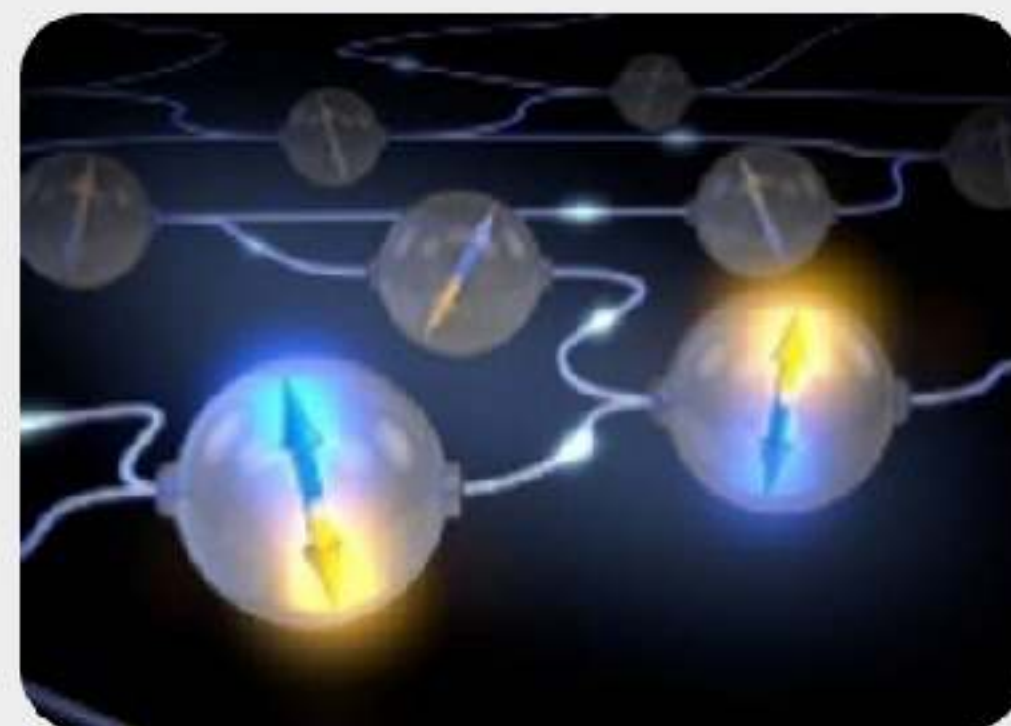
2023



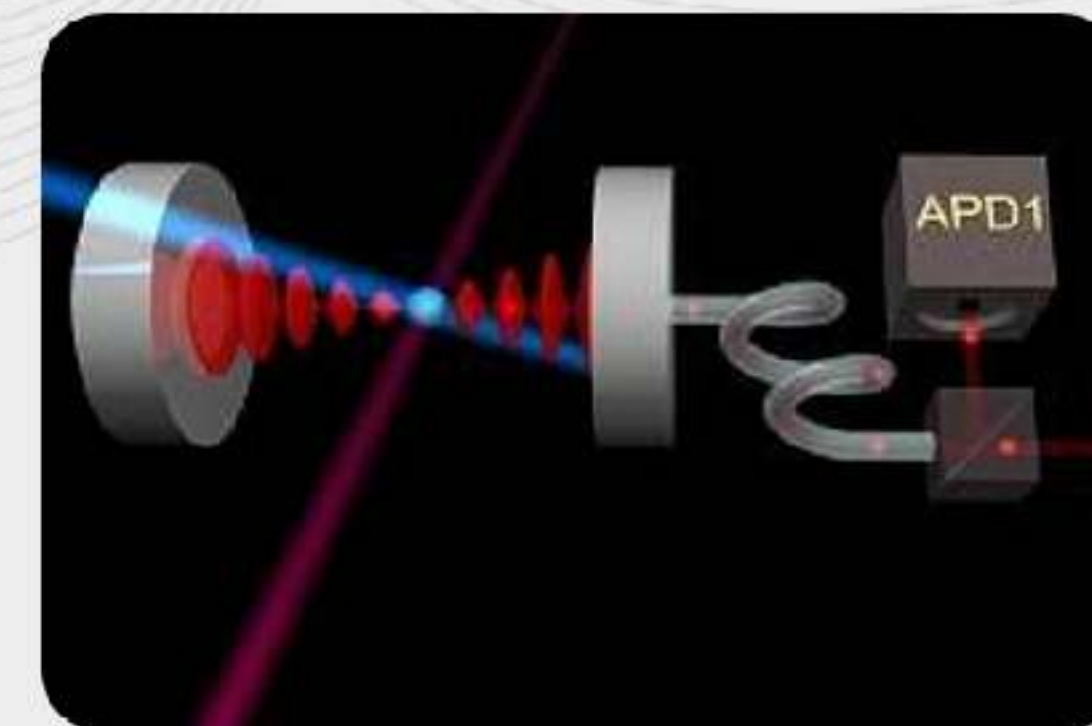
# Quantum Technologies



Quantum  
Computing



Quantum Communication  
& Cryptography



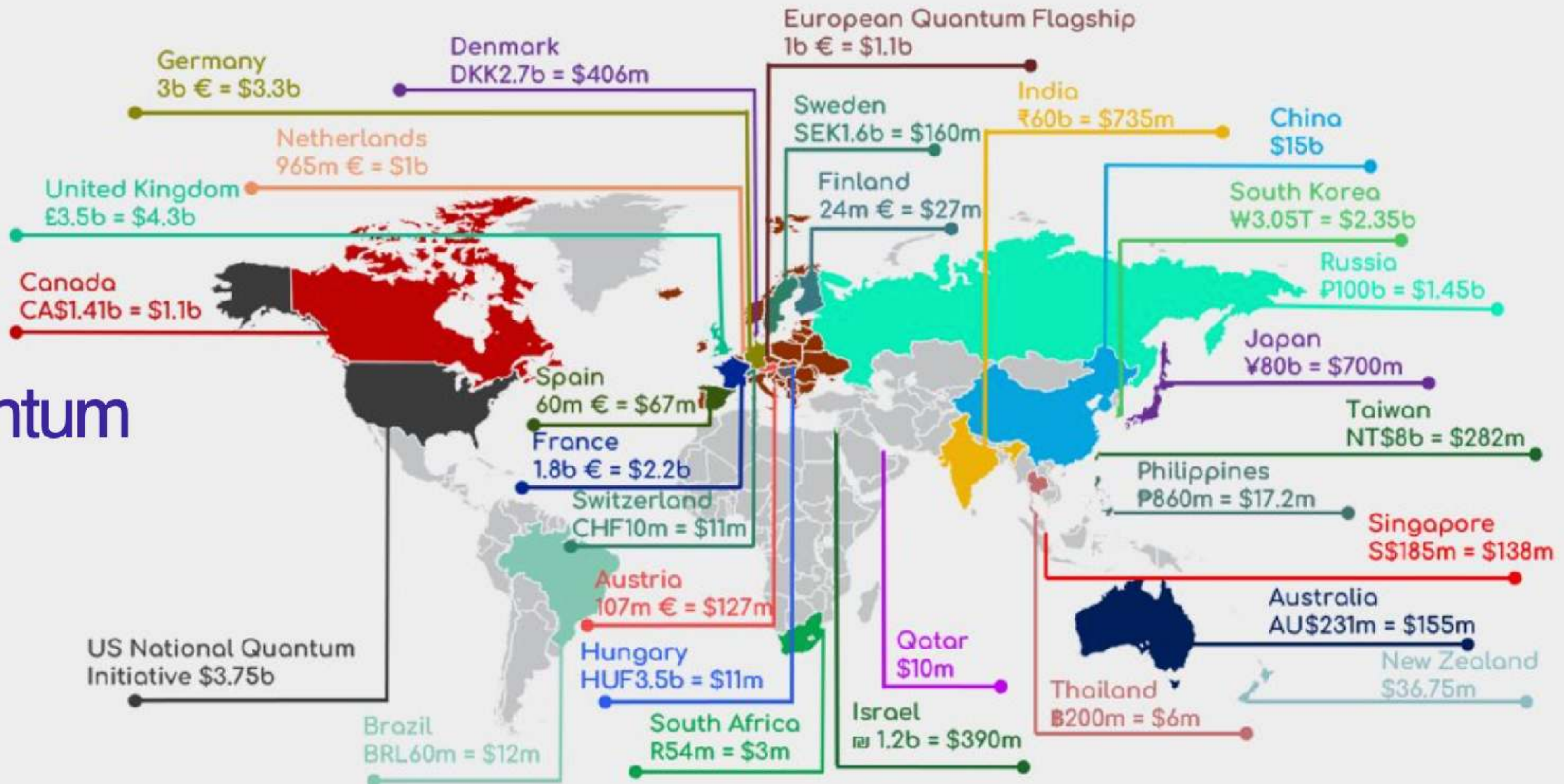
Quantum Sensors



Quantum Information Theory & Principles of Quantum Mechanics

# Global Quantum Science and Technology

Global Quantum Efforts  
**\$42bi**



# QuIIN – Action Plan

**R\$60 MM (US\$10MM) / 42 months**

## 1. R&D Strengthening: Quantum Cryptography (CV-QKD)



- Protocols
- Testbed
- Post-processing

## 2. Education & Training



- Quantum Communication
- Quantum Computing

## 3. Technological Association



- Industrial partners & Research Institutions
- Benefits: Information, PI, Training, Infrastructure

## 4. Startup Creation and Attraction



- Startup Community
- Training
- Acceleration
- Investors;
- Venture Capital.



**Prof. Valéria Loureiro da Silva**  
QuIIN Coordinator (Head)

**Dr. Alexandre B. Tacla**  
QuIIN Joint Coordinator

**André Luis Dantas Lima**  
QuIIN Executive Manager

## Research & Development Team (40+ people)

- **7 PhD researchers** (staff)
- **30+ Fellows** (5 PhDs, 10 MSs, 17 grad & 2 undergrad)
- **QuIIN Collaborators**

University of Aveiro, Portugal

Technical University of Denmark

IQM, Germany

Hunter College CUNY – USA

CBPF, Rio de Janeiro

PUC-Rio, Rio de Janeiro

Unicamp, Campinas

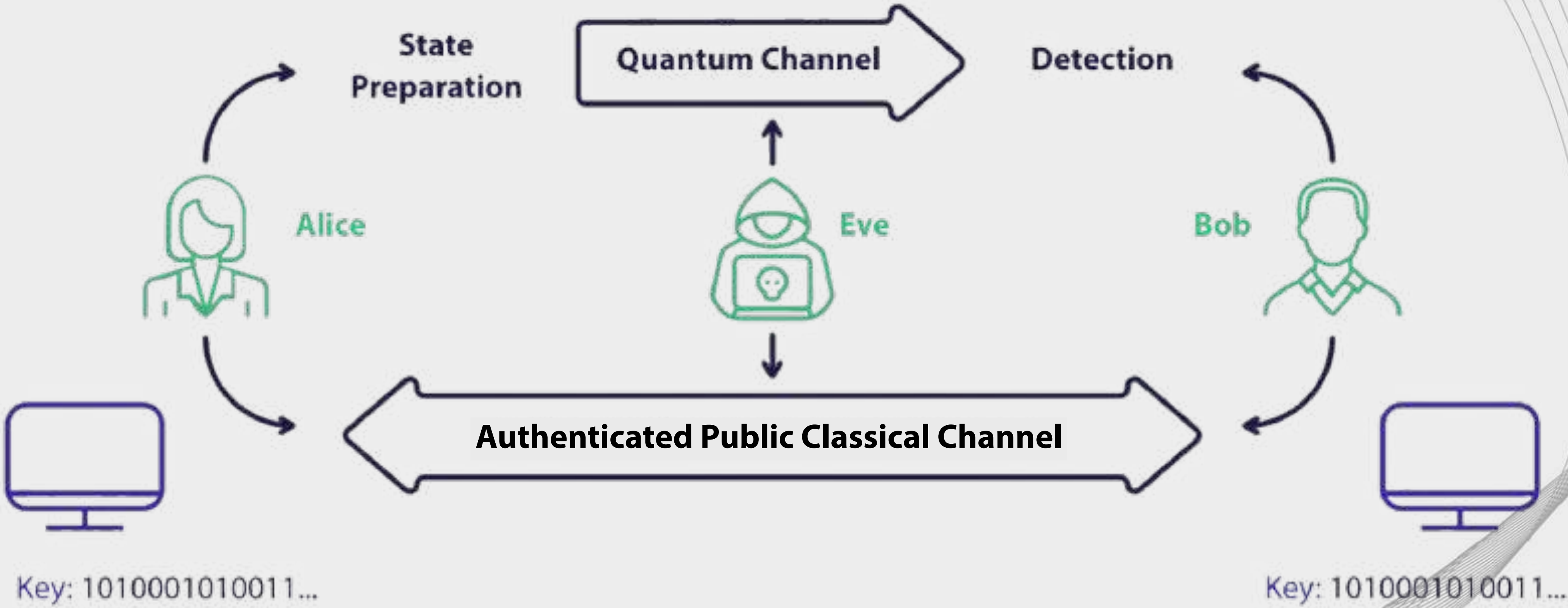
UFCG, Campina Grande

UFRN, Natal

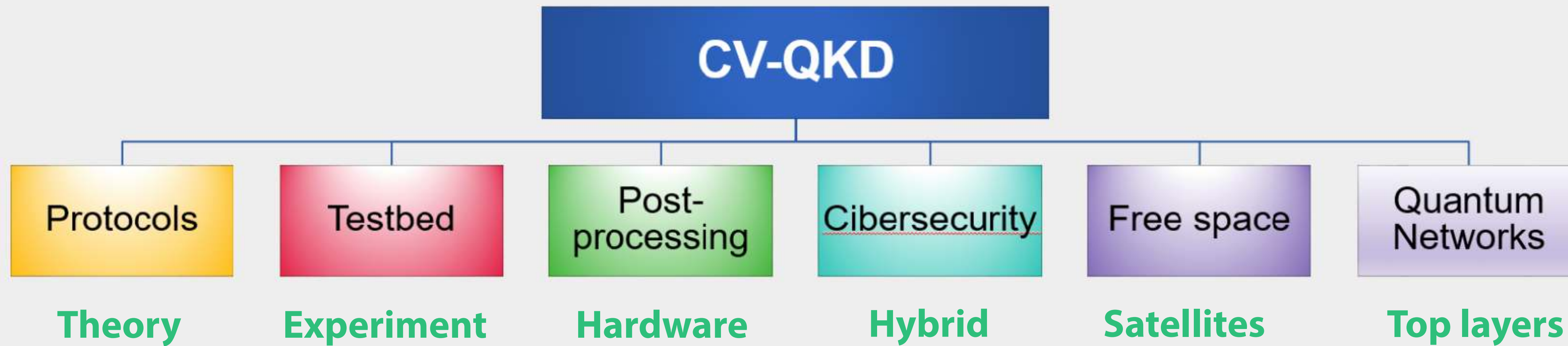
- **And Growing!** (open positions)



# R&D: Quantum Cryptography (Quantum Key Distribution – QKD)



# R&D Plan



# Upcoming Events



## Invited Speakers

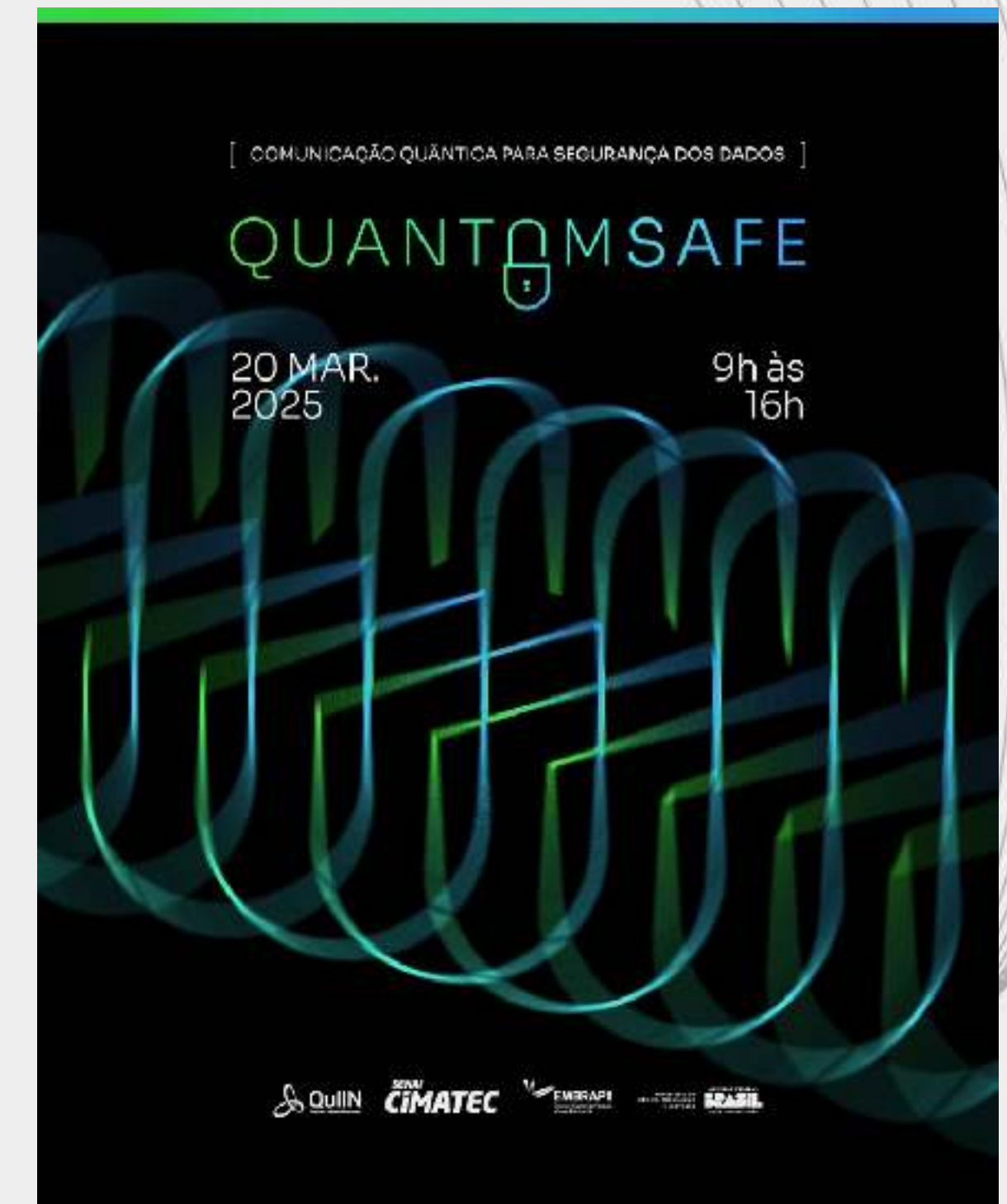
- Felipe Fanchini (UNESP)
- Ivan Oliveira (CBPF)
- Vitor Andrezo (IME)
- Antonio Vidiella (Unicamp)
- Nadja Kolb (UFPE)
- Rafael Barros (USP)
- Eduardo Jorge (UFAL)
- Calebe Micael de Oliveira (UFS)
- Edison Puig (ITA)
- Waldemir Cambiucci (Microsoft)

## Colloquia on Quantum Technologies March 18 & 19



## Quantum Communication for Data Security

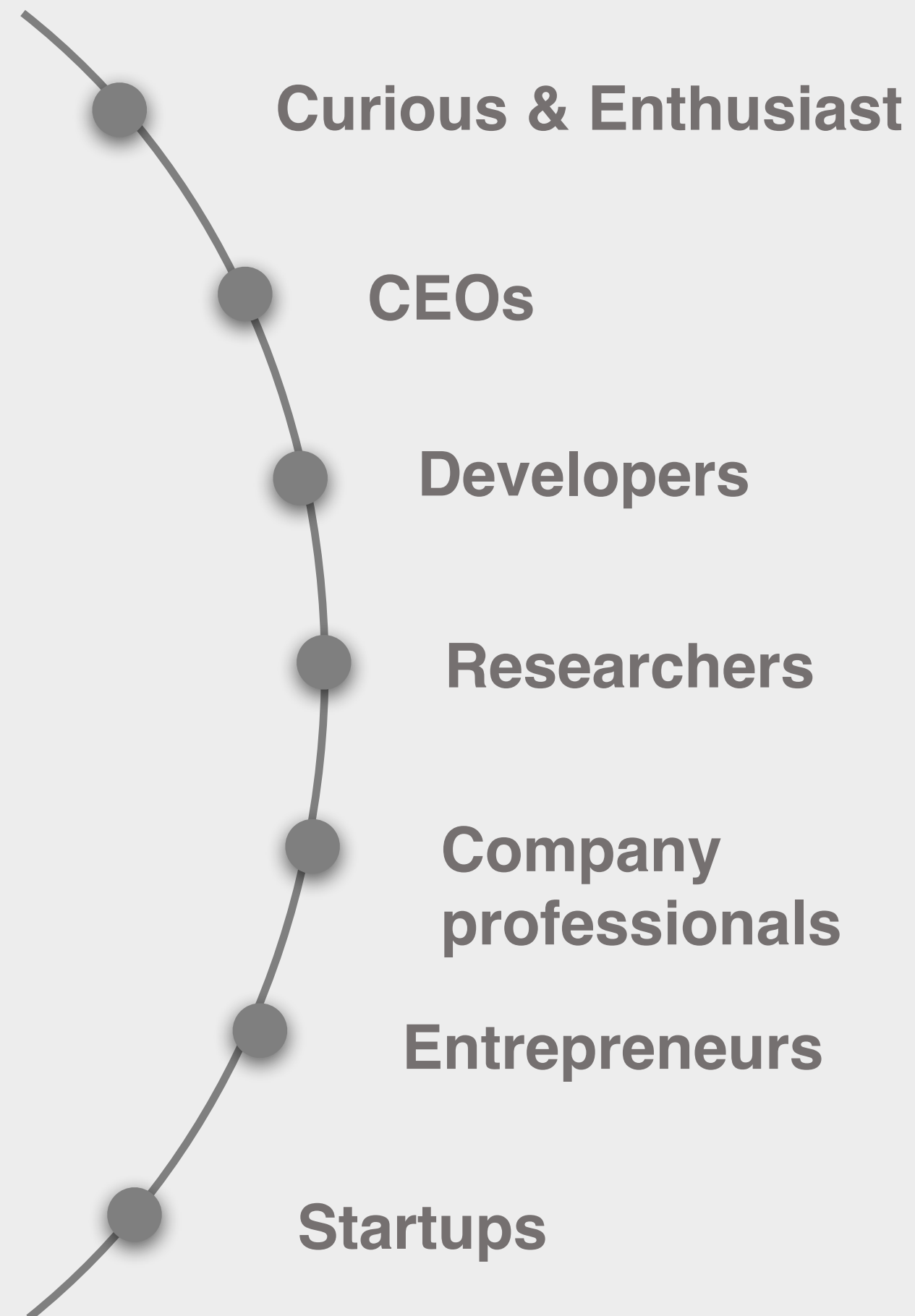
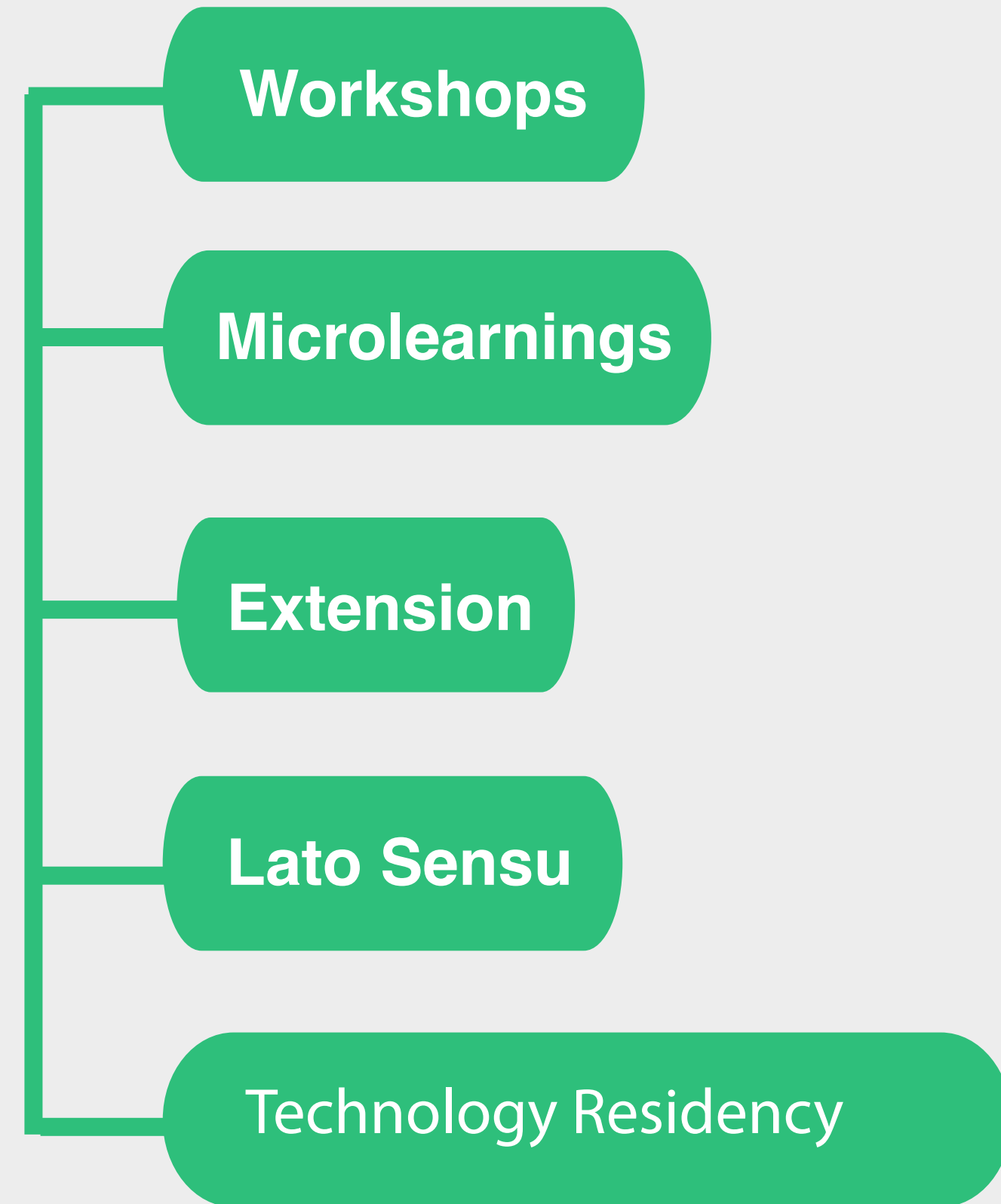
March 20



For more info, please contact Erica  
[erica.rios@fieb.org.br](mailto:erica.rios@fieb.org.br)

& more coming in April...

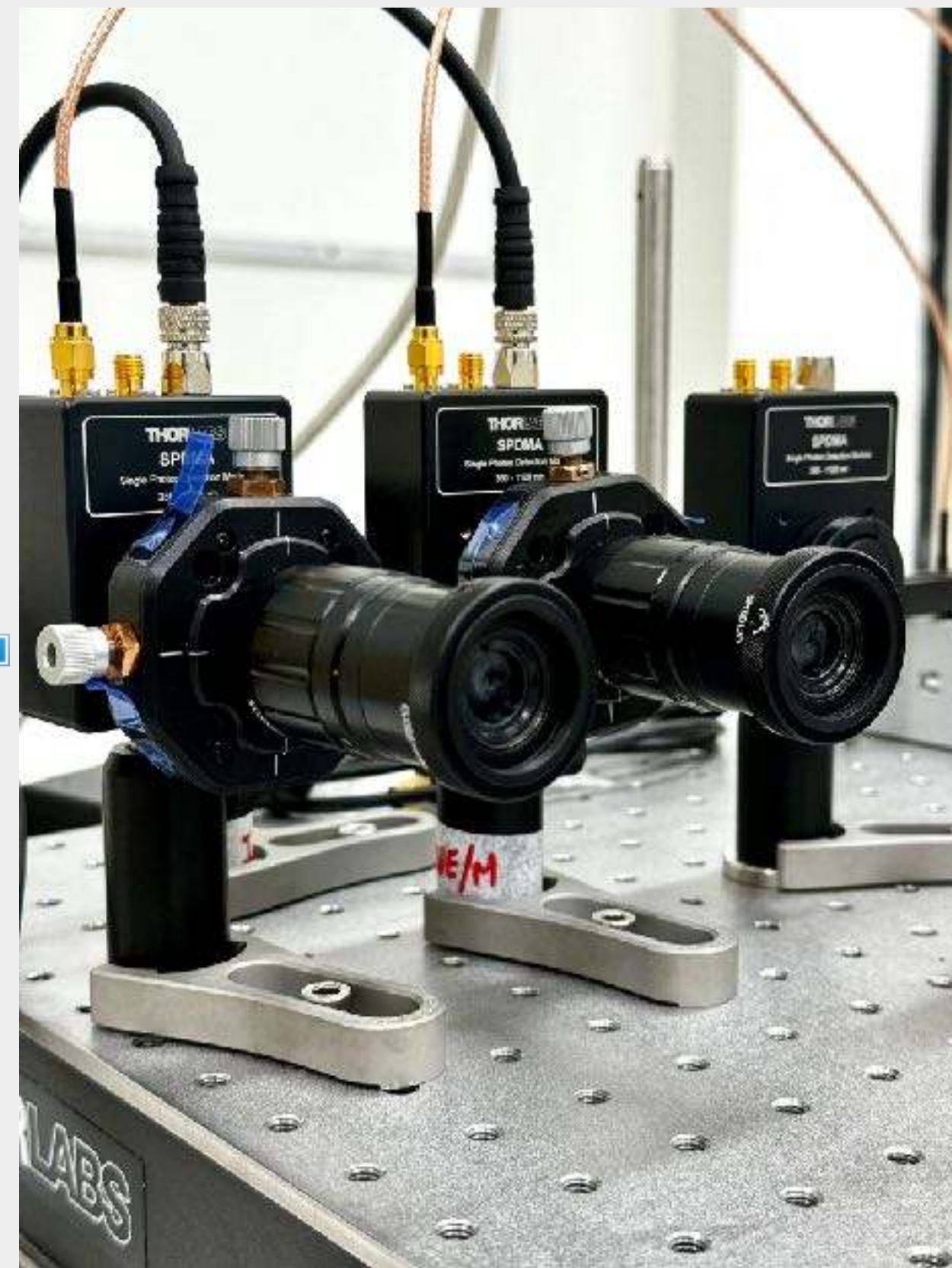
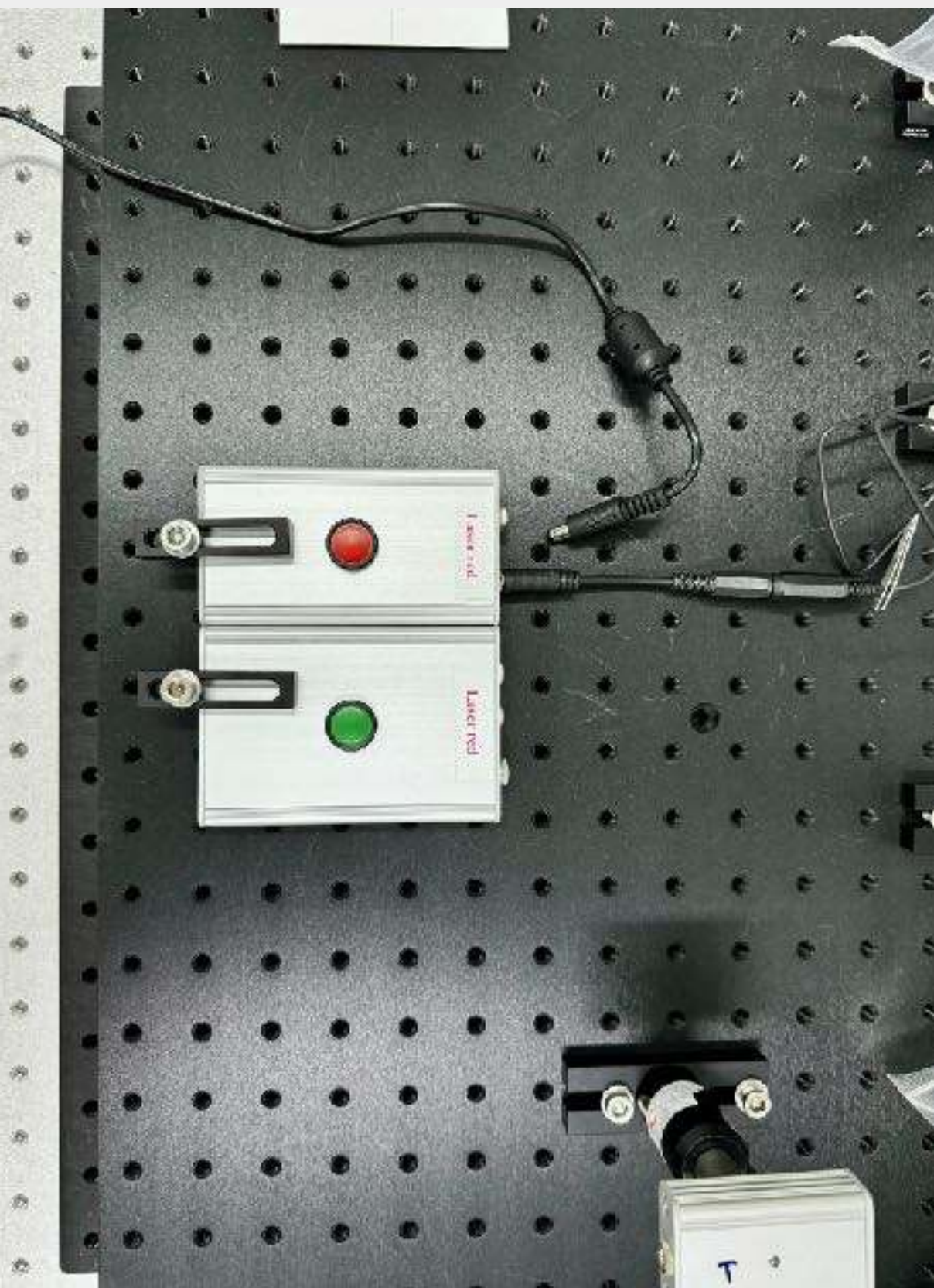
# Education & Training Plan



- Benefits
- Awareness
  - Demand Creation
  - Technological Adoption
  - Investment attraction
  - Industry Development



# Hands-on Learning Laboratory



**Experiments on Quantum Cryptography and Quantum Optics**

April 2024


# 1<sup>st</sup> Specialization program in Quantum Communication




Six-month intensive program ended in December



< PROGRAMA DE FORMAÇÃO  
EM **TECNOLOGIAS QUÂNTICAS** \_ PÓS CIMATEC

SAIBA COMO  
SE TORNAR UM  
**PROFISSIONAL**  
DE **TECNOLOGIAS QUÂNTICAS**

 **LIVE DE LANÇAMENTO**  
**24.MAI**  
9H30  
NO YOUTUBE DO SENAI CIMATEC



2025

# Remote program for Quantum Computing and Quantum Communication



**Inscrições Abertas**

< O FUTURO QUÂNTICO  
JÁ COMEÇOU

LANÇAMENTO  
ESPECIALIZAÇÃO  
EM COMPUTAÇÃO  
QUÂNTICA

NOVA TURMA  
ESPECIALIZAÇÃO  
EM COMUNICAÇÃO  
QUÂNTICA

INSCRIÇÕES  
ABERTAS ATÉ  
21 FEV.  
2025

FAÇA SUA INSCRIÇÃO

QUIN CIMATEC EMBRAPA BRASIL

The advertisement features a woman with glasses and a white top, holding a tablet. The background is dark with green and white text. Logos for QUIN, CIMATEC, EMBRAPA, and BRASIL are at the bottom.

Applications  
open until Feb 21



# Technology Association



Access to information



Education and Training



Access to experiments



HW/SW & PI Platforms



**Bronze**



**Silver**



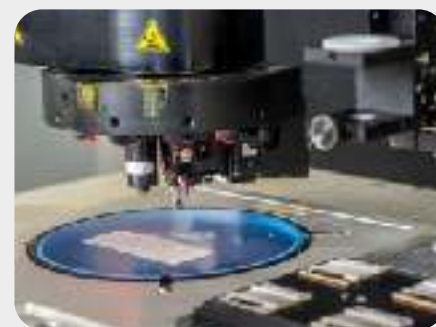
**Gold**



**Diamond**



Technology User  
Companies (Demanders)



Technology Providers  
(Industrial Developer)



Innovation Partner  
(ICT/Universities)



Startups and Spinoffs



Investors



# Thank you!

