

# International Year of Quantum Science and Technology

## From SIRTEQ to QuanTiP

Quantum Science and  
Technologies in Paris Region

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CNRS Délégation  
Île-de-France Villejuif

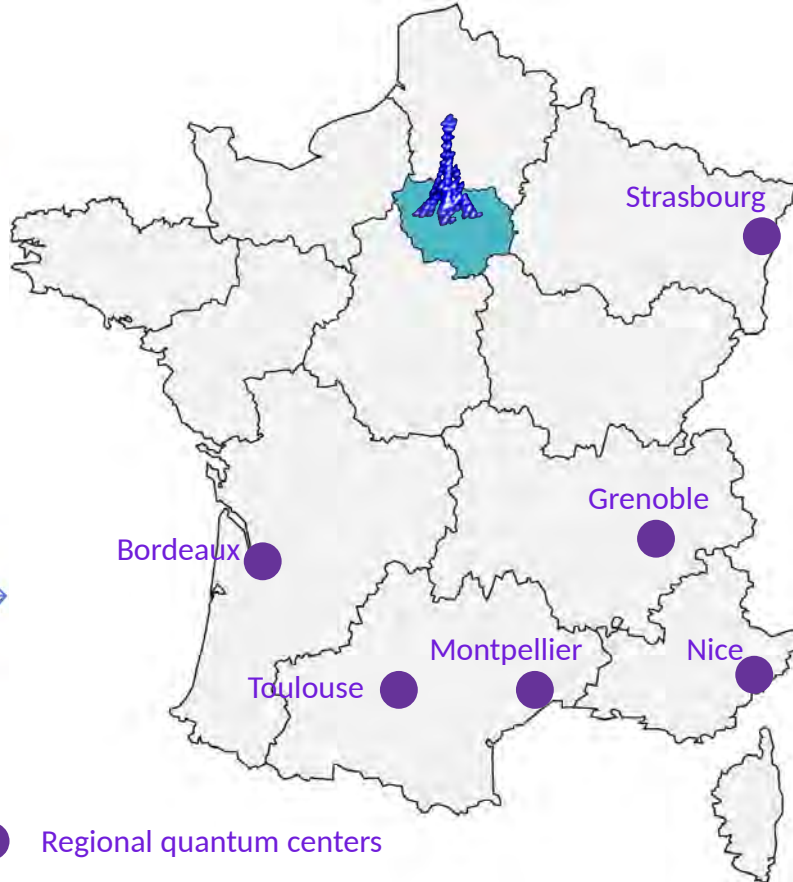


INTERNATIONAL YEAR OF  
Quantum Science  
and Technology

UNIVERSITÉ  
SORBONNE  
PARIS NORD

# Paris Region in French research landscape

## A world-class region in quantum science & technology



2 % of French territory...

...but 20 % of its population

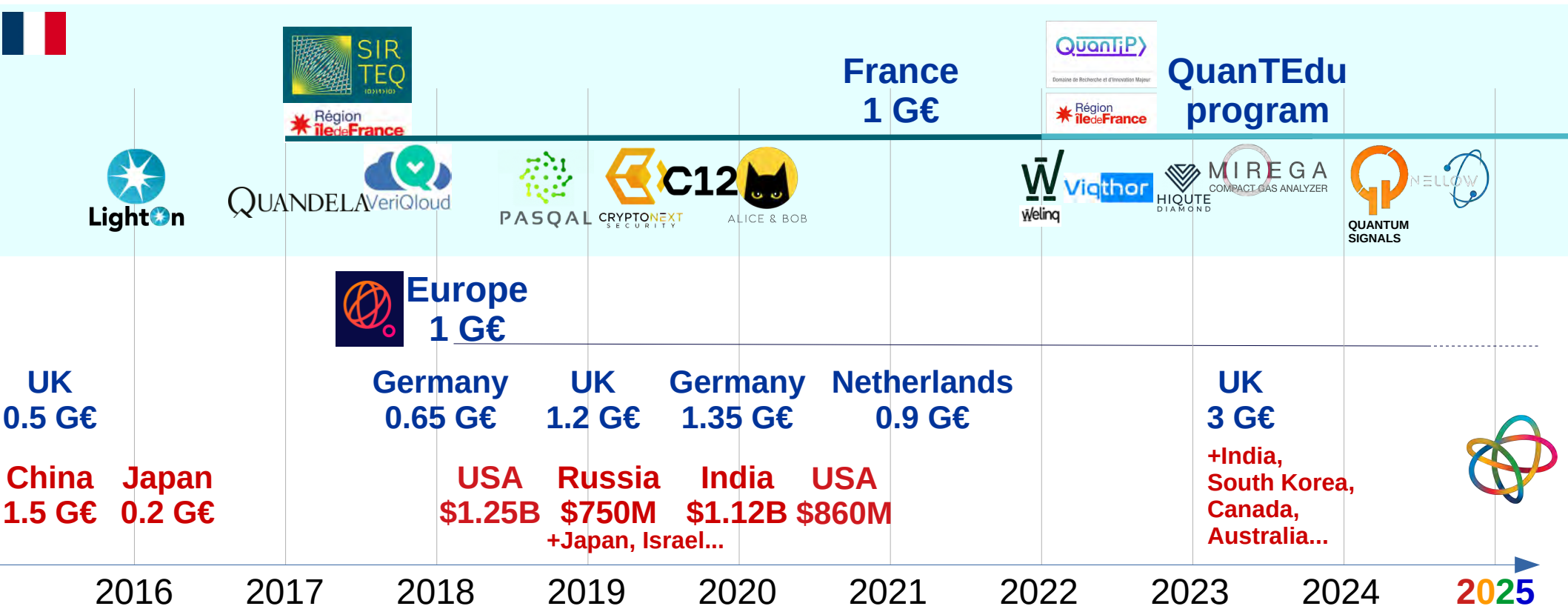
40-50 % of national scientific research

world-class institutes and universities

research-industry ecosystem

# Quantum technology funding programs

Key role of Paris Region in supporting research and industry



# SIRTEQ and QuanTiP networks

A research and innovation network funded by Paris Region

QuanTiP

Domaine de Recherche et d'Innovation Majeur

Région  
île de France



2017-2021

QuanTiP

2022-2026

>20 M€ for 2017-2026

>200 projects funded

1200 researchers

153 teams

42 institutes

24 universities & institutions

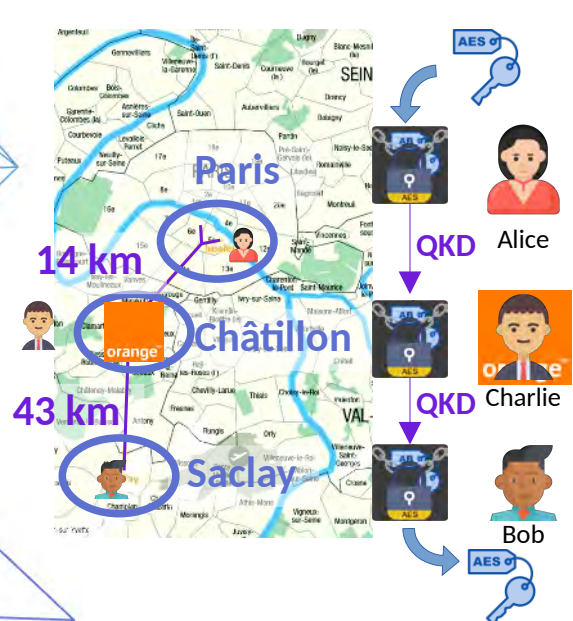
13 startups founded

conferences & workshops

popularization for the  
general public and schools


# Highlights of academic research

## Building the future quantum internet in Paris region



KQD exchange with a trusted node 

1. benchmark with a commercial system    

2. deploy high performance continuous variable prototype LCF, LIP6 with  company

Deploy a quantum repeater link with a cold-atom memory - LKB with 

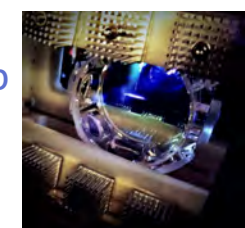
Entanglement distribution from polarization-entangled photons - MPQ



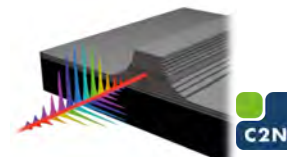
Piétri et al., Optica Quantum 2, 428 (2024)



→ startup company



Cao et al., Optica 7, 1440 (2020)



Appas et al., npj Quant. Inf. 7, 118 (2021)

Large consortium led by E. Diamanti, CNRS & Sorbonne Université, Paris

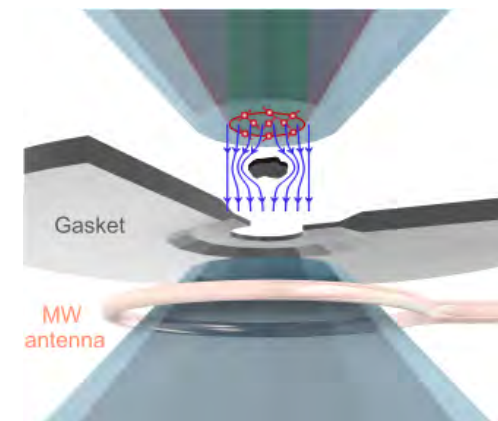
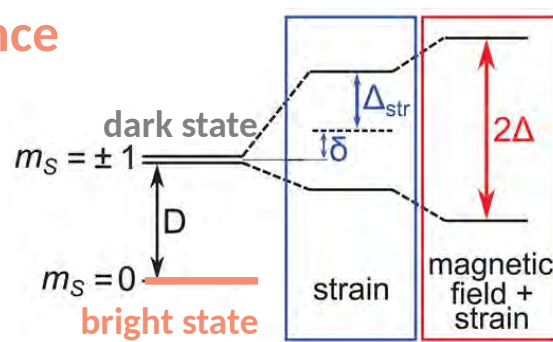
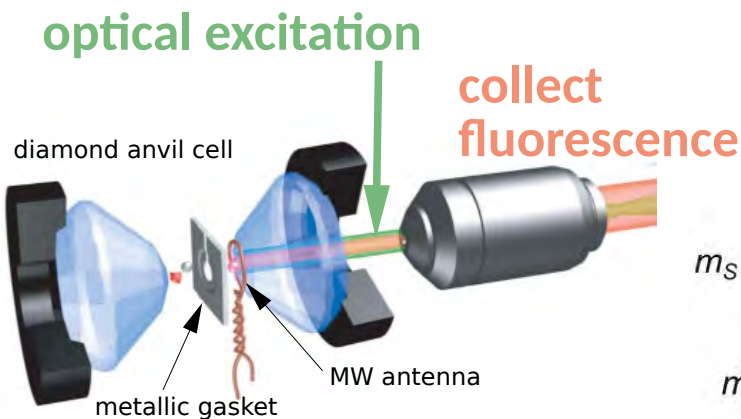
Support: from regional to European



Perspective: joint work with Refimeve metrology fiber infrastructure at pan-European scale

# Highlights of academic research

## Sensing in extreme conditions with NV centers in diamond



**2019: proof of concept: local measurement of  $B=11$  mT at 24 GPa**

Lesik *et al.*, *Science* 366, p. 1359 (2019)

**Recent results: observation of Meissner effect at 3 mT for  $T < T_c = 140$  K under 4 GPa in mercury-based cuprate superconductors**

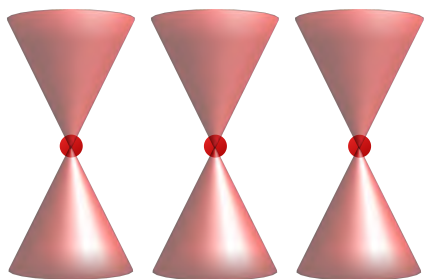
Dailedouze *et al.*, *arXiv:2501.14504*

**ERC Advanced grant for J.-F. Roch starting in 2025**

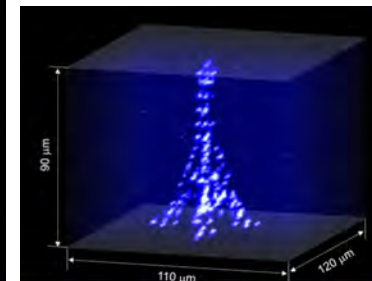
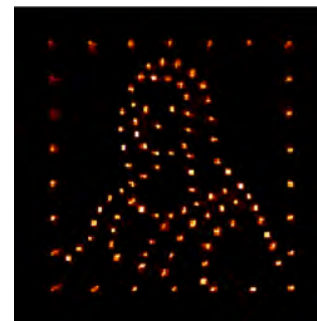
**Collaboration J.-F. Roch group + CEA-DAM, CNRS & ENS Paris-Saclay**

# Highlights of academic research

## Optical tweezers arrays for neutral atoms



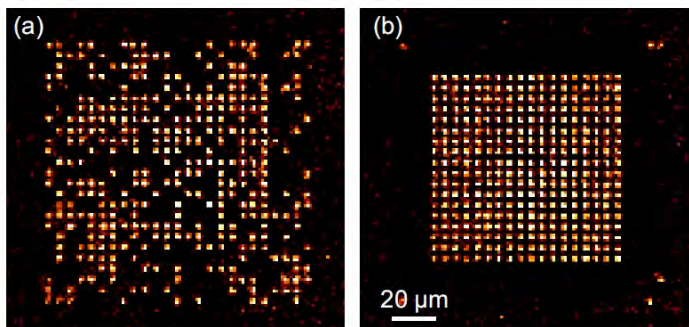
single atoms in optical tweezers,  
assembled in arbitrary geometry



Schymik *et al.*, PRA **102**, 063107 (2020)

### Up to 800 atoms in cryogenic environment

A. Browaeys & T. Lahaye group,  
CNRS & Institut d'optique, Palaiseau



Schymik *et al.*, Phys. Rev. A **102**, 063107 (2021)

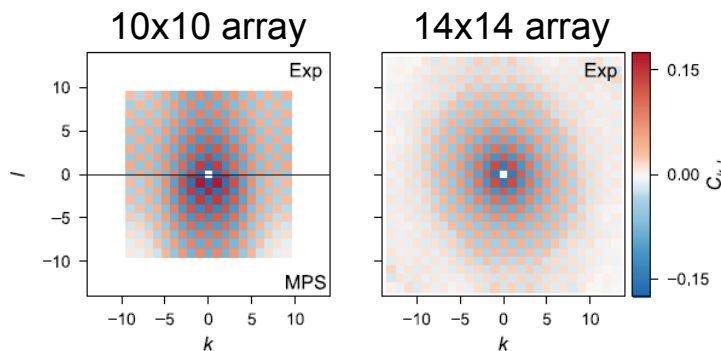
Pichard *et al.*, Phys. Rev. Applied **22**, 024073 (2024)

# Highlights of academic research

## Tweezers arrays for neutral atoms: from academy to industry



switchable strong interaction in a highly (Rydberg) excited state



P. Scholl *et al.*, *Nature* **595**, 233 (2021)

ideal for quantum simulation of spin Hamiltonians



# Celebrating the IQ in Paris region

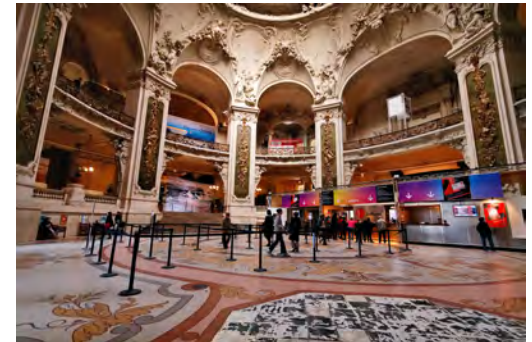
## Key upcoming events in 2025



5 workshops +  
International Conference  
on Quantum Computing  
May 12-16, Paris IHP 2025



Tweezers demonstration  
experiment developed  
by the QuantIP team



1-week exhibition in  
Palais de la Découverte  
Sep. 23-28, Paris

And also...

- **science festival** (October, Paris & Villetaneuse)
- support **outreach actions** (e.g. exhibition at UNESCO), **dedicated call** for outreach
- **lab tours** for high school children
- outreach **talks in high schools**
- **broadcasting** news and events from our partners, **joint projects**