

# Swiss Quantum Initiative - Overview

Law and Economics Foundation St. Gallen

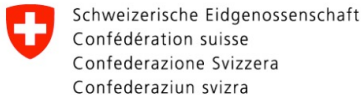
St. Gallen / Bern, May 16, 2024

# The Swiss Quantum Initiative (SQI) governance and funding

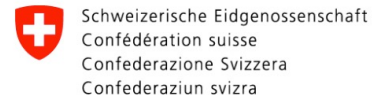
The Swiss Quantum Initiative (SQI) is

- mandated by the Swiss Confederation via SERI,
- hosted by the Swiss Academy of Sciences SCNAT and
- coordinated and led by the Swiss Quantum Commission (SQC) on a voluntary basis

Cooperation with the Swiss National Science Foundation SNSF and Innosuisse



**Innosuisse - Swiss Innovation Agency**

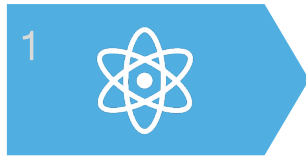


**State Secretariat for Education,  
Research and Innovation SERI**



# More than a scientific initiative: simplified\* view on the "Quantum Value Chain"

Illustrative



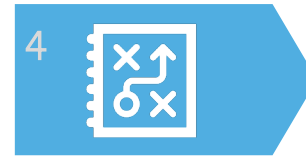
1  
Basic  
research



2  
Applied  
research



3  
Tech transfer &  
prototyping



4  
Commercial  
startup



5  
Industrial  
scaling

SQI goal: "Strengthen Switzerland's leading position  
across the entire value chain"

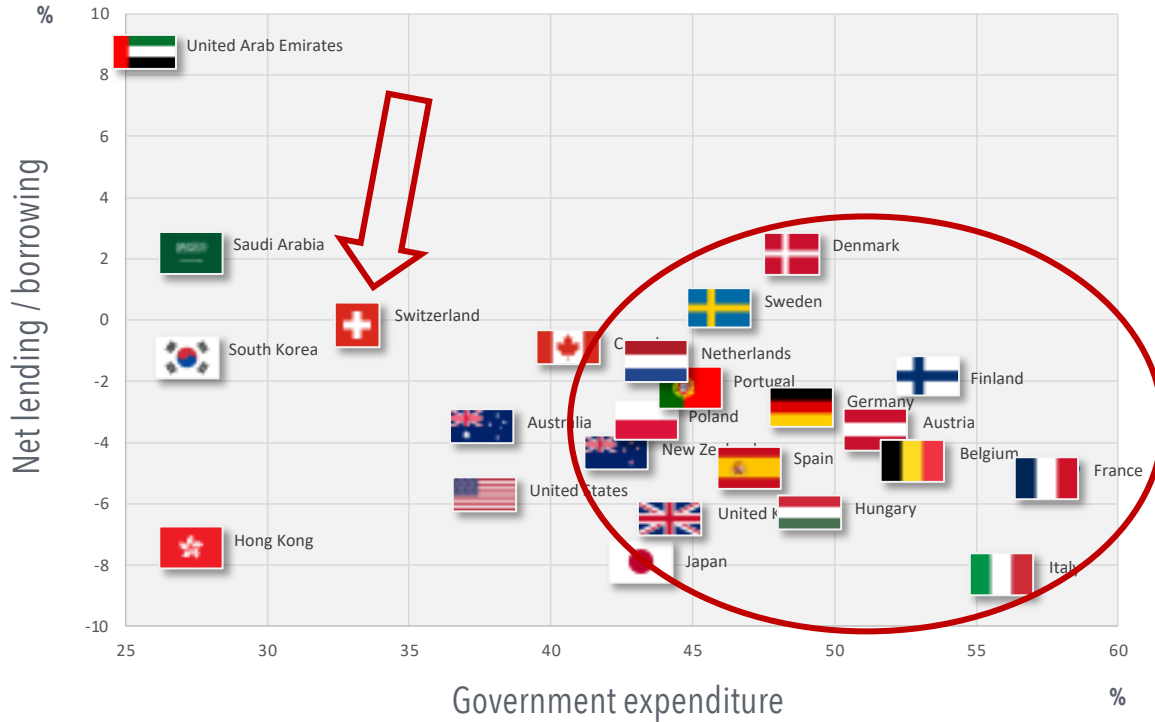
\* Illustrative. Not strictly linear.

# Specialties of the Swiss approach

- Cooperative governance
- Open and liberal market approach; no top-down industrial policy
- Curiosity-driven innovation
- “On top” national funding; complementing existing, decentral structures
- Long-term view

Honest and enthusiastic communication, but not contributing to some of the current “hype”

# Government expenditure versus net lending / borrowing



BACKGROUND

Source:  
[https://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_government\\_spending\\_as\\_percentage\\_of\\_GDP](https://en.wikipedia.org/wiki/List_of_countries_by_government_spending_as_percentage_of_GDP)

# Swiss Quantum Commission (SQC)



Nicolas Gisin (president)  
University of Geneva/  
Constructor Uni.



Patrick Maletinsky  
University of Basel



Kirsten Moselund  
PSI Villingen



Wolfgang Tittel  
University of Geneva/  
Constructor University



Jonathan Home  
ETH Zurich



Alexandre Pauchard  
CSEM, Neuchâtel



Anna Fontcuberta i Morral  
EPF Lausanne



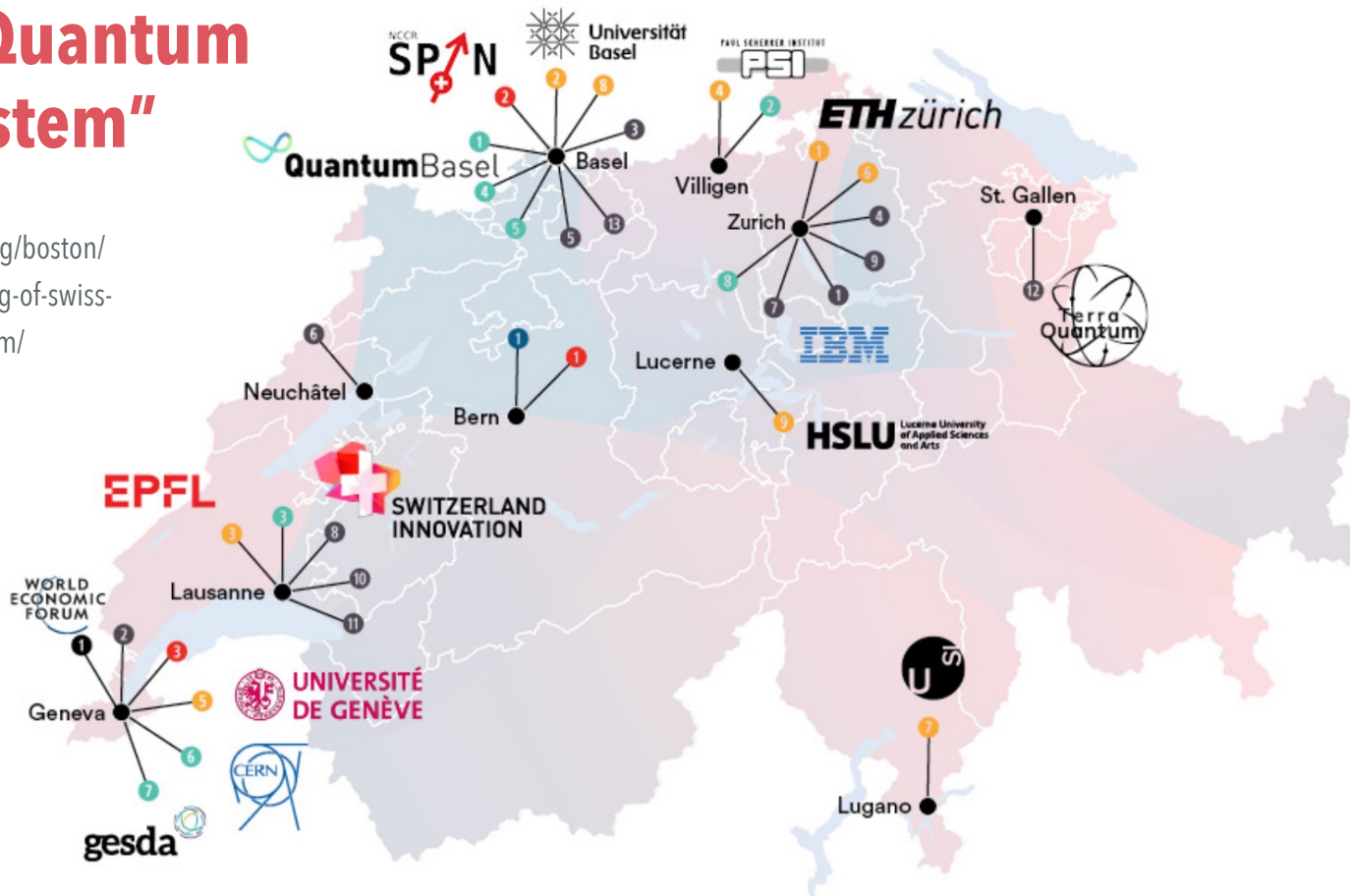
Esther Hänggi  
Lucerne University  
of Applied Sciences and  
Arts



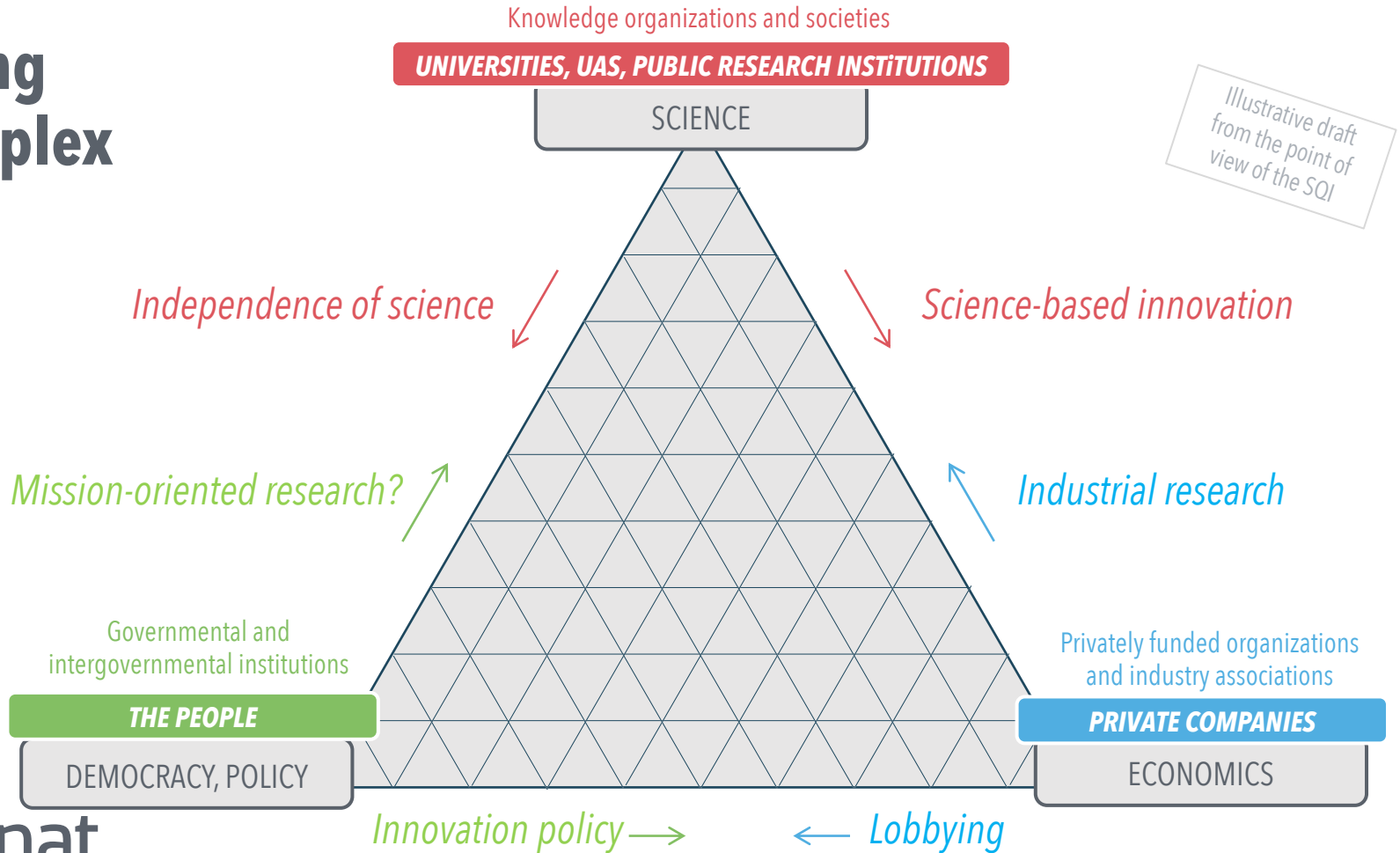
Heike E. Riel  
IBM Rüschlikon

# Swiss Quantum "Ecosystem"

<https://swissnex.org/boston/news/new-mapping-of-swiss-quantum-ecosystem/>  
quantum.scnat.ch

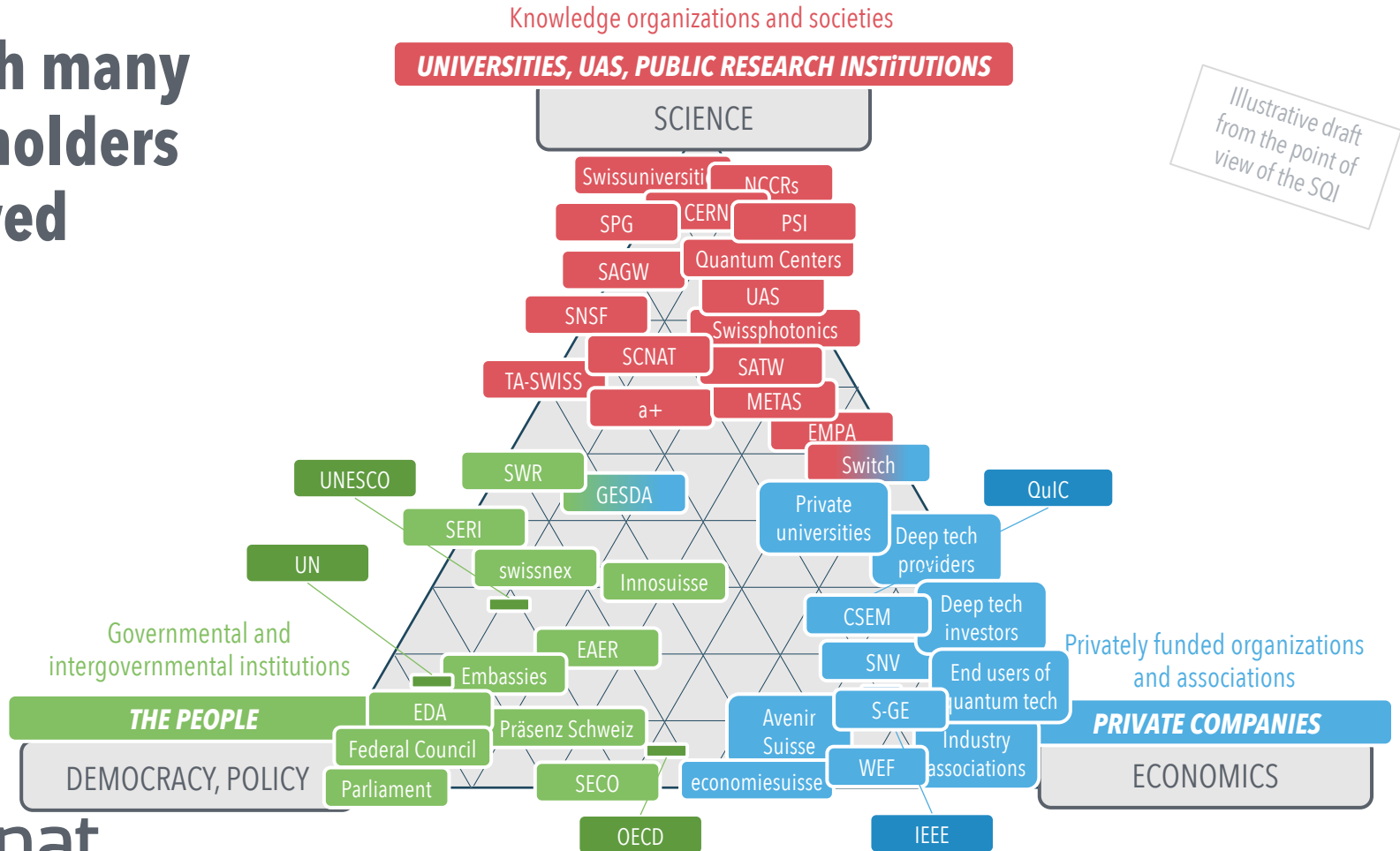


# Exciting & complex



Illustrative draft  
from the point of  
view of the SQI

# ... with many stakeholders involved



Illustrative draft from the point of view of the SQI

# The field(s) of quantum

document available on our web page  
[quantum.scnat.ch](http://quantum.scnat.ch)

*Mastering quantum systems  
on the individual quanta level and engineered entanglement*

## Fields of applied research and development

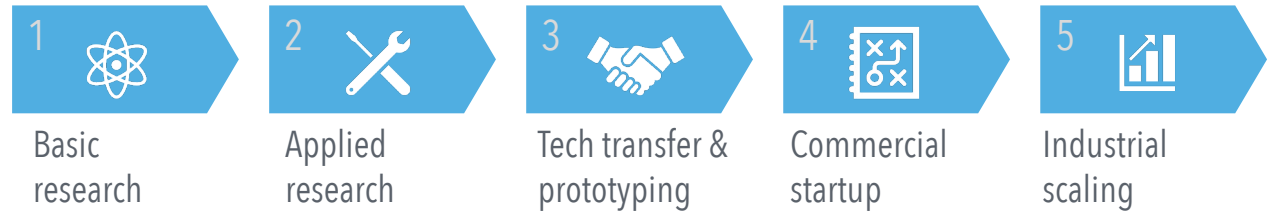
- Quantum communication
- Quantum computation
- Quantum simulation
- Quantum sensing and metrology

## Fields with a cross-sectional or foundational character

- Materials for quantum technologies
- synthetic quantum materials exhibiting entanglement
- Quantum control hardware
- Computer sciences
- Quantum theory
- ...

# Value chain, TRLs and typical investment stages

ILLUSTRATIVE



**TRLs:**  
Technology Readiness Levels  
(indication of typical steps;  
variations in practice)

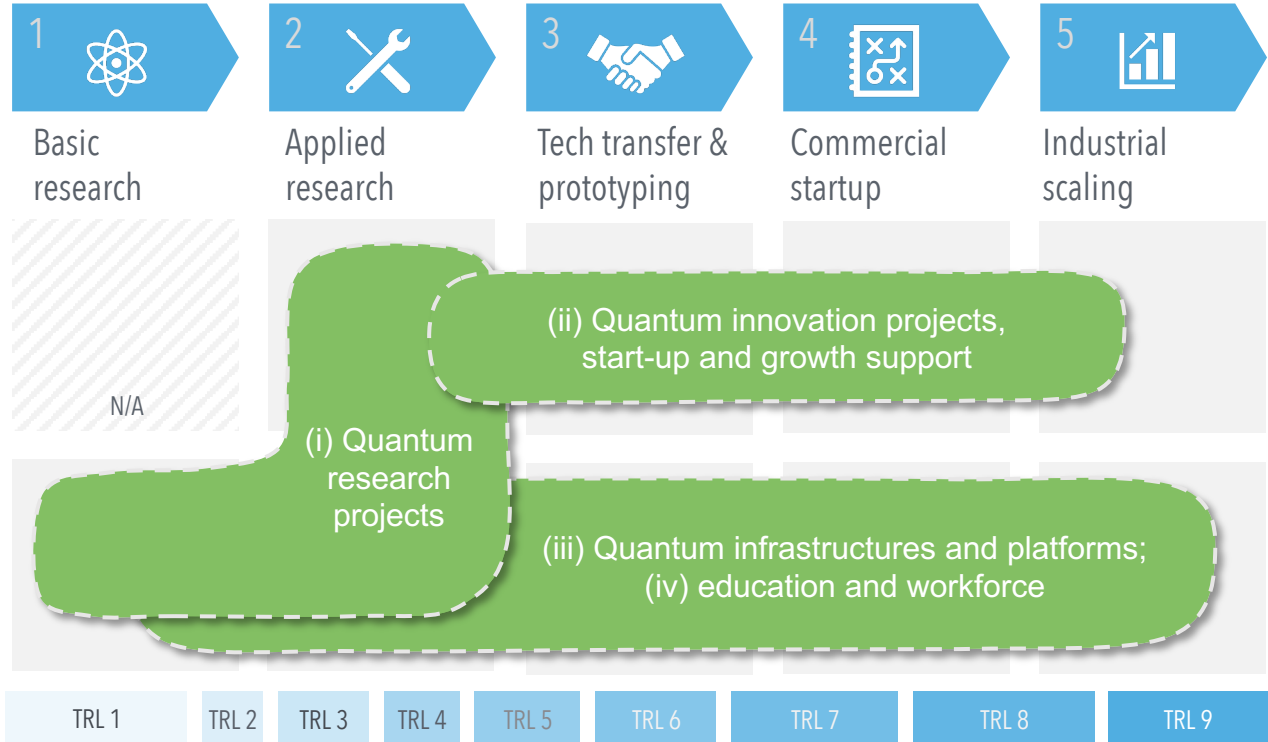


**Investment stages:**  
(indication of typical steps;  
variations in practice, depending  
on technical area, e.g. higher costs  
for quantum computing HW)



# SQL main fields of action and funding

ILLUSTRATIVE  
- not to scale -



**Outcome-focus:** towards specific applications. Outcomes targeted at specific projects or beneficiaries (e.g. startup project funding)

**Fundamental research and foundations:** agnostic to specific beneficiaries or direct commercial outcomes (e.g. quantum infrastructure support)

Typical technology readiness levels (TRL):

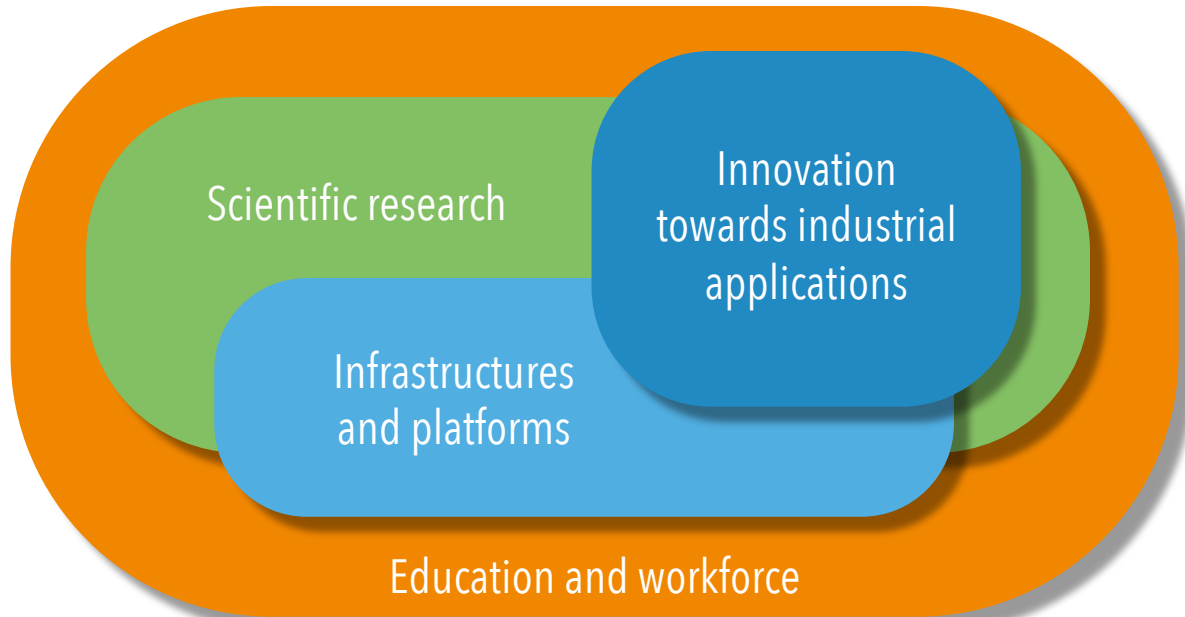
# SQC recommendations for 2025-2028 (selection)

- Overall, we are (still) in a time that calls for more **curiosity-driven research and innovation**
- SQI funding for **scientific research** in 2025-28 should be bundled into **one larger call**, ca. in 2027
- Significant attention should be given to **infrastructures** and emerging platforms for quantum (both with fundamental and applied characters)
- There is a need to **support innovation** and **young companies** without interfering excessively in market dynamics with taxpayers' money

document available on our web page  
[quantum.scnat.ch](https://quantum.scnat.ch)

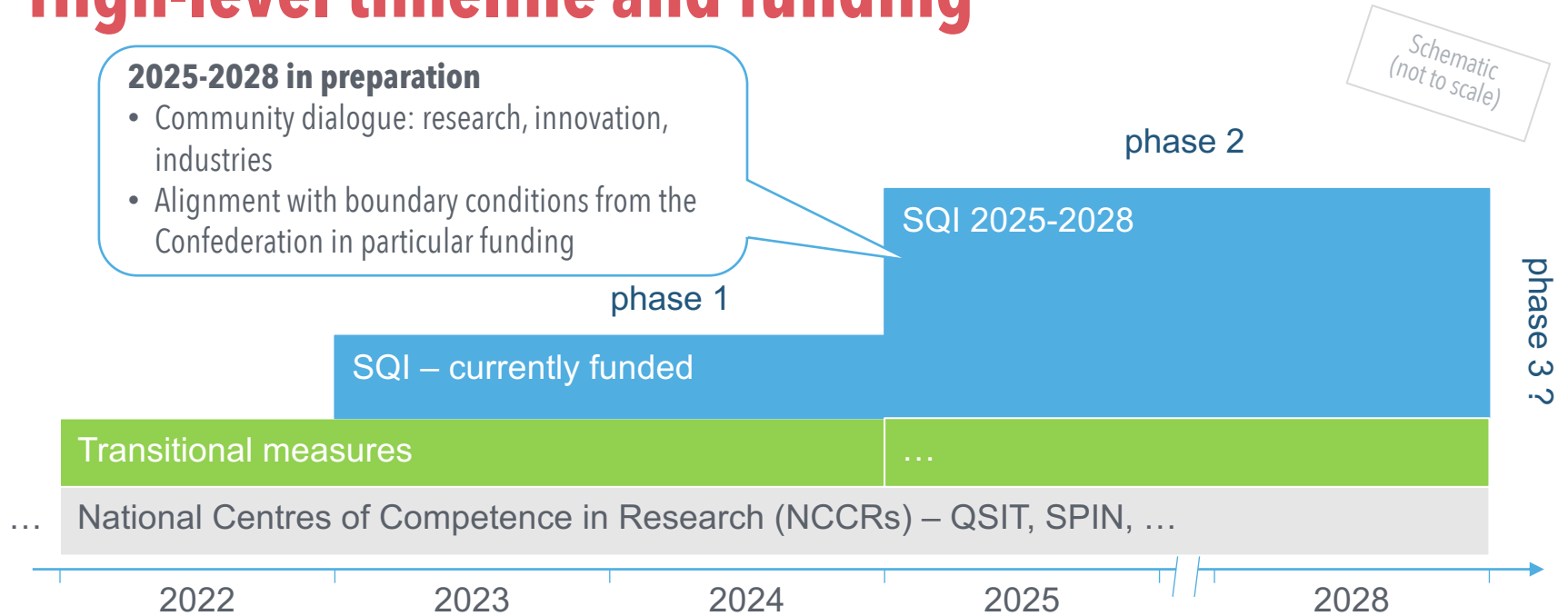
# Education as an underlying topic for all fields of action within the Swiss Quantum Initiative

Illustrative



*International aspects and communications embedded in all themes*

# High-level timeline and funding



Current SQI funding: 20 Mio. CHF for 2023-2024

Further funds planned for 2025-2028: ca. 80 Mio. CHF (TBD)

Limited to accredited institutions  
(Some exceptions possible via Innosuisse)

# Funding instruments, announcements:

quantum.scnat.ch

- **Research:** Swiss Quantum Call 2024; via SNSF (submission date tomorrow)
- Call for 2-pager ideas on **national quantum infrastructures** developments with a national & industrial relevance
- Support for **events and conferences**

In preparation:

- **Voucher model** to utilize existing, shared **infrastructures for quantum**
- Financing **industry PhDs**
- **Innovation** support; via Innosuisse

Tip:  
Partner with one or more accredited institutions

# Call for 2-pager ideas for quantum infrastructure with a triple value: academic - industrial - national

- Part of the strategic dialogue with the Swiss Quantum Community
- No funding decisions in this phase (it is about *ideas* and a *dialogue*)
- 14 papers submitted so far with 20 ideas from academia and industries
- Broad range of national infrastructure topics / ideas / projects including: materials science, preparation and testing; cleanrooms; device fabrication; communication networks / links; computing services / platforms; algorithm development (sample key words for illustrative purposes only)
- Next step: first review; strategic round-table, Villars-sur-Ollon, February 1, 2024

# Thank you

