

PAUL SCHERRER INSTITUT



Bill Pedrini :: Quantum Technologies :: Paul Scherrer Institut

The Cristallina project

SwissFEL performance workshop, 26.01.2022



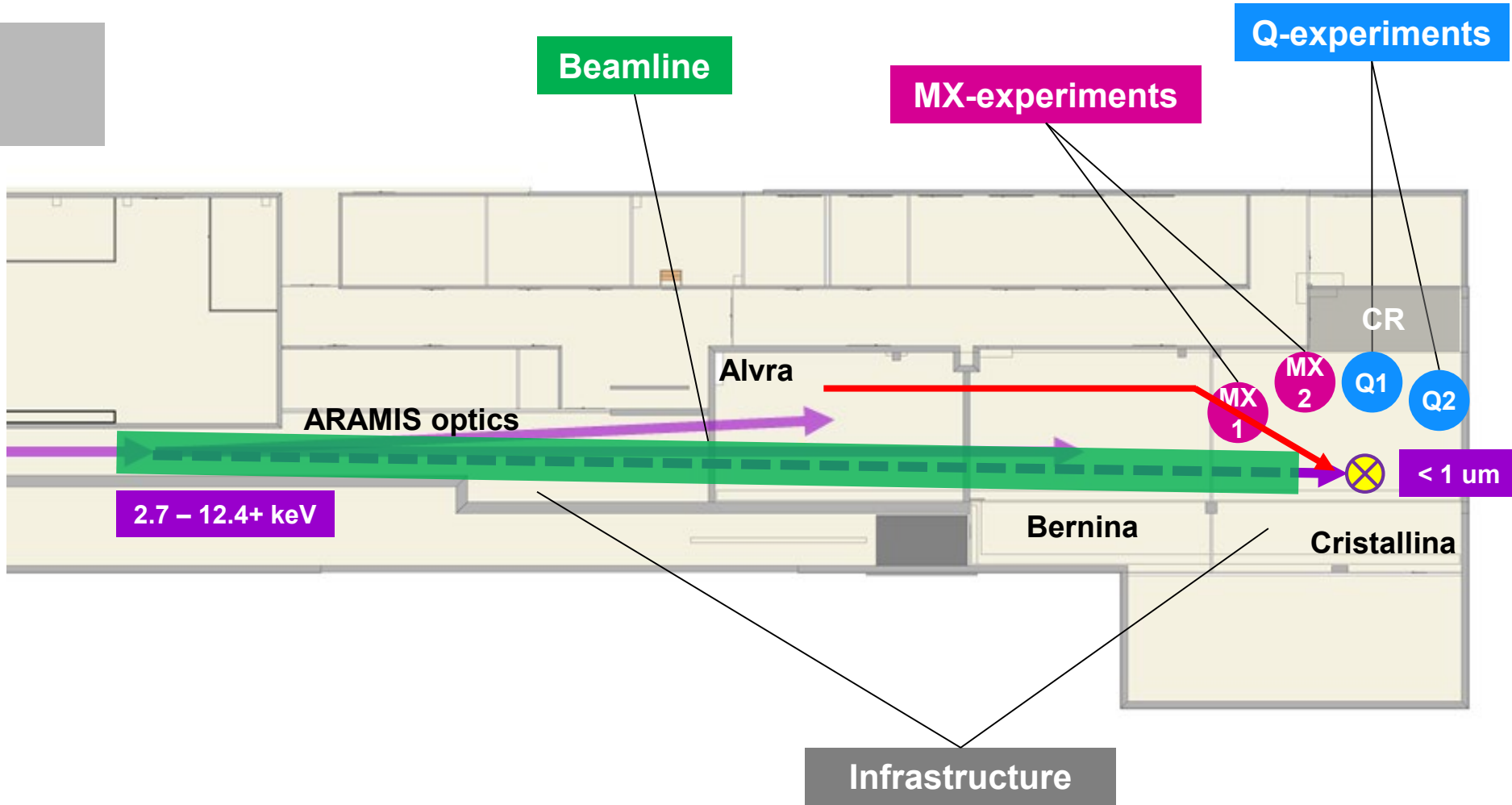
Agenda

1. Reminder Cristallina project
2. Current status
3. Plan 2022
4. Varia

1.

Reminder Cristallina project

The Cristallina project (copy-paste from 2021)



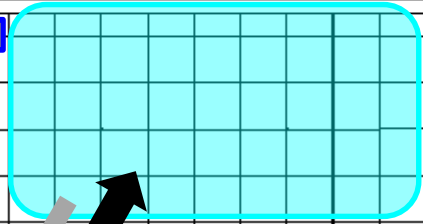
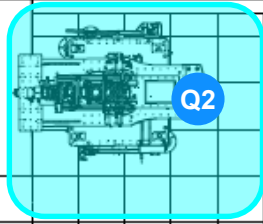
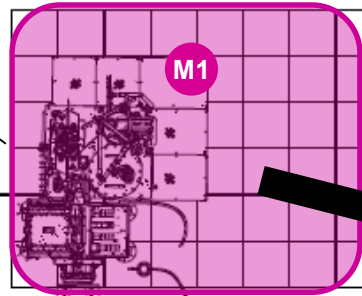
Operation concept

Cr-MX
Prep 1

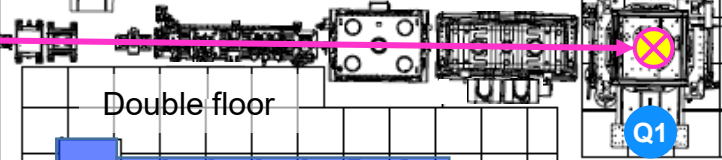
Control room

Cr-Q
Prep1

Cr-Q
Prep2



Granite floor

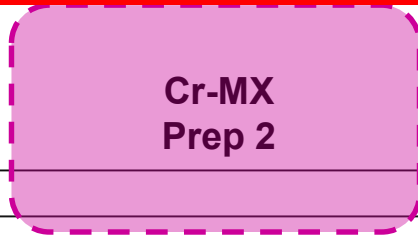


Double floor

Racks

Double floor

EH. 057



Cr-MX
Prep 2

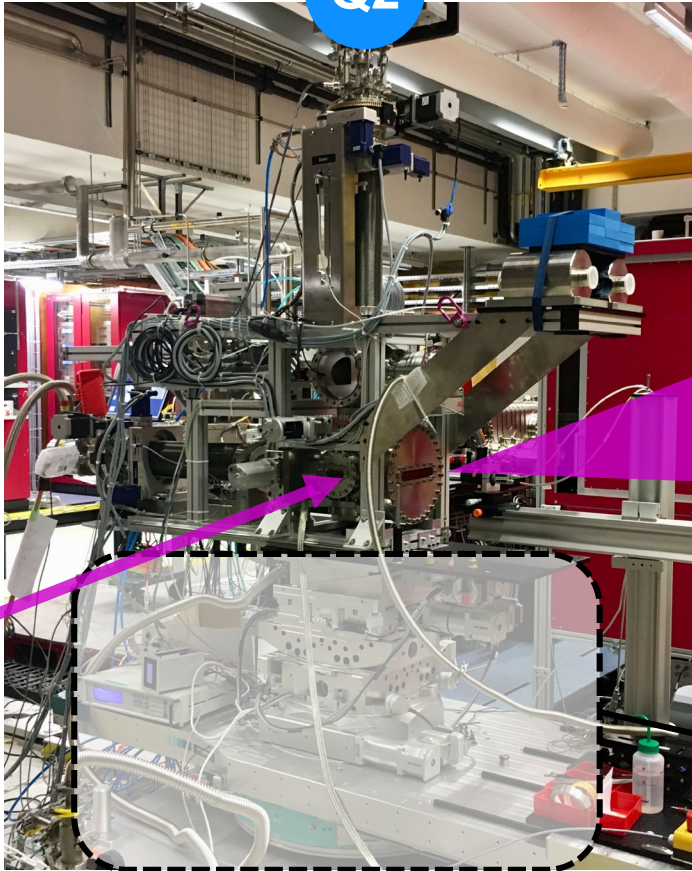
PORTHOS wall
~2029



Main sample
position

Cristallina-Q instruments

Q2



Pulsed magnet system

- **> 47 T**
 - **< 4 K**
- (Demonstrated at Bernina 2019)

Q1



ULT cryo-magnet system

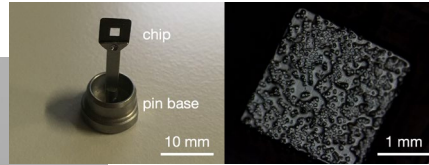
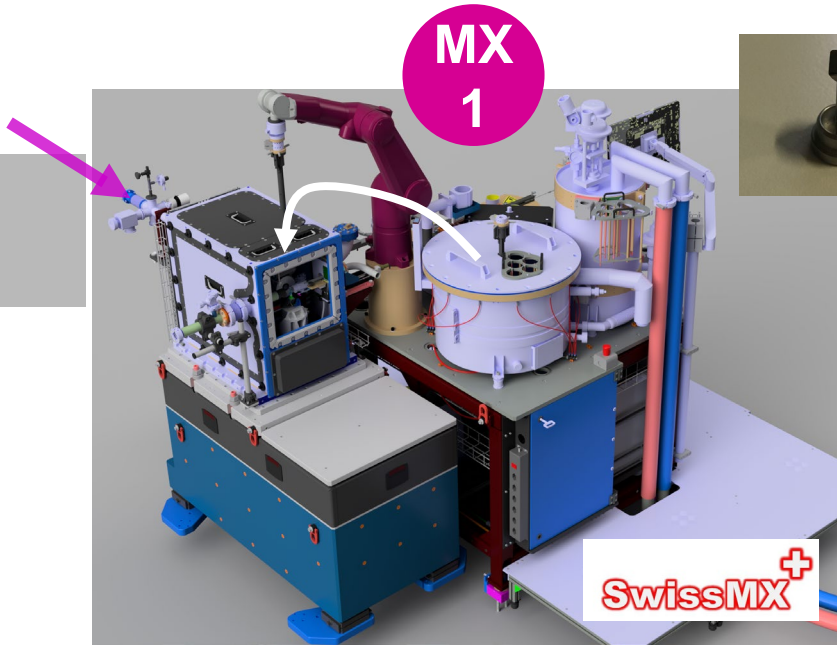
- **< 1 K**
- **5.2 T vector magnet**

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Universität Zürich^{UZH}

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FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

Cristallina-MX instruments

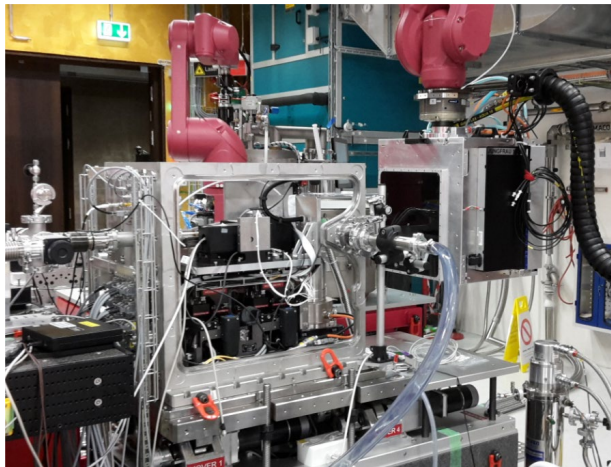


MX
2



Fixed-target protein crystallography

- Commissioned at Bernina (2019)



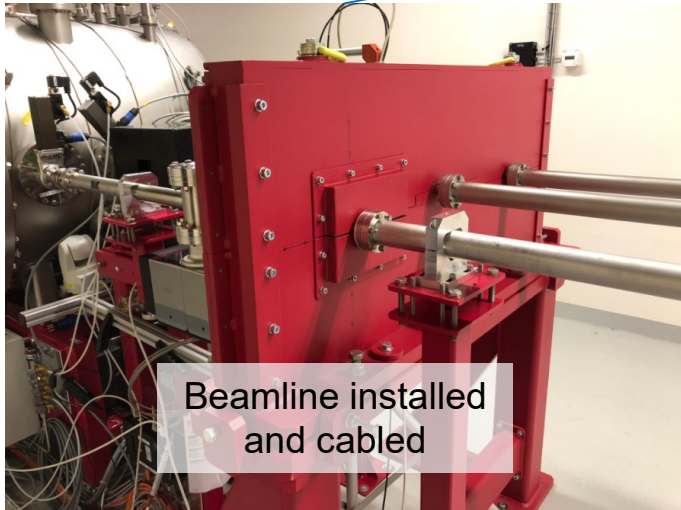
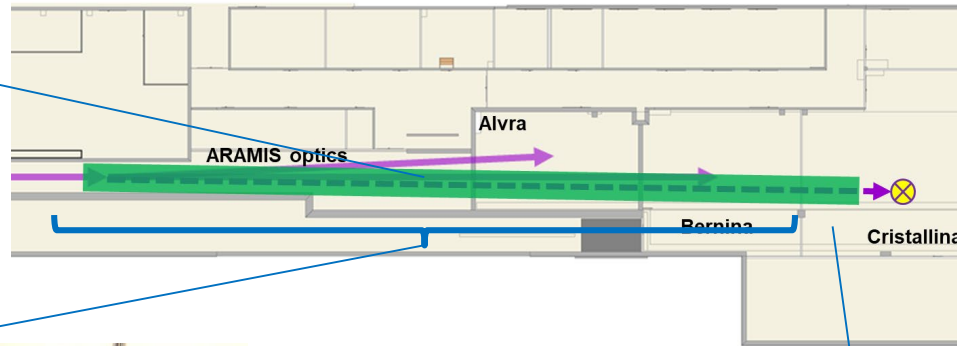
2.

Current status

(end New Year shutdown)

Beamline

Phase-2 component:
Double channel-cut
monochromator «in
specification»



Beamline installed
and cabled

Optics hutch + Alvra + Bernina



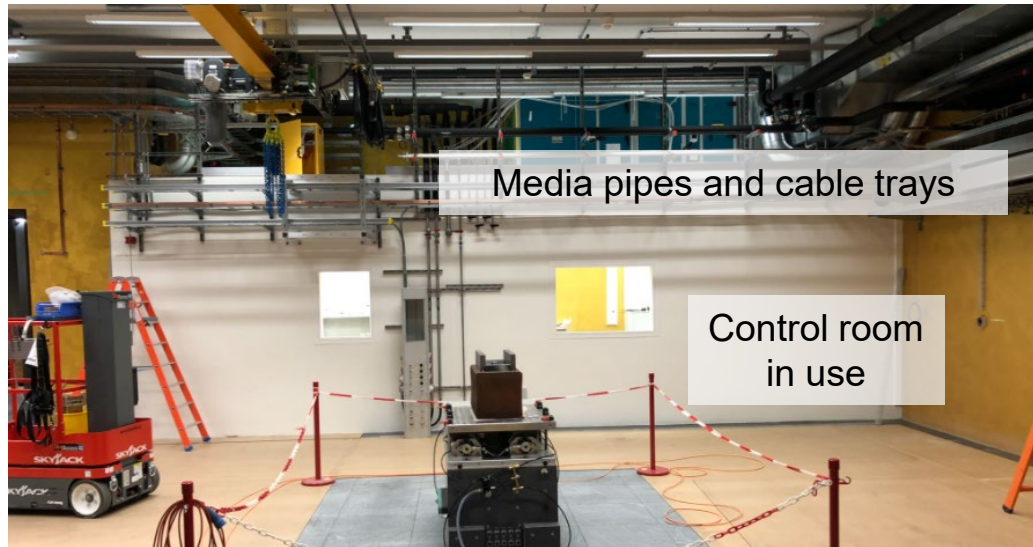
Beamline installed

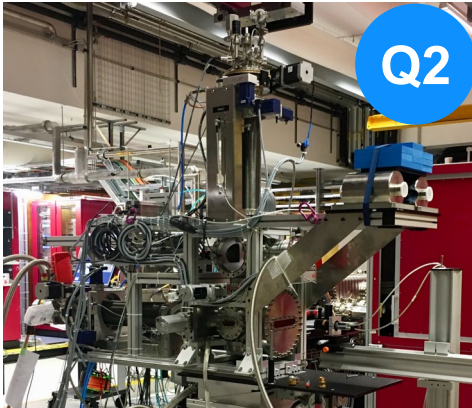
KB mirror
missing



Cabling ongoing
until Feb

Cristallina experimental hutch

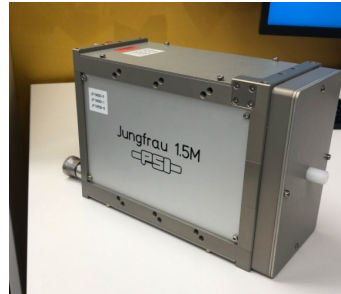




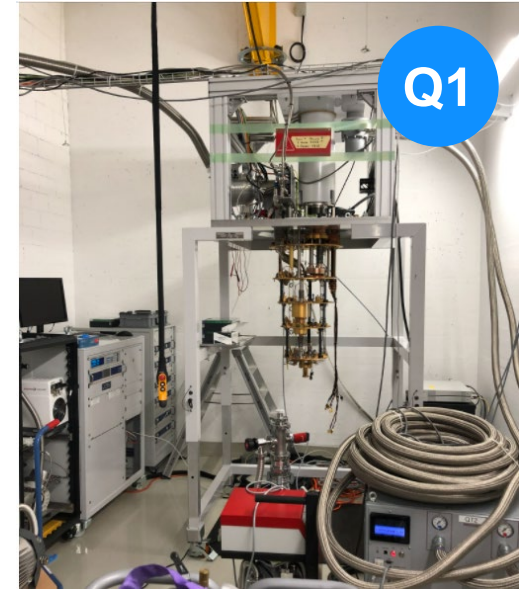
Pulsed magnet system

- Ongoing refurbishment (cryostat)
- Ongoing development (coils / capacitor bank)
- Transfer UZH → PSI soon

JF1.5M

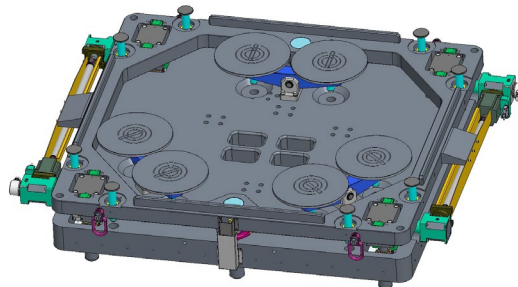


- Start testing «now»



ULT cryo-magnet system

- Under commissioning in EH.050



Airpad-borne diffractometers

- Concept for implementation of airpads under discussion with external company



SwissMX basis

- Modified by airpad addition
- Used as test-object for granite floor flatness

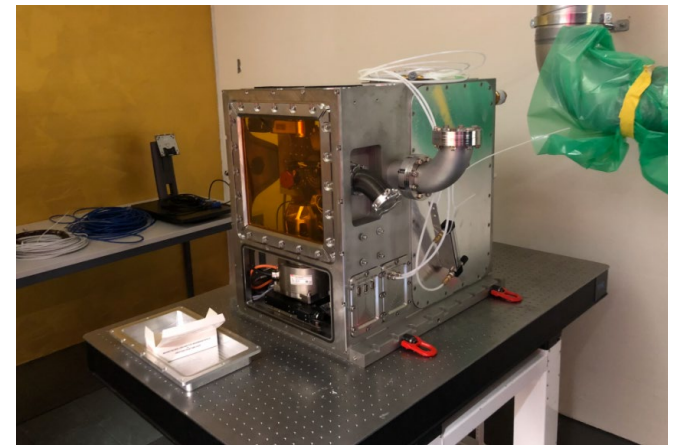
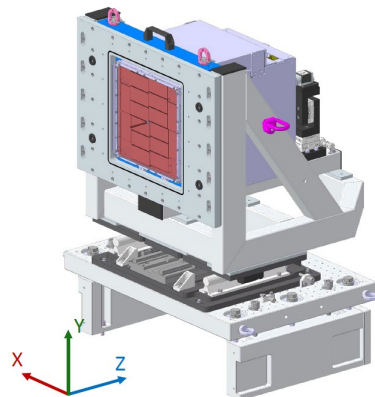


SwissMX chamber

- Start re-commissioning after «holidays» at SLS

JF8M

- Detector delivery Apr 2022
- Mechanics in procurement

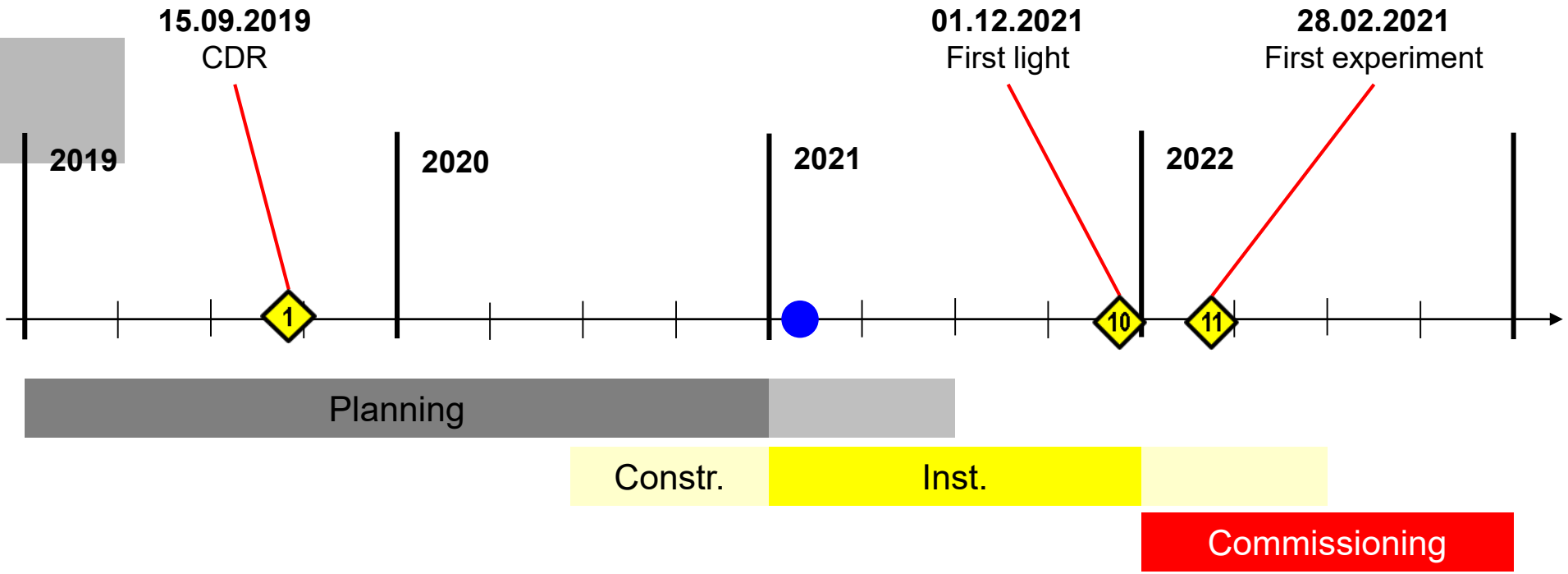


A solid grey rectangular block is positioned on the left side of the slide, partially overlapping the section header.

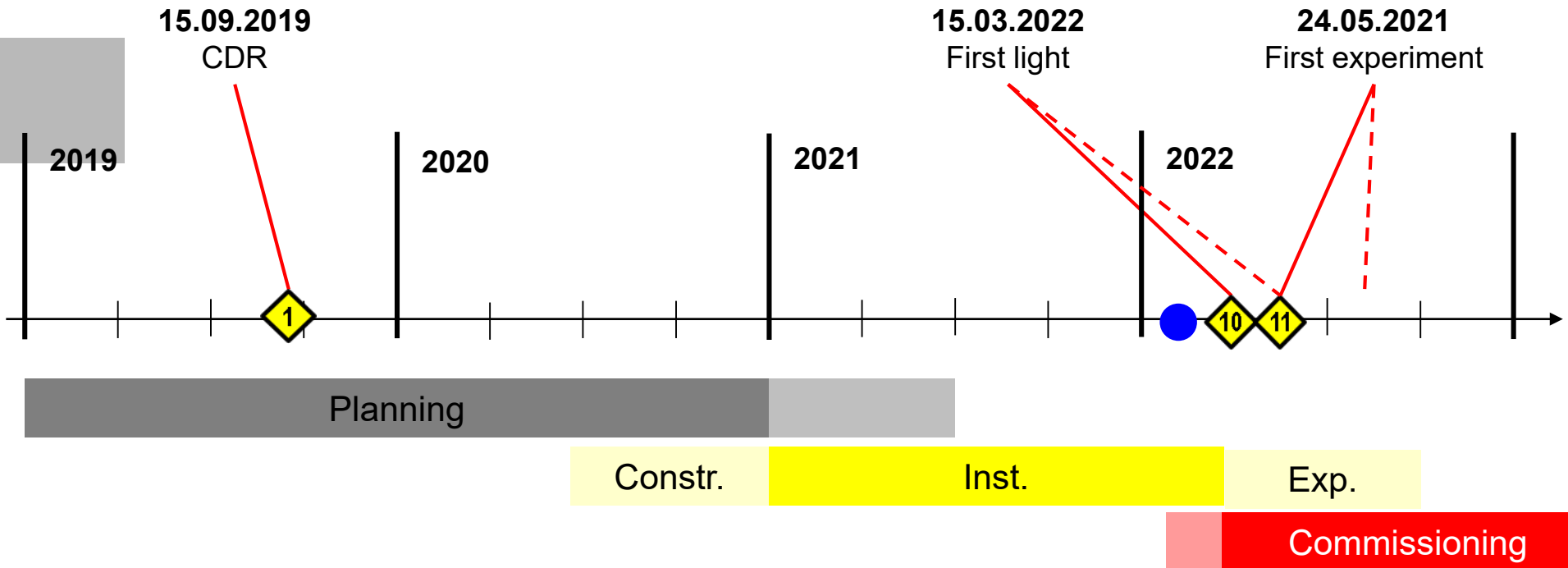
3.

Plan 2022

Timeplan Cristallina project, status Jan 2021



Timeplan Cristallina project, updated



- Beamline
- Cristallina-Q instruments
- Cristallina-MX instrument

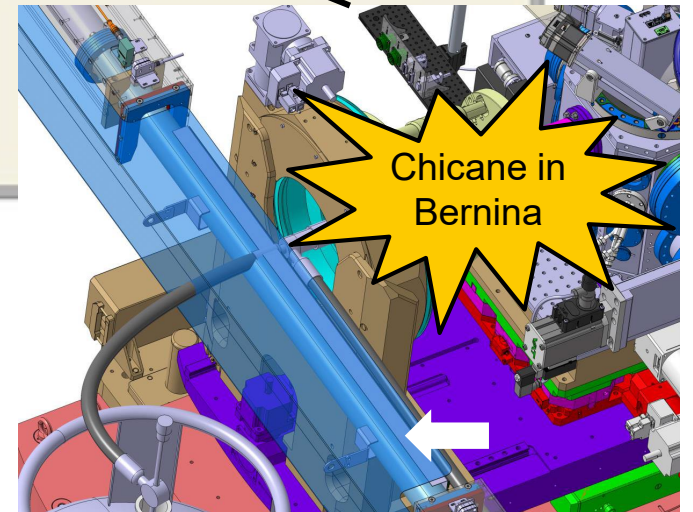
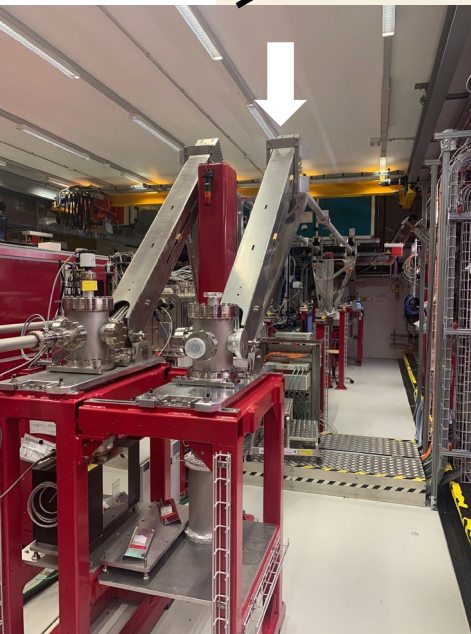
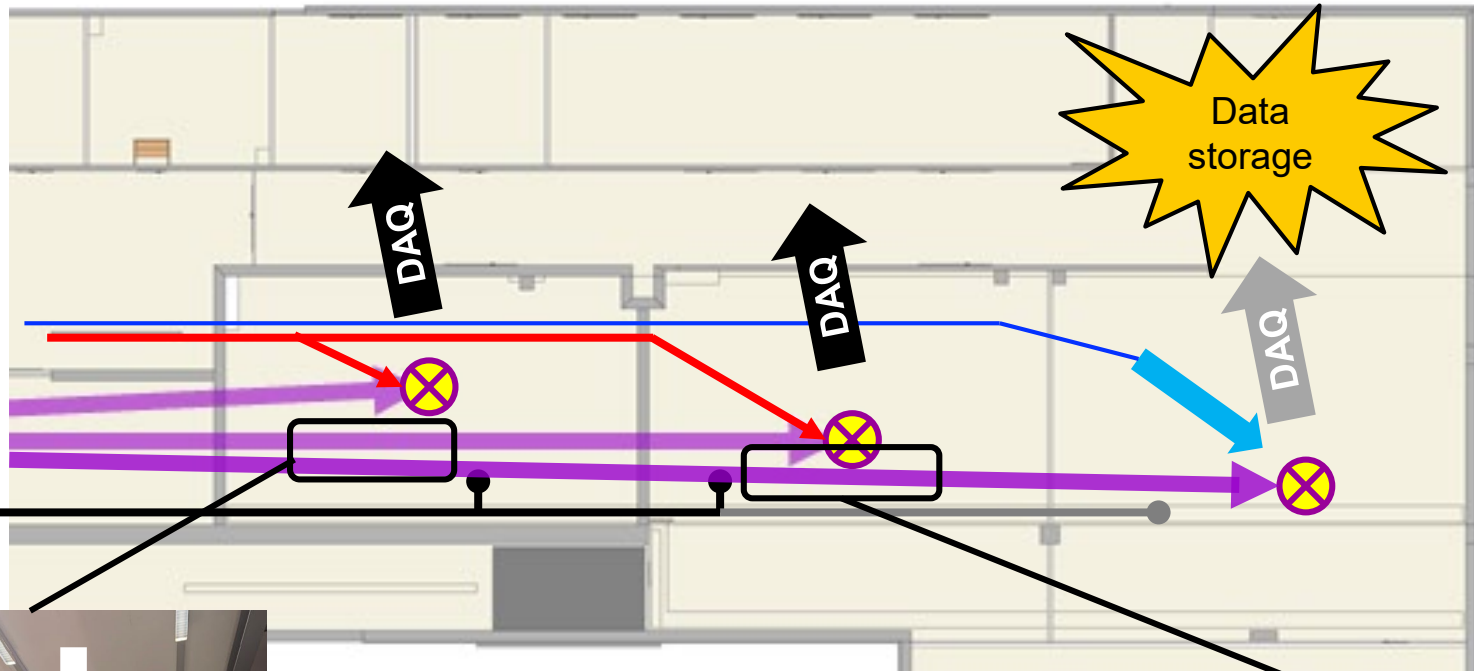
Attosecond mode



4.

Varia

Slide from Jan 2021: 2 → 3

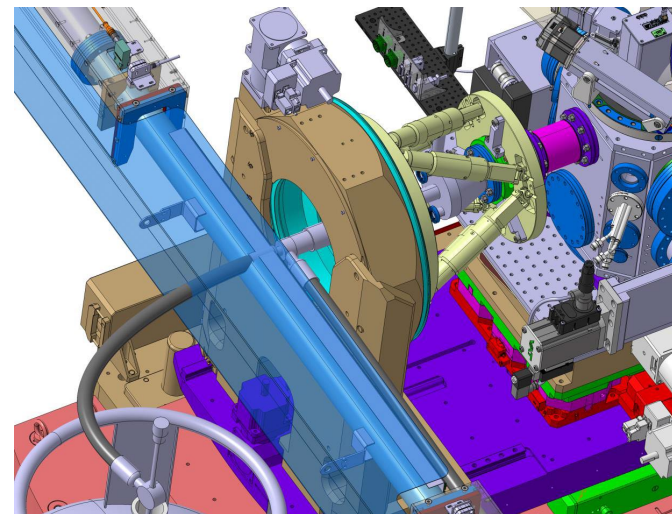
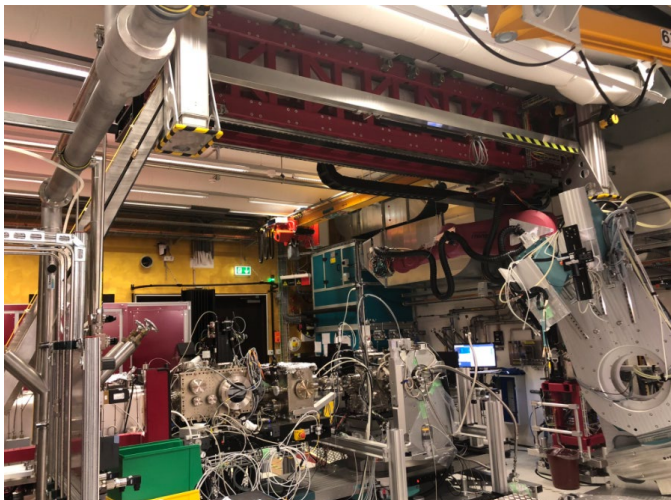


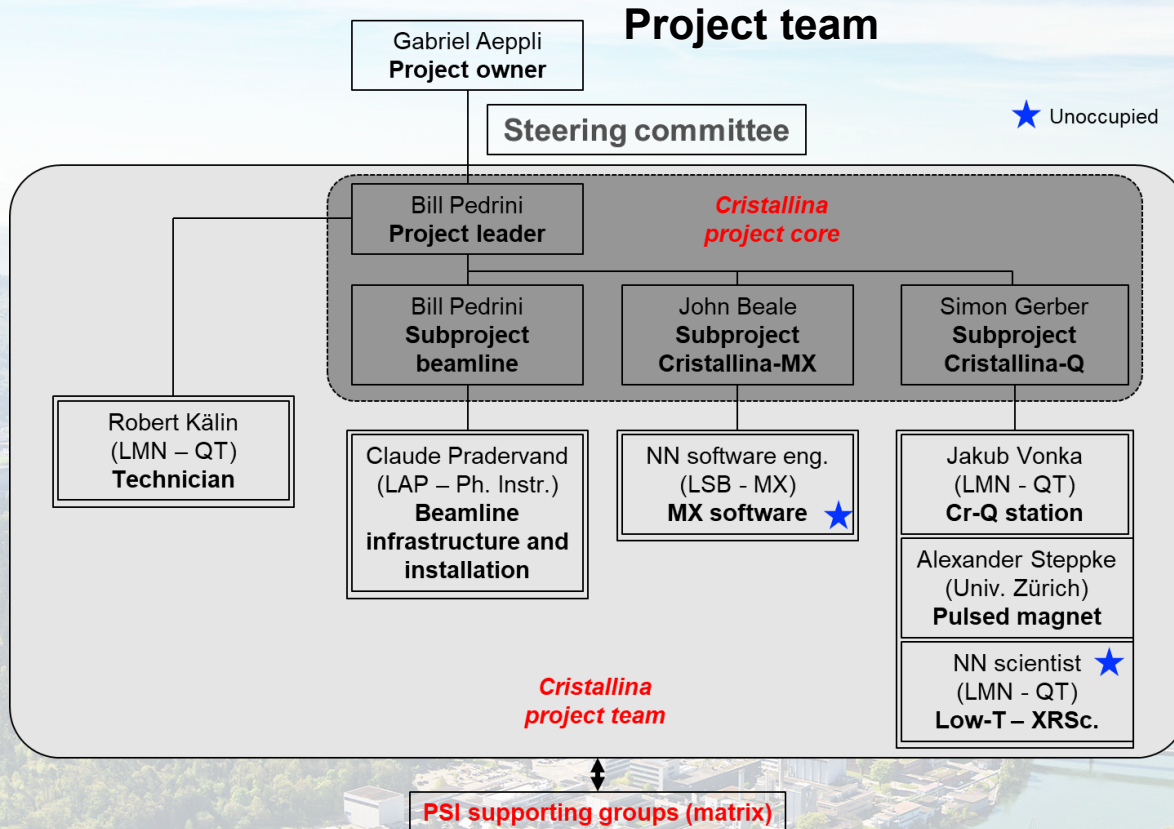
Data storage space on ra-cluster:

- Currently ~0 TB allocated on the ra cluster for Cristallina; need 100 TB «now» and >500TB in mid 2022
- Impossible to commission anything in the current state (even Jungfrau offline tests)

Chicane in Bernina:

- Compatible with preparation work for the Bernina «THz setup»
 - Incompatible with preparation work for most other setups
- To be considered for scheduling of ARAMIS beamtimes (Cristallina before Bernina is not convenient)





... and the **many many many** PSI collaborators that are contributing the project