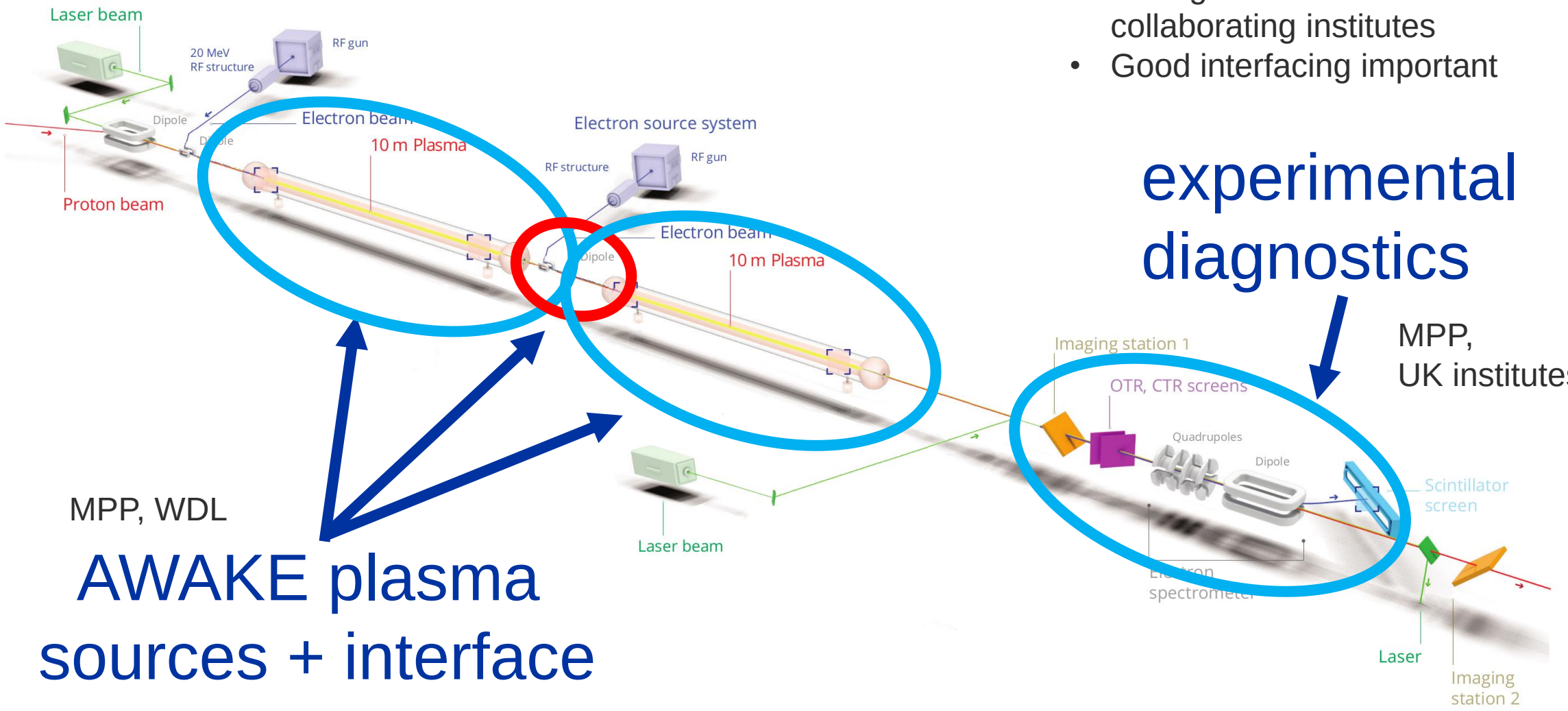
CP6: Plasma wakefield experiment

- Strong contributions from collaborating institutes
- Good interfacing important



experimental diagnostics

MPP, UK institutes

MPP, WDL

AWAKE plasma sources + interface

AWAKE plasma sources installation

status

Established:

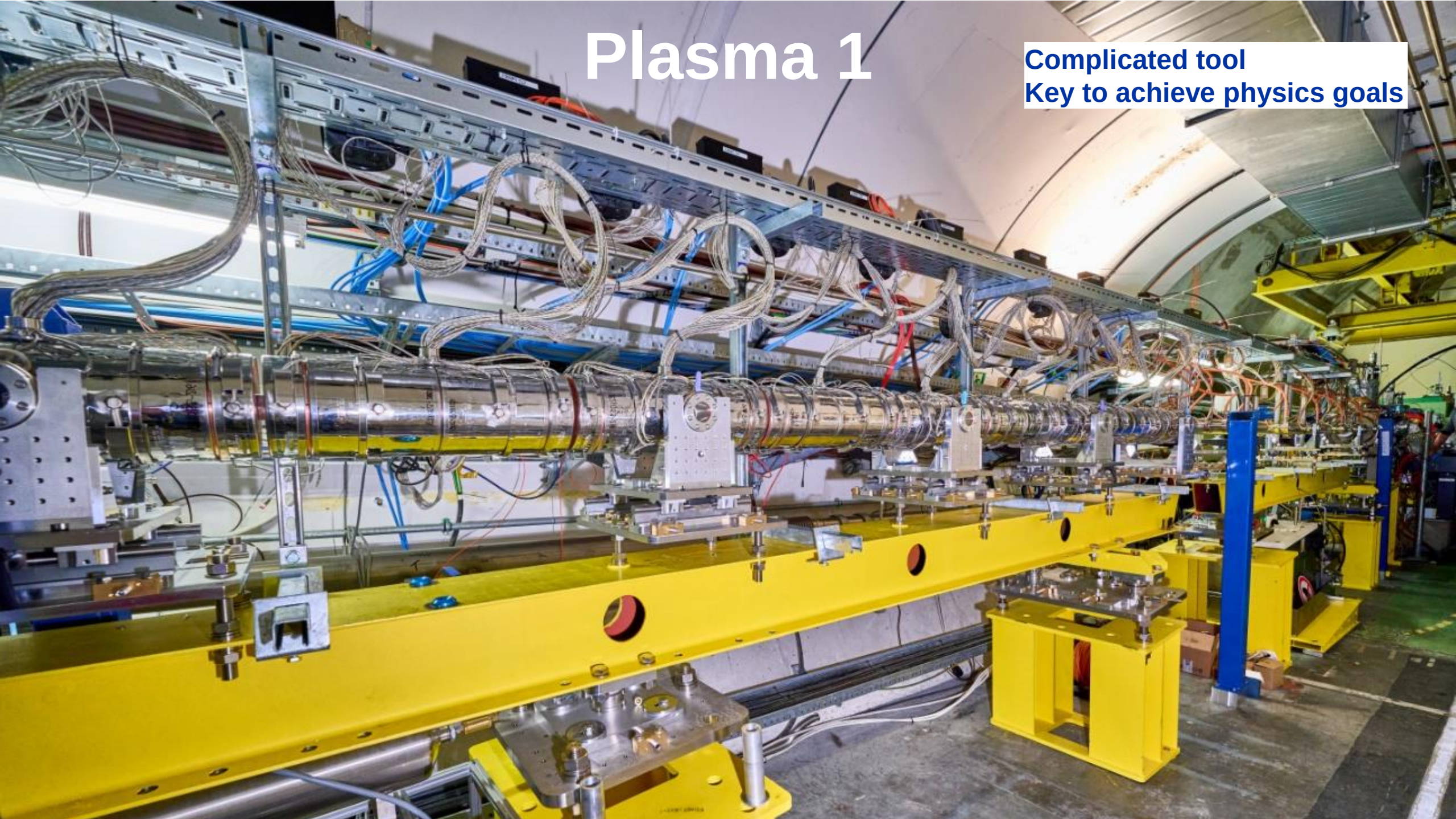
- Most likely reinstallation of the existing two rubidium vapor sources.

Conceptual level:

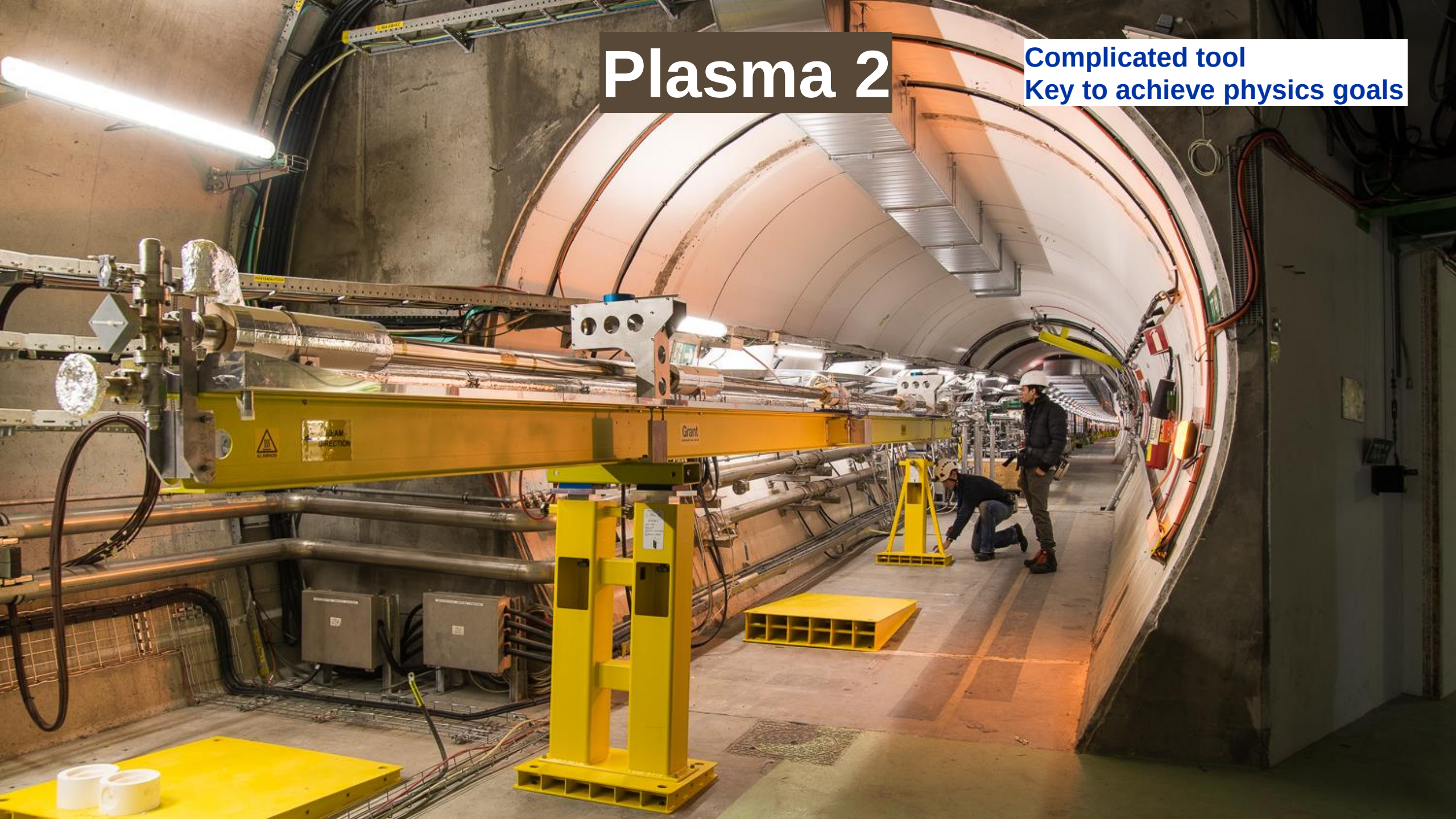
- Biggest unknown: injection region between the two sources.

strong collaboration with MPP, WDL

Plasma 1



Complicated tool
Key to achieve physics goals


Plasma 2
Complicated tool
Key to achieve physics goals

AWAKE plasma sources installation

preparation phase → 2025/2026, 12-Months

Note: this includes much more than the actual installation in the tunnel

BE-CEM-IN: Development of plasma source control system

BE-GM-ASG: Component alignment

Red: not signed on PLAN

EN-ACE: Integration and scheduling of the AWAKE plasma source installation

EN-MME: design, the construction drawings, CAD models for the integration team

HSE-OHS: Approval of the safety case / safety check

SY-BI: Beam instrumentation development for the plasma source

TE-VSC-IVO: Study of the AWAKE plasma source design

AWAKE plasma sources installation

installation phase → LS3, 2026/2027, 12 Months

BE-CEM-IN: Installation of control system equipment

BE-GM-ASG: Component alignment

BE-GM: Marking

EN-ACE: AWAKE integration follow up and scheduling

EN-CV: In case of need for modification work, like e.g. new water connection

EN-EL: Signal cabling

EN-HE-HH: Equipment transport

HSE-RP: Support in case of Rb handling and use of previously irradiated material

SY-BI: Installation of plasma source instrumentation

TE-MSC-NCM: mu–metal installation of the vapor source

TE-VSC-BVO: Bakeout of plasma source in the tunnel

TE-VSC-IVO: Connection of plasma sources to the vacuum system

AWAKE plasma sources installation

commissioning phase → 2027/2028, 6 Months

BE-CEM-IN: Setup and testing of the plasma source control system

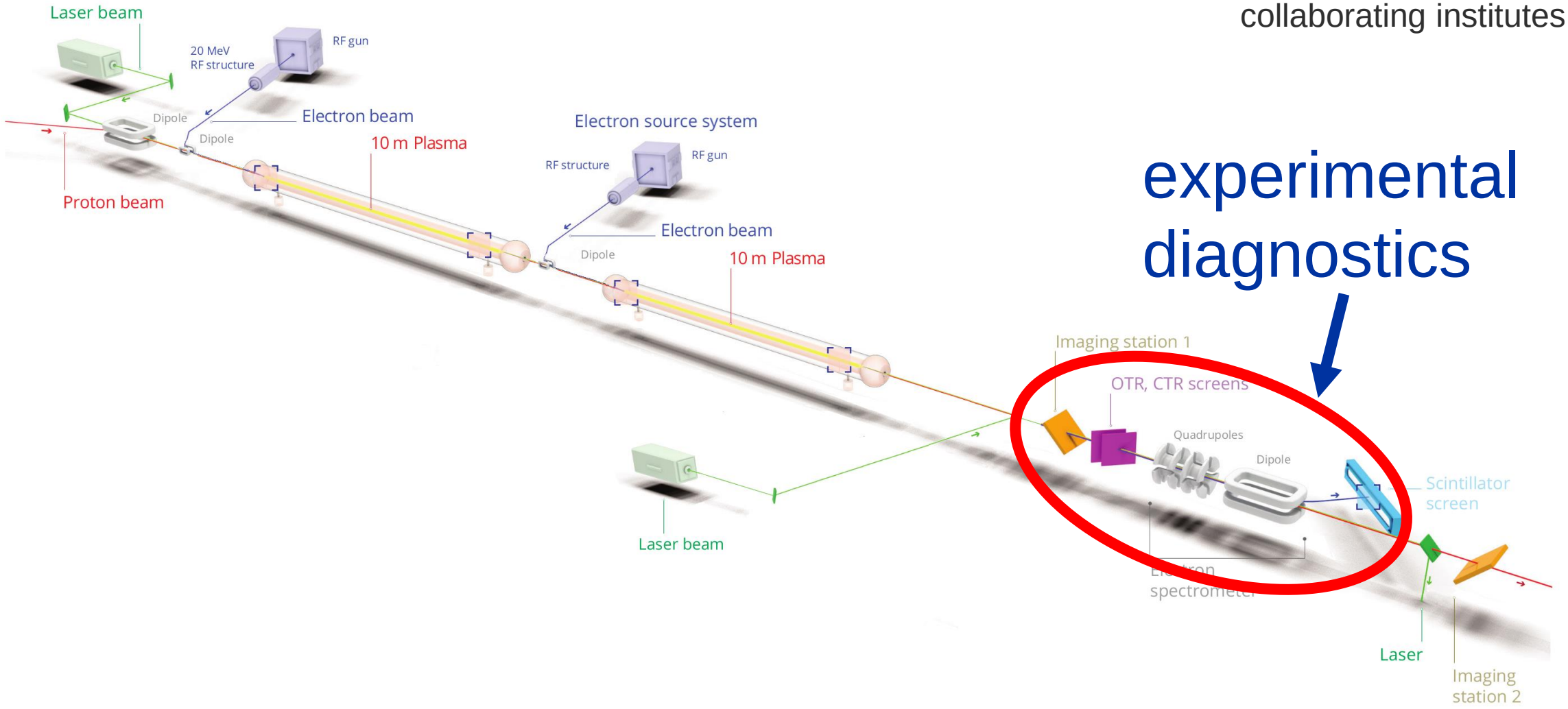
HSE-RP: Handling of irradiated material / accesses

SY-BI: Instrumentation support during commissioning

TE-VSC-IVO: Support for vacuum operations

CP6: Plasma wakefield experiment

In coordination with collaborating institutes



experimental diagnostics

AWAKE experimental diagnostics

status

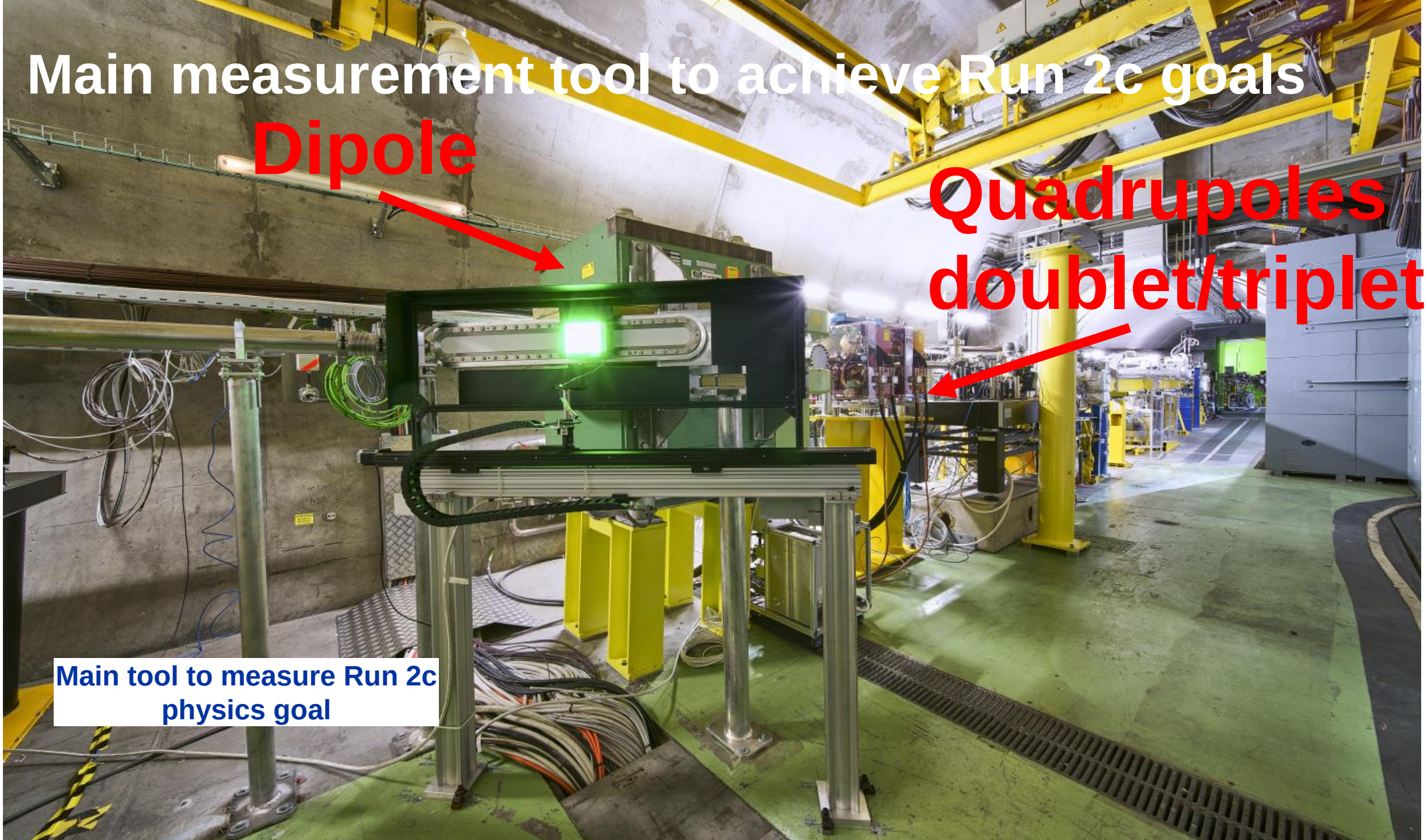
Established:

- OTR/CTR diagnostics

Design phase:

- Spectrometer: first proposal to reuse existing power converters with new magnets
  → feedback: not an option, because parameters do not match → redesign, **critical**

strong collaboration of CERN with MPP, UK Institutes


Main measurement tool to achieve Run 2c goals
Dipole
Quadrupoles
doublet/triplet
Main tool to measure Run 2c physics goal

AWAKE experimental diagnostics

preparation phase → 2025/2026, 12 Months

BE-CEM-IN: Development of the control system for new diagnostics

EN-MME: Design, the construction drawings, CAD models for the integration team

SY-BI: Support to design experimental diagnostics and software development

SY-EPC: Preparation of power converters for the AWAKE spectrometer quadrupoles and dipoles

SY-RF-LHS: Accurate timing signals for streak cameras and other diagnostics (few ps)

TE-MSC: Preparation of spectrometer magnets (quads and dipole)

TE-VSC-IVO: Design of the vacuum chamber and interfaces

AWAKE experimental diagnostics

installation phase → LS3, 2026/2027, 12 months

Note: this includes much more than the actual installation in the tunnel

BE-CEM-IN: installation of equipment and for the control system

BE-GM-ASG: markings

EN-ACE: integration and scheduling of the installation

EN-EL: optical fibres

EN-EL: signal cabling

EN-EL: DC cabling

EN-HE-HH: underground handling

EN-MME: design and integration of layout

SY-BI: supporting installation of experimental diagnostics

SY-EPC: installation of power converters

SY-RF-LHS: installation of power converters

TE-MSC: installation of spectrometer magnets

TE-VSC-IVO: installation of diagnostic specific vacuum chambers

AWAKE experimental diagnostics

commissioning phase → 2027/2028, 6 Months

SY-BI: support with commissioning

SY-RF-LHC: commissioning and support for timing

Thank you!

Anything missing?