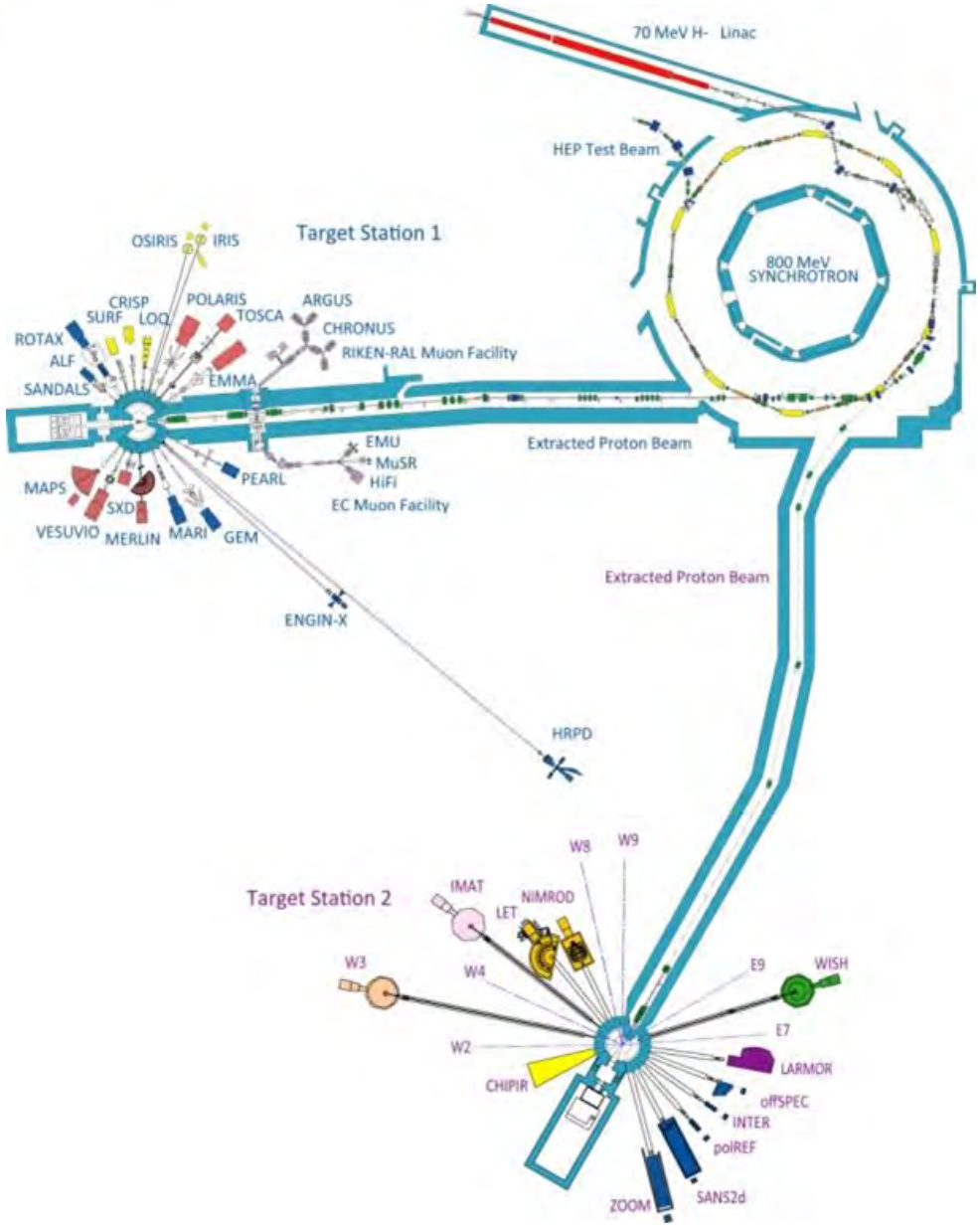
Science & Technology Facilities Council
ISIS

ISIS May 2015: current status and future plans

Robert McGreevy (ISIS Pulsed Neutron Source, UK)
(talk delivered by Carla Andreani – University Roma Tor Vergata)

Science & Technology Facilities Council
ISIS



Science & Technology Facilities Council
ISIS

Dec 16th 2014: 30 years of neutrons at ISIS

Some of our achievements:

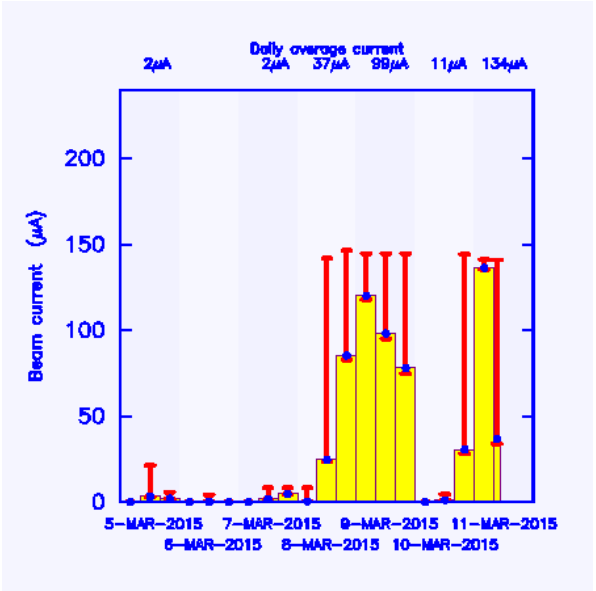
- 114,000 days of neutron and muon instrument time requested across 24,000 separate beamtime proposals
- 60,000 experiment days delivered on ISIS instruments, for around 13,000 separate experiments
- 30,000 Gb of data collected
- Over 10,000 publications produced
- ~12g of neutrons produced – about a teaspoonful!

Science & Technology Facilities Council
ISIS

ISIS long shutdown work successfully completed

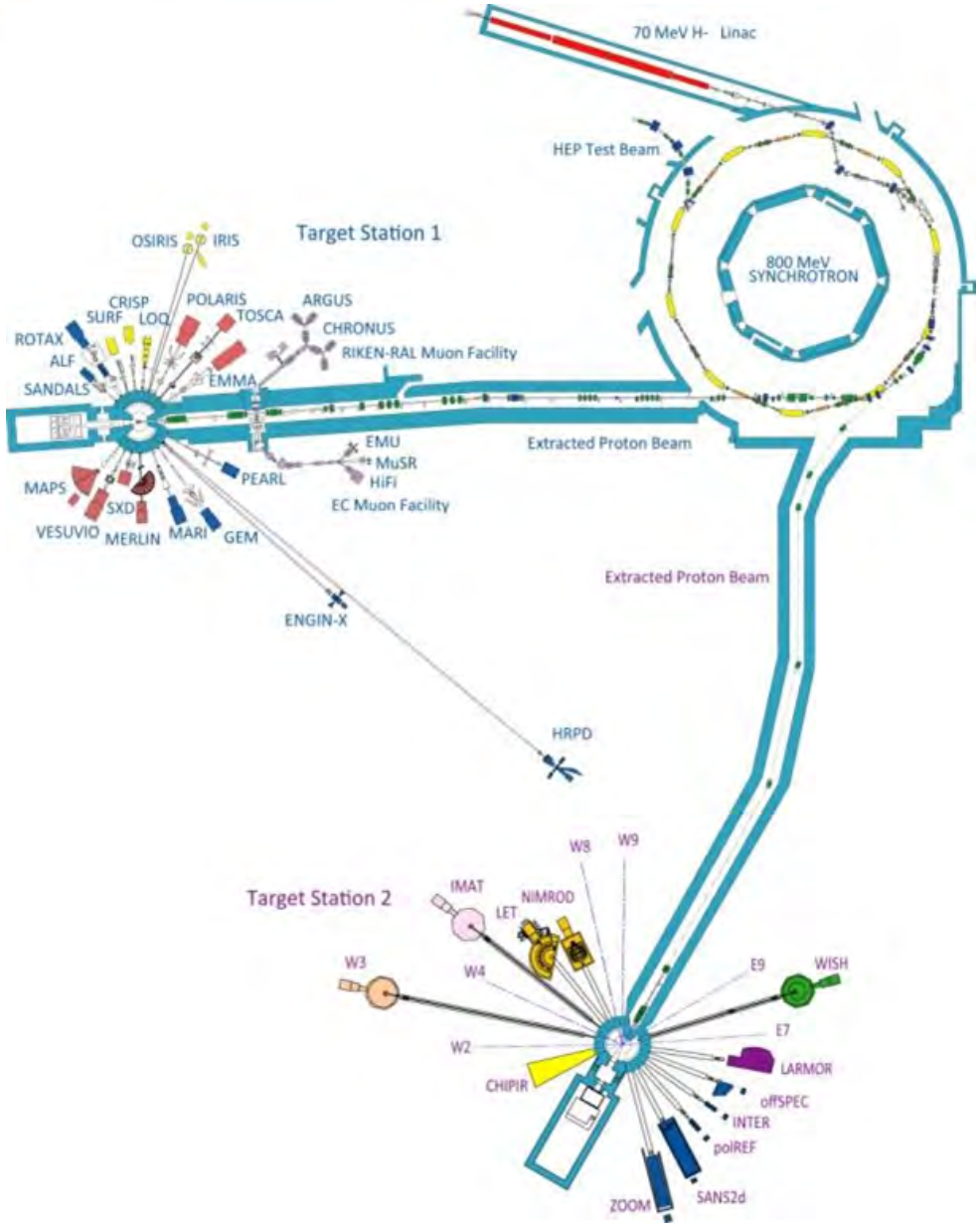
Accelerator has restarted operation

New ISIS control room

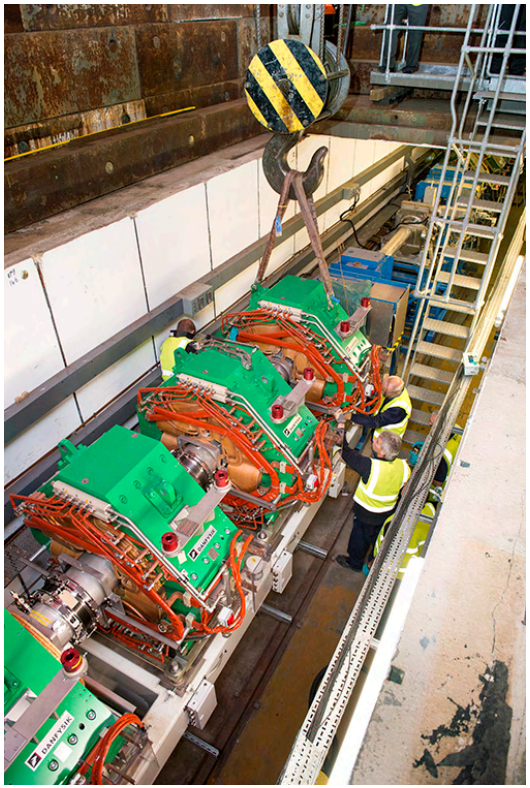


Science & Technology Facilities Council
ISIS

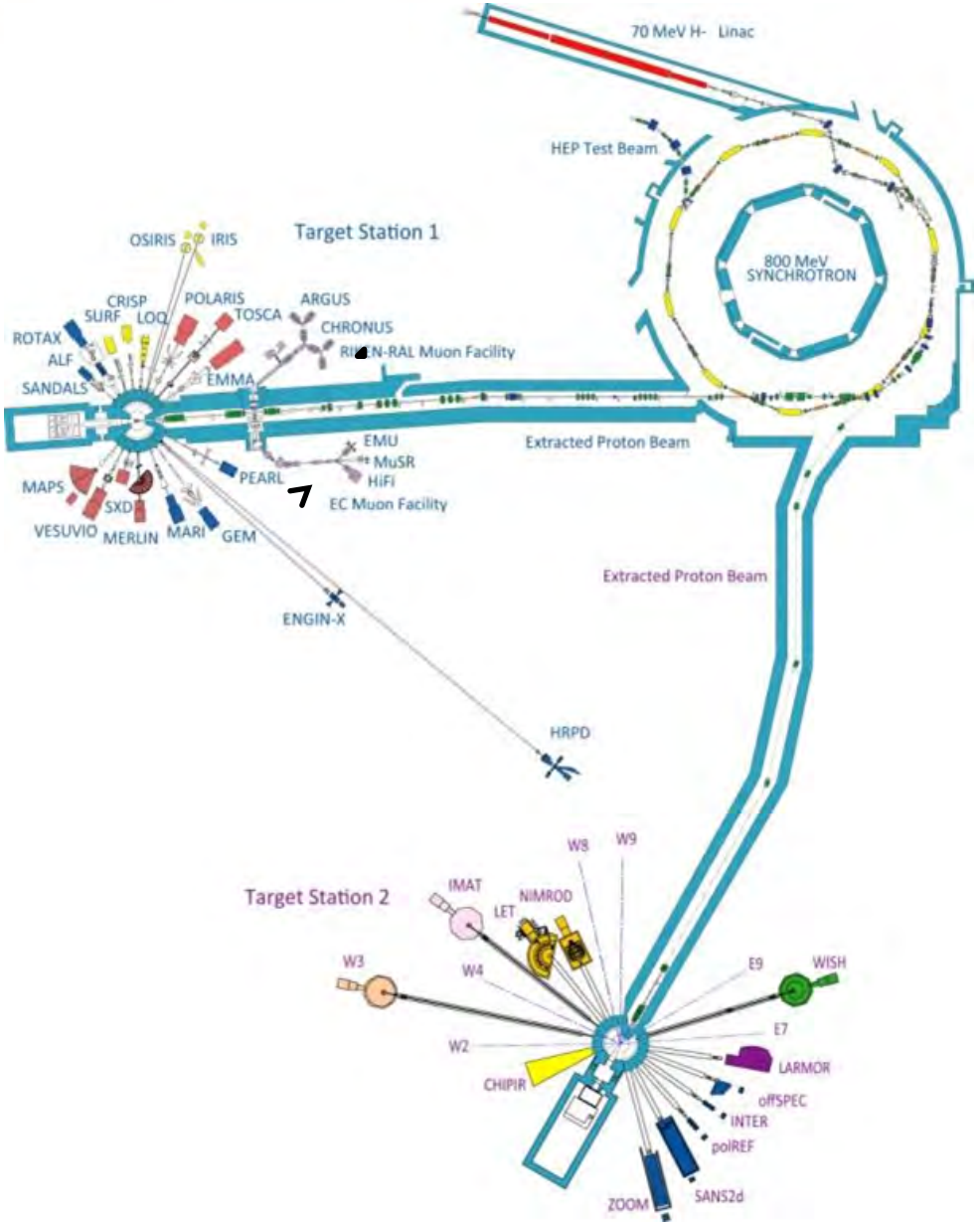
Major long shutdown tasks



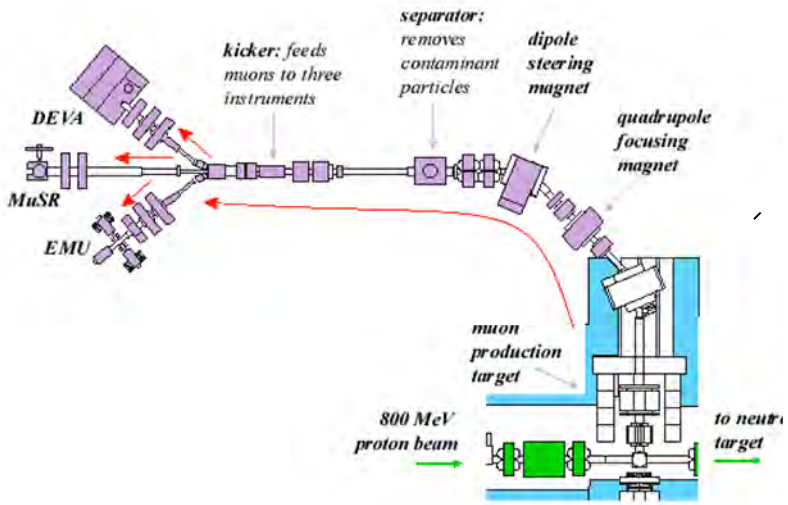
Science & Technology Facilities Council
ISIS

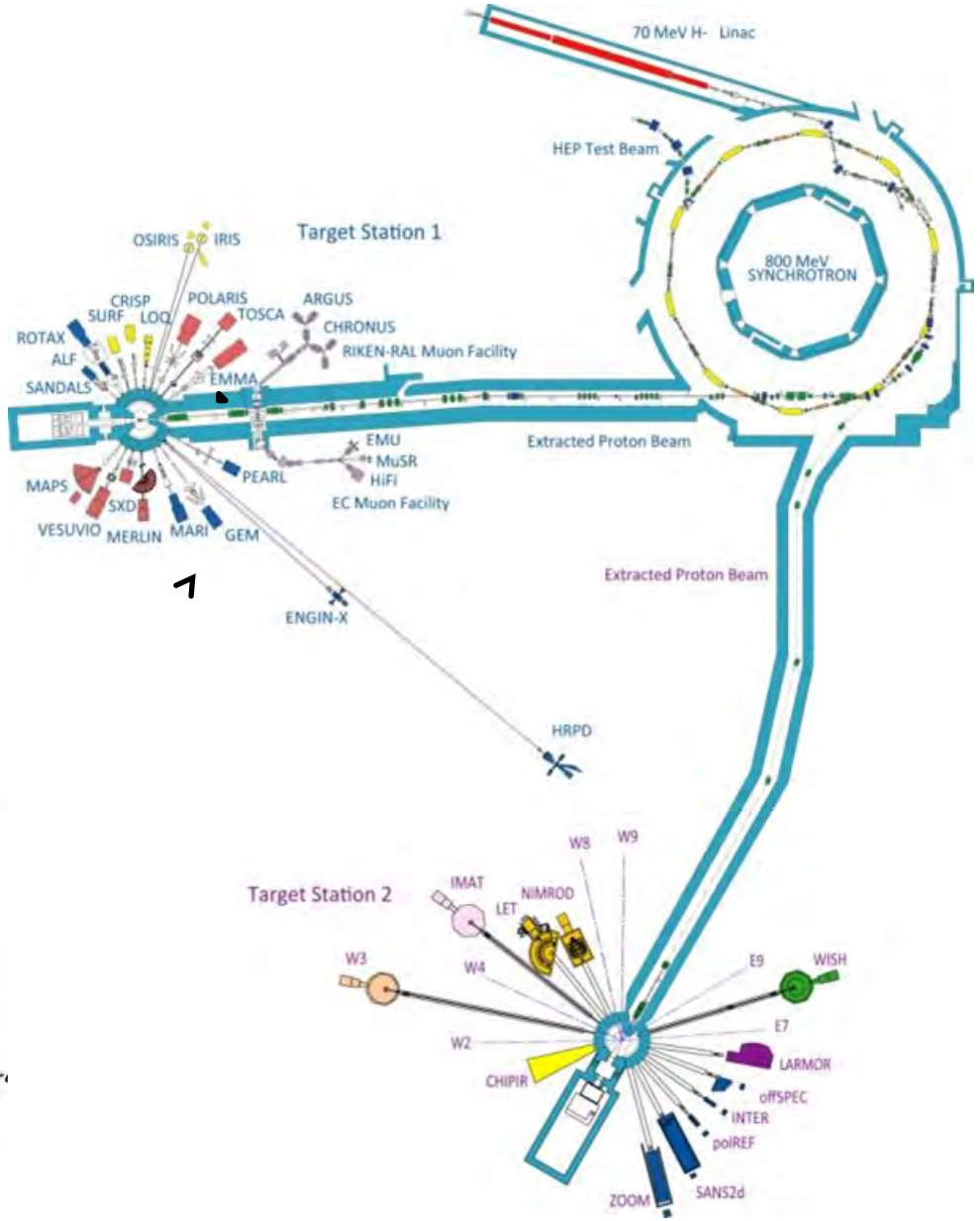


Replacement of EPB focusing magnets EQ 41-43 upstream of the intermediate target



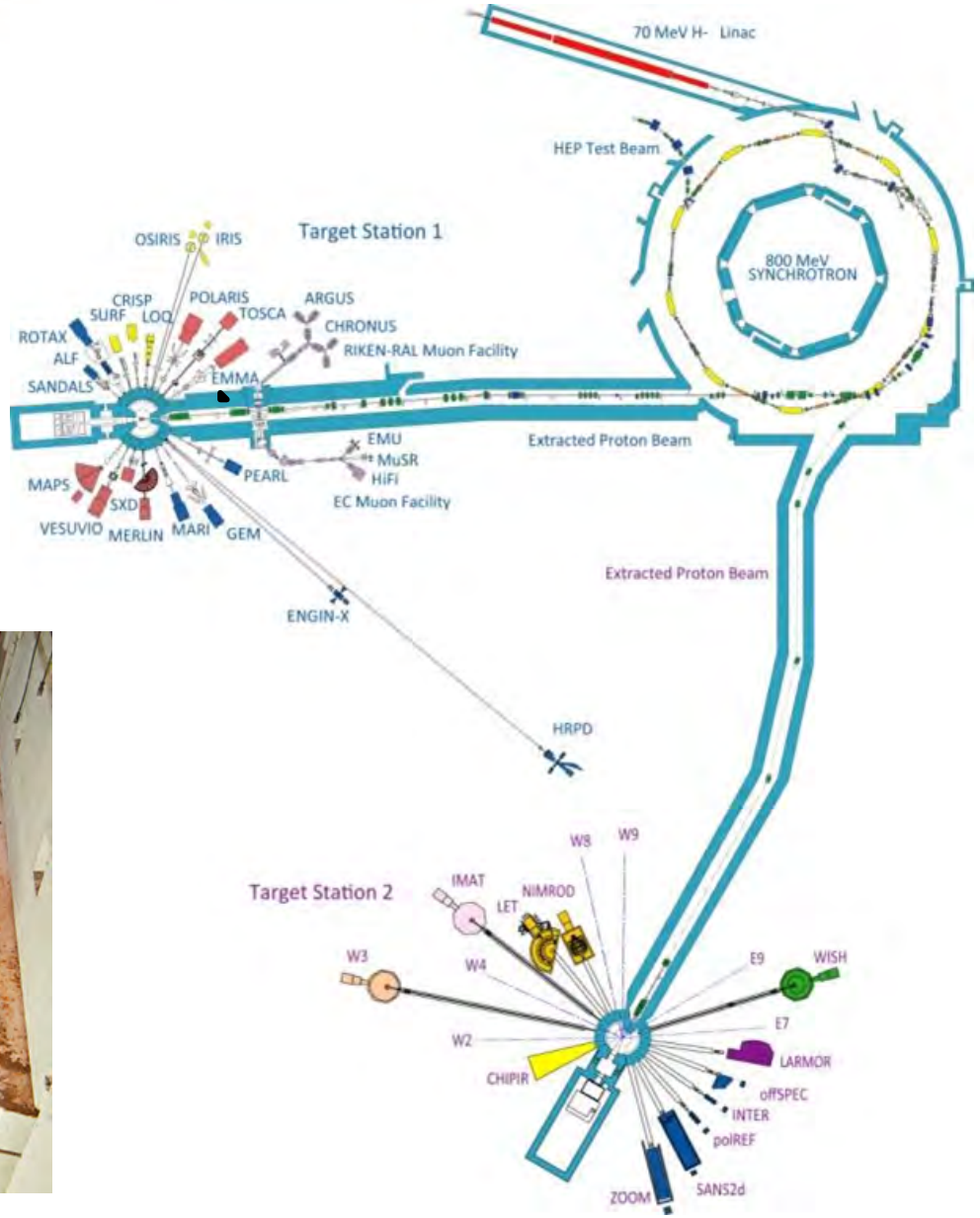
Science & Technology Facilities Council
ISIS





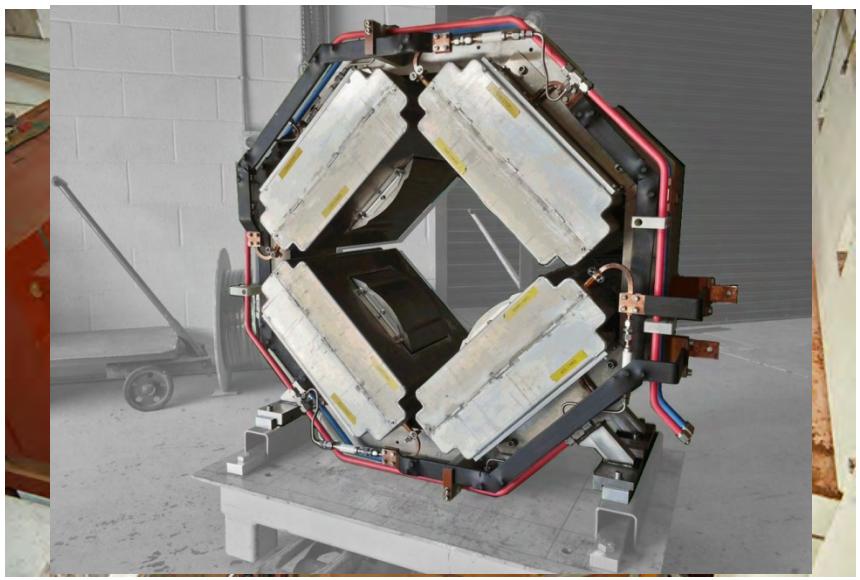
Muon beamline front end replacement

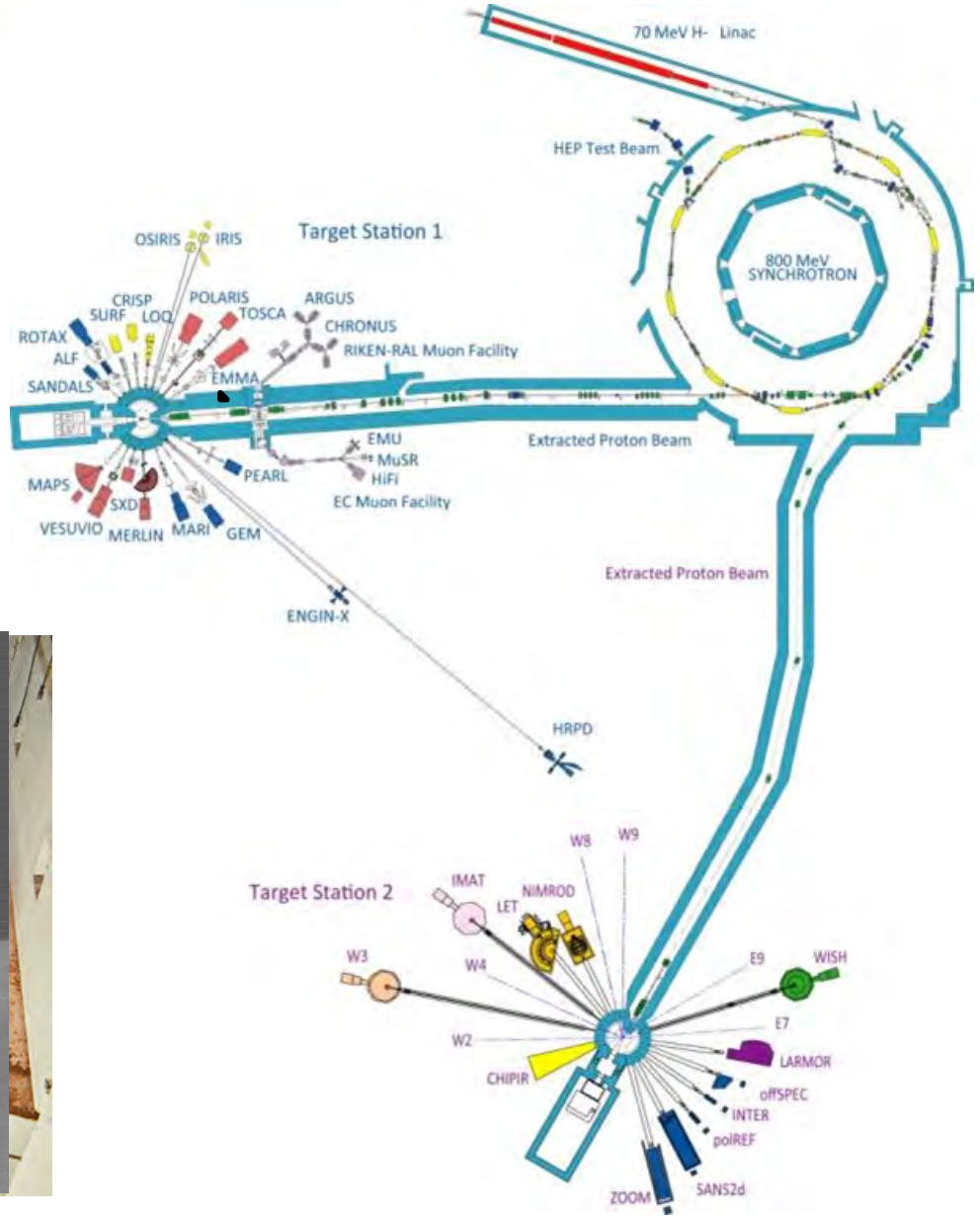
Science & Technology Facilities Council
ISIS



Muon beamline front end replacement

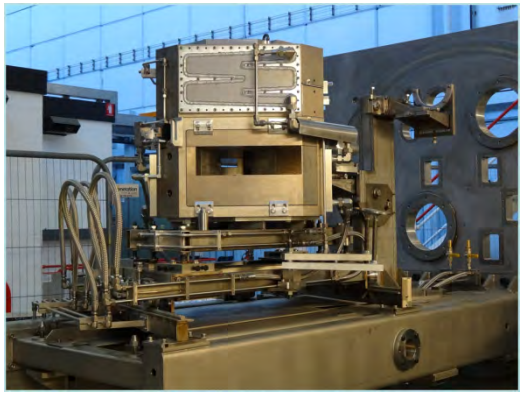
Science & Technology Facilities Council
ISIS

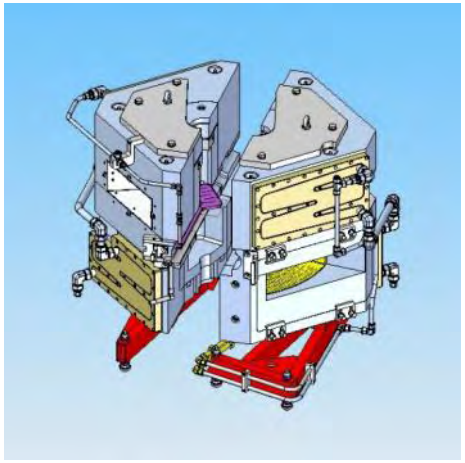




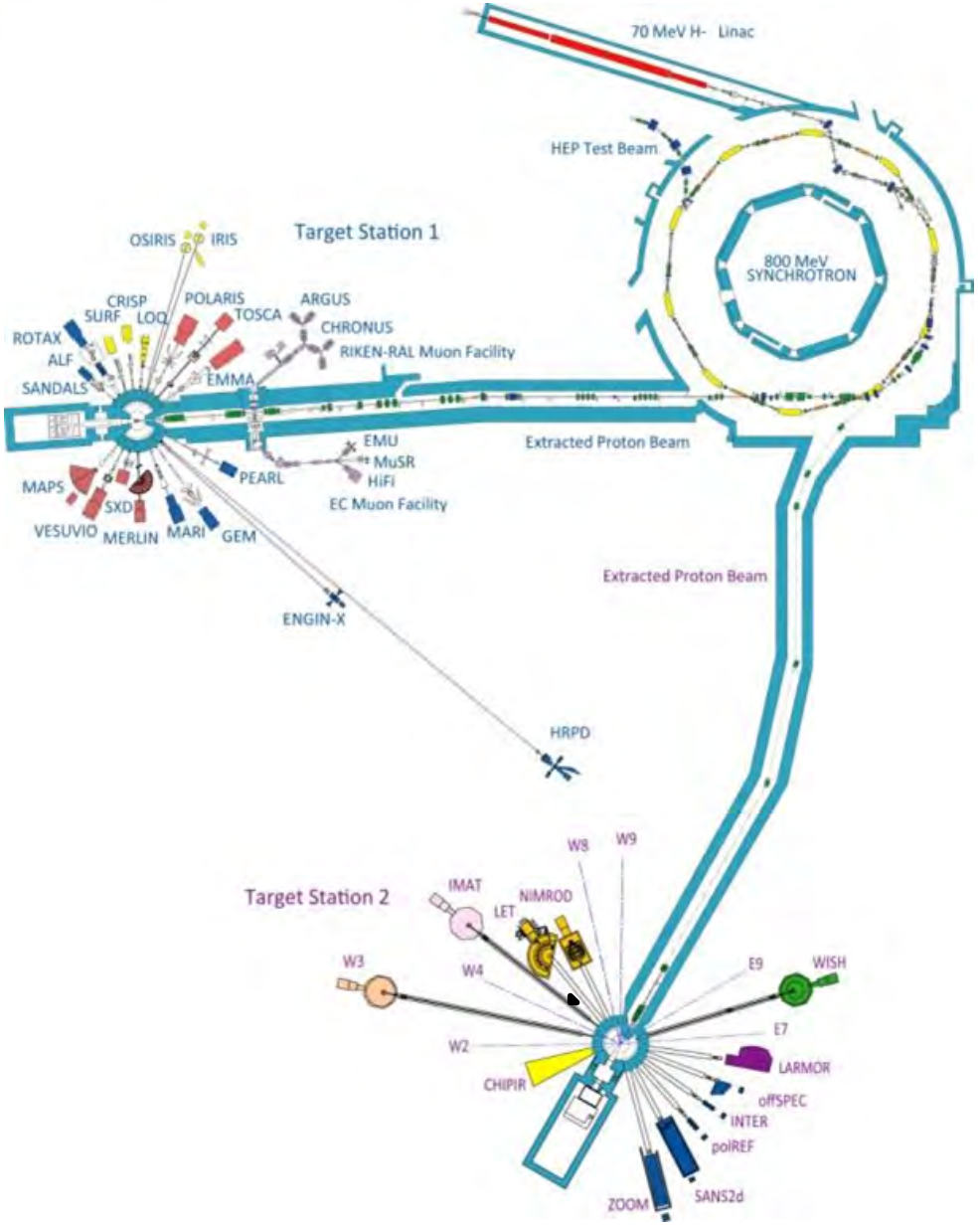
New rad hard concrete magnets

Science & Technology Facilities Council
ISIS



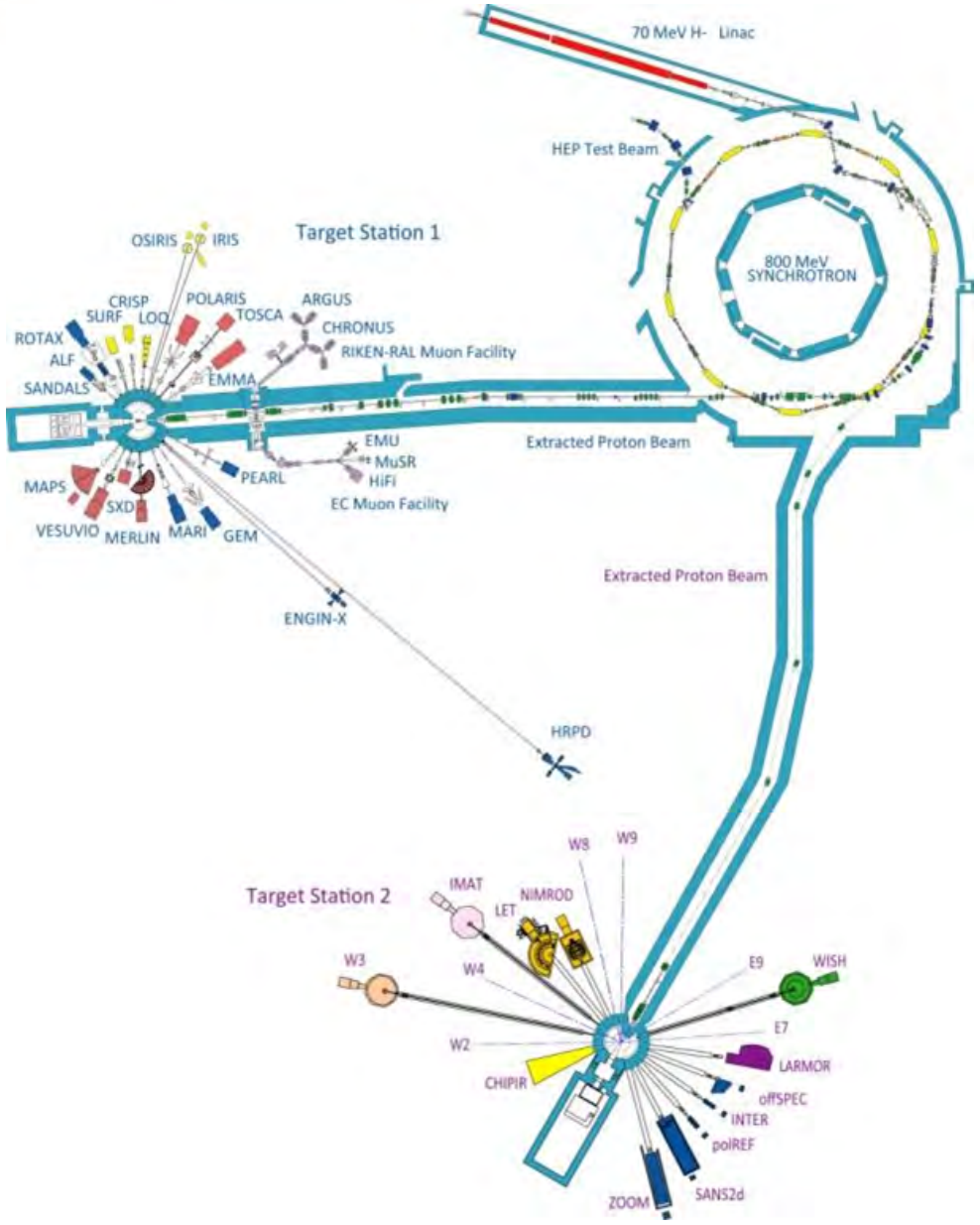


TS2 reflector change

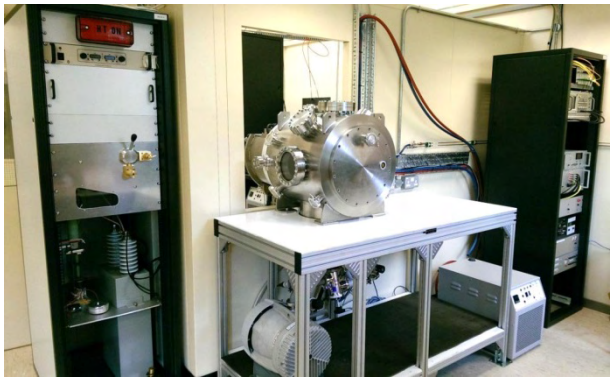


Science & Technology Facilities Council
ISIS

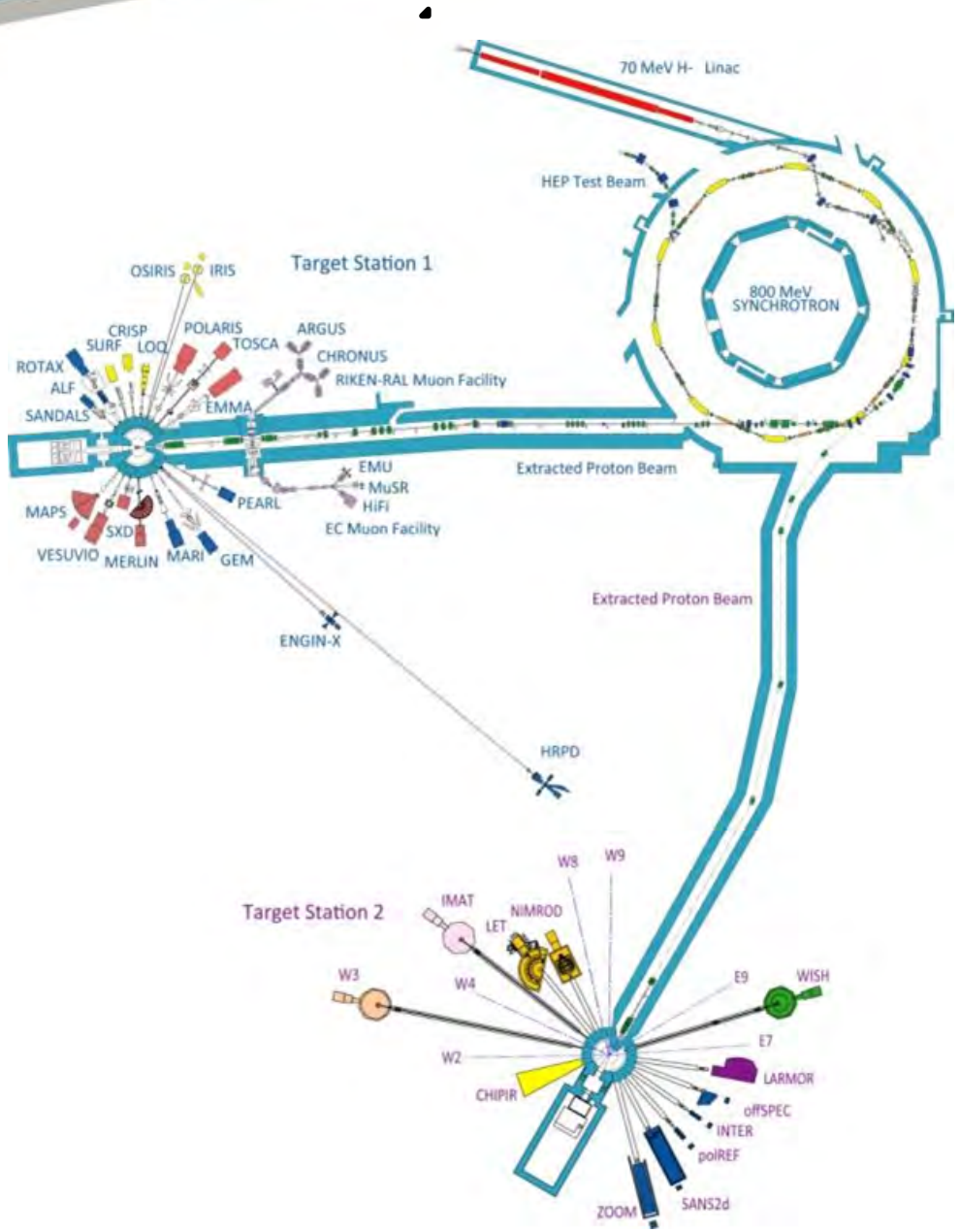
Accelerator



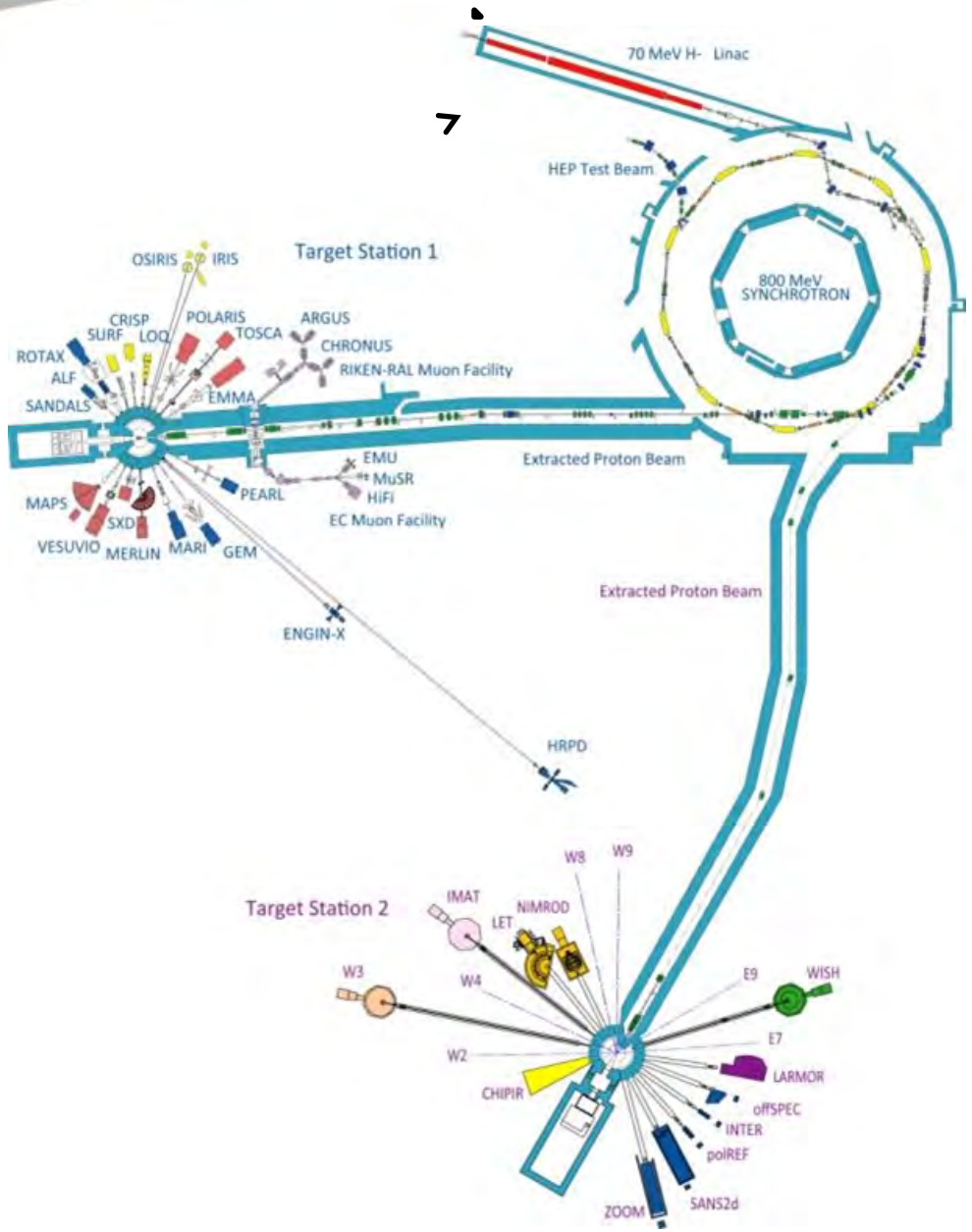
Science & Technology Facilities Council
ISIS



VESPA: ion source test stand

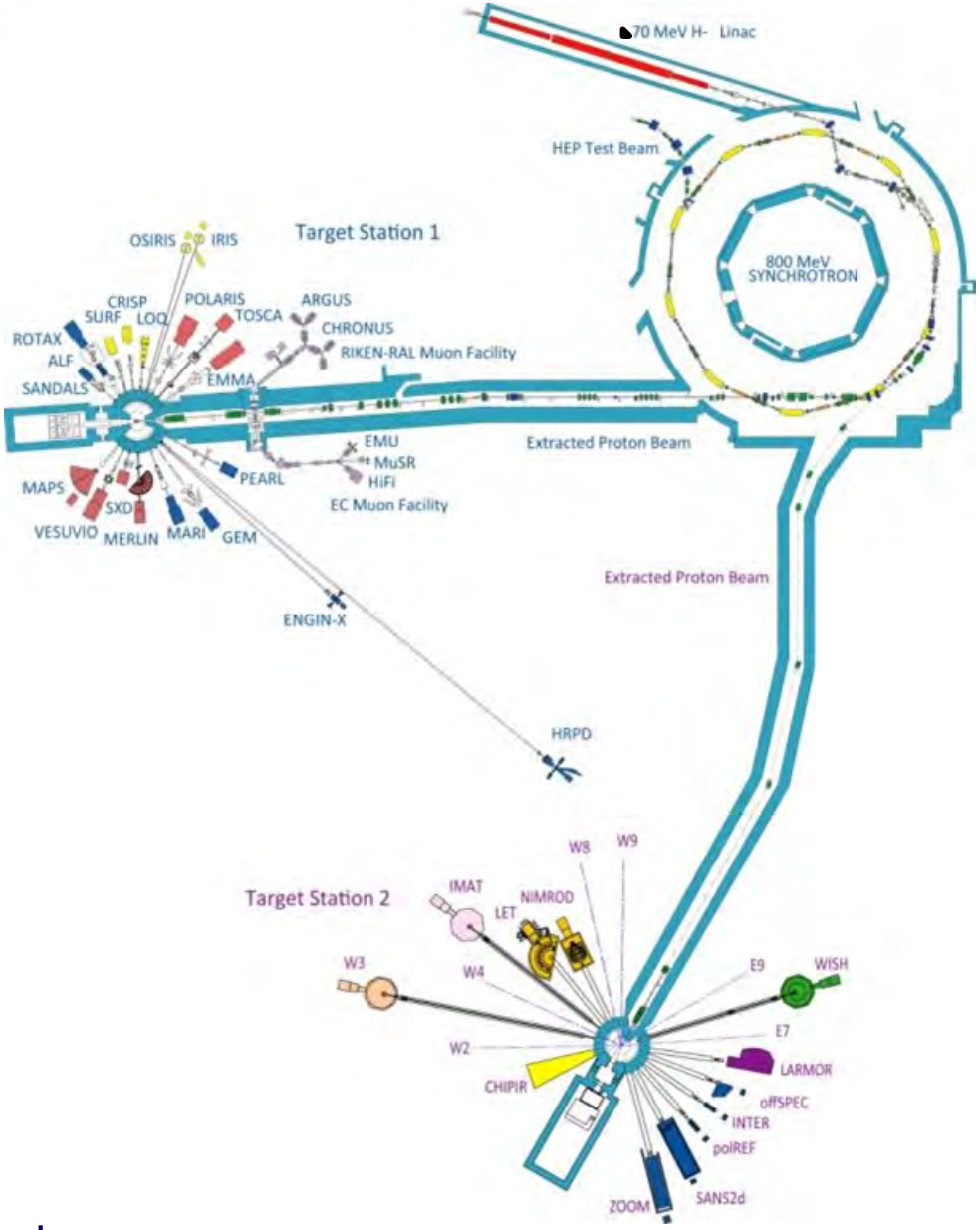


Science & Technology Facilities Council
ISIS



Front end test stand: new RFQ

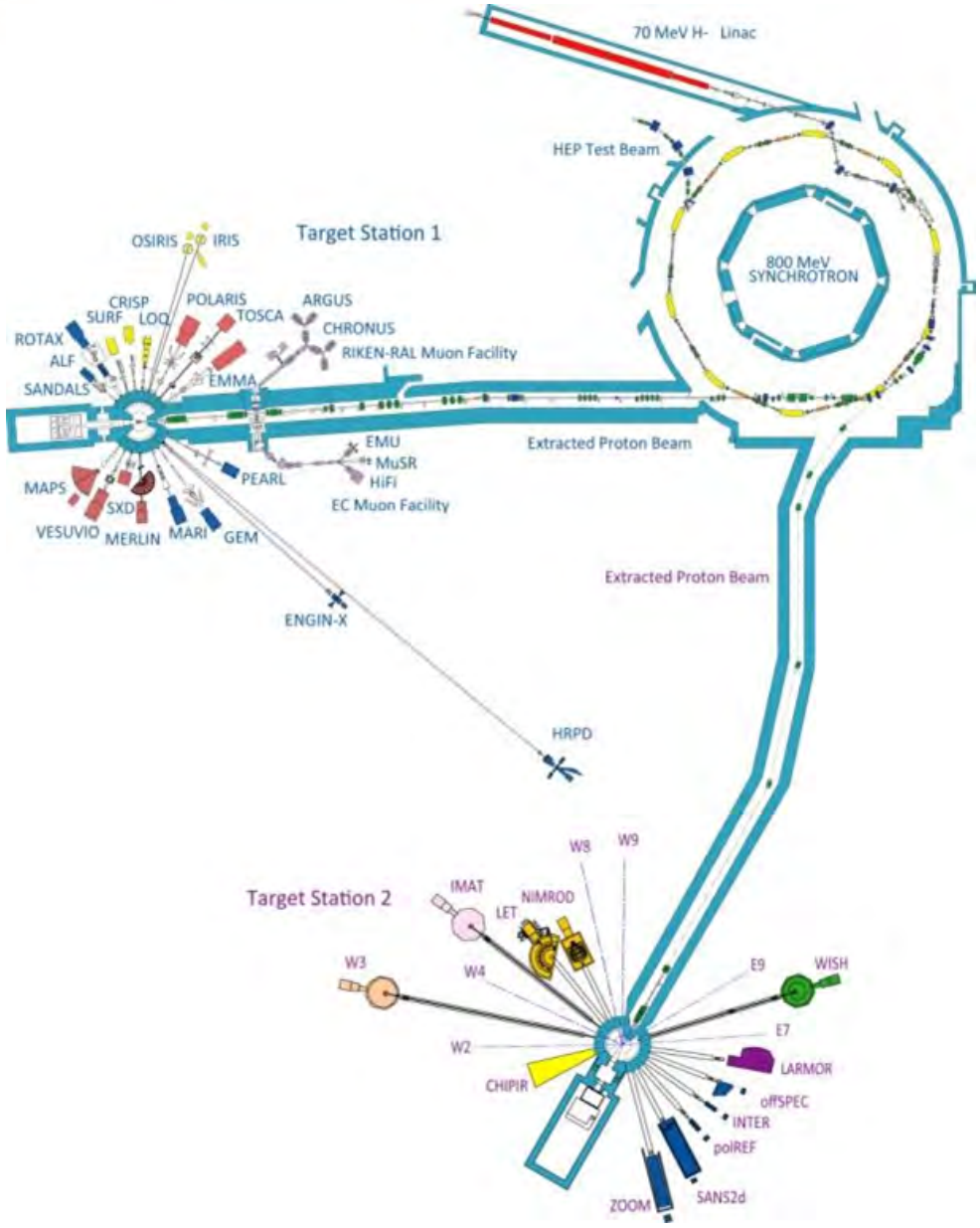
Science & Technology Facilities Council
ISIS



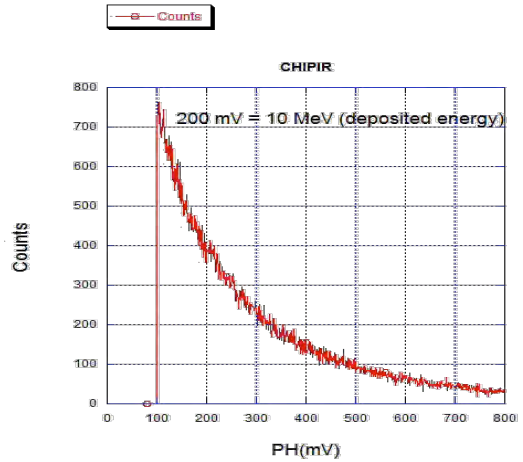
New Linac Tank 4 prototype and test stand

Science & Technology Facilities Council
ISIS

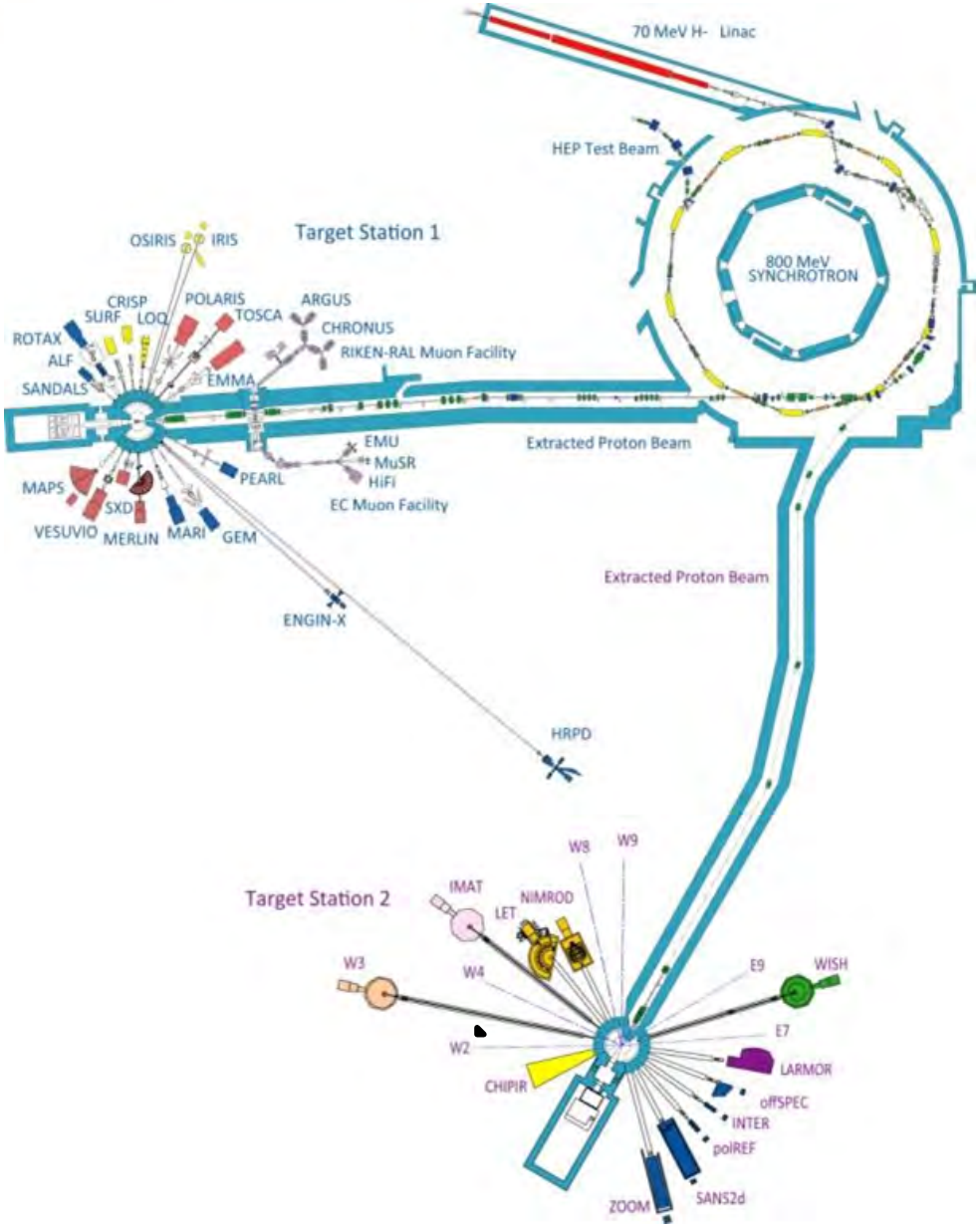
Instruments



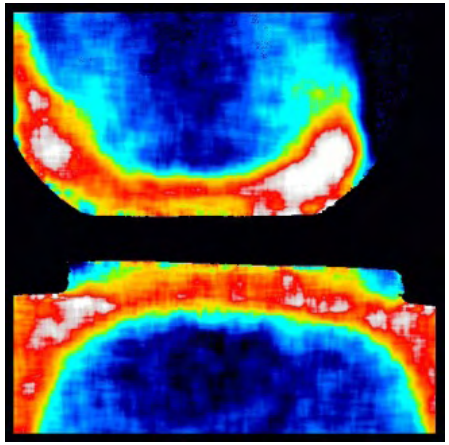
Science & Technology Facilities Council
ISIS

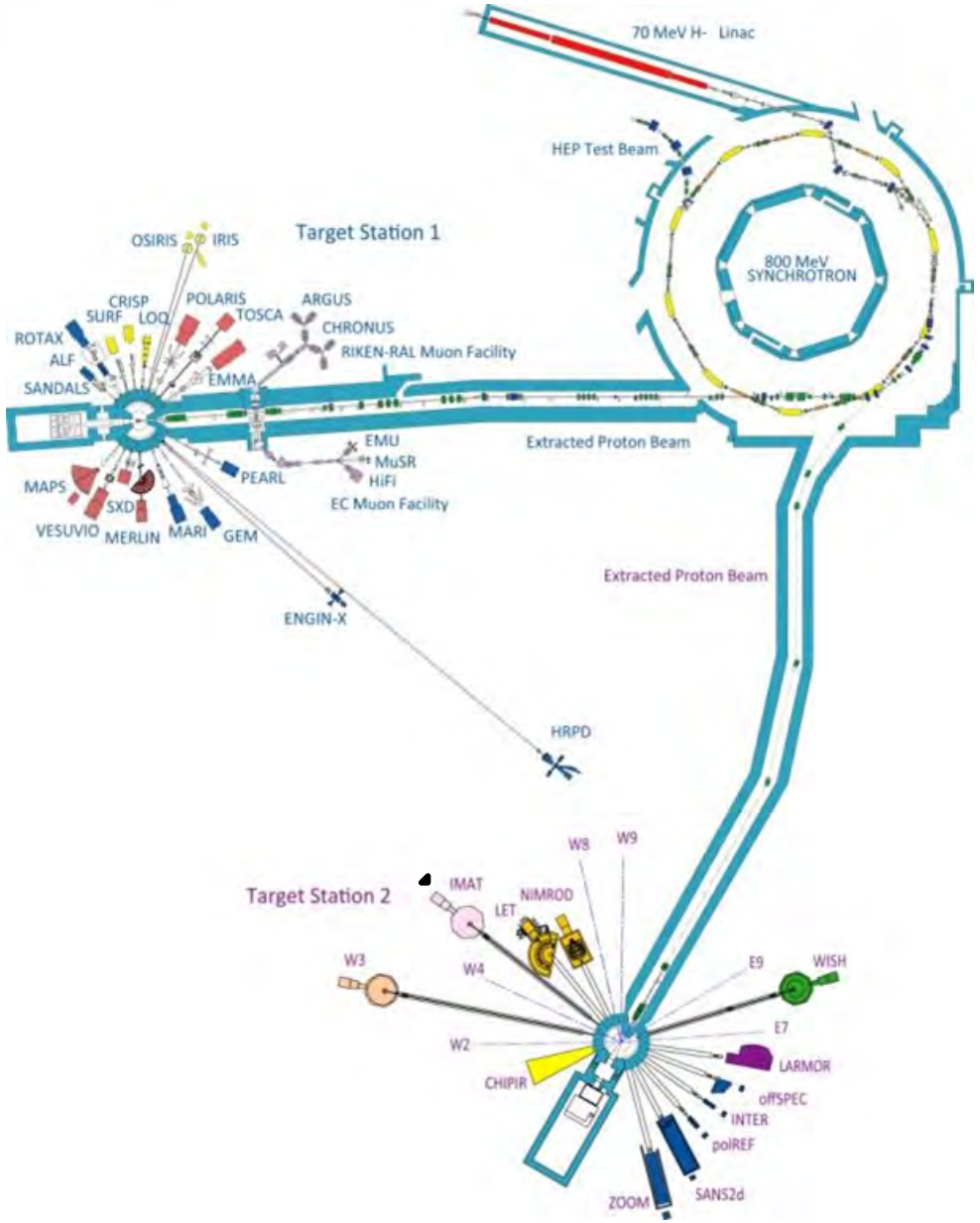


ChipIr



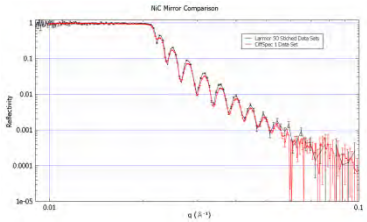
Science & Technology Facilities Council
ISIS

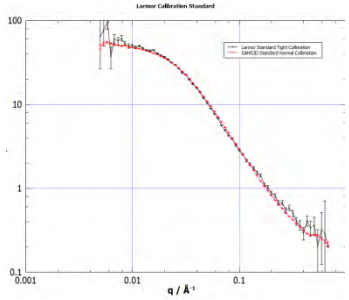


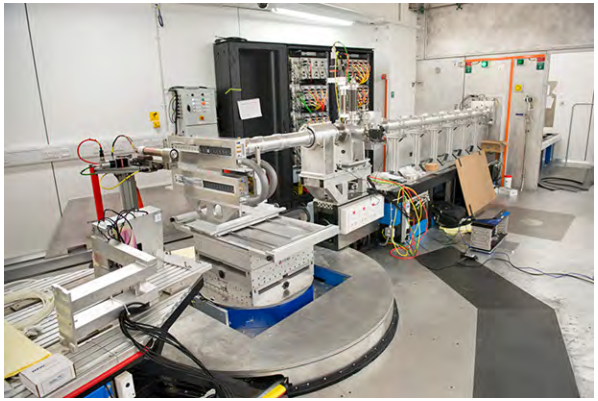


IMAT

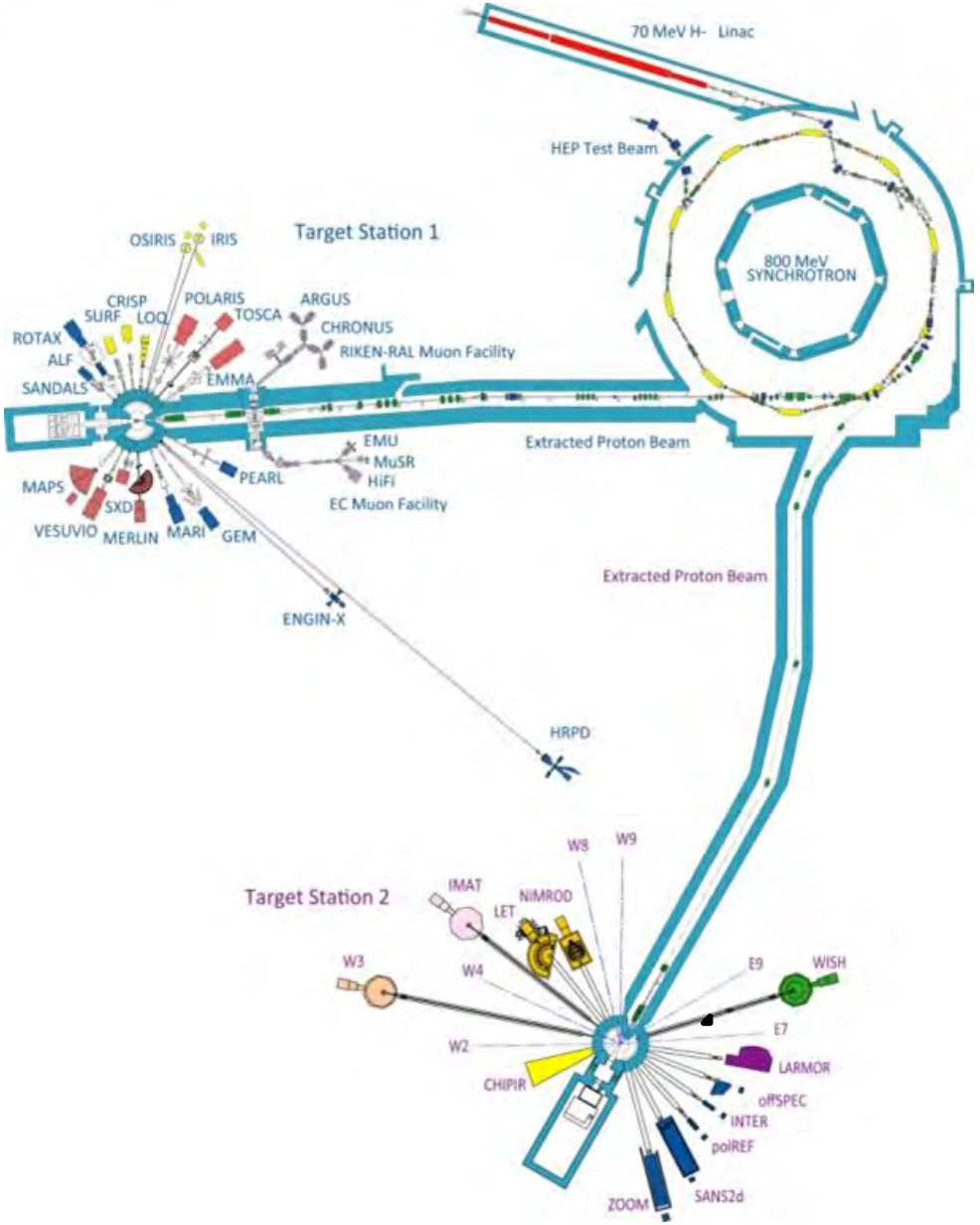
Science & Technology Facilities Council
ISIS





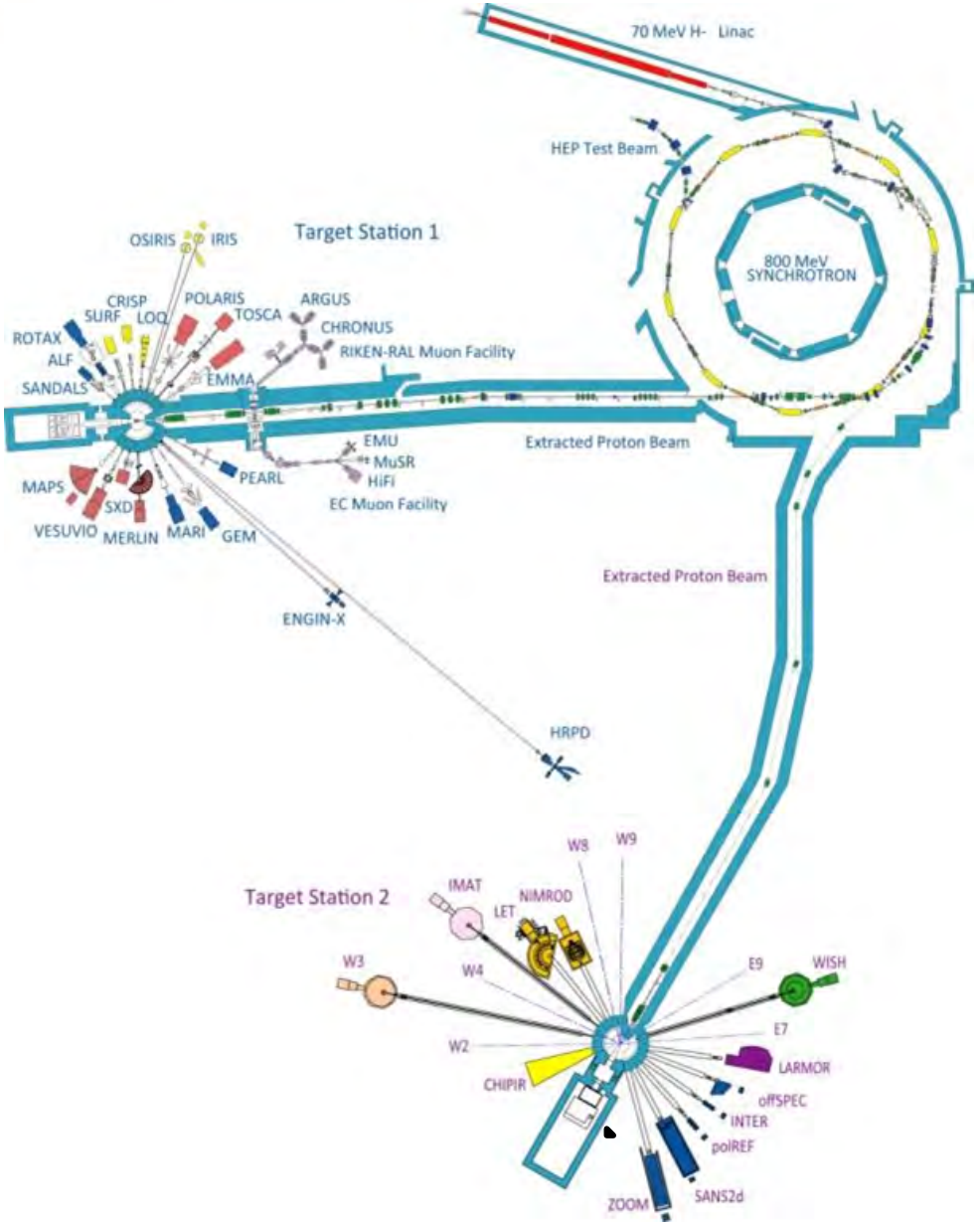


Larmor

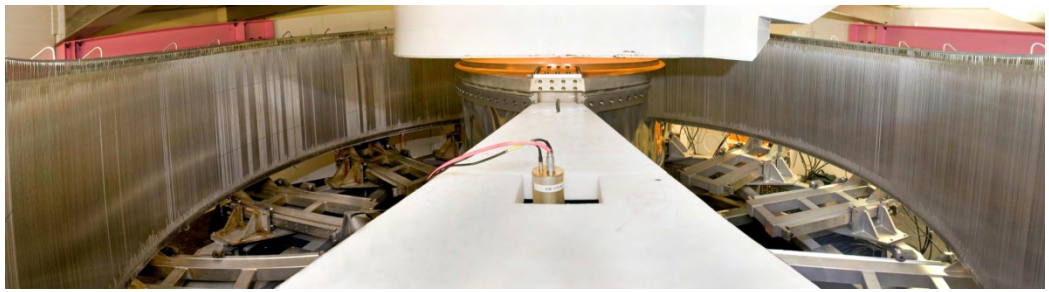


Science & Technology Facilities Council
ISIS

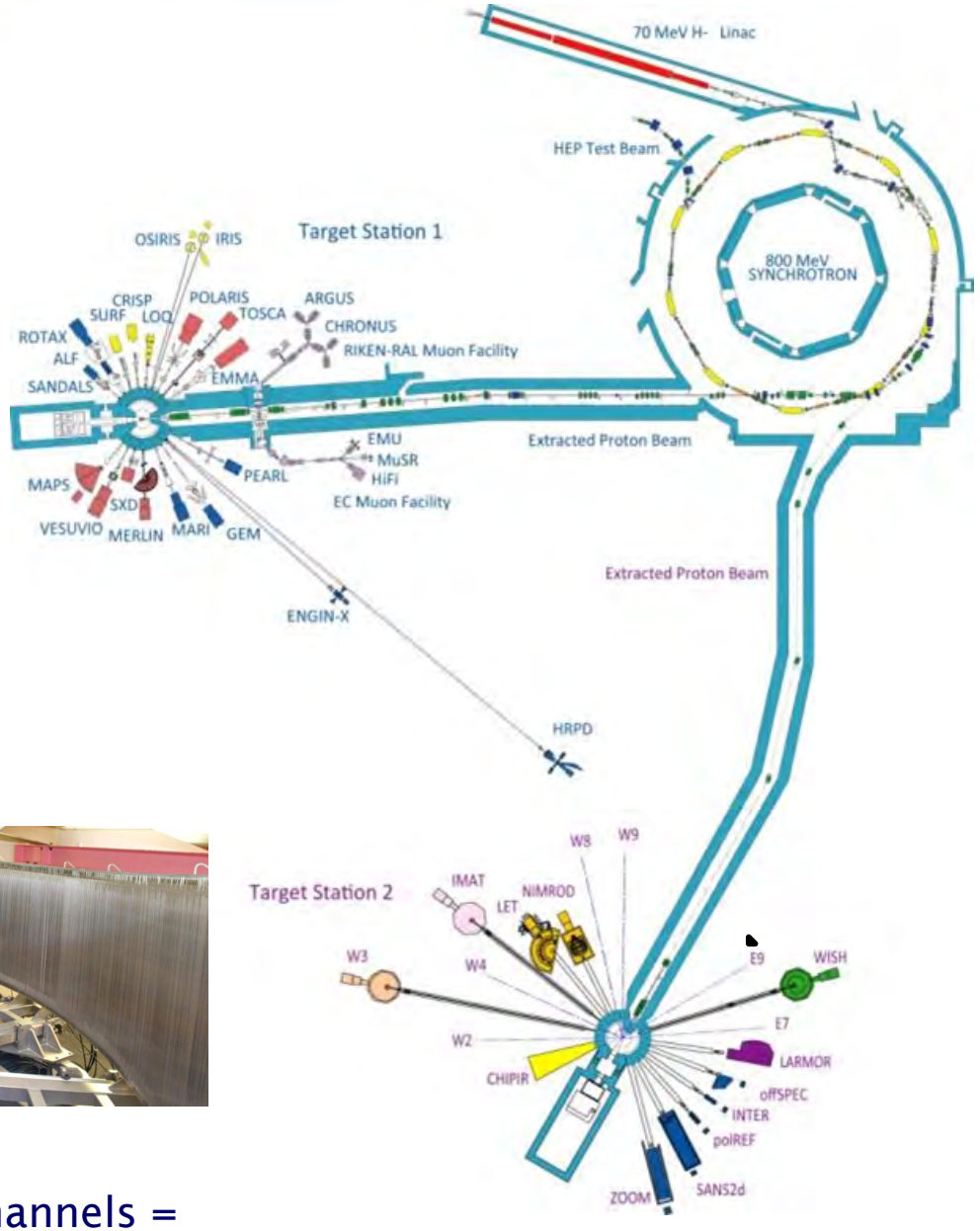
ZOOM



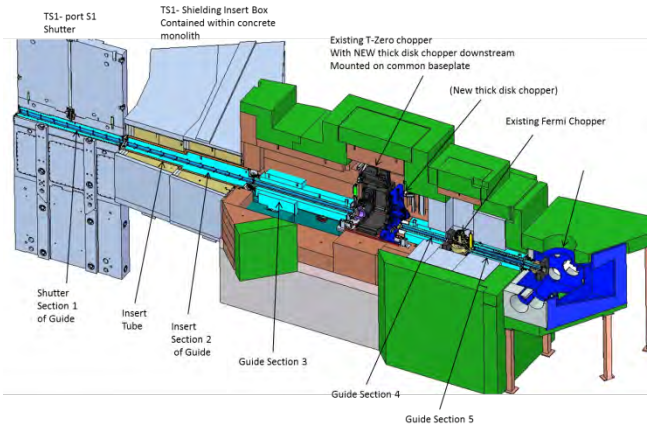
Science & Technology Facilities Council
ISIS

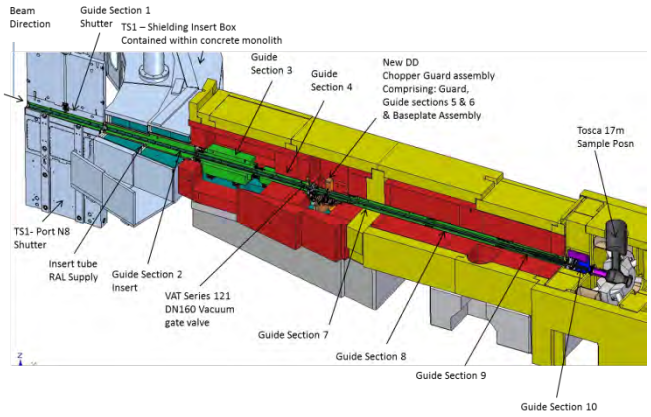


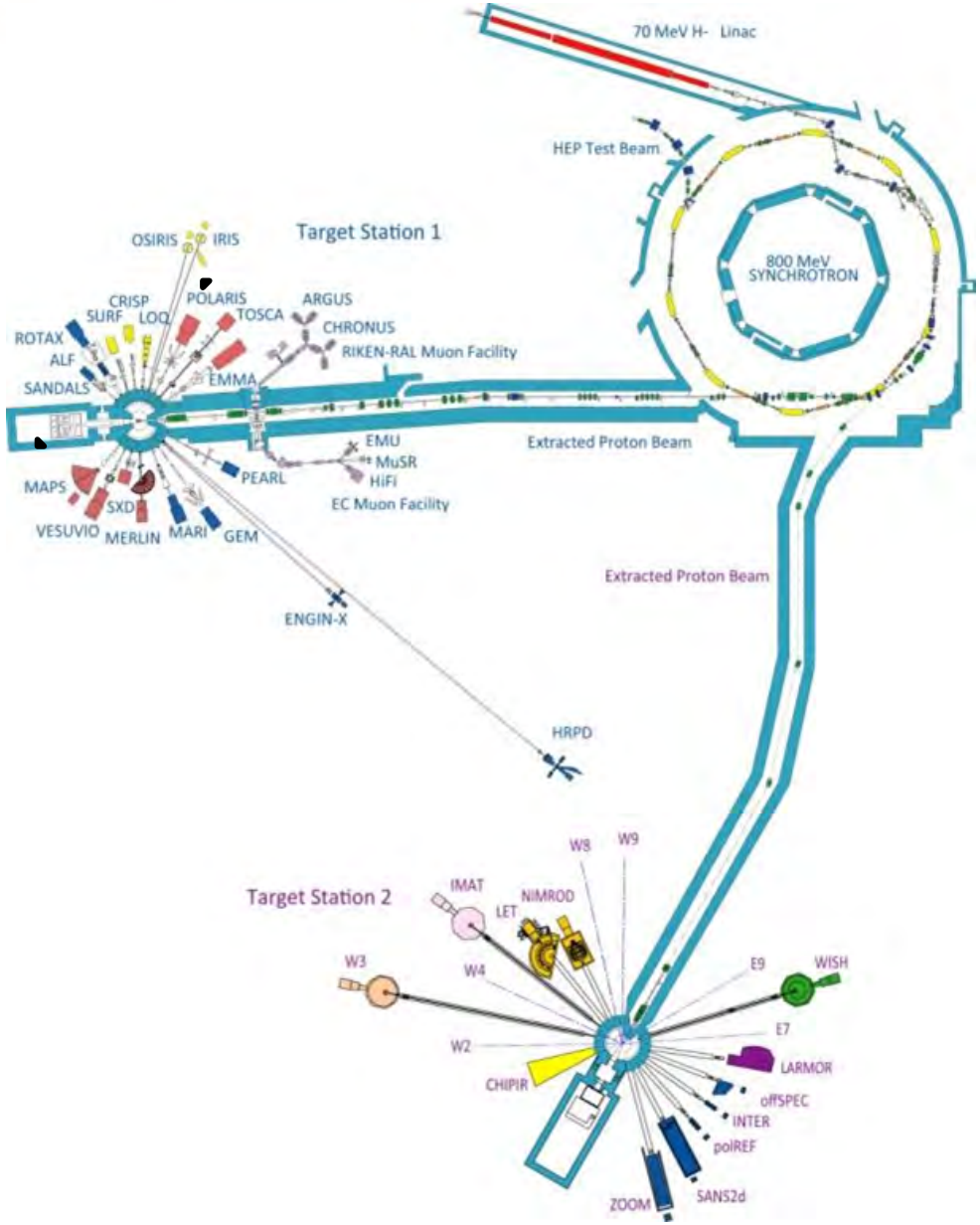
WISH detector complete:
1520 tubes x 128 pixels x 5000 tof channels =
1Gb / dataset (compressed)



Science & Technology Facilities Council
ISIS

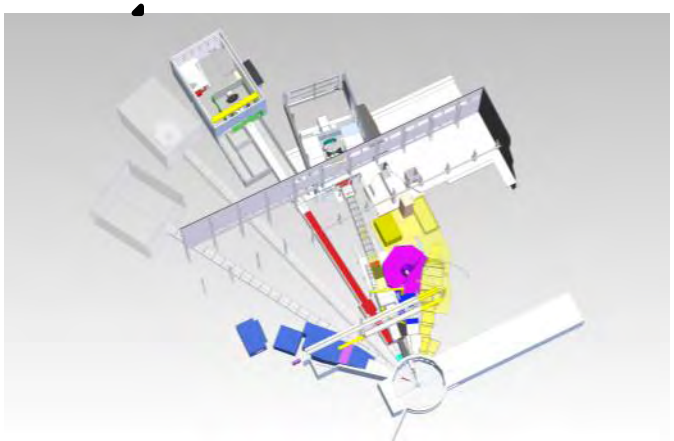


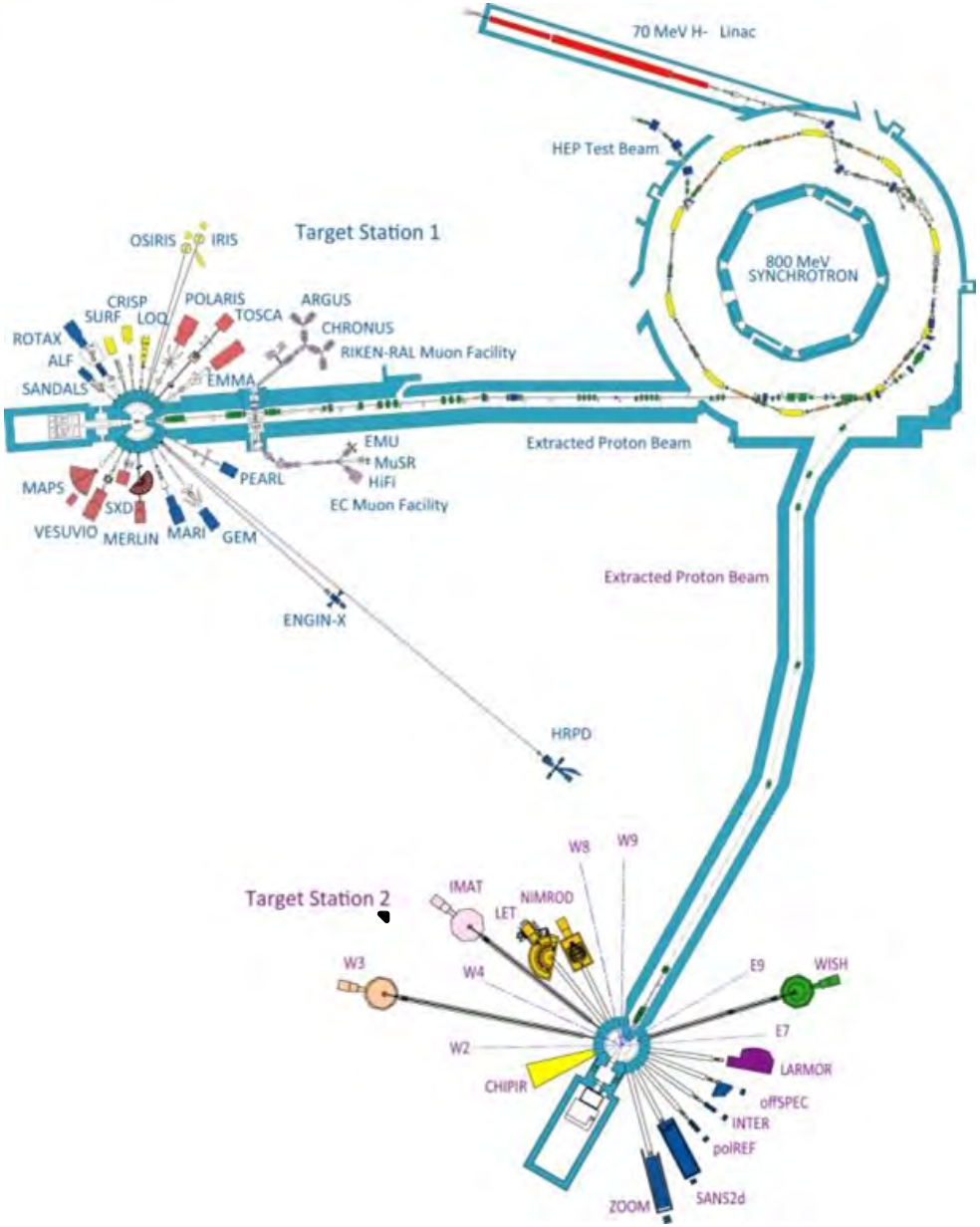




TOSCA, MAPS
guide upgrade projects

Science & Technology Facilities Council
ISIS

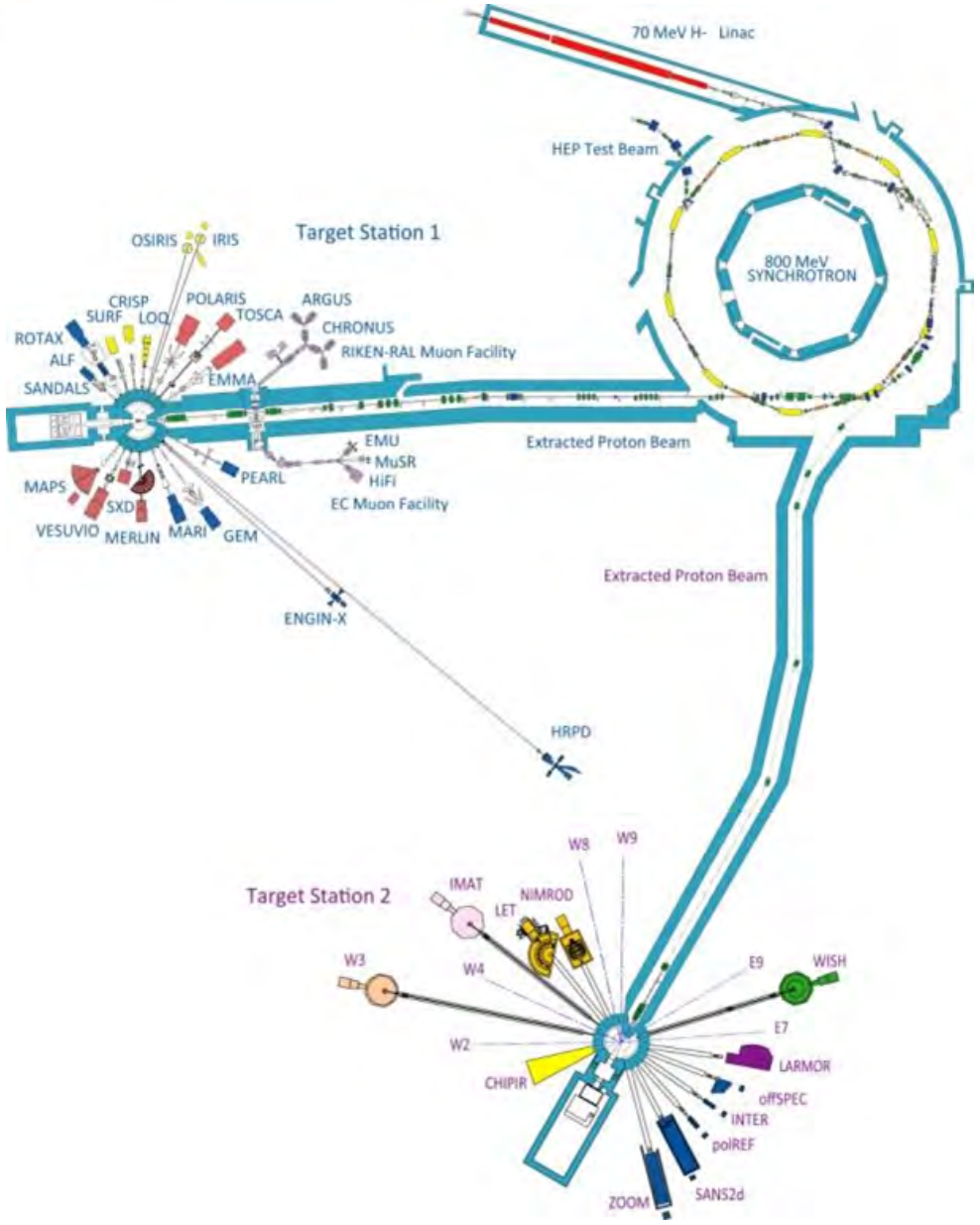




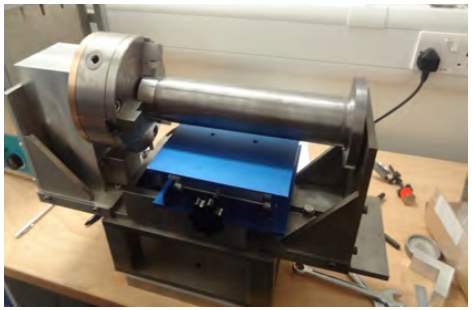
e-MAP: a new
engineering instrument

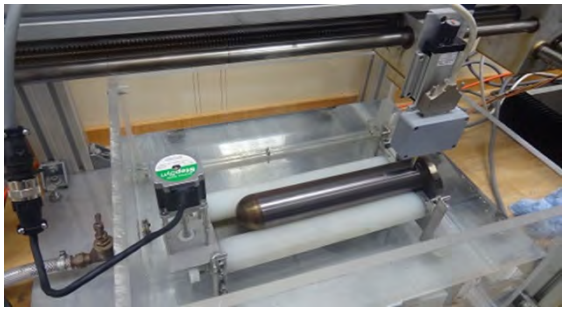
Science & Technology Facilities Council
ISIS

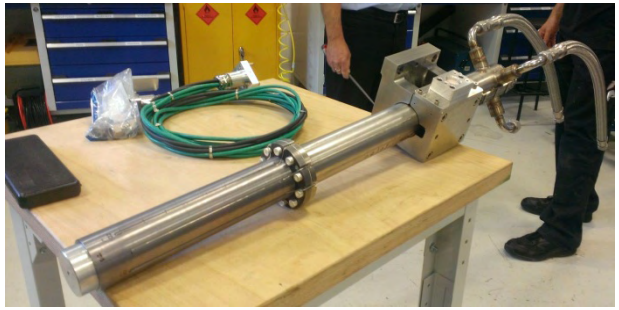
Targets



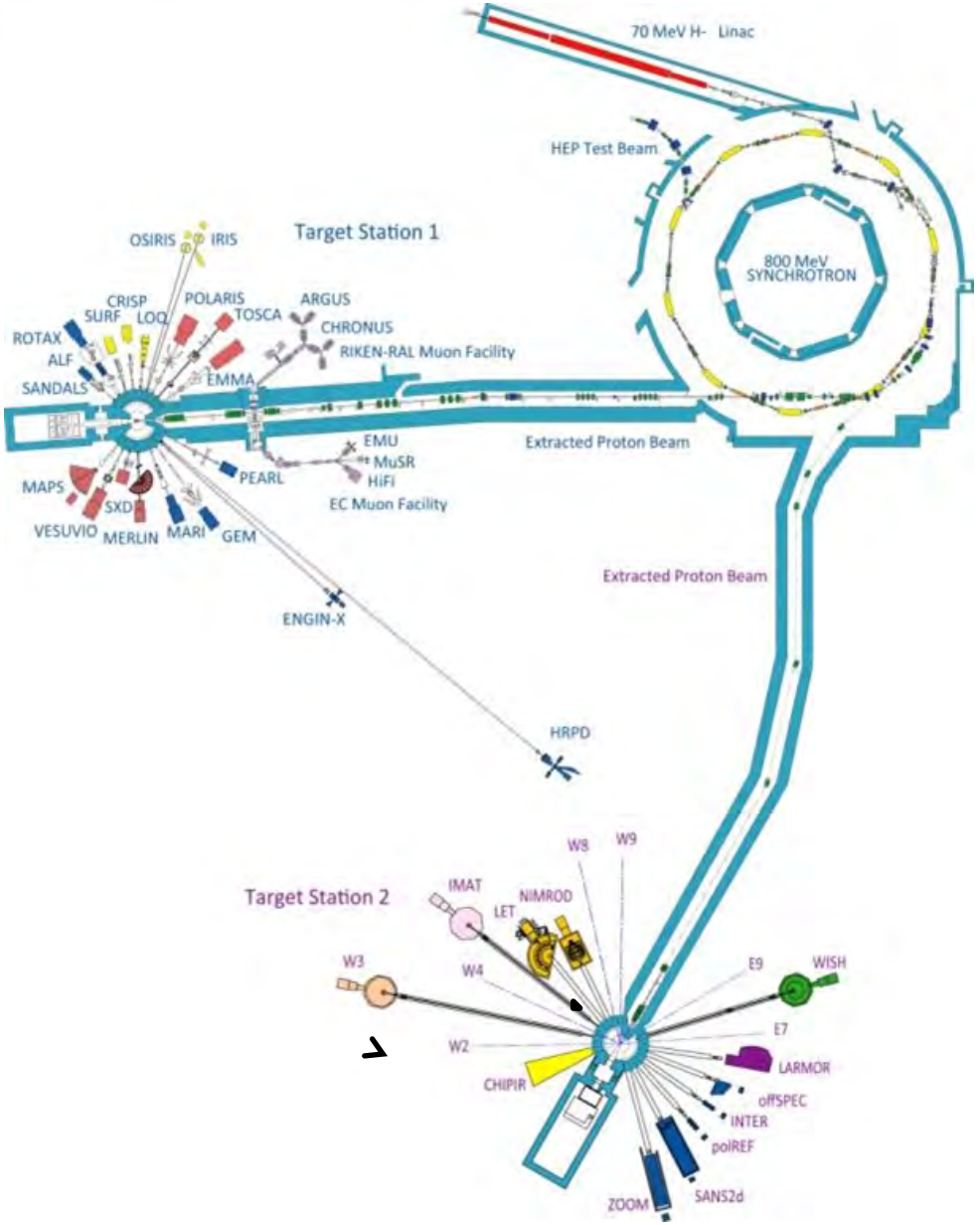
Science & Technology Facilities Council
ISIS



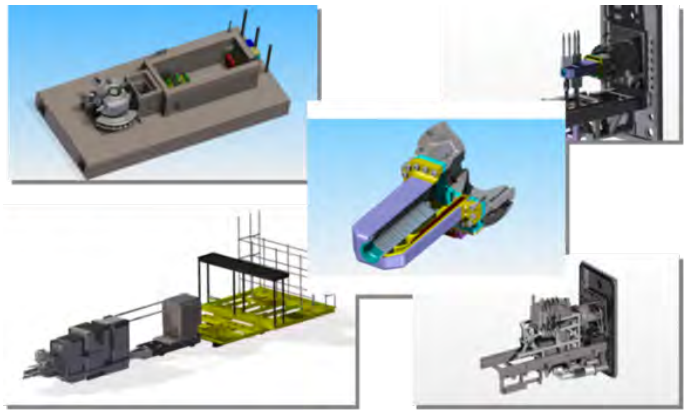


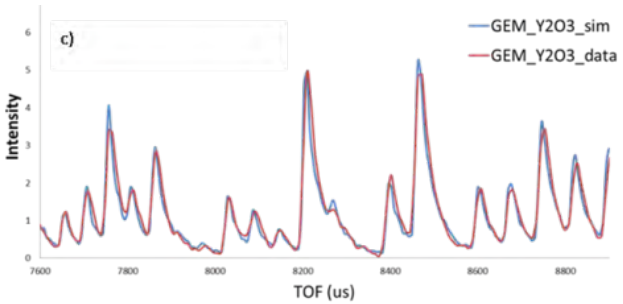


TS2 target manufacture

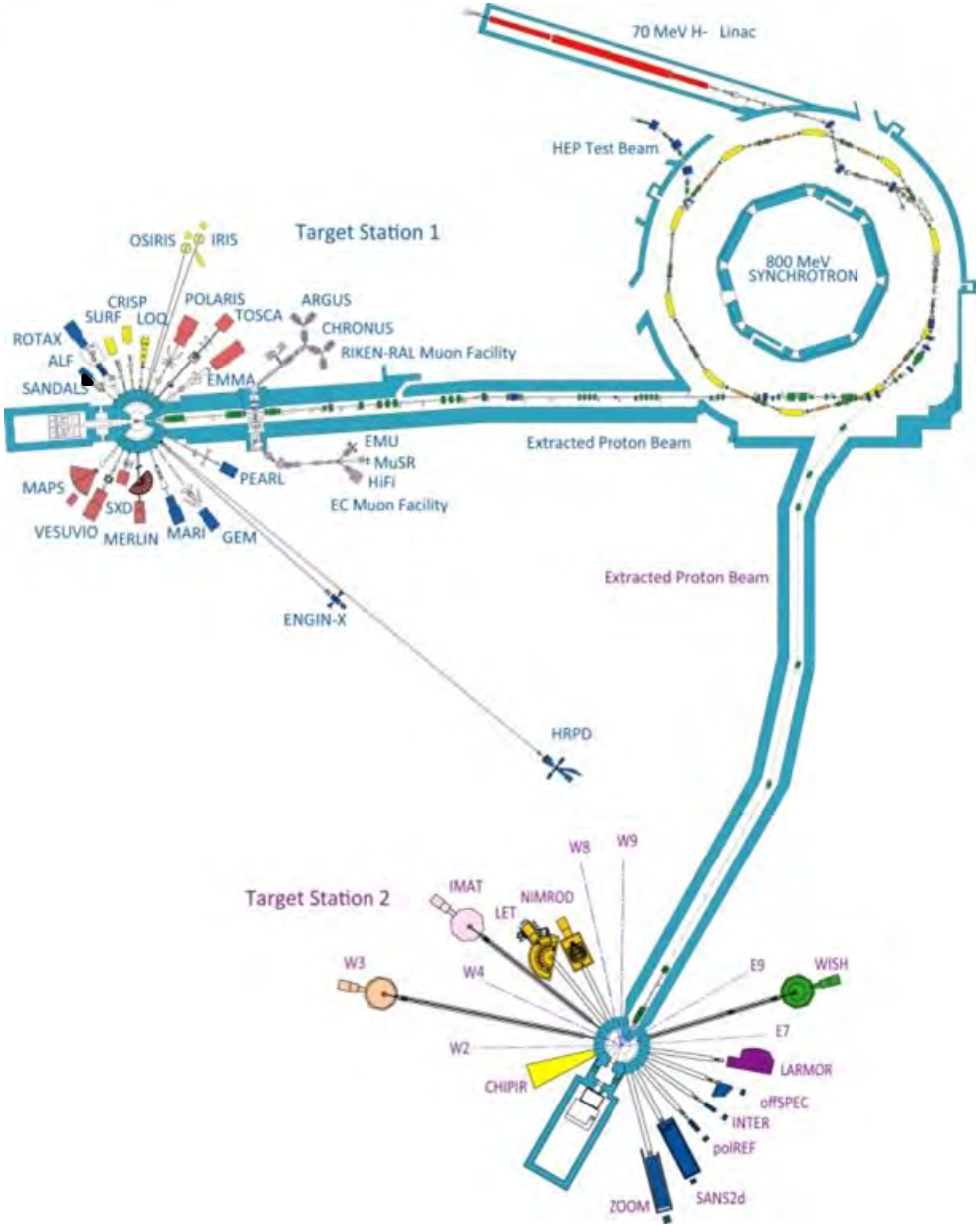


Science & Technology Facilities Council
ISIS



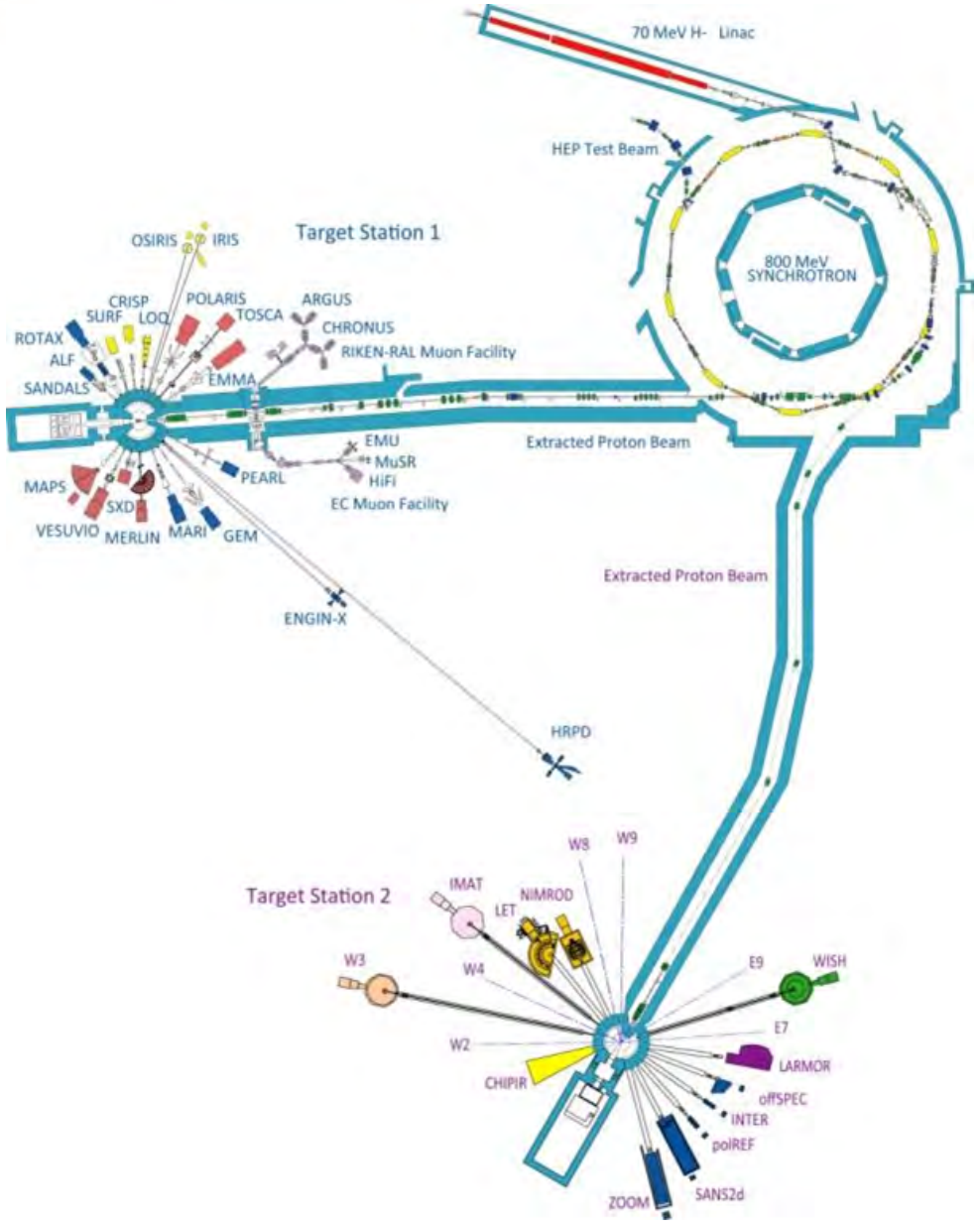


TS1 target/moderator
upgrade project



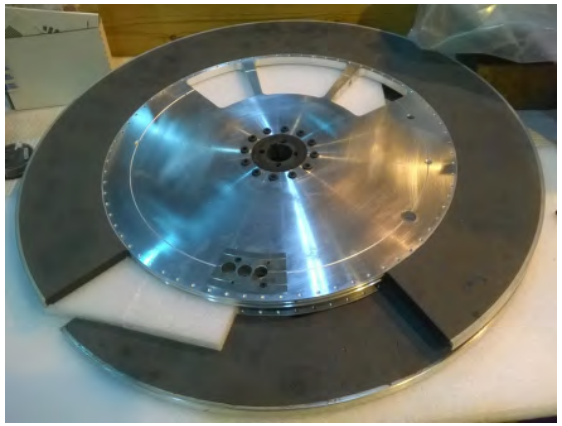
Science & Technology Facilities Council
ISIS

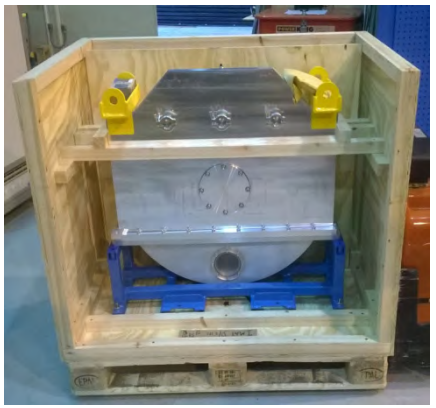
Instrumentation,
sample environment,
detectors, software

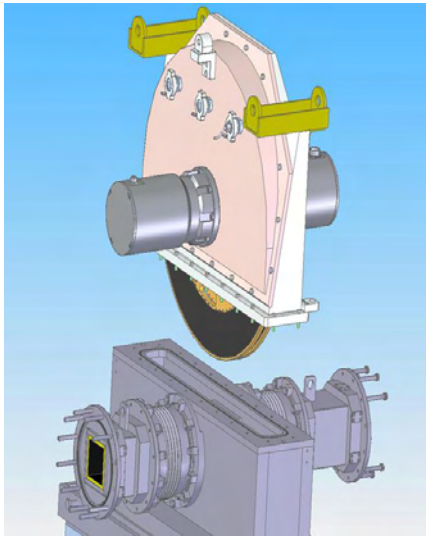


Science & Technology Facilities Council
ISIS

Chopper Vacuum Drive System







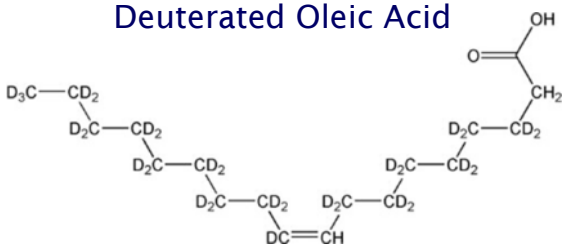
Science & Technology Facilities Council
ISIS

Synthesis Lab in R80 – UCL collaboration

Deuteration Facility – moved from Oxford

Materials required by ISIS User Community for approx. 25% of experiments.

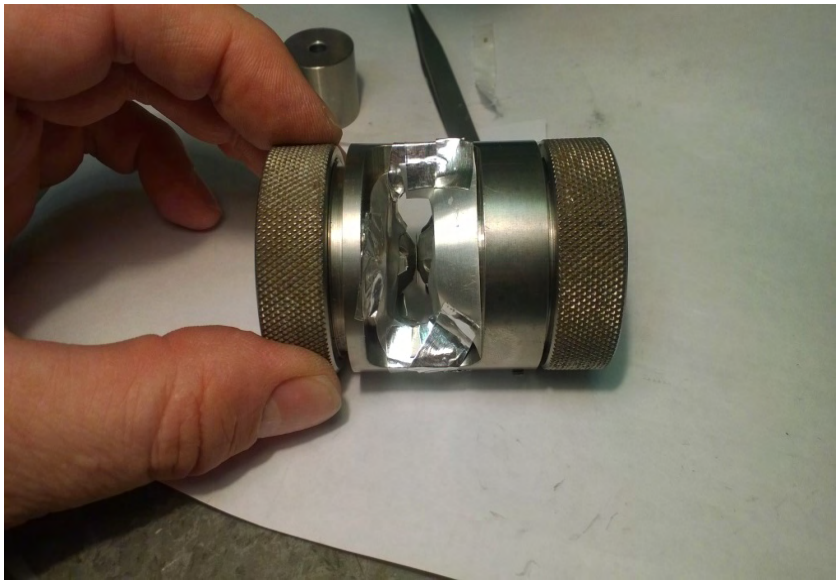
Deuterated Oleic Acid

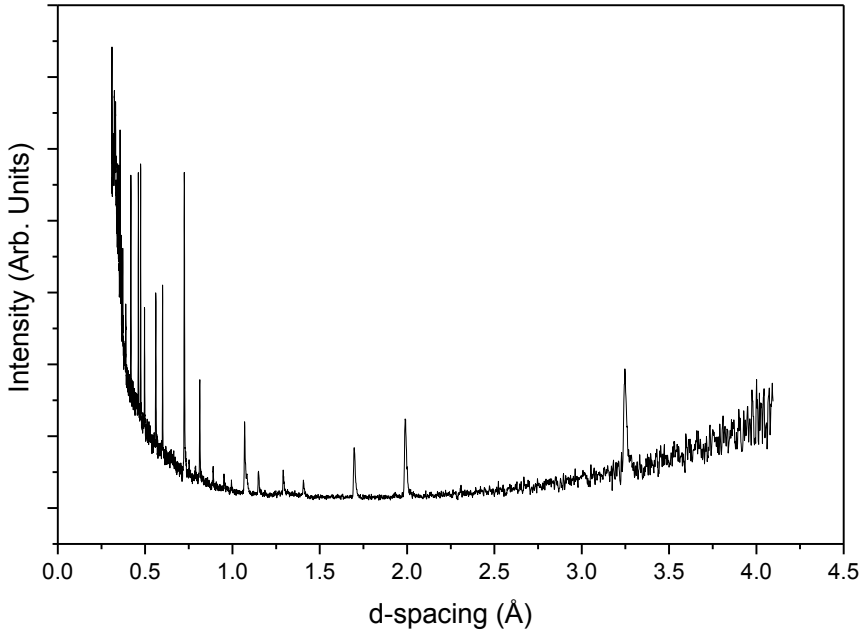


High pressure Parr Reactor

Science & Technology Facilities Council
ISIS

Sample environment – high pressures





Higher pressures means smaller samples. Recent tests show good data from ~0.2 mm^3 germanium powder in around 8 hours

Science & Technology Facilities Council
ISIS

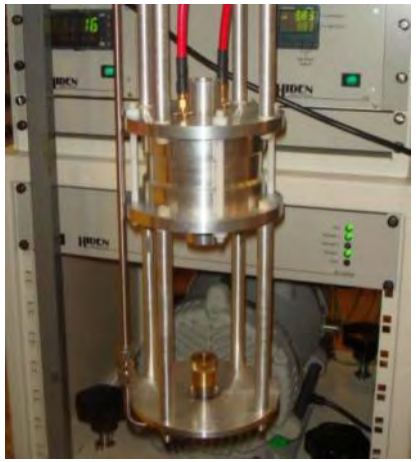
Sample environment - low temperatures

During cycle 2013/3 a record of 22 Ultra Low Temperature experiments (< 1K) were completed - a record for ISIS.

ISISstat – cryogen free cryostat design licensed to Oxford Instruments

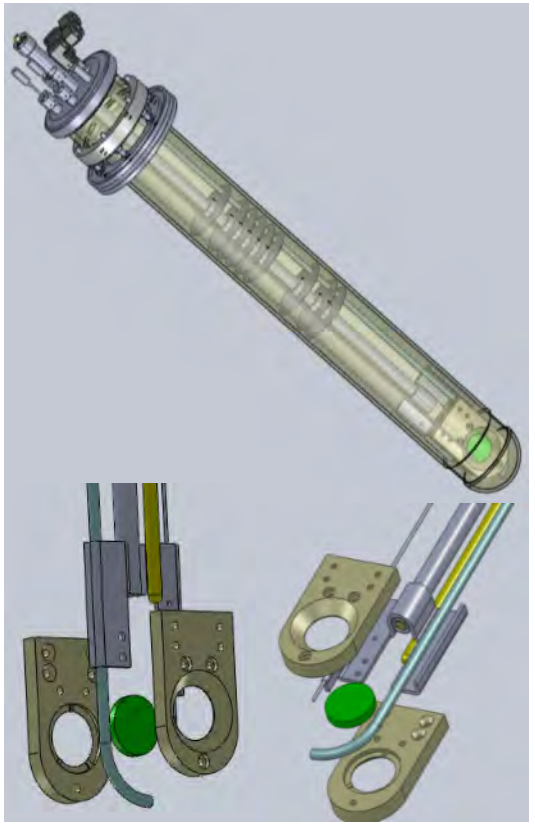
Science & Technology Facilities Council
ISIS

Sample environment - *in-situ* techniques



Microwave characterisation cell
(Cardiff + ISIS).

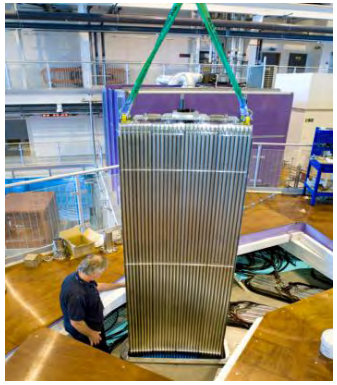
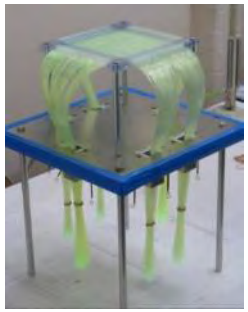
Catalysis cells
(Catalysis Hub @ RCaH + ISIS).

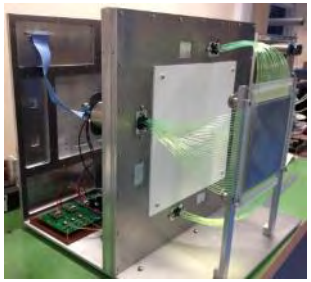
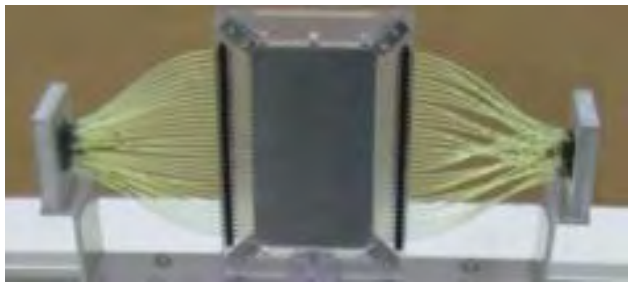
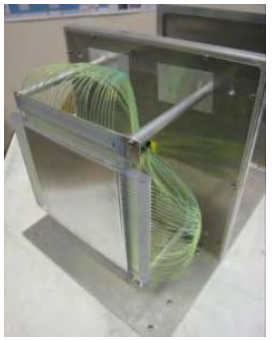


Concentration cell
(St Andrews + ISIS).

Science & Technology Facilities Council
ISIS

Detectors

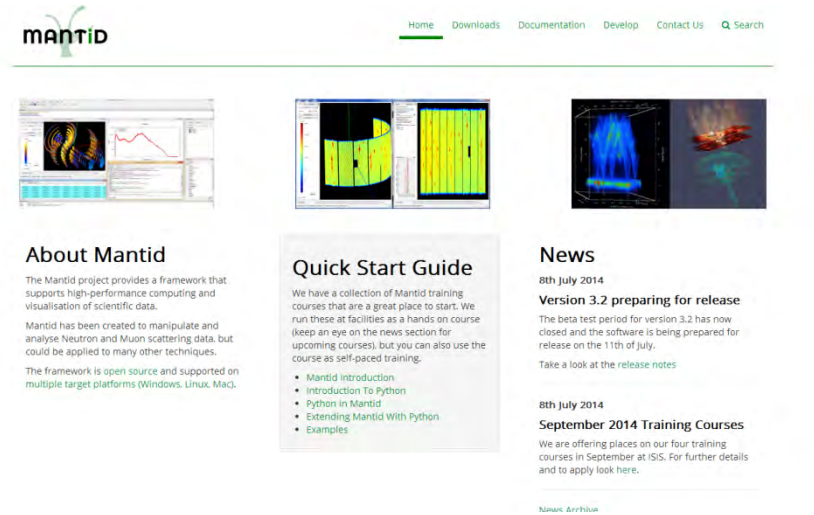
Continued development of 3He and scintillator detectors

Science & Technology Facilities Council
ISIS

Data Analysis/Data Management

MANTID

- Collaboration with SNS
- ESS recently joined
- Contributions from Julich, PSI, ANSTO



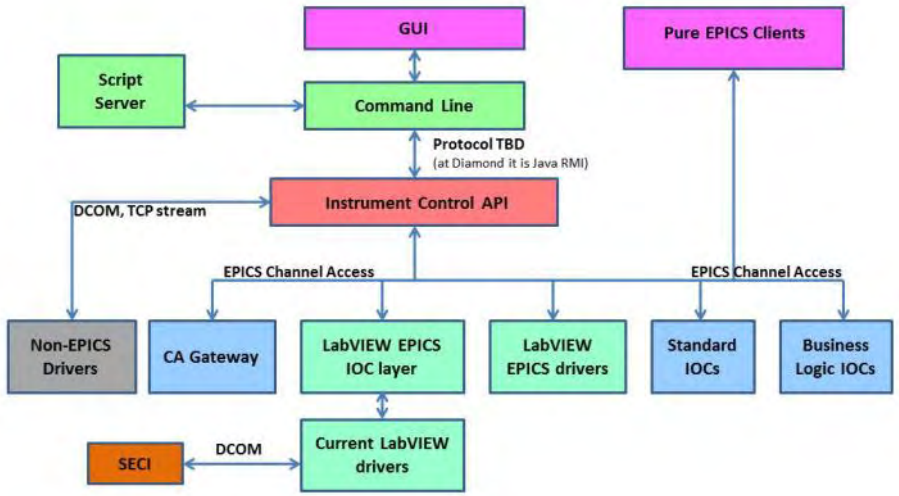
ICAT

- Collaboration with many neutron and photon facilities

Science & Technology Facilities Council
ISIS

Instrument Control Project

- Deployed on ChipIr and Larmor
- Collaboration with SNS, DLS and potentially ESS



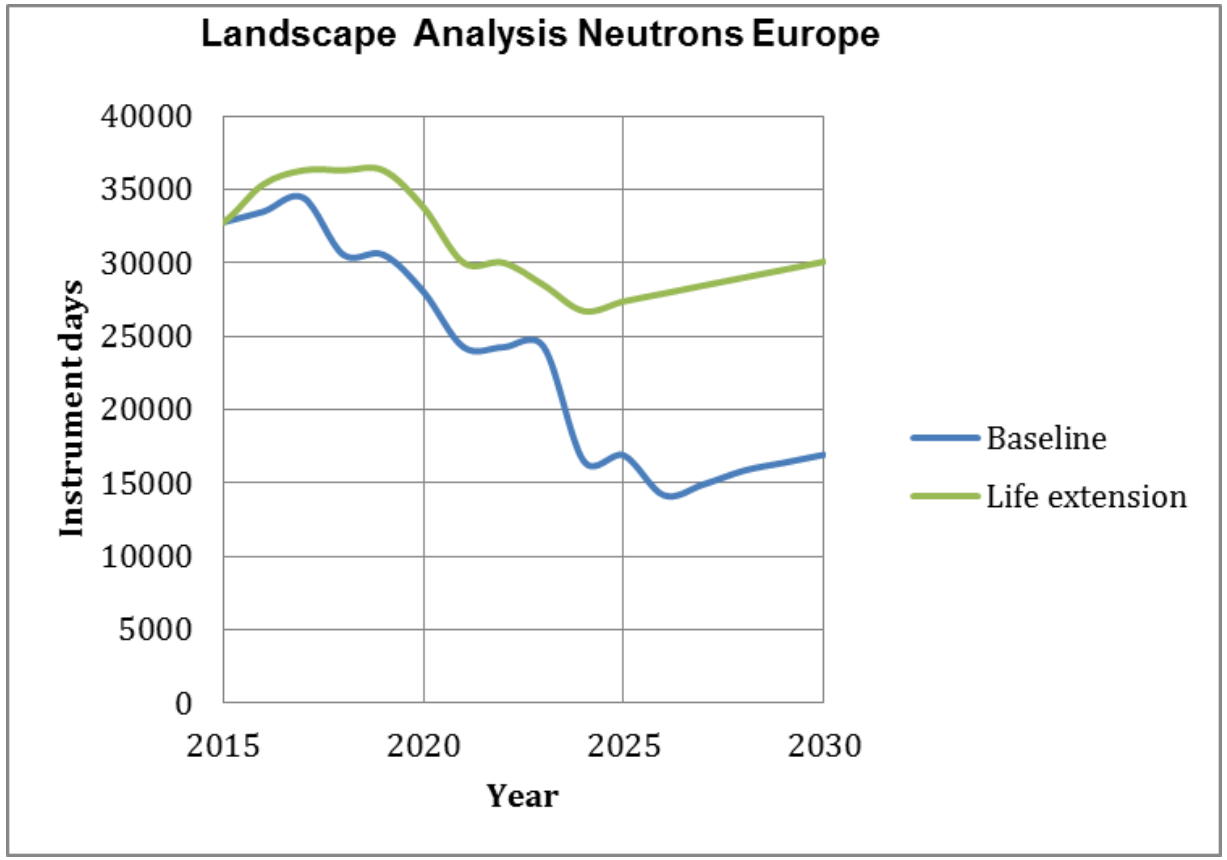
EPICS

Science & Technology Facilities Council
ISIS

The future?

Science & Technology Facilities Council
ISIS

The future?



Science & Technology Facilities Council
ISIS

ISIS 20 year strategy

- The UK needs ISIS; Europe needs ISIS
- Be running at double current capacity by 2020
  with increased capability
  with current availability (>90%)
- Increased international partnerships
- Reputation built on excellence and leadership
- By 2030 be building a new (international) facility: ISIS-II

2013 2014 2015 2018 2020 2022 2025 2030 2033

Science & Technology Facilities Council
ISIS

ISIS 2014-

- New 6 year contract with CNR Italy (March 2014)
- New 5 year contract with Sweden (January 2015)
- UK funding for India, China, South Africa (2014-19)
- 5 year contract with India (July 2015?)

Science & Technology Facilities Council
ISIS

ISIS 2014-

- Flat budget FY14/15, increased budget FY15/16
- 120 user days/year averaged over FY13/14 and FY14/15
- Long shutdown August 2014 – February 2015
- 167 days user operation FY15/16
- All instruments (including TS2 Phase II) by FY16/17
- 3 month shutdown 2016 (TS1 – TOSCA and MAPS guide upgrades)
- Finalise TS1 upgrade outline design summer 2015?
- Start ISIS-II feasibility study autumn 2015
- Linac Tank 4 installation 2019?
- TSI upgrade 2019?