

NIBS2026 welcome note from TRIUMF

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TRIUMF is Canada's Particle Accelerator Centre





TRIUMF is one of
Canada's major
investments in large-scale
research infrastructure

With >500 staff and >200
students & post-doctoral
researchers, TRIUMF
advances isotope science
and technology, both
fundamental and applied.

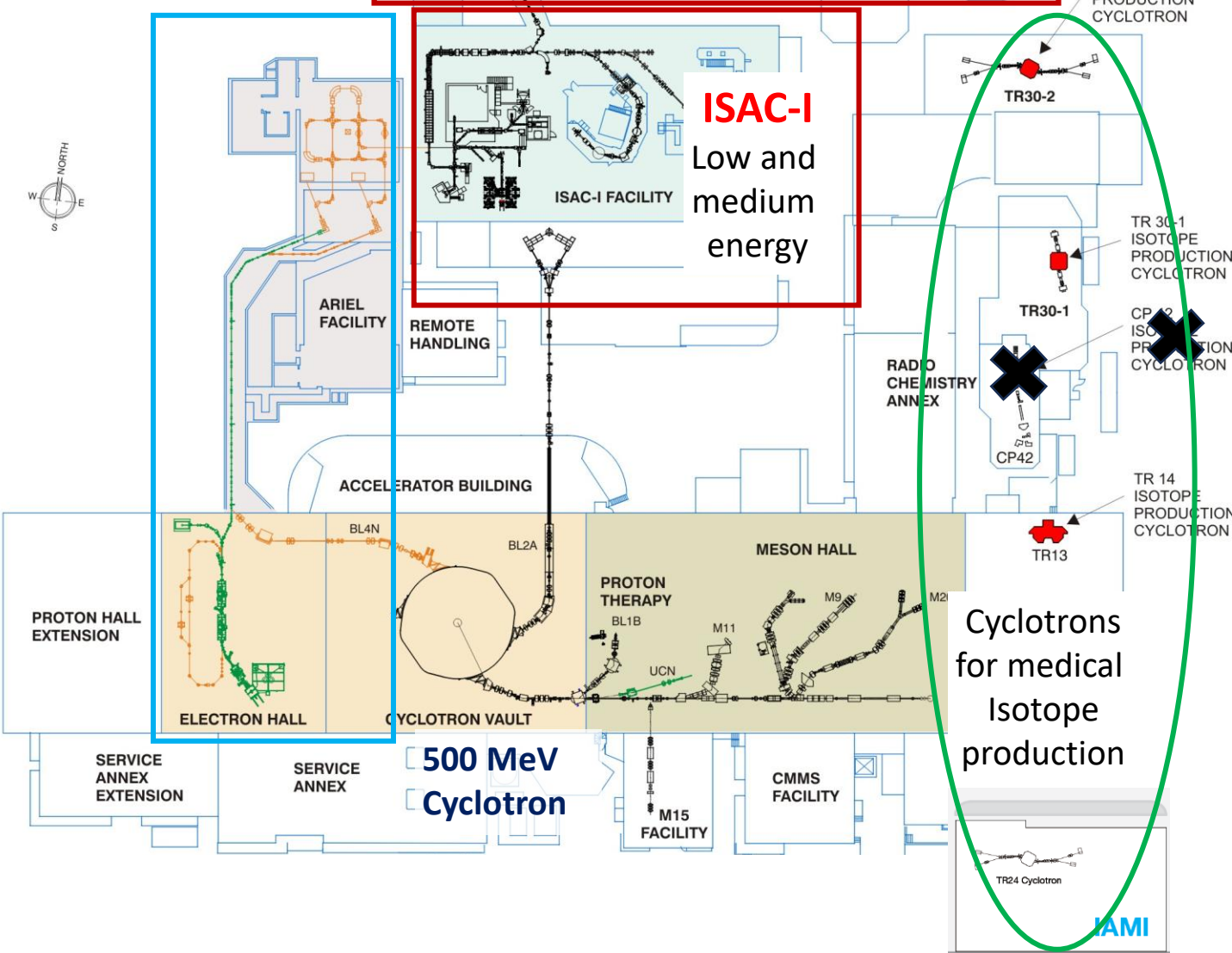
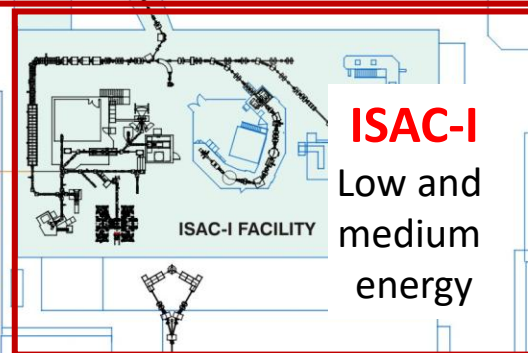
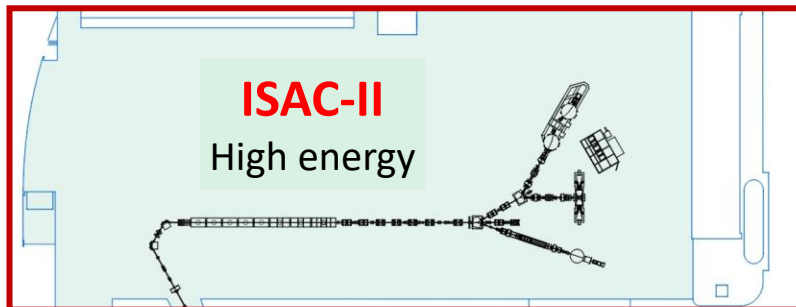




We have more than five decades of experience in building a rich particle accelerator infra-structure that enables cutting-edge research while growing accelerator expertise.

TRIUMF accelerator complex

ARIEL



Primary beam driver:
Cyclotron, 500 MeV, H^-
Produces rare isotopes, neutrons and muons!

Isotope Separator and Accelerator facility - ISAC

Isotope Separator Online (ISOL) facility

ISAC-I: Normal conducting-linac, 0.15-1.5 MeV/u

ISAC-II: Superconducting-linac, 5-15 MeV/u

Advanced Rare Isotope Laboratory - ARIEL

Superconducting electron linac

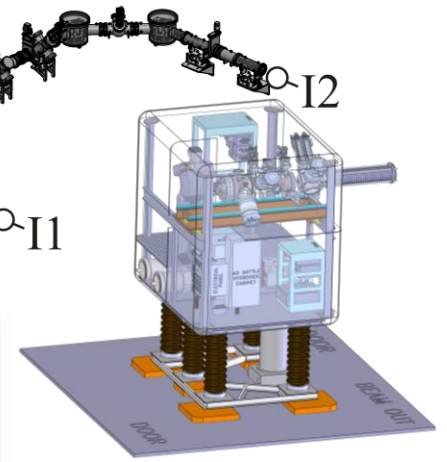
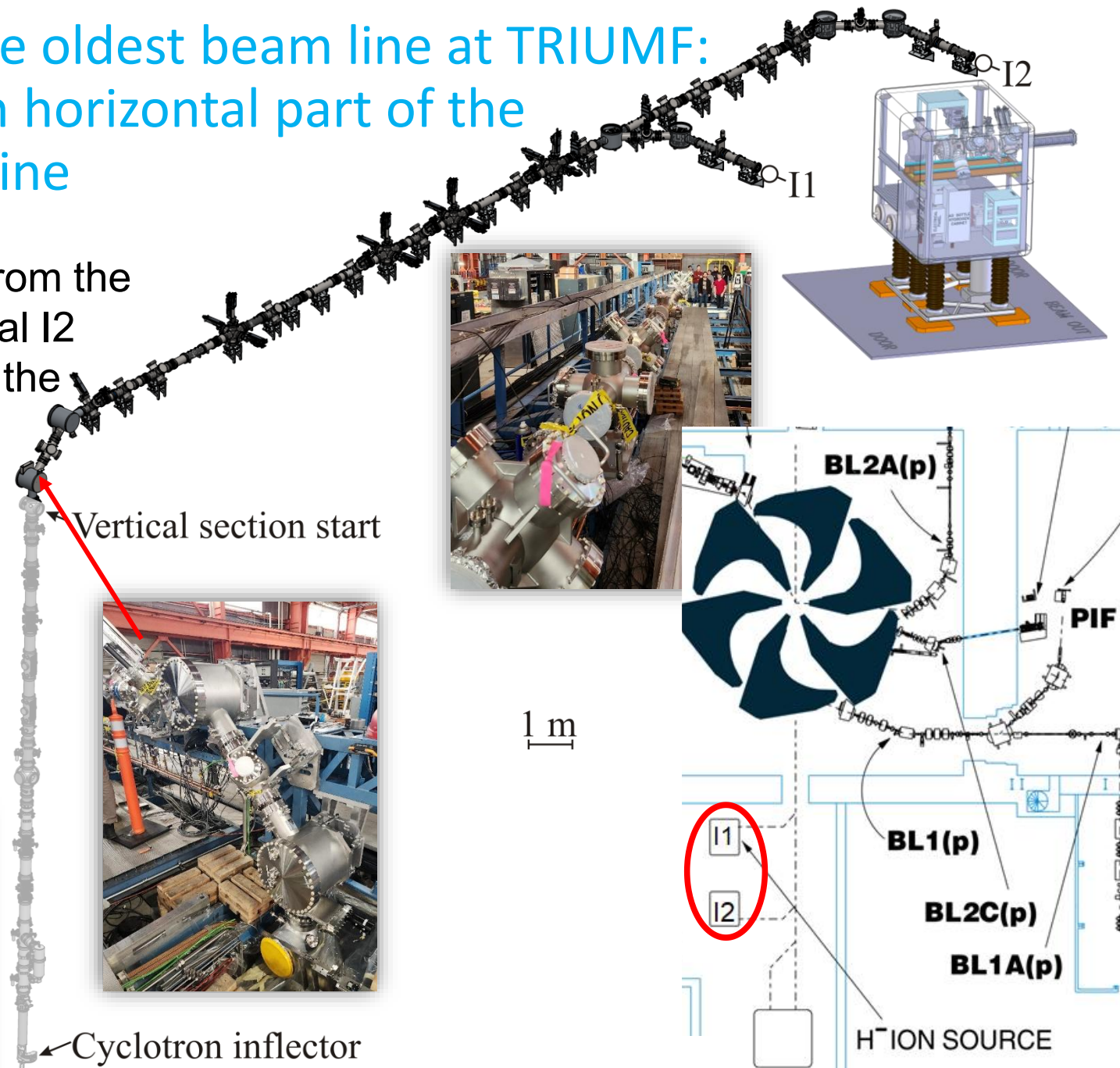
30 MeV, 10 mA, cw

4 Cyclotrons for medical isotope production
(with a TR24 to be commissioned in the Institute for advanced Medical Isotope – IAMI)

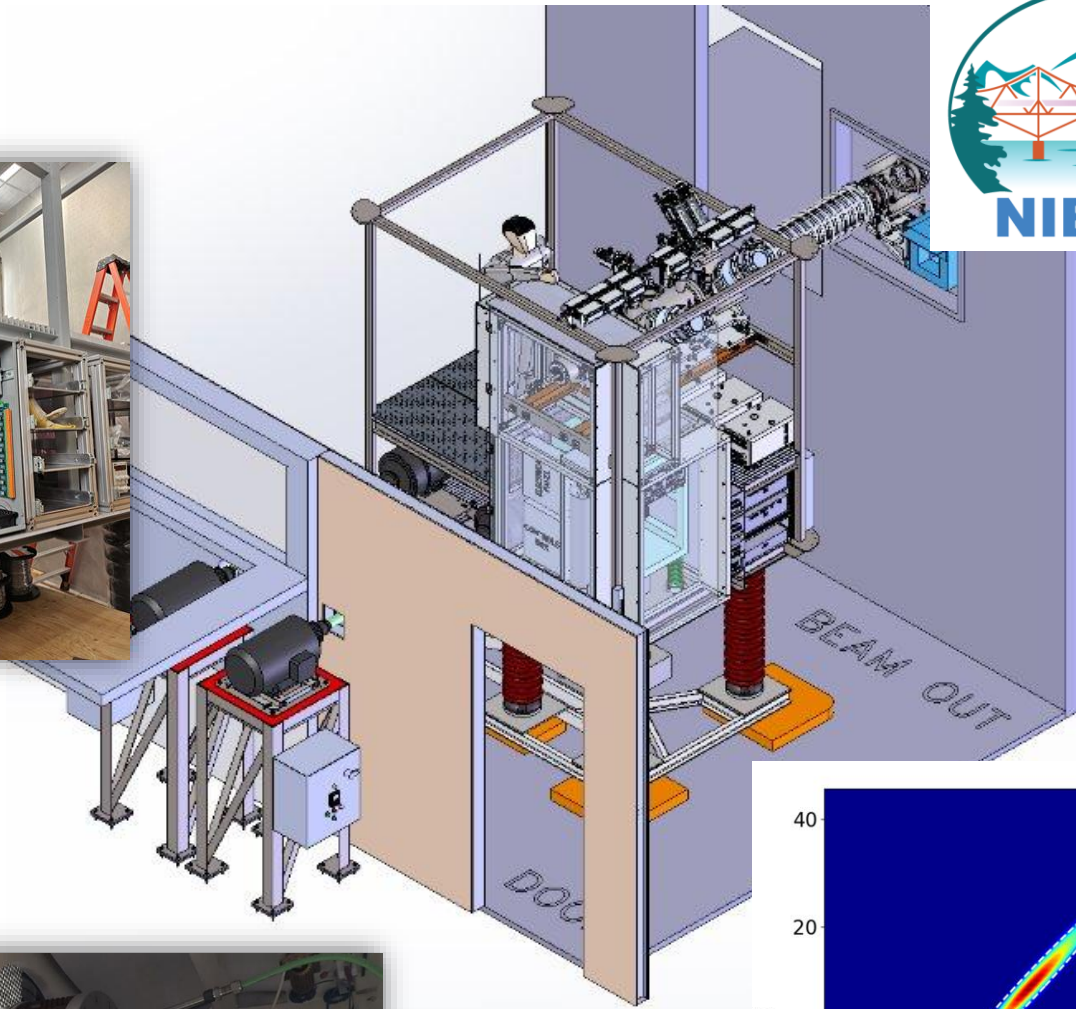
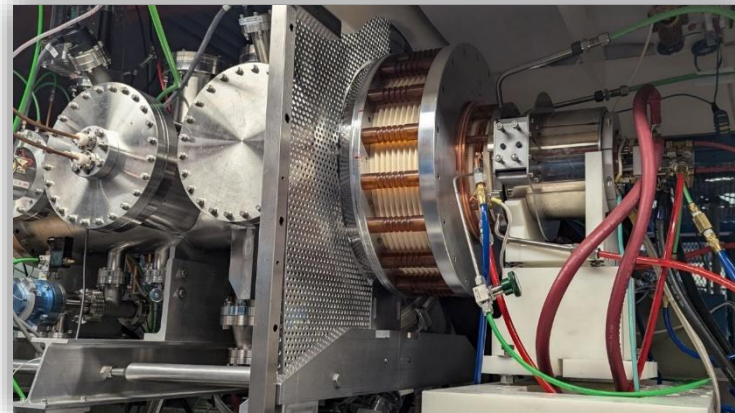
Cyclotrons
for medical
Isotope
production

Replacement of the oldest beam line at TRIUMF: 520 MeV cyclotron horizontal part of the H⁻ injection beamline

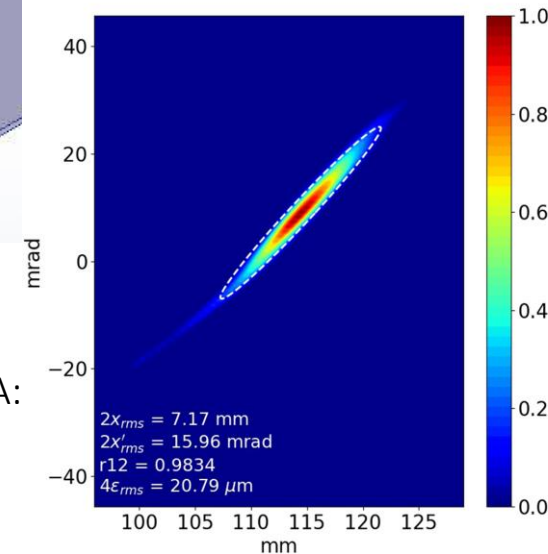
- Cyclotron horizontal injection beamline from the operational terminal I1 and a new terminal I2 under construction (300 kV terminals) to the start of the (new) vertical section.
- Beam line installation completed in early 2025
- Beam line commissioning completed by May 2025



- New 300 kV terminal with all services!
- Comprises a new ion source for H⁻ beam injection with higher brilliance
- Ion source is ready, beam measurements done at I3 test stand
- Most of the components are installed in the terminal or ready for installation.



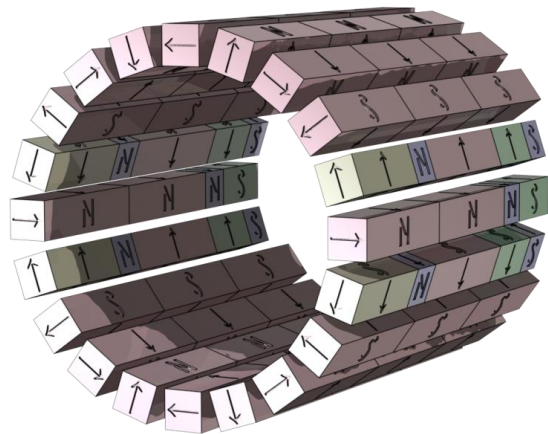
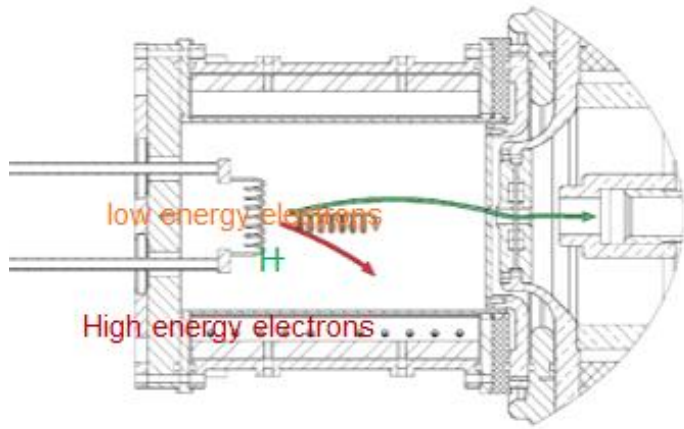
Demonstrated at test stand: H⁻ emittance at 1 mA:
 $20.8 \mu\text{m}$ (design goal: $20 \mu\text{m}$)



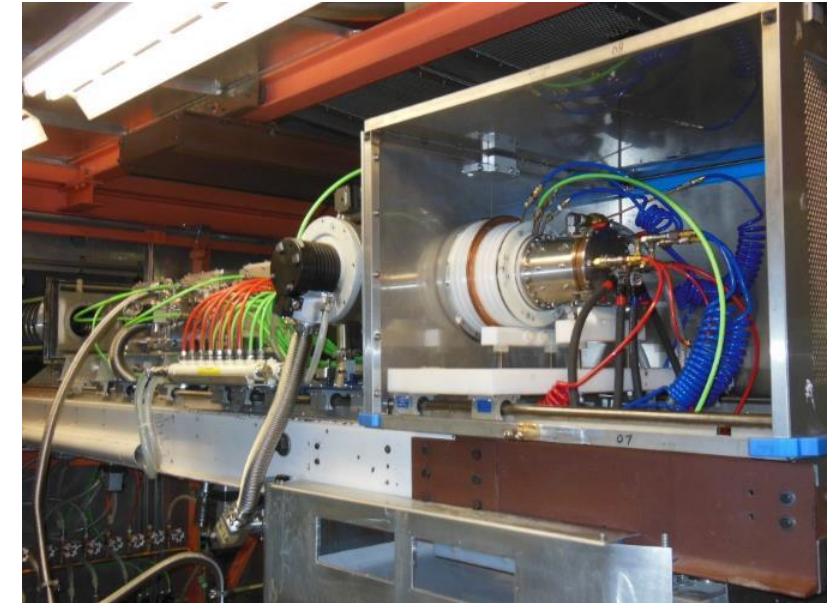
Some H- sources development

H⁻ ion source for cyclotron
beam injection 5 mA

Filament development for longer operation periods
→ optimizing the wire length, material and increase
no. of wires mounted in parallel.



cusp field for plasma confinement



Beam extraction tests on a test bench to
explore high beam currents:
maximum ion current 60 mA



Thank you
and
welcome to
NIBS2026!

www.triumf.ca

