TRIUMF

Canada's national laboratory
for particle and nuclear physics
and accelerator-based science

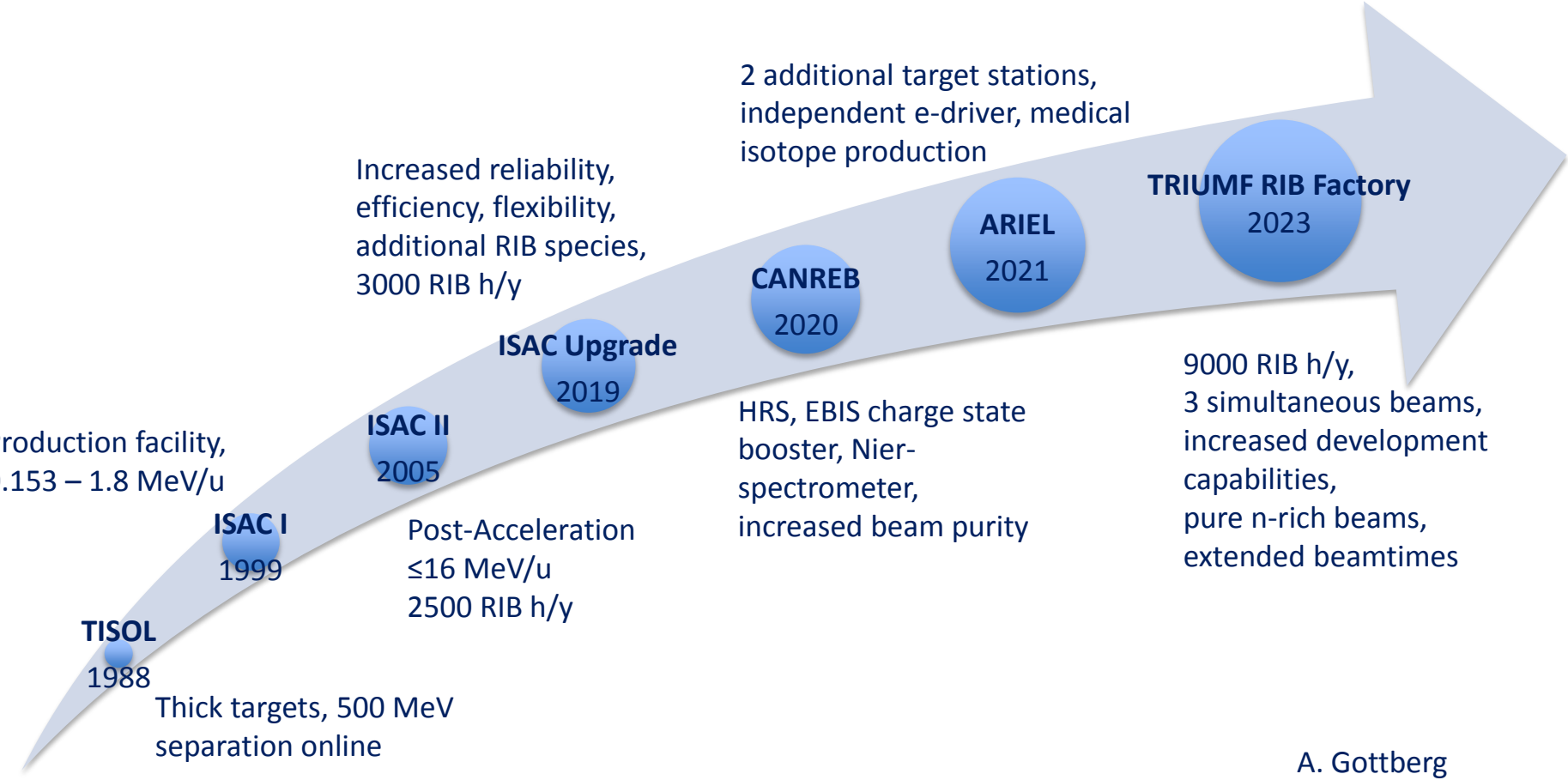
ARIEL town hall meeting

Towards day-1 experiments

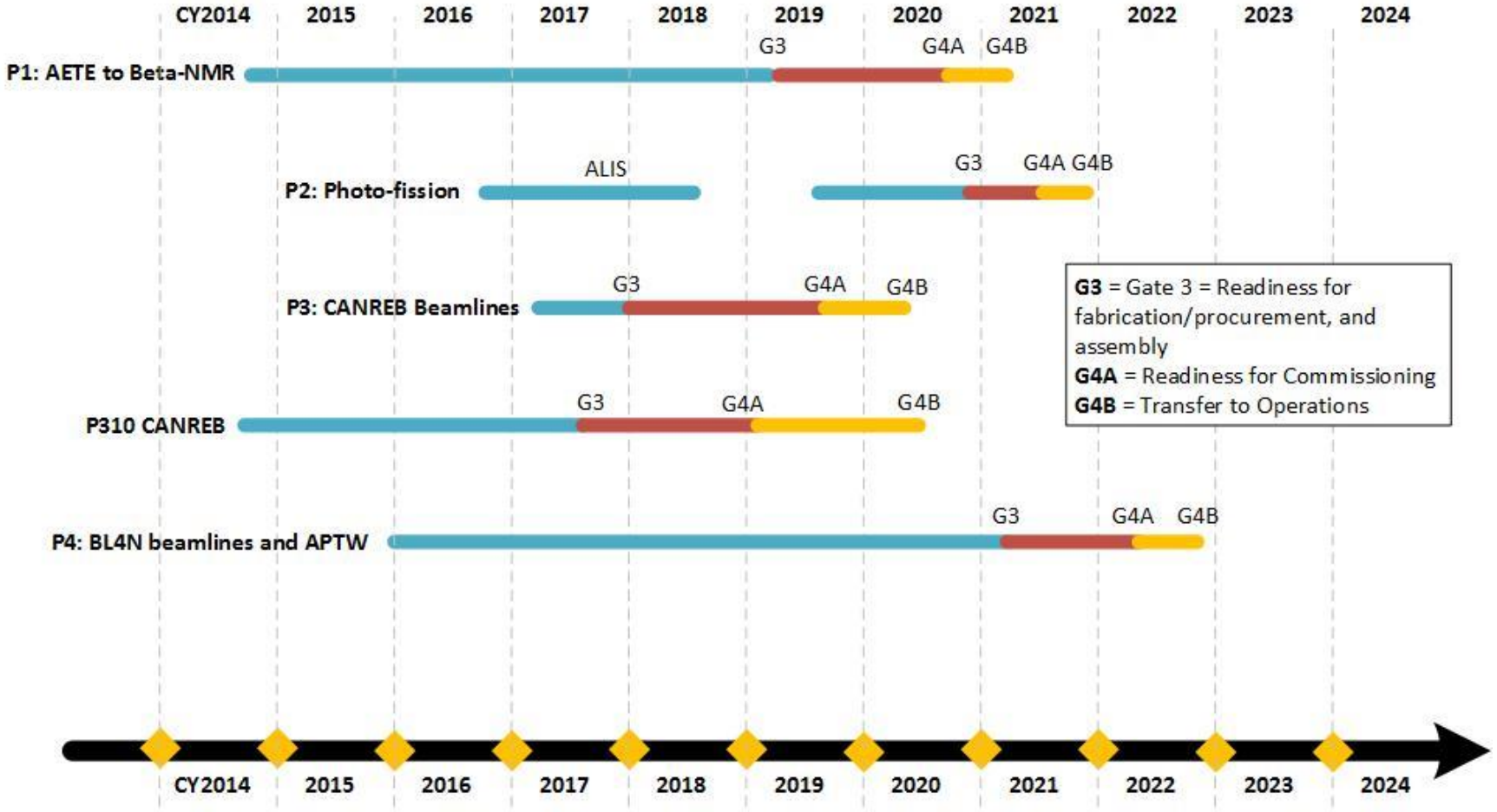
Jens Dilling
Associate Laboratory Director
Physical Sciences Division

January 2017

ARIEL + ISAC: A RIB Factory



A. Gottberg


CY2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
P1: AETE to Beta-NMR
G3
G4A
G4B
P2: Photo-fission
ALIS
G3
G4A G4B
P3: CANREB Beamlines
G3
G4A
G4B
P310 CANREB
G3
G4A
G4B
P4: BL4N beamlines and APTW
G3
G4A
G4B
G3 = Gate 3 = Readiness for fabrication/procurement, and assembly
G4A = Readiness for Commissioning
G4B = Transfer to Operations
CY2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

ARIEL Completion to Science

Year	Science exploitation
2020	ISAC-CANREB-ISAC beams
2022	ARIEL beam (Li-8)
2022	ARIEL photo-fission beams to ISAC
2023	ARIEL spallation beams to ISAC

Towards day-1 experiments of ARIEL

TRIUMF ARIEL
ADVANCED RARE ISOTOPE LABORATORY

Science enabling milestone	Month/Year
First EEC approved experiments with high-mass accelerated beams from ISAC utilizing the CANREB/ARIEL EBIS charge breeder	10/2020
First EEC approved beta-NMR experiments with photo-produced ^{8}Li	03/2022
First EEC approved experiments with photo-fission RIBs from the e-Linac	06/2022
First EEC approved experiments with RIBs from ARIEL Proton target	03/2023

→ Higher intensity, cleaner high-mass accelerated beams

→ More RIB hours, cleaner n-rich RIBs

→ 3 parallel RIBs

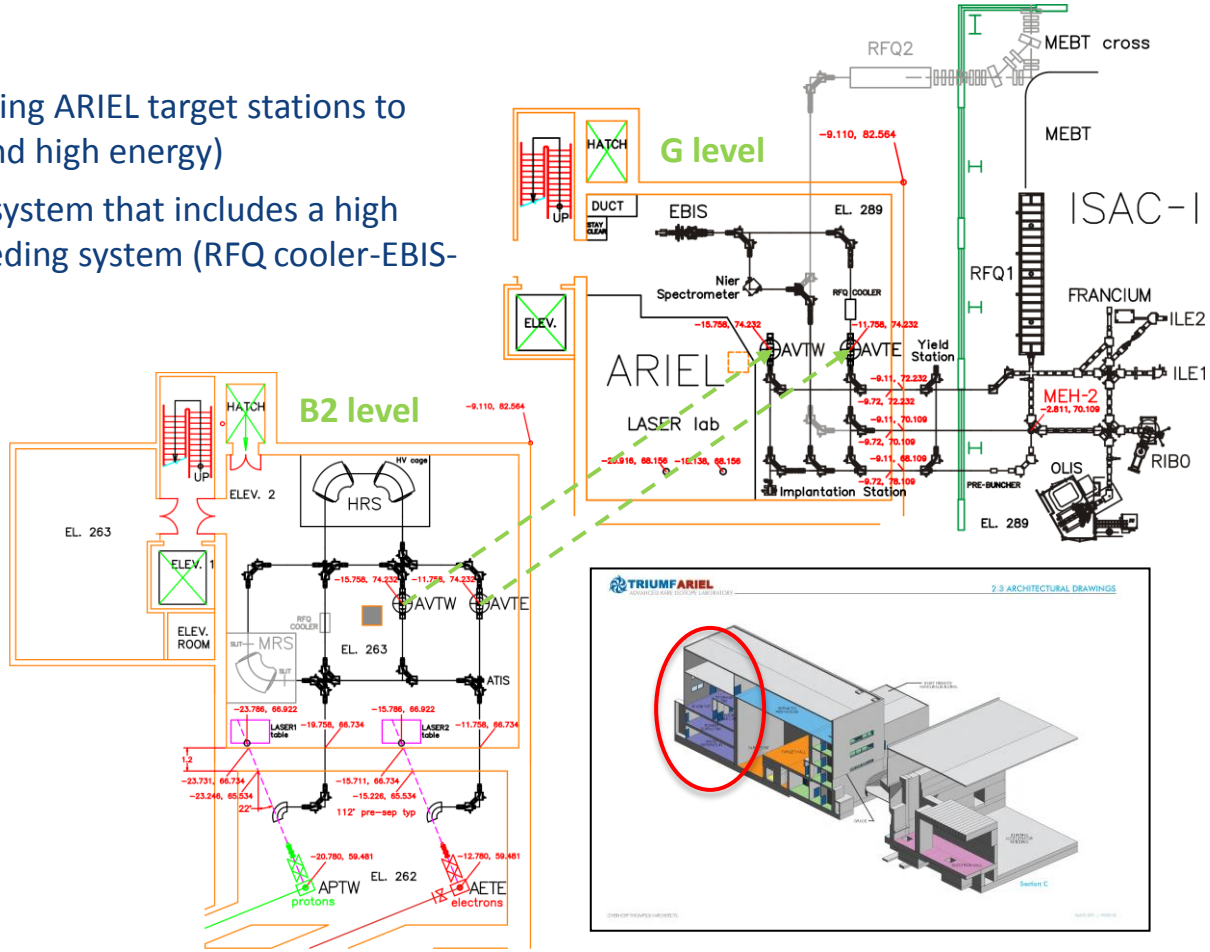
- 10.2020: beam from ISAC to CANREB and back to ISAC
  - New opportunities for post-accelerated beams with EBIS: clean and higher efficiency (Adam)
  - Will require beam transfer optimization (off-line) and charge breeding testing (off-line and on-line)

Towards day-1 experiments

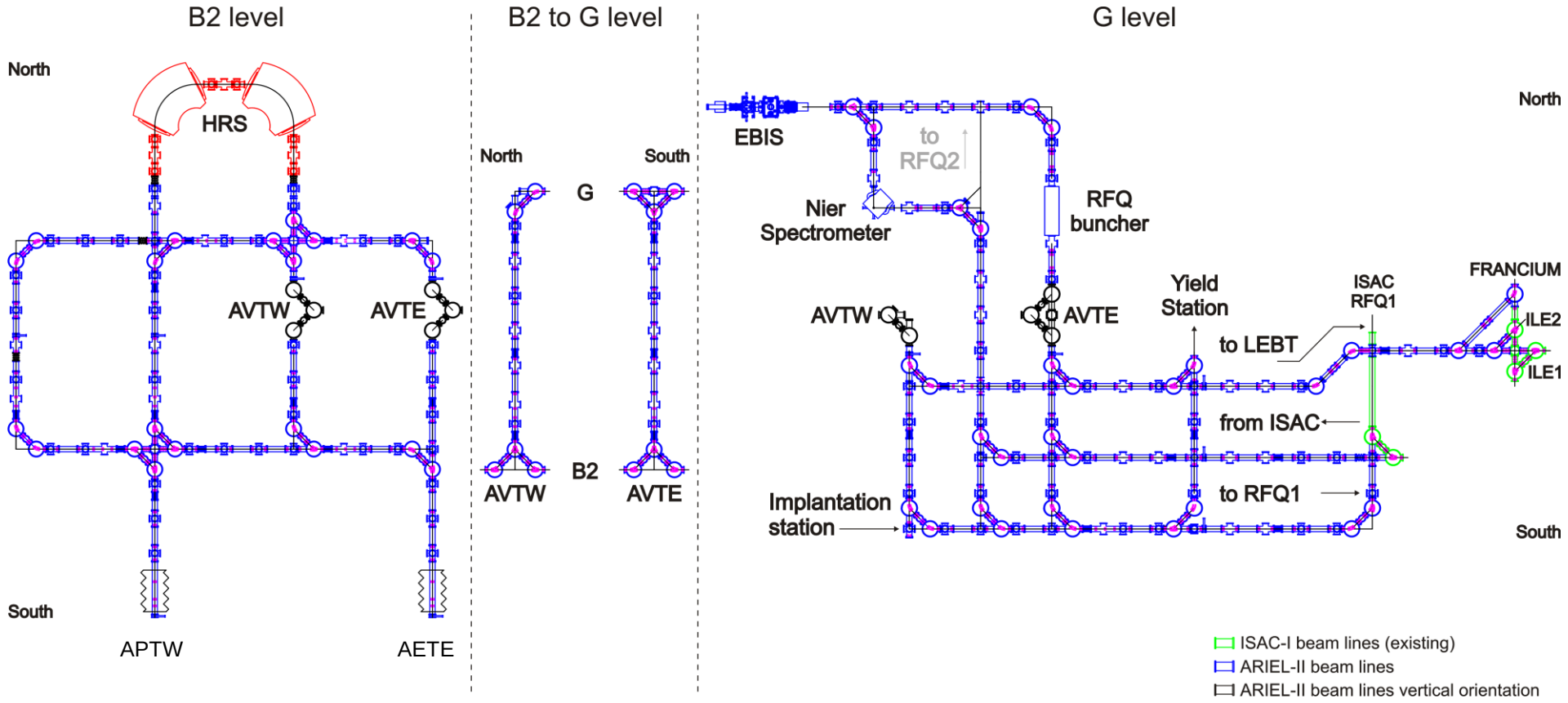
- 03.2022: EEC approved experiments to β-NMR
  - More opportunities for β-NMR (Alex)
  - Will require commissioning
- 06.2022: EEC approved experiments from fission targets (electrons)
  - More opportunities for n-rich isotopes (Alex)
  - Will require commissioning

RIB transport system and CANREB

- 200 m new RIB transport system connecting ARIEL target stations to ISAC experimental areas (low, medium and high energy)
- CANREB is a subset of the RIB transport system that includes a high resolution separator and the charge breeding system (RFQ cooler-EBIS-Nier)



RIB transport system and CANREB



- 2020: beam from ISAC to CANREB and back to ISAC
  - Question: from 2020 on, we will have new and better charge breeding capabilities; should we focus this year on post-accelerated beams from experiments at ISAC II?
  - Perhaps less post-accelerated beams in 2019 (only one month?) And some time for commissioning of beam transport and charge breeding? Optimal running for 2020.
  - If so, we could make a special call for proposals in the EECs leading up to that.

Towards day-1 experiments

- 03.2022: EEC approved experiments to β-NMR
  - More opportunities for β-NMR
  - Increase user-base, more beam leading up to then?
- 06.2022: EEC approved experiments from fission targets (electrons)
  - More opportunities for n-rich isotopes
  - Will require commissioning
  - Special requirements from the users?

TRIUMF

Canada's national laboratory
for particle and nuclear physics
and accelerator-based science

Thank you!
Merci!

Follow us at TRIUMFLab

TRIUMF: Alberta | British Columbia | Calgary | Carleton | Guelph | Manitoba | McGill | McMaster | Montréal | Northern British Columbia | Queen's | Regina | Saint Mary's | Simon Fraser | Toronto | Victoria | Western | Winnipeg | York