

Navigating Remote Research and Networking in the 'Post'-Pandemic Era: Lessons Learned & Future Outlook

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with help & discussions from

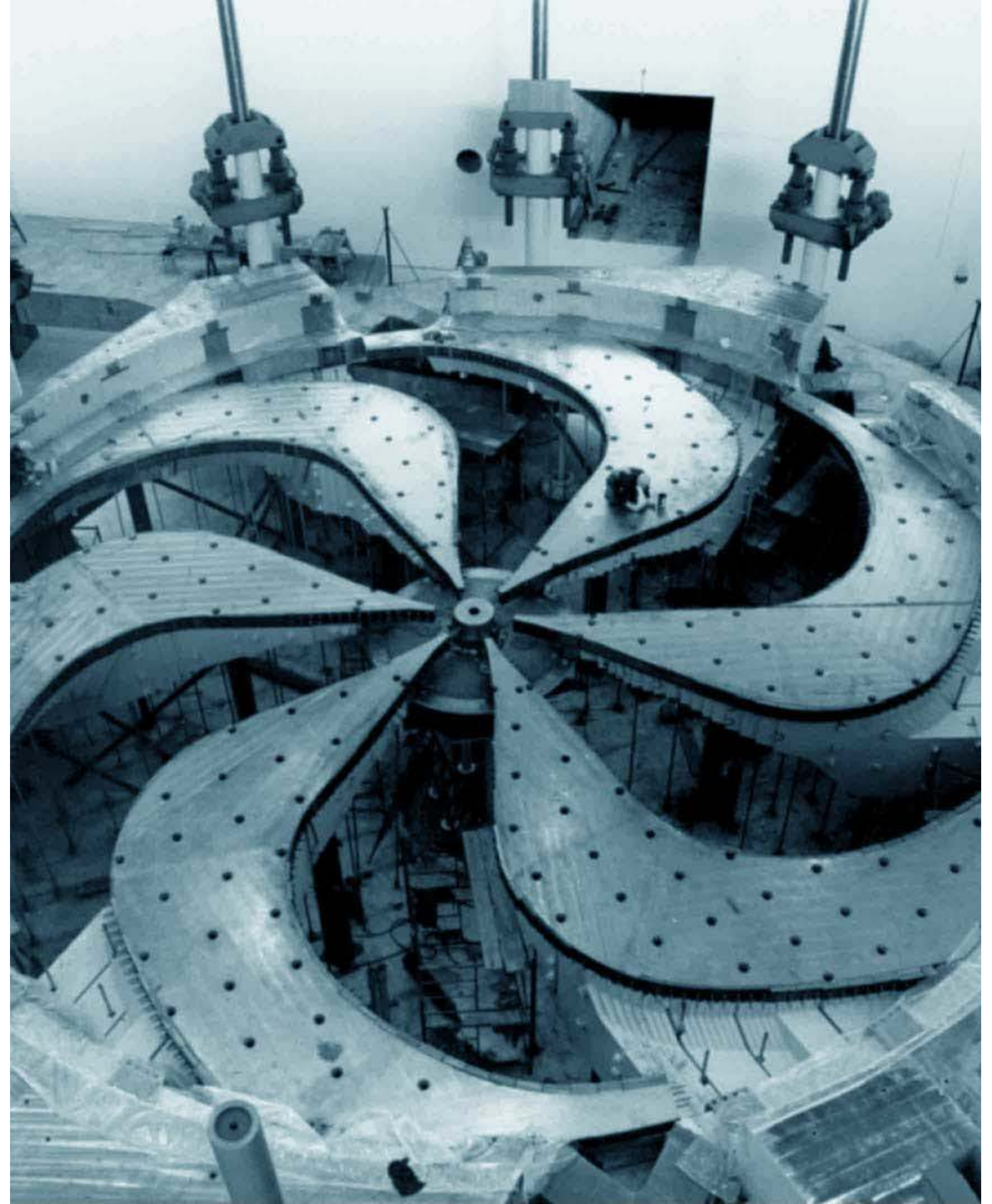
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TUG AGM @ Science Week 2020

2020-08-21



TRIUMF's research portfolio, from fundamental to applied:



Expands the boundaries
of human knowledge



Advances the treatment
of critical diseases



Develops new technologies
and innovations



Deepens our understanding
of the natural world



Leveraging three core platforms – ARIEL, IAMI, TRIUMF Innov. – the Plan delivers value across three critical dimensions:

■ Science and Technology

- **Goal 1:** Make groundbreaking discoveries across TRIUMF's multidisciplinary research portfolio
- **Goal 2:** Reinforce TRIUMF as a globally leading particle accelerator centre

■ People and Skills

- **Goal 3:** Become a hub for interdisciplinary education and training
- **Goal 4:** Inspire Canadians to discover and innovate

■ Innovation and Collaboration

- **Goal 5:** Translate knowledge and discovery into innovation
- **Goal 6:** Increase national and international collaboration



However, this year is different, it is special...

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- In March 2020, TRIUMF closed its doors and stopped 'regular' operation...we still had people here to keep the systems safe and secure...

What next:

- TRIUMF started a COVID task force to look at what needs to be done to keep people safe (**Return to Site**)
- Next, we looked at if we can bring people back on-site for **essential work** (medical isotopes)
- And over the last 5 months we have developed plans (with various tasks forces and committees) to bring people back (**Ramp-up Research**):
 - This was done in phases, right now we are starting **Phase 3**:
 - Up to 300 people...including some out of province and eventually international visitors/users...we will keep an eye on developments and guidelines from the authorities

COVID-19 Employee Resources and Lab Policy & Procedures

This page contains resources for TRIUMF's community to navigate the impacts of the COVID-19 pandemic.

Updates and FAQ

Updates

Read the most recent site-wide communications and directives from the Task Force.


- [TRIUMF Operations \(Updated June 2, 2020\)](#)
- [Latest Directorate updates \(New\)](#)

COVID-19 FAQ (New)

Frequently asked questions about TRIUMF's response to COVID-19

We worked very hard to keep things on track, and people safe...

- The task forces had representation of many stakeholder groups, including users and GAPS, etc.
- Information on TRIUMF web site, All-hands and Town-Hall meetings, User Newsletter, etc
- So-far we have had one staff with positive test, but no further infections...it looks like our (conservative) protocols work.
- But there is impact on research...
...not everything is negative.



TRIUMF
User Services Newsletter
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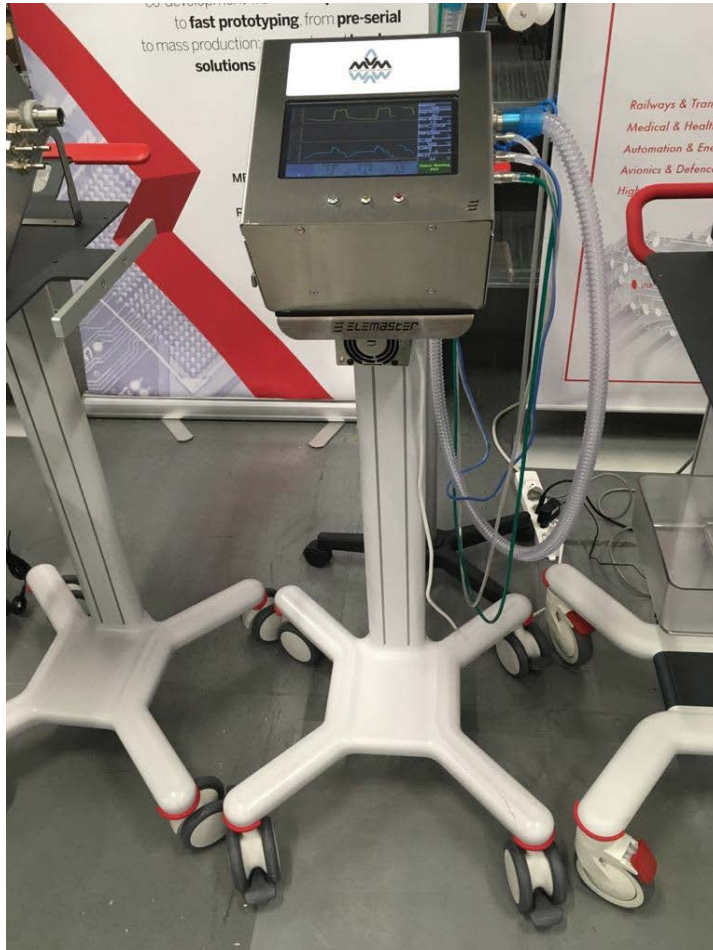
A Message from the Deputy Director, Research – Reiner Kruecken
reinerk@triumf.ca

Dear Friends and Colleagues,

Following on the earlier communication this month, we are providing here an update on the status and plans for the ramp-up of research activities at TRIUMF.

TRIUMF continues to follow provincial and federal guidance, framed in particular by the "Restart Plan" put forward by the Province of British Columbia (BC), which aims to keep social interactions at <60% of normal to keep hospital loads manageable until a viable treatment or vaccine for

Mechanical Ventilator Milano



Started in Italy by scientists from the Darkside collaboration in response to COVID-19 crisis and ventilator shortage

Conceived as low-cost, reliable, fail-safe, and easy to operate electro-mechanical ventilator that can be produced quickly, at large scale, based on readily-available parts.

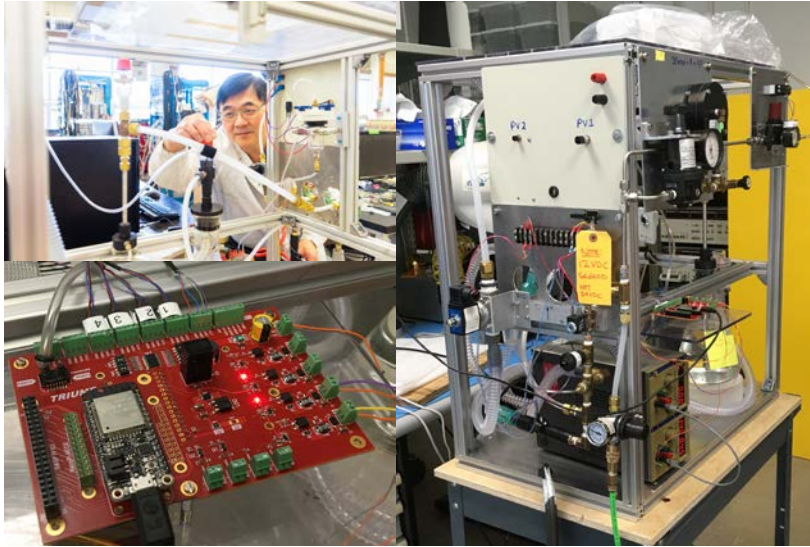
The Canadian involvement started on March 23rd when Art McDonald asked TRIUMF, CNL and SNOLAB to help

May 1: FDA EUA approval

May 26: Canadian Government orders 10k units

July 31: Health Canada submission

TRIUMF MVM activities:

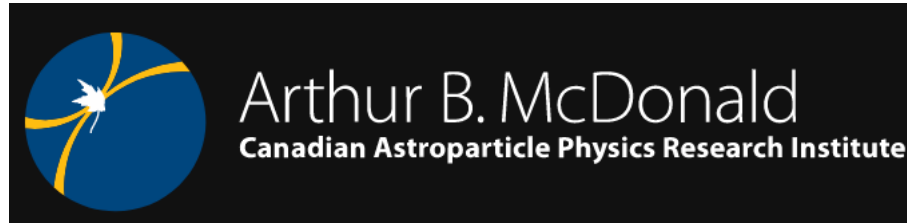


- Prototyping of electronics boards
- Software development and quality assurance
- Main testing lab for over 200 validation tests
- Liaison with manufacturers and regulatory agencies





Canadian Partners



Supported by:



TUG Update - Life Sciences

Life Sciences focus during pandemic:

- Most 'pandemic achievements' to date have taken pre-pandemic research results and convert into publications. This effort is ongoing.
- Division focus also shifted to project and experiment planning (see below), this is now shifting as site access restored

Pivot to focus on facility construction, upgrades, projects

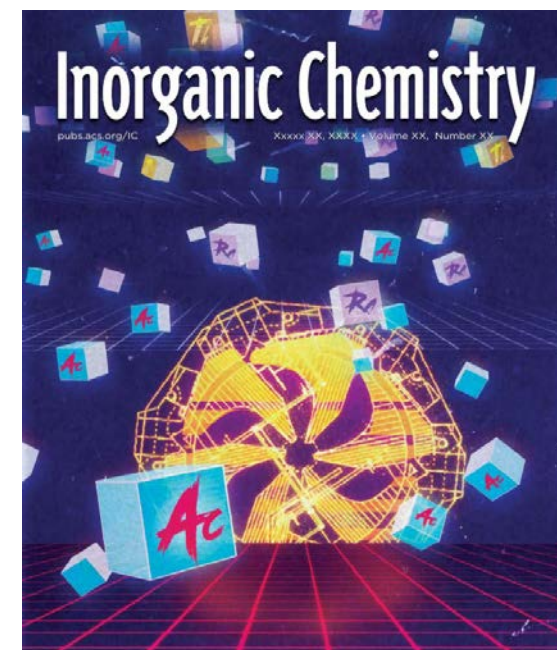
- IAMI construction (construction=essential) ; site setup, crane installation, formworks and concrete pour underway
- Contractor scheduling for radiochemistry laboratory upgrades (GMP laboratory renovation for UBC neuroPET program)
- Heavy focus on facility preparation for P476 (large-scale Ac-225 production at TRIUMF)

Research

- All PIs had to manage work/life balance – significant challenges for many with children;
- Ensuring well-being of students/trainees
- All PIs initiated writing efforts – reviews, publication of pre-pandemic results
- Some PIs initiated simulation/theoretical work

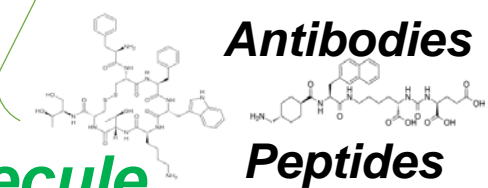
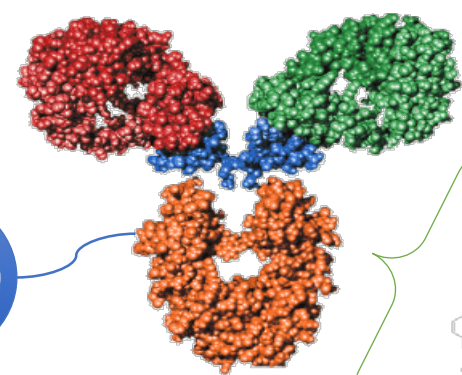
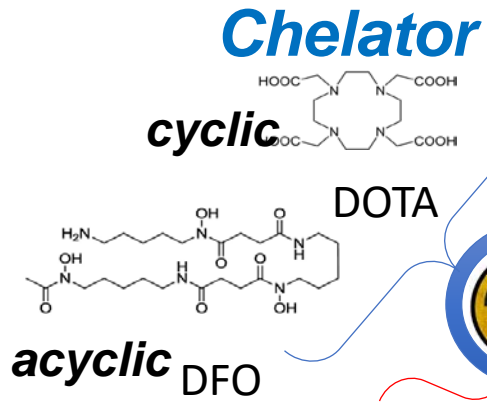


IAMI construction site



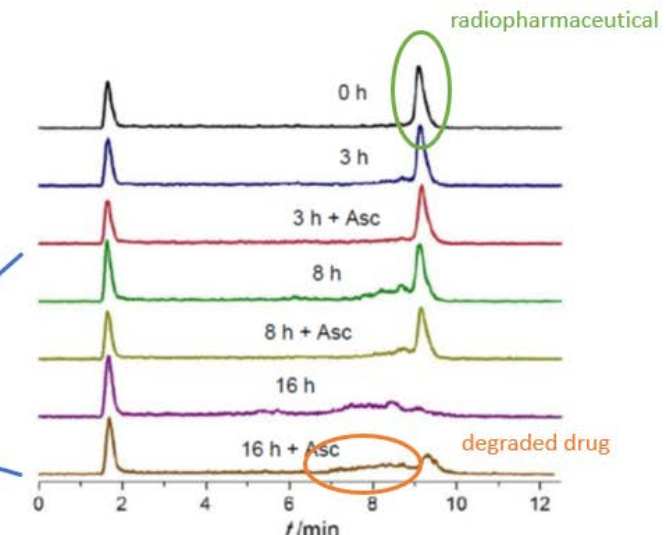
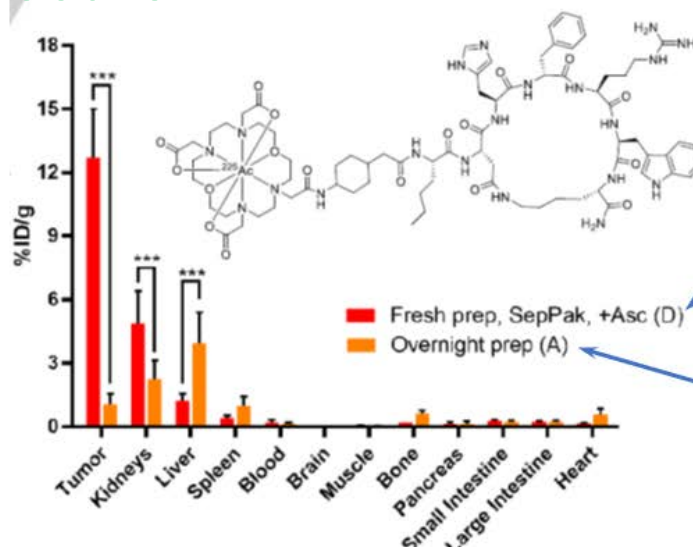
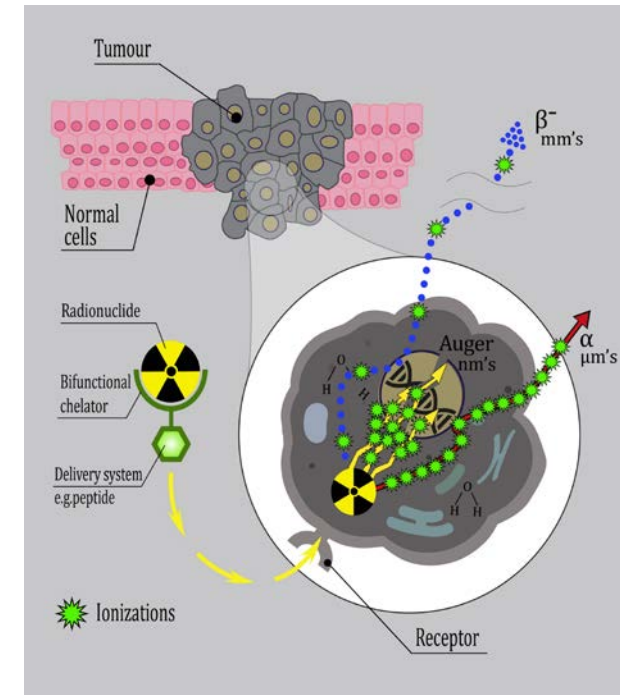
TUG Update - Life Sciences

- Beyond bio β NMR, PT research, several PIs maintain interest in radiopharmaceutical development
- Synthesis and biodistribution of Ac-225 labeled peptides targeted toward melanoma



Biomolecule

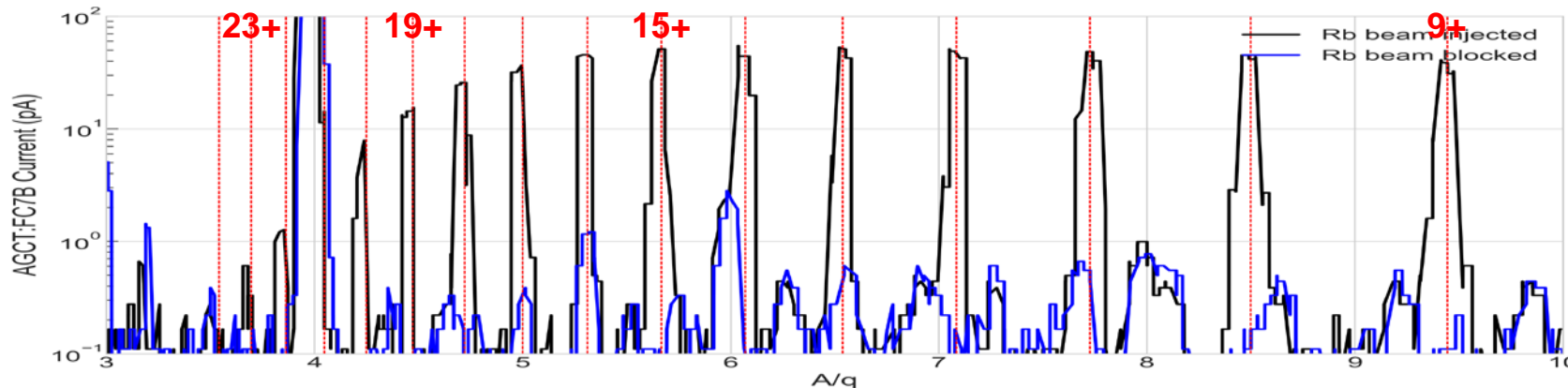
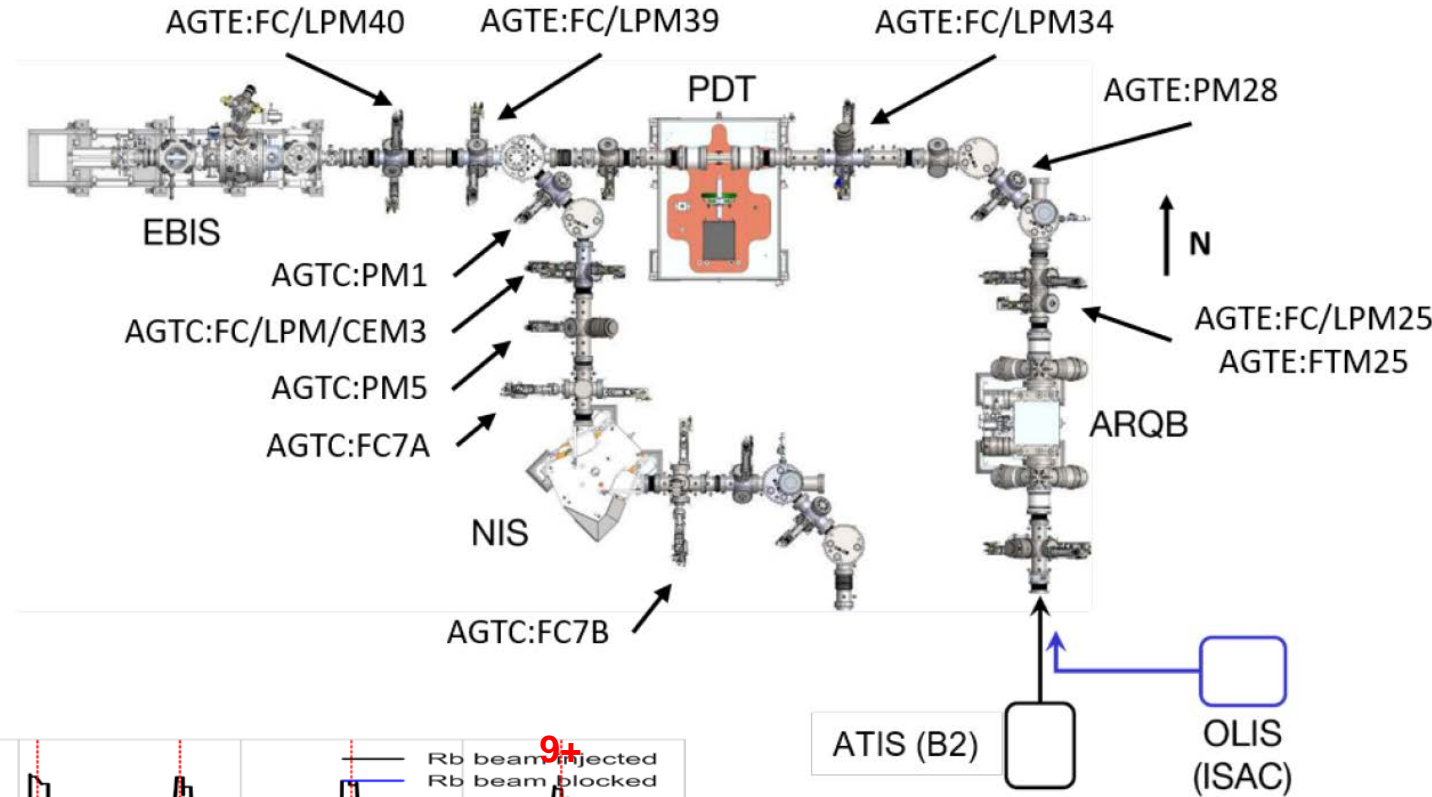
Diagnostic: PET, SPECT
 Therapy: beta, alpha, auger
Radionuclide



Accelerator Activities and Research:

CANREB EBIS commissioning

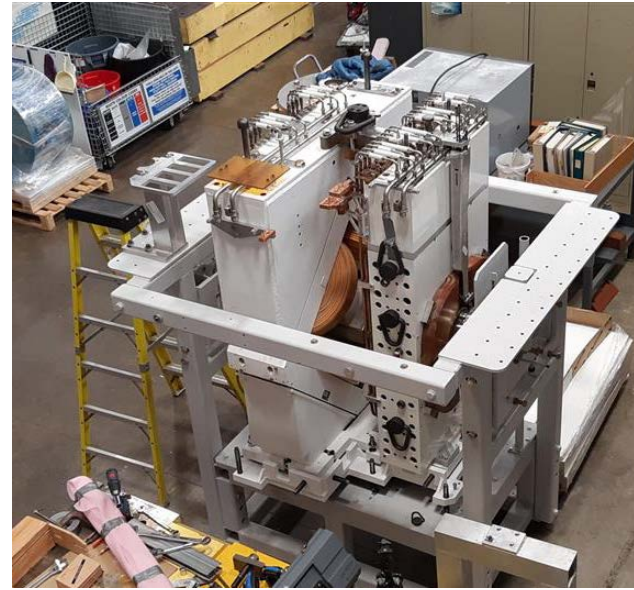
- CANREB EBIS commissioning done by **remote control**, no one from the Commissioning Team went on site at any point for beam tuning, only for hardware work!
- Example: ^{85}Rb @ 4 keV beam energy, CB time = 8 ms, e-beam current ~ 28 mA



T2-M9 repair – managed under COVID-19 restrictions

- Used the time of phase 1 to complete all design and required documents
- Use phase 2 to test all systems that need remote handling on a mock-up
- Installation was prioritized in phase 3 (shielding block removal, electrical and mechanical services)
- Project team with members from ACC division (remote handling, beam lines), Physical Sciences Division (CMMS staff), Project Management Office and engineering (design office, mechanical shop, electrical and mechanical services)

→ Completion of the project is a success story!

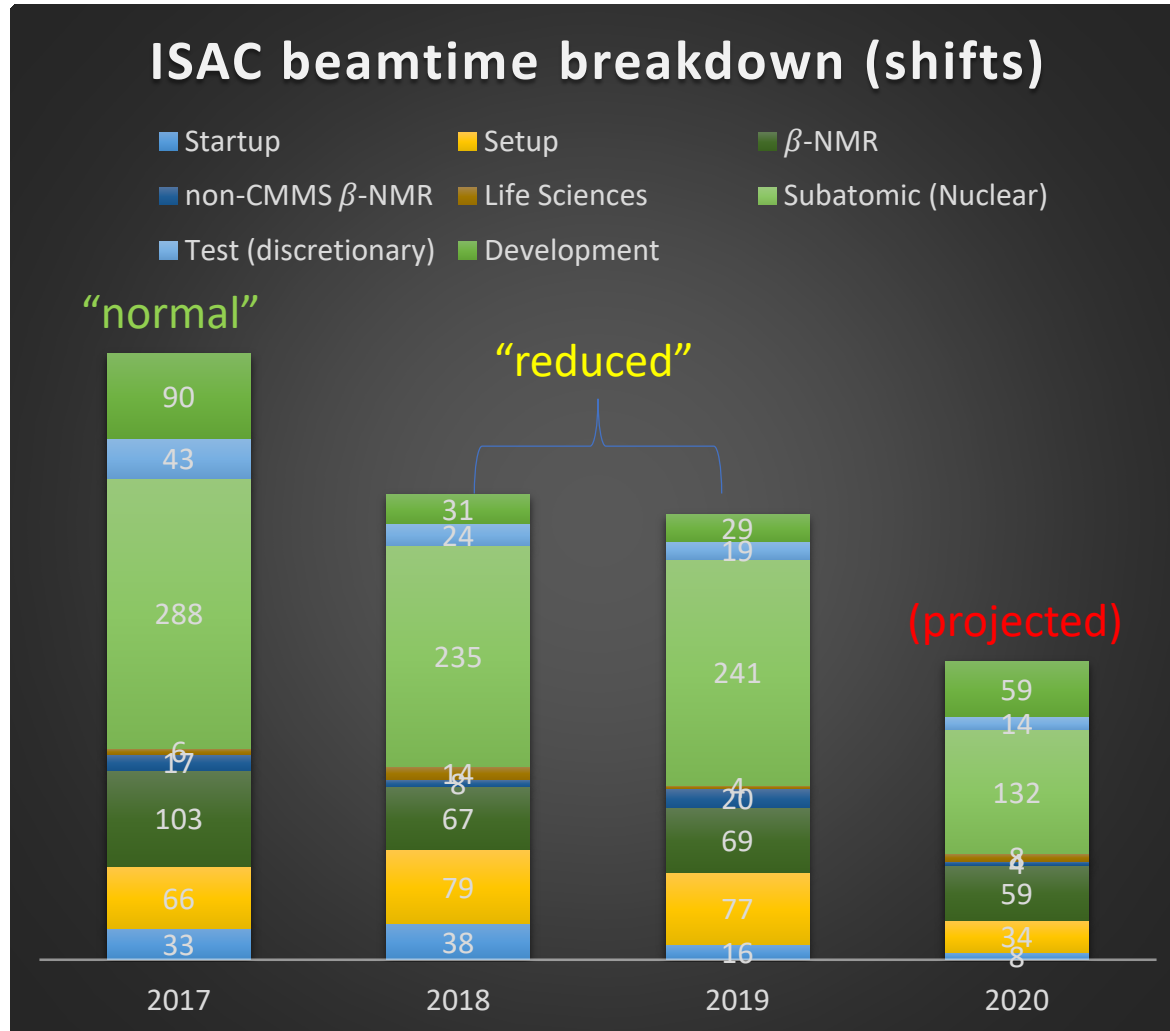


Managing Accelerator Operations in the different phase of the pandemic

- Training of RIB operators to augment medical isotope production
- Access restrictions to the Driver Control Room (DCR)
Member of expert groups (Controls, Diagnostics etc) must wear N95 masks if they have to work in the DCR.
- Focus on essential maintenance and break fixes for isotope production in phase 1
- Management of work forces for additional projects to prepare operation via divisional spread sheets in phase 2
- RIB control room staffed with a single operator



PSD Activities and Research: 2020: Effect on ISAC Beam Schedule



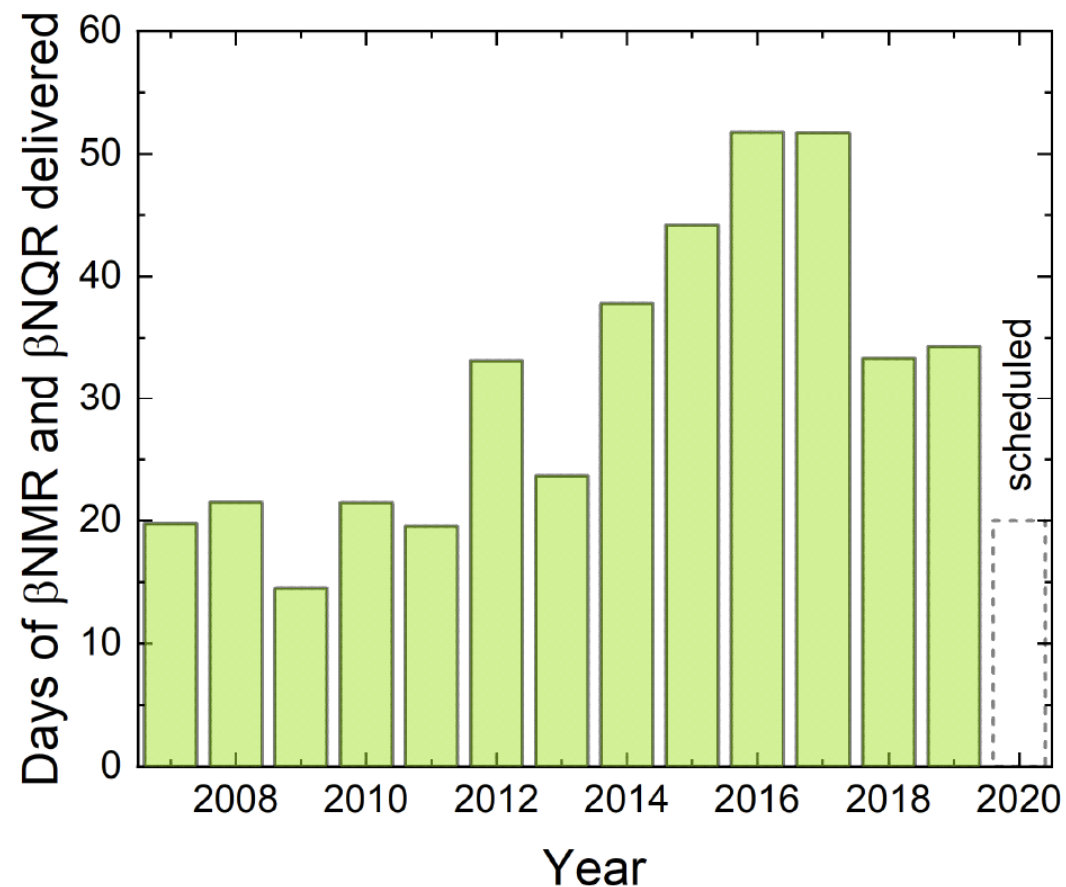
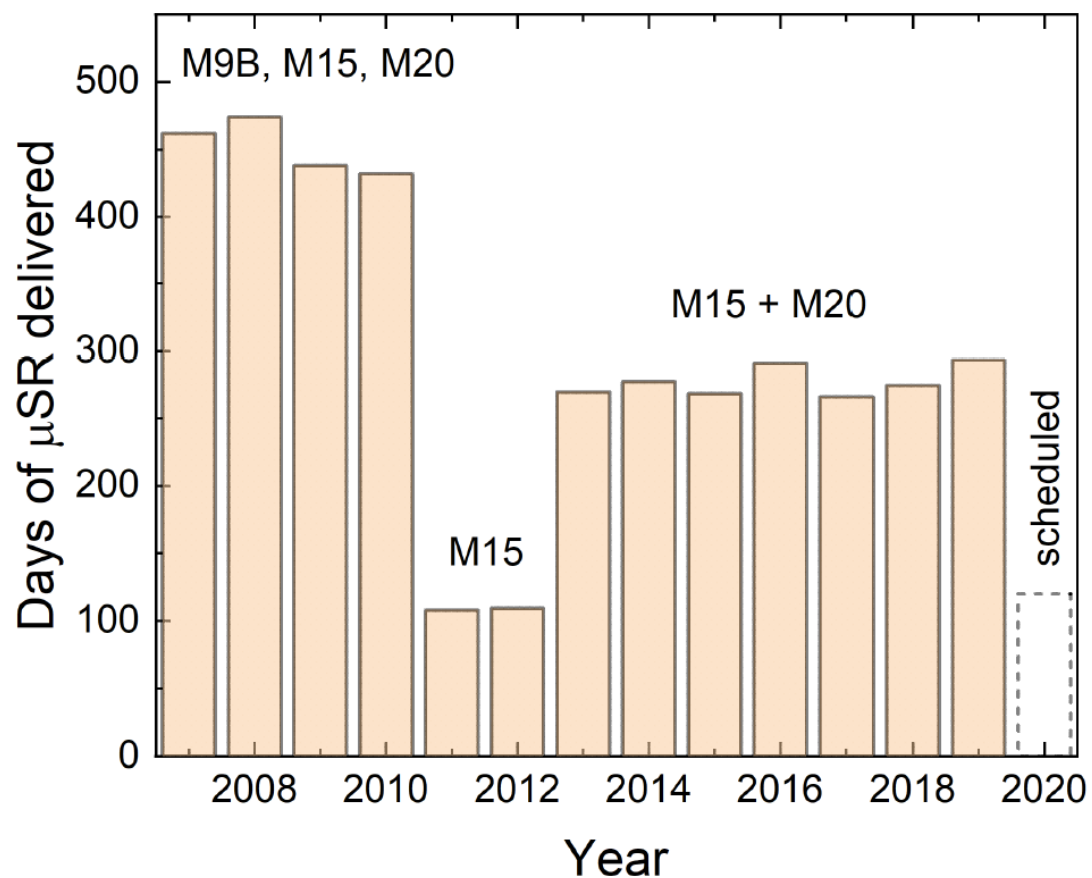
- Original (pre-COVID) scheduled ISAC start-up was April 22nd
- “Lockdown” start-up originally July 4th
- Further COVID-19 precautions + Linde compressor replacement + BL2A monitor failure → Aug 25th ISAC RIB to experiments
- Result is that this will absolutely be a shorter year for beam-time than a “reduced” year
- Many opportunities delayed/postponed
- **However, we did manage to schedule substantial program of experiments with core local personnel, elements of remote running**

2020: Effect on ISAC Beam Schedule; an example of catching up on publishing...

FACILITY / GROUP	Published since March 2020	Accepted for publication	Submitted to Journal	In preparation/ Under analysis	TOTALS
Gamma-Ray Spectroscopy	0	4	4	1	9
TITAN	6	0	1	12	19
EMMA/TIGRESS	0	0	0	2	2
Astro (DRAGON etc)	2	1	1	9	13
Laser Spec	0	0	0	1	1
External Experiments	1	0	0	1	2
TRINAT	0	0	0	2	2
BeEST	1	0	0	0	1
OSAKA	0	0	1	0	1
TOTALS	10	5	7	28	50

Molecular and Material Science and Quantum Material Schedule Impact

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Significant reduction and focus on core-personal executed (on-site) research and enhanced remote capabilities.

Some thoughts on remote experiment operation:

- Facilities are by and large “failsafe”, i.e. incident causes interlock trip → system goes in static mode → then requires either (a) response by ISAC Operator (b) response by Experimenter/Facility Coordinator
- DAQ / on-line analysis can be performed by remote researchers
- Some facilities require more continual monitoring/adjustment, e.g. laser devices
- Sample testing and characterization (CMMS) can be done remotely, BUT this only works if information is fully available for the on-site researcher....that means this has to be an open collaboration and will not work as a mail-in service (TRIUMF is too specialized and customized...)
- Take cyber-security into account; is there information accessible that you need to keep safe (the TRIUMF accelerator and safety systems are ‘not at risk’)

Off-site projects & research

(some examples)

UCN EDM experiment: TUCAN

- Transport of new UCN source cryostat from manufacturer to KEK, important milestone, (after successful vacuum leak tests)



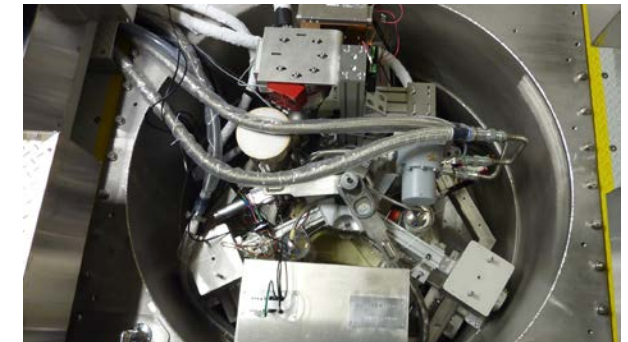
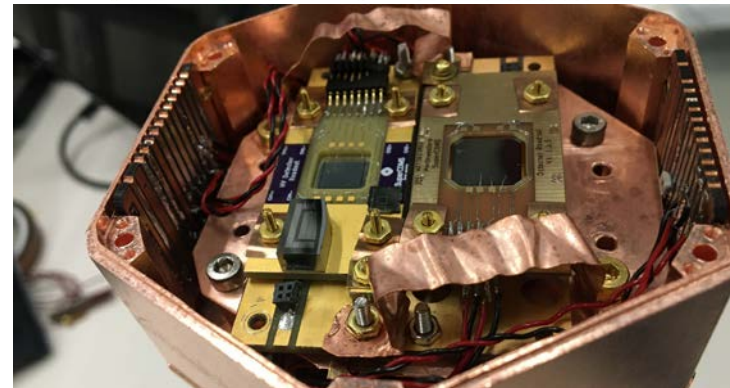
Hyper-K experiment:

- Construction of the entrance yard is progressing in Japan



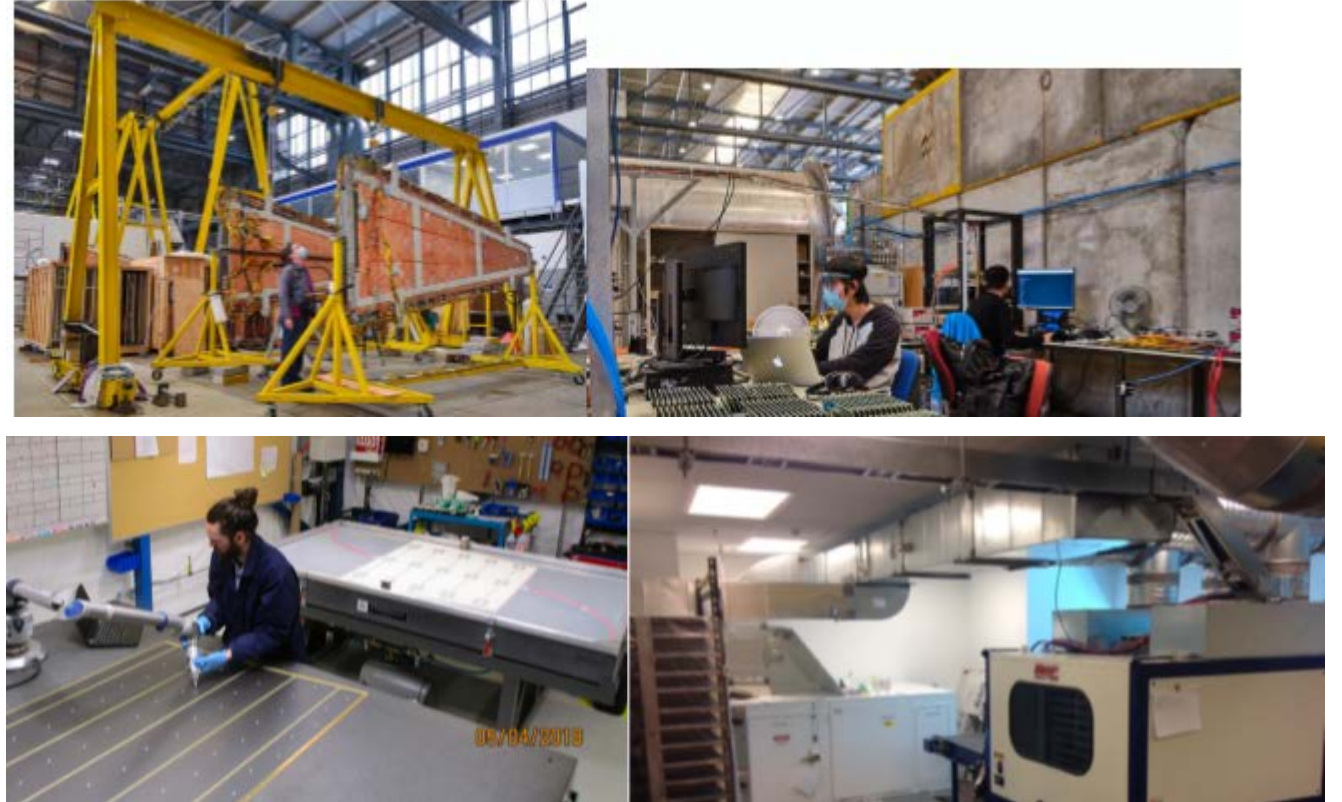
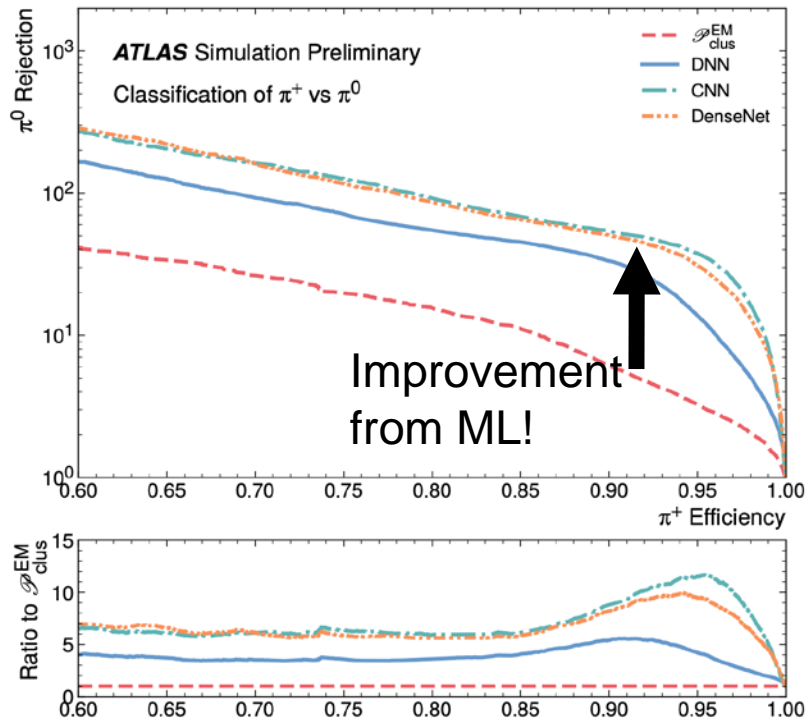
SuperCDMS experiment:

- Testing starting up at SNOLAB
- Restart of CUTE



ATLAS upgrade + Machine Learning

New [ATLAS results released](#) using Machine Learning for pion identification and calibration



ATLAS upgrades: at CERN and TRIUMF
New Small Wheel system fabrication and installation

Other feedback and ideas (from PS division)

‘Positives’

- Inclusion of more off-site people in meetings and beam times.
- Many people have worked off-site with e.g. more times with family/partner during stressful times.
- Reduced ‘stress’ on space at TRIUMF
- Virtual meetings can approach in-person with many free and paid online tools (SharePoint/OneDrive, virtual whiteboards like <https://awwapp.com/>).
- Unexpected social opportunities: sharing of pets, babies, knitting projects, etc.

‘Negatives’

- Most graduate students and some postdocs do not have an ergonomic home office with sufficient speed internet, (ideally) in a dedicated space.
 - For most students we entered the very private space of their bedrooms. Since BlueJeans and Teams added virtual backgrounds, this is less of an issue.
- The loss of much non-verbal communication and peripheral vision plus the uncomfortable pauses/delays
 - Gauging reactions can be difficult to impossible esp during screen sharing.
- Not yet a good replacement for sitting side by side to pore over stuff in multiple formats.
- Teams can be more intrusive than e.g. knocking on a door, e.g. w.r.t. the "gone for the day" boundary and being unexpectedly in a discussion.
- Re socializing and hallway conversations: less is known about current events at TRIUMF (despite the Town Halls) and find less spontaneous synergies.

Summary

- TRIUMF reacted quickly to keep people and systems safe and secure
- Return To Site and Ramp-up Research, lots of discussions and significant planning.
 - Special efforts to consider special circumstances and thinking about people, too.
 - Great experience to see how the TRIUMF family is coming together.
 - Work on projects and research continued, and some new project emerged.
 - The new phase of remote work/networking has some good features and we should continue to utilize that (conferences, workshops, networks, collaborations) and reduced commuting, etc
- We anticipate a full on-line schedule next year, we think about ways to fully utilize remote opportunities.
- Your feedback is needed

Thank you
Merci

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