

Particle Physics Faculty Meeting

- Agenda
 - News / ACOT 10'
 - Updates from committees and research groups
 - AOB

Important Dates

Dates:	Event
December 5 – 6	TRIUMF BOM Fall 2019 (Board of Management)
December 10 – 13	CNSC Operational Performance Inspection
Dec 25 – Jan 1, 2020	Christmas/Holiday Closure
January 20 – 21, 2020	MMS-EEC
January 30 – 31, 2020	SAP-EEC
January 31	Mid-Winter Celebration, River Rock Show Theatre, Richmond
February 20, 2020	TRIUMF Innovations Board of Directors meeting
February 25 – 26, 2020	KEK-TRIUMF Symposium
April 2 – 4, 2020 (locked down, pending final confirmation)	ACOT Spring 2020 (Advisory Committee on TRIUMF)
April 23 – 24, 2020	TRIUMF BOM Spring 2019 (Board of Management)
April 30, 2020	TRIUMF Innovations Board of Directors meeting
May 7 – 8, 2020	LSPEC
April 30, 2020	TRIUMF Innovations Board of Directors meeting
November 19 – 21, 2020	ACOT Fall 2020 (Advisory Committee on TRIUMF)
December 3 – 4, 2020	TRIUMF BOM Fall 2020 (Board of Management)

Hiring

- Leadership Retreat
 - Move forward with all PSD hires from the -10% scenario
 - Alpha has green light and we are aiming for Spring (May) 2020 for the ad (from Jens)
 - Same for all other divisions
 - Jens preparing addendum for additional requests with UCN as highest priority
 - In addition New Frontier position, 2 joint positions and detector development

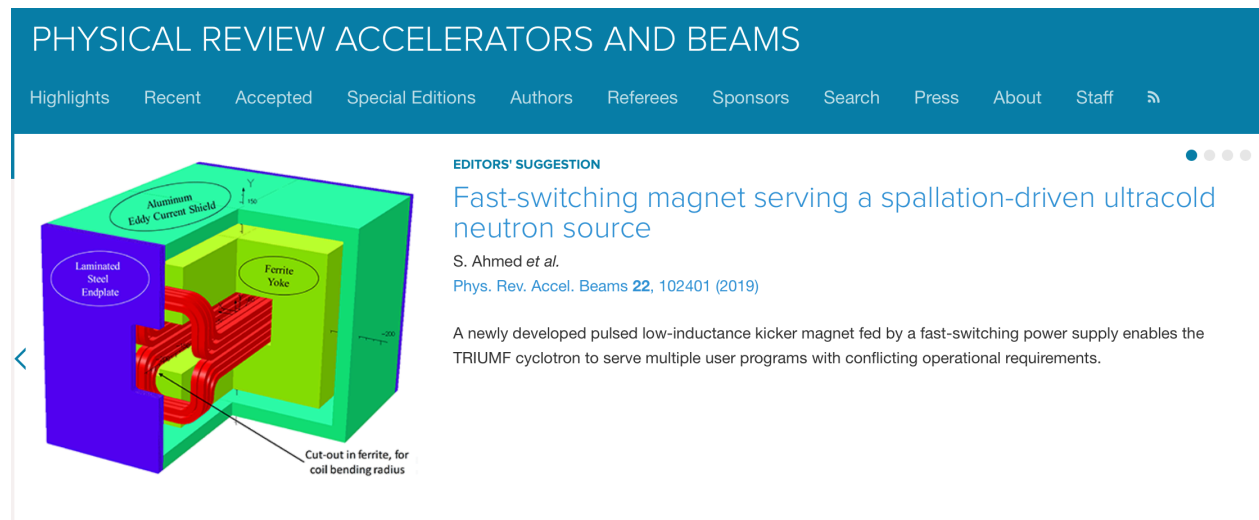
ACOT Agenda – Feedback

- **Particle Physics Parallel Session Friday 9am-11am**
 - Particle Physics: Update 15'+5' Mark Hartz
 - Science and Technology: Update Fabrice Retiere - 10'+5'
 - ATLAS - 5'+3'
 - T2K/HyperK - 5'+3'
 - TUCAN - 5'+3'
 - ALPHA - 5'+3'
 - SuperCDMS - 5'+3'

 - Discussion 45'
 - Space
 - Hiring priorities
 - ...

UCN

- New Publication
- *Fast-switching magnet serving a spallation-driven ultracold neutron source*
- S. Ahmed et al. Phys. Rev. Accel. Beams 22, 102401 – Published October 11



PHYSICAL REVIEW ACCELERATORS AND BEAMS

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EDITORS' SUGGESTION

Fast-switching magnet serving a spallation-driven ultracold neutron source

S. Ahmed *et al.*
Phys. Rev. Accel. Beams **22**, 102401 (2019)

A newly developed pulsed low-inductance kicker magnet fed by a fast-switching power supply enables the TRIUMF cyclotron to serve multiple user programs with conflicting operational requirements.

- One of the editor's suggestion <https://journals.aps.org/prab>

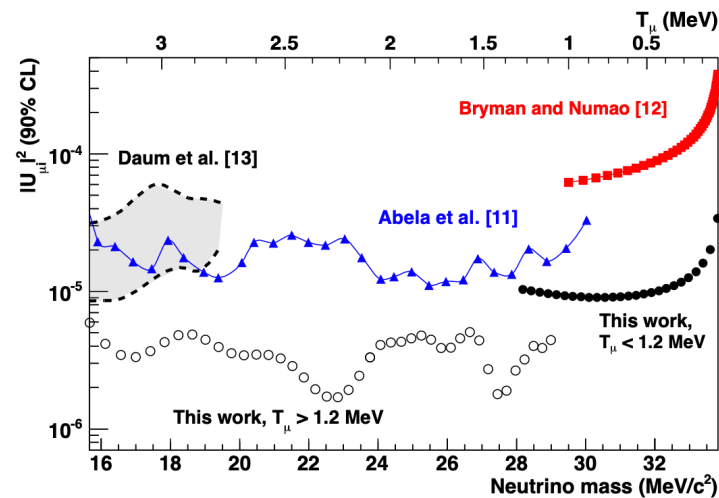
- PSI 2019 - Physics of fundamental Symmetries and Interactions



- TRIUMF well represented and are giving invited review talks:
 - Doug Bryman: Testing lepton flavor universality with pion decays
 - Beatrice Franke: Searching for the electric dipole moment of the neutron - a landscape overview
 - Makoto Fujiwara: Fundamental Physics with Cold Antihydrogen: 20 years of AD and a new era with ELENA

Pienu

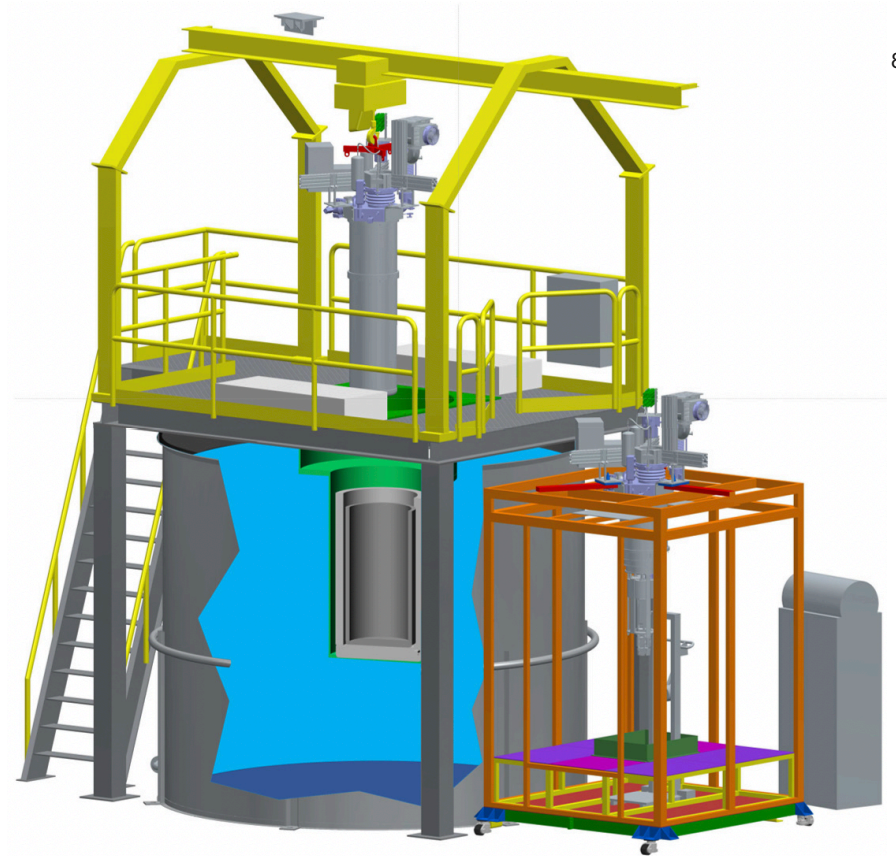
- *Muon neutrino paper Search for Heavy Neutrinos in $\pi \rightarrow \mu \nu$ Decay*
- Published in the issue of Phys. Lett. B798 (2019) 134980
- <https://arxiv.org/abs/1904.03269>



- *New Constraints on Sterile Neutrinos in the MeV to GeV Mass Range*
- Accepted by PRD <https://arxiv.org/abs/1909.11198>

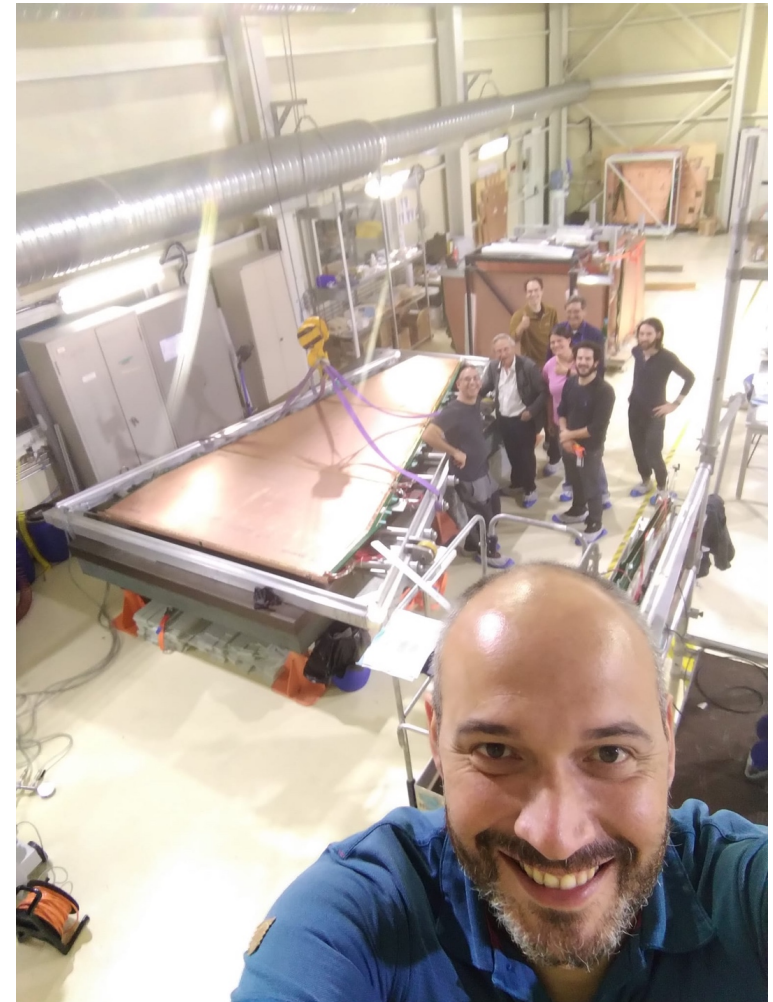
Cute / SuperCDMS

- Installation completed earlier this year
- First commissioning runs in June-July
- First operation with detector end of July
- First full run with detector in September
- New run started end of October; goals:
 - Commission vibration isolation system
 - Study detector noise performance
 - Study detector response to voltage bias



ATLAS

- New Small Wheel Integration at CERN proceeding for Phase 1 Upgrade of ATLAS Muon Spectrometer
- First large sTGC wedge was successfully turned over on Friday
- Picture includes TRIUMF postdocs, engineers and technicians
- TRIUMF responsibility for getting the vacuum-turning tool built- it works
- Has to lift a quarter-ton wedge without putting any strain on the frame or deforming the quadruplets



UCN

- The UCN beam time 2019 was concluded prematurely due to a clogging in the UCN source cryostat. We are currently investigating the cause.
- In the first 14 days of beam time we tested new hardware for the new UCN source.
- 1) An improve neutron storage valve for the source showed a three-fold increase in neutron storage lifetime. It is ready for installation in the new source.
- 2) Cryo- and radiation-compatible UCN guides and their flanges were successfully tested.
- 3) Two novel experimental techniques were explored and are currently analyzed.
- The clogging cost us 18 days of beam time, so experiments with the improved superconducting polarizer, the new UCN beam switcher and an EDM cell prototype have to be post-poned to a future beam time.

X17

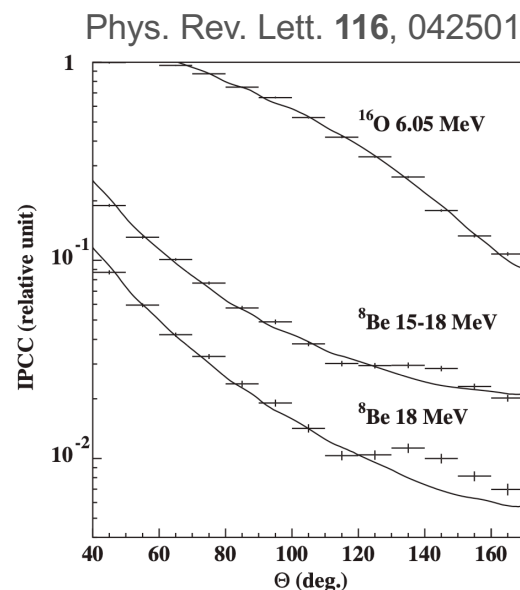
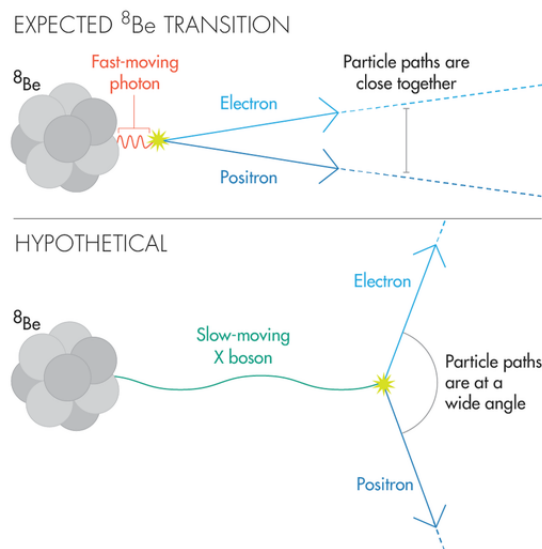
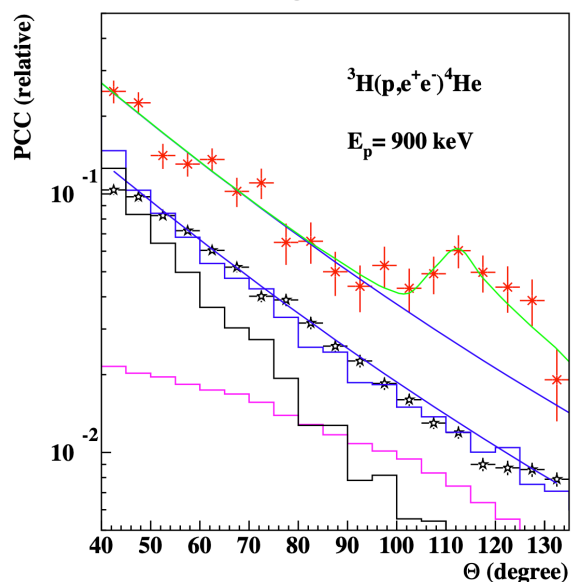
New evidence supporting the existence of the hypothetical X17 particle

A.J. Krasznahorkay, M. Csatlós, L. Csige, J. Gulyás, M. Koszta, B. Szihalmi, J. Timar, D.S. Firak, A. Nagy, N.J. Sas, A. Krasznahorkay

(Submitted on 23 Oct 2019)

We observed electron–positron pairs from the electro–magnetically forbidden M0 transition depopulating the 21.01 MeV 0^- state in ^4He . A peak was observed in their e^+e^- angular correlations at 115° with 7.2σ significance, and could be described by assuming the creation and subsequent decay of a light particle with mass of $m_{\text{X}}c^2 = 16.84 \pm 0.16(\text{stat}) \pm 0.20(\text{syst})$ MeV and $\Gamma_{\text{X}} = 3.9 \times 10^{-5}$ eV. According to the mass, it is likely the same X17 particle, which we recently suggested [Phys. Rev. Lett. 116, 052501 (2016)] for describing the anomaly observed in ^8Be .

<https://arxiv.org/abs/1910.10459>



Committee Updates

- CFI Submissions
- CAP / PPD
- IPP
- New Initiative Planning
- Seminar/Colloquia
- Safety
- Space
- 5S
- Academic
- Summer schools
- Health & Wellness
- Data Science
- Diversity committee
- Physical Sciences Division Structure
- PPR Working Group

Project News

- ATLAS
- T2K/HyperK
- UCN
- ALPHA
- SuperCDMS
- Pienu
- NA62
- DEAP
- SNO+
- EXO
- HALO
- g-2
- Belle 2
- Theory



Next Meetings

- January 9th 12:30 in the board room